Remedial Investigation Report
LCP Chemicals, Inc. Superfund Site
Linden, New Jersey
Volume II of V
Appendices A through G

Prepared for
ISP Environmental Services, Inc.
500 Hercules Road
Wilmington, Delaware 19808-1599

Revised October 2013

July 2013

Project Number: 137005

Brown AND Caldwell
2 Park Way, Suite 2A
Upper Saddle River, New Jersey 07458

693611

Appendices

Volume II of V

Appendix A Property Transfers
Appendix B Field Operations Plan
Appendix C Well Construction and Soil Boring Logs
- C-1 RI Field Investigation
- C-2 Previous Investigations
- C-3 Off-Site Ditch Logs

Appendix D Hydrogeologic Data
- D-1 Hydraulic Conductivity Reports
- D-2 Hydrographs

Appendix E Wetland Delineation
Appendix F Habitat Assessment Report
Appendix G Representative Photographic Logs

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Appendix I Data Validation Reports
Appendix J Tabular Summary of Analytical Data
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Appendix O Human Health Risk Assessment
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Appendix A: Property Transfers

TABLE OF DOCUMENTS SUPPLIED

No.	Date	Book	Page	Grantee	Grantor	Description	Property	Easement
1	7/27/1909	533	233	Borough of Linden	Grasselli Chemical Company	trunk sewer line through property to Staten Island Sound		X
2	9/27/1909	533	589	Borough of Linden	Tremley Point Corporation	Trunk Sewer line through property		X
3	2/28/1912	588	499	Borough of Linden	Edward F. Robinson	Trunk Sewer line through property		X
4	10/20/1928	1165	576	Grasselli Dyestuff Corporation	The Grasselli Chemical Company	conveys two tracts as shown	X	
5	10/20/1928	1165	582	Grasselli Dyestuff Corporation	The Grasselli Chemical Company	conveys two tracts as shown	X	
6	11/30/1928	1162	250	E.I. duPont de Nemours and Company	The Grasselli Chemical Company	conveys lands not previously conveyed to Grasselli Dystuff Corp. (exceptions to Tract 5)	X	
7	10/31/1939	1391	302	General Aniline & Film Corporation	General Aniline & Film Corporation	consolidates and renames General Aniline Works And American I.G. Chemicals into General Aniline & Film	X	
8	5/5/1942	1458	210	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	additional acquisition from DuPont	X	
9	9/15/1949	1776	7	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	additional acquisition from DuPont	X	
10	7/7/1950	1847	79	duPont de Nemours	Central Railroad Company of New Jersey	irrevocable license to keep, maintain and use a private access road across railroad property		X
11	4/18/1951	1898	168	Linden Roselle Sewerage Authority	Sinclair Refining Company	Block 587, Lots 5 & 21	X	
12	1/27/1958	2356	834	General Aniline & Film Corporation	Central Railroad Company of New Jersey	copy not included, believed to convey the railroad property highlighted	X	
13	7/9/1963	2548	319	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	Block 587, Lots 2.01, 2.02	X	
14	1/10/1964	2681	229	City of Linden	General Aniline & Film Corporation	easement for 36" Linden storm sewer		X
15	11/19/1965	2771	858	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to maintain and use pipeline bridge and pipelines crossing railroad (location uncertain)		X
16	11/19/1965	2771	862	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to use roadway crossing railroad (location uncertain)		X
17	1/19/1967	2794	745	General Aniline & Film Corporation	The Central Railroad Company of New Jersey	conveys two tracts as shown	X	
18	5/15/1967	2802	839	General Aniline & Film Corporation	Allied Chemical Corporation	(see next below) - assigns all previous agreements in area from Allied to G. A. & F.		X
19	5/15/1967	2802	536	General Aniline & Film Corporation	Allied Chemical Corporation	transfers ownership of southeasterly portion of G.A.& F property	X	
20	11/3/1967	2821	929	Union Carbide Corporation	General Aniline & Film Corporation	pipeline easement in railraod R.O.W.		X
21	8/20/1970	2909	697	Elizabethtown Gas Company	GAF Corporation	easement following Centerline of Gas Main on north & west sides of property		X
22	2/24/1971	2917	226	Elizabethtown Water Company	GAF Corporation	amending previous ROW and easement made on 2/26/65 db2736 p999		X
23	6/1/1971	2924	209	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 DB 2681 PG 225		X
24	8/12/1971	2928	677	Buckeye Pipe Line Company	GAF Corporation	petroleum pipeline easement on west side of property		X
25	4/17/1972	2946	162	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 db2681 p225 and 8/1/71 (above)		X
26	7/21/1972	3093	335	Kuehne Chemical Company, Inc.	Linden Chlorine Products, Inc.	cross easement agreement between LCP and Kuehne Chemical Co. (lessor)		X
27	8/24/1972	2954	273	Linden Chlorine Products	GAF Corporation	P.Q. deed for LCP. Lots 3.01, 3.02, 3.03 Block 587, references many easements in last 2 pages	X	
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29	8/24/1972	2954	296	Linden Chlorine Products	GAF Corporation	reciprocal rights over various roadways		X
30	8/24/1972	2954	312	Linden Chlorine Products	GAF Corporation	rights to use railroad tracks.		X
31	8/24/1972	2954	323	Linden Chlorine Products	GAF Corporation	rights to use Utility Poles and install new ones		X
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33	8/24/1972	2954	340	GAF Corporation	Linden Chlorine Products	right to use flume and outfall ditch for disposal of its wastewater		X
34	1/17/1974	2995	280	Northville Linden Terminal Corp.	GAF Corporation	rights to driveway/road		X
35	5/8/1975	3033	986	Elizabethtown Water Company	Linden Chlorine Products	two 10' wide water main easements		X
36	5/22/1975	3034	974	Northville Linden Terminal Corp.	GAF Corporation	120' x 50' easement, formerly passed on from LCP to GAF in 1972. DB 2954 PG 331		X
37	3/5/1976	3061	4	Elizabethtown Water Company	Linden Chlorine Products	two 10' wide water main easement.		X
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41	8/11/1983	3331	219	Linden Chlorine Products	Kuehne Chemical Company	quit-claim deed releases rights, ROWs, easements and right to purchase... lease made 7/21/1972, db3093 p335		X
42	9/17/1986	3499	97	GAF Corporation	Linden Chlorine Products	GAF is now leasing the substation from LCP		X
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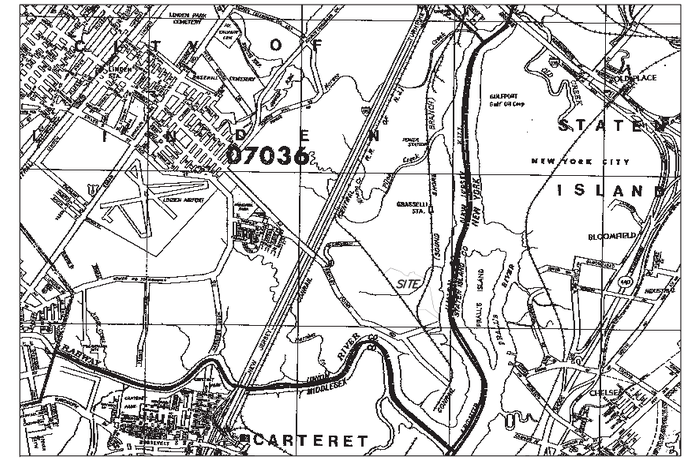
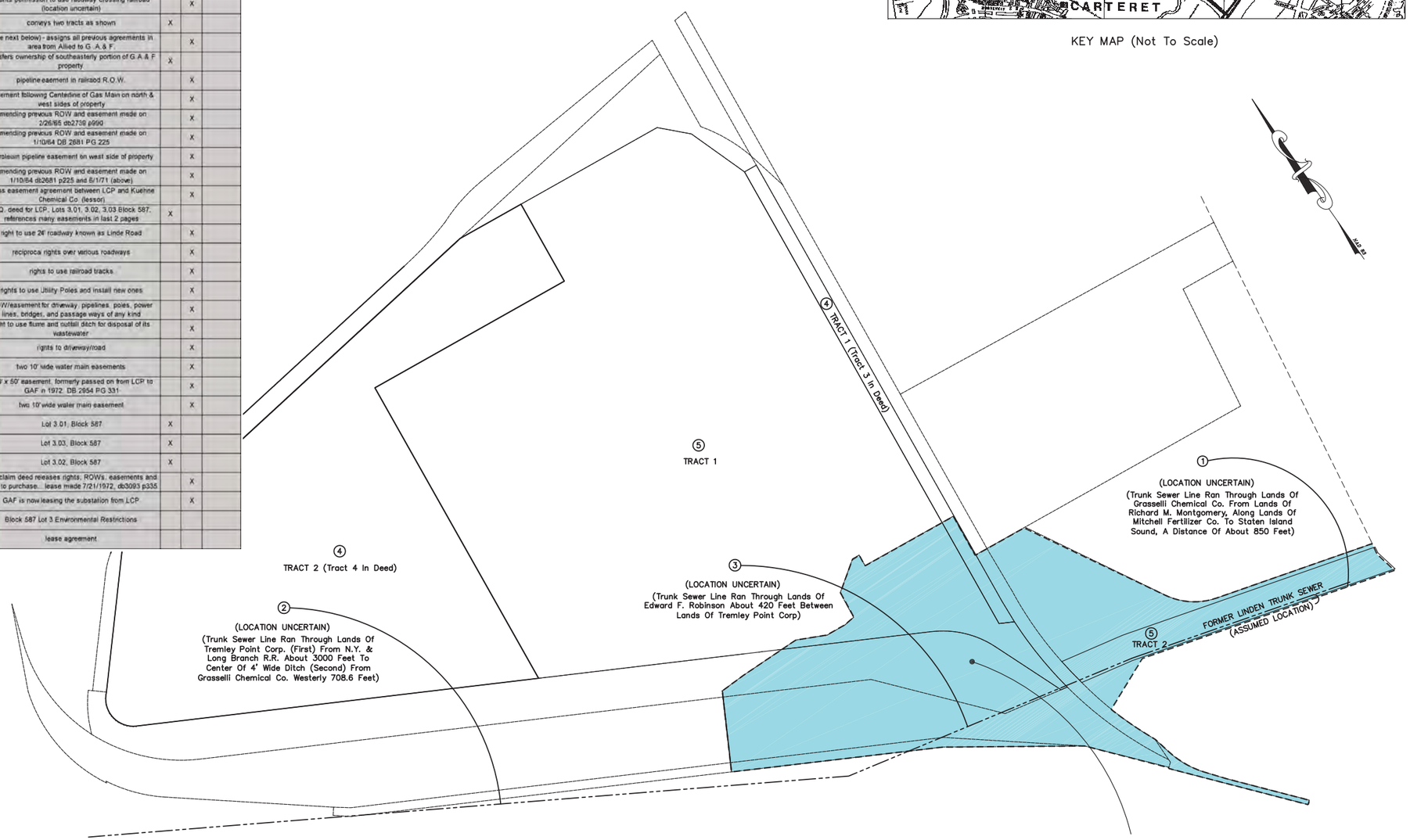


KEY MAP (Not To Scale)



GRASSELLI DYESTUFF CORPORATION – PRIOR TO 1939 LCP SITE

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Keller & Kirkpatrick Certificate of Authorization #24GA28001400
301 Gibraltar Drive, Suite 2A, Morris Plains, NJ. 07950 973-377-8500
CONSULTING ENGINEERS
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CHRONOLOGICAL DEED PLOTTING
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21	8/20/1970	2909	697	Elizabethtown Gas Company	GAF Corporation	easement following Centerline of Gas Main on north & west sides of property		X
22	2/24/1971	2917	226	Elizabethtown Water Company	GAF Corporation	amending previous ROW and easement made on 2/26/65 db2756 p690		X
23	6/1/1971	2924	209	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 DB 2681 PG 225		X
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E.I. DUPONT DE NEMOURS & COMPANY – 1928

LCP SITE

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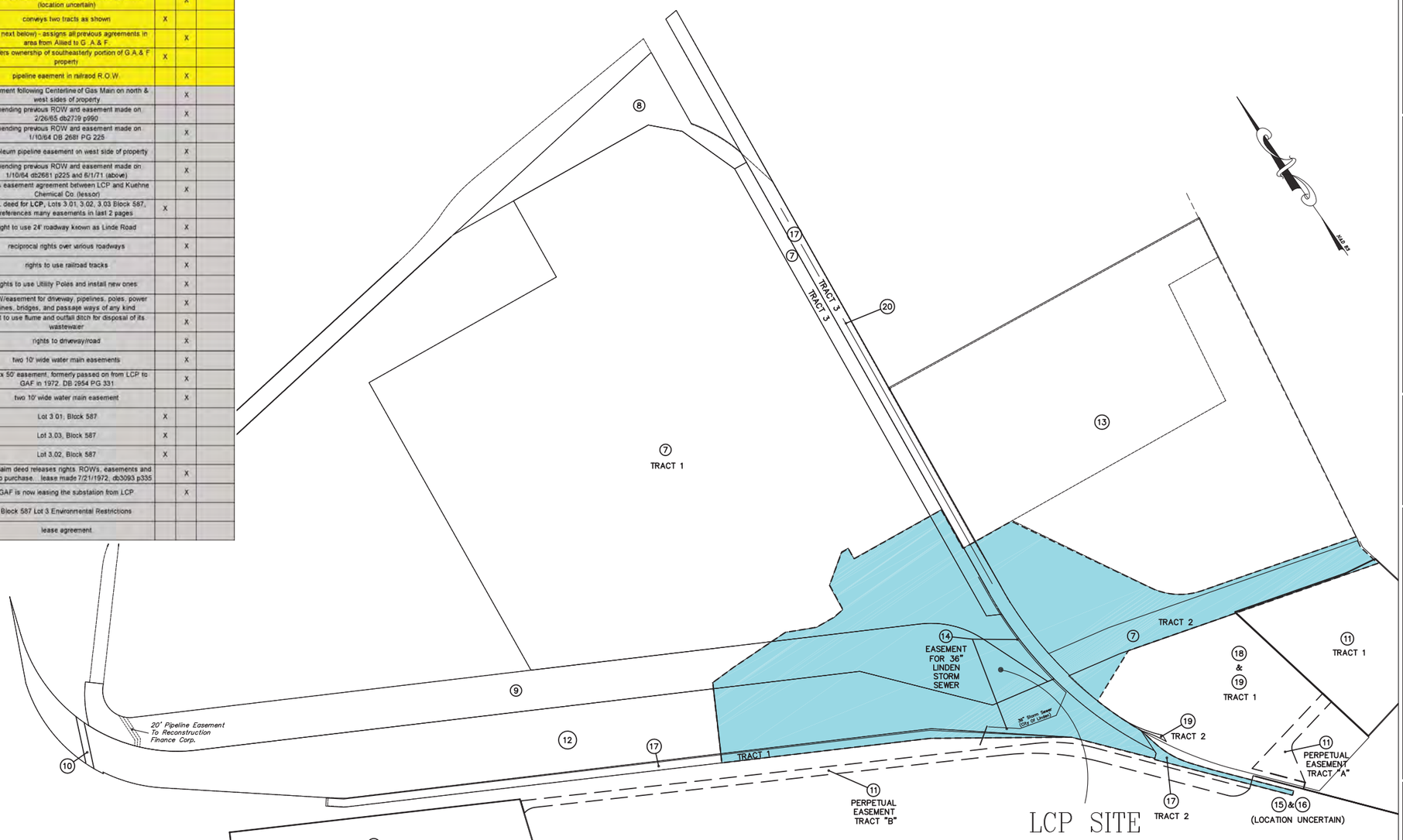

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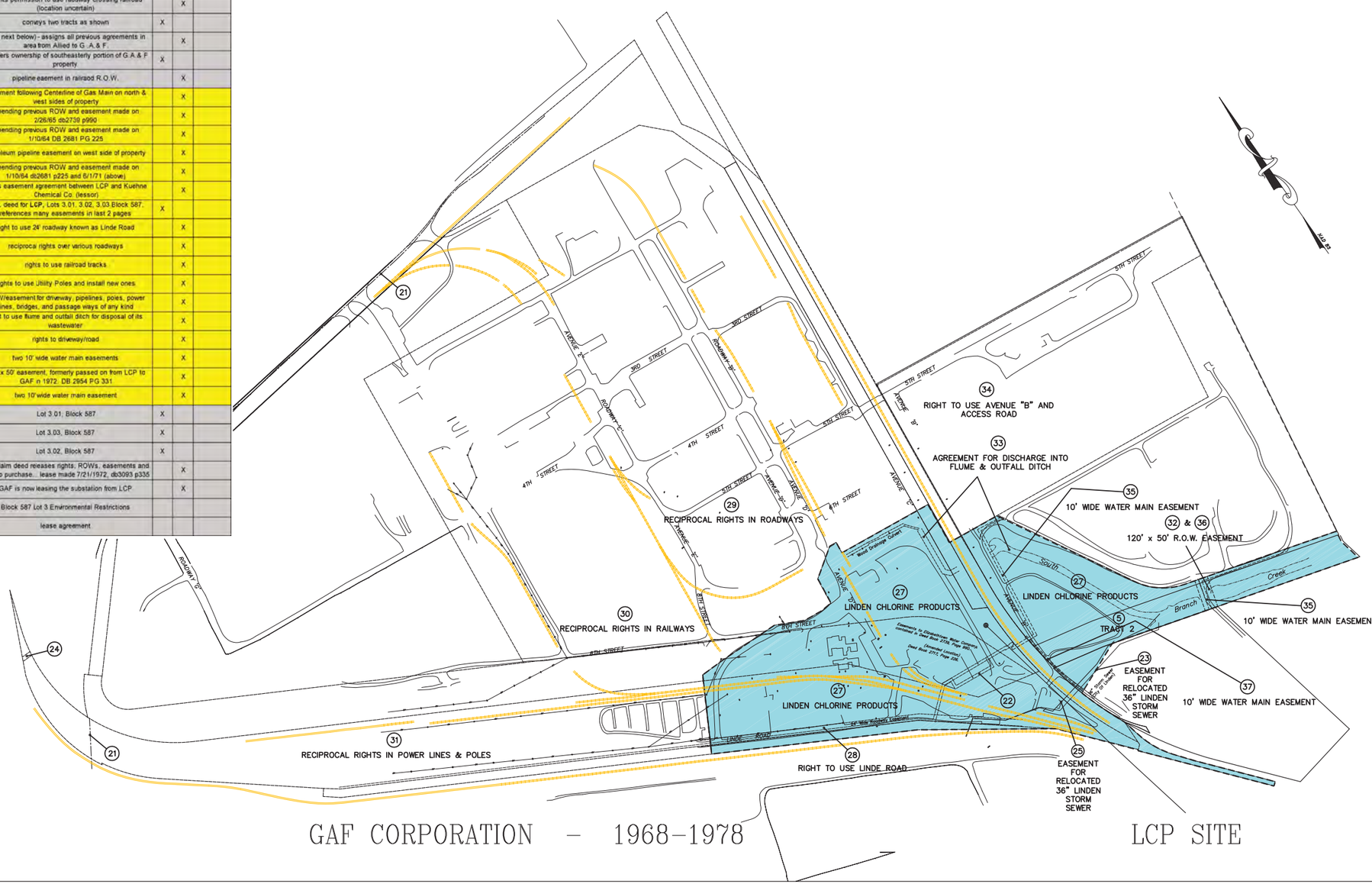
11	4/18/1951	1898	168	Linden Roselle Sewerage Authority	Sinclair Refining Company	Block 587, Lots 5 & 21	X	
12	1/27/1958	2356	834	General Aniline & Film Corporation	Centra Railroad Company of New Jersey	copy not included, believed to convey the railroad property highlighted	X	
13	7/9/1963	2548	319	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	Block 587, Lots 2.01, 2.02	X	
14	1/10/1964	2681	229	City of Linden	General Aniline & Film Corporation	easement for 36" Linden storm sewer		X
15	11/19/1965	2771	858	Allied Chemical Corporation	Centra Railroad Company of New Jersey	grants permission to maintain and use pipeline bridge and pipelines crossing railroad (location uncertain)		X
16	11/19/1965	2771	862	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to use roadway crossing railroad (location uncertain)		X
17	1/19/1967	2794	745	General Aniline & Film Corporation	The Central Railroad Company of New Jersey	conveys two tracts as shown	X	
18	5/15/1967	2802	839	General Aniline & Film Corporation	Allied Chemical Corporation	(see next below) - assigns all previous agreements in area from Allied to G. A. & F.		X
19	5/15/1967	2802	536	General Aniline & Film Corporation	Allied Chemical Corporation	transfers ownership of southeasterly portion of G.A.& F property	X	
20	11/3/1967	2821	929	Union Carbide Corporation	General Aniline & Film Corporation	pipeline easement in railraod R.O.W.		X
21	8/20/1970	2909	697	Elizabethtown Gas Company	GAF Corporation	easement following Centerline of Gas Main on north & west sides of property		X
22	2/24/1971	2917	226	Elizabethtown Water Company	GAF Corporation	amending previous ROW and easement made on 2/26/65 db2739 p990		X
23	8/1/1971	2924	209	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 DB 2681 PG 225		X
24	8/12/1971	2928	677	Buckeye Pipe Line Company	GAF Corporation	petroleum pipeline easement on west side of property		X
25	4/17/1972	2946	162	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 db2681 p225 and 8/1/71 (above)		X
26	7/21/1972	3093	335	Kuehne Chemical Company, Inc.	Linden Chlorine Products, Inc.	cross easement agreement between LCP and Kuehne Chemical Co. (lessor)		X
27	8/24/1972	2954	273	Linden Chlorine Products	GAF Corporation	P.Q. deed for LCP, Lots 3.01, 3.02, 3.03 Block 587, references many easements in last 2 pages	X	
28	8/24/1972	2954	284	Linden Chlorine Products	GAF Corporation	right to use 24' roadway known as Linde Road		X
29	8/24/1972	2954	296	Linden Chlorine Products	GAF Corporation	reciprocal rights over various roadways		X
30	8/24/1972	2954	312	Linden Chlorine Products	GAF Corporation	rights to use railroad tracks		X
31	8/24/1972	2954	323	Linden Chlorine Products	GAF Corporation	rights to use Utility Poles and install new ones		X
32	8/24/1972	2954	331	GAF Corporation	Linder Chlorine Products	ROW/easement for driveway, pipelines, poles, power lines, bridges, and passage ways of any kind		X
33	8/24/1972	2954	340	GAF Corporation	Linder Chlorine Products	right to use flume and outfall ditch for disposal of its wastewater		X
34	1/17/1974	2995	280	Northvale Linden Terminal Corp.	GAF Corporation	rights to driveway/road		X
35	5/8/1975	3033	986	Elizabethtown Water Company	Linder Chlorine Products	two 10' wide water main easements		X
36	5/22/1975	3034	974	Northvale Linden Terminal Corp.	GAF Corporation	120' x 50' easement, formerly passed on from LCP to GAF in 1972. DB 2954 PG 331		X
37	3/5/1976	3061	4	Elizabethtown Water Company	Linder Chlorine Products	two 10' wide water main easement		X
38	12/14/1979	3207	82	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.01, Block 587	X	
39	12/14/1979	3207	93	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.03, Block 587	X	
40	12/14/1979	3207	97	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.02, Block 587	X	
41	8/11/1983	3331	219	Linden Chlorine Products	Kuehne Chemical Company	quit-claim deed releases rights, ROWs, easements and right to purchase... lease made 7/21/1972, db3093 p335		X
42	9/17/1986	3499	97	GAF Corporation	Linder Chlorine Products	GAF is now leasing the substation from LCP		X
43	9/23/1994	4228	125		Linder Chlorine Products	Block 587 Lot 3 Environmental Restrictions		
44	7/21/1972	3093	335	Kuehne Chemical Company, Inc.	Linder Chlorine Products	lease agreement		



GAF CORPORATION - 1968-1978

LCP SITE

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Keller & Kirkpatrick Certificate of Authorization #24GA28001300
301 Gibraltar Drive, Suite 2A, Morris Plains, NJ. 07950 973-377-8500
CONSULTING ENGINEERS LANDSCAPE ARCHITECTS
LAND SURVEYORS PLANNERS
WERNER A. MALL, Professional Land Surveyor, Lic. 37201
GEORGE F. JAMES, Professional Engineer, Lic. 22834

CHRONOLOGICAL DEED PLOTTING
FOR
LCP Chemicals & Plastics, Inc.
TAX BLOCK 587
CITY OF LINDEN, UNION COUNTY, NEW JERSEY

SHEET No. 4 OF 6

TABLE OF DOCUMENTS SUPPLIED

No.	Date	Book	Page	Grantee	Grantor	Description	Property	Easement
1	7/27/1909	533	233	Borough of Linden	Grasselli Chemical Company	trunk sewer line through property to Staten Island Sound		X
2	9/27/1909	533	586	Borough of Linden	Tremley Point Corporation	Trunk Sewer line through property		X
3	2/28/1912	588	496	Borough of Linden	Edward F. Robinson	Trunk Sewer line through property		X
4	10/20/1928	1165	576	Grasselli Dyestuff Corporation	The Grasselli Chemical Company	conveys two tracts as shown	X	
5	10/20/1928	1165	582	Grasselli Dyestuff Corporation	The Grasselli Chemical Company	conveys two tracts as shown	X	
6	11/30/1928	1162	250	E.I. duPont de Nemours and Company	The Grasselli Chemical Company	conveys lands not previously conveyed to Grasselli Dystuff Corp. (exceptions to Tract 5)	X	
7	10/31/1939	1391	302	General Aniline & Film Corporation	General Aniline & Film Corporation	consolidates and renames General Aniline Works And American I.G. Chemicals into General Aniline & Film	X	
8	5/5/1942	1458	210	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	additional acquisition from DuPont	X	
9	9/15/1949	1776	7	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	additional acquisition from DuPont	X	
10	7/7/1950	1847	79	duPont de Nemours	Central Railroad Company of New Jersey	irrevocable license to keep, maintain and use a private access road across railroad property		X
11	4/18/1951	1898	166	Linden Roselle Sewerage Authority	Sinclair Refining Company	Block 587, Lots 5 & 21	X	
12	1/27/1958	2356	634	General Aniline & Film Corporation	Central Railroad Company of New Jersey	copy not included. believed to convey the railroad property highlighted	X	
13	7/9/1963	2648	319	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	Block 587, Lots 2.01, 2.02	X	
14	1/10/1964	2681	229	City of Linden	General Aniline & Film Corporation	easement for 36" Linden storm sewer		X
15	11/19/1965	2771	858	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to maintain and use pipeline bridge and pipelines crossing railroad (location uncertain)		X
16	11/19/1965	2771	862	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to use raodway crossing railroad (location uncertain)		X
17	1/19/1967	2794	745	General Aniline & Film Corporation	The Central Railroad Company of New Jersey	conveys two tracts as shown	X	
18	5/15/1967	2802	839	General Aniline & Film Corporation	Allied Chemical Corporation	(see next below) - assigns all previous agreements in area from Allied to G.A.& F.		X
19	5/15/1967	2802	536	General Aniline & Film Corporation	Allied Chemical Corporation	transfers ownership of southeaterly portion of G.A.& F property	X	
20	11/3/1967	2821	929	Union Carbide Corporation	General Aniline & Film Corporation	pipeline easement in railraod R.O.W.		X
21	8/20/1970	2909	697	Elizabethtown Gas Company	GAF Corporation	easement following Centerline of Gas Main on north & west sides of property		X
22	2/24/1971	2917	226	Elizabethtown Water Company	GAF Corporation	amending previous ROW and easement made on 2/26/65 db2739 p990		X
23	6/1/1971	2924	209	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 DB 2681 PG 225		X
24	8/12/1971	2928	677	Buckeye Pipe Line Company	GAF Corporation	petroleum pipeline easement on west side of property		X
25	4/17/1972	2946	162	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 db2681 p225 and 6/1/71 (above)		X
26	7/21/1972	3093	335	Kuehne Chemical Company, Inc.	Linden Chlorine Products, Inc.	cross easement agreement between LCP and Kuehne Chemical Co. (lessor)		X
27	8/24/1972	2954	273	Linden Chlorine Products	GAF Corporation	P.Q. deed for LCP, Lots 3.01, 3.02, 3.03 Block 587, references many easements in last 2 pages	X	
28	8/24/1972	2954	284	Linden Chlorine Products	GAF Corporation	right to use 24' roadway known as Linde Road		X
29	8/24/1972	2954	296	Linden Chlorine Products	GAF Corporation	reciprocal rights over various roadways		X
30	8/24/1972	2954	312	Linden Chlorine Products	GAF Corporation	rights to use railroad tracks		X
31	8/24/1972	2954	323	Linden Chlorine Products	GAF Corporation	rights to use Utility Poles and install new ones		X
32	8/24/1972	2954	331	GAF Corporation	Linden Chlorine Products	ROW/easement for driveway, pipelines, poles, power lines, bridges, and passage ways of any kind		X
33	8/24/1972	2954	340	GAF Corporation	Linden Chlorine Products	right to use flume and outfall ditch for disposal of its wastewater		X
34	1/17/1974	2995	280	Northville Linden Terminal Corp.	GAF Corporation	rights to driveway/road		X
35	5/8/1975	3033	986	Elizabethtown Water Company	Linden Chlorine Products	two 10' wide water main easements		X
36	5/22/1975	3034	974	Northville Linden Terminal Corp.	GAF Corporation	120' x 50' easement, formerly passed on from LCP to GAF in 1972. DB 2954 PG 331		X
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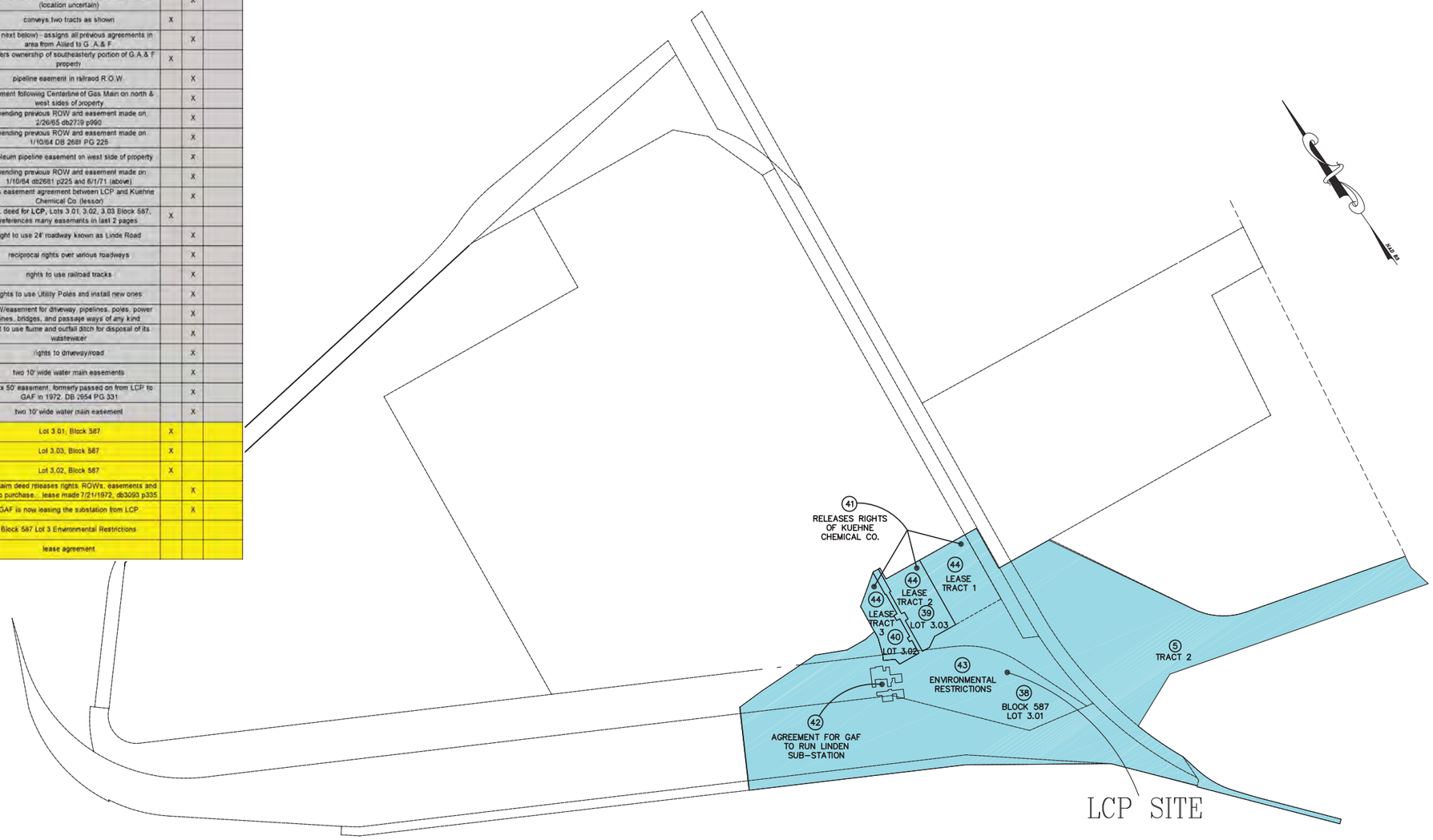
38	12/14/1979	3207	82	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.01, Block 587	X	
39	12/14/1979	3207	93	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.03, Block 587	X	
40	12/14/1979	3207	97	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.02, Block 587	X	
41	8/11/1983	3331	216	Linden Chlorine Products	Kuehne Chemical Company	quit-claim deed releases rights, ROWs, easements and right to purchase... lease made 7/21/1972, db3093 p335		X
42	9/17/1986	3499	97	GAF Corporation	Linden Chlorine Products	GAF is now leasing the substation from LCP		X
43	9/23/1994	4228	125		Linden Chlorine Products	Block 587 Lot 3 Environmental Restrictions		
44	7/21/1972	3093	335	Kuehne Chemical Company, Inc.	Linden Chlorine Products	lease agreement		



LCP CHEMICALS – NEW JERSEY, INC – 1979 TO 1994 & KUEHNE LEASE – 1972

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Keller & Kirkpatrick
Certificate of Authorization #24GA28001500
301 Gibraltar Drive, Suite 2A, Morris Plains, NJ. 07950 973-377-8500
CONSULTING ENGINEERS
LAND SURVEYORS
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WERNER A. MILL, Professional Land Surveyor, Lic. 37201
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CHRONOLOGICAL DEED PLOTTING
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TAX BLOCK 587
CITY OF LINDEN, UNION COUNTY, NEW JERSEY

SHEET No. 5 OF 6

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2	9/27/1909	533	589	Borough of Linden	Tremley Point Corporation	Trunk Sewer line through property		X
3	2/28/1912	588	499	Borough of Linden	Edward F. Robinson	Trunk Sewer line through property		X
4	10/20/1928	1165	576	Grasselli Dyestuff Corporation	The Grasselli Chemical Company	conveys two tracts as shown	X	
5	10/20/1928	1165	582	Grasselli Dyestuff Corporation	The Grasselli Chemical Company	conveys two tracts as shown	X	
6	11/30/1928	1162	250	E.I. duPont de Nemours and Company	The Grasselli Chemical Company	conveys lands not previously conveyed to Grasselli Dystuff Corp. (exceptions to Tract 5)	X	
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8	5/5/1942	1455	210	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	additional acquisition from DuPont	X	
9	9/15/1949	1776	7	General Aniline & Film Corporation	E.I. duPont de Nemours and Company	additional acquisition from DuPont	X	
10	7/7/1950	1847	79	duPont de Nemours	Central Railroad Company of New Jersey	irrevocable license to keep, maintain and use a private access road across railroad property		X
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14	1/10/1964	2681	229	City of Linden	General Aniline & Film Corporation	easement for 36" Linden storm sewer		X
15	11/19/1965	2771	858	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to maintain and use pipeline bridge and pipelines crossing railroad (location uncertain)		X
16	11/19/1965	2771	862	Allied Chemical Corporation	Central Railroad Company of New Jersey	grants permission to use roadway crossing railroad (location uncertain)		X
17	1/19/1967	2794	745	General Aniline & Film Corporation	The Central Railroad Company of New Jersey	conveys two tracts as shown	X	
18	5/15/1967	2802	839	General Aniline & Film Corporation	Allied Chemical Corporation	(see next below) - assigns all previous agreements in area from Allied to G.A.& F.		X
19	5/15/1967	2802	536	General Aniline & Film Corporation	Allied Chemical Corporation	transfers ownership of southeasterly portion of G.A.& F property	X	
20	11/3/1967	2821	929	Union Carbide Corporation	General Aniline & Film Corporation	pipeline easement in railroad R.O.W.		X
21	8/20/1970	2909	697	Elizabethtown Gas Company	GAF Corporation	easement following Centerline of Gas Main on north & west sides of property		X
22	2/24/1971	2917	226	Elizabethtown Water Company	GAF Corporation	amending previous ROW and easement made on 2/26/65 db2739 p990		X
23	6/1/1971	2924	209	City of Linden	GAF Corporation	amending previous ROW and easement made on 1/10/64 DB 2681 PG 225		X
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27	8/24/1972	2954	273	Linden Chlorine Products	GAF Corporation	P.Q. deed for LCP, Lots 3.01, 3.02, 3.03 Block 587, references many easements in last 2 pages	X	
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30	8/24/1972	2954	312	Linden Chlorine Products	GAF Corporation	rights to use railroad tracks		X
31	8/24/1972	2954	323	Linden Chlorine Products	GAF Corporation	rights to use Utility Poles and install new ones		X
32	8/24/1972	2954	331	GAF Corporation	Linden Chlorine Products	ROW/easement for driveway, pipelines, poles, power lines, bridges, and passage ways of any kind		X
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35	5/8/1975	3033	986	Elizabethtown Water Company	Linden Chlorine Products	two 10' wide water main easements		X
36	5/22/1975	3034	974	Northville Linden Terminal Corp.	GAF Corporation	120' x 50' easement, formerly passed on from LCP to GAF in 1972. DB 2954 PG 331		X
37	3/5/1976	3061	4	Elizabethtown Water Company	Linden Chlorine Products	two 10' wide water main easement		X
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39	12/14/1979	3207	93	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.03, Block 587	X	
40	12/14/1979	3207	97	LCP Chemicals--New Jersey, Inc.	LCP Chemicals & Plastics, Inc	Lot 3.02, Block 587	X	
41	8/11/1983	3331	219	Linden Chlorine Products	Kuehne Chemical Company	quit-claim deed releases rights, ROWs, easements and right to purchase.. lease made 7/21/1972, db3093 p335		X
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43	9/23/1994	4228	125		Linden Chlorine Products	Block 587 Lot 3 Environmental Restrictions		
44	7/21/1972	3093	335	Kuehne Chemical Company, Inc.	Linden Chlorine Products	lease agreement		

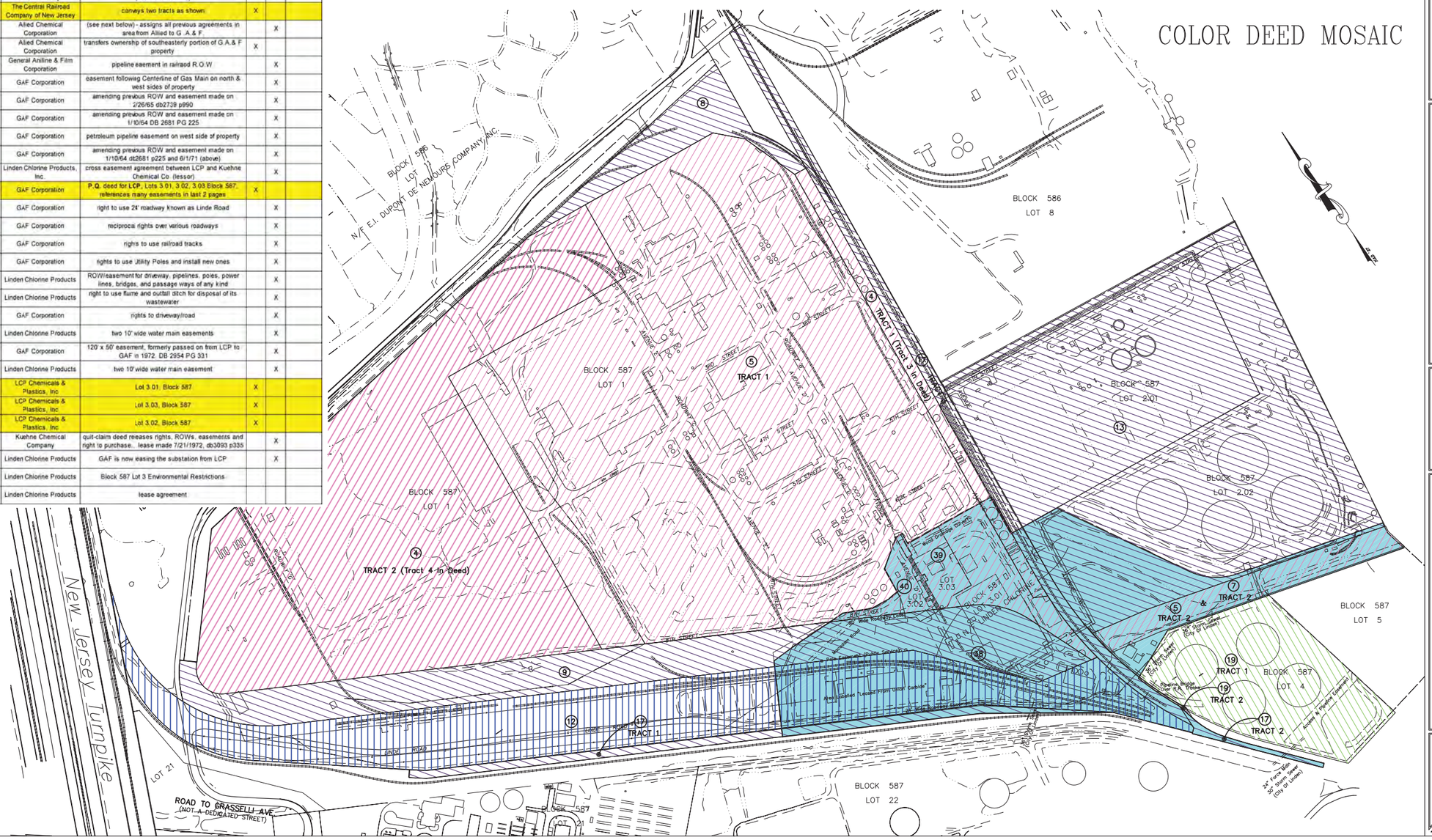
COLOR CHART

- GRASSELLI CHEMICAL COMPANY TO GRASSELLI DYESTUFF CORPORATION – PRIOR TO 1928 (4) & (5)
- TRANSFERRED FROM E.I. DUPONT DE NEMOURS & CO. TO GENERAL ANILINE & FILM CORPORATION – 1940–1963 (8) (9) & (13)
- TRANSFERRED FROM CENTRAL RILROAD CO. OF N.J. TO GENERAL ANILINE & FILM COROPORATION – 1958 (12)
- TRANSFERRED FROM ALLIED CHEMICAL CORP. TO G A F CORPORATION – 1967 (19)
- CONVEYED BY GAF CORPORATION TO LINDEN CHLORINE PRODUCTS – 1972 (27)
  & CONVEYED BY LINDEN CHLORINE PRODUCTS TO L C P CHEMICALS–NEW JERSEY, INC. – 1979 (38) (39) & (40)

CORPORATE NAME CHANGES

GRASSELLI DYESTUFF CORPORATION WAS INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE. ON FEBRUARY 27, 1929, IT CHANGED ITS NAME TO GENERAL ANILINE WORKS, INC. ON OCTOBER 30, 1939, IT BECAME KNOWN AS GENERAL ANILINE & FILM CORPORATION. ON OCTOBER 31, 1939, IT MERGED INTO AMERICAN I.G. CHEMICAL CORPORATION. ON APRIL 24, 1968, IT CHANGED ITS NAME TO GAF CORPORATION. ON AUGUST 24, 1972, GAF CONVEYED PROPERTY TO LINDEN CHLORINE PRODUCTS, INC. ON DECEMBER 14, 1979, LCP CHEMICALS & PLASTICS, INC. CONVEYED ITS PROPERTY TO LCP CHEMICALS–NEW JERSEY, INC.

NOTE: NOTE: SITE INTERIOR DETAILS SHOWN HEREON REPRESENT SITE CONDITIONS AS OF THE AERIAL SURVEY PERFORMED ON 4/05/02 AND DO NOT REFLECT PRESENT SITE CONDITIONS.



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CHRONOLOGICAL DEED PLOTTING
FOR
LCP Chemicals & Plastics, Inc.
TAX BLOCK 587
CITY OF LINDEN, UNION COUNTY, NEW JERSEY

SHEET No. 6 OF 6

Appendix B: Field Operations Plan

FIELD OPERATIONS PLAN
FIELD PROCEDURES
LCP CHEMICALS SUPERFUND SITE
LINDEN, NEW JERSEY

Prepared for
ISP Environmental Services Inc.
1361 Alps Road
Wayne, New Jersey 07470

August 2008

Project Number: 135451.103

BROWN AND CALDWELL

110 Commerce Drive
Allendale, New Jersey 07401

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Figure 1 Typical Multiple-Cased Bedrock Well Installations

1. INTRODUCTION

The field methods utilized for the Remedial Investigation (RI) field investigation at the LCP Chemicals Inc., Superfund Site (LCP site) are described, herein in Section 2. Section 2 represents the consolidation of the following six (6) USEPA-approved documents:

1. "Final Sampling and Analysis Plan, Field Operations Plan, Part I, Draft Sampling and Analysis Plan", (URS, April 12, 2001).
2. "Addendum No. 1, Field Operations Plan for the LCP Chemicals, Inc. Superfund Site, Cased Deep Borings", (Brown and Caldwell, October 2001).
3. "Addendum No. 2, Field Operations Plan for the LCP Chemicals, Inc., Superfund Site, Subsurface Utility Clearance", (Brown and Caldwell, November, 2001).
4. "Addendum No. 3, Field Operations Plan for the LCP Chemicals, Inc. Superfund Site, Sampling Beneath Buildings 230 and 240", (Brown and Caldwell, March 2002).
5. "Addendum No. 4, Field Operations Plan, LCP Chemicals, Inc. Superfund Site (Bedrock Monitoring Wells, Soil Vapor Testing, Groundwater Sampling)", (Brown and Caldwell, April 2006, Revised October 2006).
6. "Addendum No. 5, Field Operations Plan for the LCP Chemicals, Inc. Superfund Site, Ecological Sampling", (Brown and Caldwell, August 2006, Revised October 2006).

The text in Section 2 is structured from the original URS (2001) document. However, various sections are inserted and/or superseded by the Brown and Caldwell FOP addenda which are noted, respectively. The tense of the text contained in the original document (generally future tense) has been retained in Section 2. However, it should be noted that tables and figures contained in the aforementioned documents that referred to proposed locations are not provided herein, as they are superseded by information provided in the RI report.

2. FIELD PROCEDURES

The methods and procedures used to conduct the field investigation will be in accordance with standard environmental practice and consistent with current USEPA and NJDEP guidelines and requirements. The investigation will be consistent with guidance contained in the following regulatory documents:

- USEPA Compendium of Superfund Field Operations Methods, 1987
- USEPA CERCLA Quality Assurance Manual, October 1989
- USEPA Low Stress Purging and Sampling Procedure, March 1998
- NJDEP Field Sampling Procedures Manual, 2005
- NJDEP Field Analysis Manual, July 1994
- NJDEP Alternative Ground Water Sampling Techniques Guide, July 1994 (if required)

Changes to the procedures and protocols described in this section may become necessary based on actual conditions encountered in the field. These changes have been accomplished through the inclusion of FOP addenda that were described in Section 1 and noted herein. The USEPA will be informed of major changes to the field program through Technical Memoranda or other forms of communication. Major deviations from the field procedures described below will be documented and a rationale supporting the change will be provided. Proposed modifications will not be implemented in the field without USEPA approval.

2.1 Reconnaissance and Site Preparation Activities

This section describes the activities that will be conducted before the field investigation.

2.1.1 Site Reconnaissance

A reconnaissance of the site was made before the RI to survey the site for potentially hazardous conditions (e.g., exposed waste, overhead obstructions, physical hazards, etc.). Based on the results of the reconnaissance, ISP Environmental Services Inc. developed a work scope to cleanup and remove potential structural and environmental hazards (e.g., presence of potential asbestos containing material, unsafe tank structures, etc.) through an Interim Removal Action (IRA). The IRA began in October 2000 in accordance with an USEPA approved work plan (URS, August 14, 2000). As part of the IRA, the integrity of the cap for the brine sludge lagoon was evaluated. Seven small areas (nominally 5 ft by 5 ft) required erosion control, which consisted of covering the affected area with top soil, seeding, and securing the area with a net. The results of the IRA will be submitted to the USEPA under separate cover.

A survey of South Branch Creek will also be conducted before the RI to determine general sampling accessibility and to perform a preliminary assessment of the ecological resources of the area. The general conditions of the site and surrounding areas will be documented and the information will be used to refine the general approach of the RI.

2.1.2 Development of Site Facilities

A storage, lay-down, and decontamination area will be established west of the main switch yard in the former employee parking lot at the west end of the site. This location has space for equipment, for a decontamination pad, and for drums or tanks of water that will be used to store decontamination and monitoring well development water.

2.1.3 Subsurface Utility Locations

Section 2.1.3 inserted from FOP Addendum No. 2 (Brown and Caldwell, November 2001) – Supersedes Previous Section

New Jersey "One-Call" System Notification

The drilling or excavation contractor will be responsible for contacting the New Jersey "One-Call" System prior to performing any subsurface drilling or excavation work by calling **1-800-272-1000**. The utility company mark outs provided by the "One-Call" service are required to address underground public utility lines (e.g., gas, water, electric, communications, etc.) regardless of whether or not they are on private property. The notification to "One-Call" must be made by the drilling or excavation contractor. This notification may not be made by other parties (e.g., consultant, property owner, government agency, etc.).

It is recognized that LCP Chemicals Inc. Superfund Site is difficult to locate and access. Therefore, special efforts must be made to confirm that the applicable utility companies have evaluated the presence of underground utility lines at the correct site and have performed the appropriate subsurface utility mark-outs, including the following:

- Provide explicit site location directions are provided to the "One-Call" service.
- Obtain a written confirmation from "One-Call" of the notification that includes the "Sequence Number" and a list of the utilities that have been notified.
- Independently determine that applicable utility companies have actually visited the site (e.g., through a review of guardhouse sign-in records, follow up phone conversations, etc.).
- Review the resultant mark-outs in comparison to known underground utility lines at the site.

Existing Site Documents

Previous site documents and utility maps (where available) will be reviewed to provide clearance for the sampling locations.

Supplemental Utility Clearance

Supplemental utility clearance will be performed in the vicinity of each drilling location in addition to the "One-Call" notifications, as described above. This supplemental clearance is required given the uncertainty of the previous mark-outs provided under the "One-Call" system and/or to locate other on site (non-public) utilities. The supplemental utility clearance will be performed with the use of an inductive pipe locator. Alternatively, a radio frequency pipe locator may be used, as applicable. As an additional safety precaution, drilling and excavation activities within the potential utility window (to a depth of approximately eight feet) will proceed at a slower pace to further reduce risk to subsurface utilities.

2.1.4 Identification of Sampling Locations Before Sampling

The RI/FS sampling points will be measured out in the field relative to building corners or other permanent structures using tape measurements. The sampling points will be established in the field using stakes, flags, surveyors paint, or similar methods before the sampling event. The sampling points will be marked clearly and staked securely until such time that the locations are either surveyed or recorded onto a scaled map of the site.

2.2 Soil Investigation Procedures

This section describes the procedures that will be followed when conducting the investigation of soil at the site. Since the subsurface conditions at the site are relatively unknown different drilling methods are described below so that procedures are in place as a contingency.

2.2.1 Collection of Surface Soil Samples

Before collecting a surface soil sample (0-6 inches below the ground surface or 0-12 inches below the ground surface for ecological risk assessment data) the sample location will be carefully cleared by removing any grass layers, surface debris, or upper one centimeter of soil surface, as applicable. In some areas of the site (e.g., the mercury cell buildings) a jackhammer or a concrete coring device will be needed to penetrate concrete pads or floor slabs to expose the ground surface. The soil samples will be collected using decontaminated stainless-steel scoops, hand augers, trowels, or equivalent tools.

The collection of surface samples for VOCs shall be conducted using an Encore™ Sampler in accordance with USEPA requirements. The sampling device is inserted into a freshly exposed soil surface (ground surface or soil core sampler). The 5-gram plug of soil is then capped and sent to the laboratory where it will be preserved, extracted and analyzed. Three Encore™ vials and one unpreserved 60 ml jar (for percent soil moisture measurement) of soil will be collected per sample location.

To satisfy the volume requirements of multiple bottle sets, surface soil samples (other than those collected for VOCs using the Encore™ sampler) will be homogenized either in situ or in a decontaminated stainless steel mixing bowl or tray before being transferred to bottles. A description of the soil data (e.g., soil description, location, time, etc.) will be recorded on a Surface Soil Description Log or the project field book.

2.2.2 Collection of Subsurface Soil Samples from Soil Borings

Soil samples for laboratory analysis will be collected from three general depth intervals. The sampling intervals will be 0.0 to 0.5 ft below the ground surface (bgs), 0.0 to 1.0 ft bgs, and between 1.0 ft bgs and the water table (estimated to be about 6 feet bgs). Surface soil samples collected from the 0.0 to 0.5 ft interval will provide data for the human health risk assessment and surface soil samples collected from the 0.0 to 1.0 ft interval will provide data for the ecological risk assessment. Subsurface soil samples collected from the 1.0 to 6.0 ft. interval will provide data to define the vertical extent of potential contamination in any given area. Each soil boring will be advanced through the fill to a minimum depth of the top of the water table. If native soils are not encountered at the water table, then the boring will be advanced until native soils are penetrated. The boring data will provide information on the thickness of the fill layer across the site.

In general, only one subsurface soil sample for organic analysis and one subsurface soil sample for inorganic analysis will be collected from each soil boring at the site because of the reportedly shallow depth to the water table.

Continuous split-spoon or direct-push samples will be collected from each soil boring. Upon retrieval of the soil sampling device, each sample shall be screened for organic vapors using a photoionization detector (PID) and for mercury using a mercury vapor analyzer (MVA). Calibrating procedures and instructions for using a PID and MVA are provided in Section 2.9.

For each sample interval, when screening results are above the background levels, a soil sample will be collected and temporarily archived for possible chemical analysis. With the exception of soil samples collected for VOC analysis, each sample collected will be stored in one or more "ziplock" bags. Archive samples for VOC analysis will be collected using the EnCore™ Sampler. Each sample will be labeled and stored appropriately on ice until all of the screening results are evaluation.

One organic and one inorganic archived sample from each soil boring will be submitted to the laboratory for analysis, based on the screening readings, discoloration, or odor. Archived samples selected for chemical analysis will be immediately transferred to the appropriate laboratory bottles and stored and handled according to procedures outlined in Section 2.8. The remaining archived samples will be handled in the same manner as the drill cuttings from each soil boring. If contamination is not evident from the field screening, soil samples will not be archived and the laboratory sample will be collected from just above the water table and submitted for analysis.

If analysis for volatile organic compounds is to be performed on a soil sample collected from a particular sampling depth, then the sample for VOC analysis will be collected before the other samples using the collection procedure described in Section 2.2.5 - Collection of Soil Samples for the Analysis of Volatile Organic Compounds. The remaining soil will be collected for the other analyses with a decontaminated stainless steel spoon or scoop (or equivalent sampling device), placed in a decontaminated stainless steel pan, and homogenized. The homogenized sample will then be placed in the appropriate sample bottles. In addition, soil samples will be observed for physical properties such as color, sorting, etc. This information will be recorded in a field boring log. Soil logging procedures are provided in Section 2.2.4. Sampling equipment shall be disposed of or decontaminated after the collection of each sample in accordance with the procedures outlined in Section 2.5.

Due to limited knowledge of site conditions, the default drilling method selected for the field investigation is hollow-stem auger drilling for each boring location where a monitoring well will be installed and at locations for deeper borings for stratigraphic investigation. Direct-push techniques will be used at the other boring locations unless conditions such as difficult drilling conditions warrant using hollow-stem auger drilling. In addition, portable drill rigs, such as tripod rigs, may be required to collect soil samples along the steep banks of South Branch Creek. The final decision to change drilling methods will be based on the drilling contractor's and environmental consultant's experience with concurrence by the USEPA.

2.2.3 Soil Boring Procedures

Soil borings will be advanced using either hollow-stem auger drilling methods, direct-push techniques or both, depending on the site logistics and the sampling objectives at a given area of concern. Soil samples will be collected from the borings using split-spoon samplers (auger rig) or macro-core samplers with dedicated acetate liners (direct-push rig). The project driller will be responsible for obtaining the required drilling permits for the RVFS investigation.

2.2.3.1 Hollow-Stem Auger Methods

Drilling with a hollow-stem auger is a standard method of subsurface drilling which allows the recovery of representative subsurface samples for identification and laboratory testing. Continuous 2-ft split-spoon samples will be collected from each soil boring. Samples from each spoon will be screened in the field using an HNU-model PI-101 PID and a Jerome 43 1-X MVA, or equivalent instruments. PID and MVA readings for each sample interval will be recorded on a field log. The samples that show the greatest signs of contamination (i.e., elevated PID or MVA readings, discoloration, odor, etc.) will be submitted for analyses. If contamination is not evident from the field screening, then the default sampling depth for soil samples submitted for laboratory analyses will be just above the water table.

When advancing borings using the hollow-stem auger drilling method, 41/4-inch inner diameter (ID) augers will be used. This will result in a borehole diameter that is greater than eight inches, or at least four inches larger than the outside diameter of the casing and well screen in the event that a two-inch diameter monitoring well is to be installed. These specifications are in accordance with NJDEP regulations for the installation of monitoring wells. The borings will be advanced by rotating the augers to the desired depth into the subsurface soils. The borings will be advanced incrementally to permit continuous soil sampling, as required. If heaving sands are encountered, clean potable water will be added to maintain a positive hydraulic head inside the auger.

The drilling rig will be set up and operated in accordance with standard drilling practices and in a manner that will promote the safe and efficient operation of the equipment. The project driller will be a certified test borer and New Jersey-licensed well driller. Safety considerations during equipment operation are addressed in the RIES HASP (Part III of the Field Operations Plan).

The equipment used in the drilling operations will be steam cleaned upon arrival at the site. The equipment and tools that come in contact with soil during drilling will be decontaminated before resampling, before moving to the next drilling location, or before leaving the project site. A source of water to be used for decontamination has not been identified yet, but will likely be water supplied by the City of Linden. The water source may include on-site faucets, the neighboring ISP site, or hydrants owned by the city of Linden. Documentation of the quality of clean potable water to be used for drilling will be submitted to the USEPA or a designated USEPA representative prior to use once a source is identified. Decontamination procedures are described in Section 2.5.

Subsurface soil samples will be continuously collected with a two-inch diameter split-spoon in accordance with American Society for Testing and Materials (ASTM) D-1586-99 methods. Specifically, the following steps will be followed during split-spoon sampling:

1. Measure the sampling equipment lengths and diameters to document that they conform to specifications.
2. Remove the center plug from the augers prior to sampling.
3. Lower the sampler to the bottom of the auger column and check the depth against length of the rods and the sampler to ensure the sampler has not penetrated below the augers under its own weight.
4. Attach the drive head sub and hammer to the drill rods without the weight resting on the rods.
5. Lower the weight and allow the sampler to settle up to 6 inches. If it settles more, consider use of another sampler.
6. Mark four 6-inch intervals on the drill rods relative to a drive reference point on the rig. With the sampler resting on the bottom of the hole, drive the sampler with the 140 lb hammer falling freely 30 inches until 24 inches have been penetrated or 100 blows applied.

7. Record the number of blows per 6 inches.
8. Remove the sampler from the augers, open it, and describe the soil according to the procedures described below. Record the length of the sample recovered.
9. The "N" value, if required for geotechnical purposes, can be calculated by adding the blows from the 6-12 inch and the 12-18 inch interval of each sample attempt.
10. Screen the sample with a PID and a MVA and record the readings. Perform head space screening of the sample as described in Section 2.2.6.
11. Collect soil samples. The soil sample selected for laboratory analysis in a given boring will be the sample with the highest PID reading, MVA reading, or visual/olfactory signs of contamination if instrument readings are background. If the field screening readings in the boring are background, then the sample collected directly above the water table will be sent to the laboratory for analysis. Additional detail on the selection of soil sample for analysis is given in Section 2.2.6 - Field Screening (Head Space) of Soil Samples.
12. Decontaminate split-spoon sampler before using again as described in Section 2.5.

The drillers will be instructed that the boring must be advanced by drilling with the auger bit between the collection of split-spoon samples. This will allow the field inspector to maintain good depth control of samples. The collection of consecutive split-spoons samples will not be permitted except in the case of borings advanced through concrete pads or floor slabs (where the small diameter of the opening in the concrete will prevent the use of augers). This will minimize the chance of sampling slough or wash cuttings, which are not representative of subsurface conditions.

2.2.3.2 Direct-Push Techniques

Depending on site logistics, a direct-push rig may be used to advance borings. Continuous soil samples will be collected from each soil boring using a 4-ft macro-core sampler with a dedicated, clean acetate liner. Each 2-ft portion of soil sample in the 4-ft macro-core sampler will be treated separately to maintain a 2-ft sampling interval for the direct-push boring. Samples from each macro core will be screened in the field and in each area of concern, the samples that show the greatest signs of contamination (i.e., elevated PID or mercury vapor analyzer reading, discoloration, odor, etc.) will be submitted for analyses. If contamination is not evident from the field screening, then the default sampling depth for soil samples submitted for laboratory analyses will be just above the water table.

The direct-push rig (e.g., GeoProbe®, Humcane, etc.) will be set up and operated in accordance with standard drilling practices and in a manner that will promote the safe and efficient operation of the equipment. The project driller will be a certified test borer and New Jersey-licensed well driller. Safety considerations during equipment operation are addressed in the RI/FS HASP (Part III of the Field Operations Plan).

The equipment used in the direct-push operations will be steam cleaned upon arrival at the site. The equipment and tools that come in contact with soil during drilling will be decontaminated before resampling, before moving to the next drilling location, or before leaving the project site. Decontamination procedures are described in Section 2.5.

The general procedures for direct-push sampling are provided below:

1. Clear the area of vegetation and any large surface debris such as rocks that may inhibit sampling and to allow passage of the vehicle on which the equipment is mounted.

2. Before direct-push sampling, a decontaminated trowel may be used to collect a soil Sample from the 0 ft to 0.5 ft below ground surface (bgs) interval if required. Insert a dedicated, hollow acetate liner into the tube sampler and attach the tube sampler to the drill rods (or, if appropriate for the site conditions, a decontaminated split-spoon sampler may be used).
3. Push the sampler to the desired depth. If an obstruction is encountered, offset the location and record the exact direction and location in the project field book.
4. Retrieve the sampler.
5. On a level surface spread out plastic sheeting. Slide the plastic liner out of the tube sampler and place it on the plastic sheeting. Split open the plastic liner with a decontaminated knife or razor to expose the sample.
6. Screen the sample for the presence of contamination through visual and olfactory observation, for organic vapors using a PID, and for mercury vapor using a MVA. To obtain the most representative vapor reading, use a decontaminated stainless steel spoon, knife or other appropriately constructed device to score the length of the core surface or make cross sectional slices to a depth that exposes porous soil. Simultaneously, first move the probe of the PID slowly above the lateral scoring (or into the opened areas being careful not to touch the sample) and record the results. Use the MVA next, using the same procedure as for the PID.
7. After the boring is complete, place the soil not used for analyses back into the sampling borehole.
8. Decontaminate the direct-push sampling equipment.

2.2.3.3 Stratigraphic Borings

Seven stratigraphic borings will be advanced to provide information about site geology. A soil boring will be advanced to a depth of about 25 feet below ground surface at three areas of concern closest to the brine sludge lagoon. Deeper borings are not required in these areas at this time because bedrock borings were already advanced here and the general stratigraphy is known. Four additional borings will be advanced to bedrock in the west portion of the site. The data collected from the seven stratigraphic borings will be used to further develop the current geologic model of the site.

The general procedures for the stratigraphic borings will be to advance the borings using hollow-stem auger techniques to maintain accurate depth information for each sample. Continuous split-spoon samples will be collected through the upper strata (fill material) and through the upper-most layer of native soils, inferred to be marsh-type deposits. Once the marsh deposits are penetrated, split-spoon samples will be collected at five foot intervals until a depth of about 25 feet below ground surface or until bedrock is reached, depending on the location of the stratigraphic boring. Refusal of the borer, presence of weathered bedrock in the tip of the split spoon, and the judgment of the field inspector will be used as indicators that the top of bedrock has been reached. Samples for laboratory analyses will not be collected from the stratigraphic borings. Once completed, the stratigraphic borings will be sealed in accordance with the procedures described in Section 2.2.7 - Borehole Sealing.

2.2.3.4 Cased Deep Borings

Section 2.2.3.4. inserted from FOP Addendum No. 1 (Brown and Caldwell, October 2001)

Boreholes to be drilled below the Tidal March Deposits will be advanced as cased boring to minimize vertical migration during the drilling process. Each deep borehole will be initially advanced through the fill and approximately two feet (2') into the underlying Tidal Marsh Deposits with the use of hollow stem augers. Split-tube ("split-spoon") samples will be collected within the encountered materials at the depth intervals as specified in the Work Plan.

A permanent casing will be installed through the augers that will be terminated within the Tidal Marsh Deposits. The casing will consist of pipe, e.g., four-inch (4") diameter PVC pipe that is grouted into place. The actual casing material and size will be dependent upon the specific drilling equipment that is employed. The annular space around the casing will be sealed with cement/bentonite grout by the tremie method as the augers are removed from the borehole following the procedure as described in Section 2.2.7.

In the event that the Tidal Marsh Deposits are apparently absent at a particular location, the casing will still be installed through the fill to minimize vertical migration of contaminants during the drilling process. In this case, the casing will be installed below the fill at the depth where the Tidal Marsh Deposits were observed in nearby boreholes.

After the grout has set, the boring will be resumed through the casing. This will include drilling through the remaining Tidal Marsh Deposits and into the underlying Glacial Till using the water-rotary drilling method. Drilling mud will be used, as necessary, to maintain the integrity of the borehole during the drilling process.

Split-tube soil samples will be collected at the intervals, as specified in the Work Plan. Upon completion, the entire borehole, including the casing will be sealed with cement/bentonite grout by the tremie method as described in Section 2.2.7. The handling of the drill cuttings and fluids from the portion of the borehole drilled by the water-rotary method are described in Section 2.6.

2.2.3.5 Subsurface Conditions Beneath Building Nos. 230 and 240

Section 2.2.3.5 inserted from FOP Addendum No. 3 (Brown and Caldwell, March 2002)

The LCP site has been constructed on fill soil that has been placed over the Marine Tidal Marsh Deposit soils. The geotechnical characteristics of these underlying soils dictate the use of pile foundations for each of the buildings and other structures at the site. A review of available engineering design drawings has been performed in order to determine the locations of various subsurface foundation elements for Building Nos. 230 and 240 and the adjacent transformer and rectifier pads. Particular attention has been paid to the location of the foundation piles. The material of construction of the piles is not known, although there is a reasonable likelihood that they are made of wood.

It is likely that the fill soil beneath the concrete slabs in each building has settled since the construction of the buildings. Accordingly, it is presumed that there is a void space beneath each of the building slabs. The height of these voids is not known.

The subsurface components of the foundations for each pertinent structure are described briefly below.

- **Building No. 230** - Foundation details for Building No. 230 are depicted on Drawing No. D-411 [FD-5155]. Closely spaced pile clusters (4 to 15 in a cluster/cap) are located beneath each wall column. Pile caps along the exterior walls are tied together with concrete grade beams that extend below the ground surface. The thickness of the floor slab is estimated to be 1.5 feet and the thickness of the floor slab and pile cap combined is estimated to be 4.0 feet.
- **Previous Transformer and Rectifier Pads – Building No. 230** - An array of foundation pads previously existed immediately west of Building No. 230 (Drawing No. D-418 [FD-5216]) in a configuration that was different than the currently existing pads. It is likely that piles for these pads were not removed upon the construction of the current pads. The location of these olds piles is not known.
- **Existing Transformer and Rectifier Pads – Building No. 230** - An array of equipment pads currently exists immediately west of Building No. 230 (Drawing No. D416 [FD-5160]) that is different than the

previous transformer and rectifier pads depicted on Drawing No. 418. The locations of the piles beneath the existing transformer and rectifiers pads west of Building No. 230 are depicted on Drawing No. D416.

- **Building No. 240** - Foundation details for Building No. 240 are depicted on Drawing Nos. H-5058 and H-5059, as presented in the back pocket. Concrete pile caps located beneath the floor are depicted on these drawings. Pile caps along exterior walls are tied together with concrete grade beams that extend below the ground surface. The depth of these grade beams is not known. The thickness of the floor slab is estimated to be 1.5 feet and the thickness of the floor slab and pile cap combined is estimated to be 4.0 feet.
- **Transformer and Rectifier Pads – Building No. 240** - An array of equipment pads located immediately west of Building 240 are depicted on the areal topographic survey. No engineering design drawings depicting the locations of piles have been found.

It should be noted that the aforementioned engineering design drawings provide a valuable tool for decision-making regarding the horizontal borings. However, some uncertainly still exists with regard to subsurface conditions due to limitations of the referenced drawings, as follows:

- The drawings are engineering design drawings and do not represent actual "as-built" conditions.
- The drawings to not include all pertinent foundation details.
- Drawings are not available for all pertinent areas.

Based on these limitations, test excavations will be used to address specific areas of uncertainty, as described in the following section.

2.2.3.6 Test Excavations

Section 2.2.3.6 inserted from FOP Addendum No. 3 (Brown and Caldwell, March 2002)

Test excavations will be used in an attempt to clarify specific issues with regard to foundation elements beneath the buildings and adjacent concrete transformer pads. The test excavations will be performed using a small backhoe. The backhoe will be operated in a manner that will promote the safe and efficient operation of the equipment. The equipment used for the test excavations will be steam cleaned before leaving the project site. Decontamination procedures are described in Section 2.5 of the existing FOP.

It is intended that the test excavations will be employed in the following areas to:

- Determine the depth of the grade beam adjacent to each of the inclined borings and horizontal borings.
- Determine the thickness of the transformer pads in the area of the horizontal borings adjacent to Building Nos. 230 and 240.
- Attempt to excavate beneath the transformer pads adjacent to Building No. 240 in order to determine the locations of the supporting piles.

In no case will test excavations be performed in the areas immediately above the horizontal borings. The general procedures for test excavations are provided below:

1. Excavate the soil immediately adjacent or beneath the building foundation and/or concrete pads to the necessary depth to view the subsurface piles.

2. For excavations below the water table, water that accumulates with the test excavation will be pumped out using a suitable pump, as required. If the water does not have an observable sheen or odor and if the PID readings of the water remain at background levels, the water will be discharged to the ground surface and allowed to percolate back to the groundwater system. The water will not be discharged to the ground in areas where it may run off the site. If the water has signs of gross contamination, it will be collected in U.S. Department of Transportation (DOT) approved (or equivalent) 55-gallon drums and stored at the site staging area. These suspected fluids would be analyzed to determine their toxicity characteristics. After the analytical results are received, these fluids will be disposed of in accordance with applicable local, state, and federal regulations.
3. Mark the location of the subsurface piles on the building or concrete slabs.
4. After the excavation is complete, place the soil back into the test excavation.
5. Place clean gravel at the test excavation locations upon completion to minimize subsequent contact with the newly exposed soil.
6. Decontaminate the excavating equipment before it is removed from the site.

2.2.3.7 Wet-Rotary Drilling Methods

Section 2.2.3.7 inserted from FOP Addendum No. 4 (Brown and Caldwell, October 2006)

Drilling with wet-rotary drilling methods will allow the installation of multiple casings within each deep borehole. In addition, this method allows the use of conventional soil and rock sample collection methods to provide samples for visual identification and laboratory testing. In the event that evidence of free, metallic mercury is observed in the split-barrel samples while drilling the borehole, drilling will immediately be discontinued and the borehole will be sealed. The drill rig will then move laterally and the well drilling will be resumed.

Continuous soil sample collection will be performed in each boring with the use of a 2-foot, split tube sampler. Samples from each split-tube sample will be screened in the field and the samples showing the greatest signs of contamination (e.g., elevated PID or MVA readings, discoloration, odor, etc.) will be submitted for analyses. If contamination is not evident from the field screening, then the default interval will be the base of each stratigraphic unit, with the exception of the fill. The default collection depth for the fill will be just above the water table.

When advancing borings using the wet-rotary drilling method, the borehole diameter will be sized in accordance with the NJDEP requirements (i.e., 2-inch minimum annular space) for the installation of monitoring wells and with the top-of-bedrock well requirements provided in Section 2.3.1.1.

The drilling rig will be set up and operated in accordance with standard drilling practices and in a manner that will promote the safe and efficient operation of the equipment. The project driller will be a New Jersey-licensed well driller. Safety considerations during equipment operation are addressed in the HASP.

The equipment used in the drilling operations will be steam cleaned upon arrival at the site. The equipment and tools that come in contact with soil during drilling will be decontaminated in accordance with Section 2.5 of the FOP.

Split-barrel soil samples will be collected at the intervals, as specified in the Work Plan. Subsurface soil samples will be continuously collected with a two-inch diameter split-barrel in accordance with American Society for Testing and Materials (ASTM) D-1586 methods.

The drillers will be instructed that the boring must be advanced by wet-rotary methods between the collection of each split tube sample (per ASTM D-1586). This will allow the field inspector to maintain good depth control of samples. This will minimize the chance of sampling slough or wash cuttings, which are not representative of subsurface conditions.

Upon completion, the entire borehole, including the casing will be sealed with cement/bentonite grout by the tremie method as described in Section 2.2.7. The handling of the drill cuttings and fluids from the portion of the borehole drilled by the water-rotary method are described in Section 2.6.1.

2.2.3.8 Inclined Conventional Borings

Section 2.2.3.8 inserted from FOP Addendum No. 3 (Brown and Caldwell, March 2002)

Three (3) inclined conventional borings will be performed near the eastern edge of the exterior of the buildings to characterize the soil fill conditions beneath the concrete pads or floor slabs of the buildings. The inclined borings will be performed by the direct push technique or the hollow-stem auger drilling method with angle drilling capabilities following the methods as described in Sections 2.2.3.2 and 2.2.3.1, respectively, of the existing FOP. The maximum angle of the inclined borings is 45° for either the direct push or the hollow-stem auger technique.

Soil samples will be collected continuously through the fill to the top of Tidal Marsh Deposit (if present). If the Tidal Marsh Deposit is not present, then the default boring depth will be to the top of native soils. Regardless of the stratigraphy, each boring will be advanced at least to the depth of the water table, which is assumed to be within the fill unit.

Soil samples from the 4.0 to 4.5 ft interval, which corresponds to the interval directly below the estimated combined depth of the concrete floor slab and pile cap or the grade beam, will be collected for laboratory analysis for TCL/TAL parameters. One (1) additional sample may be submitted from each boring for laboratory analysis for TCL/TAL parameters, if field screening indicates elevated levels of mercury and/or organic vapors and/or obvious visual or olfactory signs of contamination. The sample depth will be adjusted, as applicable, if additional information reveals the depth of the floor slab and/or the building foundation to be incompatible with a 4.0 to 4.5 ft interval.

The drilling contractor will be responsible for contacting the New Jersey "One-Call" System prior to performing any subsurface drilling work. Supplemental utility clearance will be performed in the vicinity of each drilling location in addition to the "One-Call" notifications, as described in Addendum No. 2 to the FOP.

Soil Sample Collection Locations

The inclined conventional borings are described as follows:

- Boring IB-1 inclined conventional boring will be drilled in close proximity to the eastern edge between Buildings 220 and 230.
- Boring IB-2 inclined conventional boring will be drilled in close proximity to Building 230 on the eastern edge of the exterior of the building.
- Boring IB-3 inclined conventional boring will be drilled in close proximity to Building 240 on the eastern edge of the exterior of the building, north of the southern addition to Building 240.

2.2.3.9 Horizontal Borings

Section 2.2.3.9 inserted from FOP Addendum No. 3 (Brown and Caldwell, March 2002)

Horizontal borings will be drilled beneath Building Nos. 230 and 240 to characterize the soil fill conditions. The borings will start from the ground surface outside of the buildings, entering the ground at an angle and proceeding downward until the necessary depth is attained. The bore's path is then leveled, and the bore head is steered to the desired completion point.

The drilling will be performed using a horizontal drill rig (Ditch Witch Model No. JT 2720 or JT 4020 manufactured by The Charles Machine Works). The drilling is advanced using a rotary technique developed for, and commonly used in the underground utility industry. A bentonite slurry is used to stabilize the borehole and to remove cuttings.

The sample locations for each borehole are predetermined as three-dimensional points in space. Accordingly, the drilling assembly is steered to the predetermined point in both the vertical and horizontal plane. Drill head depth and location can be monitored by electronic tracking equipment, which also provides information necessary for making steering adjustments. Sections of drill stem are added as the bore progresses.

A horizontal soil sampler tool manufactured by Ditch Witch® Environmental Systems will be used to obtain discrete-interval samples. The sampler can collect a two-inch (2") diameter sample that is one foot (1') in length. The sampler will be decontaminated prior to each use to allow the collection of representative samples for chemical analysis and geologic evaluation at each intended interval following the decontamination method as described in Section 2.5 of the existing FOP.

The soil samples are collected by advancing the borehole to a point approximately two to three feet (2 to 3') from the desired sample location. The drilling assembly is removed from the borehole and the soil sample tool is attached to the drill string. The tool is then reinserted into the hole and pushed back to the sample location. Once the end of the borehole is reached, the sample tool is then pushed to the undisturbed formation and then retracted slightly to trigger the sampler to open. The open soil sampler is then pushed forward approximately one foot (1') further into the undisturbed soil to collect the soil sample. The drill string is then pulled out of the hole and the sample is recovered. If another sample is required along the same axis, the drill head is fitted back onto the drill string and the drilling assembly is then drilled to the next target and the procedure is repeated. If a sample is required at a deeper depth at the same location, the drilling head is retracted and the hole may be "side tracked" to the deeper depth. The hole is then drilled back to the target location and once again the sample procedure is repeated.

The drill head is normally tracked and steered using radio detection, where the drill head is tracked from above the boring and alignment readings are taken every ten feet (10'). The utility of the radio tracking will be limited at the LCP site, however, given the access limitations in the buildings and the likely presence of reinforcing steel in the thick concrete slab. In order to address this limitation, it is intended to initiate each boring on a straight and level course prior to drilling beneath the buildings. The borings will be computer-controlled on a straight and level line to the extent possible beneath the buildings using the radio data that can be received from the drill tool. This is anticipated to allow the collection of samples within a reasonable range of the proposed locations.

The horizontal borings will be sealed after completion to prevent contaminant migration. Sealing will be achieved by backfilling the borehole with bentonite slurry. The bentonite will be pumped into the borehole as the drill string is removed from the borehole.

Efforts will be made to avoid drilling into the piles and other subsurface foundation materials on which the buildings and exterior transformer pads are supported. This has been accomplished by a review of historic building design drawings that provide information regarding the subsurface piles and other subsurface details. Other visible structural clues have also been considered regarding the piles including the positions of columns, and other structural details. Additionally, test excavations will be performed around the building foundation and concrete equipment pads in an attempt to locate the subsurface piles and other subsurface details. The boring locations, as described below, have been determined based on the aforementioned foundation information.

The drilling or excavation contractor will be responsible for contacting the New Jersey "One-Call" System prior to performing any subsurface drilling or excavation work. Supplemental utility clearance will be performed in the vicinity of each drilling location in addition to the "One-Call" notifications, as described in Addendum No. 2 to the FOP.

Soil Sample Collection Locations

The horizontal boring locations, described below, have been designed to provide optimum sample placement within the constraints of the subsurface conditions. This is based on the site reconnaissance and the review of the available engineering design drawings. If the locations described below are found to be inaccessible based on field conditions or observations, an immediate field decision to relocate the boring will be made in consultation with the on-site USEPA oversight person.

The horizontal drilling will be performed on west to east trending borings starting at points located approximately 30 feet from the west side of Bldg. Nos. 230 and 240. The bores will be advanced as described below:

- A "shallow" borehole, HB-1, approximately 13 feet long, will be advanced along the northwestern portion of Building No. 230 that encounters the former "sump area". This bore will be advanced as close to the bottom of the slab as conditions allow. Samples will be collected from the western and eastern edges of the former sump (approximately 4.5 ft and 13 ft from the interior wall).

  The structural conditions that have been considered to locate this boring include the locations of the piles beneath the stairwell and foundation of Building 230, as depicted on Drawing No. D-411 (FD-5155).
- A "deep" horizontal borehole, HB-2, approximately 13 feet long, will be advanced beneath Building No. 230 parallel and approximately five feet (5') beneath the first bore that will encounter the former "sump area". It is intended that this boring will be advanced as close to the base of the fill as possible with samples collected from the western and eastern edges of the sump (approximately 4.5 ft and 13 ft from the interior wall).

  The structural conditions that have been considered to locate this boring are the locations of the piles beneath the stairwell and foundation of Building 230, as depicted on Drawing No. D-411 (FD-5155). It will not be possible to extend this boring beyond the sump to the east, as was intended, due to the presence of piles.
- A "shallow" borehole, HB-3, approximately 100 feet long, will be advanced within Building No. 230 between the trench and the common wall between Building Nos. 230 and 240 with samples collected at approximately 25-foot intervals. This bore will be advanced as close to the bottom of the slab as conditions allow.

The structural conditions that have been considered to locate this boring are the piles located beneath the transformer and rectifier pads west of Building No. 230, the piles beneath the foundation and floor, including the piles located in close proximity to the trench, as depicted on Drawing Nos. D-411 [FD-5155] and D-416 [FD-5160].

- A "shallow" borehole, HB-4, approximately 100 feet long, will be advanced approximately 25 feet south of the division between Bldg. Nos. 230 and 240 with samples collected at approximately 25-foot intervals.

  This bore will be advanced immediately below the slab. The structural conditions that have been considered to select the location of this boring are the piles located beneath the rectifier pads west of Building 240 and the piles beneath the foundation and floor, including those beneath the common wall between Building Nos. 230 and 240, as depicted on Drawing Nos. H-5058 and D-411 [FD-5155]. It will not be possible to advance the boring directly beneath the division between the buildings, as was intended, due the presence of a large number of piles below the side supports for the buildings.
- A "shallow" borehole, HB-5, approximately 100 feet long, will be advanced within the center of Building No. 240 with samples collected at approximately 25-foot intervals.

  The structural conditions that have been considered to select the location of this boring are the piles located beneath the rectifier pads west of Building 240 and the piles beneath the foundation and floor, including those in close proximity to the trench, as depicted on Drawing No. H-5058.
- A "shallow" borehole, HB-6, approximately 75 feet long, will be advanced beneath the southern addition to Building No. 240 with samples collected at approximately 25-foot intervals.

  The structural conditions that have been considered to locate this boring are the unknown locations of piles beneath the "shed", the piles beneath the foundation and floor, as depicted on Drawing No. H-5059, and the active Elizabethtown Water Company water main located partially below ground surface in this area.
- A "shallow" borehole, HB-7, approximately 6 feet long, will be advanced along the northwestern portion of Building No. 240 that encounters the former "sump area". This bore will be advanced as close to the bottom of the slab as conditions allow with a sample collected beneath the middle of the former sump.

  The structural conditions that have been considered to locate this boring are the rectifier pads west of Building No. 240 and the piles beneath the foundation and floor, including those beneath the common wall between Building Nos. 230 and 240, as depicted on Drawing Nos. H-5058 and D-411 [FD-5155]. It will not be possible to extend this boring further east due to the presence of piles.
- Additional deep, horizontal boreholes will be drilled, as required, based on the field screening results and visual character of samples from the shallow boreholes. The locations of these borings would be made in consultation with USEPA.

Each of the soil samples will be field screened using a PID and a MVA as described in Section 2.2.6 of the existing FOP. The horizontal drilling program will result in the collection of approximately 20 samples for laboratory analysis of TCL/TAL parameters. This number of samples for laboratory analysis exceeds that as prescribed in the Work Plan. However, no laboratory analysis for mercury will be performed on samples containing visible metallic mercury, consistent with previous RI work.

2.2.3.10 Field QA/QC Samples

Section 2.2.3.10 inserted from FOP Addendum No. 3 (Brown and Caldwell, March 2002)

Field QA/QC samples will be collected in accordance with Section 2.8 of the FOP. These samples will consist of:

- One field blank sample will be prepared per matrix for each day that samples are collected.
- Five percent of the samples collected shall be field duplicates (one duplicate for every 20 samples).
- A temperature blank will be used in each sample shuttle to measure the temperature of the samples upon shipment arrival to the laboratory.
- Matrix spike/matrix spike duplicate samples (MS/MSDs) will be analyzed for each matrix for every 20 environmental samples (five percent) or one per batch.

2.2.3.11 Penetrating Concrete Pads or Floor Slabs

To collect soil samples beneath concrete pads or the floor slabs of buildings, a portable electric or gas-powered core drilling machine will be used to core an access hole having a minimum diameter of 6 inches. Water will be used to wet the work area as required to prevent the generation of dust. Once the concrete core is removed, the soil beneath the slab will be collected for screening or analysis using a split-spoon sampler. Once the sample is collected from the required depth, the hole will be backfilled with the original soil and the core hole in the concrete slab will be grouted, from the bottom of the slab to the top, to seal the hole and to prevent surface water or debris from entering it.

If an electric core drilling machine is not suitable for the job because of excessive slab thickness or because of the presence of metal reinforcing bars within the slab, a jackhammer or similar pneumatic device will be used to penetrate the slab. Regardless of the equipment used, dust generation will be minimized with the application of water and the hole in the slab will be repaired with grout or patched with quick-drying cement.

2.2.4 Logging of Soil Borings

Soil samples will be described by the field inspector. The format for describing a soil sample will be in accordance with ASTM D2488-93: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and consistent with ASTM D2487-98: Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

A record of significant information related to drilling operations for each boring will be maintained as the boring advances. This information will be recorded on a field boring log. The following information will also be recorded on the log:

- Names of soil materials shall follow the name of the predominant particle size (e.g., clay, silt, sand).
- The grain size and name of the deposit shall be accompanied by the predominant mineral content, accessory minerals, color, moisture, density, plasticity, odor, particle angularity, and other characteristics.
- Symbols of the Unified Soil Classification System (USCS) will be included with the description.

Unified Soil Classification System

Soils are classified for engineering purposes according to the USCS adopted by the U.S. Corps of Engineers and Bureau of Reclamation. The following soil properties form the basis for the USCS:

- Percentage of gravel, sand, and fines
- Shape of the grain-size distribution curve
- Plasticity and compressibility characteristics

According to this system, all soils are divided into three major groups: coarse-grained, fine-grained, and highly organic (peat). The boundary between coarse-grained and fine-grained soils is taken to be the 200-mesh sieve. In the field, this distinction is based on whether the individual particles can be seen with the unaided eye. If more than 50% of the soil by weight is judged to consist of grains that can be distinguished separately, the soil is considered to be coarse-grained.

The coarse-grained soils are divided into gravelly (G) or sandy (S), depending on whether more or less than 50% of the visible grains are larger than the No. 4 sieve (3116 inch). They are each divided further into four groups:

W: Well graded; fairly clean (<5% finer than 0.074 mm)

P: Poorly graded (gap-graded); fairly clean (~ 5 %finer than 0.074 mm)

C: Clayey (42% finer than 0.074 mm); plastic (clayey) fines. Fine fraction above a line with plasticity index above 7.

M: Silty (>12%finer than 0.074 mm); non-plastic or silty fines. Fine fraction below a line with plasticity index below 4.

The soils are represented by symbols such as GW or SP. Borderline materials are represented by a double symbol, as GW-GC.

The fine-grained soils are divided into three groups: inorganic silts (M), inorganic clays (C), and organic silts and clays (O). The soils are divided further into those having liquid limits lower than 50% (L), or higher (H).

The distinction between the inorganic clays C and the inorganic silts M, and organic soils O is made on the basis of a modified plasticity chart. Soils CH and CL are represented by points above the line, whereas soil OH, OL, and MH correspond to positions below the line. Soil ML, except for a few clayey fine sands, are also represented by points below the line. The organic soils 0 are distinguished from the inorganic soils M and C by their characteristics odor and dark color.

Visual Identification

Soil properties required to define the USCS are the primary features to be considered in field identification. These properties and other observed characteristics normally identified in describing a soil are:

a. Color
b. Moisture conditions

c. Grain size
   1 Estimated maximum grain size
   2 Estimated percent by weight of fines (material passing No. 200 sieve)
d. Gradation (Sorting)
e. Grain shape
f. Plasticity
g. Predominant soil type
h. Secondary components of soil
i. Classification symbol
j. Other features such as:
   1 Organic, chemical, or metallic content
   2 Compactness
   3 Consistency
   4 Cohesiveness near plastic limit
   5 Dry strength
   6 Source-native or transported (aeolian, waterborne, glacial deposit, etc.)

2.2.5 Collection of Soil Samples for Analyses of Volatile Organic Compounds

Soil samples that will be analyzed for VOCs will be collected in accordance with the procedures outlined in USEPA Method 5035. This method allows the use of an air-tight, hemetically-sealed vial to collect the soil sample. The seal of the vial is never broken from the time of sampling to the time of analysis. A patented tool called the EnCore™ Sampler (approved by the USEPA) will be used to collect soil samples for VOC analyses.

Encore™ Sampling Procedure

Soil sample collection for VOC shall be performed with the use of the EnCore™ sampler. The sample collection procedure for soil volatiles using the EnCore™ sampler is as follows:

1. Collect three EnCore™ samples and one percent moisture sample (60ml wide mouth glass container with no head space) for each sample point location.
2. Remove the sampler and cap from the EnCore™ package and attach the T-handle to the sampler body.
3. Turn the handle and coring body down, to position the plunger so that the bottom is flush with the bottom of the freshly exposed surface of soil (ground surface or soil core sample). Quickly push the sampler into the soil until the coring body is completely full. When full, the small o-ring will be centered in the handle viewing hole. Remove the sampler from the soil and scrape any excess soil flush with the edge of the sampler using a dedicated decontaminated stainless steel trowel.
4. Use a paper towel to quickly and carefully wipe the sampler head so that the cap can be tightly attached and sealed.
5. To attach the cap, push the cap on with a twisting motion. The cap is properly sealed when the two locking arms are completely seated over the ridge on the body of the sampler.
6. Record the sample identification and time in the field book or log.

7. Complete the sample label on the EnCore™ zipper lock package.
8. Fill in the sample identification number on the self-adhesive label attached beneath the sample label on the EnCore™ package.
9. Tear the self-adhesive label at the perforation and attach the label to the rim of the sampler cap.
10. Place the sampler back into the EnCore™ zipper lock package and seal the zipper lock. The sample label is placed over the opening of the EnCore™ zipper lock package to ensure sample integrity.
11. Repeat the procedure above for the other two samplers.
12. Once all three samplers have been filled, labeled and packaged, place the three EnCore™ packages into one large zipper lock bag with a completed sample tag.
13. Collect the percent moisture sample in a separate sample container (60ml wide mouth glass container). Label the container with the sample designation.
14. Store the samples in a cooler with bagged ice to maintain 4 degrees Celsius while storing on site and during shipment to the laboratory.
15. Samples must be shipped off site to the laboratory within 24 hours.
16. Samples must be received by the laboratory for preservation and preparation for extraction within 2 days from the date of sample collection.

2.2.6 Field Screening of Soil Samples

Field screening methods will be used to screen soils for VOC or mercury contamination. Soil samples will be screened at 2-ft intervals, regardless of whether a 2-ft split-spoon sampler or 4-ft macro core sampler is used. In each area of concern, the sample showing the highest field screening result for VOCs and the sample showing the highest result for mercury will be submitted for laboratory analyses. The field screening procedures are described below.

Volatile Organic Compounds

After a PID (HNU model PI-101, or equivalent) is calibrated (Section 2.9), it is ready to be used. A baseline scan (i.e., scan on "clean air", "clean water" or "clean soil", as appropriate) should be run each day before analyzing site samples and the results recorded.

A background meter reading will be obtained and recorded at the time of field screening. If a concentration above several parts per million (ppm) is detected as background, the source of the reading will be investigated and controlled, if possible, or other appropriate actions taken as provided for in the RI/FS HASP.

The following general procedures will be used to screen for organic vapors using a PID:

- With the calibrated PID turned on, hold the tip of the probe extension approximately one inch from the material being screened. Special care must be exercised not to place the probe extension into the sample or close enough for any soil particles or liquid to be drawn into the probe and contaminate the probe. *(Note: For health and safety procedures, the probe is generally located in the breathing zone for determination of the level of personal protection required.)*
- Hold the tip of the probe extension above the sample being screened for at least ten seconds or long enough for the instrument readings to stabilize so a reliable reading is obtained.

- Record PID readings either manually on the appropriate field data forms (e.g., sample log, boring log, or the field note book) or electronically (as a data point in the instrument's memory). On newer PID models, data may be stored in the PID memory or downloaded through an external downloading port onto a personal or portable computer.
- Once the PID has been calibrated and turned on, the PID should remain on in the "stand-by" mode when not in use.

PID readings and visual observations will be used to identify the presence or absence of VOC contamination within each split-spoon soil sample. The PID reading and visual observations will be recorded on the boring log and in the project field book. The results of the screening surveys will be used to provide a qualitative assessment of subsurface soil contamination.

Mercury

After the MVA (Jerome model 431-X MVA, or equivalent) is calibrated (Section 2.9), it is ready to be used. A baseline scan (i.e., scan on "clean air", "clean water" or "clean soil", as appropriate) should be run each day before analyzing site samples and the results recorded.

A background meter reading will be obtained and recorded at the time of field screening. If a concentration above several ppm is detected as background, the source of the reading will be investigated and controlled, if possible, or other appropriate actions taken as provided for in the site-specific RI/FS HASP.

The following general procedures will be used to screen for mercury vapors using an MVA:

- With the calibrated MVA turned on, hold the tip of the probe extension approximately one inch from the material being screened. Special care must be exercised not to place the probe extension into the sample or close enough for any soil particles or liquid to be drawn into the probe and contaminate the probe.
- Press the sample button and hold the tip of the probe extension above the sample being screened for at least twelve seconds or long enough for the instrument readings to stabilize so a reliable reading is obtained.
- Record MVA readings either manually on the appropriate field data forms (e.g., sample log, boring log, or the field note book).
- Turn the MVA off when not in use and install the zero air filter in the instrument intake during storage.

MVA readings and visual observations will be used to give a preliminary assessment of the presence or absence of mercury contamination within each split-spoon soil sample. The MVA reading and visual observations will be recorded on the boring log and in the project field book. The results of the screening surveys will be used to provide a qualitative assessment of subsurface soil contamination.

Note if free elemental mercury is observed in a given sample, the headspace analyses will not be conducted. Instead, the depth interval and nature of the sample will be carefully documented and the sample will be archived for later evaluation. The presence of free mercury indicates that gross contamination is present far above regulatory criteria and consequently, neither headspace screening nor laboratory analyses of that sample would provide useful information.

2.2.7 Borehole Sealing

The RI/FS borings that penetrate the Tidal Marsh Deposit (TMD), described in the RI/FS Work Plan (Section 1.9.2), or are greater than 25 feet in depth will be sealed prior to abandonment to prevent downhole contamination. Sealing will be achieved by backfilling the borehole with bentonite or with a cement/bentonite grout. The grout will be pumped into the boring from bottom to top using either a tremie pipe or the drill rods. Borings with depths of less than 25 feet or which do not penetrate the TMD will be backfilled with the original soil and tamped. It is also anticipated that the monitoring wells MW-1 through MW-6 installed in 1981 (Geraghty & Miller, 1982) will be sealed because of poor construction, pending approval from the USEPA.

The boreholes will be sealed by a NJ licensed well sealer in accordance with N.J.A.C. 7:9-9, Sealing of Observation Wells. The following procedure will be used when sealing boreholes:

1. The grout slurry composition to be used is as follows:
   Pounds of Bentonite: 5.0,
   Pounds of Cement: 94.0
   Gallons of Water: 8.3
2. Calculate the volume of the borehole based on the bit or auger head diameter plus 10%, and determine the volume of grout to be injected. Generally, the total mixed volume is the borehole volume plus 20%.
3. Identify the equipment to be used for the preparation and mixing of the grout. Document that the volume of the tanks to be used for mixing is appropriate for the borehole sealing work.
4. Identify the source of the water to be used for the grout. Water with high sulfate or chloride levels, or heated water, should not be used. These types of waters can cause operational difficulties or modify the set-up time for the grout.
5. Identify the equipment to be used for injecting the grout. Confirm with the driller that the pump to be used has adequate pressure to enable complete return to surface.
6. Identify the volumes to be pumped at each stage or in total if only one stage is to be used.
7. Begin mixing the grout to be injected using a grout mixture specified in 1), above.
8. Record the type and amount of materials used during the mixing operation. Document that the ratios are within specification tolerance. Ensure the grout is thoroughly mixed and free of lumps. Record the consistency of the mixture.
9. Begin pumping the grout through the return line bypass system to confirm that all pump and surface fittings are secure.
10. Begin pumping the grout into the boring. Leave rods or tremie pipes in borehole (and withdraw slowly as pumping, if required) until grout level reaches the surface. Record the times and volumes injected.
11. Top off the grout level in the borehole after the rods or tremie pipe is removed.
12. Clear and clean the surface near the borehole. Level the ground to approximately the pre-existing grade. Add grout or cement as necessary to the area near the borehole. If feasible, document the setup time of the of the mixture.

Note: In most cases there may be some settling of the grout which takes place over several days. If settling occurs, the natural soils from the immediate vicinity or additional grout will be used to restore the area to grade. If a survey of the location has not yet been performed, the location will be staked prior to filling with natural soils so that it could be surveyed at a later time.

2.3 Groundwater Investigation Procedures

The monitoring wells will be installed by a New Jersey licensed well driller. The project driller will be responsible for obtaining the required NJDEP well permits for the RI/FS investigation. NJDEP well permits will be obtained for borings extending beyond 25 feet below the ground surface or for shallow temporary borings with temporary casing left in the ground for a period longer than 48 hours.

2.3.1 Monitoring Well Installation

Overburden monitoring wells with screens positioned across the water table will be installed during the RI. The well materials will be steam cleaned before installation. Well casings will consist of 2-inch ID, Schedule 40, polyvinyl chloride (PVC) pipe with flush-mount threaded joints. The well screens will typically be a 5-ft long section of 2-inch diameter PVC. In no case will the screen length exceed 10 feet. The slot size will correlate to the particle size of the material being screened. If the well is screened in clay, the smallest slot size available will be used with the appropriate size sand for the filter pack. If the well is screened in sand and/or gravel, a 0.010-inch slot screen will be used with a No. 1 filter pack. The filter pack material shall be certified clean, inert, and well-rounded, containing less than two percent flat particles or fines. The bentonite seal shall consist of 100% sodium bentonite. The overburden monitoring wells will be screened across the water table. As-built monitoring well logs will be prepared by the field inspector after each well is completed. Specifically, the procedure described below will be followed during the installation of groundwater monitoring wells.

1. Advance the subsurface boring to the desired depth in accordance with ASTM D-1586-99 procedures, by means of hollow-stem auger drilling (Section 2.2.3).
2. Remove the center plug from the augers and measure the borehole depth using a weighted measuring tape.
3. Add approximately one foot of appropriately sized filter media to the base of the borehole.
4. Insert a 2-inch diameter PVC well screen and riser pipe into the borehole through the hollow-stem augers. The well screens will be capped with threaded caps at the bottom.
5. Add sand to screen section of well while slowly removing the augers. The sand pack should extend at least two feet above the screen section within the borehole. Measure with a weighted tape.
6. Slowly add bentonite slurry to the borehole as the augers are slowly removed. The bentonite seal should extend at least two feet above the top of the sand pack section. Measure with a weighted tape.

   Note: The rate of removal of the auger from the borehole should closely follow the rate that the sand pack and bentonite fill the borehole.
7. The remainder of the borehole will be grouted to the ground surface using grouting materials through a tremie pipe as described below.
8. A cement/bentonite grout mixture will be prepared according to the NJDEP Field Sampling Procedures Manual, 2005 for monitoring well specifications.
9. Pump cement/bentonite grout to the borehole through a side-discharge tremie pipe (i.e., pipe with a short, 90 degree elbow attached) from the top of the bentonite seal to the ground surface. The side discharge will avoid disturbing the bentonite seal.
10. Remove the tremie pipe and remaining augers from the borehole.
11. Top off grout in the borehole. Grout should extend to approximately two feet below the ground surface.
12. Cut the well riser pipe to about two feet above the ground surface where a stickup casing will be used or just below the ground surface for a flush-mounted well.

13. Backfill the remaining two feet of borehole with concrete.
14. The top of the riser will be notched to be used as a reference point for water level measurements. A well cap will be installed.
15. Install a protective 6-inch diameter steel casing equipped with a locking cap or a flush-mounted manhole cap over the well riser pipe and set it into the concrete backfill. Label the casing permanently with the well identification.
16. Lock the protective casing cap.
17. Construct a 2-ft by 2-ft by 4-inch concrete pad around the protective casing. Slope the pad away from the protective casing.

Allow the grout for the protective casing to set for at least 24 hours before developing the new monitoring well.

2.3.1.1 Triple-Cased Top-of-Bedrock Monitoring Well Installation

Section 2.3.1.1 inserted from FOP Addendum No. 4 (Brown and Caldwell, October 2006)

The use of triple-cased monitoring wells will be required for the installation of bedrock monitoring wells as shown on Figure 1. The subsurface units to be cased-off include the fill and the entire thickness of the soils. A conventional two-inch, PVC well will be installed within the upper bedrock.

The specific procedure for triple-cased monitoring wells completed within the top of bedrock is as follows:

- Advance a fourteen-inch (14") diameter borehole through the fill and approximately two feet (2') into the underlying Tidal Marsh Deposits with the use of the wet-rotary drilling method in accordance with "Addendum No. 1, Field Operations Plan For the LCP Chemicals, Inc. Superfund Site, Cased Deep Borings (Brown and Caldwell, October 12, 2001).
- Measure the borehole depth using a weighted measuring tape.
- Install a ten-inch (10") diameter permanent casing within the boring approximately two feet (2') into the underlying Tidal Marsh Deposits.
- Grout the casing in place using the tremie method by placing a cement/bentonite grout in the annular space between the casing and the borehole from the base of the borehole to a depth approximately four feet (4') below existing ground surface. In the event that the Tidal Marsh Deposits are apparently absent at a particular location, the casing will still be installed through the fill to minimize vertical migration of contaminants during the drilling process. In this case, the casing will be installed below the fill at the depth where the Tidal Marsh Deposits were observed in nearby boreholes.
- After the grout has set, the boring will be resumed through the ten-inch (10") casing. This will include drilling through the remaining Tidal Marsh Deposits and through the underlying Glacial Till until refusal, using the wet-rotary drilling method. The borehole drilling mud will be used, as necessary, to maintain the integrity of the borehole during the drilling process.
- Flush the borehole with potable water and continue approximately three to five feet[1] (3' to 5') into rock by means of an NX (3" O.D.).

[1] The three to five foot (3' to 5') bedrock casing socket, as described, is required to adequately characterize the upper, fractured zone of the bedrock. This socket depth conflicts, however, with the New Jersey bedrock well construction standards that require a minimum depth bedrock casing socket of ten feet (10') [N.J.A.C. 7:9D(b)1.]. Accordingly,

- Measure the borehole depth using a weighted measuring tape.
- Ream the corehole to a nominal 10-inch (10") diameter using the wet-rotary method.
- Install a six-inch (6") diameter permanent casing within the bedrock.
- Grout the casing in place using the tremie method by placing a cement/bentonite grout in the annular space between the casing and the borehole from the base of the borehole to a depth approximately four feet (4') below existing ground surface.
- After the grout has set, the boring will be resumed through the 6-inch (6") casing approximately fifteen to twenty feet (15 to 20') by means of an NX (3" O.D.) rock core.
- Ream the corehole to a nominal 6-inch (6") diameter using the wet-rotary method.
- Insert a flush-threaded, two-inch diameter, Schedule 40 PVC monitoring well screen and riser casing in the borehole, with a well screen that is positioned across the hydrostratigraphic zone targeted for monitoring.

Develop and install the monitoring wells in accordance with Sections 2.3.1 and 2.3.2, respectively, of the "Final Sampling and Analysis Plan, Field Operations Plan, Part I" (URS, April 12, 2001).

- The handling of the drill cuttings and fluids are described in Section 2.6.1.

2.3.2 Well Development

After drilling, and no sooner than 24 hours after well installation to allow the grout for the protective casing to cure, each new monitoring well will be developed by pumping or bailing until the discharged water is visually free of suspended particles, and if possible, achieves a nephelometric turbidity unit (NTU) of less than 5.0. Well development is the process of flushing the interface between the aquifer and the well. In addition, the filter pack and screen slots are cleaned, allowing ground water to flow into the monitoring well with a minimum of retardation. Development is required to (1) restore the natural permeability of the formation adjacent to the borehole, (2) remove clay, silt and other fines from the filter pack and well screen so that subsequent water samples will not contain excessive suspended matter; and (3) remove remnant drilling fluids and contaminants potentially introduced during drilling activities.

The development process is best accomplished by causing the natural formation water inside the well screen to be moved vigorously in and out through the screen in order to agitate the clay and silt. This causes clay and silt particles to be moved into the well where they can be removed or lodged into the sand pack and/or formation. Formation water will be used for surging the well. As required by the USEPA (October 24, 2000) for this RI/FS, well development will be in accordance with the RCRA Ground Water Monitoring Draft Technical Guidance, November 1992 – Section 6.7, Well Development. If the well goes dry during development, it will then be developed with alternating cycles of purging and recovery. If, after reasonable repeated attempts, a turbidity reading of 5.0 NTUs is not achieved at any given well, then the USEPA will be informed and recommendations for additional action will be presented.

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written authorization for the well construction deviation will be required to be obtained from NJDEP, Bureau of Water Allocation in accordance with N.J.A.C. 7:9D-2.8 prior to commencing drilling. Assistance in this regard may be required from the case manager.

Equipment used for well development will be cleaned before each use to prevent possible cross contamination of the wells. Decontamination procedures are described in Section 2.5.

Development of each well will be performed by pumping or bailing. Either of these methods will remove silt-laden water. A bailer which is heavy enough to sink rapidly through the water can be raised and lowered through the water column to produce an agitating action that is similar to that caused by a surge block. The bailer has the added capability of removing turbid water and fines each time it is brought to the surface.

A submersible pump can be used effectively where recharge is rapid. Surging can be accomplished by switching the power source on and off while pumping, causing ground water to move in and out through the screen, achieving the desired cleaning action. The size of the pump used is dependent upon the well design and associated recharge rate.

An inertial lift pump may also be used for development. This is a reciprocating pump, which recovers groundwater through a tube and foot valve assembly, utilizing the inertial lift principle. This method is especially effective for pumping water heavily laden with silt and clay.

The well development procedure selected for use by the field inspector will be based on conditions encountered during well installation and the construction details of a given monitoring well. The well development water recovered from each well will be handled as described in Section 2.6 – Investigation-Derived Waste Handling.

Specific development procedures are as follows:

- Well development equipment will be assembled, decontaminated, as outlined in Section 2.5, and installed in the monitoring well. Care will be taken not to introduce contaminants to the equipment during installation.
- Monitoring wells will be developed using pumps with dedicated tubing. If a well yield is very low and is pumped dry, a dedicated bailer may be used to continue development after each recovery. No air or water will be injected into the well during development. The development will continue until the field inspector determines that the water is clear and free of solids based on NTU readings of 5.0 or less.
- Field observations, including the volume of water removed and the discharge water color will be recorded on a Well Development Log and also in the field log book. Field measurement of pH, temperature, and conductivity will be recorded periodically during well development.

ISP Environmental Services Inc. will make every reasonable attempt to develop the monitoring wells in accordance with the RCRA groundwater monitoring guidance (USEPA, November 1992). As noted in Section 1.9.3 of the RI/FS Work Plan (Hydrogeology), however, the groundwater appears to exist in overburden under perched conditions over the Tidal Marsh Deposit, with a saturated thickness of only 1-2 feet. Compliance with the 5.0 NTU criterion may not be possible if the yield of a given well is poor. Other factors may prevent achievement of low turbidity such as natural turbidity in pore water or tidal influences. In these cases, the attempts made to develop the well will be documented, the USEPA will be notified, and recommendations for additional action will be presented.

2.3.3 Groundwater Level Measurement

Groundwater levels will be measured in each monitoring well at the site within a short time period (i.e., synoptic water level round) to determine the elevation of the water table across the site. These measurements

will be collected after a period of two weeks or more after the last well was installed and developed to allow the water table aquifer to stabilize.

Water level measurements will be collected with electric sounders, interface probes, pressure transducers, or water level recorders. The measuring device will be decontaminated according to the specifications in Section 2.5.

Groundwater levels will be measured to the nearest 0.01 foot from a referenced point, usually the top of the riser pipe or inner casing. Static water levels will be measured each time a well is sampled and before equipment is introduced into the well.

2.3.4 Collection of Groundwater Samples

Section 2.3.4 inserted from FOP Addendum No. 4 (Brown and Caldwell, October 2006) – Supersedes Previous Section

The low-flow purging and sampling method will be used to collect groundwater samples.

2.3.4.1 Equipment

Various field instruments will be used during the implementation of the LTGMP. They may include but are not limited to the following:

- Electronic water level meter
- pH meter
- Turbidity meter
- Specific conductivity meter
- Oxidation Reduction Potential (ORP) meter
- Thermometer
- Dedicated purging and/or sampling pumps
- Non-dedicated purging pumps

Monitoring equipment will be protected (as much as practical) from contamination without hindering operation of the unit.

2.3.4.2 Preparatory Activities

Preparatory Office Activities

Physical aspects of the sampling program will be organized in the office prior to embarking on a field sampling project. The time spent in the field is very valuable and should be spent on sample collection, making field measurements and recording data and not on the organization of equipment and containers.

- **Sampling Sequence** - The sequence of sampling will be pre-determined on the basis of existing groundwater quality data. Generally, the least contaminated wells will be sampled first, proceeding to the progressively more contaminated wells, based upon the last event's water quality data.

- **Initiation of Field Data Records** - Field data sheets will be initiated prior to the start of sampling. Examples of initial data to be recorded include site and sampling location identification, well depth and construction, and purging and sampling collection methods.

Preparatory Field Activities

The following procedures will be conducted in the field prior to well purging and sampling. This will be coordinated with the ongoing Hydraulic Monitoring such that a round of water levels is collected just before the groundwater sampling event commences. Measurements shall be collected on the same day so the water level data may be used to generate groundwater flow maps.

- **Well Maintenance Check** - A well maintenance check that includes visual observation of the condition of the protective casing and surface seal will be performed. In addition, the well will be checked for other signs of damage or unauthorized entry.
- **Preparation of Well Area** - A suitable work area will be established around the perimeter of the well. This will provide a clean surface on which sampling equipment can be placed such that it will not become inadvertently contaminated. This work area will be prepared by placing new polyethylene (PE) sheeting on the ground around the well, taking care not to step on it. Alternatives can include the placement of a clean PE lined trash can or a clean PE covered table adjacent to the well.
- **Water Level Measurements** - The depth to water will be measured prior to initiation of sampling activities. Water level measurements will also be made during purging in order to monitor well drawdown, and special care will be taken to thoroughly decontaminate the probe prior to use.

2.3.4.3 Low-Flow Purging and Sampling Method

Introduction

The use of a low-flow purging and sampling method will minimize stress on the water-bearing zone, thereby minimize the disturbance of any sediment that has settled at the bottom of the well. Accordingly, groundwater samples will be more representative of actual aquifer conditions.

The low-flow purging and sampling method to be applied during this monitoring program is described in detail below. It is consistent with the low-flow procedure described in NJDEP's August 2005 *Field Sampling Procedures Manual* with the exception of NJDEP's five-foot sampling interval requirement. Instead of collecting one low-flow sample for every five-foot of well screen length, only one low-flow sample will be collected per monitoring well.

This variance is consistent with the USEPA references that were cited in the *Field Sampling Procedures Manual.* The two USEPA references cited, *Region 1 Low Stress (Low Flow) SOP* (USEPA, 1996) and *Region II Ground Water Sampling Procedure; Low Stress (Low Flow) Purging and Sampling* (USEPA, 1998), state that low-flow procedures may be applied to well screen intervals of up to 10 feet in length. Since the screens of the wells to be sampled at the site are 10 feet in length, the collection of only one low-flow sample from each well would be consistent with USEPA procedure.

Furthermore, this variance is consistent with peer-reviewed scientific research. This research has indicated that there is significant vertical mixing within a well casing even under low-flow purging conditions, making it impossible to define groundwater quality at specific depth intervals by simply adjusting the depth of a pump's intake. Research performed by Varljen, *et al.* (2006), for example, had demonstrated that that the location of a pump's intake within the well screen does not influence the zone sampled, and that neither the intake depth

nor the screen length matter, as the groundwater along the entire length of the screen would be drawn uniformly into the well and sampled, even under low-flow purging conditions. The findings of Varljen, *et al.* (2006) are consistent with Reilly, *et al.* (1989), Puls and Paul (1998), Hutchins and Acree (2000) and Martin-Hayden and Robbins (2000), who all found significant vertical flow and mixing within a well casing under very small head changes or low purging rates.

Based on these research findings, sampling at five-foot intervals in accordance with NJDEP policy would not satisfy the NJDEP's intent of vertically profiling contaminant distribution within a well's screen, but rather would result in the generation of redundant data that would not add any technical value to the monitoring program. Therefore, only one groundwater sample per monitoring well will be sampled using the low-flow purging and sampling method.

Pump Intake Location

The sampling pump intake will be installed within the well screen at the halfway point between the top of the screen and the bottom of the screen, or at a depth that is at least two feet below the static water level if the well is screened across the water table.

Water Quality Indicator Parameters

The following parameters will be measured in order to determine when well stability has been achieved prior to sampling. Their respective measurements will fall within the stated range for three consecutive readings. If the anticipated "third" reading of any individual parameter does not fall within the stated range, then the process to achieve three consecutive readings for that parameter will be restarted. If, after four hours, stability has not been achieved for the parameters listed below, the recommendations presented below will be followed.

Water Level Drawdown	< 0.3 ft*[2]
pH	± 0.1 unit
Specific Conductance	± 3%
Temperature	± 3%
Dissolved Oxygen	± 10%
Turbidity	± 10% for values greater than 1 NTU
ORP/Eh	± 10 millivolts

Measurements should be taken once every 5 to 6 minutes. This interval is based upon the time it takes for purge water to replace one flow-through-cell volume (generally 250 ml) and the time it takes to measure and record the data. If the purge rate decreases or if the flow cell volume is increased, the time required for purge water replacement will increase. Water Quality Indicator Parameters will be collected in a manner that will ensure integrity of the data being collected. To ensure consistency of the data, consideration of the following will be made: 1) tubing diameter, length, and material of construction; 2) flow-through cell design, capacity, decontamination, and "purge-train" set-up; 3) pump selection and plumbing fittings; 4) calibration of flow-through cell probes; 5) purge rate; and, 6) water-level-measurement technique.

[2] During pump start-up, drawdown may exceed the 0.3-ft target and then recovers as flow-rate adjustments are made.

Purge Volume vs. Stabilization Time

In some cases, it may take considerable time to achieve stabilization of the Water Quality Indicator Parameters. In other cases, they may never stabilize. However, as provided in USEPA guidance, the following options are available if stability has not been achieved after four hours of purging: 1) continue purging until stabilization occurs, no matter how long it takes; 2) discontinue purging, do not collect a sample and document the attempts to reach stabilization; or 3) discontinue purging, collect a sample and document the attempts to reach stabilization. In situations where the Water Quality Indicator Parameters do not stabilize, the sampler will document that low-flow purging and sampling could not be performed and document how the samples were collected.

If a Water Quality Indicator Parameter is not accurately measured during the monitoring process or if a certain Water Quality Indicator Parameter does not stabilize, and that particular Water Quality Indicator Parameter is not significant with respect to the type of contaminant of concern, sample collection will still proceed. Any Water Quality Indicator Parameters that are affected by field conditions or instrument malfunction will be discussed in the text of the report in order to alert the end-user of potential data bias.

Tubing

The inside diameter (ID) of tubing will be no greater than three-eighths of an inch (3/8-in). Larger tubing diameters will reduce flow velocity resulting in a corresponding increase of pump speeds to maintain flow. Increased pump speed may, in turn, elevate the potential for turbulent flow across the screened interval and this may affect the quality of the water being sampled. Conversely, any reduction in flow velocity may allow air to become trapped in the tubing, which may ultimately affect air-sensitive parameters or allow particulates to settle, which may affect turbidity values. The length of tubing, from the top of the well casing to the flow-through chamber, will be the shortest length manageable. Attention to this detail will help ensure that: 1) exposure to ambient temperature, direct sunlight, and bubble formation are kept to a minimum, and 2) deposited solids or air bubbles will less likely be trapped in tubing bends and re-mobilized after accidental movement. Occurrence of any one or combination of these factors can cause variations in Water Quality Indicator Parameter measurements, which could increase stabilization time. Therefore, tubing will be completely full of water at all times.

The tubing's material of construction will be either Teflon® or Teflon®-lined polyethylene up to the flow-through cell. Tubing downstream of the flow cell may be constructed of a lower-quality, more flexible material. Tubing "reuse" will not be permitted.

Flow-Through Cell

Cells are required to be transparent in order to "see" the physical condition of the purge water or air bubbles passing through the system. The cell will be sealed against unwanted exposure to the atmosphere, thus ensuring accurate measurement of air-sensitive parameters (dissolved oxygen, pH, etc.). The total capacity of the cell will be small (300-1,000 ml) in order to maintain a desirable turnover rate of water coming into the cell to ensure real-time data integrity. The in-line design will allow for purge water to enter the flow cell from a bottom port and exit at the top. The discharge may be fitted with a check valve.

The pump discharge line will not be connected to the flow-through cell upon initial pump startup. This will allow the sampler time to monitor drawdown, stabilize the flow rate and prevent fouling of probes by bacteria, sediment, or NAPL. Once drawdown measurements indicate that the flow rate has been controlled and a few minutes (<10) have been allowed to clear any unwanted material, the pump discharge line can then be connected to the flow cell.

The cell and probes will be rinsed with distilled/deionized water between each monitor well as accumulation of suspended material may impact probe performance. The probes will then be rinsed using a mild detergent or laboratory glassware cleaning solution, and then rinsed again with distilled/deionized water. Because the location of the flow cell or cells in relation to the sample port is critical, samples for turbidity measurement, general chemistry and laboratory analysis will be collected ahead of the flow cell. If two cells are used in series, the dissolved oxygen probe will be located in the first cell.

The flow-through cells will be located as close as possible to the well head in order to minimize the length of tubing needed between the well head and flow-through cell. The flow-through cell will be protected from ambient conditions and the ground surface.

Pump Selection

Pumps used for monitoring Water Quality Indicator Parameters will be submersible, positive-displacement pumps, and may include bladder, variable-speed submersible-centrifugal, reciprocating-piston, progressive-cavity, or gear pumps. Peristaltic pumps will not be used. The pump discharge will be fitted appropriately to receive either 1/4 or 3/8-inch inside-diameter (ID) Teflon® or Teflon®-lined polyethylene tubing.

Pumps constructed with impellers, helicoils, or gears, which are difficult to clean or are constructed of unacceptable plastic parts, will not be used for sampling. In addition, the power or gas supply line for the pump will be isolated from the sample tubing.

Plumbing Fittings

A check valve will be incorporated into the tubing train, within the pumps, or within the flow cell discharge to eliminate accidental drainage and subsequent aeration of the flow cell. More importantly, a check valve will prevent a back-surge of purged water being reintroduced at the screen interval of the well should the power source or pump experience mechanical failure. A ¼- or 3/8-inch ID barbed "T" or "Y" fitting, placed ahead of the flow cell, may be used to establish the line which will receive a needle valve for turbidity, general chemistry and analytical sample collection. The "T" or "Y" fitting used will be constructed of Teflon® or stainless steel and decontaminated between each use. The fitting may be constructed of polyethylene and decontaminated between each use if it is only used to sample for turbidity and general chemistry parameters. If analytical samples are collected through the "T" or "Y" fitting and needle valve, then those parts will be incorporated into the field blank collection technique. When collecting a sample at the port ahead of the flow cell, a flow control valve (stainless-steel needle valve [preferred] or stainless steel/Teflon® ball valve [optional]) will be used to prevent back pressure and air bubbles from forming in the tubing

The "needle valve" offers versatility as it can be used for collection of turbidity, general chemistry and analytical samples. It can be used with Teflon® tubing and can be used to control sample flow rate because the design significantly reduces any back pressure gradient. Like all other sampling equipment, the "needle valve" will be decontaminated before use at any well.

Calibration of Probes

Calibration of the probes used to monitor water quality indicator parameters will take place in the field prior to the day's events. All manufacturers' instructions for proper care and calibration of the probes will be followed. Solutions for probe calibration will be held to the temperature of the liquid (groundwater) being measured as temperature correlation is critical in calculating conductivity, dissolved oxygen and pH. As an alternative, tables and equations to compensate for the difference between ambient groundwater and

calibration solution temperature may be used if provided in the operating manuals or with the calibration solutions. No sampling will commence until all instruments are calibrated and operating properly. The calibrations steps utilized will be recorded.

Water Level Measurements

The depth to the top of the water column will be recorded prior to pump installation and/or prior to purging. If the total depth of the well needs to be determined (e.g., to verify the correct well designation and/or to determine if silt has accumulated in the bottom of a well), then it will be measured at least 48 hours prior to sample collection or after the sample has been collected and the pump removed. Total depth measurements must never be taken immediately before purging as this may cause the re-suspension of solids in the well and prolong the purge time. Once the initial water-level measurement has been recorded and the pump installed, the water-level probe will be suspended in the well at the point at which drawdown is equivalent to a 0.3-foot drop. The water levels will be recorded simultaneously with water quality instrument parameter measurements once every five minutes. Water-level-measurement devices, which may impart some disturbance to the water column (i.e., stainless steel "popper" or coated tape) will not be used.

Pump Installation

Once pumps have been properly decontaminated and fitted with appropriate tubing, installation of the pump can begin. Pumps will be installed in such a manner as to ensure that any disturbance in the well is kept to an absolute minimum. Once a pump reaches the top of the water column, its descent will proceed very slowly through the water column. The pump will be lowered until the pump's intake reaches the halfway depth between the top and bottom of the screen, or installed at least two feet below the static water level if the well screen intercepts the water table. The actual level where the pump intake will be suspended will be predetermined based upon well construction logs or prior analytical data. Under no circumstance will the pump make contact with, or be "bounced" off, the bottom of the well.

Purge Rates

The purge rate will range between 100 to 500 ml/min. The water will be initially purged prior connecting the tubing to the flow-through cell in order to prevent any fouling of the cell. Tubing will then be connected to the cell with the pump running. After making the connection, the cell will be inspected to verify that purge water has filled cell and that all air is purged from system. The pump speed will remain constant such that flow rates never exceed 500 ml/min and, once stabilized, the flow rate will not be varied. If drawdown exceeds 0.3 ft., then the pump speed will be reduced until the drawdown has stabilized; however, the pump speed will not be reduced to lower than 100 ml/min. If drawdown does not come under control at 100 ml/min, then a field decision will be rendered as to how far to allow drawdown to continue until sample collection. At no time will evacuation allow any portion of the well screen to be exposed (for wells screened below the water table) or bring the well to dryness. Well stabilization indicators parameters will be measured once the water level has stabilized.

Purge rates will be monitored by measuring the flow from the discharge side of the flow cell with a graduated cylinder. All of the required water quality indicator parameters will be recorded on appropriate filed data sheets once every 5 to 6 minutes. Once stability has been attained and recorded, sampling will begin.

Sampling

Once the water quality indicator parameters have stabilized, or once a four-hour (4-hr) time decision has been rendered, sampling can proceed. The same pumping rate used during well purging will be maintained during

sample collection. The sample will be collected directly from the flow control valve at the sample port. A final set of water quality indicator parameter measurements will be recorded immediately after sample collection.

In the event that wells do not stabilize within a four-hour (4-hr) time frame, purging may be considered to be complete in these wells after three to five (3 - 5) well volumes of water have been purged. Accordingly, purging will be considered to be complete in wells in which parameters do not stabilize after three to five (3 - 5) well volumes have been purged and/or after purging for four (4) hours, whichever is a shorter time period.

2.3.4.4 Ultra-Clean Sample Collection and Handling

"Ultra-clean" sample collection and handling methods will be used for the collection of mercury samples from groundwater. The ultra-clean approach provides an additional level of quality assurance in the field to minimize false positive results. The ultra-clean sample collection and handling methodology, as presented below, are consistent with USEPA Method 1669 "Sampling Ambient Water for Trace Metals at USEPA Water Quality Criteria Levels" (USEPA, 1996).

Ultra-Clean Sample Handling

The sampling handling will be performed according to the following steps:

- The sampling team (minimum of 2 people) will be organized into two parties designated as "Clean-Hands" and "Dirty-Hands". The establishment of these roles is intended to minimize potential interference such that the detection of constituents in groundwater samples is a reflection of actual groundwater conditions at the Site and is not biased because of cross-contamination.
- Upon arrival at the sampling location, the team will have already completed the required office preparation activities (See preparation activities section above). Both team members will don clean gloves.
- A work area will be prepared around the monitoring well area by establishing a perimeter around the well. Inadvertent cross-contamination of the sampling equipment will be minimized by placing fresh polyethylene (PE) sheeting on the ground around the monitoring well; the sampling team must not step on the PE sheeting. Alternatives can include the placement of a clean PE lined trash can or a clean PE covered table adjacent to the well. This activity should be performed by the Dirty-Hands team member since there will be potential contact with the surrounding environment.
- Dirty-hands will change gloves. A static water level will be taken by Dirty-Hands and recorded on the field-data sheets by Clean-Hands.
- The pump will be removed from the storage container by Dirty-Hands.
- The tubing to be used will be connected to the pump by Clean-Hands while NOT touching the pump.
- Clean-Hands will then lower the pump slowly through the well to the sample-depth and connect the tubing to the water quality instruments while again NOT touching the instruments. Both will change gloves.
- Dirty-Hands will secure the pump and operate all equipment for purging (water-level meter, pump control box, etc.). Clean-Hands will record the information from the display of the water quality instruments and the water-level and flow-rate given by Dirty-Hands.
- When it is time to sample both will change gloves. Dirty-Hands will remove the sample containers from the cooler (sample containers will have already been placed inside of an inner and outer zipped bag as part of the office preparation activities).

- If filtering the sample, Clean-Hands will attach the inline filter to the sample tubing. Dirty-Hands will open the outer bag and Clean-Hands will open the inner bag and remove the sample container.
- Once filled, Clean-Hands will secure the container lid and return it to the inner bag and zip it shut. Dirty-Hands will then shut the outer bag and place it in the cooler.
- Sampling is now complete and Dirty-Hands will remove all sampling equipment from the well, secure all purge-water and clean the perimeter in preparation of moving to the next location. Clean-Hands will complete all paperwork.

Ultra-Clean Preparatory Office Activities

Physical aspects of the sampling program will be organized in the office prior to embarking on a field sampling project. The time spent in the field is very valuable and should be spent on sample collection, making field measurements and recording data and not on the organization of equipment and containers.

- **Sampling Sequence** - The sequence of sampling will be pre-determined on the basis of existing groundwater quality data. Generally, the least contaminated wells will be sampled first, proceeding to the progressively more contaminated wells, based upon the last event's water quality data.
- **Initiation of Field Data Records** - Field data sheets will be initiated prior to the start of sampling. Examples of initial data to be recorded include site and sampling location identification, well depth and construction, and purging and sampling collection methods.
- **Sampling Equipment Preparations** – All sampling equipment to be used when sampling for mercury will be cleaned initially and placed into two clean, disposable storage bags for transportation to the Site.
- **Analytical Sampling Container Preparation** – When sampling for mercury all containers used will be placed into two clean zipped, plastic bags and transported to the Site inside coolers with ice. This step initiates the Clean-Hands / Dirty-Hands procedures for sampling for mercury.

Ultra-Clean Decontamination

The ultra-clean decontamination procedure is essentially the same as the 9-step decontamination procedure in Section 2.5.3 of the FOP with several exceptions, including glove changes between various steps a more rigorous method of decontaminating non-dedicated pumps.

The cleaning process will consist of the following:

- Change gloves. Disassemble pump, wash parts (except used bladder and O-rings) in laboratory detergent and potable water solution.
- Rinse the pump and parts with potable water.
- Change gloves. Rinse the pump with distilled/deionized water.
- Rinse the pump and parts with 10% nitric acid (if sampling for metals).
- Change gloves. Rinse the pump with distilled/deionized water.
- Rinse the pump and parts with reagent-grade methanol.
- Allow the pump and parts to air dry fully.
- Change gloves. Rinse the pump with distilled/deionized water.
- Assemble the pump with a new bladder and new O-rings and place into two clean, disposable storage bags.

Non-dedicated bladder pumps will be disassembled and the pump and its parts will be cleaned prior to and between each use. The bladder, O-rings and pump tubing will be replaced after each use. Pump tubing will be discarded after each use unless saved and reused for the same monitoring well (dedicated to sampling location).

2.3.5 Field Permeability Testing (Slug Tests)

In-situ permeability tests using the slug test method will be conducted on the monitoring wells. The data will be recorded using an electric pressure transducer and digital data recorder (e.g., Hermit Data Logger). Slug tests will be conducted to determine the hydraulic characteristics of the water table and bedrock aquifer. Slug testing generally involves quickly submerging a solid cylinder of known volume (the "slug") into the water column (falling-head test). After the slug is inserted and as the water column drops to reach equilibrium, the change in water level versus time is recorded by an electric pressure transducer and data processor. After the water level has recovered, the slug is removed (rising-head test) and the response is recorded. The procedures to be followed during slug testing are described below.

Slug In – Falling Head Test

1. Record well number, time, and date; unlock protective casing
2. Check the well headspace with a PID immediately upon opening the well cap
3. Obtain an accurate static water level
4. Place the pressure transducer near the bottom of the well and hook up data logger
5. Place slug (solid PVC or equivalent cylinder) in the well and quickly lower the slug below static water level.
6. The electronic data logger will record the water levels under the Standard Log Schedule. Manual water levels, if used to support the digital data, will be measured according to the following time schedule:

Time since beginning of slug test, in minutes	Intervals between measurement, in minutes
0 – 2	0.5 (30 sec.)
2 – 5	1.0
5 - 30	5.0

7. Leave the slug in place until the well has recovered to within at least 90 percent of its original static water level. In cases of very slow recharge, a 90 percent recovery is not practical, and the test will be run for a minimum of ½ hour to attempt to accumulate sufficient test data.

The falling head or "slug in" method is suitable only for a well in which the screen is fully submerged. If the screen is partially submerged, the test data will overestimate the hydraulic conductivity of the aquifer. After the drawdown phase of the slug test has recovered to within 90 percent; the "slug out" test is initiated.

Slug Out – Rising Head Test

1. Quickly remove slug from the well.
2. Allow the water level to recover to at least 90 percent of the original static water level or until the requirements of paragraph seven above have been met.
3. Clean and dry all equipment (slug, rope, tape) used in the test.

The data results of the permeability tests are interpreted based on the Bouwer and Rice Method (Bouwer and Rice, 1976, Bouwer, 1989). The following formula (Bouwer and Rice, 1976) will be used to calculate hydraulic conductivity (K):

$$K = \frac{r_e^2 (R_e / r_w)}{2L_e} - \frac{1}{t} \ln \frac{y_o}{y_t}$$

Where: r_e = well radius (ft)
R_e = effective radial distance over which the head difference is dissipated (ft)
r_w = radial distance between well center and undisturbed aquifer (ft)
L_e = length of saturated screen (ft)
y_o = water level y at time zero (ft)
y_t = water level y at time t (ft)
t = time since y_o (minutes)

As stated above, falling head tests are suitable only for those wells with a completely saturated screen interval. Therefore, only rising head tests will be performed on the shallow wells because they will be screened across the water table.

2.3.6 Tide Investigation

It was noted during RI-scoping site reconnaissances that surface water is not present along the entire length of South Branch Creek at all times. Surface water is periodically absent from the LCP bulk head area, presumably during low tide. South Branch Creek is apparently more of a drainage channel than an established, perennial, flowing stream. The effects of Arthur Kill tides on South Branch Creek will be assessed and documented through the installation and periodic monitoring of a staff gauge. A commercial staff gauge (e.g., Ben Meadows Company graduated model) will be affixed to the bridge that spans South Bridge Creek between the two tank farms (Figure 3-2).

The groundwater levels of 9 monitoring wells will be monitored to compare tidal variations in surface water and groundwater, determine the tide fluctuations in groundwater across the site, and determine mean groundwater elevations and hydraulic gradients at the site. The nine monitoring wells will be monitored for an approximate one-week period to record a range of daily tidal cycles. The staff gauge installed in South Branch Creek will be surveyed so that surface water levels and tidal variations can be monitored and compared to groundwater levels at the site.

The groundwater measurements will be collected from the wells and from the staff gauge using In-Situ brand Troll model pressure transducers and data loggers (or equivalent equipment). The transducers will be programmed to collect and record a time and pressure head reading once per hour during the monitoring time period. Three additional transducers will be placed along the channel of South Branch Creek (bulkhead area, mid stream, and by Arthur Kill) to monitor the amount of water that actually inundates the channel during high and low tides.

Tidal fluctuations in surface water bodies produce progressive pressure waves in adjacent aquifers. As these pressure waves propagate inland, groundwater levels and hydraulic gradients continuously fluctuate, creating a situation where a single set of water level measurements cannot be used to accurately characterize groundwater flow. At any measuring point (e.g., monitoring well) where groundwater fluctuates because of tides, the magnitude and direction of the hydraulic gradient fluctuates about the mean or regional hydraulic gradient. The net effect of these fluctuations on groundwater flow can be determined calculating the mean hydraulic gradient for that measuring point. This is done by filtering groundwater level measurements

recorded over a period of time to obtain a mean groundwater elevation for that measuring point. A filtering method, described by Serfes (1991), using 71 consecutive hourly water level observations will be used on the data to calculate the mean water level for each monitoring point.

The filtering method (Serfes, 1991) removes the diurnal and semidiumal lunar and solar harmonics from 71 consecutive hourly observations. Using moving averages it yields a filtered mean level for the median time of the 71 hours. First, a sequence of mean is computed for 24 observations, starting with observation one for the first mean and observation 48 for the last, yielding a total of 48 means. Second, a similar series of means is computed for 24 of those means yielding 25 means. Last, the mean of those 25 means is computed yielding the mean level at hour 36.

The filtering method can be expressed mathematically as:

Let the consecutive hourly water level values be O (1), O (2), O (3)…, O (7):

The first sequence of means (Xi) is:

$$X_i = \sum_{K=0}^{23} \frac{O(K+i)}{24}$$

Where I = 1, 2, 3,…, 48;

The second sequence of means (Yj) is

$$Y_j = \sum_{i=0}^{23} \frac{X_i + j}{24}$$

Where j = 1, 2, 3,…, 25;

Then the mean level (M) at hour 36 is

$$M = \sum_{j=1}^{25} \frac{Y_j}{25}$$

The mean groundwater elevations from the 71-hour period will be used to construct groundwater elevation contour maps for the site. Recommendations for or against additional tide investigations will be made on the basis of an evaluation of the data and presented in the RI report.

2.4 Surface Water and Sediment Investigations

Surface water and sediment sampling of South Branch Creek is proposed at six locations. When sampling for both surface water and sediment at the same location, the surface water sample will be taken first with care not to disturb bottom sediments. When possible, surface water grab samples will be collected in the actual container to be used to transport the sample to the laboratory. Therefore, pre-preserved containers are not to be used as collection vessels. Required preservatives will be added after the samples are collected. Surface water samples will be collected at mid-depth of the water column. A horizontal sample collector, such as a pond sampler, may be used to access a surface water sampling location otherwise inaccessible. The samples will be collected following the guidelines described in the NJDEP Field Sampling Procedures manual

(NJDEP, 1992). Surface water and sediment samples will be collected in a "downstream" to "upstream" direction (i.e., in a direction opposite the flow direction of the Arthur Kill tides), to minimize the chance of spreading disturbed sediment to unsampled locations.

Surface Water

The following procedure will be used to collect surface water directly in sample containers provided by the project laboratory:

1. Don a clean pair of latex gloves.
2. Estimate sampling depth by visual observation (for shallow samples) or measure depth using a weighted, flexible measuring tape or a rigid gage.
3. Invert the laboratory-supplied sample container (without preservatives), insert the sample container into the water to the desired level, and then turn the mouth of the sample container up and towards the upstream direction thus allowing the container to fill.
4. Cap sample container while container is still underwater, if possible.
5. Remove sample container from water body and cap if not already capped.
6. Rinse the exterior of the sample container thoroughly with deionized water and label container.
7. Add preservatives and check for appropriate pH.

Record all appropriate data (including sampling location, sampling depth, time of sampling, and description of sample) in field logbook or the Surface Water Sampling Log.

Sediment

The procedures for collecting surface and subsurface sediment samples for analytical and physical parameters are provided below. Based on stream characteristics and logistics, a hand corer (or equivalent device) is selected as the default sampling method for sampling sediment because this method can be used to collect a relatively undisturbed sample that shows a profile of stratification. The procedure to collect a sample using a hand corer is described below.

1. Record the sample location on a site map and in the field logbook.
2. Decontaminate stainless steel sampling equipment in accordance with the procedures outlined in Section 2.5.
3. Don a clean pair of latex gloves.
4. Push core tube into the surface of sediment.
5. Measure length of core tube above surface of water
6. Manually push or hammer the core tube into the sediment to the two-A depth.
7. Fill core tube with water (to remove air above sediment/water interface) and cap top of core tube.
8. Pull core tube out of sediment, as bottom tube breaks water surface, cap bottom of core.
9. Measure the sediment in the core tube to determine depth of penetration and recovery.
10. Transfer (using a decontaminated spoon) each selected depth interval of sediment into separate stainless steel bowls.
11. Decontaminate stainless steel sampling equipment in accordance with the procedures outlined in Section 2.5.

Repeat the steps for pushing and retrieving the core tube to obtain a sufficient quantity of sediment for all chemical and physical analyses. Sediment samples may also be collected using decontaminated stainless steel sampling scoops, trowels, or petit ponar samplers.

The following steps will be performed once the sample is collected:

- Label the sampling jars
- (New bullet inserted from FOP Addendum No. 5 (Brown and Caldwell, October 2006)) Sediment samples targeted for AVS/SEM analysis will be collected with minimum disturbance and exposure to air. These sediment aliquots will be immediate grab samples collected at a depth of 0-0.5 ft, and will be packaged in wide-mouth jars or retained as core segments capped at both ends. In either case, overlying surface water will be retained and the sampling containers will be filled to the maximum extent possible to avoid air space.
- Homogenize sediment from each depth interval and transfer the sediment into appropriate sample containers using the decontaminated spoon.
- Store and document sample.
- Mark sampling location with a buoy, stake, or other indicator for subsequent surveying of sample locations.

Sampling equipment shall be decontaminated after the collection of each sample in accordance with the procedures outlined in Section 2.5. Record all appropriate data (including sampling location, sampling depth, time of sampling, and description of sample) in field logbook or the Sediment Sampling Log.

2.5 Equipment Decontamination

To minimize the chance of cross-contamination, the equipment used during the field investigation will be decontaminated in accordance with NJDEP guidelines (May 1992). The decontamination water will be collected and containerized in 55-gallon drums or in a larger portable storage tank or tote. The cleaning procedures described in the following sections will be used for the RI/FS. The equipment used to collect samples for laboratory analyses will be precleaned in a laboratory (e.g., sampling spoons, etc.) and dedicated for that sampling point. Whenever feasible, all field sampling equipment will be laboratory cleaned, wrapped, and dedicated to a particular sampling point. For this RI, stainless steel sampling spoons and trowels that are used to collect soil or sediment samples submitted for chemical analysis will be laboratory decontaminated whenever possible. Disposable Teflon bailers, if used to collect water samples (although not likely with the use of low-flow sampling techniques), will also be dedicated, vendor decontaminated, and wrapped in autoclaved aluminum foil. The field-cleaning of sampling equipment used to collect samples for analyses will be avoided to the extent possible.

The decontamination water will be sent for disposal in accordance with the analytical results of the waste characterization tests that will be performed at the end of the field investigation. If approved by the USEPA, the decontamination water will be treated at the Stormwater treatment unit located on site.

2.5.1 Large Equipment

Large equipment, such as backhoes, drill rigs, and ancillary equipment, will be decontaminated upon arrival at the site, between borings, and before demobilization. Decontamination will consist of a high pressure hot water or "steam" wash and brushing to remove encrusted material. Potable water obtained from fire

hydrants or a local source located near the site will be used. The drill rig equipment and tools used during these activities will be pressure cleaned after the completion of each soil boring to minimize the potential for cross-contamination.

2.5.2 Soil Sampling Equipment

Non-dedicated soil sampling equipment, with the exception of the Direct-push samplers, used for collecting samples for laboratory analysis (i.e., split-spoon samplers, specialized soil samplers, spoons, and scoops) will be decontaminated using the nine-step decontamination procedure as follows:

1. Alconox or low-sudsing detergent scrub and potable water wash
2. Generous tap water rinse in a second wash tub
3. Distilled and deionized (ASTM Type II) water rinse
4. Ten percent nitric acid rinse (only if sample is to be analyzed for metals)
5. Distilled and deionized (ASTM Type II) water rinse (only if sample is to be analyzed for metals)
6. Acetone (pesticide grade) rinse (only if sample is to be analyzed for organics)
7. Distilled and deionized (ASTM Type II) water rinse (only if sample is to be analyzed for organics)
8. Total air dry
9. Aluminum foil wrap equipment (if not reused immediately)

Soil sampling equipment used for stratigraphic soil sampling only (i.e., split-spoon samplers, Shelby tubes, and specialized soil samplers) will be decontaminated using the following procedure:

1. Alconox or low-sudsing detergent scrub and potable water wash
2. Generous tap water rinse in a second wash tub
3. Distilled and deionized (ASTM Type II) water rinse
4. Total air dry
5. Place equipment in aluminum foil or wrap in plastic (if not reused immediately)

Grossly contaminated soil sampling equipment will be decontaminated using the nine-step procedure described above.

2.5.3 Water Sampling Equipment

If field cleaning of aqueous sampling equipment is required, then the following nine-step decontamination procedure shall be used:

1. Alconox or low-sudsing detergent scrub and potable water wash
2. Generous tap water rinse in a second wash tub
3. Distilled and deionized (ASTM Type II) water rinse
4. Ten percent nitric acid rinse (only if sample is to be analyzed for metals)
5. Distilled and deionized (ASTM Type II) water rinse (only if sample is to be analyzed for metals)
6. Acetone (pesticide grade) rinse (only if sample is to be analyzed for organics)

7. Distilled and deionized (ASTM Type II) water rinse (only if sample is to be analyzed for organics)
8. Total air dry
9. Aluminum foil wrap equipment (if not reused immediately)

2.5.4 Monitoring Well Riser and Screen

Before installation, field cleaning of PVC well riser and screen will consist of a manual scrubbing to remove foreign material and steam cleaning, inside and out. The PVC riser and screen will then be handled and stored in such a manner so as to prevent cross-contamination prior to installation.

2.5.5 Pumps and Lines

Pumps and lines are the most difficult items to clean because they are awkward to handle in the field and require large volumes of cleaning agents. It is important that contaminants not be carried from well to well. If the wells are found to contain only "clear" water with no observable organic film or phase, decontamination will be accomplished between each well as described below. Grossly contaminated pumps will not be reused at the site and an alternate sampling approach for the well containing free product will be considered.

To decontaminate submersible pumps the coiled lines and pump will be drained of water as best as possible. The pump and lines will be placed in a large bucket and scrubbed with dilute non-phosphate detergent. The pump will then be placed in a plastic overpack drum or plastic garbage can (metal drums should be avoided if using electric pumps) and a minimum of 20 gallons of water will be flushed through it. After the flush, the outside of the pump will be rinsed with distilled and deionized water. Pump tubing cleaned in this manner will be used solely for well purging, not for sample collection.

Surface pumps (e.g., centrifugal, inertial lift, etc.) used at the site for well purging or well development will not require decontamination because dedicated tubing will be used together with a dedicated foot valve, to prevent backflow of water from the pump into the well.

2.6 Investigation-Derived Waste Handling

The disposal of wastes generated during the RI/FS, such as soil cuttings and groundwater development water, will follow the guidelines in the NJDEP Field Sampling Procedures Manual (NJDEP, 1992).

For monitoring well development and purge water, if there is no obvious contamination observed during drilling and well installation, if the development water does not have an observable sheen or odor, and if the PID readings of the water remain at background levels, the development/purge water will be discharged to the ground surface and allowed to percolate back to the groundwater system. In general, the water will be discharged to the ground upgradient of each monitoring well and not in areas where it may run off the site. If development/purgewater has signs of gross contamination, it will be collected in U.S. Department of Transportation (DOT) approved (or equivalent) 55-gallon drums and stored at the site staging area. These suspected fluids would be analyzed to determine their toxicity characteristics. After the analytical results are received, these fluids will be disposed of in accordance with applicable local, state, and federal regulations. USEPA will be informed before wastewater generated at the site is removed off site for disposal.

Other disposable materials such as personnel protective gear (e.g., gloves, Tyveks) will be collected in plastic bags or DOT-approved 55-gallon drums for subsequent disposal.

The unused shallow soil drill cuttings and soil samples will either be drummed for disposal (if visually grossly contaminated or exhibiting high field screening results), stockpiled at the staging area under tarps and plastic for later characterization (if samples appear uncontaminated), or saved and archived for soil description and stratigraphic identifications.

Containerized materials will be transported to the site storage area, placed on pallets, and the contents labeled with weather-resistant labels or markers on the drum exteriors. The field inspector will maintain a log of the drums, their contents, and associated analytical data.

The project consultant will coordinate disposal of investigation-derived waste with a disposal contractor. These materials will be handled, transported, and disposed of according to requirements mandated by applicable federal, state, and/or local hazardous waste regulations. The disposal of non-hazardous waste materials generated at the site will be the responsibility of the each subcontractor that generated that material (e.g., drilling and sampling disposables, grout bags, excess monitoring well materials, etc.).

2.6.1 Investigation-Derived Waste

Section 2.6.1 inserted from FOP Addendum No. 1 (Brown and Caldwell, October 2001)

A "mud" slurry will be generated when advancing the portion of the cased deep borings (Section 2.2.3.4) below the permanent casing using the water rotary method. This mud will consist of drill cuttings and fluids. The drilling waste will be contained during the drilling process (e.g., using a mud tub). Upon completion of the borehole, the drilling waste will be placed in DOT approved drums, pending characterization and appropriate disposal.

2.7 Surveying

A land survey will be performed by a New Jersey State licensed surveyor to horizontally and vertically locate the sampling points established during the RI (i.e., monitoring wells, soil borings, sediment sample locations, etc.). The inner casing (riser) of monitoring wells, as well as the ground elevation and elevation of the outer casing, will be surveyed for both horizontal and vertical control, to a degree of accuracy of 0.01 foot. The survey data will be referenced to the 1983 New Jersey State Coordinate System (North American Datum of 1983) and to the North American Vertical Datum of 1988.

2.8 Sample Handling

Numerous environmental samples will be collected during the RI/FS and submitted for laboratory analyses. The matrix of the samples will consist of soil, sediment, groundwater, and surface water. The requirements for sample containers, identification of samples and packaging and shipping of samples are described below.

2.8.1 Quality Control Samples

An important aspect of the field investigation is to document and preserve the quality of the analytical data that will be generated through sample collection and laboratory analyses. Therefore, field QA/QC samples will be collected at regular intervals during the sampling program to partly satisfy this objective. The QA/QC samples will be collected in such a way that a clear association between the environmental samples and the associated QA/QC sample is established. Field records of the association will be documented and maintained. Definitions, sampling requirements, and frequency of collection of the QA/QC samples are described below.

2.8.1.1 Field Blanks

A field blank is deionized water that is poured into or pumped through the dedicated or field decontaminated sampling device, transferred to the appropriate sample containers, and transported to the laboratory for analysis. Field blanks will be prepared on sampling equipment used to collect aqueous and soil samples. Sampling equipment for aqueous samples include tubing. Sampling equipment for soil samples include stainless steel trowels and split-spoons, but not EnCore™ samplers. Field blanks are not required for Encore™ samplers (USEPA Region II, personal communication to URS, Telecon November 1, 2000). The field blank samples will be analyzed for the same parameters as the samples being collected at the time of the preparation of the field blank, with the exception of VOCs that are associated with Encore™ sampling. At a minimum, one field blank sample will be prepared per matrix for each day that samples are collected, in accordance with the NJDEP guidelines (May 1992, February 1997).

2.8.1.2 Duplicate Samples

A duplicate sample is a second sample collected independently at the same location as the original sample during a single sampling event. Duplicate sample results are used to assess precision, including variability associated with both the laboratory analysis and the sample collection process. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. Five percent of the samples collected shall be field duplicates (one duplicate for every 20 samples). Both the duplicate and the sample shall be analyzed for the same parameters in the laboratory.

The duplicate sample will be submitted to the laboratory without their knowledge of the sample designation (i.e., "blind" duplicate sample). The field logbook shall identify the duplicate sample locations. This information will not be indicated on the label, the chain-of-custody, or any other documents that accompany the sample to the laboratory so that the laboratory cannot establish the association of a duplicate sample.

2.8.1.3 Trip Blanks

This section describes the trip blank procedures for the collection and shipment of samples that are collected for the laboratory analysis of VOCs. Trip blanks will not be used if VOC samples are not collected on a given day.

For aqueous samples, a trip blank is a volatile sample vial filled in the laboratory with organic-free water (Type II, reagent grade water), transported to the site, handled like a sample, and returned to the laboratory for analysis. Trip blanks are used only for aqueous volatile samples and are subjected to the same handling as other samples. Trip blanks are not required for samples collected with EnCore™ sampler (USEPA, October 24, 2000). Trip blanks will be prepared and preserved with Hydrochloric Acid (HCl) to pH less than 2.0 by the laboratory and will arrive on site within one day of their preparation. Trip Blanks will not be held on site longer than two calendar days. Trip blanks will not be opened in the field. Trip blanks serve to identify contamination from sample containers or transportation and storage procedures. For every cooler containing water samples collected for VOC analysis, one trip blank will be added to the cooler and analyzed for the presence of VOCs.

2.8.1.4 Temperature Blank

A temperature blank will be used in each sample shuttle to measure the temperature of the samples upon shipment arrival to the laboratory. The temperature blank consists of a small vial filled with water. The vial will be labeled Region II Temperature Blank. If, upon arrival to the laboratory, the temperature of the blank is below 10 degrees Celsius, the samples will be accepted for analysis. If the temperature is at or greater than

10 degrees Celsius, the laboratory will notify the Project Manager or the designated Project Chemist immediately. The potential impacts to data usability of those samples will be discussed with the project chemist to decide whether or not additional samples would be required.

2.8.1.5 Matrix Spike and Matrix Spike Duplicate Samples

An aliquot of a matrix (water or soil) is fortified (spiked) with a known concentration of compounds of interest. The matrix spike and matrix spike duplicate (MS/MSD) are subjected to the entire analytical procedure in order to indicate both accuracy and precision of the method for the matrix by measuring the percent recovery and the relative percent difference (RPD) of the two spiked samples. These samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. The MS/MSD data are used to evaluate the matrix effect, not to control the analytical process. MS/MSDs are analyzed for each matrix for every 20 environmental samples (five percent) or one per batch in order to maintain continuous surveillance of acceptable method performance. No extra field samples (just triple volume) are required for MS/MSDs.

2.8.2 Sample Container, Preservatives, and Holding Time Requirements

The selection of sample containers is based on both the media being sampled and the analytes of interest. The sample preservatives and laboratory holding times before analyses are also based on media and analytes of interest. The NJDEP four-day handling time requirement for laboratory blanks (NJDEP, 1992) will be adhered to during this investigation. In general, the minimum preservation requirement for any sample is to store it at 4 degrees Celsius immediately after collection. A temperature blank (a vial filled with clean water) will be included with each cooler so that the project laboratory can document compliance with the temperature-preservation requirements immediately upon receipt of the samples.

2.8.3 Sample Designation and Labeling

The following procedures will be used to identify and track environmental samples collected during the field investigation. An unremovable and waterproof label will be affixed to each sample container. The following information will be written on the label with permanent marker:

- Site name
- Sample identification
- Consultant Project number
- Date/time
- Sampler's initials
- Sample preservation
- Analysis required

Typically, a label is filled out with the above information, affixed to the bottle, and then covered with wide clear tape for additional protection against accidental erasure.

2.8.4 Field Sample Numbering

The groundwater, surface water, and sediment samples collected at the site will be assigned the following, relatively standard designations:

- MW-XXX for groundwater monitoring well samples
- SW-XXX for surface water samples
- SED-XXX for sediment samples

The "XXX" shown above represents a numerical suffix that will be assigned to each sample in consecutive order.

Soil samples will be assigned a designation based on the name of the area of concern that they are associated with. For example, a sample collected from the former Waste Water Treatment Unit will be designated WWT-XXX while a sample collected from the area of the Bullet Tanks will be designated BT-XXX.

Field QA/QC samples will consist of field blanks, trip blanks, blind duplicate samples, matrix spike samples and matrix spike duplicate samples. The following designations will be used to identify these samples following a "year (xx)-month (xx)-day (xx)" scheme:

- **FB01-000415:** First field blank prepared for the RI/FS on April 15, 2000.
- **TB02-001115:** Second trip blank used for the RI/FS on November 15, 2000.
- **DUP-1:** First blind duplicate sample of the RI/FS field investigation. The actual sample designation of the blind duplicate will be tracked by the field inspector through his or her field notes and recorded in the daily inspection report.

Matrix Spike and Matrix Spike Duplicate samples will be identified as needed by adding letters "MS" and "MSD", respectively to the end of the sample identification code (e.g., MW-1MS, MW-1MSD, etc.).

2.8.5 Sample Custody

At the time of the sampling, the field inspector will record the sample information in the field book and on a chain-of-custody form, noting on each any difficulties encountered in sampling. The label, logbook, and chain-of-custody form entries shall be made in waterproof ink. The sample information recorded in the logbooks should be at least as detailed as that recorded on labels, and should indicate the type of sample (e.g., groundwater, soil, waste, etc.), preservation technique, and sampling location, with sufficient detail as to allow resampling at the same location, if necessary.

Immediately after a sample is collected and transferred to the appropriate laboratory-supplied container, the field inspector will place the filled container in ice chests or coolers that contain ice for preservation. The field inspector will maintain custody of the samples until they are shipped or hand delivered to the laboratory. Samples submitted to the laboratory will be accompanied by a chain-of-custody form to provide documentation of the sampling event. These forms will be completed and sealed inside the cooler sent to the project laboratory. The following information will be included on the chain-of-custody form:

- Date and Time Sample was Collected
- Client or Consultant
- Project Name
- Sample Identification Kumber
- Sample Description
- Sample Container Numbers and Volumes
- Cooler Identification Number (if applicable) Analysis Required
- Preservatives (if applicable)
- Signatures of Persons Involved in Chain-of-Custody
- Date and Time of Possession
- Date and Time of Relinquishing Sample Custody

The entries on the chain-of-custody form will correspond to the field logbook and sample labels. Custody seals will be used to detect tampering with the samples before laboratory acceptance. Custody seals will be affixed to the cooler in a manner that requires seal breakage in order to open the cooler as discussed in Section 2.8.6. Unauthorized seal breakage indicates possible tampering and may render the analytical results of a sample suspect.

2.8.6 Sample Packaging and Shipping

This section describes the packaging and shipping procedures that will be used for the RI field samples.

2.8.6.1 Sample Packing

The samples collected for laboratory analysis will be shipped or hand delivered to the laboratory within 48 hours of the sample collection. Sample packaging and shipping procedures are summarized as follows:

1. Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to the laboratory, or to/from a secure storage area. Commercial, overnight carriers (e.g., Federal Express Corporation) will not be involved in the Chain-of-Custody procedures because the custody form will be sealed inside the cooler at the time of shipment. .
2. Samples will be properly packaged to avoid breakage, stored on ice at 4 degrees Celsius for shipment and dispatched to the appropriate laboratory for analysis. A separate signed custody record will be enclosed and secured to the inside top of each sample box or cooler. The chain-of-custody and any additional paperwork will be placed in a plastic "ziplock" bag to prevent them from getting wet.
3. Shipping containers will be secured with strapping tape and custody seals for delivery to the laboratory. The preferred procedure includes use of a custody seal attached to the front right and back left of the cooler. The custody seals are covered with clear plastic tape. The cooler is strapped shut with strapping tape in at least two locations.
4. Courier or overnight carrier will transport samples to the laboratory.

For this investigation, it is anticipated that the laboratory samples collected at the site will be hand delivered to the laboratory by courier.

2.8.6.2 Hazardous Sample Shipping

The DOT and the International Air Transport Association (1998) have promulgated regulations for the packaging and shipping of DOT-defined hazardous materials under 49 Code of Federal Regulations (CFR) Parts 171 through 179 and IATA-defined dangerous goods. The USEPA established three categories for samples:

- **LOW-Concentration Samples** - samples containing less than 10 ppm of any known contaminant. Examples include background soil, sediment, surface water, and groundwater samples that are collected from locations not expected to have been grossly impacted by or come in contact with hazardous materials. Low-concentration samples are considered environmental samples and are not regulated by the DOT or IATA since they do not pose a transportation hazard.
- **Medium-Concentration Samples** - samples containing greater than 10 ppm but less than 15 percent (150,000 ppm) of the contaminant of highest concentration. Special regulations govern the shipment of medium-concentration samples; the field inspector will contact the environmental consultant's project manager for further instructions if medium-concentration samples require shipment.
- **High-Concentration Samples** – samples containing greater than 15 percent of at least one contaminant. Special regulations govern the shipment of high-concentration samples; the field inspector will contact the environmental consultant's project manager for further instructions if high-concentration samples require shipment.

For this investigation, it is anticipated that the laboratory samples collected at the site will be low-concentration samples and that special shipping arrangements will not be required for the RI. The field inspector will notify the environmental consultant's project manager for instructions in the event that medium- or high-concentration samples are collected and require overnight shipment.

2.9 Field Measurements and Equipment Calibration

Electronic instruments that are anticipated to be used during this field investigation include the following equipment (or equivalent equipment):

- Photoionization detector (e.g., HNU PI-I01 with a 10.2 electron volt lamp)
- Flow-through water quality meter (e.g., YSI model 6820)
- Particulate dust monitor (e.g., MIE Miniram PDM-3)
- Water level indicator (e.g., Solinst water level meter)
- Slug test probes and data recorder (e.g., In-Situ, Inc. Hermit data logger and Pressure transducers)
- Mercury Vapor Analyzer (Jerome 431-X)

Quality assurance requires that the devices and equipment used to perform field testing or data recording be calibrated before use. Calibration documentation will include identification of the instrument, serial number, date, reference standard, adjustments or repairs made, and the signature of the person performing the calibration. The calibration data will be recorded in the project field book or in an appropriate field calibration log. The calibration procedures will follow the manufacturer's guidance.

On-site field calibration activities include the use of calibration standards and field equipment checks, as appropriate, for the equipment being used. Field calibration and/or field checking of each meter will be accomplished by following the procedures outlined in the operating manual for the instrument. At a minimum, field calibration and/or field equipment checking will be performed both prior to and after equipment use. Field calibration will be documented in the field notebook.

Equipment that fails calibration or becomes inoperable during use will be removed from service and segregated to prevent inadvertent utilization. The equipment will be properly tagged to indicate that it is out of calibration. Such equipment will be repaired and recalibrated to approved standards by qualified personnel. Equipment that cannot be repaired will be replaced.

Results of activities performed using field equipment that has failed recalibration will be evaluated by the environmental consultant's Project Manager or his/her designee. If the activity results are adversely affected, the results of the evaluation will be documented, appropriate personnel notified, and a decision made of the validity of the results.

Off-site calibration and maintenance of field instruments will be the responsibility of the owners of their respective instruments (i.e., subcontractors, the USEPA, or any group working on site) and will be performed by the owners as appropriate throughout the duration of project activities. The field instrumentation, sampling equipment, and accessories will be maintained in accordance with the manufacturer's recommendations and specifications and established field equipment practice. Off-site calibration and maintenance will be performed by qualified personnel. A logbook will be kept to document that established calibration and maintenance procedures have been followed. Documentation will include both scheduled maintenance and unscheduled maintenance.

2.10 Field Documentation

The details of field investigations will be recorded in a waterproof field book. The project field book will be a controlled, formal document that will record the events of the field investigation. Ancillary field data may be recorded on field logs specific to a given task. The subsurface borings will be logged on a Soil Boring Log, monitoring well construction will be logged on a Monitoring Well Construction Log, and purging and development of wells will be logged on Well Development/Purging Log. Soil boring logs will include descriptions of subsurface material encountered during drilling, sample numbers, types of samples recovered from the borehole, water elevation data, and PID/MVA (headspace and sample screening) information.

2.10.1 Field Book and Field Logs

They following types of information will be recorded in the field book:

1. Location of sample
2. Date and time of sample collection
3. Identity of people performing activities
4. Weather conditions
5. Boring identification
6. Location of borings in relation to easily identifiable landmark
7. Sampling intervals
8. Blow counts

9. Sample descriptions (Based upon USCS)
10. Identity and calibration of field instruments
11. Depth at which saturated conditions were encountered
12. Field instrument readings, background, borehole, and samples
13. Drilling method
14. Size of downhole equipment
15. Drilling rates
16. Materials used to backfill the boreholes and quantities
17. Personnel present on site
18. Visitors to the site
19. Chronology of daily events
20. Level of personnel protection
21. Field problems, solutions, and corrective actions

The field inspector, or person making entries on a given day, will date and sign each completed page of the project field book. The field book will be completed using indelible, water proof ink. The pages of the field book will be consecutively numbered and the pages will not be removed.

If changes in the field book are necessary, changes will be indicated by a single line drawn through the affected text. The individual responsible for the change will initial and date the entry. Each day's activities or separate sampling episodes will be signed. The logbook will be protected, stored in a safe file or other repository, and retained as a permanent record.

Upon completion of daily field activities, the field inspector will complete a daily inspection record form and initiate chain-of-custody on any samples collected for geotechnical or chemical laboratory testing. After the RI drilling program, the field team will transfer information from the field logs onto standard boring log forms for the Remedial Investigation Report. The field notes will be kept in the project files.

The following types of logs, forms, and field books will be used to document activities during the field investigation.

1. **Field Book** - weatherproof bound field book
2. **Daily Inspection Record** - will be filled out by the field inspector to provide a daily chronology of site events
3. **Soil Boring Log** - one log will be completed for each boring advanced at the site
4. **Monitoring Well Construction Log** - one log will be completed for each monitoring well installed at the site
5. **Well Development/Purging Log** - one log will be completed for each well developed or purged at the site
6. **Well Sampling Form** - one form will be completed for each monitoring well sampled at the site
7. **Surface Soil Sampling Log** - will record the location and physical description of the soil sample
8. **Surface Water/Sediment Sampling Log** - will record the location and description of the surface water and sediment sample
9. **Equipment Calibration Log** - will document the calibration of a given measuring instrument
10. **Log of Photographs** - will provide a description of photographs taken at the site

11. **Slug Test Data Sheet** - will record the data generated during a slug test
12. **Chain-of-Custody Form** - will accompany each set of coolers sent to the project laboratory on a given day
13. **Water Level Log** - the water level in each well will be recorded on these sheets.

The field book and field logs will provide QA/QC documentation for the general adherence to the sampling and data collection procedures established for the LCP Chemicals, Inc. RI and will also serve to document deviations from the anticipated scope of work. This information will be used for the Data Usability Summary report discussed in Section 14.0 of the RI/FS QAPP.

2.10.2 Photographic Documentation

Pertinent field activities and sample locations may be documented with photographs, subject to approval by ISP Environmental Services, Inc. The picture number and roll number will be logged in the field book to identify the area and activity depicted in the photograph. A separate photographic documentation log form will be maintained by the Site Manager or designee. The log of photographs will include the date, the roll number, the picture number and a description of the area and activity depicted in the photograph. For cameras that use film, this information, exclusive of the description, will also be recorded on the back of each photograph and the photographs will be stored in the project file. For digital cameras, the photographic image will be stored in the project consultant's project computer directory and backed up during routine maintenance of their computer network system.

Videotape recording cameras may also be used during some field activities to provide an additional type of documentation. Videotapes will be labeled with pertinent project information and stored in the project file.

2.11 Soil Vapor Sample Collection

Section 2.11 inserted from FOP Addendum No. 4 (Brown and Caldwell, October 2006)

Note: The soil vapor sampling that was performed in May and June 2007 also followed the guidance contained in the NJDEP Vapor Intrusion Guidance, (March 2007).

Soil vapor (SV) samples will be collected from material above the water table at locations throughout the Site Work Plan Phase II Remedial Investigation LCP Chemicals Inc. Superfund Site) following the procedure outlined below:

2.11.1 Installation of Soil Vapor Probes

Soil vapor probes will be installed from which soil vapor samples will be collected. The soil vapor probes will installed as follows:

- A direct-push drill rig (e.g., GeoProbe®) will be used to advance a 2-inch soil -core sampler 5 feet into the subsurface immediately adjacent to selected proposed soil vapor probe location to observe the depth to the water table near the soil vapor sampling locations. This information will be used to select the depth to which the sample screens will be set at the surrounding sample points.
- Once the local depth to the water table is determined a 2-inch diameter borehole will be advanced using the direct-push rig to just above the water table.

- Once the borehole is complete a 1-inch diameter PVC slotted screen 0.010" will be set in the borehole with clean silica sand filter pack material placed in the annulus surrounding the screen. The length of screen used at the sample locations will depend on the depth of the water table, but is generally assumed to be between 3 and 5 feet across the Site.
- A hydrated bentonite slurry will be placed in the annular space above the filter pack to provide a seal in the borehole from surface contamination and to minimize infiltration of ambient air.
- The top of the soil vapor probe will be completed with a male-threaded, appropriately sized tubing-barb to be used with the sampling tubing. No organic thread lubricant of any kind will be used when constructing this to minimize the chance of sample contamination. The barb will be completed with a cap so that infiltration by outside air will be minimized.
- Upon completion of soil vapor sampling, described below in Section 2.11.2, the soil vapor probes will be abandoned by pulling the temporary well screen out of the ground and backfilling the borehole with a hydrated bentonite slurry.

2.11.2 Collection of Soil Vapor Samples

Soil vapor samples will be collected no less than two weeks following the installation of the soil vapor probes. Samples will not be collected on days in which high humidity or rainfall may impact the readings from the field monitoring equipment.

- One (1) Teflon®-lined polyethylene sampling tube will be connected to the tubing-barb for use in sampling. The tube will be secured to not allow debris to clog the tube and/or potentially contaminate the sample.
- Prior to Sampling for VOCs (USEPA Method TO-15), the sampling probe will be purged for approximately 10 minutes. This is intended to exchange air from the sampling tubing, which could potentially dilute or otherwise bias the sample.
- After purging, the tubing will be attached to a one-liter SUMMA canister provided by the analytical laboratory. The canister will have been evacuated by the laboratory prior to shipment to the site. After the canister is attached to the tubing, the canister valve is opened, and the vacuum in the canister causes the soil gas to flow into the canister. The canister will be allowed to fill for approximately one (1) hour. The vacuum pressure in the canister will be checked at the conclusion of sampling with a pressure gauge to confirm that sample collection was complete. A vacuum pressure reading of -5 Hg indicates that the canister is filled and under some pressure to better allow the lab to extract the sample.
- After the SUMMA canister is filled, a reading will be taken with the mercury vapor analyzer to measure mercury vapors. At locations with mercury below the detection capability of the meter, selected samples will be analyzed by Method IO-5 to quantify the lower levels.
- To collect a sample for laboratory analysis for total mercury by IO-5, gold-coated bead traps are used with a Teflon particulate filter before the trap so that no particulate can be trapped and skew results. When assembling, installing and removing the traps particle-free gloves will be worn at all times and samplers will stand down-wind to prevent contamination by shedding particles from clothing, etc.
- The trap with filter will be connected to a pump which will draw air through the trap at a constant rate of 0.3 L/min. The calibrated range of the method is 5 ng to approximately 7.5 mg depending on the variety of trap used in sampling. Therefore, to target the method range, the pumping duration will likely be the minimum practical.
- The samples will be sent to a specialized mercury laboratory for analysis.

2.12 Biota Sampling

Section 2.12 inserted from FOP Addendum No. 5 (Brown and Caldwell, October 2006)

2.12.1 Sampling Timeline

Mummichog and fiddler crabs will be collected during the biologically active season which in Linden, New Jersey, typically spans from May through September. The samples will be collected during a single sampling event as defined below for each species. It should be noted that if the target mass for laboratory analyses is not met during the time frames provided for each species then analyses will be prioritized as provided in this document.

2.12.2 Sample Locations

Six biota sampling transects will be established that coincide with sediment and surface water sampling transects Work Plan, October 2006). A single mummichog sampling station will be located at the center of each transect. Crab sampling stations will be located along both of the creek banks at each transect.

Each transect will be identified by inserting metal poles into the bank at each end of the transect. The poles will be labeled using metal tags. The horizontal locations of the transect termini will be surveyed by a licensed surveyor to the New Jersey State Plane Grid (NAD 1983). The locations of the individual sampling locations will be referenced by the field sampling personnel to the applicable transect stakes from which the coordinates of the field samples will be determined. Alternatively, the sample locations will be identified using a GPS instrument (e.g., Trimble GeoXT or equivalent).

2.12.3 Mummichog Samples

Mummichog samples will be collected from the approximate channel center at each transect. These fish will be collected utilizing either minnow traps or a seine net. The specific method to be used will depend upon site conditions and the technique's overall capture effectiveness (i.e., number of fish caught). The specific protocol to be used for each of these techniques is provided below.

Minnow Traps

Traps will typically consist of standard 17 x 9-inch cylindrical galvanized wire enclosures with an inverted funnel at each end and a mesh size of ¼ inch, or equivalent. The traps will be decontaminated prior to each use (see below) and baited. One trap will be utilized per transect. Traps will be deployed during high tide. Each trap will be handled wearing a clean pair of Nitrile gloves.

Seining

Seining may also be used to obtain mummichog samples. This technique will utilize a stationary net located approximately 10 feet downstream of the center of the transect. A mobile seine located approximately 10 feet upstream of the centerline of the transect will then move towards the stationary seine. One end of the mobile seine will be held by a biologist in a boat, while the other end will be held by personnel walking along the bank of South Branch Creek. The mobile seine will herd the fish towards the stationary seine where they will then be collected by personnel in the boat using 16 x 12 x 16-inch dip nets, or equivalent. The seines will be 20 x 4 feet with a mesh size of 3/16 inch, or equivalent. Seining will be conducted during high tide or at period when the tide is in flux (e.g., incoming or outgoing tide).

In the event that neither method yields sufficient tissue, one additional collection attempt will be made during a subsequent tidal cycle. If two tidal cycles do not provide sufficient mass for all analyses, analyses will be prioritized, as described in Section 2.12.5.

Mummichog Sample Processing

Upon collection, the fish will be identified as to species. Only mummichog will be collected; other species will be returned to South Branch Creek. The mummichog will then be rinsed in a bucket containing ambient water to remove excess sediment. The length of each individual mummichog will be measured and recorded. In addition, the mass of a representative size range of mummichog in each sample will be measured and recorded. New, disposable Nitrile or latex gloves will be worn during fish collection and processing, and new gloves will be used at each sampling station.

As mummichog are small fish (i.e., generally less than 8 cm in length), whole-fish composite samples will be utilized to provide the mass necessary for the analysis of the target analytes. The USEPA recommends that composite samples consist of similarly-sized individuals so that the smallest individual in the composite is no less than 75% of the size of the largest.[3] However, if sample mass becomes a limiting factor, or if the size range encountered in the field makes the size distinction impractical, all individuals collected will be included in the sample. The mass required for analysis is determined by the laboratory and is presented in the Quality Assurance Project Plan (QAPP) Addendum (to be submitted under separate cover). Once the necessary mass for the sample is obtained, the fish will be placed on a decontaminated surface, transferred to Ziploc™ bags, labeled, and shipped on ice to the laboratory.

A replicate sample will be collected if sufficient mass of fish is obtained. The replicate sample will provide back-up against the loss of data if the original sample is compromised in some manner (e.g., lost in transit, broken container) and provide additional sample to allow for re-analysis or analysis of additional analytes. The replicate sample will be processed in a manner identical to the original sample and then maintained in a freezer on site or at the laboratory at a temperature less than -18°C.

2.12.4 Fiddler Crab Samples

Fiddler crabs samples will be collected from the intertidal zone along the northern and southern banks at each transect (i.e., 12 total samples). Each crab sampling station will encompass a zone extending approximately 25 feet upstream or downstream from the centerline of the transect. Crabs will be collected using either traps or by hand. The specific method to be utilized will depend on its capture effectiveness (i.e. number of crabs caught in each trap).

Fiddler Crab Traps

Folding commercial 30 x 10-inch crab traps, or equivalent, will be lined with fiberglass window screen to prevent the fiddler crabs from escaping and from predation. One trap will be deployed at each sampling location (i.e., 2 traps per transect) during low tide and retrieved prior to the next incoming tide.

[3] Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1: Fish Sampling and Analysis, Second Edition. USEPA. 1995.

Hand Capture

Crabs can also be collected by hand using a trowel, shovel, or other digging device. During low tide, crabs will be chased into their burrows by walking towards them. Once in their burrows, the crabs will be excavated using the hand tools and collected by hand.

Sampling at a reasonable level of effort (e.g., two sampling crews) will continue as necessary over a period of one week. If, after that time, neither capture method results in collection of sufficient mass for all analyses at all 12 stations, analyses will be prioritized, as described in Section 2.12.5.

Crab Sample Processing

Crabs will be handled wearing new disposable Nitrile or latex gloves. Upon collection, crabs will be placed in a bucket containing ambient water to remove excess sediment. The mass of each individual fiddler crab will be measured and recorded. On addition, the length and width of a representative size range of crabs in each sample will be measured and recorded. Preference will be given to the collection of adult crabs (carapace ¾ to 1 inch in length); however, if necessary, smaller individuals will be collected to achieve the target weight for analysis. The mass required for analysis is determined by the laboratory and is presented in the Quality Assurance Project Plan (QAPP) Addendum. As with mummichog, whole crab composite samples will be collected. Crabs will be placed in Ziploc™ bags, labeled, and shipped on ice to the laboratory. If a sufficient mass of crabs is collected to allow for a replicate sample, this sample will be processed in a manner identical to the original sample and then kept frozen for contingency use, as described for mummichog.

2.12.5 Laboratory Analysis

The mummichog and fiddler crab samples will be tested for the analytical constituents as described in the Phase II Work Plan and QAPP Addenda.

In the event that sufficient mass is not obtained to complete all analyses, analyses will be performed in the following order of preference (as applicable):

1. Mercury
2. Methyl mercury
3. Other Target Analyte List (TAL) analytes
4. Arsenobetaine (fish)
5. PCBs
6. Additional parameters, as applicable

2.12.6 Decontamination

Reusable sampling equipment (i.e., scale, measuring board, buckets, nets) will be decontaminated before each sample is processed. Decontamination will consist of the following sequence: rinse with tap water, wash with a detergent solution (i.e., Alconox), rinse with tap water, and rinse with deionized water. Work surfaces will be cleaned with a detergent solution and rinsed with tap and deionized water between samples. Alternatively, the work surface may be lined with new aluminum foil before each sample is processed.

2.12.7 Field Data Records

The following information will be included on the field data sheet for each sample collected:

- Project Name
- Date
- Field personnel present
- Transect Number
- Sampling Station
- Approximate tidal stage
- Pertinent meteorological information, e.g., temperature, wind direction, and precipitation
- Sampling technique
- Species
- Mass of individual specimen.
- Lengths and widths of a representative size range of specimens in each sample
- Noticeable abnormality in appearance and/or behavior
- Field observations
- Health and safety protocols, (e.g., level of protection)
- Work Performed
- Deviations from established protocols, if any

Upon return to the office, photocopies shall be made of all field logbook pages and placed in the site file. This will ensure a record exists in the office of all field and sampling activities, and limits the potential loss of field notes due to the loss or destruction of the log book in the field.

2.12.8 Permits

The collection of all fish and crab samples will be in accordance with state regulations. A Permit to Collect Marine and Estuarine Organisms for Scientific Purposes from the Division of Fish and Wildlife of the New Jersey Department of Environmental Protection (NJDEP) has been applied for. This permit is not strictly required under CERCLA but has been requested for NJDEP records. It is anticipated that this permit will be received prior to the commencement of sampling activities.

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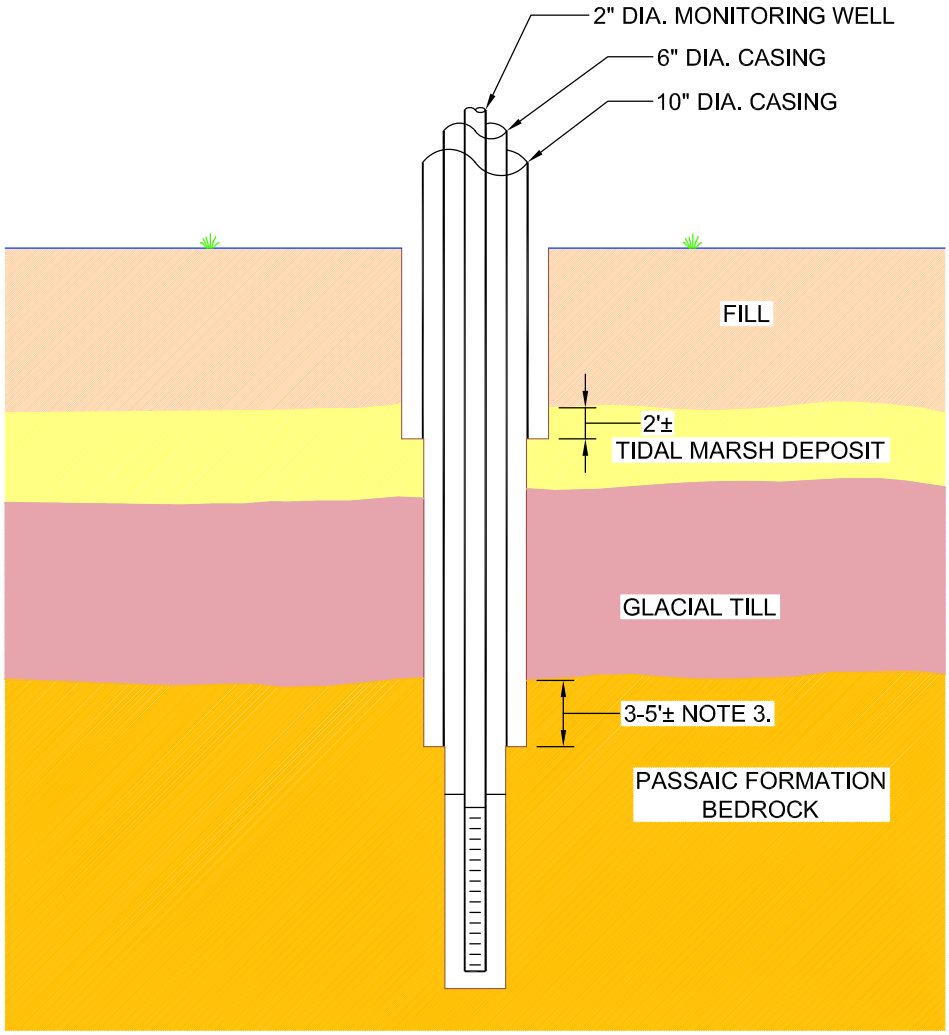
FIGURES

TRIPLE-CASED WELL



SCALE: NONE

NOTES:

1. NOMINAL ANNULAR SPACE AROUND EACH CASING IS 2".
2. ANNULAR SPACE IS FILLED WITH TREMIE-EMPLACED GROUT.
3. THE BEDROCK CASING SOCKET DEPTH CONFLICTS WITH THE NJ CONSTRUCTION STANDARDS THAT REQUIRE A MINIMUM DEPTH BEDROCK CASING SOCKET OF 10' [N.J.A.C. 7:9D(b)1.]. ACCORDINGLY, WRITTEN AUTHORIZATION FOR THE WELL CONSTRUCTION DEVIATION WILL BE REQUIRED TO BE OBTAINED FROM NJDEP BUREAU OF WATER ALLOCATION IN ACCORDANCE WITH N.J.A.C. 7:9D-2.8 PRIOR TO COMMENCING DRILLING.

FIGURE 1

TYPICAL MULTIPLE-CASED BEDROCK WELL INSTALLATIONS

PROJECT LOCATION	DATE	PROJECT NUMBER
LCP CHEMICALS, INC. ROAD TO GRASSELLI LINDEN, NEW JERSEY	SEPT, 2006	127806.202

BROWN AND CALDWELL
ALLENDALE, NEW JERSEY
N.J. C.A. 24GA28043100

P:\DRAFTING\LCP\127806\202\FIGURE 1_TRIPLE-CASED.DWG 09/13/2006 10:44:33AM By:ROleinyk XREFS: Layout: 8.5x11

Appendix C: Well Construction and Soil Boring Logs

C-1 – RI Field Investigation
C-2 – Previous Investigations
C-3 Off-Site Ditch Logs

Appendix C-1: RI Field Investigation

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **MW-10**

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/15/01*
Finish Date: *11/15/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

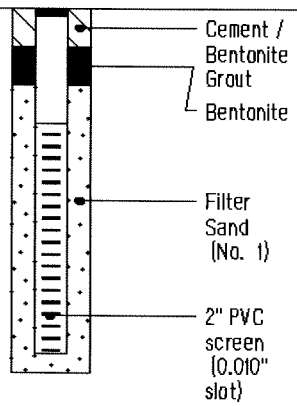
WELL DEVELOPMENT

Method: *Whale Super Purger*
Duration: *68 min.*
Gals. Purged: *75*
Slug Test: *0.01826* (cm/sec)

SURVEY DATA DATUM:

Grade: *8.22*
TWC: *Na*
TPC: *7.81*
North: *646536.58*
East: *57258153*

Geophysical Log: ☐ yes ☒ no
Comments:

Depth (feet)	WELL CONSTRUCTION	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.) / Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0								FILL	Notes: 1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changed subsequent to well installation
5									
10								TIDAL MARSH DEPOSIT @ 9' Peat	2. Well Installed immediately adjacent to boring LP-4
15									
20									
25									
30									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-11

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/16/01*
Finish Date: *11/16/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

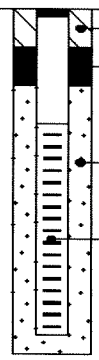
WELL DEVELOPMENT

Method: *Whale Super Purger*
Duration: *42 min.*
Gals. Purged: *37.5*
Slug Test: *0.003843* (cm/sec)

SURVEY DATA DATUM:

Grade: *7.99*
TWC: *NA*
TPC: *10.70*
North: *646451.79*
East: *572441.08*

Geophysical Log: ☐ yes ☒ no
Comments:

Depth (feet)	WELL CONSTRUCTION	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0	 Cement / Bentonite Grout; Bentonite; Filter Sand (No. 1); 2" PVC screen (0.010" slot)							FILL	Notes: 1. Well construction depths and grade were measured from ground surface at the time of drilling. Grades may have been changed subsequent to well installation.
5									
								TIDAL MARSH DEPOSIT @ 7.5' Peat	Well installed immediately adjacent to boring 231-B8.
10									
15									
20									
25									
30									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **MW-12**

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/20/01*
Finish Date: *11/20/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

WELL DEVELOPMENT

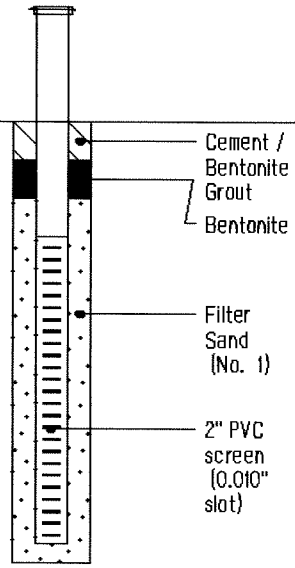
Method: *Whale Super Purger*
Duration: *34 min.*
Gals. Purged: *80*
Slug Test: *0.007658* (cm/sec)

SURVEY DATA DATUM:

Grade: *8.36*
TWC: *NA*
TPC: *11.21*
North: *646332.10*
East: *572454.67*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

Depth (feet)	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0							FILL	Notes: 1. Well construction depths and grade were measured from ground surface at the time of drilling. Grades may have been changed subsequent to well installation. 2. Well installed immediately adjacent to boring 5K-B2.
5								
10							TIDAL MARSH DEPOSIT @ 10.7' Peat	
15								
20								
25								
30								

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-13

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/15/01*
Finish Date: *11/15/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

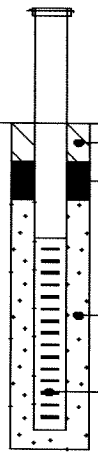
WELL DEVELOPMENT

Method: *Whale Super Purger*
Duration: *40 min.*
Gals. Purged: *90*
Slug Test: *0.007962* (cm/sec)

SURVEY DATA DATUM:

Grade: *7.61*
TWC: *NA*
TPC: *10.17*
North: *646301.84*
East: *572342.84*

Geophysical Log: ☐ yes ☒ no
Comments:

Depth (feet)	WELL CONSTRUCTION	soil / rock	Samp. No. / Run No.	Blows/ 6 in.	Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0	 Cement / Bentonite Grout; Bentonite; Filter Sand (No. 1); 2" PVC screen (0.010" slot)								FILL	Notes: 1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changes subsequent to well installation. 2. Well installed immediately adjacent to boring LP-4.
5										
									TIDAL MARSH DEPOSIT @ 7.5' Peat	
10										
15										
20										
25										
30										

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **MW-14**

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/19/01*
Finish Date: *11/19/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Drilling*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split Spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

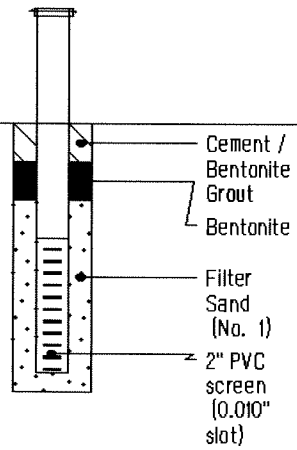
WELL DEVELOPMENT

Method: *Whale Super Purger*
Duration: *35 min.*
Gals. Purged: *37.5*
Slug Test: *0.006717* (cm/sec)

SURVEY DATA DATUM:

Grade: *7.93*
TWC: *NA*
TPC: *10.79*
North: *646404.19*
East: *571992.79*

Geophysical Log: ☐ yes ☒ no
Comments:

Depth (feet)	WELL CONSTRUCTION	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0								FILL	Notes 1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changed subsequent to well installation. 2. Well installed immediately adjacent to boring DSP-4.
5								TIDAL MARSH DEPOSIT @ 6.5' Peat	
10									
15									
20									
25									
30									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-15

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/14/01*
Finish Date: *11/14/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split Spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

WELL DEVELOPMENT

Method: *Bailer*
Duration: *6 hours*
Gals. Purged: *4.3*
Slug Test: *5.602 E-07* (cm/sec)

SURVEY DATA DATUM:

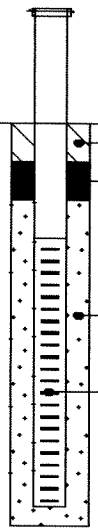
Grade: *7.99*
TWC: *NA*
TPC: *11.10*
North: *646617.04*
East: *572121.23*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION / SAMPLE DATA

soil / rock

Depth (feet)	Samp. No. / Run No.	Blows/ 6 in.	Hydraul. Cond. cm/sec	Rec. (ft.)	Rec. (ft.)	USCS	RQD	HNU (ppm)
0								
5								
10								
15								
20								
25								
30								



VISUAL CLASSIFICATION

FILL

TIDAL MARSH DEPOSIT
@ 9.5' Peat

REMARKS

Notes:

1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changes subsequent to well installation.

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-16

Project: *LCP Superfund Site*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/12/01*
Finish Date: *11/12/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

WELL DEVELOPMENT

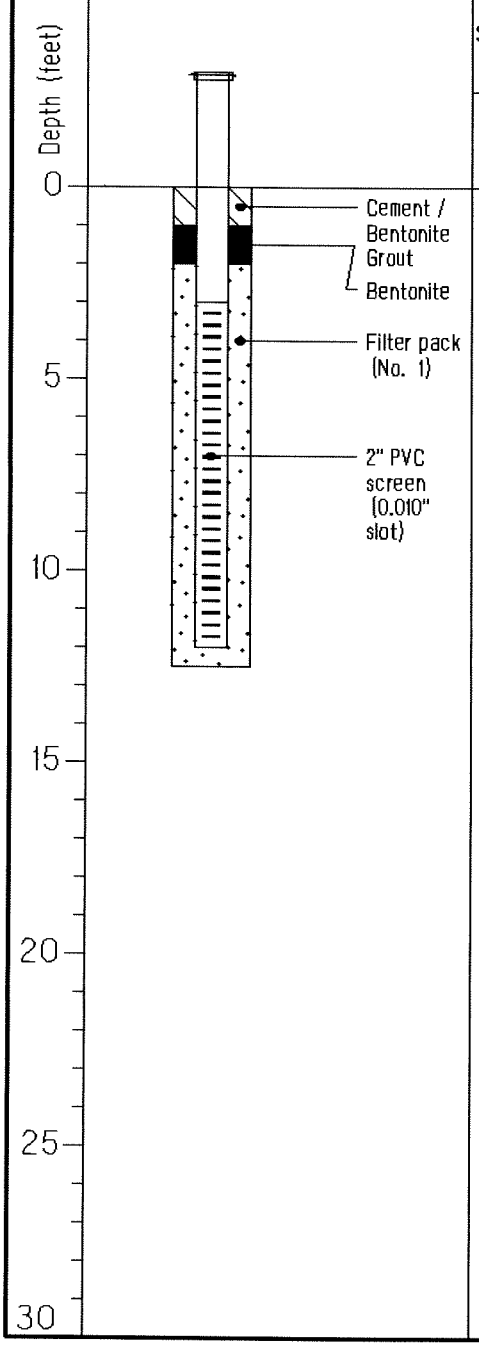
Method: *Whale Super Purger*
Duration: *56 min.*
Gals. Purged: *92*
Slug Test: *0.0467* (cm/sec)

SURVEY DATA DATUM:

Grade: *6.24*
TWC: *NA*
TPC: *9.24*
North: *647005.13*
East: *572288.20*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)

VISUAL CLASSIFICATION

FILL

TIDAL MARSH DEPOSIT
@ 12' Peat

REMARKS

Notes

1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changed subsequent to well installation.

2. Well installed immediately adjacent to boring MW-B18.

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **MW-17**

Project: *LCP Superfund Site*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/13/01*
Finish Date: *11/13/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

WELL DEVELOPMENT

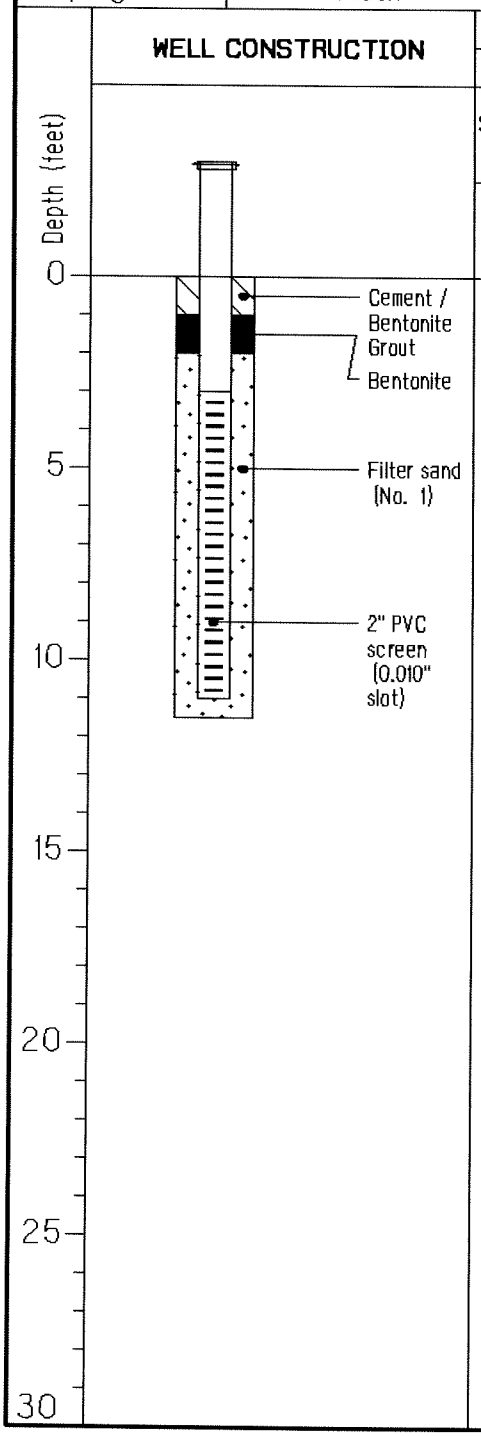
Method: *Whale Super Purger*
Duration: *55 min.*
Gals. Purged: *26*
Slug Test: *0.0007374* (cm/sec)

SURVEY DATA DATUM:

Grade: *6.90*
TWC: *NA*
TPC: *9.87*
North: *646964.47*
East: *571464.30*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.) / Rec. (ft.)	USCS / RQD	HNU (ppm)

VISUAL CLASSIFICATION

FILL

TIDAL MARSH DEPOSIT
@ 11' Peat

REMARKS

Notes

1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changes subsequent to well installation.

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-18

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/14/01*
Finish Date: *11/14/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow stem augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

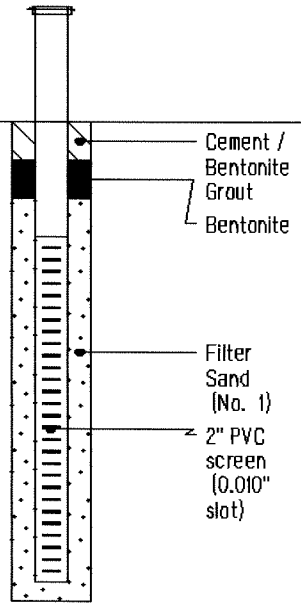
WELL DEVELOPMENT

Method: *Whale Super Purger*
Duration: *72 min.*
Gals. Purged: *70*
Slug Test: *0.0003399* (cm/sec)

SURVEY DATA DATUM:

Grade: *7.66*
TWC: *NA*
TPC: *7.57*
North: *646928.20*
East: *571888.05*

Geophysical Log: ☐ yes ☒ no
Comments:

Depth (feet)	WELL CONSTRUCTION	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0								FILL	Notes 1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changes subsequent to well installation.
5									
10								TIDAL MARSH DEPOSIT @ 12' Peat	
15									
20									
25									
30									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **MW-19**

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/14/01*
Finish Date: *11/14/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow stem augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

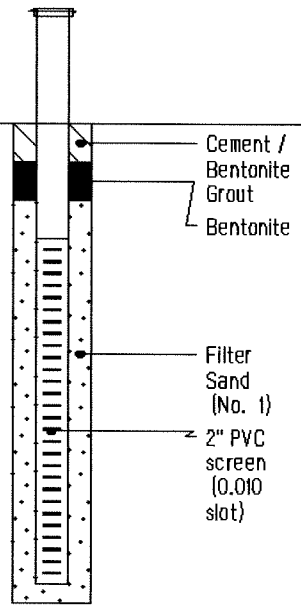
WELL DEVELOPMENT

Method: *Whale Super Purger*
Duration: *24 min.*
Gals. Purged: *52.5*
Slug Test: *6.404 E-05* (cm/sec)

SURVEY DATA DATUM:

Grade: *7.56*
TWC: *NA*
TPC: *10.21*
North: *646803.74*
East: *572323.19*

Geophysical Log: ☐ yes ☒ no
Comments:

Depth (feet)	WELL CONSTRUCTION	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0								FILL	Notes 1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changed subsequent to well installation.
5									
10								TIDAL MARSH DEPOSIT @ 12' Peat	
15									
20									
25									
30									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-20

Project: *LCP Superfund Site, Linden NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/15/01*
Finish Date: *11/15/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *Hollow Stem Augers*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*PVC*
Diameter (ID):	*2"*	*2"*
Coupling:	*Flush*	*Flush*

WELL DEVELOPMENT

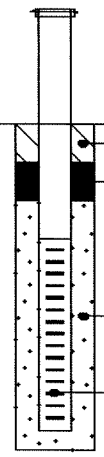
Method: *Whale Super Purger*
Duration: *31 min.*
Gals. Purged: *67.52*
Slug Test: *.456* (cm/sec)

SURVEY DATA DATUM:

Grade: *7.94*
TWC: *NA*
TPC: *10.02*
North: *646597.08*
East: *571878.42*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

Depth (feet)	soil / rock	Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
0							FILL	Notes 1. Well construction depths and grade measured from ground surface at time of drilling. Grades may have been changed subsequent to well installation.
5								
							TIDAL MARSH DEPOSIT @ 8' Peat	
10								
15								
20								
25								
30								

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600081000	Well No. MW-6D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	60.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/8/06 - 12/11/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 11.3 ft.	Easting: 572848.3 ft. Northing: 646237.5 ft. TOC Elev: 13.5 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
		GC SC	**FILL** Blk-Gray SILT & CLAY. @ .2 Blk cmf GRAVEL, little (+) cmf Sand.	8-12-23-26	1		NR	
		GW	Blk cmf GRAVEL.	NR	2		3.7-.000	
5		SW	Gray cmf SAND.	NR	3		2.6-.000	Cement / Bentonite grout
			No Recovery, large cobble in the tip of the sampler	NR	4		NR	
		SW SC	Brwn blk fmc SAND, some (-) Silt & Clay. @ 8.4' Wood.	NR	5		NR	
10		SC	@ 8.5' Blk cmf SAND, little (-) Silt & Clay, wet. Blk cmf SAND, little (-) f Gravel trace (-) Silt & Clay. Wood, Pyrite and rock fragments, wet.	NR	6		NR	
		CL ML	Silty CLAY, little (+) f Sand. @ 12.5' Blk gray cmf SAND, little (-) f Gravel.	NR	7		NR	10" Steel casing to 13.0'
		PT	**TIDAL MARSH DEPOSITS** Blk-brwn ORGANICS, some (-) Silt & Clay, wet. No Recovery	1-2-3-2	8		NR	
15		SW SC	Blk-gray SILT, some (-) fm Sand. Decomposing organics, wood, wet.	2-2-3-3	9		NR	
		SW SC	Gray mf SAND, little (-) Silt, wet.	1-1-2-2	10		NR	
20		CL	**GLACIAL TILL** Gray CLAY & SILT, little (-) fm Sand. @ 20.8' Red-brwn CLAY & SILT, little (-) fm Sand.	2-2-4-4	11		NR	
		CL ML	Red-brwn Clayey SILT, little (+) mf Sand, trace (+) cmf Gravel.	4-5-6-7	12		0.0-.017	
25				6-9-10-11	13		0.0-.016	
				9-11-13-15	14		0.0-.013	
		CL ML	Red-brwn CLAY & SILT, trace (+) c Gravel. @ 29.5' Red-brwn Clayey SILT, little (-) c Gravel.	5-6-9-11	15		0.0-.012	
30		CL	Red-brwn Clayey SILT, little (-) cmf Gravel,	5-9-10-10	16		0.0-.016	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600081000	Well No. MW-6D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts / RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		ML	trace (-) fm Sand.					
				7-10-11-10	17		0.0-.010	
		CL ML	Red-brwn Clayey SILT, trace (-) cm Gravel.	5-7-7-8	18		0.0-.010	
35								
				9-10-10-14	19		0.0-.012	
		CL ML	Red-brwn Clayey SILT, little (+) fm Sand, wet.	4-4-3-4	20		0.0-.019	
40				4-4-6-2	21		0.0-.013	
		CL ML SW	Red-brwn SILT, little (+) mc Sand and fm Gravel. Pulverized cobble. @ 43.4' Red-brwn fm SAND, some (-) Silt, little cmf Gravel.	4-6-8-9	22		0.0-.013	
				7-8-8-8	23		0.0-.012	
45			**PASSAIC FORMATION** Red-brwn Siltstone, containing bedding (weathered BR)	100/2	24		0.0-.010	# 00 Sand to 46.0' 6" Steel casing to 46.0'
			Red-brwn Siltstone, moderately hard, intensely fractured. @ 48.0' - 48.67' Horizontal fractures filled in by calcite. @ 50.67' Transition into Red-brwn Sandstone, moderately hard. @ 51.58' Horizontal fractures filled in by clay. @ From 51.67' - 53.0' Interfingering of Siltstone and Sandstone. Sandstone being fairly weathered. Pyrite deposits throughout the core. 53.0' - 53.38' Red brwn fine grained sandstone, soft, highly fractured, w/ fractures fairly weathered. @ 53.79' Transition into a Red-brwn very fine grained Siltstone, moderately hard. @ 55.0' horizontal fractures filled by clay. @ 56.25 Transitions back into a Red-brwn Sandstone, moderately hard. @ 56.67' Grading into a coarse grained Sandstone. @ 57.08' Sandstone contains pieces of quartz gravel in matrix). @ 57.5' back into Red-brwn siltstone. Red-brwn very fine grained siltstone, moderately hard, highly fractured. @ 58.25' Horizontal fractures. @ 58.58' horizontal fractures, moderately weathered, Fe staining. @ 59.5' Red-brwn very fine grain Sandstone, moderately hard.	30%	25		NR	# 1 Sand to 48.0'
50				70%	26		NR	
55								0.010" Slot screen
				54.2%	27		NR	
60								End of borehole @ 60.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080999	Well No. MW-11D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	62.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/9/06 - 12/20/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83	Easting: 572447.2 ft.
C. Conner	HSA	Failing 45	Vert Datum: NGVD88	Northing: 646438.2 ft.
			Ground Surface Elev: 8.0 ft.	TOC Elev: 10.5 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			CONCRETE								
		CL ML	**FILL** Wet, Blk Clayey SILT, little (+) cmf Sand, trace (+) Organics. Glass fragments.	6-7-10-14	1					.022-73.4	Cement / Bentonite grout
5		CL ML	Wet, Red-Blk Silty CLAY, some (-) cmf Sand.	10-6-5-4	2					.004-18.7	Strong petroleum odor
				4-5-6-7	3					.230-123.4	PID maxed out. Collect MW-11D-6-8. strong petroleum "oilly " odor w/ visible sheen on water and NAPL blebs are abundant
				5-2-2-2	4					.100-91.5	
10		OH	Wet, Blk, ORGANICS, some (-) Silt & Clay, wood in tip of sampler.	1-1-1-1	5					.893-MAX	PID rose to 215 Collect MW-6D-10-12 @ 10.8' Large wad of newspaper/shipping manifest 10" Steel casing to 12.0'
		CL	**TIDAL MARSH DEPOSITS** Blk-gray SILT & CLAY, little (-) fm Gravel. Decomposing organics, wet	4-5-5-4	6					0.000-0.0	
15		SW	Gray to Black fm SAND, little (-) Silt, wet.	3-2-1-2	7					.204-1.6	
		SW	**GLACIAL TILL** Red-brwn fm SAND, some (-) Silt, little (-) mf Gravel.	7-9-12-10	8					.064-1.0	
		CL ML	Red-brwn SILT & CLAY, little (-) f Sand, trace (-) mf Gravel, wet.	10-16-9-5	9					.024-0.6	
20		SW SP	Red-brwn mf SAND, little (-) Silt, trace (-) mf Gravel, wet.	4-7-7-10	10					.016-.6	
		CL ML	Red-brwn SILT & CLAY, little (-) f Sand, trace (-) cm Gravel, wet.	7-5-5-7	11					.011-.6	
25				7-9-8-7	12					.060-1.6	
		CL ML	Red-brwn SILT & CLAY, trace (-) mf Gravel, wet.	7-6-7-9	13					.029-1.0	Sheen, NAPL with moderate odor from 26.0'-28.0' interval
		CL ML	Red-brwn SILT & CLAY, trace (-) f Sand, moist.	6-7-6-6	14					.009-0.0	
30				6-9-7-7	15					.008-1.0	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080999	Well No. MW-11D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		ML	Red-brwn Clayey SILT, little (-) f Sand, wet.	7-9-9-8	16		.000-0.0	
				7-7-9-9	17		.000-0.0	
35		SP CL ML	Red-brwn f SAND, little (-) Clay & Silt, wet. Red-brwn SILT & CLAY, little (-) f Sand.	9-8-9-9	18		.000-0.0	
		CH	Red-brwn CLAY, little (-) Silt, trace (+) mf Gravel, wet.	10-9-7-9	19		.000-0.0	
40		CL ML BR	Pulverized piece of Red-brwn Siltstone. @ 39.1' Red brwn CLAY & SILT, little (-) f Sand, trace (+) f Gravel. Pieces of Red brwn siltstone in shoe, wet. Pulverized pieces of Red-brown thin bedded Siltstone.	10-13-15-100/3	20		.000-0.0	
								6" Steel casing to 44.0'
45		BR	**PASSAIC FORMATION** Red-brwn very fine grain thin bedded Siltstone, intensely fractured, with moderately weathered joints. @ 45' Transition into a moderately hard thin bedded Siltstone containing calcite nodules. @ 45.5' Horizontal fracture.	30.6%	21		.000-0.0	
		BR	47.0' - 47.5' Same as above. @ 47.5' Transition into a fine grain sandstone w/ horizontal fractures filled in by calcite and an abundance of mica flakes. @ 47.8' Transition back into siltstone, intensely fractured w/ joints being fairly weathered.	75%	22		.000-0.0	# 00 Sand to 48.0' # 1 Sand to 50.0'
50		BR	Red-brwn very fine grain, moderately hard Siltstone, fairly fracured. @ 55.5' Transition into a fine to medium grain, fairly weathered Sandstone. Mica flakes present throughout core.	83.3%	23		.000-0.0	
55								0.010" Slot screen
		BR	Red-brwn very fine grain Siltstone, moderately hard and fairly fractured. @ 57.7' Diagonal fracture, fairly weathered w/ Fe staining. @ 58' Transition into a Red-brwn fine to medium grain soft Sandstone w/ moderately weathered fractures. @ 59.5' Red-brwn Siltstone w/ horizontal clay filled fractures. Vertical clay filled fracture extending from 60.9' - 62.0'.	53.3%	24		.000-0.0	
60								End of borehole @ 62.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080991	Well No. MW-14D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	53.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/30/06 - 12/1/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.1 ft.	Easting: 572006.1 ft. Northing: 646397.7 ft. TOC Elev: 10.7 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.					
5								
		GP SP	**FILL** Red cfm GRAVEL, some (+) Sand, trace (+) Silt. @ 6.4' Blk cfm GRAVEL and SAND, some (+) Silt, wet.	7-4-3-2	1		0-0	Cement / Bentonite grout
		CL ML	**TIDAL MARSH DEPOSITS** Blk-green Silty CLAY, some (+) Sand, little (+) Organics, wet. No sample collected.	2-1-1-1	2		0- .010	
10								
		CL ML	Gray Clayey SILT, trace (+) cmf Gravel, decomposing organics.	3-4-4-4	1		.7- .007	10" Steel casing to 11.0'
		ML CL ML CL CL ML ML CL	**GLACIAL TILL** Red-brwn Clayey SILT, little (-) Sand, little (+) cmf Gravel, wet. Red-brown, Clayey SILT, little (-) Sand, little (+) cmf Gravel. Gray Clayey SILT, decomposing organics (roots) wet. Red-brwn Clayey SILT, trace (-) cm Gravel, wet.	3-7-9-8	2		1.3- .009	
15				12-14-16-16	3		0-0	
				17-16-30-33	4		1.1- .007	
20		ML CL	Red-brwn SILT & CLAY, trace (-) f Sand, wet.	19-20-20-24	5		1.8- .004	
		ML CL	Red-brwn SILT & CLAY, trace (-) mf Gravel, moist.	18-25-29-30	6		2.3- .004	
				9-12-15-21	7		1.9- .003	
25		ML CL	Red-brwn SILT & CLAY, trace (-) mf Gravel, moist. @ 25.3 Red brwn Clayey SILT, little (+) f Sand, moist.	16-27-28-30	8		2.8- .004	
		ML CL	Red-brown Clayey SILT, little (+) f Sand.	16-22-22-27	9		3.1- .005	
30				27-30-30-42	10		2.6- .004	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080991	Well No. MW-14D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		ML CL	Red-brwn CLAY & SILT, trace (+) f Sand. In shoe red brwn Clayey SILT, little (-) f Sand, trace (+) cmf Gravel, wet.	NR	11		0-0	
				NR	12		0-0	
35		ML	Red-brwn Clayey SILT, trace (+) f Sand, little (+) cmf Gravel, wet. In shoe broken piece of Red brwn siltstone showing bedding (weathered bedrock-Passaic formation)	NR	13		0-0	
								# 00 Sand to 37.0' 6" Steel casing to 39.0'
40		BR	**PASSAIC FORMATION** Red-Brwn very fine grain Siltstone. @ 39.17' Fe staining. Horizontal fractures filled in by clay. Siltstone is slightly weathered. Moderately hard, thin bedded. @ 40.0' to 41.5' silstone is highly fractured with joints being slightly weathered.	11.5%	16		NR	@ 42' Shiny silver color deposits. No MVA detection; not mercury. # 1 Sand to 39.0'
45		BR	Red-Brwn very fine grain Siltstone, moderately hard and thin bedded. @ 43.3' Fe staining. @ 43.3' to 44.5' Highly fractured with joints being slightly weathered. @ 46.67'-47.58' Highly fractured with joints being filled in by clay.	17.5%	17		NR	0.010" Slot screen
50		BR	48.0-51.58 Lithology same as above. 48.0-49.17, Highly fractured with joints filled in by clay. @ 51.58 transition into a Red Brown Sandstone. @ 52.0 transition back into a Red Brown Siltstone.	61.7%	18		NR	Bentonite slurry from 51.0' - 53.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080993	Well No. MW-16D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	62.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/3/06 - 12/7/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 6.2 ft.	Easting: 572308.0 ft. Northing: 647004.9 ft. TOC Elev: 8.7 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples taken.					
5								Cement / Bentonite grout
		SM	**FILL** Blk cmf SAND, little (-) Silt & Clay, trace (-) f Gravel, wet.	1-3-4-3	1		.000-0.0	
10				5-4-2-2	2		.000-0.0	slight chlorinated odor 10" Steel casing to 10.0'
		ML	**TIDAL MARSH DEPOSITS** Blk Clayey SILT, some (+) Organics, wet.	1-1-2-1	3		.000-0.0	light rotten egg smell
		SW SM	Gray mf SAND, little (-) Silt, trace (+) Clay, wet. Decompsing organics.	1-2-2-3	4		8.8-.049	
15				6-9-10-17	5		2.9-.035	
		SW SC	Gray mc SAND, little (-) Silt, wet.	7-7-9-10	6		0.0-.028	
		CL ML SM ML CL ML CL	**GLACIAL TILL** Red-brwn SILT, some (+) fm Sand, little (+) cmf Gravel. Red-brwn f SAND, little (-) Silt. Red-brwn Clayey SILT, little (-) Sand, wet. Red-brwn Clayey SILT, little (-) fm Sand, trace (+) cmf Gravel, wet.	10-17-12-10	7		0.0-.022	
20				9-6-10-9	8		0.0-.018	
				9-10-10-8	9		0.0-.000	
25				12-11-11-12	10		0.0-.005	
		ML CL	Red-brwn CLAY & SILT, little (-) cm Gravel, wet.	NR	11		0.0-.000	
30		ML CL	Red-brwn SILT & CLAY, trace (-) f Sand and mf Gravel. wet.	4-4-5-5	12		0.0-.000	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080993	Well No. MW-16D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		ML CL	Red-brwn CLAY & SILT, trace (-) f Sand. wet.	5-7-9-8	13		0.0-.000	
				4-5-6-6	14		0.0-.000	
35		ML CL	Red-brwn Clayey SILT, little (+) cmf Gravel, little (-) fm Sand.	6-9-10-10	15		0.0-.000	
				7-41-12-12	16		0.0-.004	
		BR	**PASSAIC FORMATION**					
		BR	Red-brwn pulverized Siltstone (weathered bedrock)	12-22-100/5	17		0.0-.000	
40			39.0-39.6 Pulverized Red-brwn Siltstone (weathered bedrock). @ 39.6 Red-brwn Siltstone					
		BR	Red-brwn fine grained Siltstone, intensely fractured, moderately hard and weathered. @ 44.5 Red-brown clay deposits w/ weathered bedrock.	0.0%	18		NR	6" Steel casing to 42.0'
		BR	44.0' - 44.75' Red brwn very fine grained intensely fractured Siltstone, moderately hard, fairly weathered, Fe staining. @ 45.5' horizontal fractures filled in by clay. @ 45.67" Same lithology, more indurated Siltstone, containing pyrite mineralization	57.3%	19		NR	
45								
		BR	throughout. @ 46.92' Horizontal fracture filled in by calacite. 48.0 - 48.25' Lithology same as above. @ 48.25 Horizontal fractures that are filled in by calcite. @ 50.1 horizontal fractures filled in by calcite from 50.1-50.6, Red-brwn Siltstone, moderately weathered, soft, and hightly fractured. @ 50.6 Red-brwn moderatly hard Siltstone, unweathered,	85.8%	20		NR	# 00 Sand to 48.0'
50								# 1 Sand to 50.0'
		BR	contains pyrite mineralization throughout. Red-brwn very fine grain Sandstone, moderately hard and slightly weathered. SS highly fractured (horizontal). Fractured zones, highly weathered, soft. @ 54.4 transitions into a Red-brwn fine grained Siltstone, moderately hard. @ 54.75 horizontal fractures filled in by clay.	60%	21		NR	
55								0.010" Slot screen
		BR	Interfingering of Siltstone and SS for remainder of core, pyrite mineralogy present throught the core.	17.7%	22		NR	
60			Red brown SS, soft, vertically fractured, moderatly weathered, with calcite and clay deposits in the joints. @ 58.83' Red brwn moderately hard siltstone, presence of Fe staining, highly fractured. From 59.92' to 61.67' Red brwn moderetly hard siltstone, intesly fractured w/ wavy bedding. Numerous horizontal fractures filled in by clay.					End of borehole @ 62.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080986	Well No. MW-17D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	57.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/30/06 - 11/27/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.8 ft.	Easting: 571478.0 ft. Northing: 646952.8 ft. TOC Elev: 10.1 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.								
											Cement / Bentonite grout
5		GW SW	**FILL** Brwn-blk-gray cfm GRAVEL and cfm SAND, little (+) Silt & Clay, trace (+) Organics, wet.	5-2-4-2	1					0-0	
		GW SW	Blk coated cfm GRAVEL and SAND, some (-) Silt, little (+) Clay, organic material on bottom.	3-3-2-3	2					0-0	Small gray NAPL blebs, ranibow sheen in black liquid odor.
10		GW SW	Blk coated cfm GRAVEL and SAND, trace (-) Silt, trace (+) Organics.	3-2-1-1	3					0-0	Black liquid, gray to rainbow NAPL blebs, odor.
		CL ML	**TIDAL MARSH DEPOSITS** Blk-green-gray Silty CLAY, some (+) Organics, trace (-) fm Sand, wet.	1-1-1-1	4					0-0	
		CL ML	Blk-gray Silty CLAY, some (-) organics, wet.	2-1-1-1	5					0-0	10" Steel casing to 13.0'
15		CL ML	**GLACIAL TILL** Gray fmc SAND. @ 16.0' Red-brwn SILT & CLAY, little (-) fmc Sand.	1-2-3-4	6					9.8-MAX	
		CL ML	Wet, Red-brwn Clayey SILT, some (-) fmc Sand, trace (+) f Gravel	4-7-7-7	7					1.3-.046	
20				7-9-10-10	8					14.7-.018	
		CL ML	Wet, Red-brwn Clayey SILT, some (-) fm Sand.	7-8-9-10	9					3.7-.012	
		CL ML	Wet, Red-brwn SILT & CLAY, little (+) fm Sand.	4-7-8-2	10					5.3-.023	
25		CL ML	Wet, Red-brwn Silty CLAY, little (+) fmc Sand, trace (+) f Gravel.	7-7-7-9	11					4.9-.007	
		CL ML	Red-brwn Clayey SILT, little (-) fm Sand.	7-8-9-8	12					3.9-.007	
30				4-5-6-6	13					8.4-.004	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080986	Well No. MW-17D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		CL ML	Red-brwn SILT & CLAY, trace (+) Sand, wet. @ 32.0' small lens w/ relic bedding. No bedding apparent beyond. Red-brwn SILT & CLAY, little (+) fmc Sand w/ Shale (Bedrock) Fragments.	4-6-6-5	14		4.4- .007	
		BR	**PASSAIC FORMATION** Wet, Red-brwn weathered bedrock Shale fragments	10-13-17-100/6	15		18.4- .155	
35								# 00 Sand to 36.0'
		BR	Red-Brwn mudstone, thin laminations. @ 37.3' fracture with possible calcite deposits.	0.0%	16		NR	6" Steel casing to 37.0' # 1 Sand to 38.0'
40		BR	Red-Brwn Siltstone, contains vertical fractures with secondary mineralization. @ 43.6' Transition into a Red-brwn friable Sandstone, containing feldspar (possible arkose).	55.9%	17		NR	
45		BR	44.0' - 46.17' Red-brwn fine grain friable Sandstone, containing numerous horizontal fractures. @ 46.0' Horizontal fractures filled in by secondary mineralization. @ 47.0' Transition back into a Red-brwn Siltstone. @ 47.92' Horizontal fracture filled in by calcite.	50.0%	18		NR	0.010" Slot screen
50		BR	Red-Brwn Siltstone. @ 50.1' Horizontal fracture filled in by clay. @ 51.75' Horizontal fracture filled in by clay. @ 53.25' Numerous hairline fractures.	85%	19		NR	
55		BR	54.0' - 54.6' Same as above. @ 55.3' Fracture filled in by clay.	88%	20		NR	Bentonite slurry from 52.0' - 57.0' End of borehole @ 57.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080987	Well No. MW-18D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	58.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/3/06 - 11/29/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.7 ft.	Easting: 571908.7 ft. Northing: 646922.2 ft. TOC Elev: 10.0 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.								
5											Cement / Bentonite grout
			No Recovery	1-2-2-3	1					.001-0.0	
				5-4-4-2	2					.000-0.0	
10											
		CL ML	**TIDAL MARSH DEPOSITS** Blk-gray-green Silty CLAY, some (+) Organics, trace (+) fm Sand, wet.	1-2-1-1	3					.009-0.0	10" Steel casing to 11.0'
		CL ML	Blk-brwn Clayey SILT, decomposing plant roots. @ 13.4 3" piece of wood.	1-2-2-1	4					0.1-.009	
15		CL ML	Gray Clayey SILT, some (-) fm Sand, wet.	2-3-7-10	5					0.0-.009	
		SW	**GLACIAL TILL**								
		CL ML	Red-brwn well sorted f SAND, little (-) Silt. Red-brwn Clayey SILT, little (+) cmf Gravel, wet.	4-5-5-6	6					2.6-.037	
				7-7-9-10	7					2.0-.008	
20											
				9-10-11-8	8					0.1-.009	
				9-10-10-10	9					0.1-.009	
		CL ML	Red-brwn SILT & CLAY, little (+) fm Sand, wet.								
25				7-9-10-10	10					0.3-.007	
				12-11-15-20	11					2.6-.004	
		CL ML	Red-Brwn SILT & CLAY, wet. Pulverized pieces of C Gravel found @ 33 ft. in shoe of split spoon, wet.	7-9-12-15	12					3.0-.007	
30											

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080987	Well No. MW-18D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
				10-11-12-10	13		2.9-.006	
		CL ML	Red-Brown Clayey SILT, some(-) cmf Gravel. @ 34.4' Same as above with Red brown Siltstone (showing bedding).	7-9-13-10	14		5.5-.001	
35		BR	**PASSAIC FORMATION** Red-brwn weathered Siltstone (weathered bedrock)	13-16-18-10	15		1.9-.004	
		BR	Pulverized Siltstone found in shoe (Siltstone showing bedding).	25-100/5	16		8.0-.006	# 00 Sand to 38.0' 6" Steel casing to 40.0'
40		BR	Red-Brwn very fine grain Siltstone. Thin bedding. @ 44.25' Horizontal hairline fracture, moderately hard.	0.0%	17		NR	# 1 Sand to 40.0'
45		BR	Red-brwn very fine grained, thin bedded Siltstone, numerous hairline horizontal fractures throughtout core. @ 44.25' core is pulverized. @ 46.0' signs of crossbedding (fractures filled in by calcite). @ 46.5', 47.0', and 47.67' Siltstone is noticably softer than rest of the core.	36.5%	18		NR	0.010" Slot screen
				59.2%	19		NR	
50		BR	Red-Brwn very fine grained Sandstone, very friable. @ 51.2' Transition back into a red-brown fine grain Siltstone. @ 52.0' Siltstone is much harder than previous cores.					
		BR	Red-Brwn fine grain, thin bedded Siltstone. @ 56.0' Horizontal fractures filled in by clay.	90%	20		NR	
55								Bentonite slurry from 52.0' - 58.0'
								End of borehole @ 58.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080992	Well No. MW-20D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	53.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/30/06 - 12/4/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.1 ft.	Easting: 571692.8 ft. Northing: 646589.9 ft. TOC Elev: 10.5 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.					
5								Cement / Bentonite grout
		GP	**FILL** Blk GRAVEL and SAND, some (+) Silt. @ 6.2' Blk-gray-brwn Silty CLAY, little fm Sand, some (+) Organics, wet.	1-1-1-1	1		0-0	
10		GW	Blk cmf GRAVEL, wet.	3-2-2	2		0-0	6" Steel casing to 10.5'
		CL ML	**TIDAL MARSH DEPOSITS** Blk-gray Silty CLAY, little (+) fm Sand and Organics, wet.	12-2-2-2	3		3.3-.004	Sample-MW-20D-12-14
15		CL ML	**GLACIAL TILL** Red-brwn SILT & CLAY, little (-) fmc Sand, wet.	4-5-4-5	4		5.1-0	
				4-5-4-4	5		.3-0	
		NR	No recovery.	8-6-7-9	6		0-0	
20		ML	Red-brwn Clayey SILT, little (+) fmc Sand, trace (+) cmf Gravel, wet.	6-7-9-9	7		1.7-.003	
		ML CL	Red-brwn SILT & CLAY, some (-) cmf Sand, little (-) fm Gravel, wet.	6-8-10-12	8		1.2-0	
25		ML CL	Red-brwn SILT & CLAY, little (-) fmc Sand, wet. @ 29.3'Relic bedding, weathered bedrock. @ 29.5' competent Siltstone in tip of ss-sampler, wet.	9-9-9-10	9		5.1-0	
				9-12-12-16	10		5.2-0	
				13-12-15-16	11		5.9-0	
30		CL	Red-brwn Silty CLAY, some (-) cmf Sand,	8-8-9-11	12		5.1-0	Cobble in tip of 28.0' - 30.0'

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080992	Well No. MW-20D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		ML	wet. @ 32.9 have weathered bedrock, bedding evident. Red-brwn Shale, wet.	14-21-20-18	13		5.5-0	interval ss-sample Sample MW-20D-32-34
35		BR	**PASSAIC FORMATION** Weathered Siltstone, bedrock	10-23-60-60	14		7.8-.027	Sample MW-20D-36-38
				100/6	15		18.2-.059	
40		BR	Red-Brwn Siltstone, fairly fractured, moderately hard. @ 39.92 Horizontal fracture filled in by clay.	43.3%	16		0.0-.000	10" Steel casing to 38.0' # 00 Sand to 39.0' # 1 Sand to 41.0'
45		BR	Red-Brwn very fine grain Siltstone, moderately weathered. Siltstone in this interval is intensely fractured with clay deposits in fracture @ 44.50' - 46.58' very fine grain moderatly hard, unweathered Siltstone. @ 46.42' Grading back into a sandy Siltstone. @ 46.67' Red-Brwn fine grained Sandstone.	64.2%	17		0.0-.000	0.010" Slot screen
50		BR	@ 47.17' Transition into a fine grained highly weathered Siltstone. Between 47.17' - 48.0' Siltstone contains shiny silver to gold metallic particles (checking for Hg) Red-Brwn fine grain Siltstone. @ 48.17' Diagonal fracture that is filled w/clay. Entire run is moderately fractured w/ mica flakes. @ 50.25' Red-brwn fine grain Sandstone. @ 50.33 transition back into Red-brwn Siltstone. @ 51.83 Red-brwn Sandstone w/ m Gravel. @ 52.0 Grading back into Red-Brwn fine grain Siltstone.	23.3%	18		0.0-.000	End of borehole @ 53.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600081002	Well No. MW-21D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	60.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/3/07 - 12/5/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83	Easting: 572532.2 ft.
C. Conner	HSA	Failing 45	Vert Datum: NGVD88	Northing: 646048.6 ft.
			Ground Surface Elev: 7.5 ft.	TOC Elev: 9.5 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.								
5											Cement / Bentonite grout
		SW SC	**FILL** Wet, Blk cmf SAND, some (-) Silt & Clay. Wood chunks in the tip of sampler.	10-7-4-4	1					NR	
				5-4-4-5	2					NR	
10											
		PT	**TIDAL MARSH DEPOSITS** Wet, Blk, ORGANICS, some (-) Silt & Clay, Peat.	1-1-1-1	3					NR	
		CL	Gray-blk Silty CLAY, little (-) f Sand.								
		ML	Gray Silty CLAY, little (-) f Sand.	2-3-4-4	4					0.6-.004	6" Steel casing to 13.0'
		CL	Decomposing organics.								
		ML									
15		SW	**GLACIAL TILL** Red-brwn mf Sand, little (-) Silt, trace (-) cmf Gravel, wet.	5-6-6-6	5					3.0-.010	
		ML	Red-brwn Clayey SILT, some (-) fm Sand, trace f Gravel, wet.	6-7-6-7	6					3.4-.005	
		ML CL	Red-brwn SILT & CLAY, trace (-) f Sand, wet.	4-4-4-4	7					0.0-.005	
20				4-5-5-6	8					0.0-.005	
		CL ML	Red-brwn CLAY & SILT, trace (+) cmf Gravel, trace (-) mf Sand, wet.	4-5-5-6	9					0.0-.004	
25				16-30-65-24	10					0.8-.000	
		SP	Red-brwn fm SAND, some (+) Silt, wet.								
		ML	Red-brwn Clayey SILT, trace (+) cmf Gravel, wet.	7-9-9-8	11					0.8-.000	
		ML	Red-brwn Clayey SILT, little (+) fm Sand.	5-5-9-15	12					0.4-.000	
30			@ 29.8' Red brwn Clayey SILT, little (+) fm Sand, trace (+) cmf Gravel, wet.								

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600081002	Well No. MW-21D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Well	PID/MVA Readings (ppm)	Remarks
		SM SC	Red-Brwn fm SAND, little (-) Silt & Clay, wet.	9-10-10-11	13					1.9-.000	
		CL ML	Red-Brwn CLAY & SILT, trace (+) mf Gravel, wet.	6-6-6-9	14					1.0-.000	
35		CL ML	Red-Brwn CLAY & SILT, little (+) f Sand, little (-) cmf Gravel, wet. @ 36.2' Same as above w/ fragments of Red-Brwn Siltstone.	8-8-10-12	15					1.8-.000	
		CL ML	Red-Brwn CLAY & SILT, little (+) f Sand and cmf Gravel. @ 37.1' Pulverized pieces of Red-brwn Siltstone	16-30-28-15	16					2.3-.000	
40		ML	Red-brwn Clayey SILT, little (+) fm Sand. Fragments of Red-brwn Siltstone. Siltstone showing bedding (weathered bedrock).	19-18-15-100/4	17					1.6-.003	
45		BR	**PASSAIC FORMATION** Red-brwn very fine grained moderately hard Siltstone. @ 46.0' Horizontal fracture filled in by clay, pyrite deposits in joints. @ 47.25' Transition into a fine grained, moderately hard Sandstone.	70%	18					NR	10" Steel casing to 43.0' # 00 Sand to 44.0' # 1 Sand to 46.0'
50		BR	Red-brwn very fine grained, moderately hard Sandstone. @48.5' Horizontal fracture with pyrite deposits. @ 49.5' Horizontal fracture filled in by calcite, Sandstone softer. @ 56.5' Sandstone intensely fractured.	57%	19					NR	
55		BR	Red-brwn very fine grain Siltstone, moderately hard containing relic bedding. @ 53.25' Transition into a fine grain Red-brwn Sandstone, soft, with interbeds of Siltstone. @ 53.83' Grading into a Red-brwn Siltstone containing pyrite. @ 55.16' Transition back into a red-brwn fine grain Sandstone. 26" to 42" three diagonal open fractures (about 4" each). Sandstone very soft. @ 56.75'	40%	20					NR	0.010" Slot screen
60		BR	Transition back into a Red-brwn Siltstone. @ 57.58' intensely fractured zone, soft. Red-brwn very fine grain Sandstone containing interbeds and lenses of Red-brwn Mudstone. Sandstone moderatly hard with pyrite mineralization scattered throughout core. @ 59.67' Grading into a Red-brwn very fine grain Siltstone containing horizontal fractures filled in by clay. Siltstone moderately hard containing pyrite.	95.8%	21					NR	Bentonite slurry from 58.0' - 60.0' End of borehole @ 60.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600081001	Well No. MW-21S Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	6"	2" PVC	.010"	10.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/25/06 - 10/25/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.4 ft.	Easting: 572519.4 ft. Northing: 646068.0 ft. TOC Elev: 10.2 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			Concrete								
		CL	**FILL**	6-9	1					0.9-0	Cement / Bentonite grout
		ML NR	Brwn, Silty CLAY, little (+) cmf Sand, moist. No recovery	7-6-7-8	2					NR	# 00 Sand to 2.0' # 1 Sand to 3.0'
5		SP	Brwn-tan cmf SAND, little (+) Silt & Clay, trace (+) fm Gravel, @ 4.3' Large wood frag.	5-6-6-7	3					1.8-0	0.010" Slot screen
		SP	Wet, cmf SAND, little (+) Silt & Clay, trace (+) fm Gravel.	11-6-5-3	4					16.8-0	
10		CL	**TIDAL MARSH DEPOSITS** Tan-brwn Silty CLAY, some (-) organics, wet.	5-2-2-2	5					.9-0	Odor, rainbow sheen w/minor amounts of NAPL on water in spoon in 8.0' -10.0' interval End of borehole @ 10.0'

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080990	Well No. MW-22S Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	6"	2" PVC	.010"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/25/06 - 10/25/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.5 ft.	Easting: 572216.6 ft. Northing: 646279.8 ft. TOC Elev: 10.9 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
		NR	No Recovery.	12-58-32-34	1		0.1-0	
		SW SM	**FILL** Moist-dry, Brwn cmf SAND, little (+) Clayey Silt, little (-) cmf Gravel. Brick fragments.	13-12-24-13	2		32.8-0	Cement / Bentonite grout
5		ML CL	Moist, Red brwn SILT & CLAY, little (+) fmc Sand, @ 4.9' Wet, Blk fm SAND, little (-) fmc Gravel, trace (-) Silt & Clay.	2-5-4-8	3		16.8-0	# 00 Sand to 4.0' # 1 Sand to 5.0'
		SW GW	Wet, Blk cmf SAND, little (-) fmc Gravel, trace (-) Silt & Clay.	5-6-6-5	4		1.3-0	Slight sheen with odor in 6.0' - 8.0' interval
		NR	No Recovery.	8-8-4-3	5		0-0	0.010" Slot screen
10		ML CL	**TIDAL MARSH DEPOSITS** Wet, Brwn Clayey SILT, some (-) Organics, @ 11.2' Gray SILT & CLAY, little (+) fmc Sand.	1-1-2-2	6		NR	
								End fo borehole @ 12.0'

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080989	Well No. MW-23D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	53.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/15/06 - 11/30/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83	Easting: 572133.4 ft.
C. Conner	HSA	Failing 45	Vert Datum: NGVD88	Northing: 646560.0 ft.
			Ground Surface Elev: 8.2 ft.	TOC Elev: 10.7 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples Collected. See MW-23S log for shallow descriptions.					
5								Cement / Bentonite grout
10								
			No Recovery	1-2-1-1	1		0.0-.000	
		CL ML	**TIDAL MARSH DEPOSITS** Blk Clayey SILT. Decomposing organics, wet.	1-3-3-3	2		0.0-0.043	6" Steel casing to 13.0' Sulfer Odor
15				3-7-6-7	3		0.0-0.076	
		CL ML CL ML	**GLACIAL TILL** Red-brwn Clayey SILT, little (+) fmc Sand, trace (-) cmf Gravel, wet. Red-brwn SILT & CLAY, little (-) cmf Gravel, trace (+) f Sand, wet.	7-9-10-12	4		0.0-0.004	
20				12-13-10-11	5		0.8-0.007	
		CL ML	Red-Brwn Silty CLAY, trace (-) cmf Gravel, moist.	11-13-15-12	6		TOL-0.005	
				10-9-10-10	7		0.0-0.000	
25				10-13-13-14	8		0.0-0.000	
				9-12-12-16	9		0.0-0.004	
30		CL ML	Red-brwn Clayey SILT, some (+) f Sand, wet.	12-8-9-8	10		0.0-0.000	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080989	Well No. **MW-23D** Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts / RQD (%)	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Well	PID/MVA Readings (ppm)	Remarks
		CL ML	Red-brwn CLAY & SILT, wet.	9-8-10-11	11					0.0-0.004	
				5-7-7-7	12					0.0-0.000	
35		CL ML	Red-brwn Clayey SILT, little (-) mf Gravel.	7-6-7-2	13					0.0-0.008	
				7-7-9-11	14					0.0-0.015	
		BR	**PASSAIC FORMATION** (Weathered bedrock) Red-brwn Siltstone w/ bedding.	15-100/5	15					0.0-0.000	# 00 Sand to 39.0'
40		BR	Red-brwn very fine grain Siltstone. 41.0' - 41.5' diagonal fractures filled in by clay, moderately hard. @ 41.5' Pulverized pieces of Red-brwn Siltstone, soft. @ 42.67' Horizontal fracture that splits core. Fracture filled in by clay.	18.8%	16					NR	10" Steel casing to 39.0' # 1 Sand to 41.0'
		BR	Red-brwn Siltstone, moderately hard, moderatley fractured. @ 44.67' Fe staining, shiny gold/silver minerals scattered throughout inner core (possible pyrite). @ Clay deposits in fractures.	16.7%	17					NR	
45		BR	Red-brwn very fine grain Siltstone, fairly hard. @ From 48.83' - 49.2', Horizontal fractures are filled in by calcite. @ From 49.2' - 51.83', highly fractured zone. @ 51.83' Horizontal fracture filled in by clay. @ 52.5' Horizontal fracture filled in by calcite.	28.3%	18					NR	0.010" Slot screen
50											End of borehole @ 53.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080988	Well No. MW-23S Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	6"	2" PVC	.010"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/26/06 - 10/26/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.2 ft.	Easting: 572131.4 ft. Northing: 646552.5 ft. TOC Elev: 10.5 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
		GW SW	**FILL** Brwn red cmf GRAVEL and mfc SAND, little (+) Clay & Silt. Grass, topsoil, organic material. @ 0.25' Red-brwn SILT & CLAY.	4-1-2-3	1					.2/0	Cement / Bentonite grout
		CL ML	Red CLAY & SILT, trace (-) mf Sand. Brick fragments, wet.	3-2-2-2	2					.2/0	# 00 Sand to 2.0' # 1 Sand to 3.0'
5		CL ML	Red CLAY & SILT, little (-) m Gravel, trace (+) mf Sand, wet	1-3-3-2	3					.3/0	
		CL ML	Red CLAY & SILT, some mf Sand, trace (-) mf Gravel, wet.	4-3-3-4	4					.3/0	0.010" Slot screen
		CL ML	Red Silty CLAY, trace (-) Gravel and Sand, wet.	4-3-5-4	5					.3/0	
10		CL ML	**TIDAL MARSH DEPOSITS** Blk CLAY & SILT, some greenish blk-orange Organics, wet.	1-2-1-1	6					.3/0	End of borehole @ 12.0'

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080994	Well No. MW-24S Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	6"	2" PVC	.010"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/26/06 - 10/26/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.8 ft.	Easting: 572051.8 ft. Northing: 646780.2 ft. TOC Elev: 12.6 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
		GW	**FILL** Gray-Red-Brwn mf GRAVEL, some (+) Silt & Clay, little (+) Sand.	7-7-13-13	1					.2-0	Cement / Bentonite grout # 00 Sand to 1.5' # 1 Sand to 2.0'
		GW	Blk cm GRAVEL, wet	8-10-11-10	2					.3-0	
5				2-6-2-2	3					.3-0	Black liquid coating sediment, sheen
		GW SW	Blk cfm GRAVEL and cmf SAND, little (+) Clayey Silt. @ 6 .2' Blk Clayey SILT, little (+) cm Gravel, trace (+) f Sand. @ 7.3' Gray GRAVEL, some (+) Clay & Silt, wet.	2-8-7-8	4					.3-.005	NAPL visible 0.010" Slot screen
		CL ML	**TIDAL MARSH DEPOSITS** Brwn-gray CLAY & SILT, little (+) cm Sand and cm Gravel. @ 9.5' Blck-gray-brwn silty CLAY, some (-) cm Sand, little (+) cm Gravel, wet.	5-7-10-7	5					.3-.035	Odor
10		ML	Gray to blk mf SAND, little (+) Silt, trace (+) mf Gravel. @ 11.0' Clayey SILT. Decomposing organics.	1-1-2	6					0.0-.035	Sheen, Black blebs throughout saturated material. Saturated liquid with Rainbow sheen. Hg beads visible with magnifying glass.

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080997	Well No. MW-25D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
THC/Allendale	SDM	14"	2" PVC	.010"	54.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
11/7/06 - 12/21/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.5 ft.	Easting: 572549.8 ft. Northing: 646665.1 ft. TOC Elev: 10.3 ft.
R. Empson	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.					
5								Cement / Bentonite grout
		CL ML	**TIDAL MARSH DEPOSITS** Gray blk Silty CLAY, some (-) organics.	1-1/12-1	1		NR	
10		ML	Gray-blk Clayey SILT. Decomposing Organics.	NR	2		MAX	Beads of metallic mercury
				NR	3		MAX	Beads of metallic mercury were visable on gloves and sample
15		SW	**GLACIAL TILL** Red-brwn fm SAND, little (+) Silt. @ 17.3' Red-brwn cmf SAND, trace (+) Silt.					10" Steel casing to 15.0' through TMD. Deviation from FOP approved by USEPA.
				7-8-9-9	4		.004-0.0	
		CL ML	Red-brwn Clayey SILT, trace (+) fm Sand, trace (-) cmf Gravel, wet	9-10-12-10	5		.010-0.0	
20		CL ML	Red-Brwn SILT & CLAY, trace (+) f Sand, trace (-) mf Gravel, moist.	10-9-10-9	6		.018-1.0	
				7-9-7-7	7		.010-0.0	
25		CL ML	Red-brwn Clay & Silt, trace (-) mf Gravel, wet.	6-7-7-8	8		.013-0.0	
		CL ML	Red-brwn Clayey SILT. @ 27.3 Pulverized pieces of blk and Red-brwn Shale.	10-9-6-9	9		.016-0.0	
30		CL ML	Red-brwn CLAY & SILT, trace (+) mf Gravel, wet.	17-14-16-13	10		.023-0.0	

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MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080997	Well No. MW-25D Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts RQD (%)	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well	PID/MVA Readings (ppm)	Remarks
		CL ML	Red-brwn Clayey SILT, little (+) fm Sand. @ 32.4 Red-brwn fm SAND, some (-) Silt, wet.	16-20-29-33	11		.026-0.0	
		CL ML	Red-brwn SILT & CLAY, little (-) f Sand, trace (+) mf Gravel.	10-6-9-6	12		.034-0.0	MW-25D-33-35
35		CL ML	Red-brwn Clayey SILT, trace (-) f Gravel. moist.	10-10-10-11	13		.010-0.0	
		CL ML	Red-brwn SILT & CLAY, little (-) f Sand, trace(+) to no cmf Gravel, wet.	4-5-6-5	14		.005-0.0	
40		BR	**PASSAIC FORMATION** Red-brwn Siltstone w/ thin bedding (bedrock), dry.	9-10-10-9	15		.016-0.0	# 00 Sand to 40.0'
		BR	Red-brwn very fine grained, intensely fractured and weathered Siltstone. @ 44.42' Fe staining.	13-26-100/5	16		.010-0.0	6" Steel casing to 42.0' # 1 Sand to 42.0'
45		BR	46.0' - 46.17' Same as above. @ 46.17' Red-brwn very fine grained moderately hard Siltstone. @ 47.42' Horizontal fractures filled in by clay. @ 47.67' abrupt change into a Red-brwn, fine to medium grained soft Sandstone, intensely fractured and weathered. From 48.17' - 50.0' Interfingering of Siltstone and Sandstone, w/ Sandstone containing fractures.	0.0%	17		NR	
50		BR	51.0'-52.08' Red-brwn moderately hard, very fine grained Siltstones w/ deposits of feldspar within its matrix. @ 52.08' Horizontal fracture filled in by clay. @ 52.08-53.50 Highly fractured and moderately weathered joints. @ 53.50 Diagonal hairline fractures filled in by clay.	48.3% 63.9%	18 19		NR NR	0.010" Slot screen End of borehole @ 54.0'

MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: 2600080998	Well No. MW-26S Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	6"	2" PVC	.010"	10.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/26/06 - 10/26/06	Advanced Drilling	Hammer Type: Manual	Submersible pump.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.3 ft.	Easting: 572484.2 ft. Northing: 646630.6 ft. TOC Elev: 12.0 ft.
C. Conner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log (Sample Int, Recovery, Lithology, Well)	PID/MVA Readings (ppm)	Remarks
		CL ML	**FILL** Brwn CLAY & SILT, some (-) mf Sand.	5-2-2-3	1		0-0	Cement / Bentonite grout
		GW SW CL	Mf GRAVEL, some fm Sand. Red-Brwn CLAY & SILT, some f Sand, wet.	7-5-3-2	2		0-0	# 00 Sand to 2.0' # 1 Sand to 3.0'
5		ML CL	Red-Brwn Silty CLAY, some mf Sand, wet.	2-1-2-2	3		.2-0	0.010" Slot screen
				6-7-7-8	4		.2-0	
		CL ML	**TIDAL MARSH DEPOSITS** Blk-green Silty Clay, some Organics.					
10		CL ML	Blk-green Silty CLAY, some Organics. @ 8.6' to Red-brwn CLAY & SILT, trace mf Sand and Gravel.	2-2-2-2	5		.2-0	Sample MW-26S-8-10 End of borehole @ 10.0'

Stick Up

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MONITORING WELL LOG

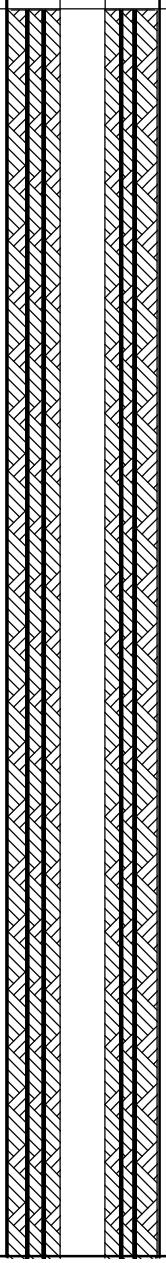
BROWN AND CALDWELL	Project Name: LCP-ISP Drilling Project Number: 134216 Project Location: Linden, NJ	Permit Number: 2600085639	Well No. MW-27D Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
BMR/Allendale	MPC	6"	2" PCV	.010"	60.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: N/A	Development Method:
12/12/07 - 12/13/07	Samuel Stothoff	Hammer Type: N/A	Whale pump surging.

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD29 Ground Surface Elev: 9.4 ft.	Easting: 573162.0 ft. Northing: 646195.0 ft. TOC Elev: 10.3 ft.
Denny Wene	Air Hammer	IR T-4		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Well (Stick Up)	PID/MVA Readings (ppm)	Remarks
			No samples collected.								
5											
10											Tidal Marsh encountered.
15											
20											Glacial till/weathered bedrock.
25											
30											



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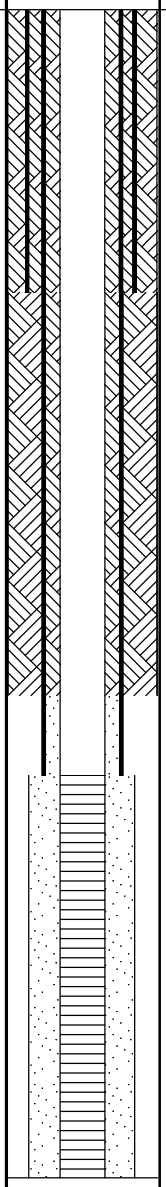
MONITORING WELL LOG

BROWN AND CALDWELL	Project Name: LCP-ISP Drilling Project Number: 134216 Project Location: Linden, NJ	Permit Number: 2600085639	Well No. **MW-27D** Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Well	PID/MVA Readings (ppm)	Remarks
35											Bedrock encountered. 10" steel casing installed at 37'.
40											
45											
50											6" steel casing installed at 50'.
55											
60											End of boring.



BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: DSP-1

Project: *LCP Superfund Site*
Client: *ISP – ESI*
Project No.: *21405.102*
Start Date: *11/19/01*
Finish Date: *11/29/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *HSA (casing) / Mud rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*4"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

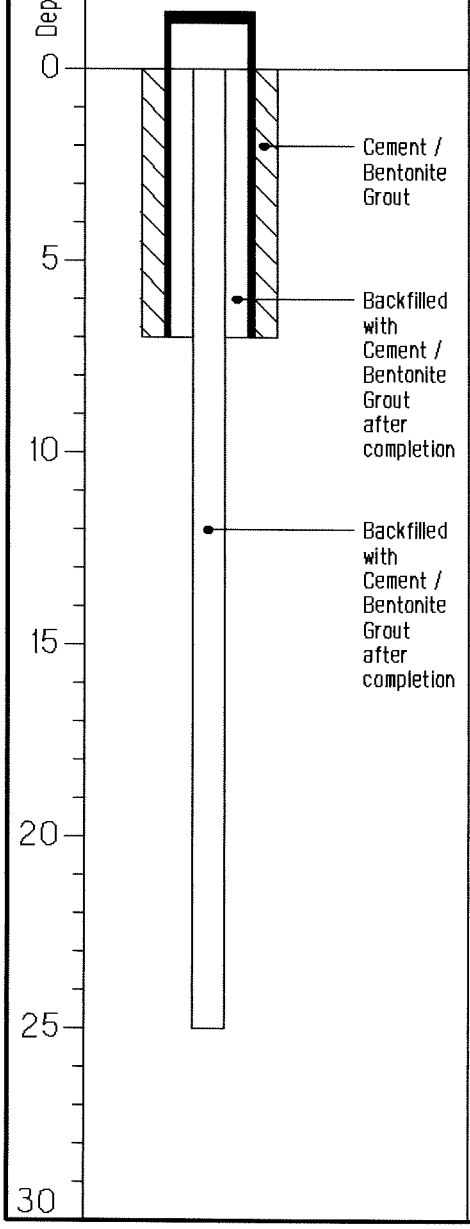
Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

SURVEY DATA

DATUM: NA
Grade: *8.05*
TWC: *NA*
TPC: *NA*
North: *646406.86*
East: *571994.96*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

soil / rock

Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)
S-1	5-5-8-9	1.5	CL	NA
S-2	9-5-6-7	1	CL	NA
S-3	6-5-4-7	1	CL	NA
S-4	4-2-1-1	1	GP/PT	NA
S-5	10-10-3-3	1	NA	NA
S-6	1-1-1-2	1.5	PT	NA
S-7	1-1-2-3	.3	CL	NA
S-8	4-5-9-12	1	ML	NA
S-9	1-17-19-50/5	1.5	ML	NA

VISUAL CLASSIFICATION

FILL
@ 0' Black fmc SAND, little f Gravel
@ 1.5' Red CLAY, some to no shale fragments
Black fm GRAVEL — 6.5

TIDAL MARSH DEPOSIT (Peat)
@ 6.5 PEAT
(Organic silt) — 11
@ 10' Medium brown CLAY AND PEAT

GLACIAL TILL
Reddish brown CLAY, some f Sand, little fm Gravel
Reddish brown CLAY & SILT, some minus to little plus fm Gravel — 19.4

PASSAIC FORMATION
Weathered Shale
End of boring @ 20'

Note: Subsequent drilling of adjacent bedrock well MW-14D revealed the depth to the Passaic formation at 37.0 ft.

REMARKS

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **DC-B12**

Project: *LCP Superfund Site*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *10/3/01*
Finish Date: *11/30/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *Handex / ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *HSA (casing) / Mud rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*2"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

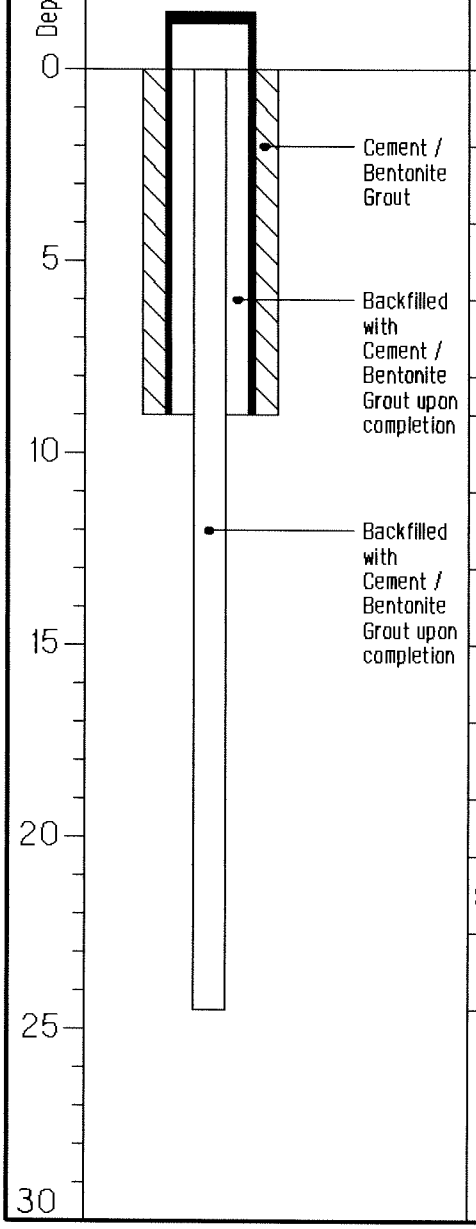
Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

SURVEY DATA

DATUM: NA
Grade: *7.21*
TWC: *NA*
TPC: *NA*
North: *646152.05*
East: *572422.12*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

Samp. No. (soil)	Blows/ 6 in.	Rec. (ft.)	USCS	HNU (ppm)
S-1	32-28	.5	GW	NA
S-2	6-34-30	.2	GW	NA
S-3	2-5-4-37	0	NA	NA
S-4	10-7-2-1	1	GW/PT	NA
S-5	9-8-2-1	1	GW/PT	NA
S-6	1-1-1-1	1.7	OL	NA
S-7	wt. of h.	2	OL	NA
S-8	4-8-8-13	2	OL	NA
S-9	10-8-12-13	1	SC	NA
S-10	15-6-6-6	.8	CL	NA
S-11	8-8-5-11	1.5	CL	NA

Run No. (rock)	Hydraul. Cond. cm/sec	Rec. (ft.)	RQD

VISUAL CLASSIFICATION

FILL
@ 0' Medium brown fmc GRAVEL, some to no Clay, little to no mfc Sand

7

TIDAL MARSH DEPOSIT (Peat)
@ 7' PEAT

(Organic silt)
@ 11' Dk gray CLAY, some to little Peat, some to no f Sand

18

GLACIAL TILL
@ 16' Reddish brown f SAND, some- Silt
@ 17' Reddish brown fm SAND AND CLAY, little f Gravel
@ 20.5' Reddish brown CLAY to Silty CLAY, trace to little f Sand, trace to no fm Gravel

End boring @ 24.5'

REMARKS

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: 230-B1

Project: *LCP Superfund Site*
Client: *LCP*
Project No.: *21405.102*
Start Date: *10/2/01*
Finish Date: *11/29/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *Handex / ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *HSA (casing) / Mud rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*4"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

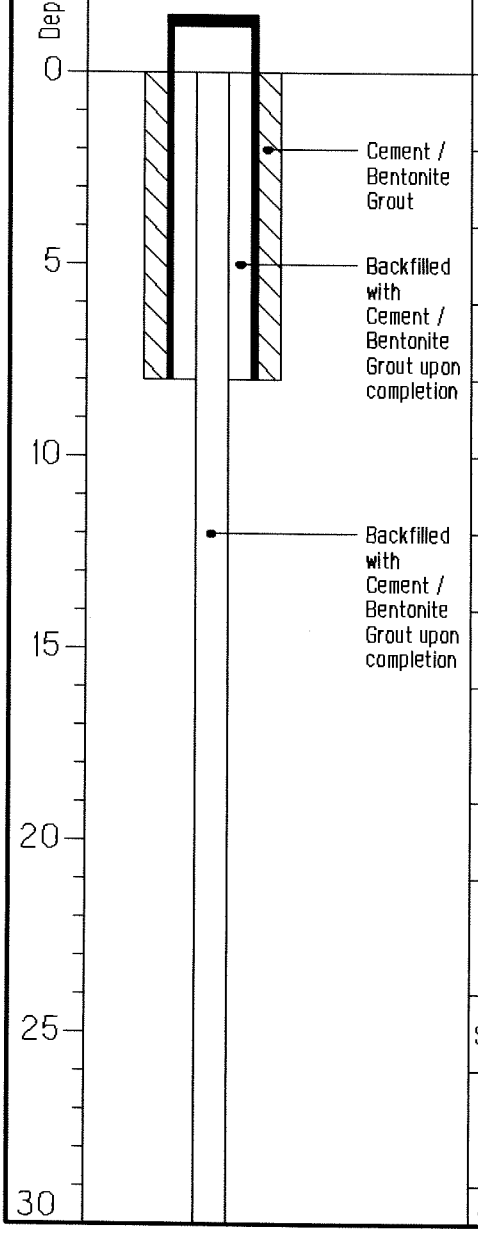
Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

SURVEY DATA

DATUM: NA
Grade: *7.64*
TWC: *NA*
TPC: *NA*
North: *646620.13*
East: *572149.43*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

Samp. No. (soil) / Run No. (rock)	Blows/6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)
S-1	NA	.5	SC	NA
S-2	NA	.5	SW	NA
S-3	2-5-2-5	.8	SC	NA
S-4	1-1-2-2	1.5	PT	NA
S-5	wt-1-1-1	2	PT	NA
S-6	wt-1-1-1	1	PT	NA
S-7	1-2-3-2	1	SM	NA
S-8	2-4-8-8	1	SM	NA
S-9	5-8-12-9	1.5	CL	NA
S-10	4-4-8-9	1.5	CL	NA
S-11	5-6-7-8	1.5	CL	NA

VISUAL CLASSIFICATION

FILL
@ 0' Medium brown fm SAND, no to AND CLay, little to no Organics

6

TIDAL MARSH DEPOSIT (Peat)
@ 6' PEAT

(organic silt)
@ 10.9' Gray CLAY & SILT

12

GLACIAL FLUVIAL DEPOSIT
@ 12' Gray fm SAND, little Silt

14.5

GLACIAL TILL
@ 14.5' Reddish brown CLAY & SILT, little fm Gravel, trace m Sand

@ 29' Reddish brown Silty CLAY

REMARKS

Samples from 0 - 4' were collected using direct-push rig.

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: 230-B1

Project: *LCP Superfund Site*

Client: *LCP*

Project No.: *21405.102*

Start Date: *10/2/01*

Finish Date: *11/29/01*

(CONTINUATION)

Depth (feet)	WELL CONSTRUCTION	soil / rock	SAMPLE DATA: Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
30			S-11	5-6-7-8	1.5	CL	NA		
35			S-12	4-5-50/3	1.5	CL	NA	35 / 38	
40									
45									
50									
55									
60									
65									
70									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **231-B1**

Project: *LCP Superfund Site*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *11/19/01*
Finish Date: *11/27/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *ADT Diamond*
Equipment: *Auger Rig (CME 75)*
Method: *HSA (casing) / Mud Rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*4"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

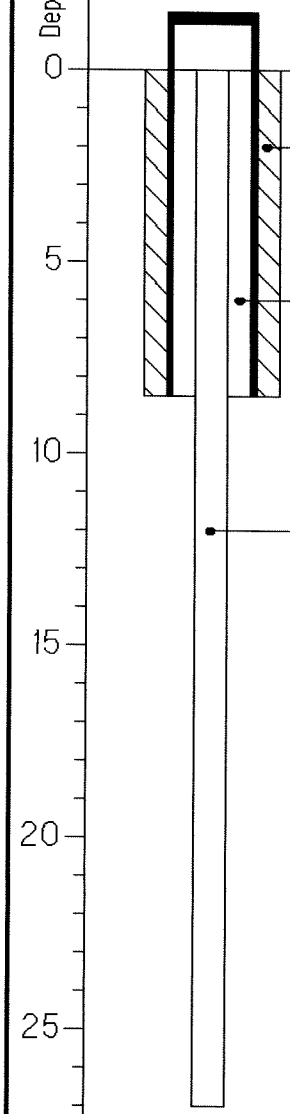
SURVEY DATA

DATUM: NA

Grade: *8.14*
TWC: *NA*
TPC: *NA*
North: *646437.01*
East: *572458.32*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

soil / rock

Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)
S-1	4-4-5-5	.3	SW	NA
S-2	4-2-1-2	.5	CL	NA
S-3	1-1-1-2	1	CL	NA
S-4	3-5-2-1	1.5	CL/PT	NA
S-5	4-4-11-13	1	PT	NA
S-6	1-1-1-1	1	OL/PT	NA
S-7	1-1-1-2	.3	ML	NA
S-8	1-2-3-2	1.5	SM	NA
S-9	9-11-12-15	1.5	PT	NA
S-10	5-6-7-7	1	SM	NA
S-12	4-5-11-15	.2	GC	NA
S-13	13-10-11-10	1.5	ML	NA

VISUAL CLASSIFICATION

FILL
@ 0' Medium brown fmc SAND, trace Organics
@ 2' Medium brown CLAY, little to AND mc Sand, little to no m Gravel
@ 6.9' Black wood debris coated in a petroleum product — 7
TIDAL MARSH DEPOSIT (Peat)
@ 7' PEAT
(Organic silt)
@ 10.5' Dk Gray organic rich CLAY, occasional peat, H2S odor
@ 12.5' Dk. Brown SILT, spongy texture, some f Sand, H2S odor
@ 14.5' Medium brown f SAND, some Silt, traces of Organic material
@ 15.5' Dk. Gray fm SAND — 16.5
GLACIAL FLUVIAL DEPOSIT
@ 16.5' Gray to grayish brown fm SAND, some to AND Silt, uniform to mottled
GLACIAL TILL
@ 17.7' Reddish brown some to AND Silt, some to AND fm Sand, trace to little fm Gravel
@ 23' Reddish brown c Gravel, some Clay
@ 25' Reddish brown SILT & CLAY, little fm Gravel — 27
End boring @ 27'

REMARKS

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **BT-B5**

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *10/2/01*
Finish Date: *11/28/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *Handex / ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *HSA (casing) Mud rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*4"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

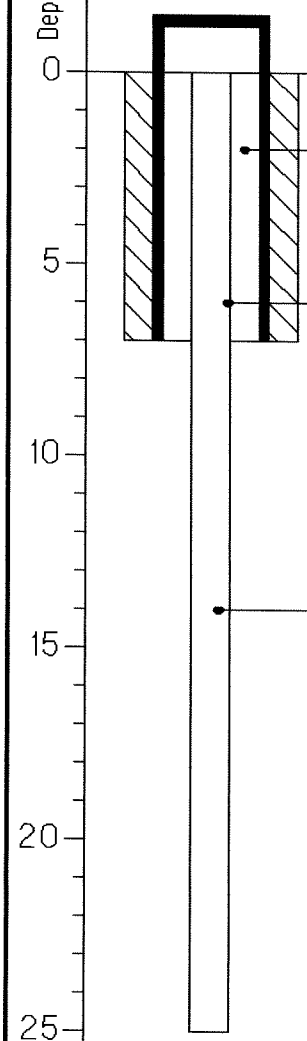
Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

SURVEY DATA

DATUM: NA
Grade: *7.80*
TWC: *NA*
TPC: *NA*
North: *646700.81*
East: *572430.73*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

soil / rock

Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)
S-1	8-9-5-3	1	GC	NA
S-2	5-7-7-12	1.5	CL	NA
S-3	1-2-5-3	2	CL/PT	NA
S-4	wt. of h.	1	PT	NA
S-5	wt. of h.	2	PT	NA
S-6	wt. of h.	.5	CL	NA
S-7	wt. of h.	1.5	OL/PT	NA
S-8	2-6-3-3	2	CL	NA
S-9	4-4-5-6	1.5	SM	NA
S-10	3-8-8-10	1	SW	NA
S-11	6-10-10-10	1	ML	NA
S-12	5-9-10-10	1	ML	NA

VISUAL CLASSIFICATION

FILL
@ 0' Dk brown fm GRAVEL AND CLAY, little fmc Sand, trace organics
@ 2.5' Red CLAY, little f Gravel
5.5

TIDAL MARSH DEPOSIT (Peat)
@ 5.5' PEAT, H2S odor

(Organic silt)
@ 10.5' Gray to brown CLAY, some organics, H2S odor
@ 13' Dk Gray CLAY, some organics, little to no mc Gravel, H2S odor
18

GLACIAL FLUVIAL DEPOSIT
@ 18' Medium Gray to brown fm SAND, little Silt, homogenous to mottled
19

GLACIAL TILL
@ 19' Reddish brown f SAND, little f Gravel, trace Silt
@ 21' Reddish brown SILT & CLAY, little plus fm Gravel, little f Sand
@ 23' Reddish brown SILT and f SAND, little fm Gravel
25

End of boring @ 25'

REMARKS

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: HF-B3

Project: *LCP Superfund Site*
Client: *ISP - ESI*
Project No.: *21405.102*
Start Date: *10/02/01*
Finish Date: *11/28/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *Handex / ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *HSA (casing) / Mud rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*4"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

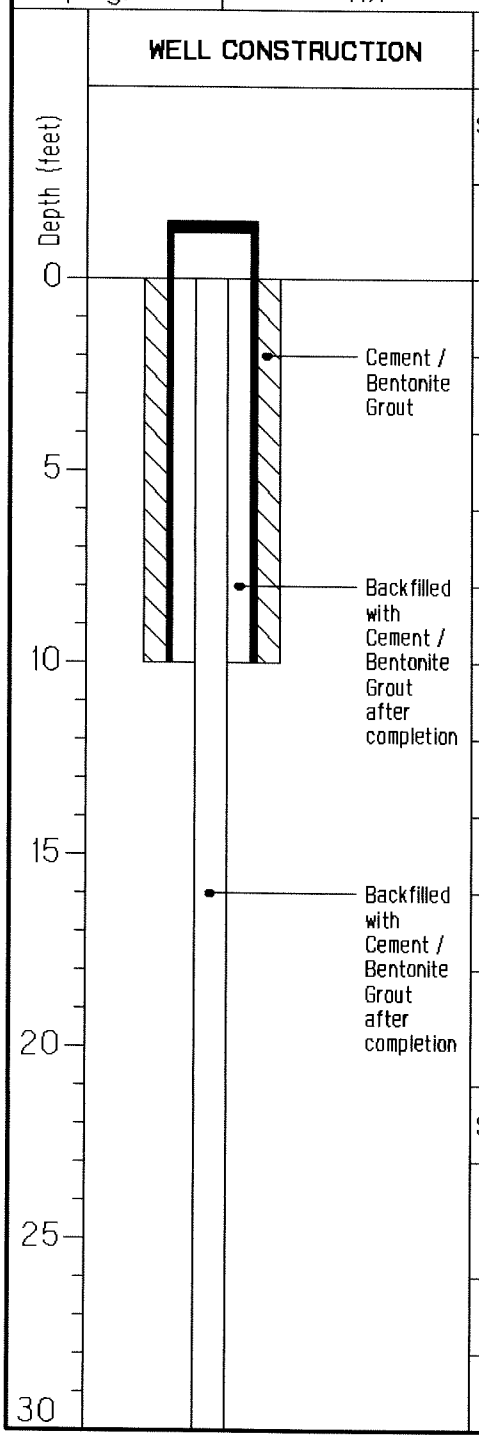
Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

SURVEY DATA

DATUM: NA
Grade: *7.59*
TWC: *NA*
TPC: *NA*
North: *646916.76*
East: *571629.19*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

Samp. No. (soil) / Run No. (rock)	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)
S-1	4-6-2-8	1	CL	NA
S-2	11-9-10-10	1.5	CL	NA
S-3	10-6-4-5	1	CL	NA
S-4	5-2-2-2	1	CL	NA
S-5	2-1-1-1	2	CL/PT	NA
S-6	1-1-1-1	2	PT	NA
S-7	1-2-1-1	2	PT	NA
S-8	1-1-2-5	1	CL	NA
S-9	3-5-7-8	1	ML	NA
S-10	3-5-8-10	1.5	ML	NA
S-11	3-5-7-8	1	ML	NA

VISUAL CLASSIFICATION

FILL
@ 0' Medium brown CLAY, some fmc Sand, little mc Gravel
@ 2' Red to reddish brown CLAY some to no m Gravel, little to no fm Sand

8.5

TIDAL MARSH DEPOSIT (Peat)
@ 8.5' PEAT
(Organic silt)
@ 10.5' Dk. Gray CLAY AND PEAT

13.5

GLACIAL FLUVIAL DEPOSIT
@ 13.5' Dk gray to brown CLAY, little to no Gravel, uniform to mottled

14.5

GLACIAL TILL
@ 14.5' Red brown CLAY & SILT, some to little plus fm Gravel, little to no f Sand

REMARKS

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: HF-B3

Project: *LCP Superfund Site*

Client: *ISP - ESI*

Project No.: *21405.102*

Start Date: *10/02/01*

Finish Date: *11/28/01*

(CONTINUATION)

Depth (feet)	WELL CONSTRUCTION	soil / rock	SAMPLE DATA: Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)	VISUAL CLASSIFICATION	REMARKS
30								@ 31' Reddish brown fm GRAVEL AND CLAY	
			S-12	6-9-15-44	1	GC	NA		
								33 PASSAIC FORMATION (Weathered Rock)	Top of Weathered rock based on driller
35									
								@ 38' Red brown fm GRAVEL AND CLAY, some pieces of shale 38.2	
			S-13	50/2.5	.3	GC	NA	End boring @ 38.2	
40									
45									
50									
55									
60									
65									
70									

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: **MW-B16**

Project: *LCP Superfund Site, Linden, NJ*
Client: *ISP - ESI*

Project No.: *21405.102*

Start Date: *10/03/01*
Finish Date: *11/26/01*

DRILLING DATA

Inspector: *JLP*
Contractor: *Handex / ADT Diamond*
Equipment: *Auger rig (CME 75)*
Method: *HSA (casing) / Mud rotary (boring)*

SAMPLING METHODS

	Sampler	Tube	Core
Type:	*Split Spoon*	*NA*	*NA*
Diameter:	*2"*	*NA*	*NA*
Other:	*NA*	*NA*	*NA*

WELL CONSTRUCTION

	Riser	Screen
Material:	*PVC*	*NA*
Diameter (ID):	*4"*	*NA*
Coupling:	*NA*	*NA*

WELL DEVELOPMENT

Method: *NA*
Duration: *NA*
Gals. Purged: *NA*
Slug Test: *NA* (cm/sec)

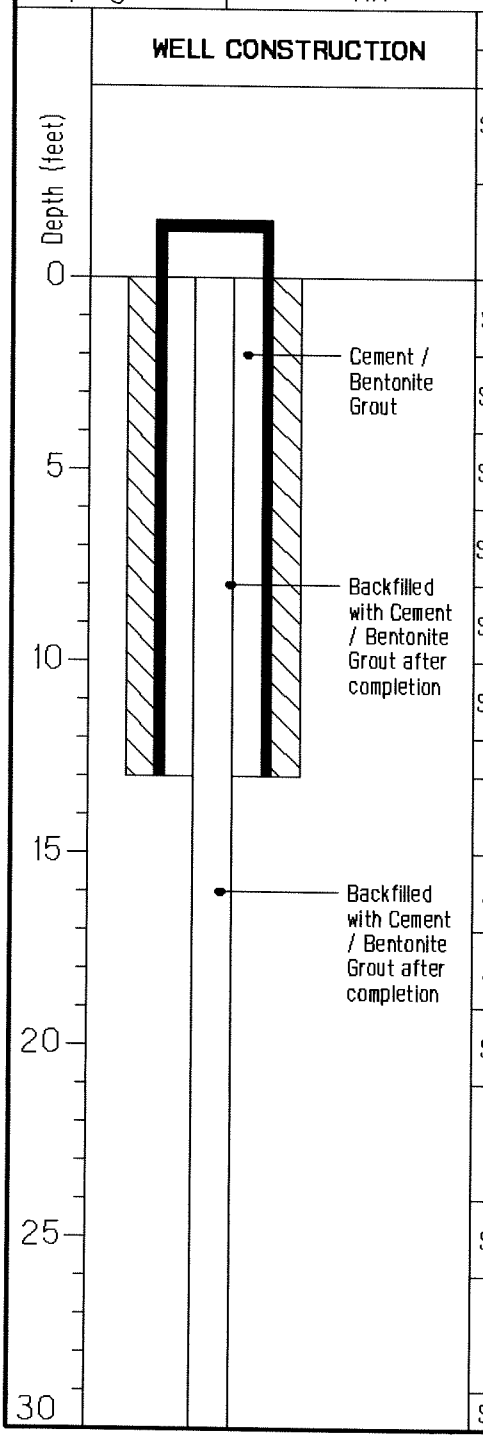
SURVEY DATA

DATUM: NA

Grade: *6.35*
TWC: *NA*
TPC: *NA*
North: *647001.29*
East: *572297.59*

Geophysical Log: ☐ yes ☒ no
Comments:

WELL CONSTRUCTION



SAMPLE DATA

Samp. No. (soil) / Run No. (rock)	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.)	USCS / RQD	HNU (ppm)
S-1A	50/5	.3	SW	
S-2A	26-38-50	0	NA	
S-3A	5-7-7-6	1	GW	
S-4A	2-3-4-4	1.2	GW	
S-5A	2-4-4-3	1	GW	
S-6A	2-2-1-1	.7	GW	
S-1	1-1-1-2	1.5	OL	
S-2	10-10-11-14	2	OL/PT	
S-3	9-9-10-12	2	SW	
S-4	14-15-14-50/4	2	SM	
S-5	2-4-6-9	1.5	ML	
S-6	3-5-7-9	1.5	ML	

VISUAL CLASSIFICATION

FILL
@ 0' Brown fmc SAND, little f Gravel
@ 4' Black f GRAVEL, some fmc Sand, saturated

11

TIDAL MARSH DEPOSIT (Peat)
@ 11' PEAT

(Organic silt)
Lt grayish brown Clayey SILT, strong H2S odor, saturated
@ 16' Lt gray fm SAND, trace to AND Silt, trace to no f Gravel, H2S odor

18

GLACIAL FLUVIAL DEPOSIT
@ 18' Reddish brown SILT, trace f Sand, slightly stratified
@ 19 ft Dk Gray fm SAND, trace Silt

20.5

GLACIAL TILL
@ 20.5' Reddish brown f SAND AND SILT, little f Gravel, little mc Sand
@24' Red brown CLAY & SILT, little to no f Gravel, trace fmc Sand

REMARKS

BROWN AND CALDWELL

Subsurface Boring Log

Well Name/Location: MW-B16

Project: *LCP Superfund Site, Linden, NJ*

Client: *ISP - ESI*

Project No.: *21405.102*

Start Date: *10/03/01*

Finish Date: *11/26/01*

(CONTINUATION)

Depth (feet)	WELL CONSTRUCTION	soil / rock	SAMPLE DATA				VISUAL CLASSIFICATION	REMARKS
		Samp. No. / Run No.	Blows/ 6 in. / Hydraul. Cond. cm/sec	Rec. (ft.) / Rec. (ft.)	USCS / RQD	HNU (ppm)		
30		S-6	3-5-7-9	1.5	ML			
35		S-7	3-5-7-8	1.5	ML		@34' Red brown SILT & CLAY, trace fm Sand, little fm Gravel	
							38 PASSAIC FORMAITON	Top of Weathered rock according to the driller
40		S-8	50/3	.3	NA		@39' Red brown weathered shale 39.5 End of boring @ 39.5	
45								
50								
55								
60								
65								
70								

BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **ADS-101** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	8.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.1 ft.	Easting: 571720.5 ft. Northing: 646904.2 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		ML CL	**FILL** Moist, Blk-brwn SILT & CLAY, some (-) cmf Sand. @ 0.3 Brwn-gray SILT & CLAY, little (+) cmf Sand, trace (-) cmf Gravel.	NA	1					.3- .032	Collected ADS-101-0-1 Collected ADS-101-1-3
5		ML CL	Wet, Red-brown. Same as above.	NA	2					0.1- .028	
		SW	Tan-orange cmf SAND.								
		ML	**TIDAL MARSH DEPOSITS** Black Clayey SILT, little (+) Organics, wet.								End of Boring @ 8.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **ADS-102** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	8.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.9 ft.	Easting: 571702.8 ft. Northing: 646879.3 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		CL ML	**FILL** Blk Silty CLAY, some (-) cmf Sand, Dry. @ 0.4 Red-brwn SILT & CLAY, little (-) cmf Sand, trace (+) fmc Gravel.		1					0.0- .007	Collected ADS-102-0-1.5
5		CL ML	Wet, as above.		2					1.4- .013	
		ML	**TIDAL MARSH DEPOSITS** Black Clayey SILT, some (-) Organics.								Collected ADS-102-7-8

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LB-101** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	11.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/6/06 - 12/6/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: --	Easting: -- Northing: -- TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Moist, Tan-brwn cmf SAND.		1					NR	Sampled LB-101-0-1
		SW	Blk cmf SAND.								
		SP	Moist, as above.		2					NR	
5											
		SP	Wet, Blk cmf SAND.		3					NR	
		SW	Blk cmf SAND, little (-) Gravel.								
10		CL	**TIDAL MARSH DEPOSITS** Gray cm CLAY, some (-) Organics.								End of boring @ 11.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LB-102** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	11.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/6/06 - 12/6/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: --	Easting: -- Northing: -- TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Brwn cmf Sand, moist. Concrete fragments.		1					NR	Sampled LB-102-0-1
		SP	Blk cmf SAND, Wet.		2					NR	Sampled LB-102-1-3
5											
					3					NR	
10		CL	**TIDAL MARSH DEPOSITS** Gray Silty CLAY, some (-) Organics.								End of boring @ 11.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LB-103** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	11.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/6/06 - 12/6/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: --	Easting: -- Northing: -- TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Concrete. Tan-Brwn cmf SAND, moist @ 1.1 Blk cmf SAND.	NA	1					NR	Sampled LB-103-0-1
		SP	Wet, same as above.	NA	2					NR	
5		ML CL SP	Red-brwn SILT & CLAY, some (-) fmc Gravel. Wet, Blk cmf SAND.								
		SP	Wet, same as above.	NA	3					NR	
10		CL	**TIDAL MARSH DEPOSITS** Blk Silty CLAY, some (-) Organics.								End of boring @ 11.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-101** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.1 ft.	Easting: 571462.2 ft. Northing: 646731.4 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		GP	**FILL** Moist, Blk brwn cmf GRAVEL, some (-) cmf Sand, little (+) Silt & Clay. @ 1.1' Red cmf SAND, some (-) Silt & Clay, little (-) fm Gravel.		1					0.1-.000	
5					2					NR	
		SP GP	Blk cmf SAND, little (-) fm Gravel, Wet @ 6.7'.								Sample LHP-101-5-8
					3					0.0-.000	
10		CL ML	**TIDAL MARSH DEPOSITS** Brwn SILT & CLAY, some (+) Organics.								

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-102** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	8.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.3 ft.	Easting: 571555.9 ft. Northing: 646797.2 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP GP	**FILL** Moist, cmf GRAVEL, little (+) Silty Clay. @ 0.3 Blk cmf SAND, trace (+) f Gravel. @ 1.4 Red brwn Silty CLAY, some (-) cmf Sand.		1					0.0- .007	Sampled LHP-102-0-1
5					2					0.0- .008	
		SP	Blk cmf SAND, little (-) Silty Clay.								Sampled LHP-102-7-9
					3					1.4- .013	
		CL	**TIDAL MARSH DEPOSITS** Gray-blk Silty CLAY, some (-) Organics.								
											End of boring @ 12.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-103** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.4 ft.	Easting: 571700.9 ft. Northing: 646725.9 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL**		1					0.5-	Sampled LHP-103-0-1
		GP	Black cmf GRAVEL and to some (-) cmf							.012	Sampled LHP-103-1-3
		SP	Sand AND to no Silt & Clay, dry.								
		GP	White cmf SAND, some (-) mf Gravel. @								
		SP	1.7 Black cmf SAND. @ 2.1 Red-brown								
		GP	Clayey SILT, some (-) cmf Sand. Concrete, brick and wood.								
			Same as above, wet at 4.0.		2					NR	
5											
		SP	Black cmf SAND, little (+) Silt & Clay.		3					NR	
		CL	**TIDAL MARSH DEPOSITS**								
10			Gray black Silty CLAY, some (-) Organics.								
											End of boring @ 12.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-104** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.8 ft.	Easting: 571804.7 ft. Northing: 646690.7 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		GP	**FILL** Blk cmf GRAVEL, asphalt. @ 0.4 Tan cmf SAND.		1					0.0-.013	Sampled LHP-104-0-1
5		GP SP	Blk cmf SAND, little (-) Gravel.		2					0.0-.579	Sampled LHP-104-7-9
		GP SP	Same as above, wet.		3					0.0-.009	
10		CL	**TIDAL MARSH DEPOSITS** Gray Silty CLAY, some (-) Organics. @ 11.0 Blk fmc SAND, some (-) Silty Clay, little (-) organics.								End of boring @ 12.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-105** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	8.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.2 ft.	Easting: 571851.9 ft. Northing: 646670.0 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Brwn cmf SAND, little (+) cmf Gravel, dry.		1					NR	Sampled LHP-105-0-1 Sampled LHP-105-1-3
5		SP	Blk cmf SAND, wet.		2					0.2/.012	
		CL	**TIDAL MARSH DEPOSITS** Gray-blk Silty CLAY, some (-) Organics.								End of boring @ 8.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-106** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.5 ft.	Easting: 571869.1 ft. Northing: 646636.1 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log (Sample Int, Recovery, Lithology, Backfill)	PID/MVA Readings (ppm)	Remarks
		ML CL SP	**FILL** Blk-brwn SILT & CLAY, some (-) cmf Sand, little (-) fm Gravel. Blk cmf SAND.	NA	1		0.7- .000	Sampled LHP-106-0-1 Sampled LHP-106-1-3
5				NA	2		0.0- .000	
				NA	3		0.0- .000	
10		CL ML	**TIDAL MARSH DEPOSITS** Gray-blk Silty CLAY, some (-) Organics. @ 11.2' Gray Silty CLAY.					

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-107** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	8.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.8 ft.	Easting: 571897.3 ft. Northing: 646614.1 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Blk-gray cmf SAND, trace (+) Silt & Clay, dry. Cinders.	NA	1					NR	Sampled LHP-107-0-1
5		SP	Same as above, wet.	NA	2					0.1-.007	Sampled LHP-107-5-7
		CL	**TIDAL MARSH DEPOSITS** Blk-gray Silty CLAY, some Organics.								End of boring @ 8.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-108** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.0 ft.	Easting: 571689.7 ft. Northing: 646649.7 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP GP SW	**FILL** Blk cmf GRAVEL, asphalt. @ 0.5 Brwn cmf SAND, some (-) cmf Gravel. Wet, Blk cmf SAND. @ 2.2 Red-brwn Silty CLAY, some (+) fmc Sand.	NA	1					NR	Sampled LHP-108-0-1
5		SP	Blk cmf SAND, little (+) Silt & Clay.	NA	2					NR	
10		ML CL	**TIDAL MARSH DEPOSITS** Gray SILT & CLAY, some (+) Organics.	NA	3					NR	
											End of boring @ 12.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-109** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	2"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Continuous Core	Development Method:
12/4/06 - 12/4/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.6 ft.	Easting: 571810.0 ft. Northing: 646593.0 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SW SM SM ML	**FILL** cmf SAND, some (-) Silt & Clay, little (-) fm Gravel. @ 0.4 Blk-gray cmf GRAVEL, some (-) cmf Sand. Red-brwn Silty CLAY, little (+) fm Sand. Wet at 6.2.		1					NR	Sampled LHP-109-0-1
5					2					NR	
		SW SM	Blk, wet, cmf SAND, some (-) Silt & Clay.		3					NR	
10		CL ML	**TIDAL MARSH DEPOSITS** Gray Silty CLAY, some (-) Organics.								Sampled LHP-109-7-9 End of boring @ 12.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-124** Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
JMB/Allendale	SDM	8"		NA"	38.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/27/06 - 10/31/06	Advanced Drilling	Hammer Type: Manual	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.4 ft.	Easting: 571706.3 ft. Northing: 646701.2 ft. TOC Elev: NA ft.
C. Corner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log (Sample Int, Recovery, Lithology, Backfill)	PID/MVA Readings (ppm)	Remarks
		ASP	**ASPHALT**					
		ML CL	**FILL** Red SILT & CLAY, some (+) cfm Gravel and Sand. @ .7' Gray-tan cfm GRAVEL and cfm SAND, wet.	8-100/5	1		.4-0	Sampled LHP-124-.5-2
		ML CL	Red SILT & CLAY,some (-) to little (-) cfm Sand, dry. wet at 6'.	8-8-6-8	2		.4-.005	Sampled LHP-124-2-4
5				5-10-7-5	3		.5-0	
		FILL	Red SILT & CLAY, some (-) cfm Gravel and cfm Sand, wet.	10-1-5-2	4		.5-0	
		CL ML	**TIDAL MARSH DEPOSITS** Blk-green Silty CLAY, some (+) gray-yellow Organic material, trace (-) f Sand, wet.	1-1-1-1	5		0	
10				1/18-1	6		0-.011	4-inch casing grouted in place. Sampled LHP-124-10-12.
				1-2-1-4	7		0-0	
		CL ML	**GLACIAL TILL** Red-brwn-blk Silty CLAY, some (+) fm Sand, wet.	3-6-7-8	8		0-0	
15		ML CL	Red-brwn-black SILT & CLAY, some (+) mf Sand, some to little cfm Gravel, wet.	2-4-5-6	9		0-0	
				5-6-6-6	10		0-0	
20				6-6-9-13	11		0-0	
		ML CL	Red-brwn SILT & CLAY, some (+) cmf Gravel, some (-) mf Sand, wet.	7-12-8-12	12		0-0	
25		ML CL	Red-brwn SILT & CLAY, little (-) cmf Sand, trace (-) mf Gravel, wet.	13-15-16-22	13		0-0	
		CL	Red-brwn Silty CLAY, little (+) mf Sand, trace (-) mf Gravel. Displays relic bedding.	8-10-12-13	14		0-0	
		ML CL	Red-Brwn Silty CLAY, trace (-) mf Sand, wet. @ 28.7' Red brwn Silty CLAY, little (-) mf Sand, trace (-) mf Gravel, compacted, displaying relic bedding.	7-10-1-13	15		0-0	Sampled LHP-124-28-30
30		CL	Red-brwn-gray Silty CLAY, some (-) to little	14-27-16-15	16		0-0	

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. LHP-124 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	PID/MVA Readings (ppm)	Remarks
			(+) mf Gravel, trace (-) cmf Sand, wet.								
				14-52-27-17	17					0-0	
		CL	Red-brwn Silty CLAY, some (+) mf Gravel, trace (-) mf Sand, wet.	15-16-38-55	18					0-0	
35											
		ML CL	Red-Brwn SILT & CLAY, some (+) cmf Gravel, little (+) Sand, wet.	25-100/4	19					0-0	
			PAISSIC FORMATION Red-brwn Siltstone.								End of Boring @ 38.0'

BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-125** Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
JMB/Allendale	SDM	8"		NA"	36.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/27/06 - 11/1/06	Advanced Drilling	Hammer Type: Manual	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.0 ft.	Easting: 571751.9 ft. Northing: 646629.1 ft. TOC Elev: NA ft.
C. Corner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		ASP	**ASPHALT**								
		GW SW	**FILL** Brwn-Orange cfm GRAVEL and cfm SAND, some (+) Silt & Clay, wet.	18-32-20	1					.4-.021	Sampled LHP-125-.5-2
		GW SW ML CL	Brwn cfm GRAVEL and cfm SAND, some (+) Silt & Clay. Grading to Red SILT & CLAY, wet.	12-4-8-1	2					.4-.005	
5				6-5-4-3	3					.5-.041	Sampled LHP-125-4-6
		GW SW	Blk cfm GRAVEL and cfm SAND, some (+) Silt & Clay.	6-5-5-3	4					0-.031	
				2-1-1-1	5					.5-0	
		CL	**TIDAL MARSH DEPOSITS** Blk green Silty CLAY, Some (+) Organics, wet.								
10		CL ML	Blk Silty CLAY, some (+) Organics. Peat. @ 11.6 Blk gray Silty CLAY, wet.	3-2-2-5	6					0-.014	Sampled LHP-10.5-12
		ML CL	**GLACIAL TILL** Red-brwn SILT & CLAY, little (+) fmc Sand, trace (+) fm Gravel, wet.	8-13-15-22	7					0-.006	Sampled LHP-12-14 4-inch casing grouted in place.
15		ML	Red-brwn Clayey SILT, little (+) to some (-) fmc Sand, trace (+) to little (-) fmc Gravel, wet.	13-16-18-21	8					.7-.005	
				8-12-26-22	9					.1-0	
				18-22-21-23	10					0-0	
20		CL ML	Red-brwn CLAY & SILT, little (+) fmc Sand, trace (+) fmc Gravel, wet.	8-12-17-35	11					.6-0	
				26-22-24-35	12					1.7-0	
25		CL	Red-brwn Silty CLAY, little (+/-) fm Sand, trace (-) c Gravel, wet.	26-34-25-33	13					NR	
				12-16-18-17	14					.6-0	
		CL ML	Red-brwn Clayey SILT. Apparent relic bedding, wet.	8-10-12-10	15					NR	
30		ML CL	Red brwn blk cmf SAND. @ 29.55' Red-brwn SILT & CLAY, little (+) fmc	7-14-21-27	16					NR	

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. LHP-125 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	PID/MVA Readings (ppm)	Remarks
		ML CL	Sand, trace (+) fm Gravel, wet. Red-brwn, SILT & CLAY, some (-) cmf Sand, little fmc Gravel, wet.	20-23-30-38	17					NR	
				100/.5	18					NR	
35		BR	**PASSAIC FORMATION** Red-brwn Siltstone, weathered BR, bedding evident.								End of boring @ 36.0'

BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-126** Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	8"		NA"	38.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/26/06 - 11/1/06	Advanced Drilling	Hammer Type: Manual	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.5 ft.	Easting: 571856.9 ft. Northing: 646622.4 ft. TOC Elev: NA ft.
R. Empson	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
			CONCRETE								
		GP GP	**FILL** Gray cmf GRAVEL and cmf SAND, little (-) Silt, wet. Brwn blk mf GRAVEL and cmf SAND, some (-) Silt & Clay. Chunks of brick, wet.	2-2-2-4	1					0-.001	Sampled LHP-126-2-4
				2-5-4-3	2					0-0	
5				4-4-3-4	3					0-0	
				2-2-2-2	4					0-0	Sampled LHP-126-8-10
10		CL GP GC CL ML CL	**TIDAL MARSH DEPOSIT** Blk-green Silty CLAY, some (+) Organics, wet. Blk cmf GRAVEL and cmf SAND, some (+) Silt & Clay, little (+) Organics, wet. Blk-gray-green Silty CLAY, some (+) mf Sand, little (+) Organics, wet.	1-1-1-4	5					.3-.061	Odor
				1-4-5-6	6					1.1-.013	Odor
			GLACIAL TILL								
15		ML CL	Red-gray Silty CLAY, some (+) mf Sand, wet. Red-brwn Silty CLAY, little (-) cmf Gravel, trace (+) mf Sand, wet.	4-3-8-7	7					2.1-.005	
				13-18-24-22	8					.3-0	
		ML CL	Red-brwn SILT & CLAY, little (+) cmf Gravel, trace (+) mf Sand, wet.	13-12-18-13	9					0-0	
20				16-16-14-13	10					0-0	Evidence of basalt
				17-14-18-18	11					.1-0	
25				18-22-48-16	12					2.2-0	
				6-5-7-11	13					2.1-0	
				11-22-15-17	14					.4-0	
30		ML	Red-brwn Silty CLAY, trace (+) mf Gravel,	7-6-6-9	15					3.0-0	

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. LHP-126 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	PID/MVA Readings (ppm)	Remarks
		CL	wet.	7-7-6-8	16					.2-0	
35		ML CL	Red-brwn SILT & CLAY, little (+) cmf Gravel. Weathered rock in shoe, evidence of bedding.	5-11-13-14	17					.1-0	
		BR	**BEDROCK** Red-brwn Siltstone, bedding evident, (weathered bedrock).	27-34-84-100/5	18					0-0	
											End of boring @ 38.0'

BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-127** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	8"		NA"	12.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
12/6/06 - 12/6/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.5 ft.	Easting: 571843.0 ft. Northing: 646699.0 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Moist, Blk fmc SAND, little (+) fmc Gravel, trace (+) Silt & Clay, wet @ 3.0.	NA	1					NR	Sampled LHP-127-0-1
											Sampled LHP-127-3-5
5				NA	2					NR	
		SP	Blk cmf SAND, some (-) fm Gravel, trace (+) Clayey Silt, wet.								
				NA	3					NR	
10		CL	**TIDAL MARSH DEPOSITS** Gray-blk Silty CLAY, some (-) Organics.								
											End of boring @ 12.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LHP-128** Page 1 of 1

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	8"		NA"	8.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
12/6/06 - 12/6/06	TPI	Hammer Type: NA	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 7.5 ft.	Easting: 571815.0 ft. Northing: 646716.0 ft. TOC Elev: NA ft.
TPI	Geoprobe	Geoprobe		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP	**FILL** Damp, Blk cmf SAND, some (-) Clayey Silt, wet @ 2.6'	NA	1					NR	Sampled LHP-128-0-1
5				NA	2					NR	
		CL	**TIDAL MARSH DEPOSIT** Gray-blk Silty CLAY, some (-) Organics.								Sampled LHP-128-7-8 End of boring @ 8.0'

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **LP-101** Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
JMB/Allendale	SDM	8"		NA"	52.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/27/06 - 11/2/06	Advanced Drilling	Hammer Type: Manual	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 8.3 ft.	Easting: 572560.4 ft. Northing: 646544.2 ft. TOC Elev: NA ft.
C. Corner	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Backfill	PID/MVA Readings (ppm)	Remarks
		SP GP	**FILL** Brwn mfc SAND, some (+) Silt & Clay, little mfc Gravel. Brick. @ 0.7 dry, Gray	15-19-22-28	1					.4- .008	
		SP SM	cfm GRAVEL, some (+) Sand, little (+) Silt & Clay. Red-brwn-tan mf SAND and SILT, some (+) Clay, little mfc Black Gravel, dry.	23-18-8-8	2					.4- .030	
5		SW SM CL ML	Brwn-blk-green mfc SAND and SILT, some (+) Clay, trace (-) mf Gravel, wet. Brwn-gray CLAY & SILT, wet. Fly ash.	1-1-1-1	3					.4- .030	
				1-1/12-1	4					.4- .012	
				1/12-1-1	5					.4- .707	Sampled LP-101-8-10
10		CL ML	**TIDAL MARSH DEPOSIT** Brwn-green Silty CLAY, some (+) Organics, wet.								
		CL ML	No sample collected. Blk-gray-green Silty CLAY, some (+) Organics, trace (+) cm Sand.	1-1	6					112- sat.	Odor, Sampled LP-101-11-13
		CL ML	Blk-gray green Silty CLAY, trace (+) mf Sand.	1-1	7					53.8- .914	Odor
15				2-2-4-3	8					35.1- sat.	Odor, Sampled LP-101-14-16
		SP	Gray-blk, mf SAND, trace (-) Silt, wet	1-1/12-1	9					3.0- .005	
		ML CL	Gray-Blk SILT & CLAY, some (+) mf Sand, wet.	2-4-2-11	10					0- .030	Odor
20		SP SM ML CL	**GLACIAL TILL** Red-gray cmf SAND, some (+) Silt, wet. Red-Brwn SILT & CLAY, some (+) cmf Gravel and cmf Sand, wet.	5-5-6-10	11					0- .003	
				5-2-7-8	12					0- .005	
25				5-10-11-8	13					0- .004	
				7-9-11-14	14					0- .013	Sampled LP-101-26-28
		ML CL	Red-brwn SILT & CLAY, little (+) mf Sand, trace (+) Gravel, wet.	6-9-13-11	15					0- .010	
30		ML	Red-brwn SILT & CLAY, some (+) cmf	4-4-5-9	16					0- .004	

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. LP-101 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Backfill	PID/MVA Readings (ppm)	Remarks
		CL	Gravel and cmf Sand, wet.					
				6-9-9-4	17		0-.011	
				14-14-9-15	18		0-.010	
35				5-9-11-13	19		0-0	
		ML CL	Evidence of weathered rock, relic bedding evident.					
		ML CL	Red-brwn SILT & CLAY, little (+) mf Sand, trace (+) mf Gravel, wet. Relic bedding evident.	7-14-17-29	20		0-0	
40		ML CL	Red brwn SILT & CLAY some (+/-) cfm Gravel, some (-) to trace (+) cmf Sand, wet. Evidence of Basalt @ 42 ft.	9-9-10-14	21		.2-0	
				14-17-19-22	22		4.3-0	
		ML CL	Red-brwn SILT & CLAY, some (+) cfm Gravel and some (-) cfm Sand, wet.	27-38-43-41	23		.3-0	
45				34-34-37-35	24		0-0	
				14-14-15-21	25		1.1-0	
50		BR	**BEDROCK** Red-brwn Siltstone, weathered bedrock with bedding evident.	45-100/5.5	26		1.2-.040	Sampled LP-101-50-52 End of boring @ 52.0'

BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **WWT-101** Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
MPC/Allendale	SDM	8"		NA"	47.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon	Development Method:
10/27/06 - 11/6/06	Advanced Drilling	Hammer Type: Manual	NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: NAD83 Vert Datum: NGVD88 Ground Surface Elev: 9.4 ft.	Easting: 572035.5 ft. Northing: 646780.6 ft. TOC Elev: NA ft.
R. Empson	HSA	Failing 45		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log (Sample Int, Recovery, Lithology, Backfill)	PID/MVA Readings (ppm)	Remarks
		SW	**FILL** Brown cmf SAND and SILT, some (+) Clay and cmf Gravel, dry.	5-4-5-6	1		.2-.001	
		GW SW	Brown cmf GRAVEL and mf SAND, some (+) Silt, some (+) Clay, wet. Grading @ 2.7 Red-brwn SILT & CLAY, some (+) cmf Sand, little cfm Gravel, wet. Chunks of brick	5-5-5-5	2			
5			No recovery.	1-1-1-2	3			
		CL ML	Red-Brown SILT & CLAY, some (+) cmf Sand, little (+) mf Gravel, wet. @ 6.7 Brown-Black-Red cm SAND & SILT, some (+) Clay wet.	3-2-2-5	4			
		SM	Red-Brown-Black cmf SAND and SILT, some (+) Clay, wet.	3-2-2-6	5		.4-0	Little Black NAPL droplets, rainbow sheen.
10		CL ML	Black Silty CLAY, some (+) cmf Sand, wet.	1-2-3-5	6		.3-0	
		SC	**TIDAL MARSH DEPOSITS** Black cmf SAND, some (-) Silt & Clay, trace (-) f Gravel, @ 13.3' Black Silty CLAY, wet.	2-2-5-3	7		.3-.730	NAPL, sheen on soil and liquid. Sample WWT-101-12-14. Blebs determined to be mercury beads with magnifying glass.
15		CL ML	Gray Silty CLAY, little (+) fm Sand,	3-3-4-6	8		5.2-.092	Sample WWT-15-17
		CL ML	**GLACIAL TILL DEPOSITS** Red-brown SILT & CLAY, little cmf to fmc Sand, wet.	7-7-8-12	9		5.6-.019	
20		ML CL	Red-brown Clayey SILT, little (+) fm Sand, wet.	12-11-10-9	10		6.1-.012	
		ML CL	Red-Brown SILT & CLAY, little (+) fmc Sand, wet.	6-4-7-10	11		4.7-.020	Sample WWT-21-23
		ML CL	Red-brwn Silty CLAY, little (+) fmc Sand, wet.	7-7-9-12	12		5.5-.011	
25				7-7-7-8	13		3.3-0	
				7-9-8-9	14		5.3-.005	
30		ML CL	Red-brown SILT & CLAY, little (-) fmc Sand, trace (-) fm Gravel, wet.	9-9-10-10	15		4.9-0	

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BORING LOG

BROWN AND CALDWELL	Project Name: LCP-RI_131369 Project Number: 131369 Project Location: Linden, NJ	Permit Number: NA	Boring No. **WWT-101** Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	PID/MVA Readings (ppm)	Remarks
		ML CL	Red-brown Clayey SILT, little (+) fm Sand, wet.	7-9-10-10	16					1.3-.006	
				10-10-18-21	17					2.7-.003	
35		ML CL	Rounded cmf SAND. @ 34.4 returns to Red-brown Clayey SILT, little (-) fm Sand, wet.	11-12-12-19	18					2.4-.004	
		ML CL	Red-brown cmf SAND, little (+) Silt & Clay, trace (+) fmc Gravel, wet.								
		ML CL	Red-brown SILT & CLAY, some (-) fmc Sand, little fmc Gravel, wet.	14-18-19-41	19					2.9-.006	
40		ML CL	Red-brown cmf SAND, some (+) Silt & Clay, little (-) fmc Gravel. Gravel chunk of bedrock, wet.	27-18-14-18	20					3.7-.003	
		ML CL	Red-brown Clayey SILT, little (+) fmc Sand, wet,	8-9-14-15	21					3.1-.003	
		ML CL	Red-brown Clayey SILT, some (-) fmc Sand, little (-) fm Gravel, wet.	15-10-27-38	22					1.3-.003	
45		BR	**BEDROCK** Red-brown weathered Siltstone-Sandstone, cmf SAND, some (-) fmc Gravel, little (-) Silt & Clay, wet.	100/2	23					1.9-.003	

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
12K-B1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/6/2001	646,344.0	572,091.8			7.5						
12K-B1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	>250		SW	Med brown cmf SAND, some mf Gravel
12K-B1-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0	>250		CL	Red CLAY, little f gravel, dense
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--			NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	45		CL	Red CLAY, some mf Gravel, dense
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	8		CL	Red CLAY, some mf Gravel, dense @ 6.5 ft becoming Black mf GRAVEL, saturated
--	8.0 - 10.0	1.0	DP	Fill/TMD	N	N	0	23		GW/PT	Black mf GRAVEL, saturated @ 8.8 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--		PT	Peat?, NR
12K-B2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/6/2001	646,332.2	572,102.7			7.5						
12K-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	>250		GW	Med brown mf GRAVEL, some cmf Sand
12K-B2-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0	134		GW	Med brown mf GRAVEL, some cmf Sand @ 1 ft becoming Red CLAY, little f gravel
--	2.0 - 4.0	1.5	DP	Fill	N	N	0	69		CL	Red CLAY, little f gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	34	CL	Red CLAY, little to some f gravel
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	8	CL	Red CLAY, some mf Gravel @ 6.5 ft becoming Black mf GRAVEL, saturated
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0	15	GW/PT	Black mf GRAVEL, saturated @ 9 ft becoming PEAT.
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

150K-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/10/2001	646,285.0	572,462.9	6.52

150K-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	0.6	SM	Brown to brownish red f SAND, some Silt & Clay, little mf gravel
150K-1-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.134	3.5	SM	Brown to brownish red f SAND, some Silt & Clay, little mf gravel @ 1 ft becoming CLAY, little mf gravel, little f sand
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.163	0.6	CL	Reddish brown CLAY, little f gravel, little f sand
--	4.0 - 6.0	2.0	DP	Fill	N	Y	0.027	9.1	CL	CLAY, little f sand @ 4.5 ft Blk cmf SAND, trace mf gravel @ 5 ft CLAY, blk stain @ 5.5 ft cmf SAND, tr mf grav, oily, sat
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.2	DP	Fill	N	Y	0.026	6	CL/SM	Reddish brown Clay, little mf gravel @ 8.3 ft becoming Black mf SAND, little silt, little mf gravel
--	10.0 - 12.0	0.0	DP	Fill?	--	--	--	--		NR
--	12.0 - 14.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	14.0 - 16.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	16.0 - 18.0	2.0	DP	TMD	N	N	--	--	OL	Organic Silt
--	18.0 - 20.0	2.0	DP	TMD	N	N	--	--	OL	Organic Silt

230-B1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
10/2/2001	646,620.1	572,149.4	7.637

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
230-B1-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	38	SC	Med brown f SAND and CLAY, little organics
--	0.5 - 2.0	0.0	DP	Fill	--	--	--	--		NR
--	2.0 - 4.0	0.5	DP	Fill	N	N	0.011	12	SW	Med brown mf SAND, little organics
230-B1-4-6	4.0 - 6.0	0.8	2-5-2-5	Fill	N	N	0.015	1200	SC	Med brown mf SAND and CLAY
--	6.0 - 8.0	1.5	1-1-2-2	TMD	N	N	--	--	PT	PEAT
--	8.0 - 10.0	2.0	WOR-1-1-1	TMD	N	N	0.014	133	PT	PEAT
--	10.0 - 12.0	1.0	WOR-1-1-1	TMD	N	N	0.012	150	PT	PEAT @ 10.9 ft becoming Gray CLAY & SILT
--	12.0 - 14.0	1.0	1-2-3-2	GF	N	N	0.003	9	SM	Gray fm SAND, little silt
--	14.0 - 16.0	1.0	2-4-8-8	GF/GT	N	N	0.011	125	SM	Gray fm SAND, little silt @ 14.5 ft becoming Red brown CLAY & SILT, little f gravel, trace fm sand
--	19.0 - 21.0	1.5	5-8-12-9	GT	N	N	0.005	219	CL	Red brown CLAY & SILT, little fm gravel, trace m sand
--	24.0 - 26.0	1.5	4-4-8-9	GT	N	N	0.003	224	CL	Red brown CLAY & SILT, little fm gravel, trace m sand

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	29.0 - 31.0	1.5	5-6-7-8	GT	N	N	0.003	29	CL	Red brown Silty CLAY
--	34.0 - 36.0	1.5	4-5-50/3	GT/TOWR	N	N	0	1	CL	Red brown Silty CLAY @ 35 ft becoming Weathered SHALE
230-B10	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/30/2001	646,484.6	572,190.2			8.3					
230-B10-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.071	6	GW	Dk brown m GRAVEL
--	0.5 - 1.5	1.0	DP	Fill	N	N	0.322	6	GC	Dk brown cmf GRAVEL and CLAY, little mf sand
230-B10-1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.273	8	GC	Dk brown cmf GRAVEL and CLAY, little mf sand
230-B11	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/30/2001	646,488.6	572,156.9			8.3					
230-B11-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.067	9	GC	Med to dk brown mc GRAVEL, some Clay
--	0.5 - 1.5	1.0	DP	Fill	N	N	0.075	7	GC	Med to dk brown mc GRAVEL, some Clay
230-B11-1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.03	6	GC	Med to dk brown mc GRAVEL, some Clay
230-B2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/30/2001	646,665.4	572,150.6			8.7					

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
230-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.006	3	CL	Med brown CLAY, little c gravel
--	0.5 - 1.5	1.0	DP	Fill	N	N	0	1	CL	Med brown CLAY, little c gravel
230-B2-1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0	2.7	CL	Med brown CLAY, little c gravel
230-B3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/30/2001	646,647.0	572,199.9			8.5					
230-B3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.005	2	SW	Med brown m GRAVEL and c SAND
--	0.5 - 1.5	1.0	DP	Fill	N	N	0.007	4	CL	Med brown CLAY, little mf gravel, trace mf sand, moist
230-B3-1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.025	6	CL	Med brown CLAY, little mf gravel, trace mf sand, moist
230-B4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/30/2001	646,616.2	572,179.1			8.6					
230-B4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.004	2	GC	Med brown c GRAVEL, little clay
--	0.5 - 1.5	1.0	DP	Fill	N	N	0.006	2	CL	Reddish brown CLAY, little mf gravel
230-B4-1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.016	5	CL	Reddish brown CLAY, little mf gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
230-B5	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)							
9/13/2001	646,591.0	572,187.3		7.166							
230-B5-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.013	5.6	SC	Med brown cmf SAND, some Clay, trace organics
--	0.5 - 1.5	1.0	DP	Fill	N	N		0	31	SC	Med brown cmf SAND, some Clay, trace organics
230-B5-1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N		0	125	SC	Med brown cmf SAND, some Clay, trace organics
230-B6	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)							
8/22/2001	646,600.1	572,140.3		8.7							
230-B6 0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.177	>250	CL	Red CLAY, some mc Gravel, trace organics
--	0.5 - 1.5	1.0	DP	Fill	N	N		0.043	160.4	GW	Med brown cmf GRAVEL, some cmf Sand @ 1 ft becoming Red CLAY, little mc gravel
230-B6 1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N		0.006	143	CL	Red CLAY, little mc gravel
230-B7	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)							
8/22/2001	646,590.2	572,149.1		8.7							
230-B7 0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.023	153.8	SW	Med brown cmf SAND, some mf Gravel
--	0.5 - 1.5	1.0	DP	Fill	N	N		0.007	130.2	CL	Red CLAY, some mc Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
230-B7 1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.012	143.2	CL	Red CLAY, some mc Gravel
230-B8	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,533.0	572,166.9			8.5					
--	0.0 - 0.5	0.5	DP	Fill	N	N	0.062	71	GP	Gray c GRAVEL
--	0.5 - 1.5	1.0	DP	Fill	N	N	0.19	164	GP	Gray c GRAVEL
230-B8 1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.06	138	CL	Reddish brown CLAY, some mf Sand
230-B9	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,531.7	572,135.7			8.5					
230-B9 0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.13	128	GW	Med brown cmf GRAVEL, some mc Sand, trace organics
--	0.5 - 1.5	1.0	DP	Fill	N	N	0.738	>250	CL	Red CLAY, little mf gravel @ 1 ft becoming Orange/brown mc SAND
230-B9 1.5-2	1.5 - 2.0	0.5	DP	Fill	N	N	0.253	>250	SP	Orange/brown mc SAND
231-B1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
11/19/2001	646,437.0	572,458.3			8.137					
--	0.0 - 2.0	0.3	4-4-5-5	Fill	N	N	0.04	10	SW	M brown fmc SAND, trace organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
231-B1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	3.4	SW	Med brown cmf SAND and mc GRAVEL, trace organics
--	2.0 - 4.0	0.5	4-2-1-2	Fill	N	N	0.098	23	CL	M brown CLAY, little fmc sand, little m gravel, saturated
--	4.0 - 6.0	1.0	1-1-1-2	Fill	N	N	0.077	65	CL	M brown CLAY and mfc SAND, little m gravel, saturated
--	6.0 - 8.0	1.5	3-5-2-1	Fill	N	Y	0.054	112	CL/PT	CLAY, some fmc Sand, saturated @ 6.9 ft Wood pieces coated with black petrol substance @ 7.2 ft PEAT
--	8.5 - 10.5	0.5	4-4-11-13	TMD	N	N	0.049	16.9	PT	PEAT
--	10.5 - 12.5	1.0	1-1-1-1	TMD	N	N	0.058	7.6	OL/PT	Dk Gray organic rich CLAY, occasional Peat
--	12.5 - 14.5	0.3	1-1-1-2	TMD	N	N	0.004	2.3	ML	Dk Brown SILT, some f Sand, spongy texture
--	14.5 - 16.5	1.5	1-2-3-2	TMD	N	N	0.014	115	SM	M Brown f SAND, some Silt, traces of organics @ 15.5 ft becoming Lt Gray fm SAND
--	16.5 - 18.5	1.5	9-11-12-15	TMD/GF	N	N	0.041	66	PT	PEAT @ 16.6 ft fm SAND, s. Silt @ 17 ft f SAND and SILT, slightly mottled, strat? @ 17.7 ft SILT, s. mf Sand, tr. f gravel
--	18.5 - 20.5	1.0	5-6-7-7	GF	N	N	0.057	100	SM	Red brown f SAND, some Silt, little fm gravel
--	23.0 - 25.0	0.2	4-5-11-15	GT	N	N	0.017	14	GC	Red brown c GRAVEL, some Clay
--	25.0 - 27.0	1.5	13-10-11-10	GT	N	N	0.015	57	ML	Red brown SILT & CLAY, little fm gravel

231-B10

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/18/2001	646,601.8	572,490.3	8

231-B10-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.287	6.3	GW	Med brown cmf GRAVEL, little cmf sand

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	0.0	DP	Fill	--	--	--	--		NR
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.0	DP	TMD	N	N	--	--	PT	Peat
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

231-B11

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/19/2001	646,572.2	572,477.7	8.1

231-B11-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.007	0.6	CL	Red CLAY, little mf gravel, dense
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.006	8	CL	Red to Reddish brown CLAY, little to no mf gravel, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.5	DP	Fill	N	N	0.01	11	GW	Med brown cmf GRAVEL, some Clay
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
231-B11-8-10	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.012	1	OH/PT	Gray CLAY @ 8.5 ft becoming PEAT
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
231-B12	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/18/2001	646,600.1	572,476.5			8.1						
231-B12-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.025	2	GW	Med brown mf GRAVEL and cmf SAND, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.007	0.3	CL	Reddish brown CLAY, little cmf sand, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.006	2	CL	Dk brown CLAY, some Organics
--	6.0 - 8.0	2.0	DP	Fill	N	N		0.034	8.2	CL	Dk brown CLAY, some Organics
--	8.0 - 10.0	0.0	DP	Fill	--	--		--	--		NR
--	10.0 - 12.0	0.0	DP	Fill	--	--		--	--		NR
--	12.0 - 14.0	2.0	DP	Fill/TMD	N	N		0.015	7	OH/PT	Red CLAY @ 13 ft PEAT.
--	14.0 - 16.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR
231-B13	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/19/2001	646,618.1	572,456.5			8.1						
231-B13-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		>0.999	1.5	SW	Med brown cmf SAND, some mf Gravel, moist

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.111	5.6	SC	Brown cmf SAND @ 0.8 ft becoming cmf SAND and CLAY, some mc Gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	0.0	DP	Fill	--	--	--	--		NR
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
231-B13-8-10	8.0 - 10.0	2.0	DP	Fill/TMD	Y	N	>0.999	85	OH/PT	Red CLAY, little mf gravel @ 9 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

231-B14

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/19/2001	646,611.9	572,476.9	8

231-B14-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.003	0.6	CL	Red CLAY, some mf Gravel
--	0.5 - 2.0	0.0	DP	Fill?	--	--	--	--		NR
--	2.0 - 4.0	0.0	DP	Fill?	--	--	--	--		NR

231-B2

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/22/2001	646,434.8	572,472.9	8.1

231-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	158	CL	Med brown CLAY and cmf GRAVEL, little f sand

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
231-B2-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	>250	CL	Med brown CLAY and cmf GRAVEL, little f sand @ 1 ft becoming Red CLAY, some mf Gravel.
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.074	>250	CL	Red CLAY, some mf Gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.08	>250	CL	Red CLAY, some mf Gravel @ 4 ft becoming Gray CLAY some cmf Sand, trace mf gravel.
--	6.0 - 8.0	1.5	DP	Fill	N	N	0.075	>250	CL	Red CLAY and mc GRAVEL
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.127	>250	OH/PT	Red SILT & CLAY, little cmf gravel @ 9 ft becoming PEAT.
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

231-B3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/22/2001	646,431.0	572,443.0	8.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
231-B3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.597	97.2	ML	Med brown CLAY & SILT, some mf Gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.06	>250	ML	Med brown CLAY & SILT, some mf Gravel
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.047	184.4	ML	Med brown CLAY & SILT, some mf Gravel
--	4.0 - 6.0	1.0	DP	Fill	N	N	0.977	>250	CL	Black CLAY, some Organics, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.0	DP	Fill	N	N	>0.999	>250	CL	Black CLAY, some Organics @ 8.5 ft becoming Red CLAY and mf GRAVEL, saturated.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
231-B4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/30/2001	646,442.9	572,431.4			8.3						
231-B4-0-0.5	0.0 - 0.5	0.5	DP	Fill	Y		N	>0.999	5.7	GP	cmf GRAVEL
--	0.5 - 2.0	0.5	DP	Fill	Y		N	>0.999	38	GP	cmf GRAVEL
--	2.0 - 4.0	0.0	DP	Fill	--		--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	Y		N	>0.999	53	SP	cmf SAND
231-B4-6-8	6.0 - 8.0	2.0	DP	Fill	Y		N	>0.999	0.7	SC	Dk brown f SAND and CLAY, saturated
--	8.0 - 10.0	0.0	DP	TMD?	--		--	--	--	PT	Peat in shoe @ 8 ft, NR
231-B5	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/19/2001	646,453.5	572,415.1			8.3						
--	0.0 - 0.5	0.5	DP	Fill	Y		N	>0.999	4.3	CL	Dk brown CLAY, some cmf Sand
231-B5-0.5-2	0.5 - 2.0	1.5	DP	Fill	N		N	0.192	1.3	CL	Med brown CLAY
--	2.0 - 4.0	0.0	DP	Fill	--		--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N		N	0.024	0.8	CL	Med brown to red CLAY, no to little cmf sand, little to trace f gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	1.5	DP	Fill	N	N	0.01	2.8	CL	Red to brown CLAY, little cmf sand, trace m gravel
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.04	5	CL	Med brown CLAY, some cmf Sand, little organics
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

231-B6

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
646,469.1	572,419.7	8.3

9/27/2001

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
231-B6-0-0.5	0.0 - 0.5	0.5	DP	Fill	Y	N	>0.999	0.7	SW	Med brown cmf SAND, some m Gravel, little organics
--	0.5 - 2.0	1.0	DP	Fill	Y	N	>0.999	20.6	SW	Med brown cmf SAND, little mf gravel, trace clay
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
231-B6-4-6	4.0 - 6.0	2.0	DP	Fill	Y	N	>0.999	11	SC	Med brown f SAND and CLAY, little mf gravel, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	0.5	DP	Fill	Y	Y	>0.999	7.5	GW	Med brown mf GRAVEL
--	10.0 - 12.0	0.0	DP	Fill?	--	--	--	--		NR

231-B7

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
646,493.4	572,412.1	8.2

9/13/2001

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
231-B7-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.075	1.5	GW	Black cmf GRAVEL, little cmf sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.07	2	GW	Black cmf GRAVEL, little cmf sand @ 1.5 ft becoming Reddish brown CLAY, some mc Gravel, little f sand
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.047	2	CL	Reddish brown CLAY, some mc Gravel, little f sand
--	4.0 - 6.0	0.0	DP	Fill	--	--	--	--		NR
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.035	0.9	ML	Lt brown Silty CLAY, soft
--	10.0 - 12.0	2.0	DP	Fill	N	N	0.054	49	ML	Lt Brown to Black Silty CLAY, soft

231-B8

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/27/2001	646,456.6	572,445.5	8.2

231-B8-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	21	GW	Dk brown cmf GRAVEL, little organics, little cmf sand
--	0.5 - 2.0	0.5	DP	Fill	Y	N	>0.999	3	SW	Med to dk brown cmf SAND, some mc Gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.0	DP	Fill	Y	N	>0.999	59	SW	Med to dk brown cmf SAND, some mc Gravel @ 4.3 ft becoming Red CLAY
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
231-B8-8-10	8.0 - 10.0	2.0	DP	Fill	N	Y	0.153	235	SW	Black cmf SAND, some cmf Gravel, little organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	10.0 - 12.0	1.0	DP	TMD	N	N	--	--	PT	Peat
231-B9	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/27/2001	646,608.3	572,490.5		8						
231-B9-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.726	1.4	GW	Med brown mc GRAVEL, little cmf sand, trace organics
231-B9-0.5-2	0.5 - 2.0	1.0	DP	Fill/TMD	N	N	0.039	1.2	GC/PT	Brown CLAY and mf GRAVEL @ 1 ft becoming PEAT
--	2.0 - 4.0	0.0	DP	TMD	--	--	--	--	PT	PEAT, NR
--	4.0 - 6.0	2.0	DP	TMD	N	N	--	--	PT	PEAT @ 4 ft becoming Red CLAY, pieces of shale
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--		NR
240-1	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/26/2001	646,356.5	572,351.3		8.6						
240-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.015	7	SC	Med brown cmf SAND, some mf Gravel, little clay
--	0.5 - 2.0	0.5	DP	Fill	N	N	0	3.8	SC	Med brown cmf SAND, some mf Gravel, little clay
--	2.0 - 4.0	0.0	DP	Fill?	--	--	--	--		NR
--	4.0 - 6.0	1.0	DP	Fill	N	N	0	1.3	ML	Reddish brown Silty CLAY, little f sand

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	1.8	CL	Reddish brown Silty CLAY, little f sand
240-1-8-10	8.0 - 10.0	1.5	DP	Fill/TMD	N	N	0	16.6	CL	Reddish brown Silty CLAY, little f sand @ 9 ft becoming PEAT

5K-B1

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
10/1/2001	646,366.1 572,478.2	9

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
5K-B1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.008	0.8	CL	Red CLAY, little cmf sand
--	0.5 - 2.0	0.0	DP	Fill	--	--	--	--		NR
--	2.0 - 4.0	0.8	DP	Fill	N	N	0	1.6	CL	Red CLAY, little cmf sand @ 2.5 ft becoming Black CLAY, some Organics
--	4.0 - 6.0	5.0	DP	TMD	N	N	--	--	PT	Peat

5K-B2

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/31/2001	646,335.7 572,455.9	9.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
5K-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.195	20	SW	Dk brown cmf SAND, little f gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.026	220	GC	Med brown mf GRAVEL and CLAY @ 1 ft becoming Reddish brown CLAY, little mf gravel
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.017	445	CL	Reddish brown CLAY, little f gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.042	300	CL	Reddish brown CLAY, little f gravel, little f sand

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	1.5	DP	Fill	N	N	0.013	>250	CL	Orange CLAY, little f sand, dense
5K-B2-8-10	8.0 - 10.0	2.0	DP	Fill	N	N	0.023	>250	CL	Med brown CLAY, little mc gravel @ 9 ft becoming mc GRAVEL, some Clay
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0	160	GC/PT	Med brown mc GRAVEL, some Clay @ 10.7 ft becoming PEAT.

5K-B3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/26/2001	646,365.3	572,426.1	9

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
5K-B3-0-0.5	0.0 - 0.5	0.5	DP	Fill	Y	N	>0.999	1.2	SP	Med brown mf SAND
--	0.5 - 2.0	1.5	DP	Fill	Y	N	>0.999	439	CL	Red CLAY, little mf gravel, little c sand
--	2.0 - 4.0	2.0	DP	Fill	Y	N	>0.999	263	CL	Red CLAY, little mf gravel, little c sand @ 3 ft becoming Gray CLAY
--	4.0 - 6.0	2.0	DP	Fill/TMD?	Y	N	>0.999	311	CL	Red CLAY @ 4.2 ft becoming Lt gray to dk brown CLAY, little cmf sand @ 5.4 becoming Black ORGANICS
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--		Black organics?, NR

5K-B4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
10/1/2001	646,391.0	572,449.9	8.9

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
5K-B4-0-0.5	0.0 - 0.5	0.5	DP	Fill	Y	N	0.027	1.8	MISC	Black ORGANIC MATERIAL @ 0.3 ft becoming Lt brown mf SAND @ 0.4 ft becoming Red CLAY, little mf gravel
--	0.5 - 2.0	0.0	DP	Fill	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	1.3	DP	Fill	N	Y	0	17	CL	Red CLAY, little mf gravel @ 2.9 ft becoming Black ORGANICS and COBBLES
5K-B4-4-6	4.0 - 6.0	1.0	DP	Fill	N	Y	0	69	MISC	Black ORGANIC MATERIAL coated in petrol, little cmf sand
--	6.0 - 8.0	1.0	DP	TMD	N	N	--	--	PT	Peat

5K-B5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/31/2001	646,382.9	572,411.4	8.8

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
5K-B5-0-0.5	0.0 - 0.5	0.5	DP	Fill	Y	N	0.022	120	MISC	Black organic material @ 0.2 ft becoming Reddish brown CLAY, little mf gravel, little glass, little organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.01	176	CL	Reddish brown CLAY, little mf gravel, little glass
--	2.0 - 4.0	1.0	DP	Fill	N	N	--	--	CL	Grayish brown CLAY, trace organics
5K-B5-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.004	8.7	GW	Brown mf GRAVEL, some cmf Sand, saturated @ 5 ft becoming CLAY, little mf gravel, dense
--	6.0 - 8.0	1.7	DP	Fill	N	N	0.015	210	GW	Black mf GRAVEL, little clay, saturated

AB-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/4/2001	646,701.1	572,550.1	7.5

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
AB-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.119	2	SC	Med brown mf SAND, some mc Gravel, little clay
--	0.5 - 2.0	1.0	DP	Fill	N	N	0.811	2.7	SC	Med brown mf SAND, some mc Gravel, little clay

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	Y	N	>0.999	2.7	SC	Med brown mf SAND, little clay
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	Y	N	>0.999	4.2	CL	Dk brown Silty CLAY, little cmf sand
--	10.0 - 12.0	2.0	DP	TMD	N	N	>0.999	14.3	CL	Black Silty CLAY, little organics @ 11.8 ft becoming Peat.

AB-2

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/4/2001	646,643.2	572,556.8	8.2

AB-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	2.3	SC	Med brown cmf SAND, little clay, trace m gravel, trace organics
AB-2-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	4	SC	Med brown cmf SAND, little clay, trace m gravel, trace organics @ 1 ft becoming Gray CLAY, trace f gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.922	3.6	OL	Gray CLAY, trace f gravel, moist
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.015	11	OL	Gray to Black CLAY, some mf Gravel
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.013	29	ML	Med brown Silty CLAY @ 8.5 ft becoming Med brown and gray CLAY & SILT, saturated
--	10.0 - 12.0	1.5	DP	Fill/TMD	N	N	0.011	12	ML/PT	Med brown and gray CLAY & SILT, saturated, @ 11 ft becoming PEAT.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
ADN-1											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/5/2001		647,036.3	572,061.5			7.4					
ADN-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.012	11	CL	Med brown CLAY and cmf SAND, little organics
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.006	9	CL	Med brown CLAY and cmf SAND, little organics @ 1.2 ft becoming Red CLAY, little mf gravel, little cmf sand
--	2.0 - 4.0	2.0	DP	Fill	N	N		0.016	58	CL	Red CLAY, little mf gravel, little cmf sand
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.011	39	CL	Red CLAY, little mf gravel, little cmf sand
--	6.0 - 8.0	1.0	DP	Fill	N	N		0.017	>250	CL	Red CLAY, little mf gravel, little cmf sand @ 6.5 ft becoming Black CLAY and ORGANIC MATERIAL
ADN-1-8-10	8.0 - 10.0	2.0	DP	Fill	N	N		0.048	>250	CL	Red CLAY, little f gravel @ 9 ft becoming Black CLAY and ORGANIC MATERIAL @ 9.2 ft becoming Red CLAY, moist
--	10.0 - 12.0	0.0	DP	Fill	--	--		--	--		NR
--	12.0 - 14.0	2.0	DP	Fill	N	N		0.04	295	CL	Red and black CLAY, moist
--	14.0 - 16.0	2.0	DP	TMD	N	N		--	--	PT	Peat
ADN-2											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/5/2001		646,983.0	572,063.3			7.6					
ADN-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	10	CL	Brown CLAY and f SAND, little mf gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	8	CL	Reddish brown CLAY, some cmf Sand, little f gravel
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.003	6	CL	Red-brwn CLAY, some cmf Sand, little f gravel @ 2.5 ft Blk f GRAVEL, s. c Sand @ 3 ft Red CLAY, l. m grav
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.003	5	CL	Red CLAY, trace f gravel
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	17	CL	Red to lt. brown to red CLAY, trace f gravel
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.008	99	CL	Red CLAY, trace f gravel
ADN-2-10-11	10.0 - 11.0	1.0	DP	Fill	N	N	0.025	4	CL	Red CLAY
--	11.0 - 12.0	1.0	DP	TMD	N	N	--	--	OL/PT	Black ORGANICS and CLAY - Peat
--	12.0 - 14.0	2.0	DP	TMD	N	N	0.03	>250	OL	Black CLAY and ORGANIC MATERIAL, trace f gravel
--	14.0 - 16.0	2.0	DP	GT	N	N	0.096	>250	CL	Red CLAY, little mf gravel

ADS-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/17/2001	646,923.2	571,494.5	8.1

ADS-1-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.02	0	SW	mf SAND, little cmf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.02	0	SW	mf SAND, little cmf gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.016	0	GW	Dk brown cmf GRAVEL

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.02	120	GW	Dk brown cmf GRAVEL
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.019	0	GW	Dk brown cmf GRAVEL, little f sand, saturated
--	10.0 - 11.0	1.0	DP	Fill	N	N	0.015	0	GW	Dk brown cmf GRAVEL, little f sand, saturated
--	11.0 - 13.0	2.0	DP	Fill/TMD	N	N	0.018	0	GW/PT	Dk brown cmf GRAVEL, little f sand, saturated. PEAT @ 12.8 ft.

ADS-10

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,657.8	571,899.2	8.2

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-10-0-0.5	0.0 - 2.0	2.0	DP	Fill	N	N	0	0	GW	Dk brown to black cmf GRAVEL, little c sand
--	2.0 - 4.0	0.5	DP	Fill	N	N	0	0	GW	Dk brown to black cmf GRAVEL, little c sand
ADS-10-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0	0	GW	Dk brown to black cmf GRAVEL, little c sand
--	6.0 - 8.0	0.3	DP	TMD	N	N	--	--	PT	Peat

ADS-11

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,703.6	571,837.5	8.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-11-0-0.5	0.0 - 2.0	2.0	DP	Fill	N	N	0.004	0	GW	Dk brown mf GRAVEL, little c sand
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill/TMD	N	N	0	0	GP/PT	Dk brown cmf GRAVEL @ 5.5 ft becoming PEAT
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

ADS-12

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,767.7 571,814.2	8.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-12-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.011	0	ML	Red CLAY & SILT, little mc gravel, trace organics
ADS-12-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.009	0	GM	Black cmf GRAVEL, little silt @ 1.5 ft becoming Red SILT & CLAY.
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	0	GW	Black cmf GRAVEL
--	6.0 - 8.0	1.0	DP	TMD	N	N	0	0	PT	Peat

ADS-2

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,914.6 571,834.1	8.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	0	GW	Med brown mc GRAVEL, some cmf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	0	GW	Med brown mc GRAVEL, some cmf Sand @ 1 ft becoming Black c SAND.
--	2.0 - 4.0	1.0	DP	Fill	N	N	0	0	ML	Red SILT & CLAY, little mc sand, trace cmf gravel.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-2-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0	0	ML	Red SILT & CLAY, little sand, trace cmf gravel.
--	6.0 - 8.0	2.0	DP	Fill/TMD	N	N	0	0	ML/PT	Red SILT & CLAY @ 7.5 ft becoming PEAT

ADS-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,874.5	571,980.2	7.9

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	0.5	SW	Med brown mc SAND, some cmf Gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	0.3	SM	Med brown mc SAND, some cmf Gravel @ 1 ft becoming Red brown SILT & CLAY, little mf sand, little cmf gravel.
--	2.0 - 4.0	2.0	DP	Fill	N	N	0	0.2	ML	Red brown SILT & CLAY, little mf sand, little cmf gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	4	SM	Red brown f SAND and SILT, some Clay, trace mc gravel
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	1	GM	Black cmf GRAVEL, little silt
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	4	GM	Black cmf GRAVEL, little silt
--	10.0 - 12.0	2.0	DP	TMD	N	N	0.005	4	PT	Peat

ADS-4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,850.1	572,029.2	8.5

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-4-0-0.5	0.0 - 2.0	2.0	DP	Fill	N	N	0.008	0	GM	Med brown cmf GRAVEL, some cmf Sand, little silt @ 1 ft becoming Med brown to gray SILT & CLAY.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids		MVA (mg/m3)	OVA (ppm)	Soil Description	
					Mercury	Organics			USCS	Burmister
--	2.0 - 4.0	0.8	DP	Fill	N	N	0.005	0	ML	Med brown to gray SILT & CLAY @ 2.3 ft becoming Black cmf GRAVEL.
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	0	GW	Black cmf GRAVEL, saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	0	GW	Black cmf GRAVEL, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	0	GW	Black cmf GRAVEL, saturated
--	10.0 - 12.0	2.0	DP	Fill	N	N	0.003	0	GW	Black cmf GRAVEL, saturated
ADS-4-12-14	12.0 - 14.0	2.0	DP	Fill	N	N	0.027	0	GP	Black cmf GRAVEL, saturated
--	14.0 - 16.0	2.0	DP	Fill/TMD	N	N	0.011	0	GP/PT	Black cmf GRAVEL, saturated. Peat on tip @ 16 ft.

ADS-5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,709.4	572,072.4	9.2

ADS-5-0-0.5	0.0 - 2.5	2.5	DP	Fill	N	N	0.006	1.9	GW	Med brown cmf GRAVEL, some cmf Sand @ 1.5 ft becoming Med brown to red f SAND and SILT, little clay.
--	2.5 - 4.0	0.0	DP	Fill	--	--	--	--		NR
ADS-5-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.017	15	SW	Lt brown cmf SAND
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	2.9	SP	Orange f SAND
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.06	--	SP	Med brown mf SAND
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0.054	--	SW/PT	Orange f SAND. PEAT in shoe @ 12 ft.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
ADS-6	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/18/2001	646,692.6	572,032.2			9.2						
ADS-6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.042	1.3	GW	Med brown cmf GRAVEL
ADS-6-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N		0.204	1.7	ML	Med brown SILT & CLAY, little mf gravel, trace organics.
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	1.0	DP	Fill	N	N		0.014	0.6	SM	Dk Gray f SAND and SILT, some c Gravel, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--		--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N		0.006	1.7	SM	Reddish brown f SAND and SILT, trace c gravel
--	10.0 - 12.0	0.0	DP	Fill?	--	--		--	--		NR
ADS-7	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/17/2001	646,583.6	572,040.1			8.8						
ADS-7-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.013	767	GW	Med brown cmf GRAVEL, little cmf sand
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.018	767	GW	Med brown mf GRAVEL, little mf sand, trace silt @ 1.8 ft becoming Med brown f SAND, little silt, moist.
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.031	2142	SM	Reddish brown f SAND and SILT, little clay, moist

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.018	0	SM	Med brown cmf SAND, little silt @ 5 ft becoming mc SAND, little f gravel, moist to saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.016	180	SM	Reddish brown f SAND and SILT, trace mc gravel, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.02	0	SM	Med brown cmf SAND, little f gravel, little silt @ 9 ft becoming f SAND and SILT, little clay.
--	10.0 - 12.0	1.0	DP	TMD	N	N	0.285	2142	PT	Peat

ADS-8

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/18/2001	646,613.7	571,986.2	8.7

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ADS-8-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	0	GW	Med brown c GRAVEL, some mf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.003	0	GW	Med brown c GRAVEL, some mf Sand @ 1.0 ft becoming Black cmf GRAVEL, some Clay.
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
ADS-8-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.007	0	GW	Med brown to black mc GRAVEL, some cmf SAND, moist
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	0	GW	Black mc GRAVEL, little c sand, moist
--	8.0 - 10.0	2.0	DP	TMD	N	N	--	--	PT	Peat
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
ADS-9	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/18/2001	646,636.1	571,950.1			8.5						
ADS-9-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	0	GW	Dk brown to black cmf GRAVEL
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.004	0	GW	Dk brown to black cmf GRAVEL
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N		0	0	GW	Dk brown cmf GRAVEL
--	6.0 - 8.0	0.3	DP	TMD	N	N		--	--	PT	Peat
BSL-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/20/2001	646,565.7	572,759.0			4						
BSL-1-0-1	0.0 - 1.0	1.0	DP	Fill	N	N		0	0.7	SP	Med brown cmf SAND
--	1.0 - 2.0	0.5	DP	Fill	N	N		0	0.7	GW	Gray CLAY @ 0.7 ft becoming Dk brown mf GRAVEL, some cmf Sand
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
BSL-1-4-6	4.0 - 6.0	2.0	DP	Fill/TMD	N	N		0.005	0.5	GP/PT	Dk brown mf GRAVEL, some cmf Sand @ 4.5 ft becoming Gray CLAY, saturated @ 5.5 ft becoming PEAT
--	6.0 - 7.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
BSL-10	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/21/2001	646,259.5	572,902.5			2						
BSL-10-0-1	0.0 - 1.0	1.0	DP	Fill	N	N		0.03	2	SC	Brown mf SAND, some Clay, little organics @ 0.5 ft becoming mf GRAVEL, some cmf Sand
--	1.0 - 2.0	0.0	DP	Fill?	--	--		--	--		NR
--	2.0 - 4.0	0.0	DP	Fill?	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	TMD	N	N		--	--	PT	Peat
--	6.0 - 8.0	2.0	DP	TMD	N	N		--	--	PT	Peat
BSL-11	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/26/2001	646,256.0	572,881.2			6.4						
BSL-11-0-1	0.0 - 1.0	0.5	DP	Fill	N	N		0.016	10	SC	Lt brown f SAND @ 0.5 ft becoming Gray CLAY and mf GRAVEL, little organics
--	1.0 - 2.0	0.0	DP	Fill	--	--		--	--		NR
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill/TMD	N	N		0.008	21.5	GP/PT	Black mf GRAVEL @ 5 ft becoming PEAT.
--	6.0 - 8.0	1.0	DP	TMD	N	N		--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
BSL-12	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/26/2001	646,230.2	572,888.8			6.5						
BSL-12-0-1	0.0 - 1.0	1.0	DP	Fill	N	N		0.065	0.8	SC	Med brown to gray mf SAND, some Clay, little cmf gravel, little organics
--	1.0 - 2.0	0.0	DP	Fill?	--	--		--	--		NR. Refusal @ 2 ft.
BSL-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/21/2001	646,514.7	572,787.1			3.5						
BSL-2-0-1	0.0 - 1.0	1.0	DP	Fill	N	N		0.003	7.6	SW	Med brown cmf SAND, little organics
--	1.0 - 2.0	0.5	DP	Fill	N	N		0.016	0	GW	Dk brown cmf GRAVEL, some cmf Sand, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill/TMD	N	N		0	0	GP/PT	Dk brown cmf GRAVEL, some cmf Sand, moist @ 5 ft becoming PEAT.
--	6.0 - 8.0	2.0	DP	TMD	N	N		--	--	PT	Peat
BSL-3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/20/2001	646,513.6	572,772.5			6						
BSL-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.004	0.9	SP	Med brown cmf SAND

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	0.7	SW	Brown cmf SAND @ 1 ft becoming CLAY, some mf Gravel, moist
--	2.0 - 4.0	0.0	DP	Fill?	--	--	--	--		NR
--	4.0 - 6.0	0.0	DP	Fill?	--	--	--	--		NR
--	6.0 - 7.0	0.0	DP	Fill?	--	--	--	--		NR
--	7.0 - 9.0	0.0	DP	Fill?	--	--	--	--		NR
--	9.0 - 10.0	0.0	DP	Fill?	--	--	--	--		NR. Refusal @ 10 ft.

BSL-4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/21/2001	646,459.6	572,812.2	3.5

BSL-4-0-1	0.0 - 0.5	0.3	DP	Fill	N	N	0	0	SW	Med brown cmf SAND, some Organics
--	0.5 - 2.0	0.0	DP	Fill	--	--	--	--		NR
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
BSL-4-4-6	4.0 - 6.0	0.5	DP	Fill/TMD?	N	N	0	0	SW/PT	Med brown cmf SAND, some f Gravel @ 4.5 ft probably becoming PEAT, very soft.
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	8.0 - 10.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
BSL-5											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/21/2001		646,455.3	572,797.4			6					
BSL-5-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.005	0.9	SW	Med brown cmf SAND, some mf Gravel, moist
--	0.5 - 2.0	1.5	DP	Fill	N	N		0	0	SW	Med brown cmf SAND, some mf Gravel @ 1.5 ft becoming Orange to black CLAY, trace organics, moist
--	2.0 - 4.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR
--	4.0 - 6.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR
--	6.0 - 8.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR
BSL-6											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/26/2001		646,392.2	572,846.6			2					
BSL-6-0-1	0.0 - 1.0	1.0	DP	Fill	N	N		0.046	3.5	SW	Med brown cmf SAND, little organics, saturated
BSL-6-1-2	1.0 - 2.0	1.0	DP	Fill/TMD	N	N		0.021	10.4	GC/PT	Med brown CLAY and mf GRAVEL, little cmf sand @ 1.7 ft becoming PEAT.
--	2.0 - 4.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR
BSL-7											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/21/2001		646,383.7	572,834.6			4.5					

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
BSL-7-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.015	0	SW	Med brown cmf SAND, little organics
--	0.5 - 2.0	0.5	DP	Fill	N	N	0.028	1.9	GW	Med brown mf GRAVEL, little cmf sand, moist
--	2.0 - 4.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	4.0 - 6.0	2.0	DP	TMD	N	N	0.008	0	PT	Peat
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

BSL-8

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/26/2001	646,332.4	572,874.1	1.5

BSL-8-0-1	0.0 - 1.0	1.0	DP	Fill	N	N	0.013	1.5	SW	Med brown mf SAND, some Organics
--	1.0 - 2.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	2.0 - 4.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

BSL-9

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/21/2001	646,327.9	572,851.3	6

BSL-9-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	0	SW	Lt brown cmf SAND, some Organics
BSL-9-.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.017	0	SW	Brown cmf SAND, some Organics @ 1 ft becoming mf GRAVEL, some cmf Sand, saturated

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.006	0	CL	Lt gray CLAY @ 5.5 ft becoming Med brown mf Gravel, some cmf Sand, saturated
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat expected in this interval based on BSL-7, NR.
--	8.0 - 10.0	0.0	DP	TMD?	--	--	--	--	PT	Peat expected in this interval based on BSL-7, NR.

BT-B1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/18/2001	646,639.2	572,496.5	8

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
BT-B1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.026	1.1	CL	Reddish brown CLAY, some mf Gravel, little cmf sand, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.011	0.5	CL	Reddish brown CLAY, some mf Gravel, little cmf sand, trace organics
--	2.0 - 4.0	0.5	DP	Fill	N	N	0.007	0.9	CL	Reddish brown CLAY, some mf Gravel, little cmf sand, trace organics
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	0.9	CL	Reddish brown CLAY, some mf Gravel, little cmf sand, trace organics
--	6.0 - 8.0	1.0	DP	Fill	N	Y	0.003	1	CL	Red-brwn CLAY, some mf Gravel, little cmf sand, tr. organics @ 6.5 ft become blk mf GRAVEL, s. cmf Sand, sat.
--	8.0 - 10.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
BT-B2											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/18/2001		646,643.4	572,480.4			8.1					
BT-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.071	1.4	SW	Black c SAND and f GRAVEL	
BT-B2-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.043	1.1	CL	Red CLAY, little mf gravel, trace organics	
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR	
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.017	13	CL	Red CLAY, little mf gravel, trace organics	
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR	
--	8.0 - 10.0	2.0	DP	TMD	N	N	--	--	PT	Peat	
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat	
BT-B3											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/18/2001		646,643.2	572,464.2			8.1					
BT-B3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.098	1.6	GW	Black cmf GRAVEL	
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.057	1.8	GW	Black cmf GRAVEL @ 1 ft becoming Reddish brown CLAY, trace f gravel	
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR	

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	0.0	DP	Fill	--	--	--	--		NR
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.009	2	CL	Reddish brown CLAY, trace f gravel
--	10.0 - 12.0	2.0	DP	TMD	N	N	0.014	1.1	CL/PT	Reddish brown CLAY, trace f gravel @ 11 ft becoming Peat.

BT-B4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/30/2001	646,667.7	572,431.5	8.2

BT-B4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.043	2.5	GW	ASPHALT and mf GRAVEL, little cmf sand
BT-B4-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	5.9	GW	ASPHALT and mf GRAVEL, little cmf sand @ 1 ft becoming Dk brown cmf GRAVEL, some mc Sand
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.009	6	CL	Red CLAY, little c gravel @ 3 ft becoming Dk brown CLAY and mc GRAVEL, little f sand
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.033	6.6	CL	Med brown to red CLAY, some to no mf Gravel
--	6.0 - 8.0	2.0	DP	Fill/TMD	N	N	0.011	15.4	OL/PT	Dk brown to black Clay @ 7.3 ft becoming PEAT.

BT-B5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
10/2/2001	646,700.8	572,430.7	7.8

BT-B5-0-.5	0.0 - 0.5	0.5	8	Fill	N	N	0.276	1.3	GC	Dk brown mf GRAVEL and CLAY, little cmf sand, trace organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	0.5	9-5-3	Fill	N	N	0.851	2.2	GC	Dk brown mf GRAVEL and CLAY, little cmf sand, trace organics
--	2.0 - 4.0	1.5	5-7-7-12	Fill	N	N	0.035	1.9	CL	Red CLAY, little f gravel, very dense
--	4.0 - 6.0	2.0	1-2-5-3	Fill/TMD	N	N	0.044	1	CL/PT	Red CLAY, little f gravel, very dense @ 5.5 ft becoming PEAT
--	7.0 - 9.0	1.0	WOH	TMD	N	N	>0.999	2.5	PT	PEAT
--	9.0 - 11.0	2.0	WOH	TMD	N	N	>0.999	2.3	PT	PEAT
--	11.0 - 13.0	0.5	WOH	TMD	N	N	>0.999	1.1	CL	Gray CLAY, some Peat
--	13.0 - 15.0	1.5	WOH	TMD	N	N	>0.999	0.8	OL/PT	Dk Gray CLAY, some Peat, little mc Gravel
--	15.0 - 17.0	2.0	2-6-3-3	TMD/GF	N	N	>0.999	1.7	CL	Dk Gray CLAY, little organics @ 16.2 ft becoming Med Gray fm SAND, little silt
--	17.0 - 19.0	1.5	4-4-5-6	GF	N	N	0.175	3	SM	Med Gray and Brown fm SAND, little silt, mottled
--	19.0 - 21.0	1.0	3-8-8-10	GT	N	N	0	3	SW	Reddish brown f SAND, little f gravel, trace silt
--	21.0 - 23.0	1.0	6-10-10-10	GT	N	N	0	7	ML	Red brown SILT & CLAY, little (+) fm gravel, little f sand
--	23.0 - 25.0	1.0	5-9-10-10	GT	N	N	0	5	ML	Red brown SILT and f SAND, little fm gravel

BT-B6

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/18/2001	646,713.8	572,450.7	8.1

BT-B6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.835	1	SW	Dk brown cmf SAND, some mf Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids		MVA (mg/m3)	OVA (ppm)	Soil Description	
					Mercury	Organics			USCS	Burmister
BT-B6-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	1	SW	Dk brown cmf SAND, some mf Gravel @ 1 ft becoming Reddish brown CLAY, some cmf Gravel, some cmf Sand
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.016	1.1	CL	Reddish brown CLAY, some cmf Gravel, some cmf Sand
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.013	1.1	CL	Reddish brown CLAY, some cmf Gravel, some cmf Sand @ 5.5 ft Black cmf GRAVEL, some cmf SAND, sat.
--	6.0 - 8.0	0.5	DP	Fill	N	N	0.022	5.3	GW	Black cmf GRAVEL, some cmf Sand, saturated
--	8.0 - 10.0	1.0	DP	TMD	N	N	--	--	PT	Peat
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

CF-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/31/2001	646,706.7	572,613.0	8.1

CF-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.025	65	SW	Med brown cmf SAND, little mc gravel, little clay
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.004	48	SW	Med brown cmf SAND, little mc gravel, little clay
CF-1-2-4	2.0 - 4.0	2.0	DP	Fill	N	N	0.009	148	CL	Red CLAY, little c gravel, dense
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.003	50	GW	Brown to black mf GRAVEL, some c Sand, moist @ 5.8 ft becoming Dk Gray CLAY, some f Gravel
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	58	CL	Dk Gray CLAY, some f Gravel @ 6.2 ft becoming Black mf GRAVEL
--	8.0 - 10.0	2.0	DP	TMD	N	N	--	--	PT	Peat
--	10.0 - 12.0	1.0	DP	TMD	N	N	--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
CF-2											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/28/2001		646,703.9	572,645.3			4.5					
CF-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.033	1	CL	Med brown CLAY, little mf gravel, trace organics
--	0.5 - 2.0	2.0	DP	Fill	N	N		0	0.5	CL	Med brown CLAY, little mf gravel, trace organics @ 1.3 ft becoming Dk brown mf GRAVEL, some cmf Sand, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	TMD	N	N		--	--	PT	Peat
--	6.0 - 8.0	1.0	DP	TMD	N	N		--	--	PT	Peat
CF-3											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/28/2001		646,685.2	572,668.2			4					
CF-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	1	CL	Med brown CLAY, trace c gravel, trace organics
CF-3-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N		0	2	CL	Brown CLAY, trace c gravel, trace organics @ 1 ft becoming mf GRAVEL, little mf sand, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	1.5	DP	TMD	N	N		--	--	PT	Peat
--	6.0 - 8.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
CF-4											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/28/2001		646,662.3	572,689.8			3.5					
CF-4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.056	3.4	CL	Med brown CLAY, little mf gravel, little organics	
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.036	1.7	CL	Med brown CLAY, little mf gravel, little organics	
--	2.0 - 4.0	0.2	DP	Fill	N	N	--	--	GW	Med brown mf GRAVEL, little f sand, trace organics	
--	4.0 - 6.0	1.0	DP	Fill/TMD	N	N	0.036	2.6	GP/PT	M. brown mf GRAVEL, little f sand, trace organics @ 4.2 ft ft. Gray CLAY and SILT, mst to sat @ 4.9 ft PEAT.	
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR	
CF-5											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/28/2001		646,617.1	572,693.1			10.4					
CF-5-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	1	SW	Med brown cmf SAND, little c gravel	
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	1.3	SC	Lt gray f SAND and CLAY @ 0.7 ft becoming Orange f SAND	
--	2.0 - 4.0	1.5	DP	Fill	N	N	0	2.6	SP	Orange f SAND	
CF-5-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.006	3	SW	Brick @ 4.4 ft becoming Orange f SAND @ 5.9 ft becoming Black mf GRAVEL	
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.003	1.7	GW	Black mf GRAVEL @ 6.2 ft Lt Gray CLAY @ 6.6 ft Blk cmf GRAVEL @ 6.6 ft Lt. Gray CLAY, hard.	

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.005	1	CL	Orange CLAY, little f gravel
--	10.0 - 12.0	1.0	DP	TMD	N	N	--	--	PT	Peat

CF-6

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/28/2001	646,622.0	572,666.7	10.2

CF-6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	5	SC	Med brown f SAND, trace clay, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.211	9.2	SW	Med brown to orange f SAND, no to little mf gravel, trace clay, trace organics
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.03	2.6	SP	Orange f SAND
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.137	4	SP	Orange f SAND
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	8	GW	Dk brown mf GRAVEL @ 7 ft becoming Orange CLAY
--	8.0 - 10.0	0.0	DP	Fill	--	--	--	--		NR
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR
--	12.0 - 14.0	2.0	DP	Fill	N	N	0	3	GW	Black cmf GRAVEL, little silt, saturated
--	14.0 - 16.0	2.0	DP	TMD	N	N	--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
CF-7											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/28/2001		646,623.4	572,633.0			10.3					
CF-7-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.016	15	SC	Med brown f SAND, some Clay, trace c gravel, trace organics	
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	7.1	SC	Med brown f SAND, some Clay, trace c gravel, trace organics @ 1 ft becoming Orange f SAND	
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.526	5	SW	Dk brown mf SAND, some f Gravel, trace organics	
CF-7-4-6	4.0 - 6.0	1.0	DP	Fill	N	N	>0.999	16	SW	Med brown f SAND, some f Gravel, trace silt, trace organics	
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR	
--	8.0 - 10.0	1.0	DP	Fill/TMD	N	N	0.031	4	GC/PT	Dk brown mf GRAVEL @ 8.6 ft becoming Lt. Gray CLAY, saturated @ 8.8 ft becoming PEAT.	
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR	
CF-8											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/28/2001		646,640.1	572,605.0			8.8					
CF-8-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.003	0.9	SC	Med brown mf SAND, little c clay, trace mf gravel	
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.006	3	GW	Med brown to orange mf SAND, trace clay, trace gravel	
--	2.0 - 4.0	1.2	DP	Fill	N	N	0.005	3.8	CL	Red CLAY, little mf gravel @ 3 ft becoming Black mf GRAVEL	

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.006	3	GC	Gray mf GRAVEL, little clay, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	TMD	N	N	0.087	13	GW/PT	cmf GRAVEL, saturated @ 9 ft becoming Peat.
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

CF-9

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/31/2001	646,679.8	572,609.8	8.5

CF-9-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.135	14	SC	Med brown mf SAND, some Clay, some mc Gravel
CF-9-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.013	9	SC	Med brown mf SAND, some Clay, some mc Gravel
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.003	7.5	CL	Red CLAY, little mc gravel, dense
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.005	7	CL	Red CLAY, little mc gravel, dense @ 5 ft Gray SILT & CLAY @ 5.2 ft Dk brown mf GRAVEL, s. mc Sand, sat.
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.005	8.8	GM	Dk brown mf GRAVEL, some mc Sand, saturated @ 6.2 ft becoming Gray SILT & CLAY
--	8.0 - 10.0	2.0	DP	TMD	N	N	--	--	PT	Peat
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

DC-B12

State Plane Coordinates (ft. NAD83): 646,152.1 572,422.1

G.S. Elev. (ft. NGVD29): 7.211

10/3/2001

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
DC-B12-0-0.5	0.0 - 0.5	0.5	32	Fill	N	N	0.014	17	GW	Med brown cmf GRAVEL, some Clay
--	0.5 - 2.0	0.0	28	Fill	--	--	--	--		NR
DC-B12-2-4	2.0 - 4.0	0.2	6-34-30	Fill	N	N	0.028	66	GW	Med brown cmf GRAVEL, little cmf sand, moist
--	4.0 - 6.0	0.0	2-5-4-37	Fill	--	--	--	--		NR
--	6.0 - 8.0	1.0	10-7-2-1	Fill/TMD	N	N	--	--	GW/PT	Med brown c GRAVEL @ ~ 7 ft becoming PEAT.
--	9.2 - 11.0	0.8	9-8-2-1	TMD	N	N	0.014	26	GW/PT	Black fmc GRAVEL, coated in a petroleum product @ 9.7 ft becoming PEAT
--	11.0 - 13.0	1.7	1-1-1-1	TMD	N	N	0.032	1.3	OL	Dk Gray CLAY, some Peat
--	13.0 - 15.0	2.0	WOH-H-H-3	TMD	N	N	0.014	2.9	OL	Dk Gray CLAY, some f Sand, little peat
--	15.0 - 17.0	2.0	4-8-8-13	TMD/GT	N	N	0.014	0.2	OL	Dk Gray CLAY, some f Sand, little peat @ 16 ft becoming Red brown f SAND, some (-) Silt
--	17.0 - 19.0	1.0	10-8-12-13	GT	N	N	0.005	0	SC	Red brown fm SAND and CLAY, little f gravel
--	20.5 - 22.5	0.8	15-6-6-6	GT	N	N	0.008	0.1	CL	Red brown CLAY, trace f sand
--	22.5 - 24.5	1.5	8-8-5-11	GT	N	N	0.005	0	CL	Red brown Silty CLAY, little f sand, trace fm gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
DC-SED1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/20/2001	646,622.5	572,437.0			--						
SED-DC-1	0.0 - 0.5	0.5	DP	DC Sed	N	N		0.044	0.2	SW	Dk brown cmf SAND, some Organics, saturated
DC-SED2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/20/2001	646,168.1	572,448.7			--						
SED-DC-2	0.0 - 0.5	0.5	DP	DC Sed	N	N		0.058	0	SW	Dk brown cmf SAND, some Organics, saturated
DC-SED3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/20/2001	646,363.9	572,244.7			--						
SED-DC-3	0.0 - 0.5	0.5	DP	DC Sed	N	N		0.746	0.5	ML	Med brown SILT, saturated
DC-SS1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/18/2001	646,620.2	572,440.7			8.1						
DC-SS1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		>0.999	1	SW	Dk brown cmf SAND, some Organics
DC-SS10	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001	646,207.7	572,484.1			8.2						

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.0 - 0.5	0.5	DP	Fill	N	N	0.013	3.5	SW	Med to dk brown cmf SAND, little clay
DC-SS11	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/17/2001	646,167.8	572,448.9		8.2						
DC-SS11-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.138	16	SW	Dk brown cmf SAND, little mf gravel
DC-SS13	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/17/2001	646,181.1	572,394.9		8.3						
DC-SS13-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.139	1.2	GM	Med brown mf GRAVEL, little cmf sand, little silt
DC-SS14	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/17/2001	646,216.5	572,365.2		8.4						
--	0.0 - 0.5	0.5	DP	Fill	N	N	0.03	1.2	GW	Med brown cmf GRAVEL, some mc Sand, trace clay
DC-SS15	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/17/2001	646,244.8	572,341.7		8.4						
DC-SS15-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.992	2.3	SM	Med brown mf SAND, little mf gravel, little silt

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
DC-SS16	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001	646,302.9	572,294.5			8.4						
--	0.0 - 0.5	0.5	DP	Fill	N	N		0.018	5.7	SW	Dk brown mc SAND, some mf Gravel
DC-SS17	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001	646,297.8	572,259.8			8.3						
DC-SS17-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.252	2.3	GW	Med brown mf GRAVEL, some cmf Sand, little clay, trace organics
DC-SS18	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001	646,370.4	572,233.7			8.3						
--	0.0 - 0.5	0.5	DP	Fill	N	N		0.027	1.6	GW	Med brown cmf GRAVEL, some cmf Sand @ 0.2 ft becoming Red CLAY, little f gravel
DC-SS19	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001	646,415.2	572,215.8			8.2						
--	0.0 - 0.5	0.5	DP	Fill	Y	N		>0.999	1.6	SC	Reddish brown mf SAND and CLAY, little mf gravel
DC-SS2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001	646,618.8	572,494.6			8						

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
DC-SS2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	0.4	SW	Dk brown cmf SAND, little mf gravel, little organics
DC-SS20	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/17/2001	646,452.9	572,191.5			8.2					
--	0.0 - 0.5	0.5	DP	Fill	N	N	0.047	0.6	CL	Reddish brown CLAY, some cmf Sand, little mc gravel
DC-SS3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/17/2001	646,563.7	572,489.7			8					
DC-SS3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	0.4	SW	Dk brown cmf SAND, some m Gravel, some Organics
DC-SS4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/18/2001	646,515.3	572,491.9			8					
--	0.0 - 0.5	0.5	DP	Fill	N	N	0.061	0.7	SW	Dk brown cmf SAND, little f gravel, trace organics
DC-SS5	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/18/2001	646,459.4	572,477.3			8.1					
--	0.0 - 0.5	0.5	DP	Fill	N	N	0.014	1.4	SW	Dk brown cmf SAND, some mc Gravel, little organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
DC-SS6											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001		646,345.3	572,495.5			7.641					
DC-SS6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.261	0	SW	Med brown cmf SAND, little mf gravel, trace organics
DC-SS7											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001		646,288.5	572,502.2			8.2					
DC-SS7-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.137	7	SW	Med brown cmf SAND, little mf gravel, little organics
DC-SS8											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/18/2001		646,240.6	572,496.6			6.662					
--	0.0 - 0.5	0.5	DP	Fill	N	N		0.003	1.4	CL	Reddish brown CLAY, little f gravel
DC-SS9											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/17/2001		646,210.5	572,495.0			7.566					
DC-SS9-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.123	1	SW	Med brown mf SAND @ 0.2 ft becoming CLAY and cmf SAND, little mf gravel
DSP-1											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
10/3/2001		646,406.9	571,995.0			8.053					

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
DSP-1-0-0.5	0.0 - 0.5	0.5	5	Fill	N	N	0.023	0.8	CL	Med brown to red CLAY, some mf Gravel, little cmf sand
--	0.5 - 2.0	1.0	6-4-5	Fill	N	N	0.003	0.3	CL	Med brown to red CLAY, some mf Gravel, little cmf sand
--	2.0 - 4.0	0.8	4-4-5	Fill	N	N	0.003	0	CL	Red CLAY, little f gravel
DSP-1-4-6	4.0 - 6.0		6-5-4-7	Fill	N	N	0.005	34	CL	Red CLAY, mf chunks of shale
--	6.0 - 8.0	1.0	4-2-1-1	Fill	N	N	0	1.6	GP/PT	Black fm GRAVEL, saturated @ 6.5 ft becoming PEAT
--	7.7 - 8.0	0.3	10-10-3-3	TMD	N	N	0	3.8	PT	PEAT
--	9.0 - 11.0	1.5	1-1-1-2	TMD	N	N	0	0.8	PT	PEAT @ 10 ft becoming M brown CLAY and PEAT
--	11.0 - 13.0	0.3	1-1-2-3	GT	N	N	0	0.8	CL	Red brown CLAY, some f Sand, little fm gravel
--	13.0 - 15.0	1.0	4-5-9-12	GT	N	N	0	0.7	ML	Red brown CLAY & SILT, some (-) fm Gravel
--	18.0 - 20.0	1.5	11-17-19-50/5	GT	N	N	0	0.6	ML	Red brown CLAY & SILT, little (+) fm gravel @ 19.4 ft becoming Weathered SHALE

DSP-2

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/4/2001	646,408.7	571,992.7	7.4

DSP-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	5.6	GC	Dk brown mf GRAVEL, some Clay, little mf sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	9	CL	Red with trace purple CLAY, little mf gravel, dense
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.184	2.1	CL	Red with trace purple CLAY, little mf gravel, dense @ 3.2 ft becoming Black mf GRAVEL, cinders

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.06	3	CL	Red CLAY, little mf gravel, dense @ 5.5 ft becoming Black mf GRAVEL, cinders
--	6.0 - 8.0	0.5	DP	Fill	N	N	0.041	1.4	GW	Black mf GRAVEL, cinders

DSP-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/4/2001	646,424.3	571,961.2	7.6

DSP-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.011	5	CL	Dk brown CLAY, some cmf Gravel, little mf sand, saturated
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.026	2	CL	Reddish brown CLAY, little mf gravel
DSP-3-2-4	2.0 - 4.0	1.5	DP	Fill	N	N	0.035	1.6	CL	Reddish brown CLAY, little mf gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.013	2	CL	Reddish brown CLAY, little mf gravel @ 4.3 ft becoming Lt brown f SAND @ 5.3 ft becoming Red CLAY, dense
--	6.0 - 8.0	1.8	DP	Fill/TMD	N	N	0.011	2.6	GM/PT	Red CLAY, dense @ 6.5 ft becoming Black mf GRAVEL, some c Sand, cinders @ 7.6 ft becoming PEAT.

DSP-4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/4/2001	646,417.8	571,980.7	7.5

DSP-4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.004	26	CL	Reddish brown CLAY, little mf gravel, little cmf sand, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.022	4	CL	Reddish brown CLAY, little mf gravel, little cmf sand, trace organics
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.009	4	CL	Reddish brown CLAY, little mf gravel, little cmf sand, trace organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
DSP-4-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.008	0.8	CL	Red CLAY, some mf Gravel @ 5 ft becoming Black mf GRAVEL, moist to saturated
--	6.0 - 8.0	1.2	DP	Fill/TMD	N	N	0	28	CL/PT	Red-brwn CLAY, little mf gravel, little cmf sand, trace organics @ 6.5 ft Blk mf GRAVEL, l. c sand, @ 7 ft PEAT.
EC-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001	646,749.9	572,682.6			--					
EC-1	0.0 - 1.0		DP	Fill	--	--	--	--	CL	Red CLAY and SAND
EC-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001	646,673.6	572,730.5			--					
EC-2	0.0 - 1.0		DP	Fill	--	--	--	--	CL	Red CLAY and SAND
EC-3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001	646,592.3	572,789.5			--					
EC-3	0.0 - 1.0		DP	Fill	--	--	--	--	CL	Red CLAY and SAND
EC-4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001	646,489.2	572,839.8			--					
EC-4	0.0 - 1.0		DP	Fill	--	--	--	--	SM	Sandy, Topsoil

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
EC-5										
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001		646,346.5	572,904.5			--				
EC-5	0.0 - 1.0		DP	Fill	--	--	--	--	SM	SAND, some Silt
EC-6										
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001		646,205.8	573,005.4			--				
EC-6	0.0 - 1.0		DP	Fill	--	--	--	--	SM	SAND, some Silt
EC-7										
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001		646,171.2	573,134.9			--				
EC-7	0.0 - 1.0		DP	Fill	--	--	--	--	SM	SAND, some Silt
EC-8										
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001		646,137.7	573,256.1			--				
EC-8	0.0 - 1.0		DP	Fill	--	--	--	--	SP	Sand
EC-9										
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001		646,101.0	573,375.6			--				

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
EC-9	0.0 - 1.0		DP	Fill	--	--	--	--	SP	Sand
ESR-1	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
9/4/2001	646,208.8	572,749.2		8.9						
ESR-1-0-1	0.0 - 0.5	1.0	DP	Fill	N	N	0.056	3.4	GW	Gray c GRAVEL
--	0.5 - 2.0	0.5	DP	Fill	N	N	--	--	SP	Lt brown f SAND
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
ESR-1-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.018	77	SP	Lt brown f SAND
--	6.0 - 8.0	1.0	DP	Fill/TMD	N	N	0.004	27	SP/PT	Lt brown f SAND @ 6.5 becoming PEAT
HB-1A	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
4/18/2002	646,648.9	572,212.4		--						
HB-1A	6.8 - 6.8	1.0	DP	Natural Soil	Y	N	0.026	3.6	OL	Black CLAY
HB-3A	State Plane Coordinates (ft. NAD83)			G.S. Elev. (ft. NGVD29)						
4/17/2002	646,565.8	572,228.1		--						
HB-3A	5.3 - 5.3	0.5	DP	Fill?	N	N	0.043	5	SC	Dk Brown f SAND, little clay, trace organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
HB-3B	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/17/2002	646,563.5	572,251.4			--					
HB-3B	4.5 - 4.5	1.0	DP	Natural Soil	Y	N	--	0	CL	Red brown CLAY, dense
HB-3C	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/18/2002	646,561.7	572,271.5			--					
HB-3C	4.5 - 4.5	1.0	DP	Natural Soil	Y	N	--	0.2	CL	Red brown CLAY, dense
HB-3D	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/18/2002	646,559.3	572,296.3			--					
HB-3D	4.5 - 4.5	1.0	DP	Natural Soil	Y	N	--	0	CL	Red brown CLAY, dense
HB-4A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/19/2002	646,531.2	572,212.0			--					
HB-4A	5.3 - 5.3	1.0	DP		N	N	0.017	1.5	SW	Dk Gray fm SAND, saturated
HB-5A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/22/2002	646,490.9	572,207.8			--					

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
HB-5A	3.0 - 3.0	1.0	DP		N	N	0.008	1.4	CL	M brown CLAY, some mc SAND, little f gravel
HB-7A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/19/2002	646,549.4	572,201.1			--					
HB-7A	5.0 - 5.0	0.5	DP		Y	N	--	0.4	CL	M brown CLAY, some mc Gravel, little organic material (wood)
HB-8A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/23/2002	646,477.9	572,362.6			--					
HB-8A	3.0 - 3.0	1.0	DP		N	N	0.006	0.3	SW	Dk brown mc SAND, some fm Gravel, piece of wood, saturated
HB-8B	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/23/2002	646,482.0	572,313.3			--					
HB-8B	4.8 - 4.8	1.0	DP		Y	N	0.012	2.3	CL	Silty CLAY, trace fm gravel
HB-8C	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
4/23/2002	646,485.2	572,278.3			--					
HB-8C	5.5 - 5.5	1.0	DP		N	N	0.003	20	OL	Black and brown CLAY, some fm Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
HB-9A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
4/24/2002	646,436.5	572,363.9			--						
HB-9A	4.8 - 4.8	1.0	DP		N		N	0.007	1.7	SW	M Brown mc SAND, little f gravel
HF-B1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/10/2001	645,983.3	572,547.2			7.8						
HF-B1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N		N	0	2.8	GW	Brown mf GRAVEL, little mf sand
--	0.5 - 2.0	0.5	DP	Fill	N		N	0.012	194.3	ML	Reddish brown SILT & CLAY, trace coal
--	2.0 - 4.0	0.0	DP	Fill	--		--	--	--		NR
--	4.0 - 6.0	1.5	DP	Fill	N		Y	0.004	6.4	ML	Red-brwn SILT & CLAY, little mf gravel @ 4.3 ft Black SAND @ 4.6 ft clayey SILT @ 5 ft cmf SAND and mf GRAVEL, sat.
--	6.0 - 8.0	0.0	DP	Fill	--		--	--	--		NR
HF-B1-8-10	8.0 - 10.0	2.0	DP	Fill/TMD	N		Y	0.049	185	GW/PT	Black cmf SAND and mf GRAVEL, saturated, @ 9.5 ft becoming PEAT @ 9.7 ft Gray f SAND, little silt
--	10.0 - 12.0	0.0	DP	TMD?	--		--	--	--		NR
HF-B2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/4/2001	646,817.9	572,662.4			8.2						

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
HF-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.023	2.5	SW	Med brown cmf SAND, little mc gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.003	3.2	SW	Med brown cmf SAND, little mc gravel
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.008	2	SP	Lt brown f SAND
HF-B2-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.01	2.1	SC	Lt brown f SAND @ 4.3 ft Red CLAY, little f gravel, little cmf sand @ 4.9 ft Blk GRAVEL @ 5.2 ft $ CLAY
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.006	2	ML	Gray Silty CLAY @ 6.7 ft Dk brown mf GRAVEL, some c Sand @ 7.2 ft Lt Orangy brown CLAY, soft
--	8.0 - 10.0	1.5	DP	TMD	N	N	--	--	PT	Peat
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

HF-B3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
10/2/2001	646,916.8	571,629.2	7.593

HF-B3-0-.5	0.0 - 0.5	0.5	4	Fill	N	N	0.117	18	CL	Med brown CLAY, some cmf Sand, little mc gravel
--	0.5 - 2.0	0.5	6-2-8	Fill	N	N	0.005	12	CL	Med brown CLAY, some cmf Sand, little mc gravel
--	2.0 - 4.0	1.5	11-9-10-10	Fill	N	N	0.048	6	CL	Red CLAY, some m Gravel, very dense
--	4.0 - 6.0	1.0	10-6-4-5	Fill	N	N	0.02	3.4	CL	Reddish brown CLAY, little mf sand, moist
--	6.0 - 8.0	1.0	5-2-2-2	Fill	N	N	0.041	1	CL	Reddish brown CLAY, moist
HF-B3-8-10	8.0 - 10.0	2.0	2-1-1-1	Fill/TMD	N	N	0.07	32	CL/PT	Reddish brown CLAY, moist @ 8.5 ft becoming PEAT

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	10.0 - 12.0	2.0	1-1-1-1	TMD	N	N	0.044	0.6	PT	PEAT, some Clay
--	12.0 - 14.0	2.0	1-2-1-1	TMD/GF	N	N	0.026	0.4	PT	PEAT (clay rich) @ 13.5 ft becoming Dk Gray to brown CLAY, mottled
--	14.0 - 16.0	1.0	1-1-2-5	GF/GT	N	N	0.006	0.4	CL	Dk Gray to brown CLAY, little fm gravel @ 14.5 ft becoming Red brown CLAY & SILT, some fm Gravel
--	16.0 - 18.0	1.0	3-5-7-8	GT	N	N	0.003	0.2	ML	Red brown CLAY & SILT, some fm Gravel
--	21.0 - 23.0	1.5	3-5-8-10	GT	N	N	0.003	0.2	ML	Red brown CLAY & SILT, little (+) fm gravel, little f sand
--	26.0 - 27.0	1.0	3-5-7-8	GT	N	N	0.003	0.3	ML	Red brown CLAY & SILT, some fm Gravel
--	31.0 - 33.0	1.0	6-9-15-44	GT	N	N	0.059	10.2	GC	Red brown fm GRAVEL and CLAY
--	36.0 - 38.0	0.3	50/2.5	BR	N	N	0.003	3	GC	Red brown fm GRAVEL and CLAY, trace shale

IB-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
4/8/2002	646,648.1	572,369.9	8.2

IB-1-0-2	0.0 - 2.0	2.0	DP	Fill	N	N	0.106	0	SW	CONCRETE @ 0.5 ft becoming Lt brown fmc SAND, some mc Gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
IB-1-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.02	0	SC	M brown to yellow brown fm SAND, little clay, saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.014	0	SC	M brown to yellow brown fm SAND, little clay, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.029	0	SW	M brown fm SAND, saturated

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0.032	0	SW/PT	M brown fm SAND, saturated @ 11.5 ft becoming PEAT

IB-2

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
4/8/2002	646,559.3	572,400.3	8.2

--	0.0 - 2.0	1.0	DP	Fill	N	N	0.015	0	GW	Black fm GRAVEL, some fm Sand @ 0.2 ft becoming Red brown mc GRAVEL @ 0.5 ft becoming Yellow mfc GRAVEL
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
IB-2-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.048	0	GC	Yellow mfc GRAVEL @ 4.5 ft becoming M brown CLAY, some fm Sand
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.006	1	CL	Black CLAY and fm SAND, some f Gravel
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.004	2.5	OL	Black CLAY, some Organics, little fm gravel
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR
IB-2-12-14	12.0 - 14.0	2.0	DP	Fill	N	N	0.004	3.7	CL	Black CLAY, some Organics, little fm gravel
--	14.0 - 16.0	0.0	DP	Fill	--	--	--	--		NR
--	16.0 - 18.0	2.0	DP	Fill	N	N	0.031	4	SC	Dk Brown fm SAND and CLAY, some organics @ 16.5 ft becoming Gray f SAND and CLAY @ 17.5 ft become CLAY.
--	18.0 - 20.0	0.0	DP		--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
IB-3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
4/8/2002	646,437.8	572,388.1			8.1						
--	0.0 - 2.0	2.0	DP	Fill	N	N		0.045	1	GW	Black fm GRAVEL, some mc Sand
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
IB-3-4-6	4.0 - 6.0	1.0	DP	Fill	--	--		0.034	2.6	SW	Black fmc SAND, some mc Gravel, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--		--	--		NR
IB-3-8-10	8.0 - 10.0	2.0	DP	Fill/TMD	--	--		0.026	1	GM/PT	Black cmf GRAVEL @ 8.4 ft becoming Black CLAY, some fmc Gravel @ 9.5 ft becoming PEAT
--	10.0 - 12.0	0.0	DP	TMD	--	--		--	--		NR
LP-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/27/2001	646,561.5	572,590.7			8.31						
LP-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.028	10.3	SW	Lt brown mf SAND, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.355	2.1	CL	Gray CLAY, little mf gravel
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.157	2.4	SP	Orange mf SAND
--	4.0 - 6.0	1.5	DP	Fill	N	N		0.026	9	CL	Gray CLAY, little mf gravel @ 4.2 ft becoming Orange mf SAND @ 4.5 ft becoming SILT & CLAY, some c Gravel, sat.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	0.0	DP	Fill	--	--	--	--		NR
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR
--	12.0 - 14.0	0.5	DP	Fill/TMD	N	N	0.029	3.7	SW/PT	Med brown mf SAND, saturated @ 12.4 becoming PEAT.

LP-10

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/27/2001	646,482.1	572,532.0	8.2

LP-10-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	4.9	CL	Reddish brown CLAY and f SAND, little m gravel, trace organics
LP-10-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	3.1	CL	Reddish brown CLAY and f SAND, little m gravel, trace organics
--	2.0 - 4.0	1.5	DP	Fill	N	N	>0.999	0	OL	Gray CLAY @ 2.5 ft becoming Red CLAY and f SAND @ 3 ft becoming Gray CLAY
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.017	0.8	CL	Gray CLAY, little cmf gravel, soft, saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.011	0	CL	Gray CLAY, little cmf gravel, soft, saturated @ 6.5 ft becoming Med brown mf GRAVEL, some c Sand, sat.
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.01	0.3	CL/PT	Med grown to gray CLAY, little mf gravel, saturated @ 9 ft becoming PEAT.
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

LP-11

State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
646,435.9	572,540.1	8.4

8/27/2001

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
LP-11-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.06	11	SC	Med brown f SAND, little clay, little mc gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	13.6	OL	Gray CLAY, little mf gravel
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.574	5	OL	Gray CLAY, little mf gravel @ 2.6 ft becoming Lt brown f SAND @ 2.8 ft becoming Gray CLAY, little mf gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.003	10.5	OL	Gray CLAY, little f sand @ 5.2 ft becoming mf GRAVEL, little silt, moist to saturated
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	4.2	GM	Gray mf GRAVEL, little silt, saturated
--	8.0 - 10.0	0.0	DP	Fill?	--	--	--	--		NR
--	10.0 - 12.0	0.0	DP	Fill?	--	--	--	--		NR
--	12.0 - 14.0	0.0	DP	Fill?	--	--	--	--		NR
--	14.0 - 16.0	0.0	DP	Fill?	--	--	--	--		NR
--	16.0 - 18.0	2.0	DP	TMD	N	N	--	--	OL	Gray CLAY
--	18.0 - 20.0	0.0	DP	TMD?	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
LP-12	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/27/2001	646,287.8	572,609.8			12						
LP-12-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.025	0	SW	Med brown cmf SAND, little f gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N		0	0	SP	Orange f SAND
--	2.0 - 4.0	1.0	DP	Fill	N	N		0	0.3	SP	Orange f SAND
LP-12-4-6	4.0 - 6.0	2.0	DP	Fill	N	N		0.012	0	SC	Orange to brown mf SAND, little c gravel @ 5.5 ft becoming Gray Silty CLAY
--	6.0 - 8.0	1.0	DP	Fill	N	N		0.003	0	CL	Gray Silty CLAY @ 6 ft becoming Orange f Sand
--	8.0 - 10.0	2.0	DP	Fill	N	N		0	0	GM	Dk brown mf GRAVEL, little silt, trace mf sand, saturated
--	10.0 - 12.0	1.0	DP	Fill	N	N		0	0	GM	Dk brown mf GRAVEL, little silt, trace mf sand, saturated
--	12.0 - 14.0	2.0	DP	Fill	N	N		0	0	GM	Dk brown mf GRAVEL, little silt, trace mf sand @ 13.2 ft become CLAY, very hard @ 13.5 ft become mf GRAVEL, sat.
--	14.0 - 16.0	2.0	DP	TMD	N	N		--	--	PT	Peat
LP-13	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/24/2001	646,386.1	572,542.4			9						
LP-13-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.066	9	CL	Med brown CLAY, little c gravel, little f sand, trace organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	7	CL	Med brown CLAY, little c gravel, little f sand, trace organics
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.567	9	SP	Orange f SAND
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.181	15	SC	Orange f SAND @ 4.2 ft becoming Gray CLAY, moist
--	6.0 - 8.0	0.5	DP	Fill	N	N	0	12	GC	Gray cmf GRAVEL and CLAY, trace organics
--	8.0 - 10.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	12.0 - 14.0	0.0	DP	TMD	N	N	--	--	PT	Peat

LP-14

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/24/2001	646,361.3	572,565.4	9.9

LP-14-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.003	0.5	SC	Med brown cmf SAND, little mc gravel, trace clay
LP-14-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.782	0	SC	Med brown cmf SAND, little mc gravel, trace clay
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.032	0	SW	Gray cmf GRAVEL and mc SAND @ 3 ft becoming Orange f SAND
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.007	0	SC	Orange f SAND @ 5 ft becoming Red cmf SAND, little f gravel @ 5.3 ft Lt Gray CLAY, saturated.
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.007	0	OL	Lt gray CLAY @ 7 ft becoming Dk brown mf GRAVEL, some cmf Sand, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	0	ML	Gray SILT & CLAY, little m gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0.007	0	OL/PT	Gray SILT & CLAY, little m gravel @ 11 ft becoming PEAT.

LP-15

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/24/2001	646,318.1	572,556.6	9.5

LP-15-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.045	1	SC	Med brown mf SAND, little clay, little m gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.64	1	SC	Med brown cmf SAND, some mc Gravel, little clay
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.069	1	SC	Med brown cmf SAND, some mc Gravel, trace clay @ 2.2 ft becoming Orange f SAND
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.011	0.5	SC	Orange f SAND @ 4.7 ft becoming Red c GRAVEL @ 5.0 ft becoming Gray CLAY, moist
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.005	1	CL	Gray CLAY, moist @ 6.3 ft becoming Med brown cmf SAND, little mc gravel
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.006	0	ML	Orange to Lt Gray CLAY @ 9 ft becoming Med brown SILT & CLAY, little mf gravel, saturated
--	10.0 - 12.0	1.0	DP	TMD	N	N	--	--	PT	Peat

LP-16

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/27/2001	646,349.6	572,541.4	8.6

LP-16-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.049	1.8	CL	Med brown CLAY and mf SAND, some mf Gravel
LP-16-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.061	0	CL	Med brown CLAY and mf SAND, some mf Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.058	1	CL	Med brown CLAY and mf SAND, some mf Gravel @ 2.5 ft becoming Med brown Silty CLAY
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.011	0	CL	Gray CLAY, soft, saturated
--	6.0 - 8.0	1.5	DP	Fill	N	N	0.016	0	CL	Gray CLAY, soft @ 5.3 ft becoming Gray CLAY & SILT, saturated
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.018	0	OH/PT	Gray CLAY & SILT, saturated @ 9 ft becoming PEAT.
--	10.0 - 12.0	0.5	DP	TMD	N	N	--	--	PT	Peat

LP-2

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/28/2001	646,575.3	572,561.6	8.4

LP-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.7	1	SM	Med brown f SAND, trace f gravel, trace silt
LP-2-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	4	CL	Reddish gray CLAY, little mc gravel
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.083	4	CL	Red to gray CLAY, trace cmf gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.031	0	SM	Red to gray CLAY, trace f gravel @ 4.7 fmc GRAVEL @ 5.5 ft Reddish brown mf GRAVEL, little c sand
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.015	0.5	CL	White CLAY, dense @ 6.5 ft becoming Black mf GRAVEL @ 6.8 ft becoming Gray CLAY
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.047	1.1	GM/PT	Med brown cmf GRAVEL @ 8.5 ft becoming Lt. Gray CLAY, little f gravel @ 8.9 becoming PEAT.
--	10.0 - 12.0	1.0	DP	TMD	N	N	--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
LP-3											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/27/2001		646,567.5	572,593.5			9.5					
LP-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.013	1.9	SW	Gray mf SAND, little mf gravel	
--	0.5 - 2.0	1.0	DP	Fill	N	N	0	1	SP	Orange f SAND	
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR	
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.005	1.2	SW	Orange f SAND @4.8 becoming Black mf GRAVEL @ 5.5 ft becoming Lt gray Silty CLAY, shards of glass, moist	
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	0	ML	Lt Gray Silty CLAY, shards of glass, moist @ 6.5 becoming Orange CLAY, some f Sand	
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.007	1	ML	Brownish orange Clayey SILT, trace f Gravel, saturated	
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0.011	0.3	ML/PT	Lt Gray SILT @ 11 ft becoming PEAT.	
LP-4											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/21/2001		646,549.1	572,575.4			8.9					
LP-4 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.029	13.8	SW	Med brown cmf SAND, some mc Gravel	
LP-4 .5-2	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	32.7	SW	Med brown cmf SAND, some mc Gravel	
--	2.0 - 4.0	1.0	DP	Fill	N	N	>0.999	5.1	SM	Med brown cmf SAND, some mc Gravel @ 2.5 ft becoming Red mc SAND, little silt	

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	>0.999	2.1	SC	Med brown to black cmf SAND @ 5.2 ft White CLAY @ 5.3 ft Med brown mc SAND little cmf gravel, sat.
--	6.0 - 8.0	1.0	DP	Fill	N	N	>0.999	0.4	SC	Med brown mc SAND little cmf gravel, saturated @ 6.2 ft becoming White CLAY, saturated.
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	>0.999	9.1	OH/PT	Gray CLAY & SILT, saturated @ 9.5 ft becoming PEAT.
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

LP-5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/27/2001	646,541.9	572,558.1	--

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
LP-5-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	1	SC	Med brown cmf SAND, little clay, little mf gravel, trace organics
--	0.5 - 2.0	1.3	DP	Fill	N	N	>0.999	1.2	SC	Med brown cmf SAND, little clay, little mf gravel, trace organics @ 1 ft becoming Silty CLAY, little f sand, trace mf gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.8	DP	Fill	N	N	0.186	0	SM	Med brown mf SAND and SILT, little f gravel @ 5 ft becoming Black mc GRAVEL, little silt
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.213	9	CL	Dk brwn CLAY, some mf Gravel @ 8.2 ft Lt gray Silty CLAY trace f gravel @ 9.5 ft c SAND and f GRAVEL, moist
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
LP-6											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/27/2001		646,242.9	572,708.0			12					
LP-6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.037	0.6	SW	Med brown to orange f SAND, trace c gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N		0	0	SP	Orange f SAND
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.058	0	SP	Orange f SAND
LP-6-4-6	4.0 - 6.0	2.0	DP	Fill	N	N		0.477	0	SP	Orange f SAND
--	6.0 - 8.0	2.0	DP	Fill	N	N		0.049	0	SW	Orange to dk brown mf SAND
--	8.0 - 10.0	0.0	DP	Fill	--	--		--	--		NR
--	10.0 - 12.0	0.0	DP	Fill	--	--		--	--		NR
--	12.0 - 14.0	2.0	DP	TMD	N	N		--	--	PT	Peat
--	14.0 - 16.0	2.0	DP	TMD	N	N		--	--	PT	Peat
LP-7											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/24/2001		646,518.6	572,550.9			8.5					
LP-7-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		>0.999	7	SC	Brown mf SAND, some Clay, little mf gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.871	1	CL	Gray CLAY @ 1 ft becoming Gray CLAY and c GRAVEL @ 1.2 ft becoming Red CLAY, little mf gravel
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.139	1.5	CL	Lt Gray to red CLAY, little to no mf gravel, moist
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.027	0.9	CL	Red CLAY, little mf gravel @ 5 ft Med brown f SAND, some mc Gravel @ 5.6 ft Med Gray CLAY, moist
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.015	1.1	CL	Med Gray CLAY @ 6.2 ft becoming Med brown mf GRAVEL, some mc Sand, moist
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.011	1.7	ML	Med brown SILT and mf GRAVEL @ 9 ft becoming Lt gray SILT & CLAY, saturated
--	10.0 - 12.0	1.0	DP	Fill	N	N	0.008	1.7	ML	Lt gray SILT & CLAY, saturated
--	12.0 - 14.0	2.0	DP	TMD	N	N	--	--	PT	Peat
--	14.0 - 16.0	1.0	DP	TMD	N	N	--	--	PT	Peat

LP-8

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/24/2001	646,501.8	572,582.8	9.8

LP-8-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	2.9	SP	Med brown mf SAND
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.023	7	SW	Med brown to gray cmf SAND, some to no c Gravel
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.013	1.7	SC	Orange mf Sand @ 2.8 ft becoming Red CLAY, little mf gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.017	4	GC	Orange f SAND @ 5.5 ft becoming Black mf Gravel, little clay, moist
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.005	0	CL	Gray to white CLAY @ 6.5 ft becoming Med brown to black cmf GRAVEL, little f sand, saturated

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	2.8	CL	Lt gray CLAY, saturated
LP-8-10-12	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0.037	5	CL/PT	Lt gray CLAY, saturated @ 11 ft becoming PEAT.

LP-9

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/24/2001	646,424.5	572,565.5	9.4

LP-9-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.005	0.4	SC	Med brown cmf SAND, some cmf Gravel, trace clay
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.128	0	SC	Med brown cmf SAND, some cmf Gravel, trace clay
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.009	0	SC	Med brown cmf SAND, some cmf Gravel, trace clay @ 3 ft becoming Orange f SAND @ 3.9 ft becoming Gray CLAY
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.009	0.2	SC	Orange f SAND @ 5 ft becoming Lt Gray CLAY, dry to moist
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.051	0	GC	Dk gray mf GRAVEL, some Clay, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.006	0	SW	Med brown mf SAND @ 9 ft becoming Black mf GRAVEL, little cmf sand, saturated
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	12.0 - 14.0	0.0	DP	TMD	N	N	--	--	PT	Peat

MW-B16

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
10/3/2001	647,001.3	572,297.6	6.349

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.0 - 0.5	0.3	50/5	Fill	N	N	0.02	0.8	SW	Brown cmf SAND, little f gravel
--	0.5 - 2.0	0.0	DP	Fill	--	--	--	--		NR
--	2.0 - 4.0	0.0	26-38-50	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.0	5-7-7-6	Fill	N	N	0.105	8.8	GW	Black f GRAVEL, some cmf Sand, saturated
--	6.0 - 8.0	1.2	2-3-4-4	Fill	N	N	0.121	20	GW	Black f GRAVEL, some cmf Sand, saturated
--	8.0 - 10.0	1.0	2-4-4-3	Fill	N	N	0.048	27	GW	Black f GRAVEL, some cmf Sand, saturated
--	10.0 - 12.0	0.7	2-2-1-1	Fill	N	N	0.108	61	GW	Black f GRAVEL, some cmf Sand, saturated
--	13.0 - 15.0	1.5	1-1-1-2	TMD	N	N	0.003	297	OL	Lt. Gray/brown Clayey SILT, some f Sand, occasional peat, saturated
--	15.0 - 17.0	2.0	10-10-11-4	TMD	N	N	0.003	234	OL/PT	Clayey SILT, some f Sand, occ. peat, sat. @ 16 ft SILT and f SAND, tr. f gravel @ 16.5 ft fm SAND, tr silt, sat.
--	17.0 - 19.0	2.0	9-9-10-12	TMD/GF	N	N	0.006	279	SW	Lt. Gray fm SAND, trace silt, saturated @ 18 ft becoming Red brown SILT, trace f sand, slightly stratified
--	19.0 - 21.0	2.0	14-15-14-50/4	GF/GT	N	N	0	1475	SM	Dk Gray fm SAND, trace Silt @ 20.5 ft becoming Red brown f SAND and SILT, little f gravel, little cm sand
--	24.0 - 26.0	1.5	2-4-6-9	GT	N	N	0	188	ML	Red brown CLAY & SILT, little f gravel, trace fmc sand, saturated
--	29.0 - 31.0	1.5	3-5-7-9	GT	N	N	0.006	34	ML	Red brown SILT & CLAY, trace fmc sand, saturated
--	34.0 - 36.0	1.5	3-5-7-8	GT	N	N	0	88	ML	Red brown CLAY & SILT, little fm gravel, trace fm sand, saturated
--	39.0 - 41.0	0.3	50/3	BR	N	N	0.015	79	GW	Red brown weathered shale

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
PCA-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/17/2001	646,826.8	571,391.6			7.5						
PCA-1-0-.5	0.0 - 2.0	2.0	DP	Fill	N	N		0.005	0	SM	Dk browm mc SAND, some cmf Gravel @ 0.5 ft becoming Red SILT & CLAY, some cmf Gravel, trace f sand.
--	2.0 - 4.0	1.4	DP	Fill	N	N		0.004	0	ML	Red SILT & CLAY, some cmf Gravel, trace f sand
PCA-1-4-6	4.0 - 6.0	2.0	DP	Fill	N	N		0.005	20	ML	Red SILT & CLAY, some cmf Gravel, trace f sand
--	6.0 - 8.0	2.0	DP	Fill	N	N		0	0	ML	Red SILT & CLAY, some cmf Gravel, trace f sand @ 7 ft becoming Black cmf GRAVEL, saturated.
--	8.0 - 10.0	2.0	DP	Fill	N	N		0.007	0	ML	Red brown SILT & CLAY, little f gravel @ 8.5 ft. becoming Black cmf GRAVEL.
--	10.0 - 12.0	0.4	DP	TMD	N	N		0.005	0	PT	Peat
PCA-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/17/2001	646,944.0	571,703.6			8.1						
PCA-2-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.493	0	SW	Med brown cmf SAND, some mc Gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.149	--	SM	Red brown f SAND and SILT, trace organics
--	2.0 - 4.0	2.0	DP	Fill	N	N		0.157	--	SM	Red brown f SAND and SILT, trace organics
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.007	0	ML	Red brown SILT & CLAY

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.006	0	SM	Orange mf SAND, little silt
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.054	0	ML	Red SILT & CLAY @ 8.5 ft becoming Orange mf SAND, little silt, saturated
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N	0.05	0	SM	Orange mf SAND, little silt, saturated @ 10.5 ft becoming Red f SAND and SILT, little clay @ 11.5 ft becoming PEAT.

PCA-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/13/2001	646,473.7	572,050.6	8.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
PCA-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.024	4.5	SW	Lt brown f SAND, little f gravel, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.009	7	SW	Black cmf SAND, little f gravel, cinders
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.008	7.6	SW	Black cmf SAND, little f gravel
PCA-3-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.015	11	GW	Black mf GRAVEL, some c Sand, saturated @ 5.5 ft
--	6.0 - 8.0	1.0	DP	Fill	N	N	--	--	GW	Black mf GRAVEL, some c Sand, saturated

PCA-4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/13/2001	646,258.3	572,204.8	8.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
PCA-4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.006	>250	SW	Med brown cmf SAND, little mf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	1.7	ML	Reddish brown SILT & CLAY, little f sand, little mf gravel, dry

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	1.5	DP	Fill	N	N	0	1.7	ML	Reddish brown SILT & CLAY, little f sand, little mf gravel, dry
PCA-4-4-6	4.0 - 6.0	2.0	DP	Fill	N	Y	0.006	365	CL/GW	Red CLAY @ 5 ft Black mf GRAVEL, little cmf sand, moist
--	6.0 - 8.0	0.0	DP	Fill?	--	--	--	--		NR

PCA-5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/7/2001	646,665.9	572,391.6	8.2

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
PCA-5-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.003	8	SC	Med brown cmf SAND, some Clay, moist
PCA-5-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0	5.6	SC	Med brown cmf SAND, some Clay, moist @ 0.7 ft becoming Red CLAY, some mf Gravel, dense
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.5	DP	Fill	N	N	0	4.8	CL	Med brown CLAY, little f sand
--	6.0 - 8.0	0.0	DP	Fill?	--	--	--	--		NR

PCA-6

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/7/2001	646,793.7	572,287.1	8

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
PCA-6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	7	CL	Red CLAY, some cmf Sand, little mf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	7	CL	Red CLAY, some cmf Sand, little mf gravel @ 1 ft becoming Black mf GRAVEL, little clay, moist

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	4	CL	Med brown CLAY, some mf Gravel, saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	7	GW	Black mf GRAVEL

RR-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/22/2001	646,555.1	572,102.1	8.7

RR-1 0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	123	GW	Med brown mc GRAVEL and cmf SAND, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	164	GW	Med brown mc GRAVEL and cmf SAND, trace organics @ 1.5 ft becoming Gray CLAY, little m gravel.
--	2.0 - 4.0	1.0	DP	Fill	N	N	0	71.7	CL	Gray CLAY, little m gravel @ 2.5 ft becoming Red CLAY, trace m gravel.
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	164	CL	Red CLAY, some c Gravel
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	148	CL	Red CLAY, some c Gravel, moist
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	>250	CL	Med brown CLAY, some c Gravel, little mf sand @ 9 ft becoming Black CLAY, moist.
--	10.0 - 12.0	1.0	DP	Fill	N	N	0	145	CL	Red Clay, moist
--	12.0 - 14.0	2.0	DP	Fill	N	N	0.007	>250	SC	Med brown cmf SAND some Clay, saturated
RR-1 14-16	14.0 - 16.0	2.0	DP	Fill	N	N	0.047	>250	SC	Med brown cmf SAND, some Clay @ 14.5 ft becoming Dk gray to red CLAY, some mf GRAVEL
--	16.0 - 18.0	2.0	DP	Fill	N	N	0.085	>250	CL	Red CLAY, little mf GRAVEL. Refusal @ 18 ft.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
RR-10											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
10/12/2001		645,686.8	572,775.3				--				
RR-10 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	13.7		
RR-11											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
10/12/2001		645,586.1	572,862.7				--				
RR-11 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	4.2		
RR-12											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
10/12/2001		645,479.9	572,946.3				--				
RR-12 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	4.2		
RR-2											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/13/2001		646,433.1	572,150.1				8.1				
RR-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.006	4	GW	Dk brown cmf GRAVEL, little c sand, moist
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.003	2.6	GW	Med brown c GRAVEL, little clay @ 1.7 ft becoming Reddish brown CLAY little mf gravel, dense, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.005	6	ML	Wood pieces @ 4.2 Lt gray SILT & CLAY @ 4.5 ft Dk brown f GRAVEL, some cmf Sand, moist to sat.
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
RR-2-8-10	8.0 - 10.0	2.0	DP	Fill	N	N	0	16	SW	Reddish brown to black c SAND and f GRAVEL, saturated
--	10.0 - 12.0	1.5	DP	TMD	N	N	--	--	PT/PT	Peat

RR-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/13/2001	646,319.2	572,120.1	7.7

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
RR-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.015	99	SC	Med brown cmf SAND and mf GRAVEL, trace clay, trace glass fragments
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.009	245	SC	Dk brown mc SAND, little f gravel @ 1 ft becoming Red CLAY, little mf gravel, very dense
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.008	143	CL	Red CLAY, little mf gravel, very dense
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.007	172	CL	Red CLAY, little mf gravel, very dense
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.008	60	CL	Red CLAY, little to some mf gravel @ 7.5 ft becoming Black mf GRAVEL, little cmf sand, dry to saturated
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.008	54	GW/PT	Black mf GRAVEL, little cmf sand, saturated @ 9 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
RR-4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/10/2001	646,314.6	572,216.0			8.2						
RR-4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.018	6.2	SW	Brown mf SAND, some cm Gravel
--	0.5 - 2.0	1.0	DP	Fill	N	N		0.019	0.6	SW	Dk brown cmf SAND, some mf Gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.019	3.7	SW	Dk brown to black cmf SAND, little mf gravel, wet,
RR-4-6-8	6.0 - 8.0	2.0	DP	Fill	N	Y		0.026	27	SW	Dk brown mc SAND, some mf Gravel
--	8.0 - 10.0	1.2	DP	Fill/TMD	N	Y		0.024	180.1	SW/PT	Black cmf SAND, little mf gravel, wet, @ 9 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--		--	--	PT	Peat?, NR
RR-5	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/10/2001	646,192.8	572,330.4			8.2						
RR-5-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.03	2.8	SW	Brown mf SAND, some cmf Gravel, dry
--	0.5 - 2.0	1.5	DP	Fill	N	N		0	1.7	SW	Black to brown cmf SAND, little mf gravel, coal fragments?, dry
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.004	91	SW	Black to brown cmf SAND, some mf Gravel, wet @ 5 ft.
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.5	DP	Fill	N	N	0.006	126	SW	Black cmf SAND, some mf Gravel, wet
--	10.0 - 12.0	0.0	DP	Fill?	--	--	--	--		NR
--	12.0 - 14.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	14.0 - 16.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

RR-6

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/10/2001	646,082.8	572,475.9	7.9

RR-6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.005	1	SW	Brown mf SAND, some Gravel, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	1.5	ML	SILT & CLAY, trace cmf gravel @ 1.5 ft becoming cmf SAND, little mf gravel, little silt
--	2.0 - 4.0	1.0	DP	Fill	N	N	0	2.4	SM	Brown cmf SAND, little mf gravel, little silt, little clay
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.003	3.3	ML	Red-brn SILT & CLAY, trace mf gravel @ 4.5 ft mf SAND and mf GRAVEL @ 5.5 Black mf SAND tr, gravel, organics,
RR-6-6-8	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.5	DP	Fill	N	Y	0.006	44.1	ML	Reddish brown Clayey SILT, trace gravel @ 8.5 ft become cmf SAND @ 9.5 ft Olive cmf SAND, some Gravel
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	12.0 - 14.0	2.0	DP	TMD	N	N	--	--	PT	Peat
--	14.0 - 16.0	2.0	DP	TMD	N	N	--	--	PT	Peat

RR-7

State Plane Coordinates (ft. NAD83) G.S. Elev. (ft. NGVD29)

9/10/2001 646,058.1 572,549.0 7.5

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
RR-7-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.021	29.2	GM	Reddish brown mf GRAVEL, little mf sand @ 0.2 ft becoming SILT & CLAY, little mf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.668	12.5	ML	Reddish brown SILT & CLAY, little mf gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.118	6.5	SM	Reddish brown f SAND, some Silt & Clay, little mf gravel
--	6.0 - 8.0	1.0	DP	Fill	N	N	--	--	SM	Reddish brown f SAND, some Silt & Clay, little mf gravel
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	Y	0.03	8.7	SM/PT	Reddish brown f SAND some Silt & Clay, little mf gravel @ 8.3 ft mf GRAVEL and cm SAND, @ 8.5 ft PEAT.
--	10.0 - 12.0	2.0	DP	TMD	N	N	--	--	PT	Peat

RR-8

State Plane Coordinates (ft. NAD83) G.S. Elev. (ft. NGVD29)

9/26/2001 645,899.5 572,595.2 7.8

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
RR-8-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.017	1	GW	Dk brown mf GRAVEL, some mc Sand, little c gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.012	1.2	GW	Dk brown mf GRAVEL, some mc Sand, little c gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.008	65	GW	Black cmf Gravel, saturated
RR-8-6-8	6.0 - 8.0	1.2	DP	Fill/TMD	N	N	0.007	175	GW/PT	Black cmf Gravel, saturated @ 7 ft becoming PEAT.
RR-9	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
10/12/2001	645,805.3	572,665.0			--					
RR-9 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	12		
SC-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/21/2001	646,140.4	573,027.1			--					
SC-1	0.0 - 1.0		DP	Fill	--	--	--	--	SW	Sandy loam
SC-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,117.4	573,142.4			--					
SC-2	0.0 - 1.0		DP	Fill	--	--	--	--	SM	Sandy, Topsoil

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SC-3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,087.2	573,242.7			--					
SC-3	0.0 - 1.0		DP	Fill	--	--	--	--	SM	Sandy, Topsoil
SED-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,736.8	572,545.7			--					
SED-1 (0.0-0.5FT)	0.0 - 0.5	0.5	DP	SBC Sed	--	--	--	--	GP	Dark GRAVEL, loose sediment
SED-1 (0.5-1.0FT)	0.5 - 1.0	0.5	DP	SBC Sed	--	--	--	--	GW	Dark GRAVEL, loose sediment
SED-1 (1.0-1.5FT)	1.0 - 1.5	0.5	DP	SBC Sed	--	--	--	--	GW	Dark GRAVEL, loose sediment
SED-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,746.3	572,665.0			--					
SED-2 (0.0-0.5FT)	0.0 - 0.5	0.4	DP	SBC Sed	--	--	--	--	ML	Silt, loose sediment
SED-2 (0.5-1.0FT)	0.5 - 1.0	0.4	DP	SBC Sed	--	--	--	--	GP	Dark GRAVEL
SED-2 (1.0-1.5FT)	1.0 - 1.5	0.4	DP	SBC Sed	--	--	--	--	GP	Dark GRAVEL

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SED-3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,498.2	572,819.0			--					
SED-3 (0.0-0.5FT)	0.0 - 0.5	0.6	DP	SBC Sed	--	--	--	--	SM	SAND, some Silt
SED-3 (0.5-1.0FT)	0.5 - 1.0	0.6	DP	SBC Sed	--	--	--	--	GW/ML	Sandy GRAVEL (top), silty clay (bottom)
SED-3 (1.0-1.5FT)	1.0 - 1.5	0.6	DP	SBC Sed	--	--	--	--	ML	Silty CLAY, heavy vegetation
SED-4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,188.8	572,991.4			--					
SED-4 (0.0-0.5FT)	0.0 - 0.5	0.6	DP	SBC Sed	--	--	--	--	SW	SAND and GRAVEL
SED-4 (0.5-1.0FT)	0.5 - 1.0	0.6	DP	SBC Sed	--	--	--	--	CL	CLAY and GRAVEL
SED-5	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
8/22/2001	646,101.7	573,275.0			--					
SED-5 (0.0-0.5FT)	0.0 - 0.5	0.7	DP	SBC Sed	--	--	--	--	ML	SILT & CLAY, vegetation
SED-5 (0.5-1.0FT)	0.5 - 1.0	0.7	DP	SBC Sed	--	--	--	--	ML	SILT & CLAY, vegetation
SED-5 (1.0-1.5FT)	1.0 - 1.5	0.7	DP	SBC Sed	--	--	--	--	ML	SILT & CLAY, vegetation

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SED-6										
State Plane Coordinates (ft. NAD83)										
11/20/2001	646,020.8	573,557.6								
G.S. Elev. (ft. NGVD29)										
--										
SED-6 (0.0-0.5FT)	0.0 - 0.5		DP		--	--	--	--		
SED-6 (0.5-1.0FT)	0.5 - 1.0		DP		--	--	--	--		
SED-6 (1.0-1.5FT)	1.0 - 1.5		DP		--	--	--	--		
SILO-B1										
State Plane Coordinates (ft. NAD83)										
9/6/2001	646,304.7	572,345.4								
G.S. Elev. (ft. NGVD29)										
8.5										
SILO-B1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	11	GM	Black mf GRAVEL, some f Sand, little clay
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	9	CL	Reddish brown CLAY, trace f sand
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	81	CL	Reddish brown CLAY, some f Sand
SILO-B1-6-8	6.0 - 8.0	2.0	DP	Fill	N	N	0	166	CL	Black CLAY, some Organics
--	8.0 - 10.0	0.0	DP	Fill	--	--	--	--		NR
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	12.0 - 14.0	2.0	DP	TMD	N	N	--	--	PT	Peat
--	14.0 - 16.0	1.0	DP	TMD	N	N	--	--	PT	Peat
SILO-B2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/6/2001	646,280.4	572,323.8			8.4					
SILO-B2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	10	SW	Dk brown cmf SAND, some mf Gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	7.9	SW	Dk brown cmf SAND, some mf Gravel @ 1 ft c. GRAVEL, some cmf Sand @ 1.3 ft red CLAY, little gravel, little mf sand
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	1.0	DP	Fill	N	N	0	26	CL	Dk brown CLAY, some mc Gravel, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.2	DP	Fill/TMD	N	N	0	>250	GW/PT	Black mf Gravel, some c Sand, saturated @ 9 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
SILO-B3	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/6/2001	646,306.2	572,297.2			8.4					
SILO-B3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	14	GW	Black mf GRAVEL

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	0.8	CL	Red CLAY, trace f gravel, dense
--	2.0 - 4.0	1.0	DP	Fill	N	N	0	9	CL	Red CLAY, trace f gravel, dense
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	7	CL	Med brown to red CLAY, some to little mf Gravel, moist to saturated
SILO-B3-6-8	6.0 - 8.0	1.5	DP	Fill/TMD	N	N	0	15	CL/PT	Red CLAY, trace f gravel, saturated @ 7 ft becoming PEAT.

SILO-B4

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/6/2001	646,330.8	572,321.0	8.5

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SILO-B4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.005	8	GC	Med brown cmf GRAVEL and CLAY, some cmf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.004	16	GC	Med brown cmf GRAVEL and CLAY, some cmf Sand @ 0.7 ft becoming Black f GRAVEL and mf SAND, little clay, moist
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.003	14	CL	Reddish brown CLAY, some mc Gravel, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	TMD	N	N	0	27	CL	Reddish brown CLAY, some mc Gravel, saturated
--	10.0 - 12.0	2.0	DP	TMD	N	N	0.003	37	PT	Peat @ 10.5 ft becoming Reddish brown CLAY, trace mf gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
SPR-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/5/2001	647,007.5	572,500.3			6.5						
SPR-1-0-0.5	0.0 - 2.0	0.7	DP	Fill	N	N		0.396	63	GW	c GRAVEL, little mf sand, chunks of wood
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	0.0	DP	Fill	--	--		--	--		NR
--	6.0 - 8.0	0.0	DP	Fill	--	--		--	--		NR
SPR-1-8-10	8.0 - 10.0	2.0	DP	Fill	N	N		0.011	24	GW	Black f GRAVEL, some c Sand, cinders
--	10.0 - 12.0	0.0	DP	TMD	--	--		--	--	PT	Peat in shoe, NR
SPR-2A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/19/2001	647,032.0	572,302.5			6.5						
SPR-2A-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.029	18	SW	Med brown c GRAVEL and cmf SAND
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.024	12.3	GW	Black mf GRAVEL
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.022	25.1	GC	Black cmf GRAVEL, little red clay

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.025	14.4	GC	Black cmf GRAVEL, little red clay
SPR-2A-8-10	8.0 - 10.0	2.0	DP	Fill	N	N	0.024	28	GW	Black mc GRAVEL, moist
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Soft probably Peat, NR.

SPR-2B

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/19/2001	646,993.1	572,305.4	6.7

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SPR-2B-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.037	1	GW	Gray cmf GRAVEL, some cmf Sand, little asphalt
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.024	7	GW	Gray cmf GRAVEL, some cmf Sand, little asphalt
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.036	42	GM	Gray cmf GRAVEL, some cmf Sand, little asphalt @ 3 ft becoming Red SILT & CLAY, little mc gravel.
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.035	42	GW	Black cmf GRAVEL, moist
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.029	42	GW	Black cmf GRAVEL, moist
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.041	14	GW	Black mf GRAVEL, little c sand, trace silt, moist
SPR-2B-10-12	10.0 - 12.0	1.8	DP	Fill/TMD	N	N	0.059	14	GW/PT	Black mf GRAVEL, little c sand, trace silt, moist @ 11.6 ft becoming PEAT.

SPR-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/21/2001	646,828.7	572,210.7	8.2

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SPR-3 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.023	2.5	SM	Med reddish brown cmf SAND, little c gravel, trace silt & clay.
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.048	2.1	SM	Med reddish brown cmf SAND, little c gravel, trace silt & clay @ 1 ft becoming Silty CLAY.
--	2.0 - 4.0	0.5	DP	Fill	N	N	0.333	1.7	ML	Reddish brown Silty CLAY
SPR-3 4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.851	1.5	SW	Medium brown cmf SAND, trace c gravel, trace silt @ 5 ft becoming Black mc SAND, some f Gravel, moist.
--	6.0 - 8.0	1.1	DP	Fill	N	N	0.048	3.8	SW	Black mc SAND, some f Gravel, moist
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.045	13.8	SW	Black mc SAND and f GRAVEL, moist
--	10.0 - 12.0	1.0	DP	Fill	N	N	0.051	93.2	SW	Black mc SAND and f GRAVEL, moist
--	12.0 - 14.0	2.0	DP	Fill	N	N	0.107	8	SW	Black mc SAND, some f Gravel, saturated

SPR-4A

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/19/2001	647,024.9	572,323.1	6.5

SPR-4A-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.01	4.2	GW	Gray c GRAVEL, some mf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.018	13.3	ML	Med brown SILT & CLAY, little cmf gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.031	28.7	GM	Black cmf GRAVEL, little silt @ 5.5 ft becoming Dk Gray SILT & CLAY.
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SPR-4A-8-10	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.483	27.2	GP/PT	Black f GRAVEL, trace silt @ 9.5 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

SPR-4B

State Plane Coordinates (ft. NAD83) G.S. Elev. (ft. NGVD29)

8/22/2001 647,009.4 572,370.5 6.7

SPR-4B-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.23	189.6	SW	Gray c Gravel @ 0.2 ft becoming Med brown cmf SAND, little mf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.084	76.4	SW	Med brown cmf SAND, little mf gravel @ 1.5 ft becoming Gray mf Gravel, some cmf Sand.
--	2.0 - 4.0	0.8	DP	Fill	N	N	0.084	>250	GW	Gray mf GRAVEL, some cmf Sand
SPR-4B-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.036	132	SW	Med brown mfc Sand, trace mf gravel @ 5 ft becoming Black mf GRAVEL and c SAND (cinders)
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.0	DP	Fill	N	N	0.049	>250	GW	Black mf GRAVEL, some c Sand, moist
--	10.0 - 12.0	0.0	DP	Fill/TMD	--	--	--	--	PT	PEAT @ 11.5'?, NR

SPR-4C

State Plane Coordinates (ft. NAD83) G.S. Elev. (ft. NGVD29)

8/23/2001 647,006.5 572,426.0 6.6

SPR-4C-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.108	1.4	CL	Dk brown CLAY, some c Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.093	23.6	CL	Dk brown CLAY, some c Gravel @ 1 ft becoming Black mc SAND and f GRAVEL
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
SPR-4C-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.094	46	SW	Black mc SAND and f GRAVEL, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	1.0	DP	Fill/TMD	N	N	0.052	24.9	SW/PT	Black mc SAND and f GRAVEL, saturated @ 9 ft becoming PEAT.
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

SPR-5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/5/2001	647,058.1	572,121.1	7.3

SPR-5-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.01	3	SW	Dk brown cmf SAND, little mc gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.003	77	SW	Brown cmf SAND, little mc gravel @ 1 ft becoming cmf GRAVEL, little cmf sand
SPR-5-2-4	2.0 - 4.0	1.0	DP	Fill	N	N	0.004	128	SW	Black f GRAVEL and c SAND, cinders, moist
--	4.0 - 6.0	1.2	DP	Fill/TMD	N	N	0.006	46	SW/PT	Black f GRAVEL and c SAND, cinders, moist @ 5 ft becoming PEAT.
--	6.0 - 8.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
SPR-6	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/13/2001	646,824.1	571,826.8			8.1						
SPR-6-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.011	2	SW	Med brown cmf SAND and m GRAVEL
SPR-6-0.5-2	0.5 - 2.0	1.5	DP	Fill	N	N		0.006	1.3	SW	Med brown cmf SAND and m GRAVEL
--	2.0 - 4.0	2.0	DP	Fill	N	N		0.005	0	SW	Med brown cmf SAND and m GRAVEL @ 2.5 ft becoming Red CLAY, little mf gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.006	0	CL	Red CLAY, little mf gravel
--	6.0 - 8.0	2.0	DP	Fill	N	N		0.004	0	CL	Red CLAY, little to none mf gravel, no to little f sand
--	8.0 - 10.0	2.0	DP	Fill	N	N		0.004	1.1	CL	Red CLAY, little f sand
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N		0.006	0.6	CL/PT	Red CLAY, little f sand @ 11 ft becoming PEAT
SR-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/17/2001	646,195.5	572,718.6			--						
SR-1-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		--	--	SP	cmf SAND
SR-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/17/2001	646,169.3	572,721.7			--						

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
SR-2-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	--	--	SP	cmf SAND
ST-1	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/5/2001	646,909.6	572,468.1			7.4					
ST-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.037	3	SC	Dk brown cmf SAND, some Clay, little mc gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0	2	SC	Dk brown cmf SAND, some Clay, little mc gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	2.9	SC	Black cmf SAND, some f Gravel, some Clay @ 5.5 ft becoming Red CLAY
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.003	9	SW	Brown mf SAND @ 6.5 ft becoming Black f GRAVEL, some c Sand
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.04	12	GW	Black f GRAVEL, some c Sand
--	10.0 - 12.0	0.0	DP	TMD	--	--	--	--	PT	Peat in shoe, NR
ST-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)					
9/5/2001	646,851.6	572,445.8			8					
ST-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.198	3	SC	Black cmf SAND, some Clay, little mf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	2.9	SC	Black cmf SAND, some Clay, little mf gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	0.7	DP	Fill	N	N	0.019	6.5	GW	c GRAVEL and ORGANIC MATERIAL, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.039	42	SW	Med brown mf SAND, little mf gravel, little organics, saturated
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR
--	12.0 - 14.0	2.0	DP	Fill/TMD	N	N	0.035	6.2	SC	Med brown mf SAND, little mf gravel, little organics, saturated @ 13 ft becoming Gray Clay, some Organics
--	14.0 - 16.0	2.0	DP	TMD	N	N	0.726	22	CL	Gray CLAY, some Organics

ST-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/4/2001	646,809.0	572,580.2	7.4

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
ST-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.035	2.6	SP	Lt brown f SAND
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.003	2.4	SP/GW	Brown f SAND @ 1.5 ft becoming mf GRAVEL some cmf Sand
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
ST-3-4-6	4.0 - 6.0	2.0	DP	Fill/TMD	N	N	0	5.3	SW/PT	Med brown cmf SAND, trace organics @ 5 ft becoming PEAT.
--	6.0 - 8.0	1.0	DP	TMD	N	N	--	--	PT	Peat

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
TLN-1											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/20/2001	647,008.0	572,179.0			6.8						
TLN-1 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.562	0.9	GW	Med brown mc GRAVEL, some mc Sand
TLN-1 .5-2	0.5 - 2.0	1.5	DP	Fill	N	N		0.057	24.3	SW	Reddish brown c SAND and cmf Gravel
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.025	8	SW	Reddish brown c SAND and cmf Gravel @ 2.5 ft becoming CLAY, little f sand.
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.025	1.6	GW	Black cmf GRAVEL, moist
--	6.0 - 8.0	1.2	DP	Fill	N	N		0.035	6.5	GM	Black cmf GRAVEL @ 7 ft becoming Med brown f SAND and SILT, moist to saturated
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N		0.029	1.9	GW/PT	Med brown cmf GRAVEL, some mf Sand @ 9.5 ft becoming PEAT.
--	10.0 - 12.0	1.0	DP	TMD	N	N		--	--	PT	Peat
TLN-2											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/19/2001	647,001.4	572,252.4			6.7						
TLN-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.026	10.6	GW	Gray cmf GRAVEL, trace c sand
--	0.5 - 2.0	2.0	DP	Fill	N	N		>0.999	132	GW	Gray cmf GRAVEL, trace c sand
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.06	192.3	GW	Gray cmf GRAVEL, trace c sand @ 3 ft becoming Red CLAY, some mc Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.028	13	GW	Black cmf GRAVEL, saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.024	7.2	GW	Black cmf GRAVEL, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.041	59.7	GW	Black cmf GRAVEL, saturated
--	10.0 - 12.0	1.5	DP	TMD	N	N	0.032	9.4	GW	Black cmf GRAVEL, saturated

TLN-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
7/17/2001	646,965.2	572,381.1	6.8

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
TLN-3-0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.02	--	GW	Med brown cmf GRAVEL, some c Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.011	--	GW	Brown cmf GRAVEL, some cmf Sand
TLN-3-2-4	2.0 - 4.0	2.0	DP	Fill	N	N	0.033	--	CL	Red CLAY, little f gravel @ 3.5 ft becoming Black f GRAVEL and c SAND.
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.018	--	GW	Black mf GRAVEL, little c sand, saturated
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.016	--	GW	Black mf GRAVEL, little c sand, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.019	--	GW	Black mf GRAVEL, little c sand, saturated
--	10.0 - 12.0	1.0	DP	TMD	N	N	0.022	--	CL	Black CLAY, little organics

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
TLN-4	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/20/2001	646,947.8	572,320.3			6.8						
TLN-4 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.023	0.7	GW	Gray to med brown cmf GRAVEL, some cmf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.111	0.3	GW	Gray to med brown cmf GRAVEL, some cmf Sand @ 1.5 ft becoming Black f SAND.
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.028	1.3	SW	Reddish brown mf SAND, little f gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.055	0.1	SW	Lt brown cmf SAND some c Gravel @ 4.5 ft becoming mf SAND, some Clay.
--	6.0 - 8.0	2.0	DP	Fill	N	N		0.044	1.1	SC	Lt brown mf SAND, some Clay @ 7 ft becoming Black mf GRAVEL, cinders, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N		0.056	3	SC	Med brown cmf SAND, some Clay, saturated
--	10.0 - 12.0	2.0	DP	Fill	N	N		0.036	11	SW	Black mf GRAVEL and c SAND, saturated
--	12.0 - 14.0	2.0	DP	Fill	N	N		0.037	3.4	SW	Med brown cmf SAND, little f gravel
--	14.0 - 16.0	2.0	DP	Fill/TMD	N	N		0.035	6.4	SW	Med brown cmf SAND, little f gravel @ 15.8 ft becoming PEAT.
TLN-5	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/20/2001	646,943.1	572,240.9			7						
TLN-5 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.004	3	SW	Med brown mf SAND, some c Gravel

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
TLN-5 .5-2	0.5 - 2.0	1.5	DP	Fill	N	N	0.004	2	SW	Med brown mf SAND, some c Gravel @ 1 ft becoming Gray cmf GRAVEL, little cmf sand
--	2.0 - 4.0	2.0	DP	Fill	N	N	0.014	0.6	CL	Med brown CLAY and f SAND, very dense @ 2.7 ft Black f GRAVEL @ 3.2 ft Red CLAY, little f sand
TLN-5-4-6	4.0 - 6.0	2.0	DP	Fill	N	N	0.11	2	CL	Red CLAY, some mf c Gravel, very dense @ 5.5 ft becoming Red CLAY, soft
--	6.0 - 8.0	1.5	DP	Fill	N	N	0.007	2	CL	Red CLAY, soft @ 7 ft becoming Black mf GRAVEL, cinders
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.015	2	SW	Med brown cmf SAND , some f Gravel @ 9.5 ft becoming Black c SAND and f GRAVEL
--	10.0 - 12.0	2.0	DP	Fill	N	N	0.016	13.2	SW	Black c SAND and f GRAVEL
--	12.0 - 14.0	0.0	DP	TMD	N	N	--	--	PT/PT	Peat
--	14.0 - 16.0	0.0	DP	TMD	N	N	--	--	PT	Peat

TLN-6

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/20/2001	646,963.3	572,176.2	7.1

TLN-6 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.028	9	SW	Med brown cmf SAND, some c Gravel, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.004	5.2	SW	Med brown cmf SAND, some c Gravel, trace organics @ 1 ft becoming Gray mc GRAVEL, some mc Sand.
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.003	11	GW	Gray mc GRAVEL, some mc Sand @ 2.2 ft becoming Black mc SAND, some c Gravel.
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.011	2.1	SW	Black cmf SAND, little mc gravel @ 4 ft Orange CLAY, trace f gravel @ 5.8 ft Black cmf GRAVEL, moist.
--	6.0 - 8.0	2.0	DP	Fill	N	N	0	0	GW	Black cmf GRAVEL, moist

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	0	GW	Black cmf GRAVEL
--	10.0 - 12.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

TLS-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/5/2001	646,892.8	572,182.3	8.9

TLS-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0	3.8	GW	Med brown c GRAVEL, some cmf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.009	4	GW	Med brown mf GRAVEL, some cmf Sand @ 1 ft becoming Reddish brown CLAY
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	3.6	CL	Reddish brown CLAY, little f gravel
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.004	2.3	GP	Black f GRAVEL and c SAND
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	2.5	CL	Med brown CLAY, some mf Gravel @ 9 ft becoming Black f GRAVEL and c SAND, cinders?
--	10.0 - 12.0	2.0	DP	Fill	N	N	0.005	3.4	GP	Black f GRAVEL and c SAND, cinders?
--	12.0 - 14.0	2.0	DP	Fill	N	N	0.04	2.9	GW	Black mf GRAVEL, some c Sand, cinders?
--	14.0 - 16.0	2.0	DP	Fill/TMD	N	N	0.15	8	CL/PT	Black CLAY, dense @ 15 ft becoming PEAT.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
TLS-10											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/21/2001		646,799.7	572,211.5			8.3					
TLS-10 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.075	1.5	GW	Med brown cmf GRAVEL, little cmf sand
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.16	1.7	SW	Med brown cmf SAND, some mf Gravel @ 1.5 ft becoming Med reddish brown CLAY, trace organics.
--	2.0 - 4.0	1.0	DP	Fill	N	N		0.018	12	CL	Med reddish brown CLAY, trace organics
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.017	2.1	CL	Red CLAY, trace mc gravel
--	6.0 - 8.0	2.0	DP	Fill	N	N		0.028	11.5	GW	Black mf GRAVEL, moist
TLS-10 8-10	8.0 - 10.0	2.0	DP	Fill	N	N		0.091	321	GW	Black mf GRAVEL, saturated
--	10.0 - 12.0	2.0	DP	Fill/TMD	N	N		0.16	175	GW/PT	Black mf GRAVEL, saturated @ 11 ft becoming PEAT.
TLS-11											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/7/2001		646,780.3	572,151.3			8.6					
TLS-11-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.003	6.7	SC	Med brown cmf SAND, little mf gravel, little clay
--	0.5 - 2.0	1.5	DP	Fill	N	N		0	20.6	SC	Med brown cmf SAND, little mf gravel, little clay @ 1 ft becoming CLAY, little cmf sand, little f gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	0.3	DP	Fill	N	N	0	7	GW	Med brown mc GRAVEL, saturated
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	0.5	DP	Fill	N	N	0	8	SW	Med brown cmf SAND, some f Gravel, saturated
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR

TLS-2

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
9/7/2001	646,895.3	572,219.2	7.8

TLS-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.061	7	SW	Dk brown cmf SAND, some mc Gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.026	8	SW	Dk brown cmf SAND, some mc Gravel @ 1 ft becoming Reddish to dk brown CLAY, some cmf Sand, little cmf gravel
--	2.0 - 4.0	1.5	DP	Fill	N	N	0.023	5.6	CL	Reddish to dk brown CLAY, some cmf Sand, little f gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.024	4.2	GW	Black mf GRAVEL, cinders, moist
TLS-2-6-8	6.0 - 8.0	1.5	DP	Fill	N	N	0.028	5.9	GW	Black mf GRAVEL, cinders, moist
--	8.0 - 10.0	2.0	DP	Fill	N	N	0.013	12.3	GW	Black f GRAVEL, cinders, saturated
--	10.0 - 12.0	0.5	DP	Fill/TMD?	N	N	0.007	12	GM/PT	Black f GRAVEL, cinders, saturated @ 11ft? becoming PEAT.
--	12.0 - 14.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR
--	14.0 - 16.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
TLS-3											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/21/2001	646,907.7	572,440.8			7.5						
TLS-3 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.024	1.7	GW	Med brown mc GRAVEL, trace mc sand
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.071	25	GW	Med brown cmf GRAVEL, some mc Sand @ 1.8 ft becoming cmf SAND.
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N		0.058	1.7	GW	Black mf GRAVEL and c SAND, moist
--	6.0 - 8.0	2.0	DP	Fill	N	N		0.112	2.6	GW	Black mf GRAVEL and c SAND, moist
--	8.0 - 10.0	2.0	DP	Fill	N	N		0.142	11.2	GW	Black mf GRAVEL and c SAND, moist
--	10.0 - 12.0	1.0	DP	TMD	N	N		--	--	PT	Peat
TLS-4											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/7/2001	646,867.4	572,412.7			7.9						
TLS-4-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0	10	SW	Med brown cmf SAND and mf GRAVEL
--	0.5 - 2.0	1.5	DP	Fill	N	N		0	0	SW	Med brown cmf SAND and mf GRAVEL
--	2.0 - 4.0	1.0	DP	Fill	N	N		0	0	GW	Black c GRAVEL, little cmf sand

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	2	CL	Red CLAY, some Organics, some mc Sand @ 4.5 ft becoming Black mf GRAVEL, saturated
--	6.0 - 8.0	1.0	DP	Fill	N	N	0	9	GW	Black mf GRAVEL, saturated
TLS-4-8-10	8.0 - 10.0	2.0	DP	Fill	N	N	0	16	GW	Black mf GRAVEL, saturated
--	10.0 - 12.0	0.4	DP	TMD	N	N	--	--	PT	Peat

TLS-5

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/21/2001	646,787.4	572,403.4	8.2

TLS-5 0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.267	1.3	GW	Med brown cmf GRAVEL, some cmf Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	1.3	CL	Red brown CLAY, some cmf Gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.009	0.2	GW	mf GRAVEL, some cmf SAND, trace silt @ 4.5 ft red-brn CLAY @ 5.5 ft cmf SAND and f GRAVEL, sat.
--	6.0 - 8.0	1.2	DP	Fill	N	N	0.03	0	SW	Black cmf SAND and f GRAVEL, saturated
TLS-5-8-10	8.0 - 10.0	2.0	DP	Fill	N	N	0.017	1	GW	Black cmf GRAVEL, some cmf Sand
--	10.0 - 12.0	1.2	DP	Fill/TMD	N	N	--	--	SW/PT	Black cmf SAND and f GRAVEL, saturated, @ 10.2 ft becoming PEAT.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
TLS-6											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/21/2001		646,780.6	572,365.0			8.2					
TLS-6 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.007	0.4	GW	Med brown c GRAVEL and cmf SAND
--	0.5 - 2.0	0.0	DP	Fill	--	--		--	--		NR
--	2.0 - 3.0	0.0	DP	Fill	--	--		--	--		NR
TLS-6-3-5	3.0 - 5.0	2.0	DP	Fill	N	N		0.008	10.4	SC	Black cmf SAND and CLAY, some f Gravel
--	5.0 - 7.0	0.0	DP	Fill	--	--		--	--		Refusal @ 7 ft, NR.
TLS-7											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/21/2001		646,832.8	572,358.9			7.9					
TLS-7 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.037	0	GW	Med brown cmf GRAVEL, some mc Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.714	0.4	GW	Med brown cmf GRAVEL, some mc Sand @ 1 ft becoming Reddish brown CLAY and mf SAND, little c gravel
--	2.0 - 4.0	0.0	DP	Fill	--	--		--	--		NR
TLS-8											
	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
9/7/2001		646,827.7	572,279.6			7.9					

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
TLS-8-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.003	6.2	SC	Dk brown cmf SAND, some c Gravel, little clay
--	0.5 - 2.0	0.5	DP	Fill	N	N	0	5	SC	Dk brown cmf SAND, some c Gravel, little clay
--	2.0 - 4.0	0.0	DP	Fill	--	--	--	--		NR
--	4.0 - 6.0	2.0	DP	Fill	N	N	0	13	CL	Med brown CLAY, little mf gravel, saturated
TLS-8-6-8	6.0 - 8.0	0.8	DP	Fill	N	N	0.004	8.2	GP	Black f GRAVEL
--	8.0 - 10.0	2.0	DP	Fill	N	N	0	10	GP	Black f GRAVEL
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR
--	12.0 - 14.0	1.5	DP	Fill/TMD?	N	N	0	5	CL/PT	Med brown CLAY, little f gravel, saturated @ 13.5 ft probably PEAT - very soft.
--	14.0 - 16.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

TLS-9

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/21/2001	646,786.0	572,271.9	8.1

TLS-9 0-.5	0.0 - 0.5	0.5	DP	Fill	N	N	0.05	1.9	GW	Dk brown cmf GRAVEL, some c Sand
--	0.5 - 2.0	1.5	DP	Fill	N	N	0.053	1.9	GW	Dk brown cmf GRAVEL, some c Sand @ 1 ft becoming Black f GRAVEL and c SAND
--	2.0 - 4.0	0.5	DP	Fill	N	N	0.018	0	CL	Orange CLAY, little f gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.02	16.1	CL	Reddish brown CLAY, some c Sand @ 5.8 ft becoming Black mc SAND and f GRAVEL, moist.

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	6.0 - 8.0	1.0	DP	Fill	N	N	0.022	4	SW	Black mc SAND and f GRAVEL, moist
--	8.0 - 10.0	2.0	DP	Fill/TMD	N	N	0.043	43.2	SW/PT	Black cmf SAND and f GRAVEL, saturated, @ 9.2 ft becoming PEAT.
--	10.0 - 12.0	0.5	DP	TMD	N	N	--	--	PT	Peat

WWT-1

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/23/2001	646,780.0	572,044.8	9.1

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	1.6	CL	Red CLAY, some mc Gravel, trace organics
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	1.6	SC	Med Brown cmf SAND, some mc Gravel, little red clay
--	2.0 - 4.0	1.5	DP	Fill	N	N	>0.999	5	SW	Med brown cmf SAND, some mc Gravel, dry to moist
--	4.0 - 6.0	2.0	DP	Fill	N	N	>0.999	1.8	GW	Med brown cmf GRAVEL, some f Sand, little silt
--	6.0 - 8.0	0.0	DP	Fill	--	--	--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N	>0.999	19	ML	Brown SILT, some mc Gravel, little cmf sand, saturated.
--	10.0 - 12.0	1.5	DP	Fill	N	Y	>0.999	133	ML	Brown SILT, some mc Gravel, little cmf sand @ 10.5 ft cmf SAND trace silt @ 11.2 ft Black mc SAND, sat.
WWT-1-12-14	12.0 - 14.0	1.0	DP	Fill	N	N	>0.999	194	GW	Med brown cmf GRAVEL, some mc Sand, little silt, saturated
--	14.0 - 16.0	0.0	DP	Fill?	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids	Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
WWT-1A	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
7/19/2001	646,780.0	572,044.8			--						
WWT-1-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		0.62	5.1	SM	Red brown mf SAND, little silt, little cmf gravel
--	0.5 - 2.0	1.5	DP	Fill	N	N		0.68	4.2	SM	Red brown mf SAND, little silt, little cmf gravel @ 1 ft cement @ 1.3 ft becoming Black mc GRAVEL, some Silt & Clay
--	2.0 - 4.0	1.0	DP	Fill	N	N		>0.999	12.2	SM	Red brown mf SAND, some Silt, little mc gravel
--	4.0 - 6.0	2.0	DP	Fill	N	N		>0.999	--	GW	Brown to black cmf GRAVEL, some Silt
--	6.0 - 8.0	0.0	DP	Fill	--	--		--	--		NR
--	8.0 - 10.0	2.0	DP	Fill	N	N		>0.999	--	ML	Med brown SILT and c GRAVEL, saturated
--	10.0 - 12.0	1.5	DP	Fill	Y	N		>0.999	--	GW	Gray mc GRAVEL, some cmf Sand, saturated @ 11 ft becoming Black c SAND size particles, lustrous.
WWT-2	State Plane Coordinates (ft. NAD83)				G.S. Elev. (ft. NGVD29)						
8/23/2001	646,718.5	572,046.7			9.3						
WWT-2-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N		>0.999	1.4	GC	Med brown mc GRAVEL, some mc Sand, little clay
--	0.5 - 2.0	1.5	DP	Fill	N	N		>0.999	1	GC	Med brown mc GRAVEL, some mc Sand, little clay
--	2.0 - 4.0	1.0	DP	Fill	N	N		>0.999	4	GC	Med brown mc GRAVEL, some mc Sand, little clay

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
--	4.0 - 6.0	2.0	DP	Fill	N	N	>0.999	3.3	GC	mc GRAVEL, some mc Sand, little clay @ 4.7 ft become concrete @ 5.5 ft become mc GRAVEL, little cmf sand, moist
--	6.0 - 8.0	1.5	DP	Fill	N	N	>0.999	19	ML	SILT & CLAY @ 7.5 ft becoming Dk brown c GRAVEL and SILT, saturated
--	8.0 - 10.0	2.0	DP	Fill	N	N	>0.999	10.8	ML	Dk brown Clayey SILT, saturated
--	10.0 - 12.0	2.0	DP	Fill	N	N	>0.999	154	GW	c GRAVEL, little silt, @ 11.5 ft becoming Black mc SAND, some cmf Gravel
WWT-2-12-14	12.0 - 14.0	2.0	DP	Fill	N	N	>0.999	178	GM	Black c GRAVEL, some Silt @ 13 ft Dk brown mf SAND @ 13.9 ft Red CLAY, little mf gravel, saturated
--	14.0 - 16.0	0.0	DP	Fill?	--	--	--	--		NR

WWT-3

	State Plane Coordinates (ft. NAD83)		G.S. Elev. (ft. NGVD29)
8/23/2001	646,638.6	572,035.4	9.1

WWT-3-0-0.5	0.0 - 0.5	0.5	DP	Fill	N	N	>0.999	3	GC	Dk brown mc GRAVEL and mc SAND, little clay
--	0.5 - 2.0	1.5	DP	Fill	N	N	>0.999	7	GC	Dk brown mc GRAVEL and mc SAND, little clay
--	2.0 - 4.0	1.0	DP	Fill	N	N	0.358	1.6	GC	Dk brown mc GRAVEL and mc SAND, little clay
--	4.0 - 6.0	2.0	DP	Fill	N	N	0.317	15	GW	Dk brown mf GRAVEL and cmf SAND, moist
--	6.0 - 8.0	2.0	DP	Fill	N	N	0.468	110	CL	Orange CLAY, some mf Sand, trace m gravel
--	8.0 - 10.0	1.0	DP	Fill	N	N	0.618	121	CL	Orange CLAY, some mf Sand, trace m gravel
--	10.0 - 12.0	0.0	DP	Fill	--	--	--	--		NR

Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6")	Unit	Free Liquids Mercury	Free Liquids Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Soil Description Burmister
WWT-3-12-14	12.0 - 14.0	1.0	DP	Fill/TMD	N	N	0.243	--	GW/PT	Dk brown mc GRAVEL, some cmf Sand, trace silt @ 12.5 ft becoming PEAT.
--	14.0 - 16.0	0.0	DP	TMD?	--	--	--	--	PT	Peat?, NR

Abbreviations:

Blows: DP - Direct Push drilling method, blow counts are not applicable, WOH - weight of hammer, WOR - weight of rods
Unit: TMD - tidal marsh deposits, GF - glacial fluvial, GT - glacial till, BR - bedrock, DC Sed - drainage channel sediment, SBC Sed - South Branch Creek sedimer
Soil Description: NR - indicates no recovery of soil sample, no soil description provided.

Phase II Surficial Borings
LCP Chemicals, Inc. Superfund Site, Linden, New Jersey

230-B101

	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006										
Lab Sample ID	Depth (ft)	Recovery (ft)	Blows (per 6 ")	Unit	Free Liquids Mercury	Organics	MVA (mg/m3)	OVA (ppm)	Soil Description USCS	Burmister
230-B101-0-1	1	1	NA	FILL	N	N	NR	NR	ML CL	Wet, Gray brwn SILT & CLAY, some (+) organics, little (+) cmf gravel

231-102

	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006										
231-102-0-1	1	1	NA	FILL	N	N	NR	NR	ML CL	Dry, Brwn red SILT & CLAY, some (-) cmf Sand, trace (+) fmc gravel

DEP-101

	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006	646396.8		572002.8		8.2					
DEP-101-0-1	1	1	NA	FILL	N	N	NR	NR	SP	Dry, Blk gray cmf SAND, little (-) fm gravel

LHP-110

	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006	646916.5		571545.6		7.6					
LHP-110-0-1	1	1	NA	FILL	N	N	0	0	SP	Dry, Brwn blk cmf SAND, little (+) Silt & Clay, trace (+) fmc gravel

Phase II Surficial Borings
LCP Chemicals, Inc. Superfund Site, Linden, New Jersey

LHP-111

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646951.3	571644.6	8

LHP-111-0-1	1	1	NA	FILL	N	N	0	0	SP SM	Dry, cmf SAND, some (-) Silt & Clay, little (-) fmc gravel. Glass fragments

LHP-112

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646896.9	571632.8	7.7

LHP-112-0-1	1	1	NA	FILL	N	N	0	0.3	SP GP	Dry Blk cmf SAND, little (+/-) fmc gravel. @ 0.2' Red brwn SILT & CLAY, some (-) cmf Sand, little (-) Organics. Glass fragments

LHP-113

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646932.3	571767.9	8.3

LHP-113-0-1	1	1	NA	FILL	N	N	0	0	SP SM	Dry, Gray brwn cmf SAND, little (+) silt & clay, trace (+) fmc gravel. Glass fragments

LHP-114

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646822.9	571751.2	8.2

LhP-114-0-1	1	1	NA	FILL	N	N	0	0.4	SP GP	Dry, Gray brwn cmf SAND, some (-) fmc Gravel, little (+) silt & clay. Glass fragments

Phase II Surficial Borings
LCP Chemicals, Inc. Superfund Site, Linden, New Jersey

LHP-115

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646885.8	571816.3	8.2

LHP-115-0-1	1	1	NA	FILL	N	N	0	0	SP GP	Dry Gray cmf SAND, little (+) Gravel, trace (+) silt & clay. Glass fragments

LHP-116

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646767.8	571837.7	7.8

LHP-116-0-1	1	1	NA	FILL	N	N	0.015	0	ML CL	Dry Clayey SILT, some (-) cmf Sand, little (-) fmc Gravel. Glass fragments

LHP-117

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646751.5	571928.6	8

LHP-117-0-1	1	1	NA	FILL	N	N	0	0	ML CL	Dry-moist, Red brwn Clayey SILT, some (-) cmf Sand, little (-) fm gravel.

LHP-118

	State Plane Coordinates (ft. NAD83)		G.S. Elev (ft. NGVD29)
12/4/2006	646863.4	571475	7.5

LHP-118-0-1	1	1	NA	FILL	N	N	0	0	SM SC	Dry, cmf SAND, some (-) Silt & Clay, little (-) fmc gravel. Glass, cinders fragments.

Phase II Surficial Borings
LCP Chemicals, Inc. Superfund Site, Linden, New Jersey

LHP-119										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006	646765.8		571520.7		8.4					
LHP-119-0-1	1	1	NA	FILL	N	N	0	0	SP SM	Moist, Brwn blk cmf SAND, some (-) Silt & Clay, little (-) fmc gravel. Brick, glass fragments.
LHP-120										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006	646709.6		571474.7		8.1					
LHP-120-0-1	1	1	NA		N	N	0	0.1	SP	Moist, Black brwn cmf SAND, some (-) Silt & Clay, little (-) fm gravel. Brick fragments
LHP-121										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/6/2006	646671.7		571572.3		8.5					
LHP-121-0-1	1	1	NA		N	N	NR	NR	SP	Moist, cmf SAND, little (-) Silt & Clay, trace (+) fmc gravel
LHP-122										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/6/2006	646633.2		571702.8		8.8					
LHP-122-0-1	1	1	NA	FILL	N	N	NR	NR	SP	Blk gray cmf SAND, little (+) fm gravel.

Phase II Surficial Borings
LCP Chemicals, Inc. Superfund Site, Linden, New Jersey

LHP-123										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/6/2006	646537.1		571844.5		8.4					
LHP-123-0-1	1	1	NA	FILL	N	N	NR	NR	SP SM	Dry, Blk gray, red brwn, cmf SAND, some (+) Silt & Clay, little (-) gravel.
TES-2										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006	646312.8		572438		7.4					
TES-2-0-1	1	1	NA	FILL	N	N	NR	NR	ML CL	Wet Blk gray Clayey SILT, some (+) organics, little (+) cmf gravel.
TES-3										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/4/2006					9					
TES-3-0-1	1	1	NA	FILL	N	N	NR	NR	ML CL	Dry, Brwn SILT & CLAY, little (+/-) cmf Sand, trace (+) fmc gravel
TES-4										
	State Plane Coordinates (ft. NAD83)				G.S. Elev (ft. NGVD29)					
12/5/2006	646749		571723.9							
TES-4-0-1	1	1	NA	FILL	N	N	NR	NR	SP	Dry, cmf SAND, trace (+) gravel.

Appendix C-2: Previous Investigations

SYOSSET, NEW YORK 11791

WELL LOG

PROJECT N 418 LD-1
CLIENT LCP Chemicals Inc.
DATE PREPARED 10-9-81 BY J. DeMartin

DEPTH, ft		DESCRIPTION	L.S.
0		EXISTING GRADE EL. [illegible] Ft.	
#1.1	S.S.	Fill, Heterogeneous: slag, cinders and bricks	A
#1.2	S.S.	Clay, Black-Gray, Organic, Moist to Dry V. Cohesive: Wet From G.S. To 8 Ft.	B
10			
#1.3	S.S.	Peat, Brown (Layers 2 to 6 in. Thick) Organic Matter Disseminated Throughout: Strong H2S Ordor.	B
#1.4	S.S.	Silty, Red-Brown, Tight, Clayey, Dry: with Fine Sand and Embedded Pebble Gravel	D
20			
#1.5	S.S.	Clay, Red-Brown, Tight, Dry With Fine Sand and Embedded Gravel	D
#1.6	S.S.	Clay, Red-Brown with Embedded Pebbles: Tight.	D
30			
#1.7	S.S.	Clay, Red-Brown, Moist: Less Pebbly Than Above.	D
#1.8	S.S.	Clay, Silty, Red-Brown, Dry With Abundant Pebbles And Cobble, Gravel.	D
40			
#1.9	S.S.	Silty, Clayey, Dry, Red-Brown: Cobbles And Gravel.	D
		Bedrock @ 42.3 Ft. Boring Stopped	

L.S.=Land Surface
# - S.S.=Split Spoon Core Sample Number

OWNER LCP Chemicals Inc.
WELL NO. 1 State # 26-5293
LOCATION Lagoon Area Linden, N.J. Plant
TOPO SETTING Filled Coastal Marsh
GROUND ELEV. 9.7 Ft.

DRILLING STARTED 9-29-81
DRILLING COMPLETED 9-29-81
DRILLER H. P. Drilling
TYPE OF RIG Drive Boring

WELL DATA

HOLE DIAM. 2 1/2 inch.
FINAL DEPTH 38.5 Ft.
CASING DIAM. 1 1/2 inch.
CASING LENGTH 20 Ft. (1.5 Ft. Above L
SCREEN DIAM. 1 1/2 inch.
SCREEN SETTING 18.5-38.5 Ft.
SCREEN SLOT & TYPE 20 Slot PVC
WELL STATUS Monitoring

DEVELOPMENT

TEST DATA

STATIC DEPTH TO WATER 4.78 Ft. 4.01 Ft.
DATE MEASURED 10-6-81 10-15-81
Low Tide High Ti
Measuring Point Top of PVC Pipe
Meas. Point Elevation 9.01 Ft.
DATE OF TEST
TYPE OF TEST
PUMP SETTING
SPECIFIC CAPACITY

FINAL PUMP CAPACITY
FINAL PUMP SETTING
AVERAGE PUMPAGE

WATER QUALITY

See Appendix

LITHOLOGY REMARKS SEE TABLE 1
A= Miscellaneous Fill Deposits
B= Dark Gray Organic Clay
C= Well Sorted Sands Etc.
D= Silts, Clays Etc. (Glacial Till)

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SYOSSET, NEW YORK 11791

WELL LOG

PROJECT N 418 LD-1
CLIENT LCP Chemicals Inc.
DATE PREPARED 10-6-81 BY J. DeMartin

DEPTH, ft		DESCRIPTION	L.S.
0		EXISTING GRADE EL. 3.5 Ft.	
+2.1	S.S.	Fill, Loose Brown Silt and Sand; Abundant Organic Matter	A
+2.2	S.S.	Clay, Silty, Gray; Moist to Dry Organic Matter Disseminated Throughout. Strong H2S. Smell	B
10 +2.3	S.S.	Clay, Silty, Gray, Dry with Strong H2S smell; 0.5 Ft. Layer of Brown Peat	B
+2.4	S.S.	Clay, Silty, Red-Brown, Dry with Fine Sand and Gravel Pockets; Basalt Clasts. Green Staining; Reducing Conditions	D
20 +2.5	S.S.	Clay, Silty, Dry, Red-Brown, Tight with Metamorphic and Ignegous rock fragments.	D
+2.6	S.S.	Clay, Red-Brown, Dry with Sparse Gravel	D
30 +2.7	S.S.	Clay, Red-Brown, Dry, Soft	D
+2.8	S.S.	Clay, Red-Brown, Dry with Embedded Gravel	D
40 +2.9	S.S.	Clay, Red-Brown, Dry with Abundant Gravel; Granite Fragments	D
		Bedrock @ 43 Ft. Boring Stopped	

L. S.=Land Surface
-S. S. = Split Spoon Core Sample Number

OWNER LCP Chemicals Inc.
WELL NO. 2 State # 26-5294
LOCATION Lagoon Area
Linden, N.J. Plant
TOPO SETTING Filled Coastal Marsh
GROUND ELEV. 6.5 Ft.

DRILLING STARTED 9-30-81
DRILLING COMPLETED 10-1-81
DRILLER H.P. Drilling
TYPE OF RIG Drive Boring

WELL DATA

HOLE DIAM. 2 1/2 inch.
FINAL DEPTH 28 Ft
CASING DIAM. 1 1/2 inch.
CASING LENGTH 20 Ft. (2Ft. Above L.S.)
SCREEN DIAM. 1 1/2 inch.
SCREEN SETTING 18-28 Ft.
SCREEN SLOT & TYPE 20 Slot PVC
WELL STATUS Monitoring

DEVELOPMENT

TEST DATA

STATIC DEPTH TO WATER 5.29 Ft. 3.68 Ft
DATE MEASURED 10-6-81 10-15-81
Measuring Point Top of PVC Pipe
Measuring Point Elevation 8.25 Ft.

DATE OF TEST
TYPE OF TEST
PUMP SETTING
SPECIFIC CAPACITY

FINAL PUMP CAPACITY
FINAL PUMP SETTING
AVERAGE PUMPAGE

WATER QUALITY

See Appendix

LITHOLOGY REMARKS SEE TABLE 1
A=Miscellaneous Fill Deposits
B=Dark Gray Organic Clay
C=Well sorted Sands Etc.
D=Silts, Clays Etc. (Glacial Till)

5800 JERICHO TURNPIKE
SYOSSET, NEW YORK 11791

WELL LOG

PROJECT N 418 LD-1
CLIENT LCP Chemical Inc
DATE PREPARED 10-9-81 BY J. DeMartin

DEPTH, ft		DESCRIPTION	L.S.
0		EXISTING GRADE EL. 12.1 Ft.	
#3.1	S.S.	Fill: Gravel and silt, Brown to Black; Slag and Traprock	A
#3.2	SS.	Fill: Medium Sand and Gravel: Yellow to Gray; Clean	A
		Clay, Gray-Black, Orange, Dry H2S Odor	B
10 #3.3	S.S.	Clay, Gray, Black, Dry, Organic (Plant Material): Thin (1-2 inch) Layers of Brown Peat	B
#3.4	S.S.	As Above W/6 inch Peat Layer Base	B
20 #3.5	S.S.	Sand, Fine to Medium, Gray, Wet Grading into Silty sands, Clays with Layers of Gray Organic Clay and Brown Peat and Red-Brown, Sandy Silt.	B-C
#3.6	S.S.	Sand, Fine to Medium, Red-Brown, Well Sorted with Poorly Sorted Gravelly Layers 2-6 inches Thick	C
30 #3.7	S.S.	Clay, Silty, Dry, Cohesive	D
#3.8	S.S.	Clay, Stiff, Dry with Embedded Pebbles	D
40 #3.9	S.S.	Dry Pebbles in Tight Clay Matrix	D
#3.10	S.S.	Clay, Dry, Silty with Pebbles	D
		Bedrock @ 47.5 Ft. Boring Stopped	

L. S. = Land Surface
- S. S. = Split Spoon Core Sample Number

OWNER LCP Chemicals Inc.
WELL NO. 3 State # 26-5295
LOCATION Lagoon Area
Linden, N.J. Plant
TOPO SETTING Filled Coastal Marsh
GROUND ELEV. 12.1 Ft.

DRILLING STARTED 10-1-81
DRILLING COMPLETED 10-1-81
DRILLER H.P. Drilling
TYPE OF RIG Drive Boring

WELL DATA

HOLE DIAM. 2 1/2 inch
FINAL DEPTH 30 Feet
CASING DIAM. 1 1/2 inch
CASING LENGTH 17 Ft. (2Ft. Above L.S.)
SCREEN DIAM. 1 1/2 inch
SCREEN SETTING 15-30 Ft.
SCREEN SLOT & TYPE 20 Slot PVC
WELL STATUS Monitoring

DEVELOPMENT

TEST DATA

STATIC DEPTH TO WATER 7.83 Ft. 7.72 Ft.
DATE MEASURED 10-6-81 10-15-81
PUMPING DEPTH TO WATER Low Tide High Tide
Measuring Point Top of PVC Pipe
Measuring Point Elevation 13.85 Ft.
DATE OF TEST
TYPE OF TEST
PUMP SETTING
SPECIFIC CAPACITY

FINAL PUMP CAPACITY
FINAL PUMP SETTING
AVERAGE PUMPAGE

WATER QUALITY

See Appendix

LITHOLOGY REMARKS SEE TABLE 1
A= Miscellaneous Fill Deposits
B= Dark Gray Organic Clay
C= Well sorted sands Etc.
D= Silts, Clays Etc. (Glacial TTTT)

SYOSSET, NEW YORK 11791

WELL LOG

PROJECT N 418 LD-1
CLIENT LCP Chemicals Inc.
DATE PREPARED 10-9-81 BY J. DeMarchi

DEPTH, ft		DESCRIPTION	
0		EXISTING GRADE EL. 10.3 Ft.	L.S.
#4.1	S.S.	Fill, Redish Brown; sand and Gravel	A
#4.2	S.S.	Fill, Heterogengeous, Brown, wet At Base	A
10 #4.3	S.S.	Much, wet, organic changing to dry organic clay with thin layers of brown Peat and Reeds; H2S Smell	A
#4.4	S.S.		
20 #4.5	S.S.	Sand, Fine, Green, wet, Well Sorted Feldspathic wiht Organic materials present; H2S odor grades to Coarser; Brown at Bottom	C
#4.6	S.S.	Clay, Red-Brown, Dry with Embedded pebbles	D
30 #4.7	S.S.		
#4.8	S.S.	Clay, Red-Brown, Dry with Abundant Cobbles	D
40 #4.9	S.S.	Clay, Red-Brown, Dry and Pebbles in clay matrix in alternating layers	D
#4.10	S.S.	Clay, Dense, Dry with Siltstone Clasts	D
		Bedrock @ 48.5 Ft. Boring Stopped	

L.S. = Land Surface

-S.S.= Split Spoon Core Sample Number

OWNER LCP Chemical Inc.
WELL NO. 4 State # 26-5296
LOCATION Lagoon Area
Linden, N.J. Plant
TOPO SETTING Filled Coastal Marsh
GROUND ELEV. 10.3 Ft.

DRILLING STARTED 10-1-81
DRILLING COMPLETED 10-1-81
DRILLER H. P. Drilling
TYPE OF RIG Auger

WELL DATA

HOLE DIAM. 8 inch.
FINAL DEPTH 38 Feet
CASING DIAM. 1 1/2 inch
CASING LENGTH 20 Feet (2' above L.S.)
SCREEN DIAM. 1 1/2 inch
SCREEN SETTING 18-38 Feet
SCREEN SLOT & TYPE 20 Slot PVC
WELL STATUS Monitoring

DEVELOPMENT

TEST DATA

STATIC DEPTH TO WATER 6.64 Ft 6.30 F
DATE MEASURED 10-6-81 10-15-81
Low Tide High Tid
Measuring Point Top of PVC pipe
Measuring Point Elevation 12.31 Ft.
DATE OF TEST
TYPE OF TEST
PUMP SETTING
SPECIFIC CAPACITY

FINAL PUMP CAPACITY
FINAL PUMP SETTING
AVERAGE PUMPAGE

WATER QUALITY

See Appendix

REMARKS

A= Miscellaneous Fill Deposits
B= Dark Gray Organic Clay
C= Well Sorted Sands Etc.
D= Silts, Clays Etc. (Glacial Till)

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WELL LOG

PROJECT N 416 LD-1
CLIENT LCP Chemical Inc.
DATE PREPARED 10-9-81 BY J. DeMartin

DEPTH, ft		DESCRIPTION	S.
		EXISTING GRADE EL. 12.5 Ft	
#5.1	S.S.	Fill: Bricks on top 1 ft. with clean brown sand and abundant traprock cobbles below	A
#5.2	S.S.	Fill: Loose, brown, silty sand with cobbles grading to loose grayish-brown silt and sand; wet at 11.8 Ft.	A
10 #5.3	S.S.		
#5.4	S.S.	Sand, Silty, organic; dark grayish-brown with Molusck shells; moist	B-C
20 #5.5	S.S.	Sand, grayish-Brown, moist with organic matter	C
#5.6	S.S.	Clay, moist, organic and dry, red-brown silty clay with pebbles	B
30 #5.7	S.S.	Sand, silty, gray, organic, moist alternating with poorly sorted, red, wet, gravelly sands	C
#5.8	S.S.	Clay, red-brown, dry, stiff	D
40 #5.9	S.S.	Red-Brown, pebbles gravel in clay matrix grading to a dry cobble and pebbles gravel	D
#5.10	S.S.		
		Bedrock @ 45 Ft. Boring Stopped	

OWNER LCP Chemical Inc.
WELL NO. 5 State #26-5297
LOCATION Lagoon Area Linden, N.J. Plant
TOPO SETTING Filled Coastal Marsh
GROUND ELEV. 12.5 Ft.

DRILLING STARTED 10-2-81
DRILLING COMPLETED 10-2-81
DRILLER H. P. Drilling
TYPE OF RIG Auger

WELL DATA

HOLE DIAM. 8 Inch
FINAL DEPTH 38 Feet
CASING DIAM. 1 1/2 inch
CASING LENGTH 8 Feet
SCREEN DIAM. 1 1/2 inch
SCREEN SETTING 8-38 Ft.
SCREEN SLOT & TYPE 20 Slot PVC
WELL STATUS Monitoring

DEVELOPMENT

TEST DATA

STATIC DEPTH TO WATER 5.99 Ft. 6.99 Ft
DATE MEASURED 10-6-81 10-15-81
Low Tide High Tide
Measuring Point Top of PVC Pipe
Measuring Point Elevation 12.49 Ft.
DATE OF TEST
TYPE OF TEST
PUMP SETTING
SPECIFIC CAPACITY

FINAL PUMP CAPACITY
FINAL PUMP SETTING
AVERAGE PUMPAGE

WATER QUALITY

REMARKS

A= Miscellaneous Fill Deposits
B= Dark Gray Organic Clay
C= Well Sorted Sands Etc.
D= Silts, Clays Etc. (Glacial Till)

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2317 INTERNATIONAL LANE MADISON, WI. 53704

SHEET 1 OF 1

DATE STARTED :

DATE FINISHED :

BORING No. MW6

CLIENT :

PROJECT No : 625-

PROJECT NAME & LOCATION :

REMARKS:

DRILLING CONTRACTOR :

DRILLER :

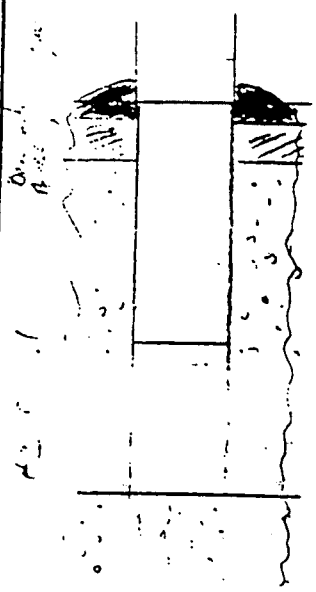
DRILLER :

EQUIPMENT :	CASING :	SOIL SAMPLER : SPLIT SPOON		CORE BARREL	AUGER	MON. WELL (MW) PIPE	CAP	DRILL RIG AND METHOD
TYPE :						P.		
SIZE :								[illegible]
HAMMER WT / FALL				BIT				

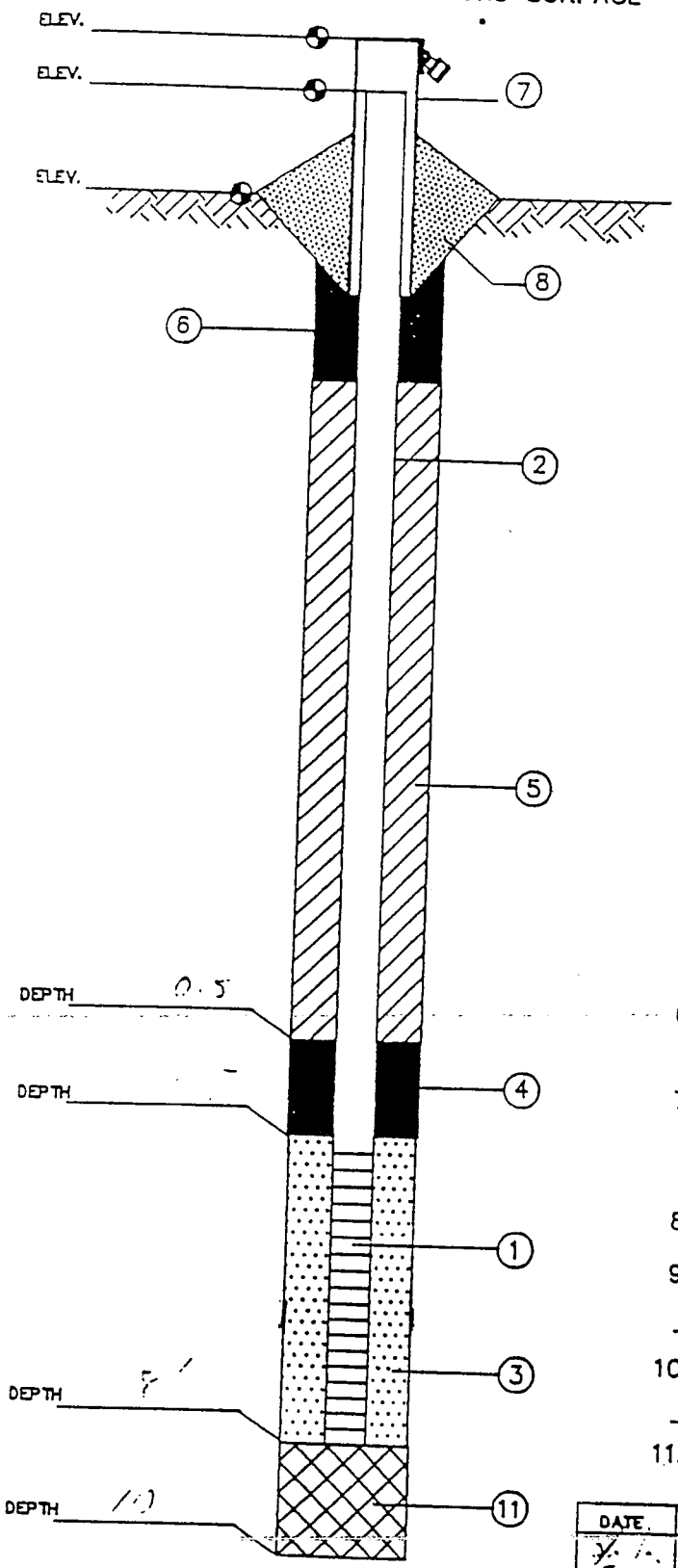
SURFACE ELEVATION :

SURFACE CONDITIONS :

WATER LEVEL AT FT. AFTER HRS. FT. AFTER HRS.

DEPTH BELOW GRADE	OVA READINGS	SAMPLE TYPE AND No.	SAMPLE DEPTH (FROM - TO)	BLOWS / 6" OR CORE TIME	STRATA DEPTH / ELEV.	DESCRIPTION AND REMARKS TRACE =0-10% LITTLE=10-20% SOME=20-30% AND=35-50%	MONITORING WELL CONSTRUCTION
					0	FILL, BN/GN, M-C SAND, COARSE PEBBLES, BRICK, CINDERS.	
					5	C-PEBBLES W/SAND + SILT	
					6	ORGANIC MATL. (PEAT) W/BN/GN CLAY. STRONG SOLVENT-LIKE + H_2S ODOR.	
					10	EOB	

ALL DEPTHS MEASURED FROM GROUND SURFACE



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MONITORING WELL CONSTRUCTION INFORMATION

JOB No. _____ CLIENT _____

LOCATION _____

DATE _____ WELL No. 6

HYDROGEOLOGIST _____

DRILLING CONTRACTOR _____

1.) SCREEN TYPE _____

SLOTTED LENGTH _____

SLOT SIZE _____

2.) SOLID PIPE TYPE _____

SOLID PIPE LENGTH _____

PIPE & SCREEN DIA. _____

JOINT TYPE – SLIP/GLUED _____ THREADED ✓

3.) TYPE OF BACKFILL AROUND SCREEN _____

4.) TYPE OF LOWER SEAL (IF INSTALLED) _____

5.) TYPE OF BACKFILL _____

HOW INSTALLED _____

6.) TYPE OF SURFACE SEAL (IF INSTALLED) _____

7.) PROTECTIVE CASING – YES ✓ NO _____

LOCKING CAP YES _____ NO _____

8.) CONCRETE SEAL – YES ✓ NO _____

9.) DRILLING METHOD _____

10.) ADDITIVES USED (IF ANY) _____

11.) TYPE OF BACKFILL _____

WATER LEVEL CHECKS *

DATE	TIME	DEPTH TO WATER	REMARKS

* FROM TOP OF WELL CASING : PVC

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SHEET 1 OF 1

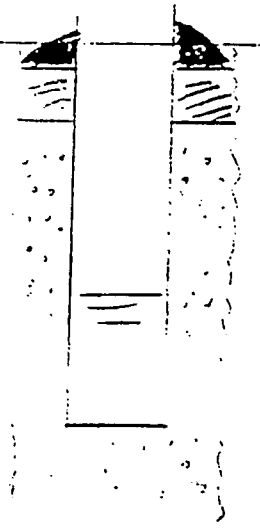
DATE STARTED : [illegible]	DATE FINISHED : [illegible]	BORING No. MW 7
CLIENT : [illegible]		PROJECT No : [illegible]
PROJECT NAME & LOCATION : [illegible]		
REMARKS:		
DRILLING CONTRACTOR : [illegible]	DRILLER : [illegible]	DRILLER :

EQUIPMENT :	CASING :	SOIL SAMPLER : SPLIT SPOON	SOIL SAMPLER :	CORE BARREL	AUGER	MON. WELL (MW) PIPE	MON. WELL (MW) CAP	DRILL RIG AND METHOD
TYPE :						PVC		HSA
SIZE :						4"		
HAMMER WT / FALL				BIT.				

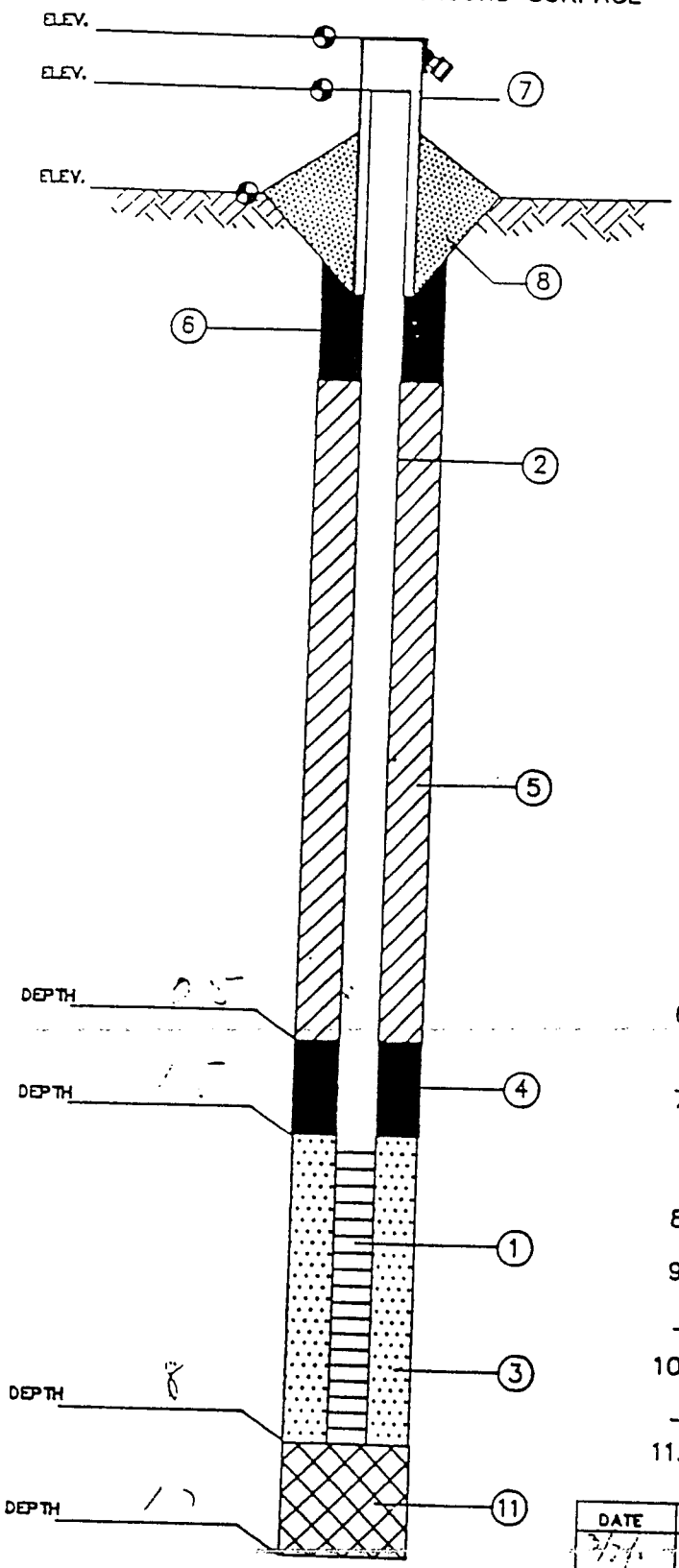
SURFACE ELEVATION :

SURFACE CONDITIONS :

WATER LEVEL AT FT. AFTER HRS. FT. AFTER HRS.

DEPTH BELOW GRADE	OVA READINGS	SAMPLE TYPE AND No.	SAMPLE DEPTH (FROM - TO)	BLOWS / 6" OR CORE TIME	STRATA DEPTH / ELEV.	DESCRIPTION AND REMARKS TRACE =0–10% LITTLE=10–20% SOME=20–30% AND=35–50%	MONITORING WELL CONSTRUCTION
0					2	FILL, BN-GN M-C SAND W/ C-PEBBLES, CINDERS	
5					6	ORGANIC MATL. (PEAT) W/ GN CLAY, SOME F-M SAND. STRONG H_2S ODOR.	
10					10	EOB.	

ALL DEPTHS MEASURED
FROM GROUND SURFACE



MONITORING WELL CONSTRUCTION INFORMATIO

JOB No. _____ CLIENT _____

LOCATION _____

DATE _____ WELL No. 7

HYDROGEOLOGIST _____

DRILLING CONTRACTOR _____

1.) SCREEN TYPE _____

SLOTTED LENGTH _____

SLOT SIZE _____

2.) SOLID PIPE TYPE _____

SOLID PIPE LENGTH _____

PIPE & SCREEN DIA. _____

JOINT TYPE – SLIP/GLUED _____ THREADED _____

3.) TYPE OF BACKFILL AROUND SCREEN _____

4.) TYPE OF LOWER SEAL (IF INSTALLED)

5.) TYPE OF BACKFILL _____

HOW INSTALLED _____

6.) TYPE OF SURFACE SEAL (IF INSTALLED)

7.) PROTECTIVE CASING – YES ✓ NO _____

LOCKING CAP YES _____ NO _____

8.) CONCRETE SEAL – YES _____ NO _____

9.) DRILLING METHOD _____

10.) ADDITIVES USED (IF ANY) _____

11.) TYPE OF BACKFILL _____

WATER LEVEL CHECKS *

DATE	TIME	DEPTH TO WATER	REMARKS

* FROM TOP OF WELL CASING

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SHEET 1 OF 1

DATE STARTED :	DATE FINISHED :	BORING No.
CLIENT :		PROJECT No :
PROJECT NAME & LOCATION :		
REMARKS:		

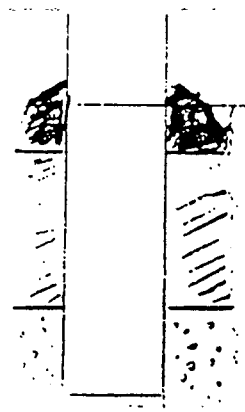
DRILLING CONTRACTOR :	DRILLER :	DRILLER :

EQUIPMENT :	CASING :	SOIL SAMPLER : SPLIT SPOON	SOIL SAMPLER :	CORE BARREL	AUGER	MON. WELL (MW) PIPE	MON. WELL (MW) CAP	DRILL RIG AND METHOD
TYPE :						PVC		
SIZE :						4"		
HAMMER WT / FALL				BIT.				

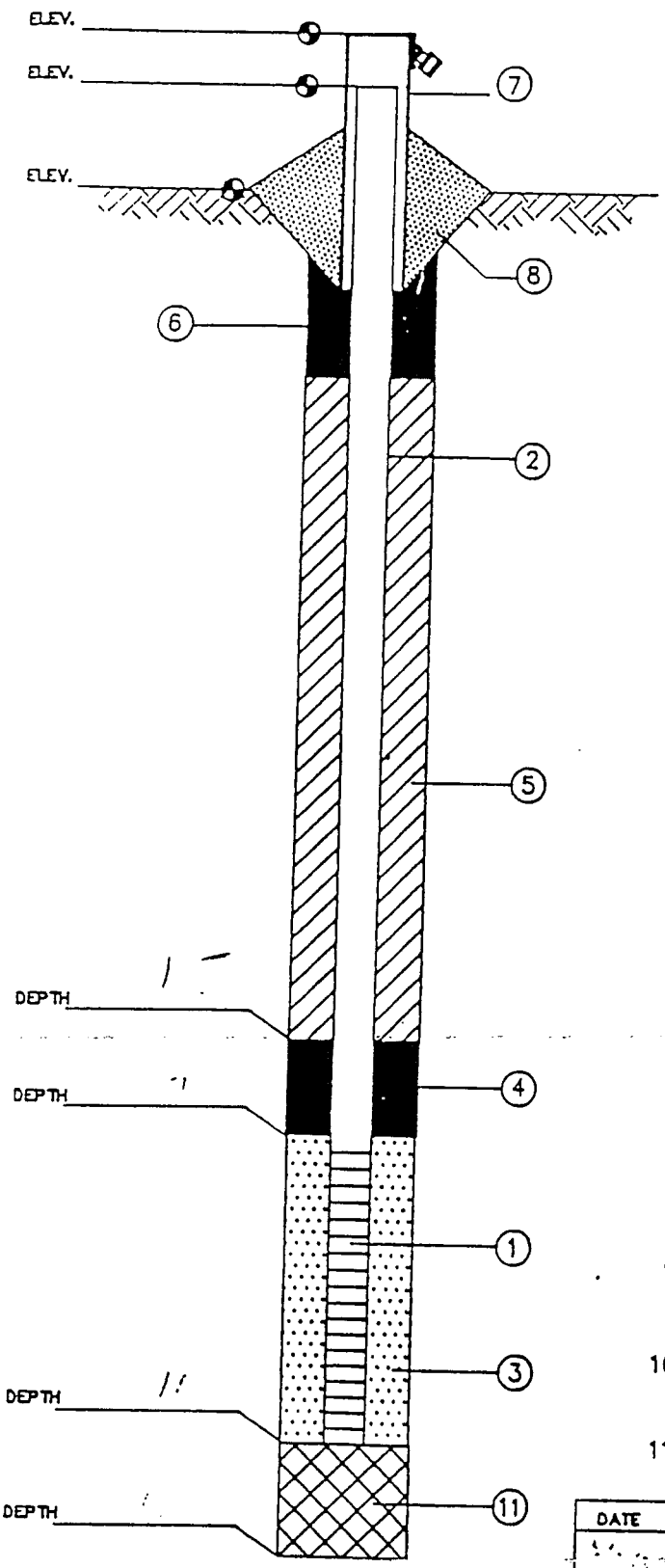
SURFACE ELEVATION :

SURFACE CONDITIONS :

WATER LEVEL AT FT. AFTER HRS. FT. AFTER HRS.

DEPTH BELOW GRADE	OVA READINGS	SAMPLE TYPE AND No.	SAMPLE DEPTH (FROM - TO)	BLOWS / 6" OR CORE TIME	STRATA DEPTH / ELEV.	DESCRIPTION AND REMARKS TRACE =0–10% LITTLE=10–20% SOME=20–30% AND=35–50%	MONITORING WELL CONSTRUCTION
0							
5						FILL, BN-TN M-C SAND W/ C-PEBBLES, CINDERS.	
10						ORGANIC MATL. (PEAT) W/GN CLAY, SOME F-SAND. STRONG H_2S ODOR.	

ALL DEPTHS MEASURED
FROM GROUND SURFACE



MONITORING WELL CONSTRUCTION INFORMATION

JOB No. _____ CLIENT _____

LOCATION _____

DATE _____ WELL No. 8

HYDROGEOLOGIST _____

DRILLING CONTRACTOR _____

1.) SCREEN TYPE _____

SLOTTED LENGTH _____

SLOT SIZE _____

2.) SOLID PIPE TYPE _____

SOLID PIPE LENGTH _____

PIPE & SCREEN DIA. _____

JOINT TYPE – SLIP/GLUED _____ THREADED _____

3.) TYPE OF BACKFILL AROUND SCREEN _____

4.) TYPE OF LOWER SEAL (IF INSTALLED)

5.) TYPE OF BACKFILL _____

HOW INSTALLED _____

6.) TYPE OF SURFACE SEAL (IF INSTALLED)

7.) PROTECTIVE CASING – YES _____ NO _____

LOCKING CAP YES _____ NO _____

8.) CONCRETE SEAL – YES _____ NO _____

9.) DRILLING METHOD _____

10.) ADDITIVES USED (IF ANY) _____

11.) TYPE OF BACKFILL _____

WATER LEVEL CHECKS *

DATE	TIME	DEPTH TO WATER	REMARKS

* FROM TOP OF WELL CASING

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SHEET 1 OF 1

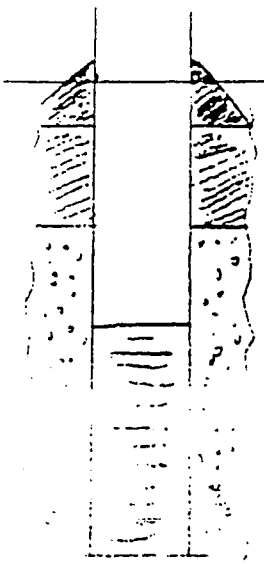
DATE STARTED :	DATE FINISHED :	BORING No. 9
CLIENT :		PROJECT No : 6[illegible]-1
PROJECT NAME & LOCATION :		
REMARKS:		
DRILLING CONTRACTOR :	DRILLER :	DRILLER :

EQUIPMENT :	CASING :	SOIL SAMPLER : SPLIT SPOON	SOIL SAMPLER :	CORE BARREL	AUGER	MON. WELL (MW) PIPE	MON. WELL (MW) CAP	DRILL RIG AND METHOD
TYPE :								
SIZE :								N/A
HAMMER WT / FALL				BIT.				

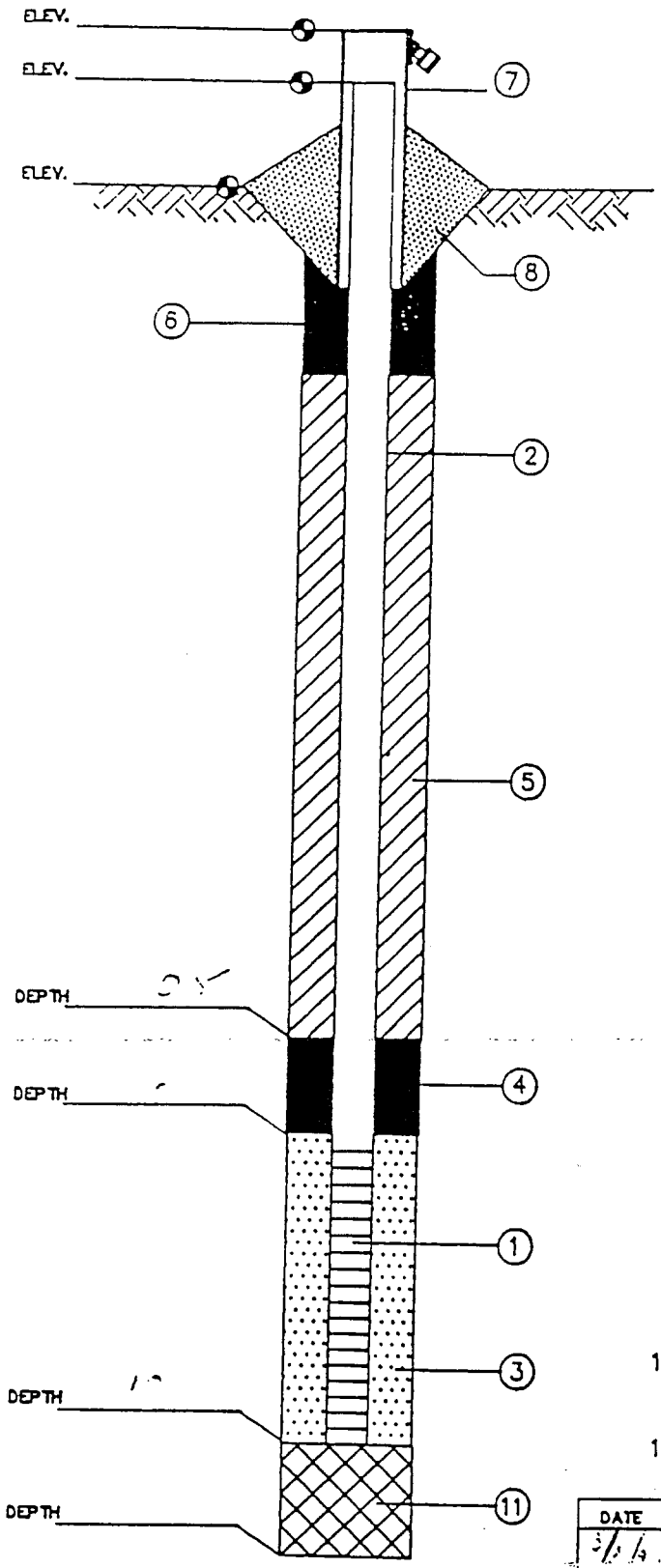
SURFACE ELEVATION :

SURFACE CONDITIONS :

WATER LEVEL AT FT. AFTER HRS. FT. AFTER HRS.

DEPTH BELOW GRADE	OVA READINGS	SAMPLE TYPE AND No.	SAMPLE DEPTH (FROM - TO)	BLOWS / 6" OR CORE TIME	STRATA DEPTH / ELEV.	DESCRIPTION AND REMARKS TRACE =0–10% LITTLE=10–20% SOME=20–30% AND=35–50%	MONITORING WELL CONSTRUCTION
0	–				0	FILL, BN/GN M-C SAND w/ C-PEBBLES, CINDERS	
5					5	GR F-M SAND, SILT, SOME C-PEBBLES	
10					6	ORGANIC MATL (PEAT) W/GN CLAY, STRONG H_2S ODOR,	
					10		

ALL DEPTHS MEASURED
FROM GROUND SURFACE



MONITORING WELL CONSTRUCTION INFORMATION

JOB No. _____ CLIENT _____

LOCATION _____

DATE _____ WELL No. 9

HYDROGEOLOGIST _____

DRILLING CONTRACTOR _____

1.) SCREEN TYPE _____

SLOTTED LENGTH 5 f

SLOT SIZE _____

2.) SOLID PIPE TYPE _____

SOLID PIPE LENGTH _____ f

PIPE & SCREEN DIA. _____ in

JOINT TYPE – SLIP/GLUED _____ THREADED ___

3.) TYPE OF BACKFILL AROUND SCREEN _____

4.) TYPE OF LOWER SEAL (IF INSTALLED)

5.) TYPE OF BACKFILL _____

HOW INSTALLED _____

6.) TYPE OF SURFACE SEAL (IF INSTALLED)

7.) PROTECTIVE CASING – YES ✓ NO ___

LOCKING CAP YES ✓ NO ___

8.) CONCRETE SEAL – YES ✓ NO ___

9.) DRILLING METHOD _____

10.) ADDITIVES USED (IF ANY) –

11.) TYPE OF BACKFILL –

WATER LEVEL CHECKS *

DATE	TIME	DEPTH TO WATER	REMARKS

* FROM TOP OF WELL CASING

Appendix C-3: Off-Site Ditch Logs

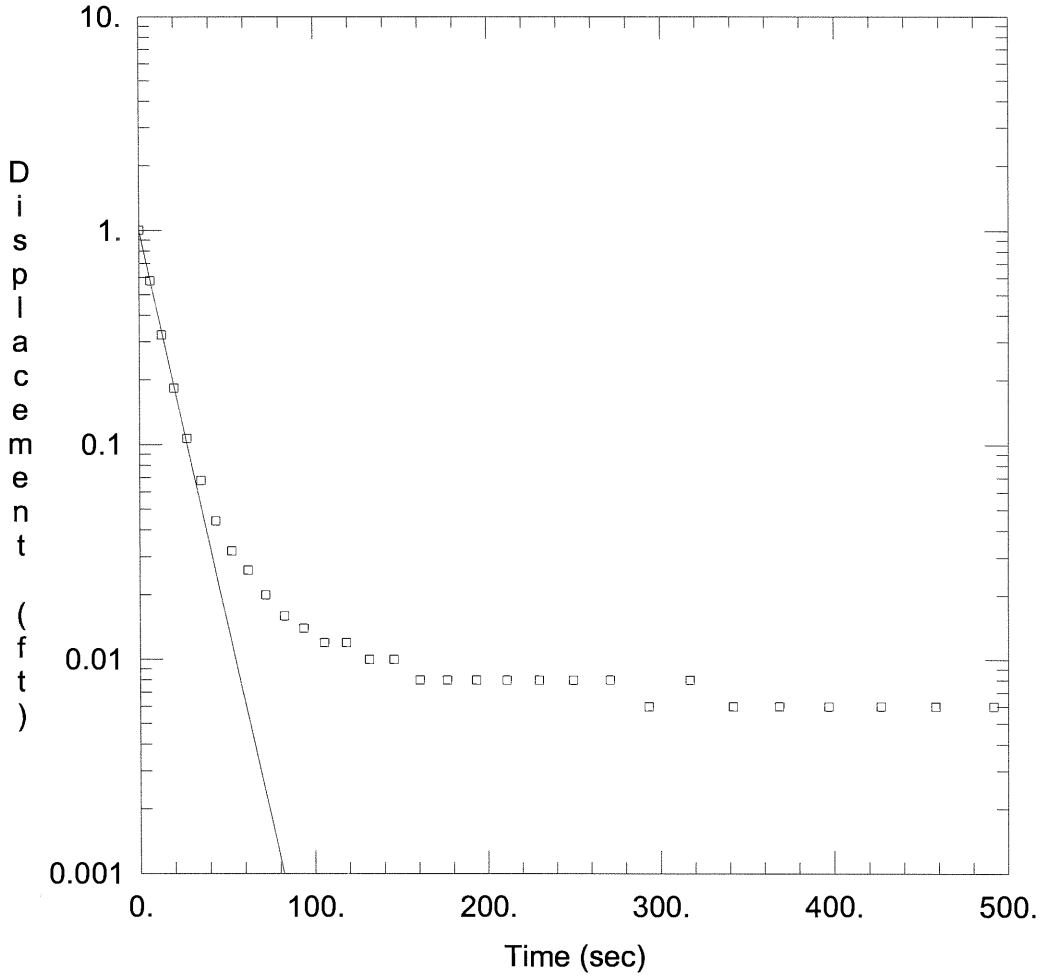
Appendix C-3
SEDIMENT SAMPLE PHYSICAL DESCRIPTIONS
LCP Chemicals, Inc. Superfund Site, Linden, New Jersey

Sample Location	Top Depth	Bottom Depth	Burmeister Description	% Gravel	%Sand	% Fines
South Branch Creek						
SED-7	0	0.5	Black SILT, some f sand, some organic matter, saturated	13.8	75.9	10.2
SED-8	0	0.5	Black SILT, some fm sand, some organic matter, saturated	0.78	86.7	12.6
SED-9	0	0.5	Black SILT, mfc sand, some organic matter, little gravel and pebbles, saturated	9.2	86.3	4.5
SED-A-1	0	0.5	Black, fine ClayeySILT, trace (+/-) fine sand, some organic, saturated	7	75.6	17.5
SED-A-2	0	0.5	Dark grey to black, SILT, some fmSand, little odd shaped (ceramic) stones, wet. Petroleum like smell.	15.8	70.2	14
SED-A-2	0.5	1	Dark grey, SiltyCLAY, trace fmsand, trace(-) pebbles, some organic matter, moist	0	78.9	21.1
SED-A-2	1	1.5	Dark grey CLAY, some silt.	0.47	75.7	23.9
SED-A-3	0	0.5	Black, fine ClayeySILT, little fine sand, some organic, saturated	3	74.7	22.3
SED-B-1	0	0.5	Black, very fine SILT, trace mcsand, saturated	50.7	42.9	6.4
SED-B-2	0	0.5	Black, fm SILT, some fmsand, little gravel, saturated	1.6	95.3	3.1
SED-B-2	0.5	1	Black, CLAYandSILT, fmsilt, some (-)fmsand, saturated	4.7	91.5	3.9
SED-B-2	1	1.5	Dark grey, Silty CLAY, fine Silt, trace sand, little organic matter, moist	11	62.1	26.9
SED-B-2	1.5	2	Light grey, Silty CLAY, Silt, trace f sand, trace organic matter, moist	1.6	54	44.5
SED-B-3	0	0.5	Black, fine to medium SILT, some msand, saturated	4	87.3	8.7
SED-C-1	0	0.5	Black, SILT, some mSand, some organic matter, saturated	0.72	74.1	25.2
SED-C-2	0	0.5	Dark grey to black, SiltyClay, some f Sand, little organic matter, moist	1.9	78.6	19.5
SED-C-2	0.5	1	Dark grey, SiltyClay, some fsand, little organic matter, moist	0	67.5	32.5
SED-C-2	1	1.5	Dark grey, CLAY, some silt, trace fsand, trace organic matter	0	69.8	30.2
SED-C-3	0	0.5	Black, fine SILT, some fSand, little organic matter, saturated	4.8	82.3	12.9
SED-D-1	0	0.5	Black to dark grey, Silt&Clay, some f Sand, some organic matter, wet	1.1	82	16.9
SED-D-2	0	0.5	Black SILT, some f Sand, some organic matter, saturated	0	79	21
SED-D-2	0.5	1	Black SILT, some f Sand, little organic matter, saturated	1.3	82.8	15.9
SED-D-2	1	1.5	Black SILT, some f Sand, little organic matter, saturated	6.5	77.2	16.3
SED-D-2	1.5	2	Black SILT, f Sand, saturated	0.84	92.7	6.5
SED-D-2	2	2.5	Black SiltyClay, some f Sand, some organic matter	0	88	12
SED-D-3	0	0.5	Black to dark grey, Silt&Clay, some f Sand, some organic matter, saturated	26.1	65.6	8.4
SED-E-1	0	0.5	Dark grey to black, SILT&ORGANICS, some clay, some sand, wet	3.2	89.2	7.6
SED-E-2	0	0.5	Dark grey to black, SiltyClay, some f Sand, little organic matter, moist	0.5	85.9	13.7
SED-E-2	0.5	1	Dark grey to black, SiltyClay, some f Sand, little organic matter, wet	0.46	94.6	4.9
SED-E-2	1	1.5	Dark grey to black, CLAY, some Silt, little organic matter	0	86.7	11.1
SED-E-2	1.5	2	Dark grey CLAY, some Silt, trace organic matter	0	86.3	13.7
SED-E-3	0	0.5	Dark grey to black, SILT&ORGANICS, some fine sand, wet	0.15	86.8	13
Arthur Kill						
SED-F-1	0	0.5	Dark grey to black, SandySILT, some pebbles, some organic matter, wet	5.4	92.1	2.6
SED-F-2	0	0.5	Dark grey to black, Clay & fmSandy, some pebbles, some organic matter, wet	15	80	5
SED-F-3	0	0.5	Dark grey to black, SandySILT, some pebbles, some organic matter, wet	3.2	94.3	2.5
SED-G-1	0	0.5	Dark grey to black, SILT, little Clay, moist	39.2	54	6.4
SED-G-2	0	0.5	Dark grey to black, SILT, little Clay, moist	46.9	46	7.5
SED-G-3	0	0.5	Dark grey to black, SILT, little Clay, moist	59.6	33	7.6
Old Place Creek						
SED-W-1	0	0.5	Dark grey to black, SILT&CLAY, some fSand, some organic matter, wet	59.3	38	2.6
SED-W-3	0	0.5	Dark grey to black, ClayeySILT, trace sand, trace f gravel, some organic matter, wet	83.3	12	4.3
SED-X-1	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	9.1	69.9	21
SED-X-3	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	0	81.8	18.2
SED-Y-1	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	0.16	76.7	23.1
SED-Y-3	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	0	79.1	20.9
SED-Z-1	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	0	72.7	27.3
SED-Z-2	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	1.4	14	85
SED-Z-3	0	0.5	Dark grey to black, SILT&CLAY, trace fine sand, some organic matter, wet	2.3	73.2	24.6

Appendix D: Hydrogeologic Data

D-1 – Hydraulic Conductivity Reports
D-2 - Hydrographs

Appendix D-1: Hydraulic Conductivity Reports



MW-6

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-6.aqt
Date: 08/20/02 Time: 12:43:31

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-6
Test Date: 12/5/01

AQUIFER DATA

Saturated Thickness: 5.07 ft
Anisotropy Ratio (Kz/Kr): 1.

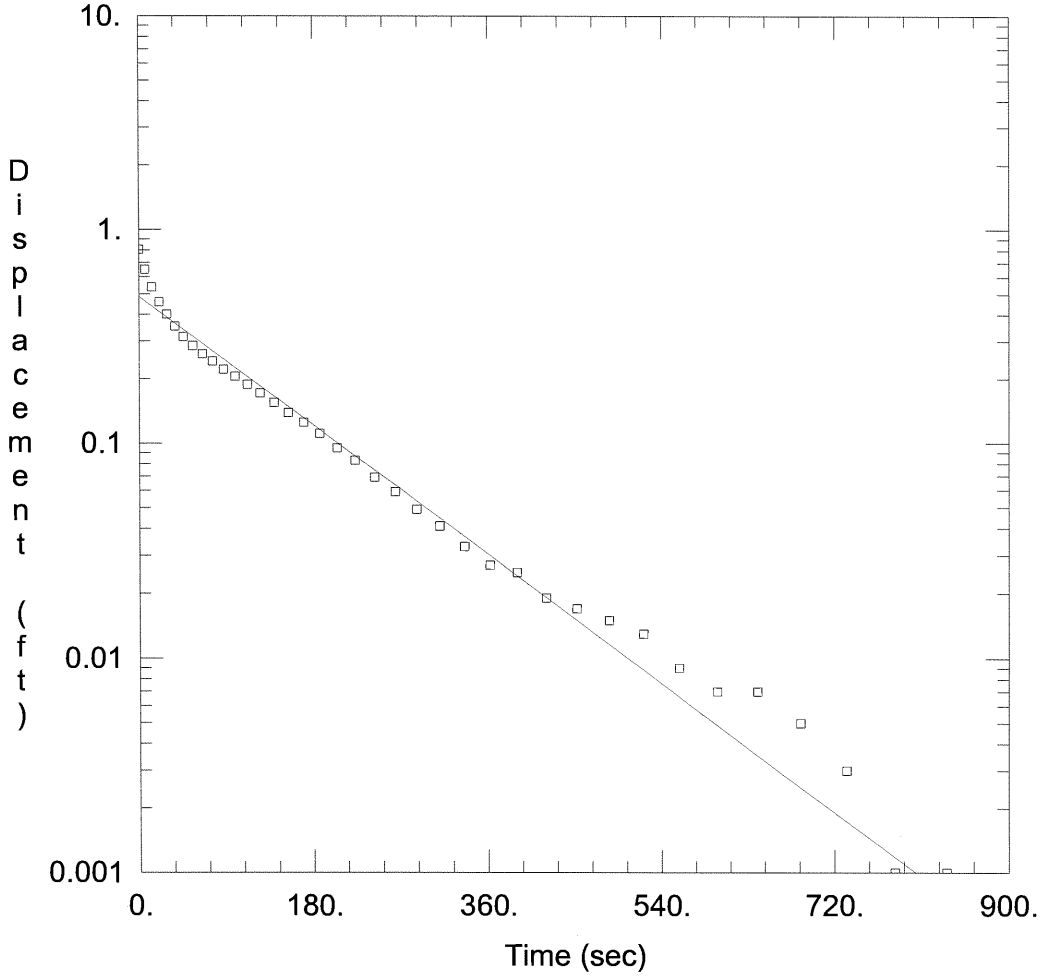
WELL DATA (MW-6)

Initial Displacement: 1.003 ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 5.07 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.01218 cm/sec
y0 = 0.9965 ft



MW-7

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-7.aqt
Date: 08/20/02 Time: 12:43:36

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-7
Test Date: 12/5/01

AQUIFER DATA

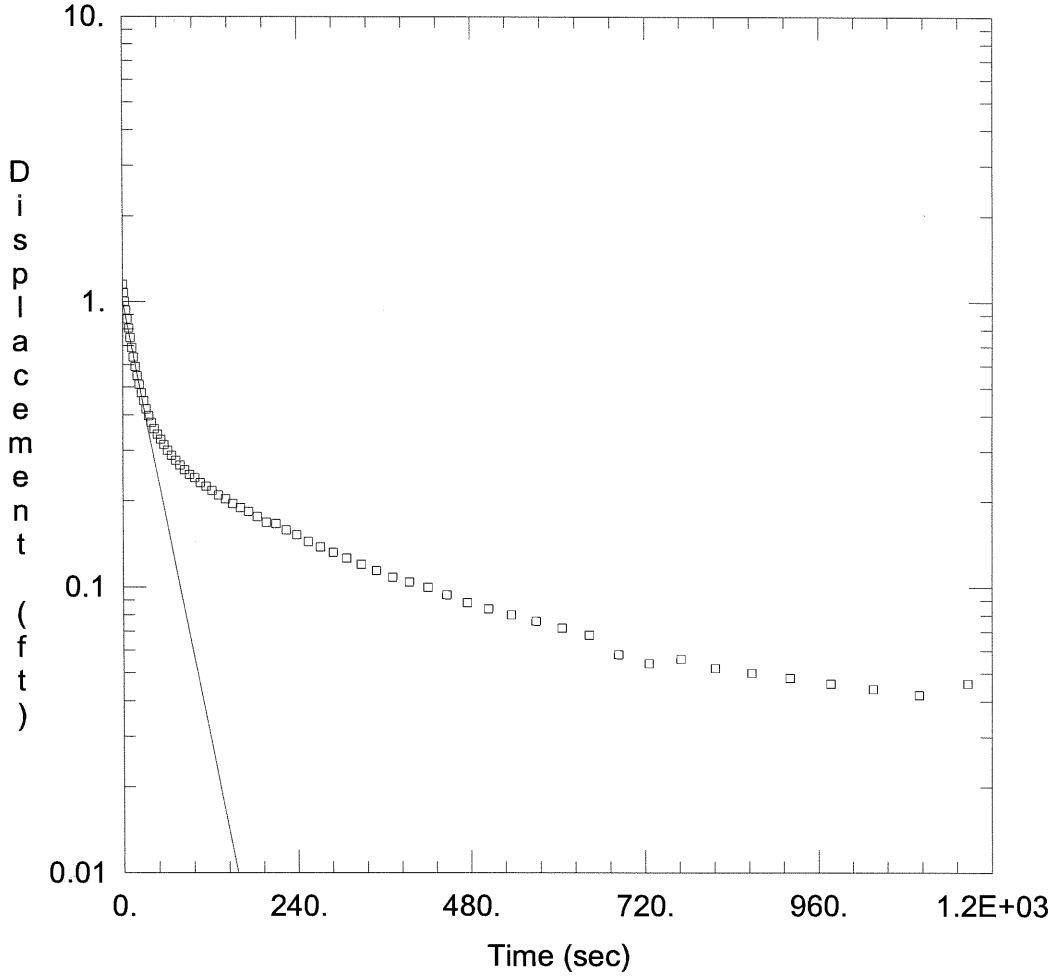
Saturated Thickness: 5.46 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-7)

Initial Displacement: 0.804 ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 5.46 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.001115 cm/sec
y0 = 0.4856 ft



MW-8

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-8.aqt
Date: 08/20/02 Time: 12:43:40

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-8
Test Date: 12/5/01

AQUIFER DATA

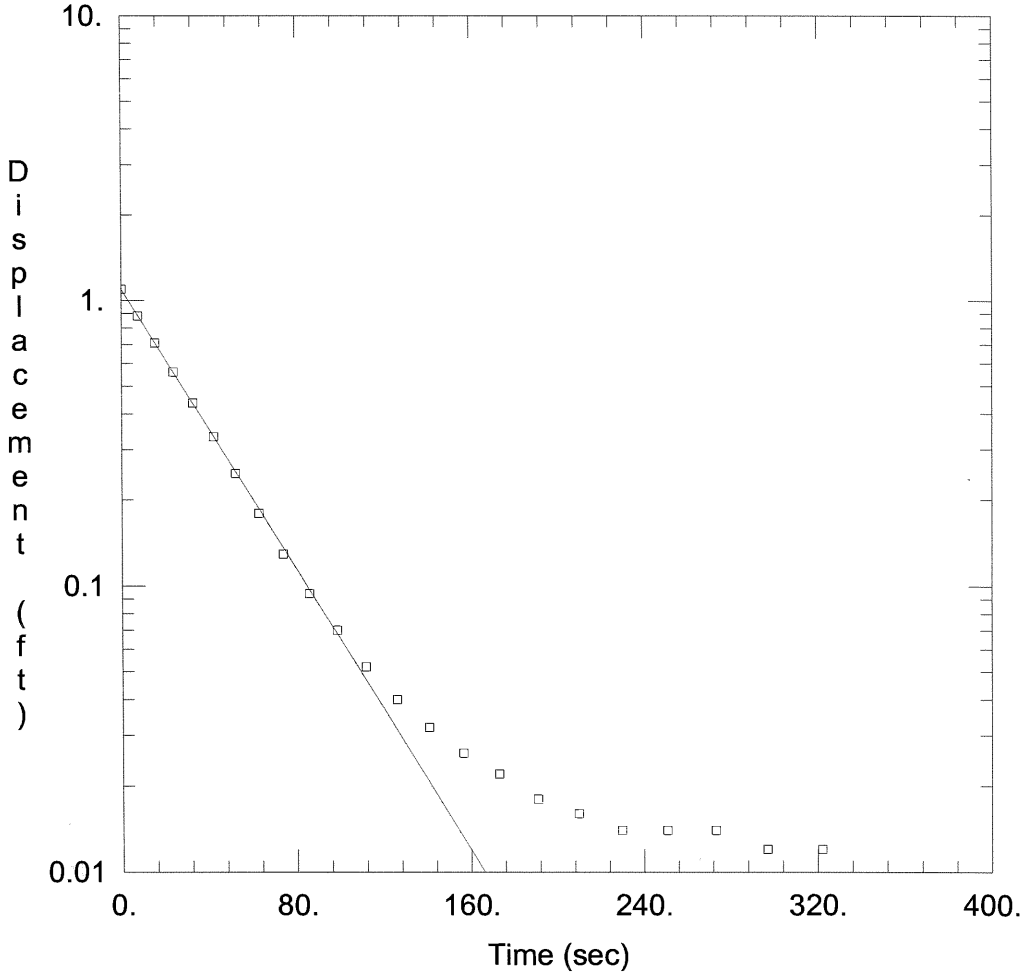
Saturated Thickness: 6.41 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-8)

Initial Displacement: 1.149 ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 6.41 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.004275 cm/sec
y0 = 1.002 ft



MW-9

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-9.aqt
Date: 08/20/02 Time: 12:43:46

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-9
Test Date: 12/5/01

AQUIFER DATA

Saturated Thickness: 4.59 ft
Anisotropy Ratio (Kz/Kr): 1.

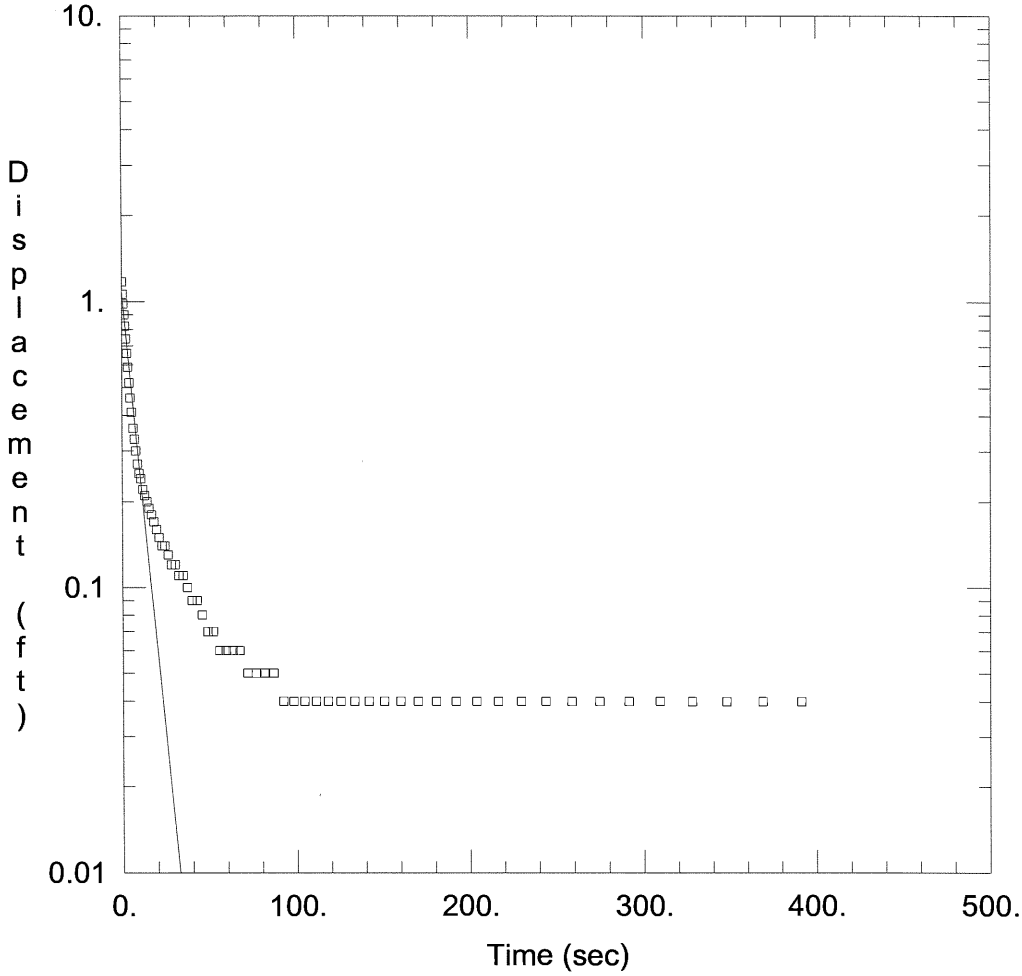
WELL DATA (MW-9)

Initial Displacement: 1.095 ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 4.59 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.004089 cm/sec
y0 = 1.093 ft



MW-10

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-10.aqt
Date: 08/20/02 Time: 12:42:17

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-10
Test Date: 12/5/01

AQUIFER DATA

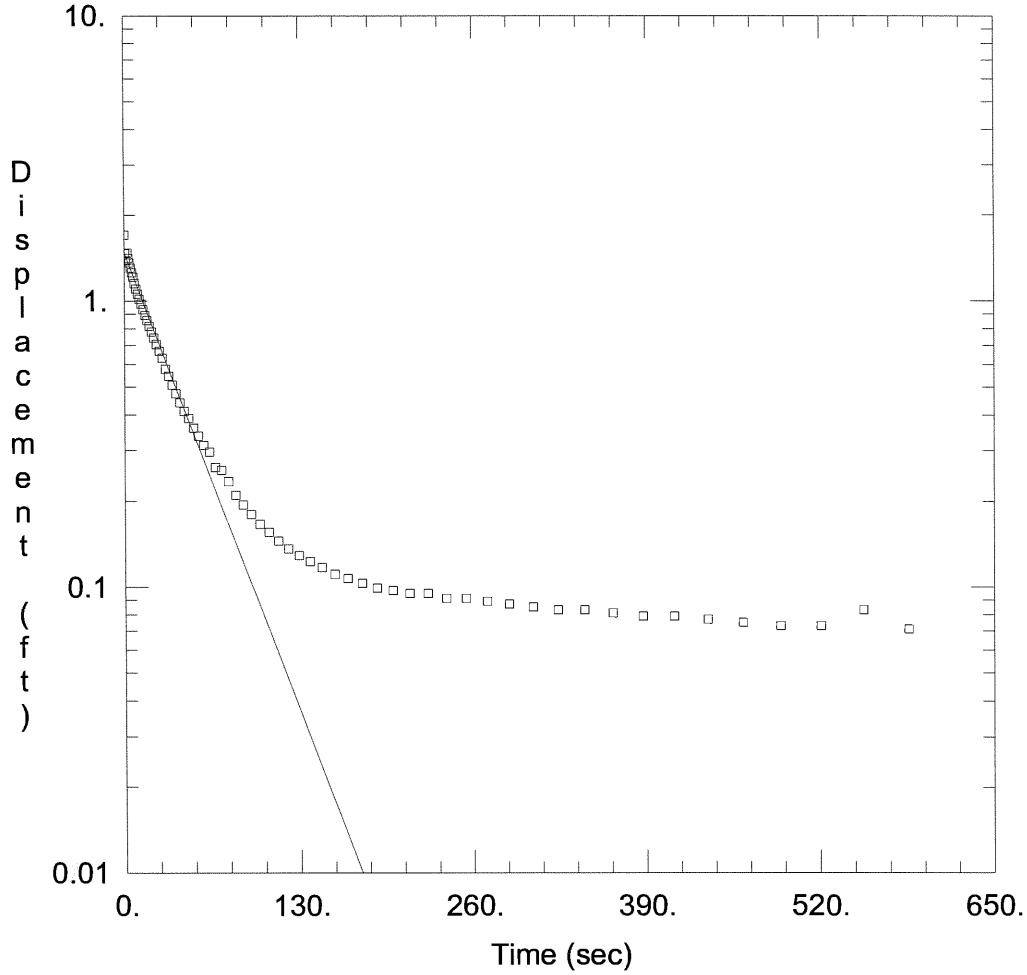
Saturated Thickness: 3.79 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-10)

Initial Displacement: 1.17 ft
Casing Radius: 0.083 ft
Screen Length: 6. ft
Water Column Height: 3.79 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.01826 cm/sec
y0 = 1.068 ft



MW-11

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-11.aqt
Date: 08/20/02 Time: 12:42:27

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-11
Test Date: 12/4/01

AQUIFER DATA

Saturated Thickness: 7.66 ft
Anisotropy Ratio (Kz/Kr): 1.

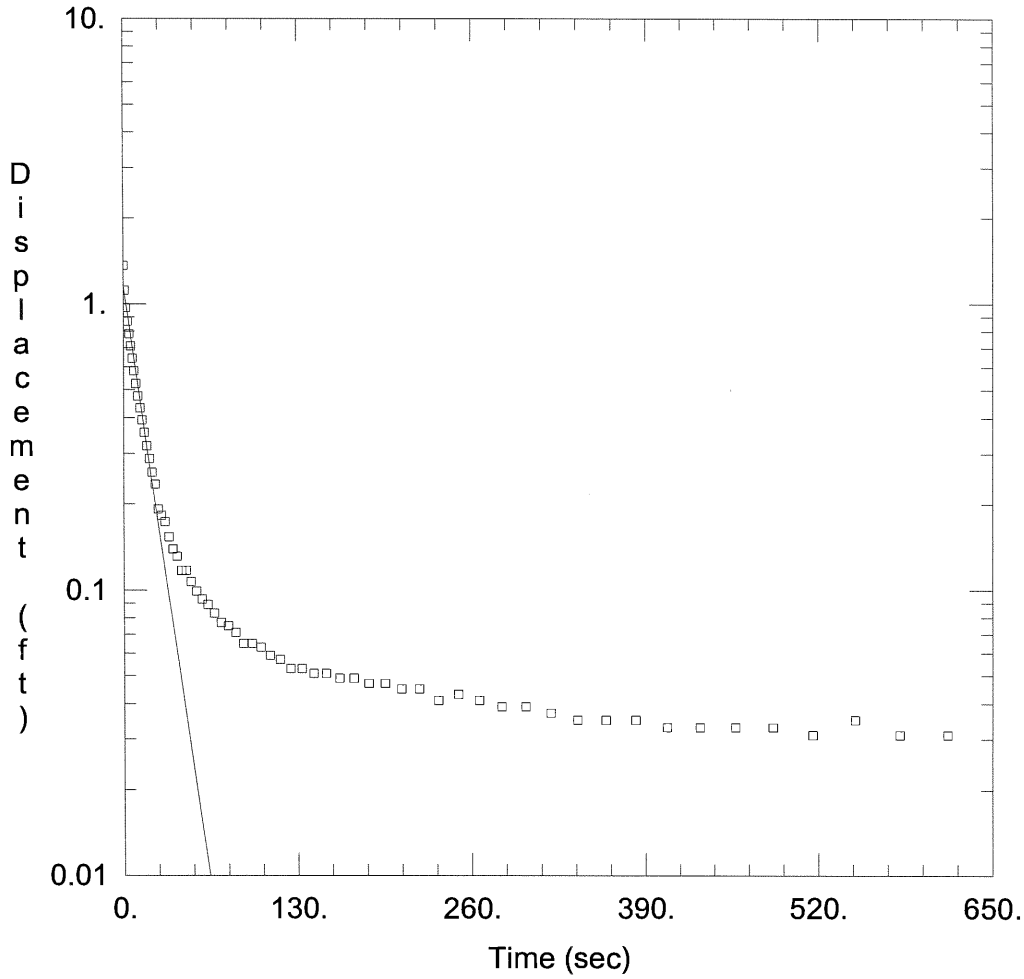
WELL DATA (MW-11)

Initial Displacement: 1.702 ft
Casing Radius: 0.083 ft
Screen Length: 5.5 ft
Water Column Height: 8.66 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.003843 cm/sec
y0 = 1.472 ft



MW-12

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-12.aqt
Date: 08/20/02 Time: 12:42:34

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-12
Test Date: 12/4/01

AQUIFER DATA

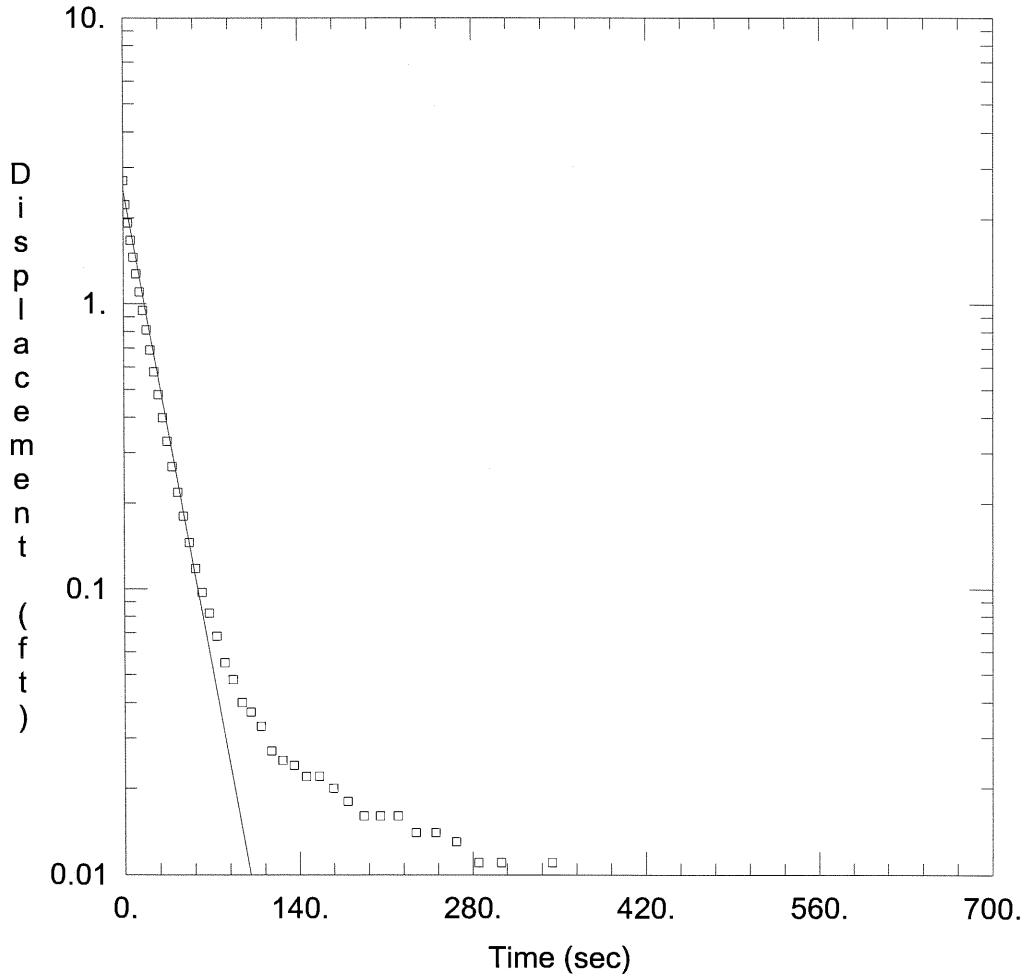
Saturated Thickness: 8.52 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-12)

Initial Displacement: 1.36 ft
Casing Radius: 0.083 ft
Screen Length: 8. ft
Water Column Height: 8.82 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.007658 cm/sec
y0 = 1.151 ft



MW-13

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-13.aqt
Date: 08/20/02 Time: 12:42:45

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-13
Test Date: 12/4/01

AQUIFER DATA

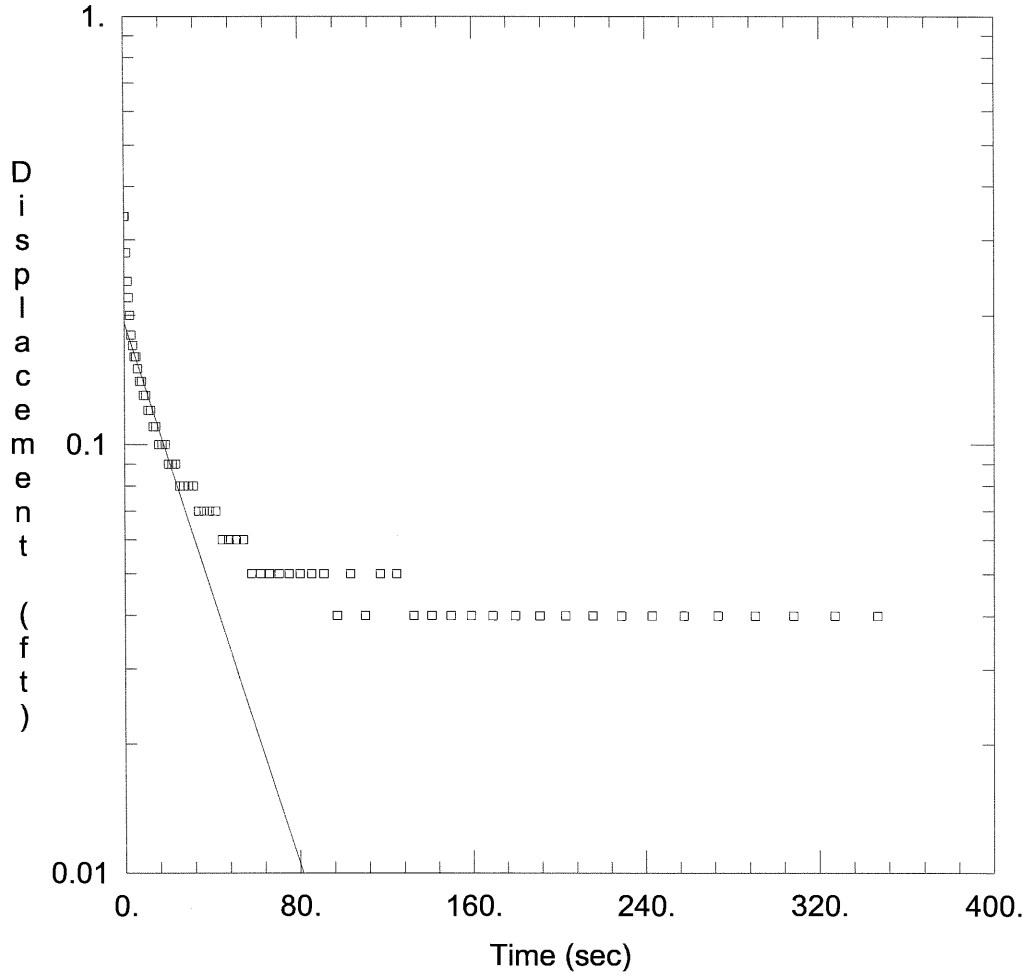
Saturated Thickness: 6.77 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-13)

Initial Displacement: 2.699 ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 6.77 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.007962 cm/sec
y0 = 2.504 ft



MW-14

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-14.aqt
Date: 08/20/02 Time: 12:42:51

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-14
Test Date: 12/4/01

AQUIFER DATA

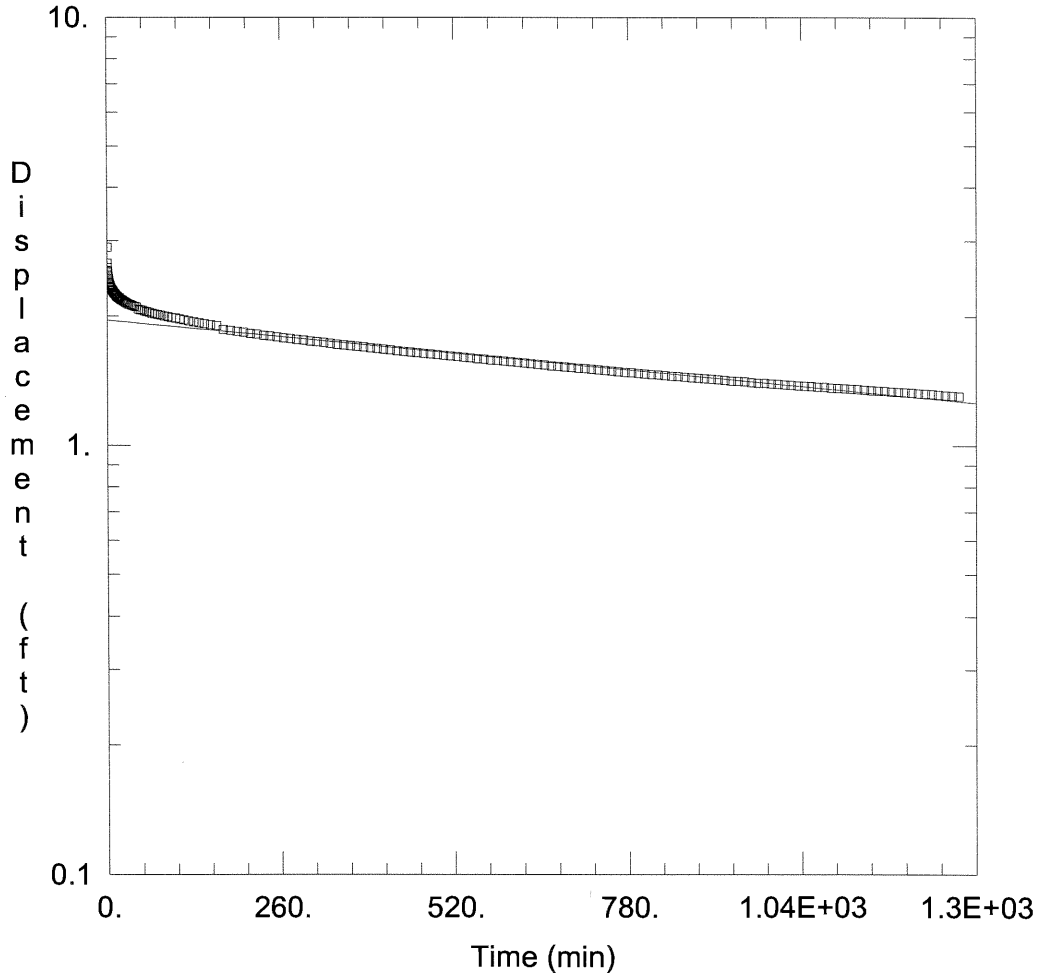
Saturated Thickness: 1.61 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-14)

Initial Displacement: 0.34 ft
Casing Radius: 0.083 ft
Screen Length: 3.5 ft
Water Column Height: 1.61 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.006717 cm/sec
y0 = 0.192 ft



MW-15

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-15.aqt
Date: 08/20/02 Time: 12:42:56

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-15
Test Date: 12/5/01

AQUIFER DATA

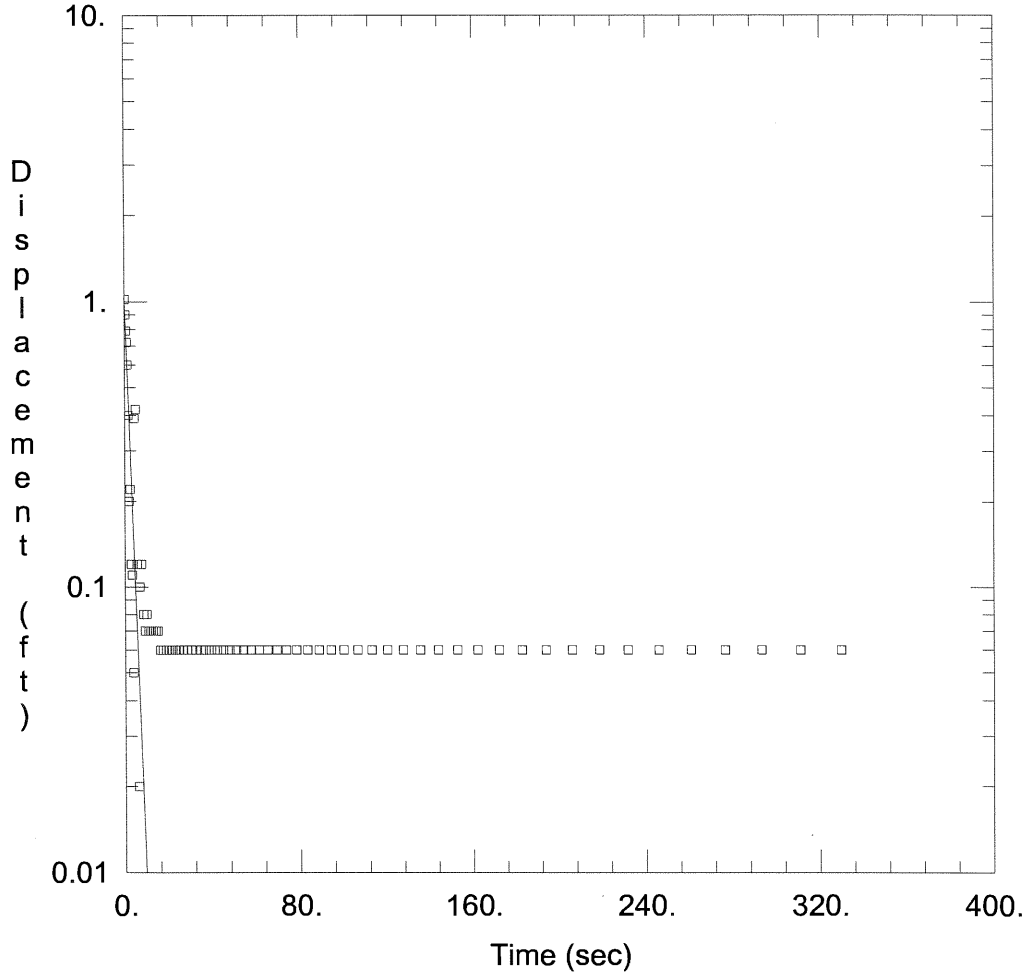
Saturated Thickness: 3.42 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-15)

Initial Displacement: 2.895 ft
Casing Radius: 0.083 ft
Screen Length: 8.5 ft
Water Column Height: 3.92 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 5.602E-07 cm/sec
y0 = 1.957 ft



MW-16

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-16.aqt
Date: 08/20/02 Time: 12:43:01

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-16
Test Date: 12/4/01

AQUIFER DATA

Saturated Thickness: 10.39 ft
Anisotropy Ratio (Kz/Kr): 1.

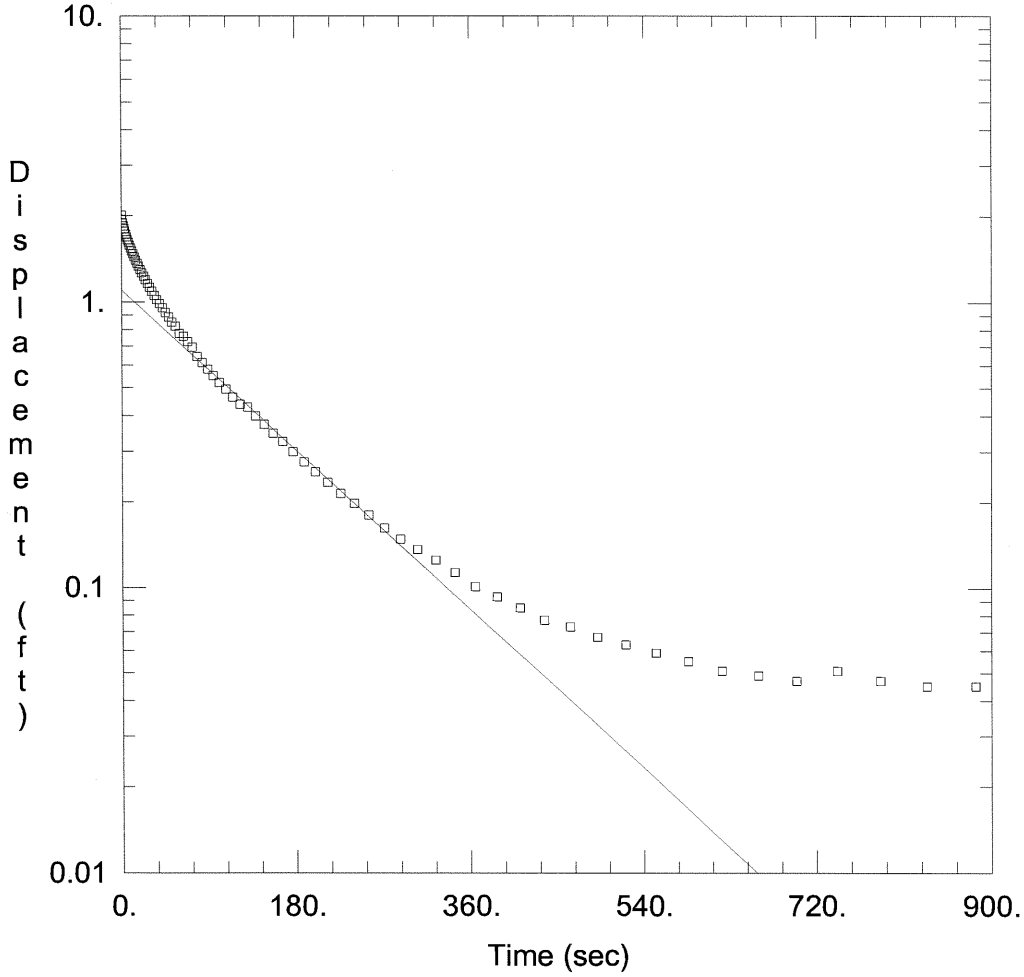
WELL DATA (MW-16)

Initial Displacement: 1.019 ft
Casing Radius: 0.083 ft
Screen Length: 9. ft
Water Column Height: 10.39 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0467 cm/sec
y0 = 1.019 ft



MW-17

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-17.aqt
Date: 08/20/02 Time: 12:43:08

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-17
Test Date: 12/4/01

AQUIFER DATA

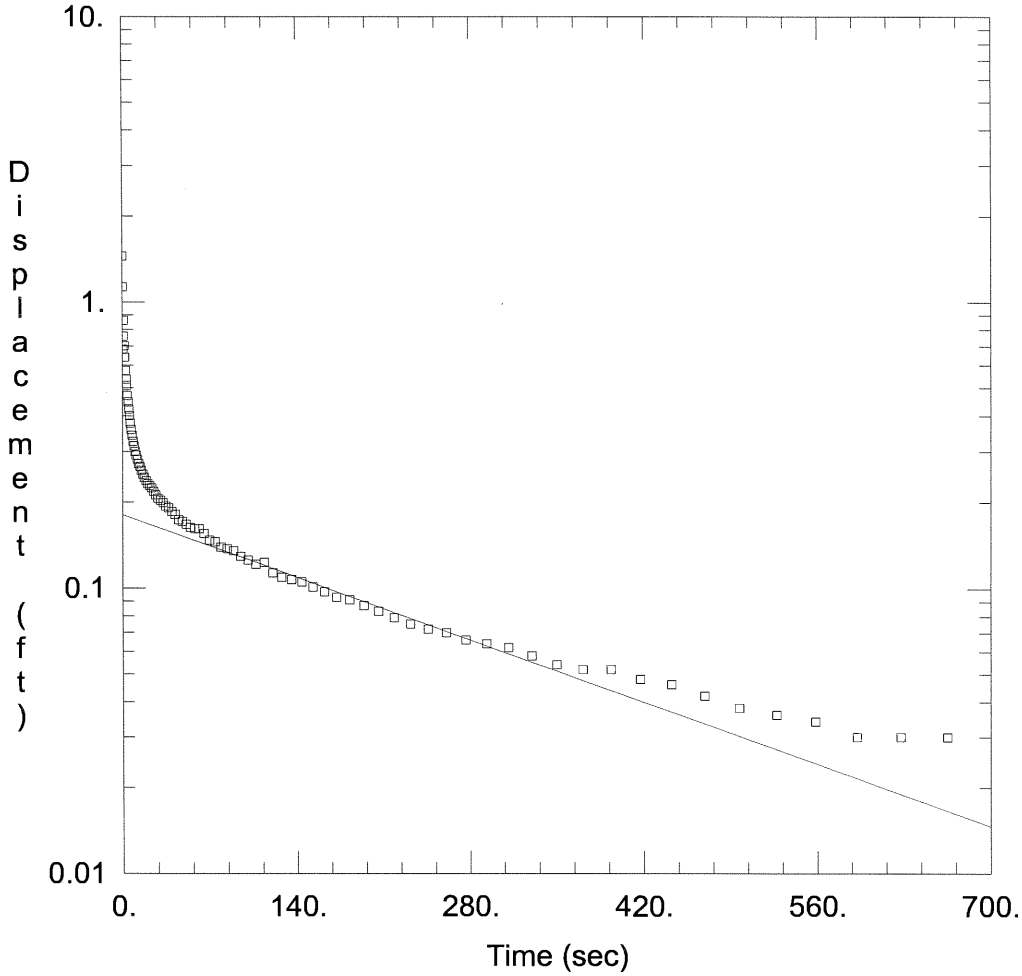
Saturated Thickness: 9.1 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-17)

Initial Displacement: 2.008 ft
Casing Radius: 0.083 ft
Screen Length: 8. ft
Water Column Height: 9.1 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.0007374 cm/sec
y0 = 1.097 ft



MW-18

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-18.aqt
Date: 08/20/02 Time: 12:43:13

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-18
Test Date: 12/4/01

AQUIFER DATA

Saturated Thickness: 8.51 ft
Anisotropy Ratio (Kz/Kr): 1.

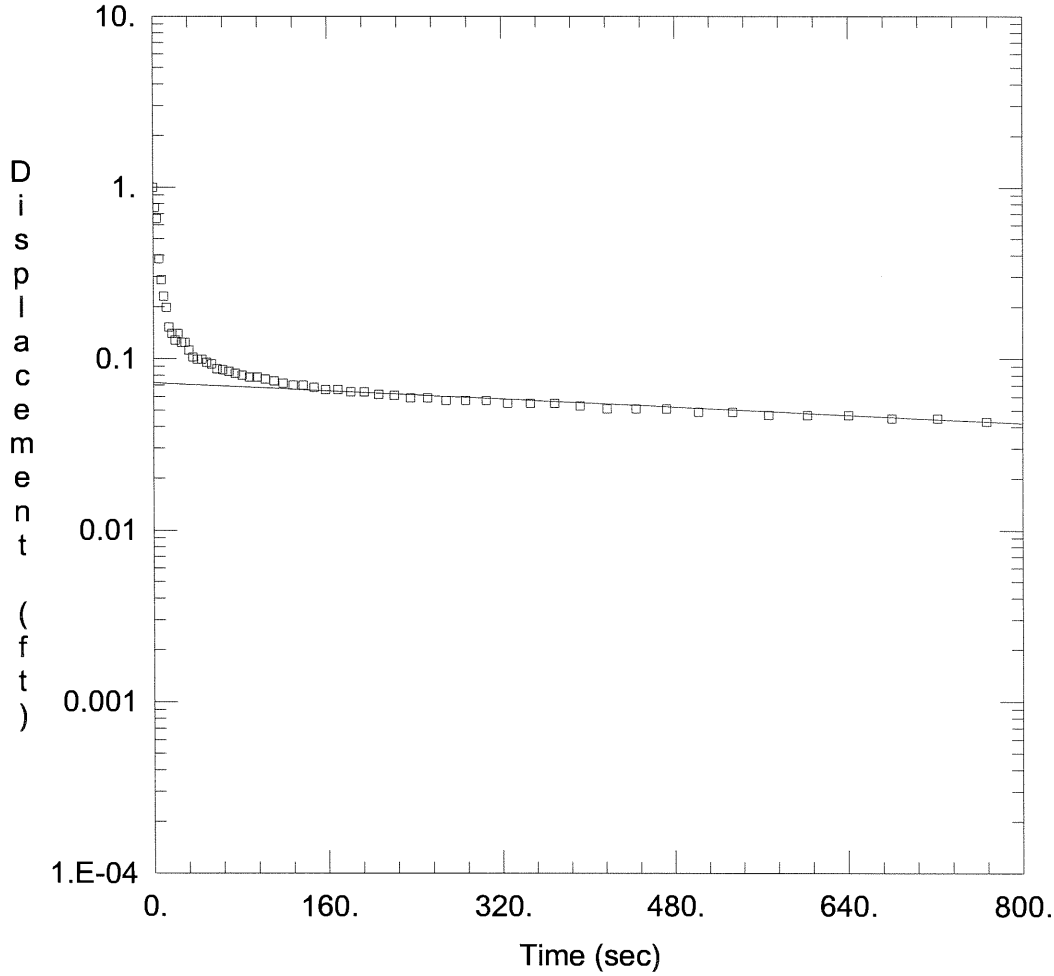
WELL DATA (MW-18)

Initial Displacement: 1.447 ft
Casing Radius: 0.083 ft
Screen Length: 9. ft
Water Column Height: 8.51 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0003399 cm/sec
y0 = 0.1803 ft



MW-19

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-19.aqt
Date: 08/20/02 Time: 12:43:20

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-19
Test Date: 12/4/01

AQUIFER DATA

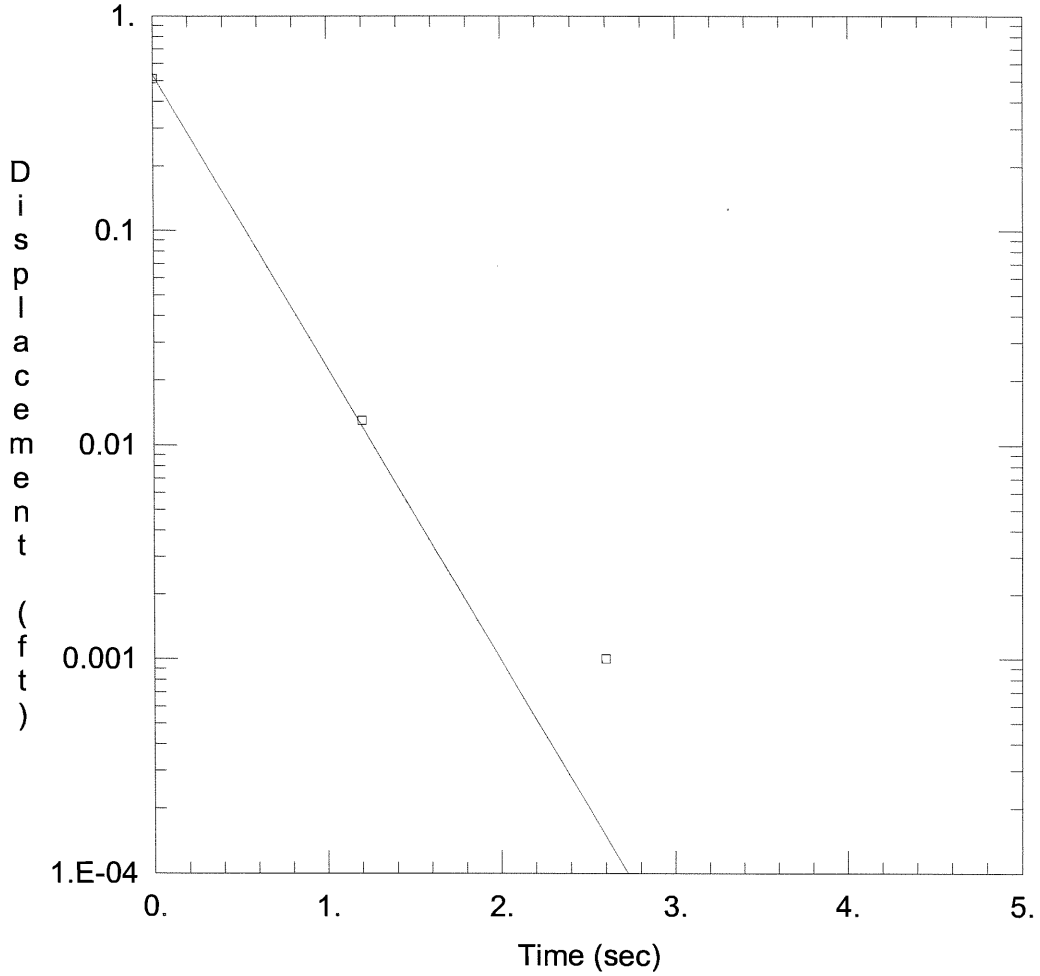
Saturated Thickness: 9.1 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-19)

Initial Displacement: 0.998 ft
Casing Radius: 0.083 ft
Screen Length: 9. ft
Water Column Height: 9.1 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 6.404E-05 cm/sec
y0 = 0.07235 ft



MW-20

Data Set: P:\LCP\21405\Data\Slug_Test_Data\mw-20.aqt
Date: 08/20/02 Time: 12:43:26

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP Environmental Services Inc
Project: LCP Superfund Site
Test Location: Linden, NJ
Test Well: MW-20
Test Date: 12/4/01

AQUIFER DATA

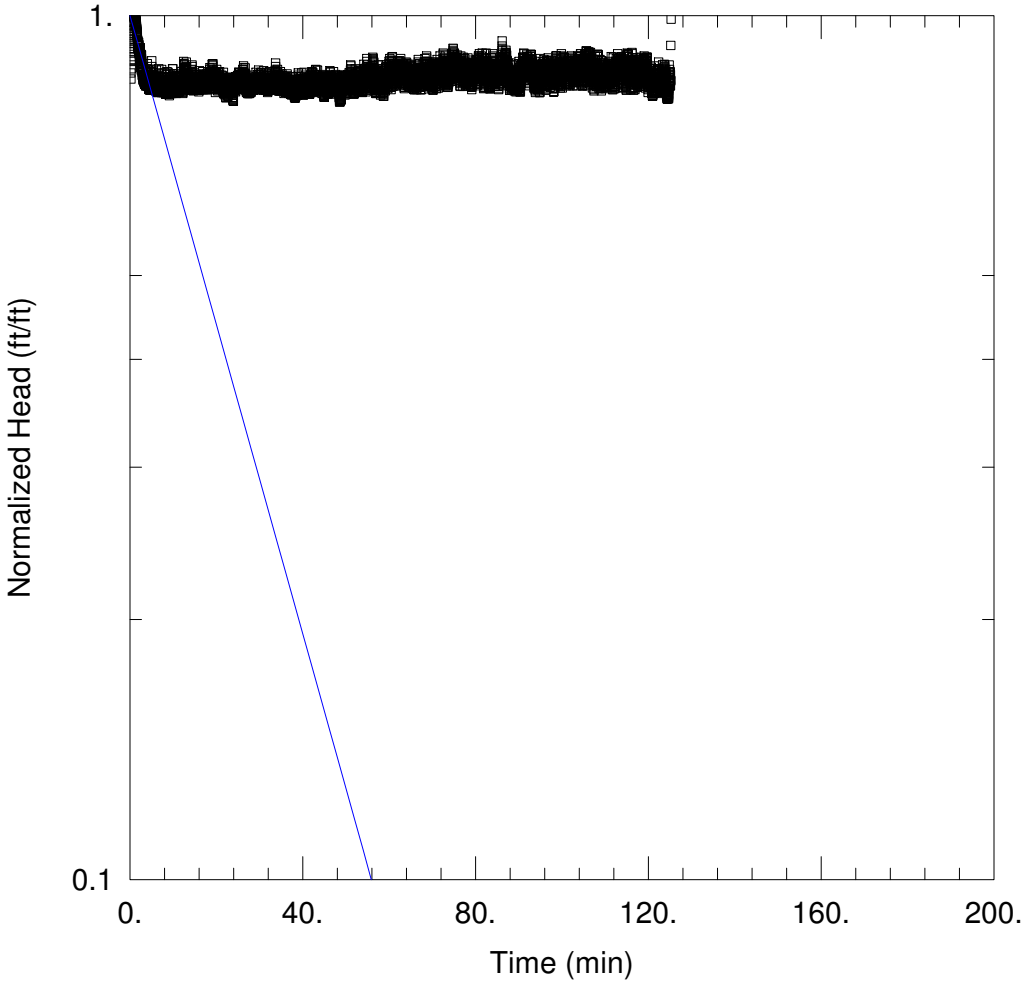
Saturated Thickness: 2.88 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-20)

Initial Displacement: 0.509 ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 2.88 ft
Wellbore Radius: 0.177 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.456 cm/sec
y0 = 0.5337 ft



RISING

Data Set: P:\...\MW-6D-RISING.aqt
Date: 07/25/07 Time: 07:47:29

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-6D
Test Date: 2/20/07

AQUIFER DATA

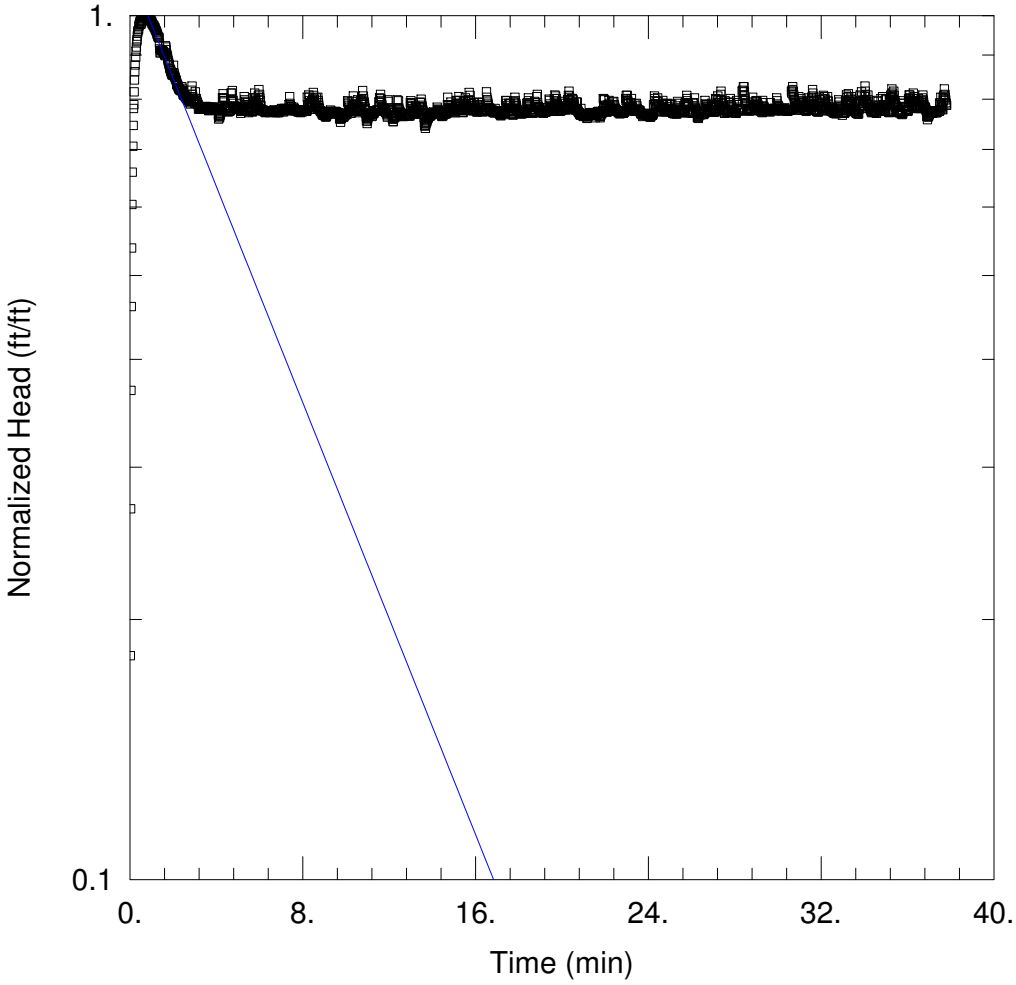
Saturated Thickness: 12. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-6D)

Initial Displacement: -0.598 ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.083 ft
Static Water Column Height: 13.05 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 3.955E-5 cm/sec
y0 = -0.5984 ft



RISING

Data Set: P:\...\MW-11D-RISING.aqt
Date: 07/25/07 Time: 07:52:00

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-11D
Test Date: 2/20/07

AQUIFER DATA

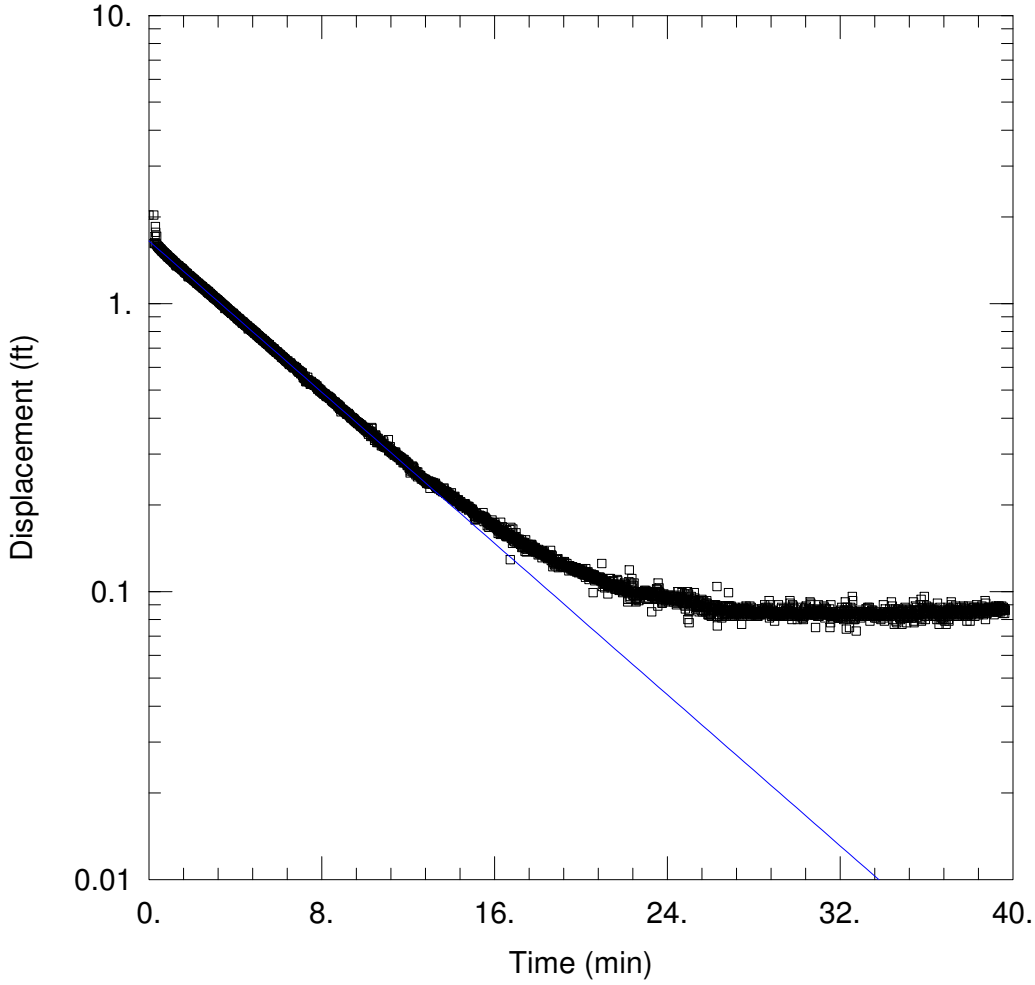
Saturated Thickness: 21. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-11D)

Initial Displacement: -0.771 ft
Total Well Penetration Depth: 21. ft
Casing Radius: 0.083 ft
Static Water Column Height: 11.17 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0001381 cm/sec
y0 = -0.8692 ft



RISING

Data Set: P:\...\MW-14D-RISING.aqt
Date: 07/25/07 Time: 07:53:27

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-14D
Test Date: 1/22/07

AQUIFER DATA

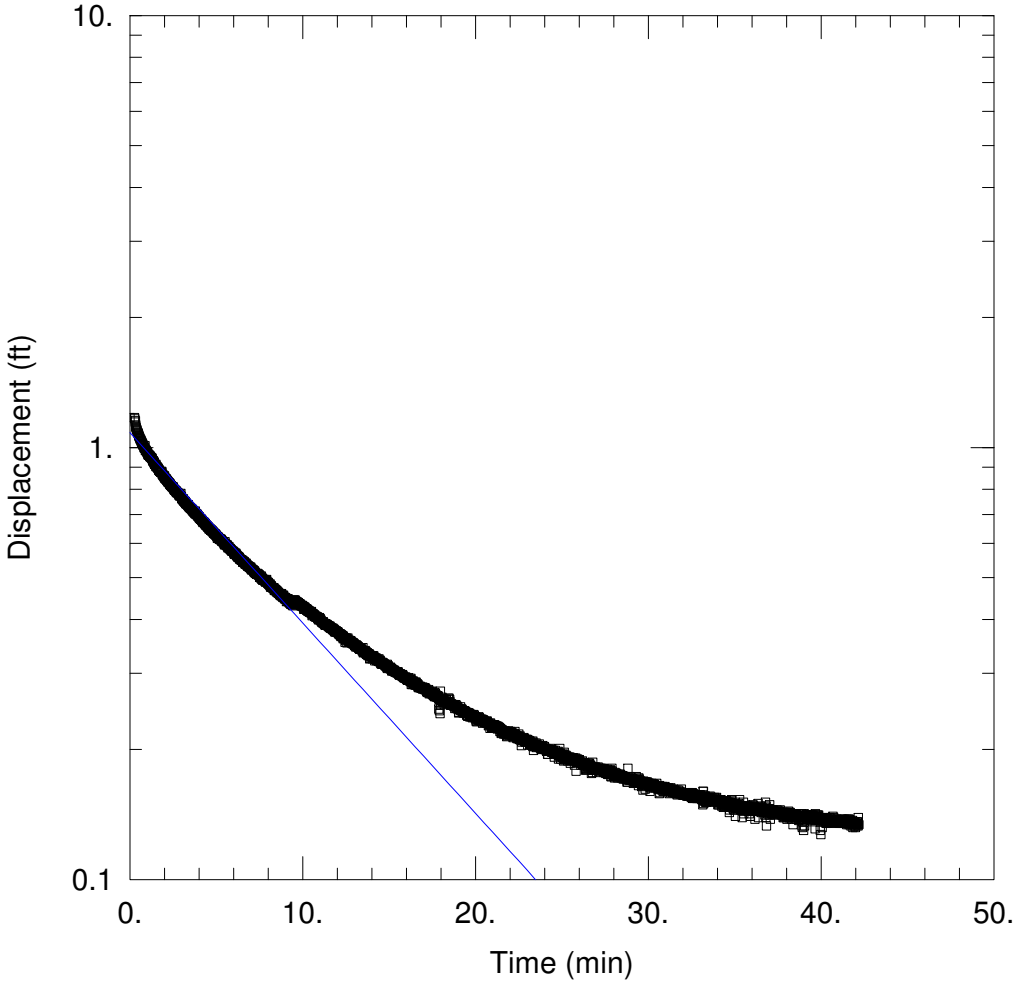
Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-14D)

Initial Displacement: 2.028 ft
Total Well Penetration Depth: 16. ft
Casing Radius: 0.083 ft
Static Water Column Height: 43.34 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.000145 cm/sec
y0 = 1.648 ft



RISING

Data Set: P:\...\MW-16D-RISING.aqt
Date: 07/25/07 Time: 08:37:13

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-16D
Test Date: 1/22/07

AQUIFER DATA

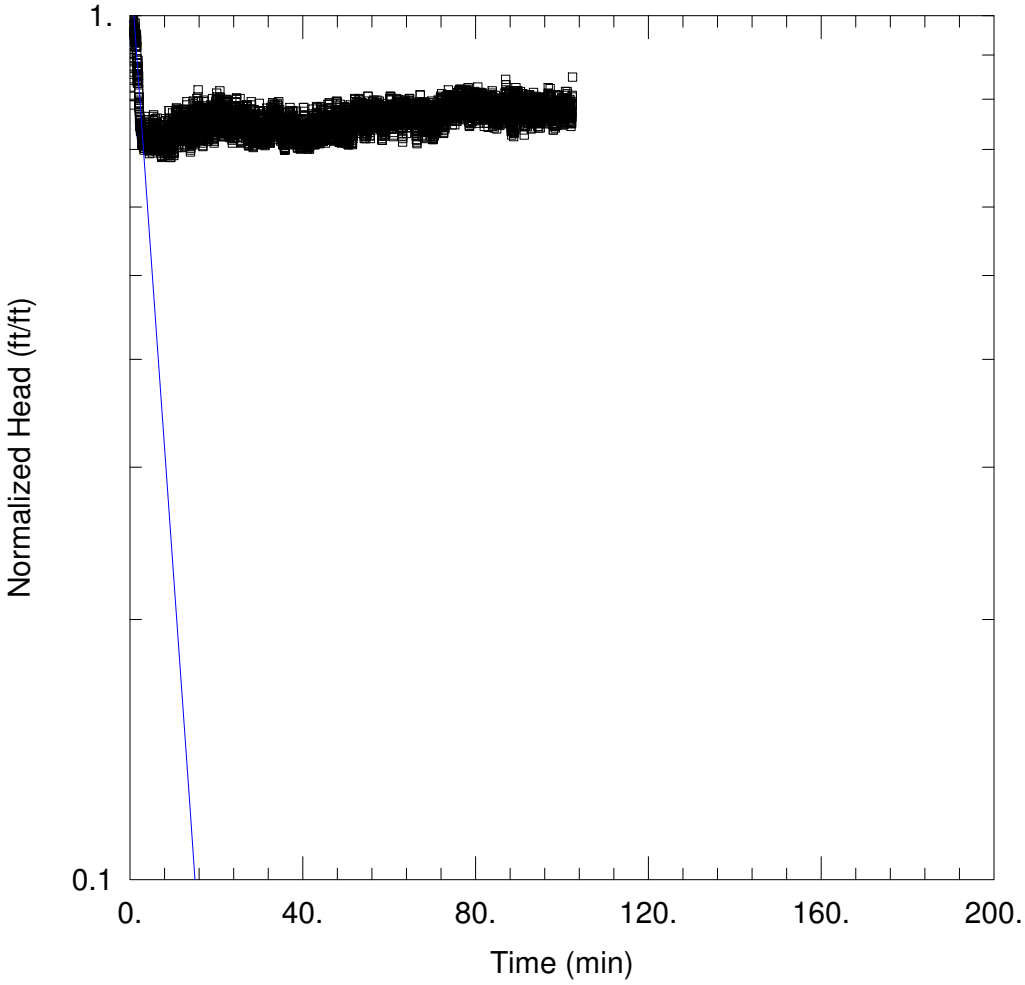
Saturated Thickness: 23. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-16D)

Initial Displacement: 1.172 ft
Total Well Penetration Depth: 23. ft
Casing Radius: 0.083 ft
Static Water Column Height: 50.26 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 9.734E-5 cm/sec
y0 = 1.082 ft



RISING

Data Set: P:\...\MW-17D-RISING.aqt
Date: 07/25/07 Time: 07:58:42

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-17D

AQUIFER DATA

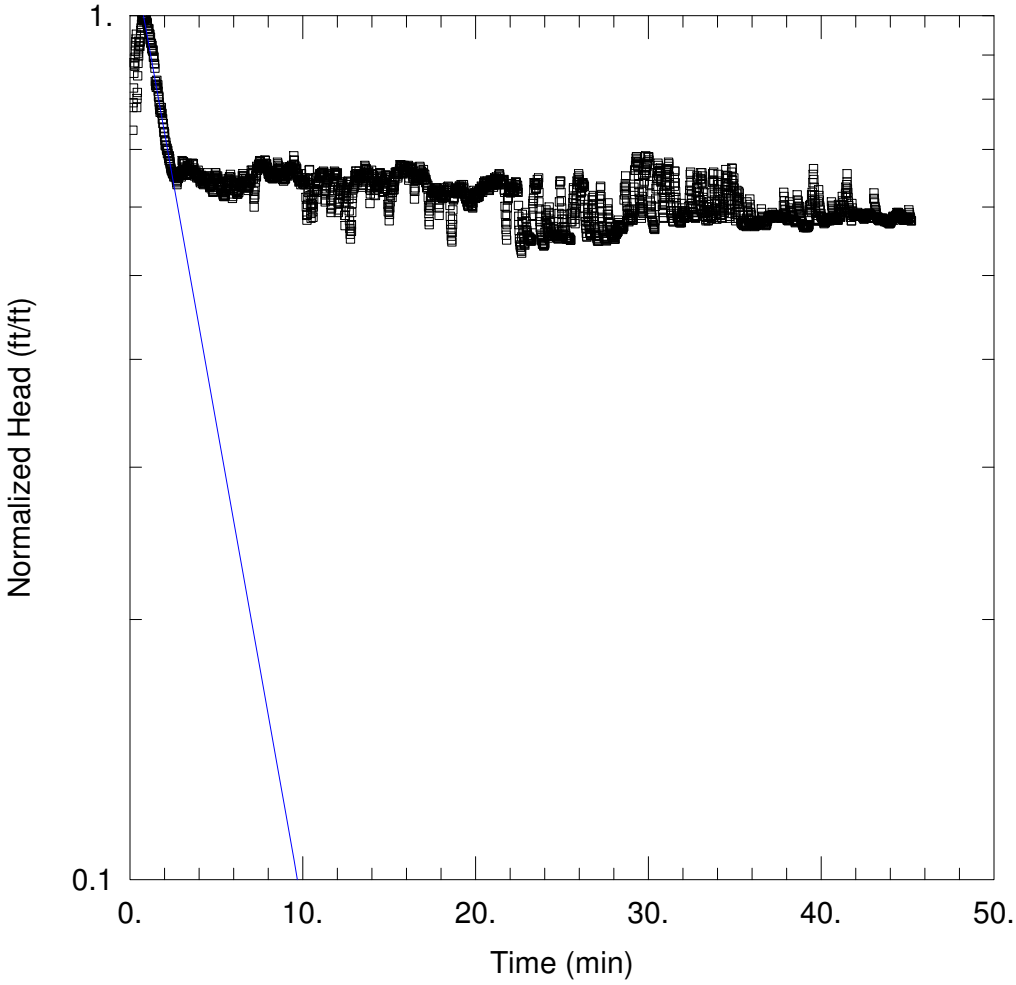
Saturated Thickness: 12. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-17D)

Initial Displacement: -0.594 ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.083 ft
Static Water Column Height: 12.01 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0001561 cm/sec
y0 = -0.6897 ft



RISING

Data Set: P:\...\MW-18D-RISING.aqt
Date: 07/25/07 Time: 08:00:38

PROJECT INFORMATION

Company: Brown and Caldwell
Client: LCP
Project: 131369.003
Location: Linden. NJ
Test Date: 2/8/07

AQUIFER DATA

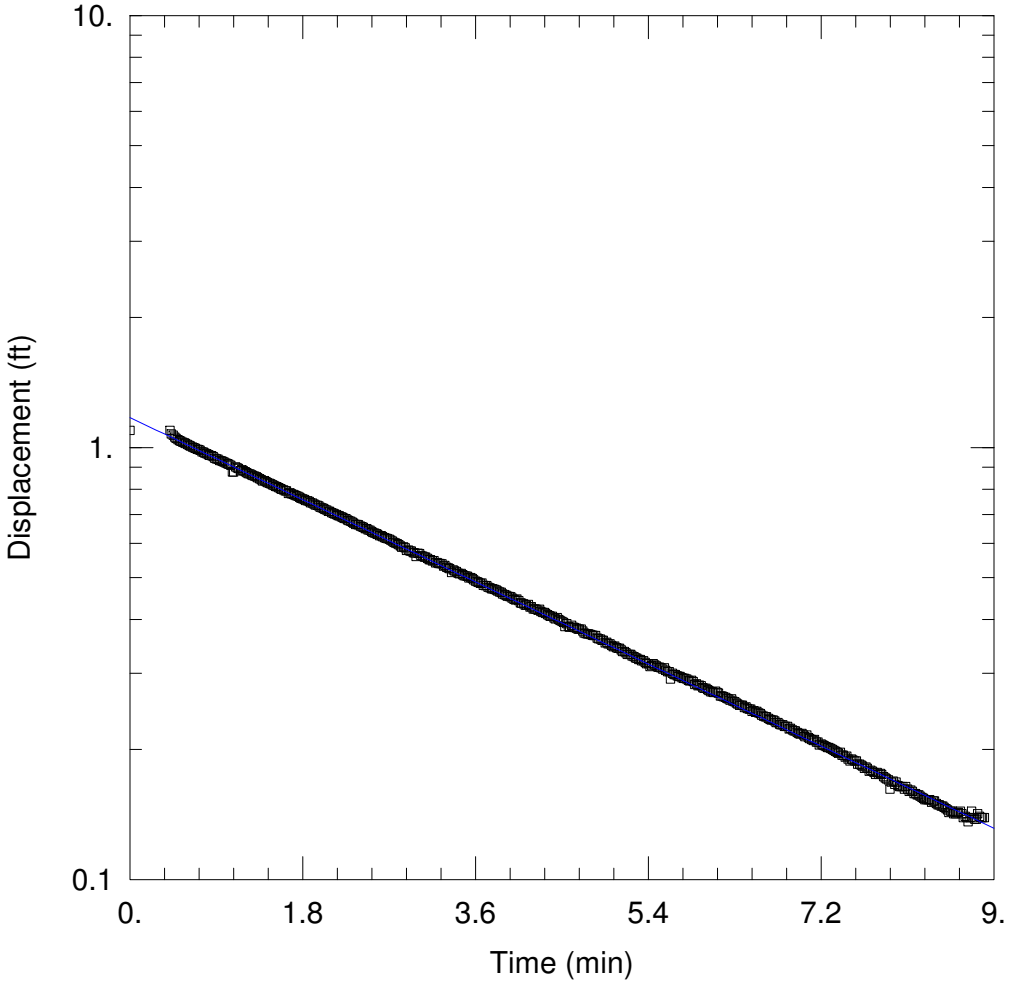
Saturated Thickness: 14. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-18D)

Initial Displacement: -0.695 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.083 ft
Static Water Column Height: 13.25 ft
Screen Length: 1. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.001129 cm/sec
y0 = -0.8526 ft



RISING

Data Set: P:\...\MW-20D-RISING.aqt
Date: 07/25/07 Time: 08:03:00

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-20D
Test Date: 1/22/07

AQUIFER DATA

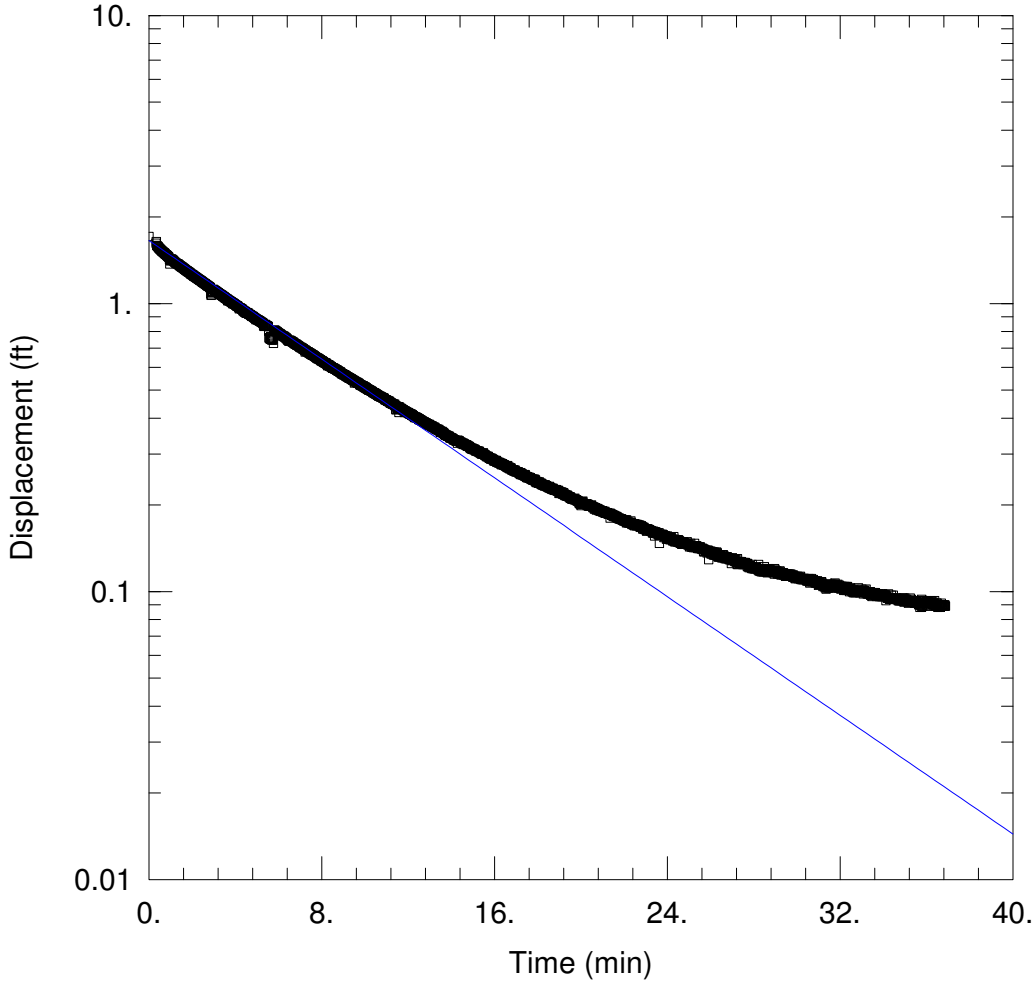
Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-20D)

Initial Displacement: 1.095 ft
Total Well Penetration Depth: 20. ft
Casing Radius: 0.083 ft
Static Water Column Height: 41.44 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0002333 cm/sec
y0 = 1.173 ft



RISING

Data Set: P:\...\MW-21D-RISING.aqt
Date: 07/25/07 Time: 08:04:48

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-21D
Test Date: 1/22/07

AQUIFER DATA

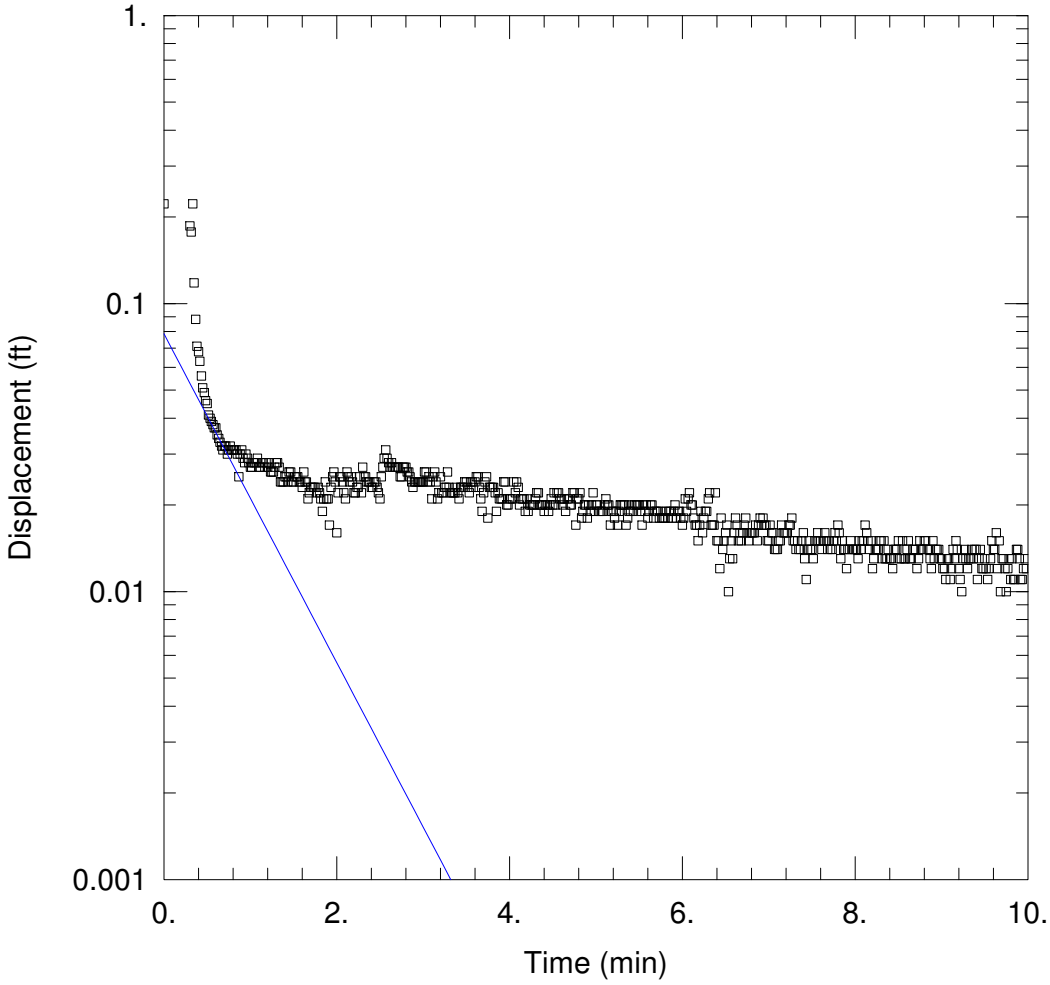
Saturated Thickness: 19. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-21D)

Initial Displacement: 1.711 ft
Total Well Penetration Depth: 19. ft
Casing Radius: 0.083 ft
Static Water Column Height: 53.03 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0001138 cm/sec
y0 = 1.655 ft



RISING

Data Set: P:\...\MW-21S-RISING.aqt
Date: 07/25/07 Time: 08:08:32

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-21S
Test Date: 1/29/07

AQUIFER DATA

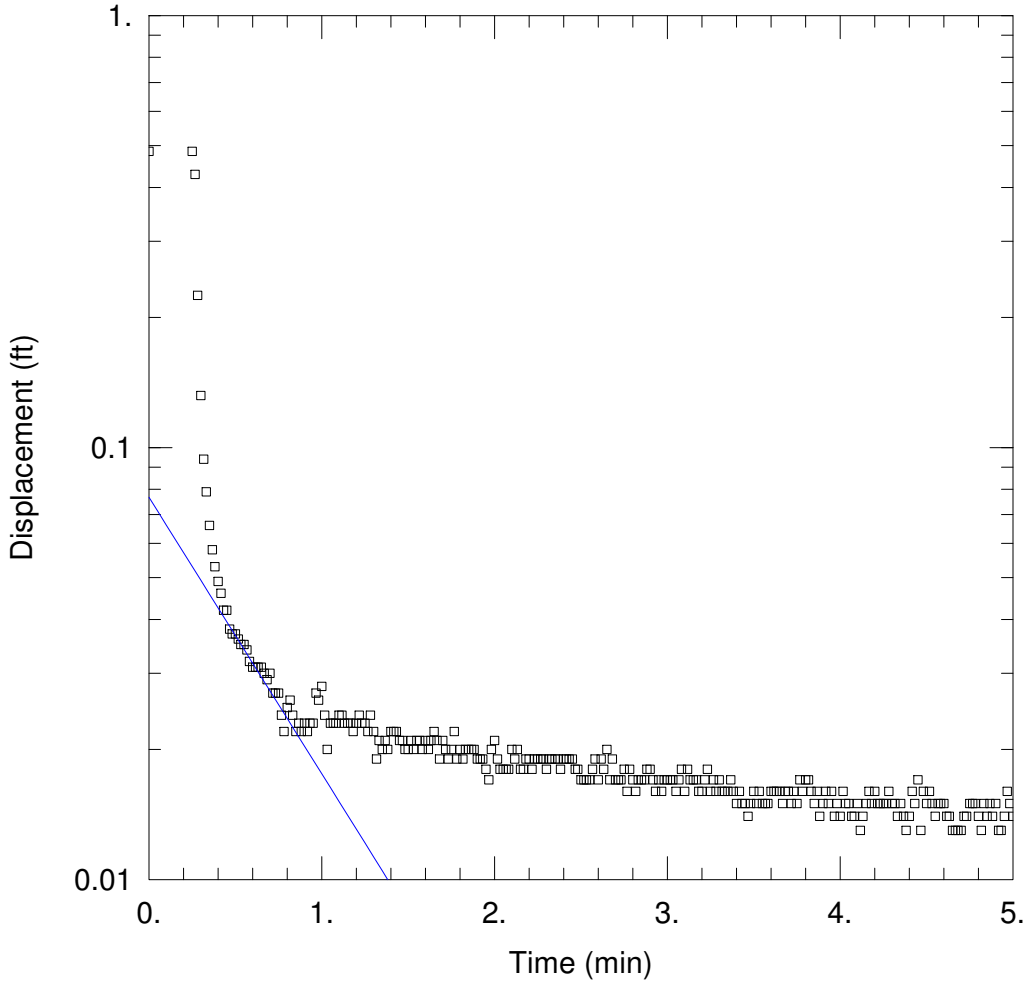
Saturated Thickness: 1.63 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-21S)

Initial Displacement: 0.222 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.083 ft
Static Water Column Height: 1.63 ft
Screen Length: 5. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.002437 cm/sec
y0 = 0.07844 ft



RISING

Data Set: P:\...\MW-22S-RISING.aqt
Date: 07/25/07 Time: 08:11:06

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-22S
Test Date: 1/29/07

AQUIFER DATA

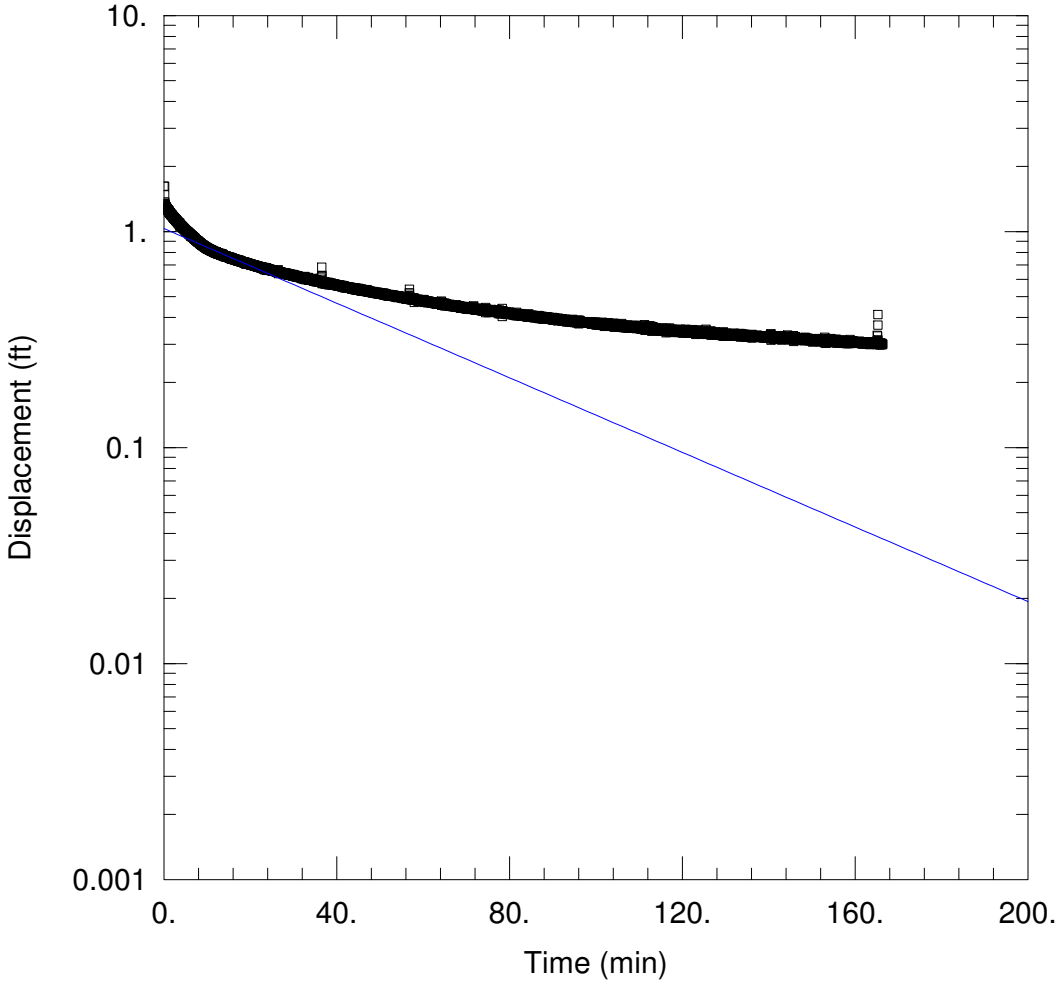
Saturated Thickness: 2.4 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-22S)

Initial Displacement: 0.485 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.083 ft
Static Water Column Height: 2.4 ft
Screen Length: 5. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.002733 cm/sec
y0 = 0.07669 ft



RISING

Data Set: P:\...\MW-23S-RISING.aqt
Date: 07/25/07 Time: 08:12:12

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-23S
Test Date: 1/29/07

AQUIFER DATA

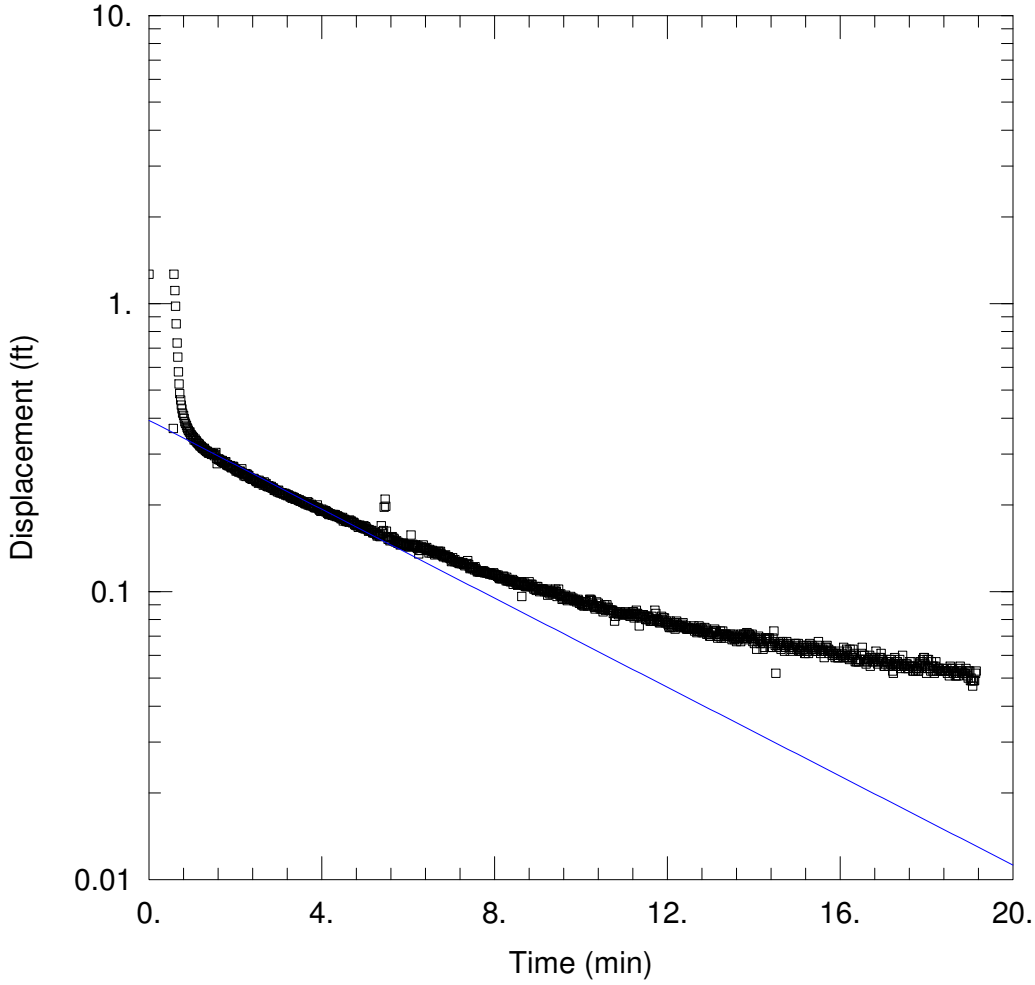
Saturated Thickness: 6.38 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-23S)

Initial Displacement: 1.623 ft
Total Well Penetration Depth: 7. ft
Casing Radius: 0.083 ft
Static Water Column Height: 6.38 ft
Screen Length: 7. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 2.633E-5 cm/sec
y0 = 1.031 ft



RISING

Data Set: P:\...\MW-24S-RISING.aqt
Date: 07/25/07 Time: 08:13:33

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-24S
Test Date: 1/29/07

AQUIFER DATA

Saturated Thickness: 7.94 ft
Anisotropy Ratio (Kz/Kr): 1.

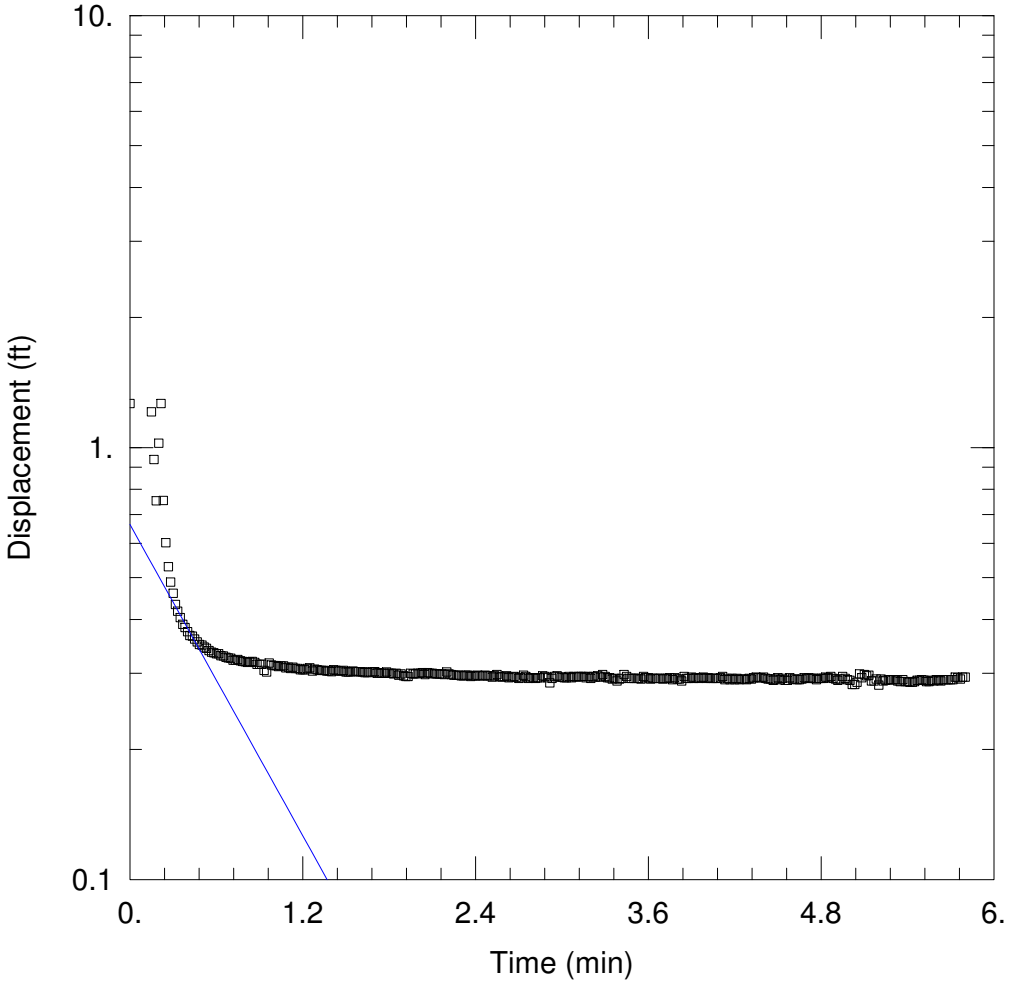
WELL DATA (MW-24S)

Initial Displacement: 1.263 ft
Total Well Penetration Depth: 10. ft
Casing Radius: 0.083 ft
Static Water Column Height: 7.94 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0001648 cm/sec
y0 = 0.393 ft



RISING

Data Set: P:\...\MW-25D-RISING.aqt
Date: 07/25/07 Time: 08:06:03

PROJECT INFORMATION

Company: Brown and Caldwell
Client: ISP-ESI
Project: 131369.107
Location: LCP Superfund
Test Well: MW-25D
Test Date: 1/22/07

AQUIFER DATA

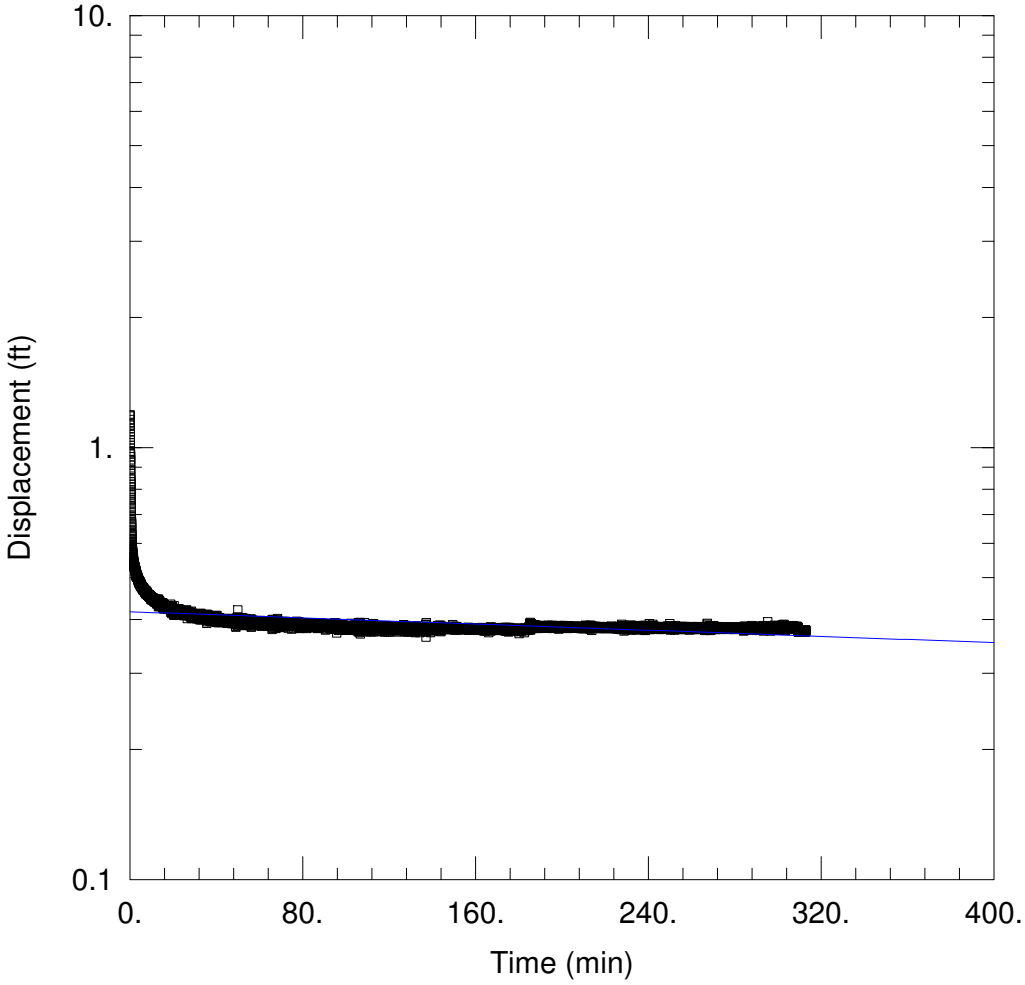
Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-25D)

Initial Displacement: 1.265 ft
Total Well Penetration Depth: 16. ft
Casing Radius: 0.083 ft
Static Water Column Height: 47.2 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.001326 cm/sec
y0 = 0.663 ft



RISING

Data Set: P:\...\MW-26S-RISING.aqt
Date: 07/19/07 Time: 15:18:58

PROJECT INFORMATION

Company: Brown and Caldwell
Client: LCP
Project: 131369
Location: Linden, NJ

AQUIFER DATA

Saturated Thickness: 0.75 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-26S)

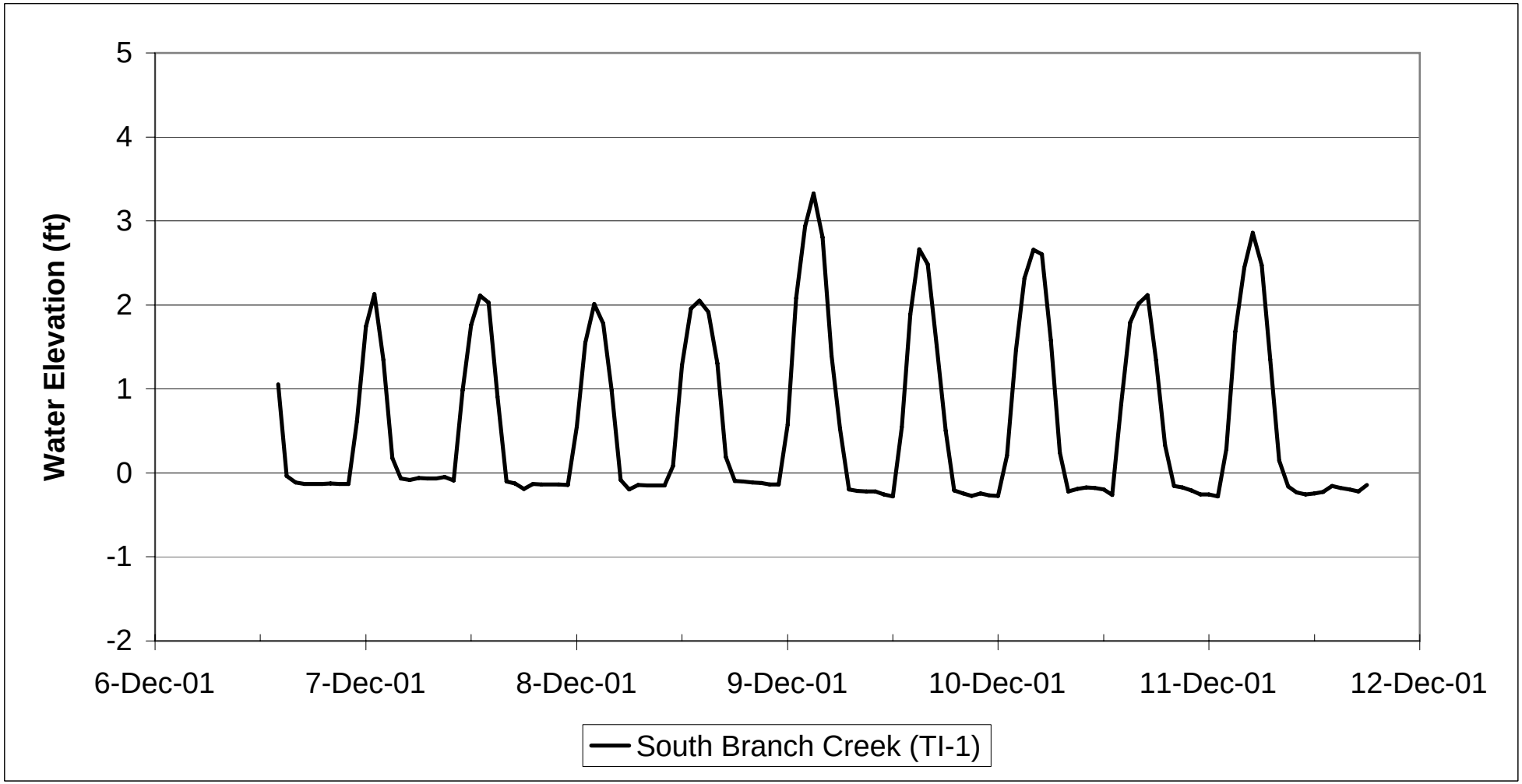
Initial Displacement: 1.189 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.083 ft
Static Water Column Height: 4.05 ft
Screen Length: 5. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.0006591 m/day
y0 = 0.4168 ft

Appendix D-2: Hydrographs

131369



HYDROGRAPH FOR
South Branch Creek (TI-1)

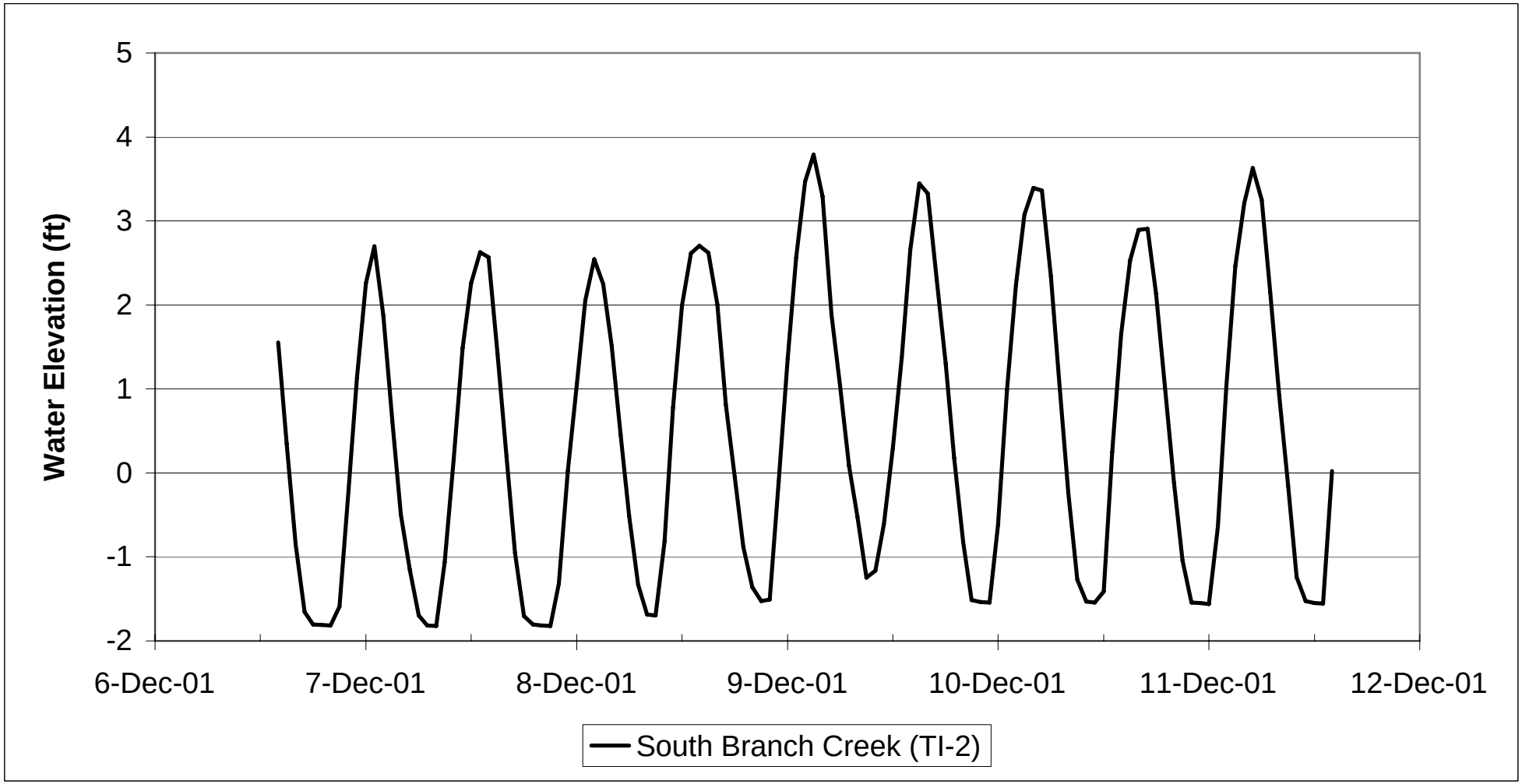
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\SBC (TI-1)
9/5/2007

131369



HYDROGRAPH FOR
South Branch Creek (TI-2)

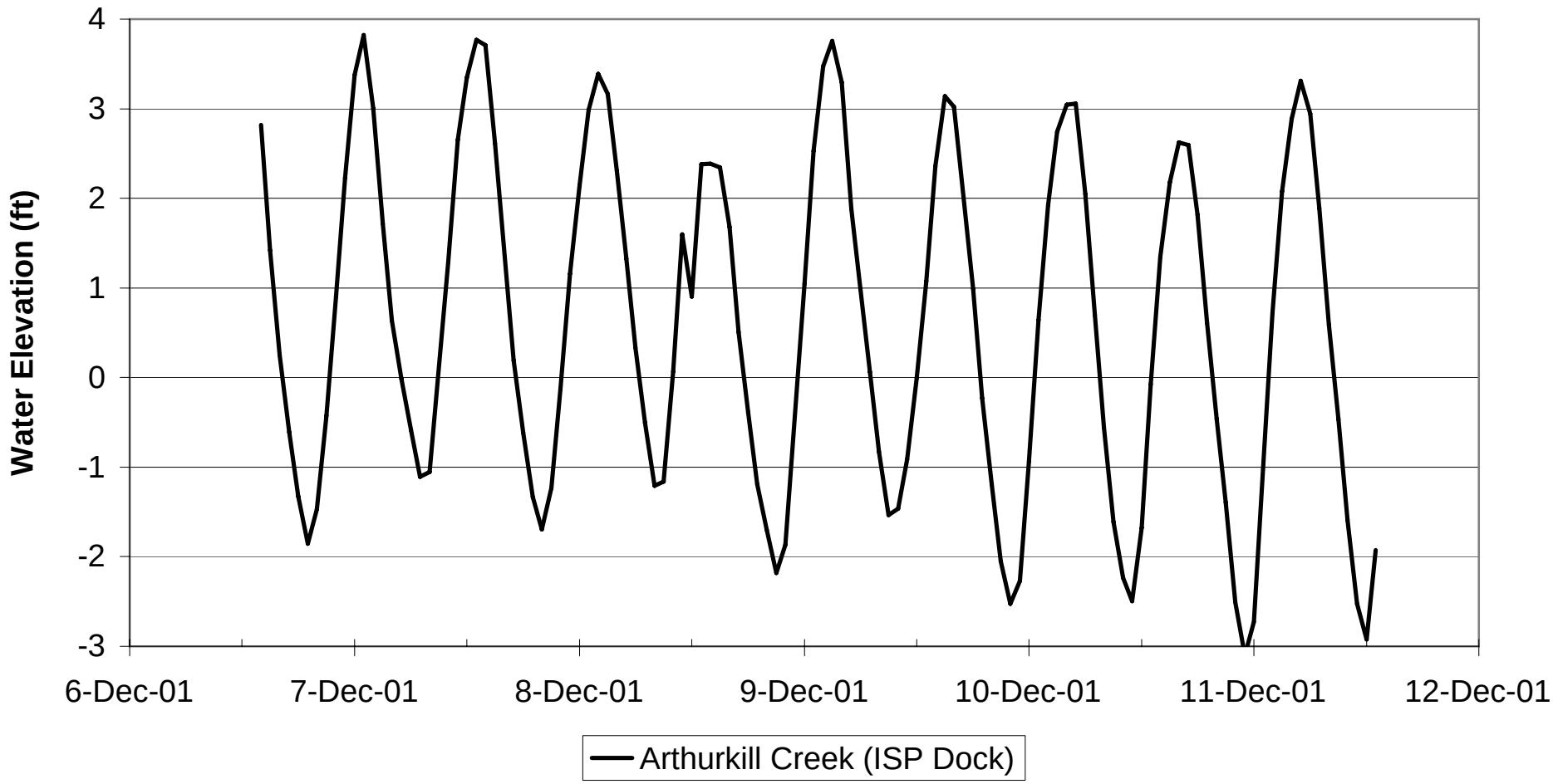
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\SBC (TI-2)
9/5/2007

131369



HYDROGRAPH FOR
Arthur Kill (ISP Dock)

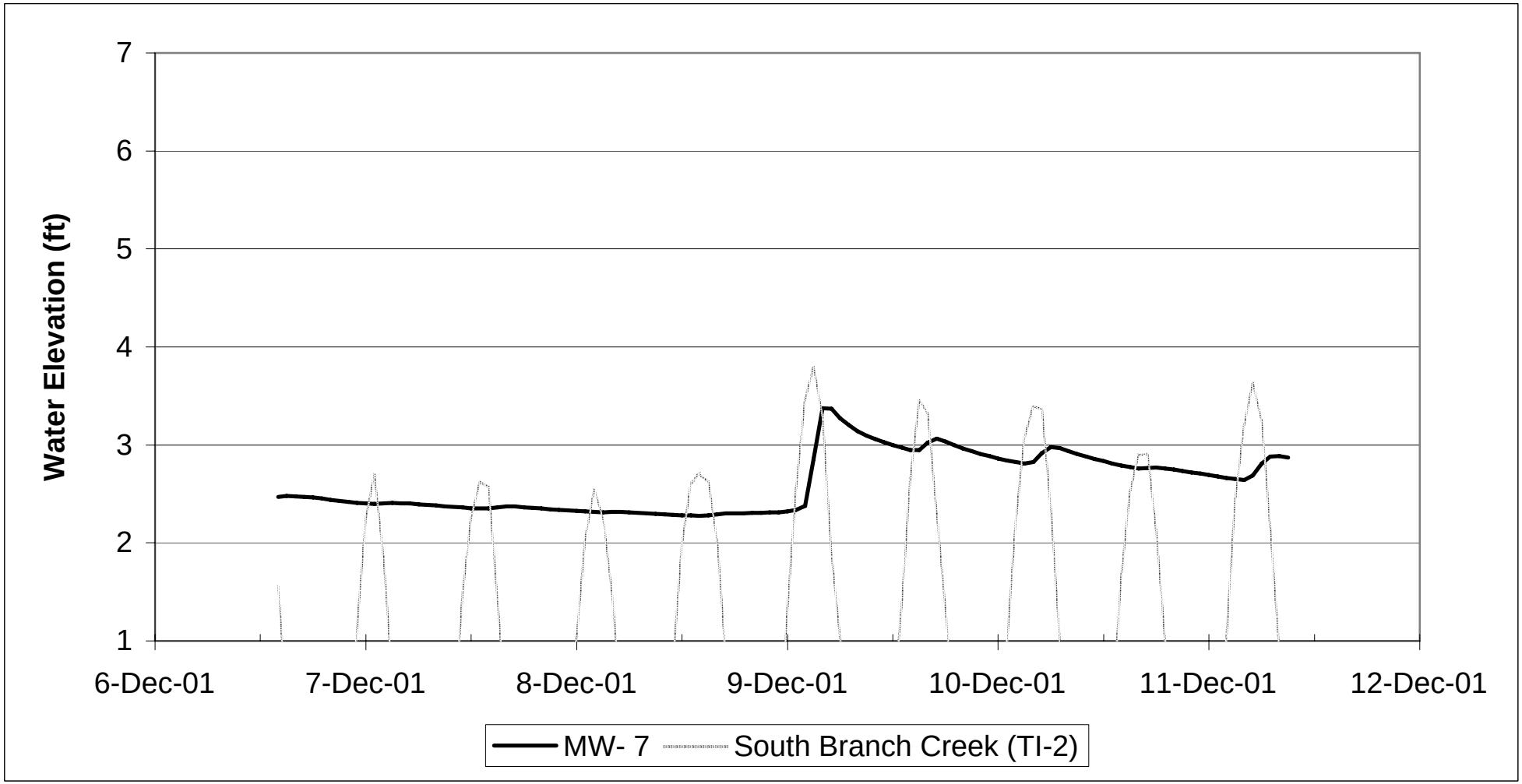
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\Arthurkill Creek (ISP Dock)
9/5/2007

131369



HYDROGRAPH FOR MW-7

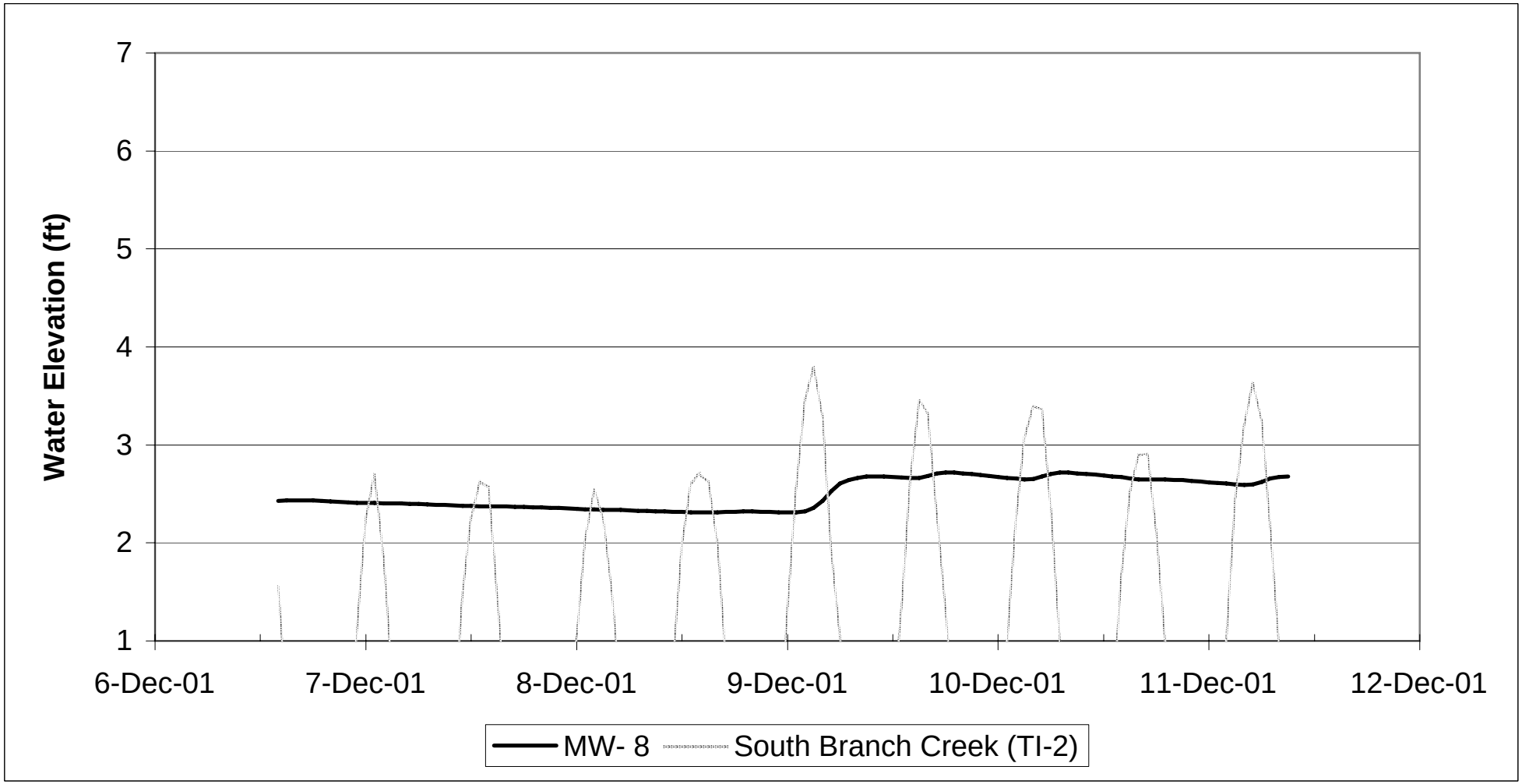
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-7
9/5/2007

131369



HYDROGRAPH FOR MW-8

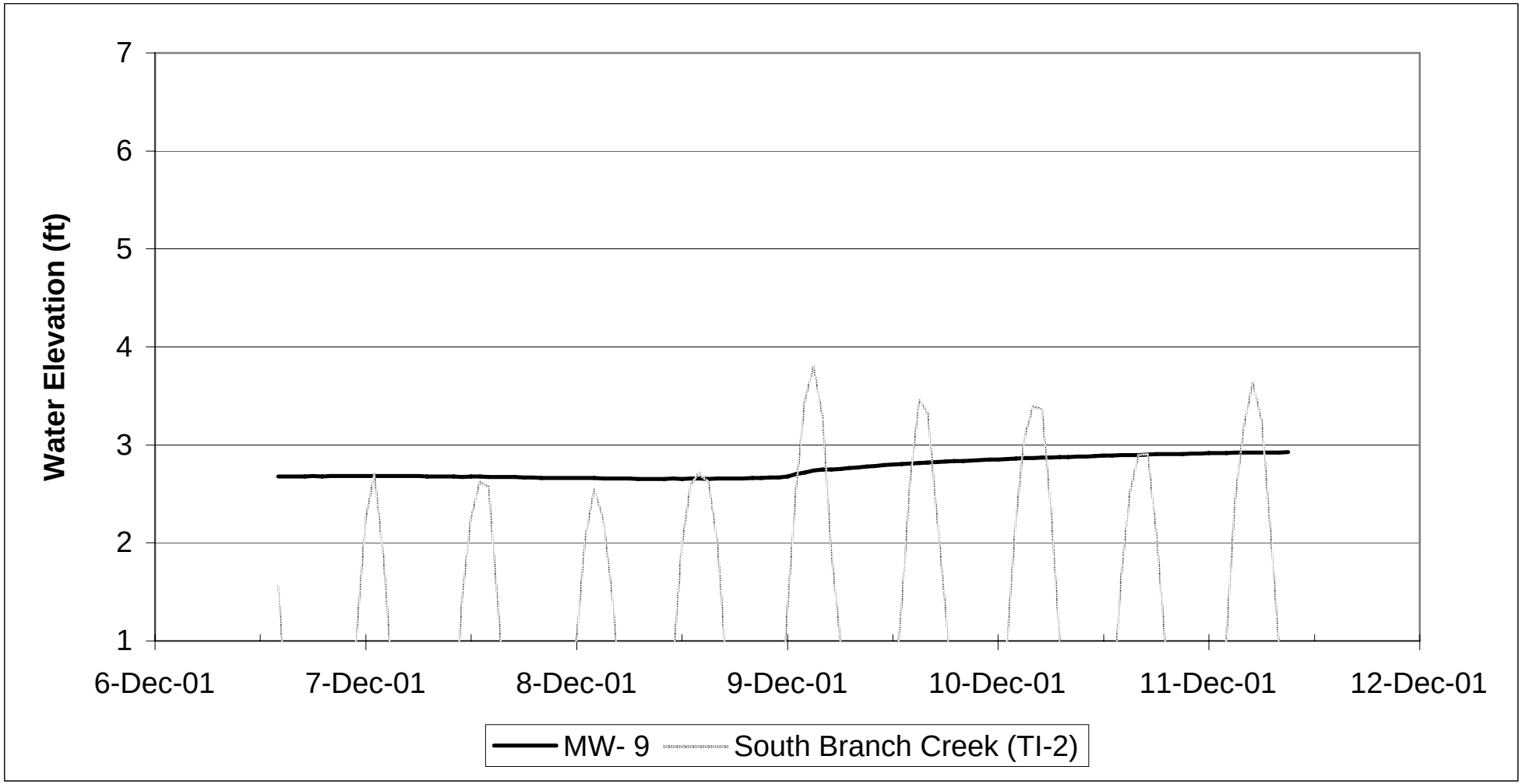
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-8
9/5/2007

131369



HYDROGRAPH FOR MW-9

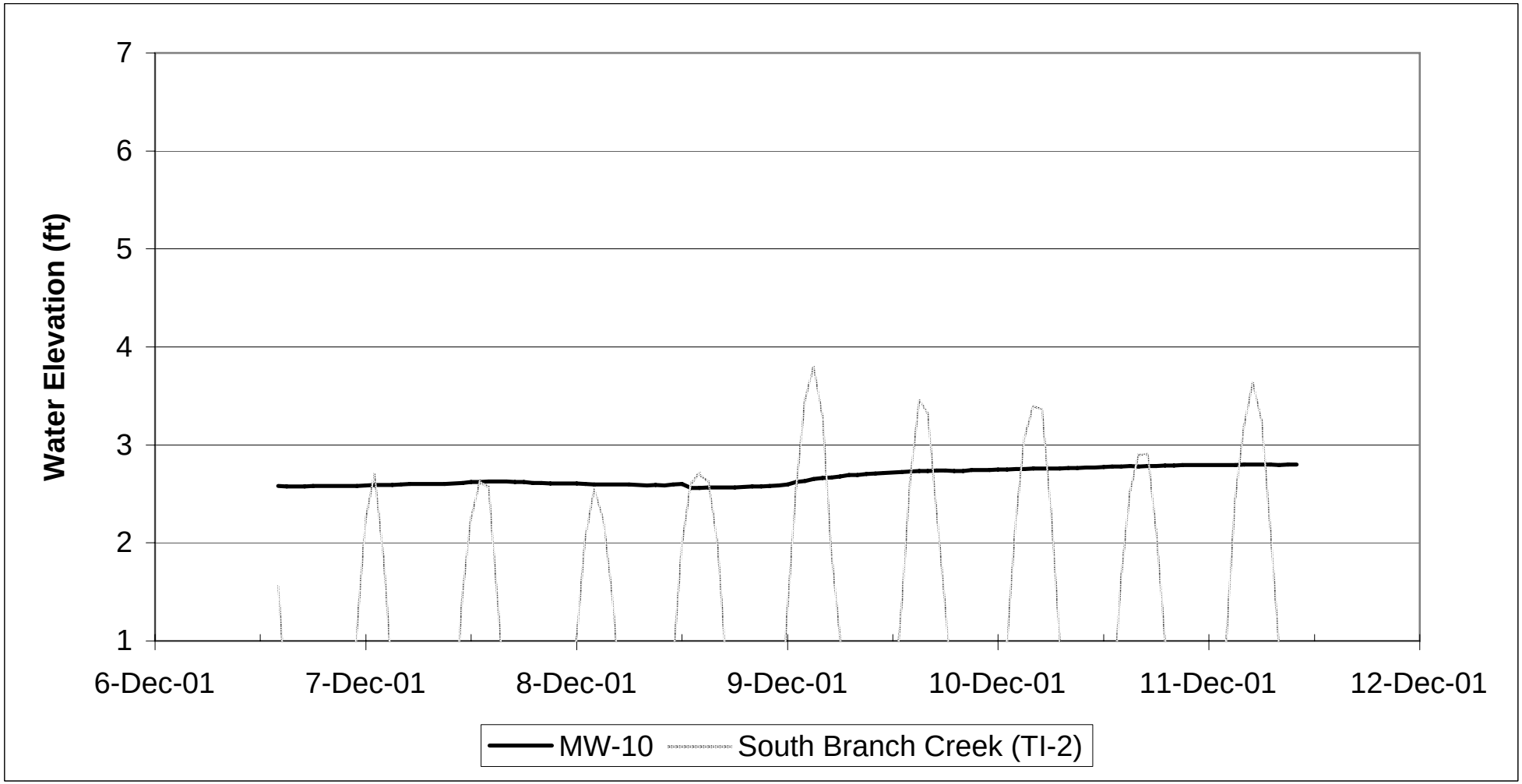
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-9
9/5/2007

131369



HYDROGRAPH FOR MW-10

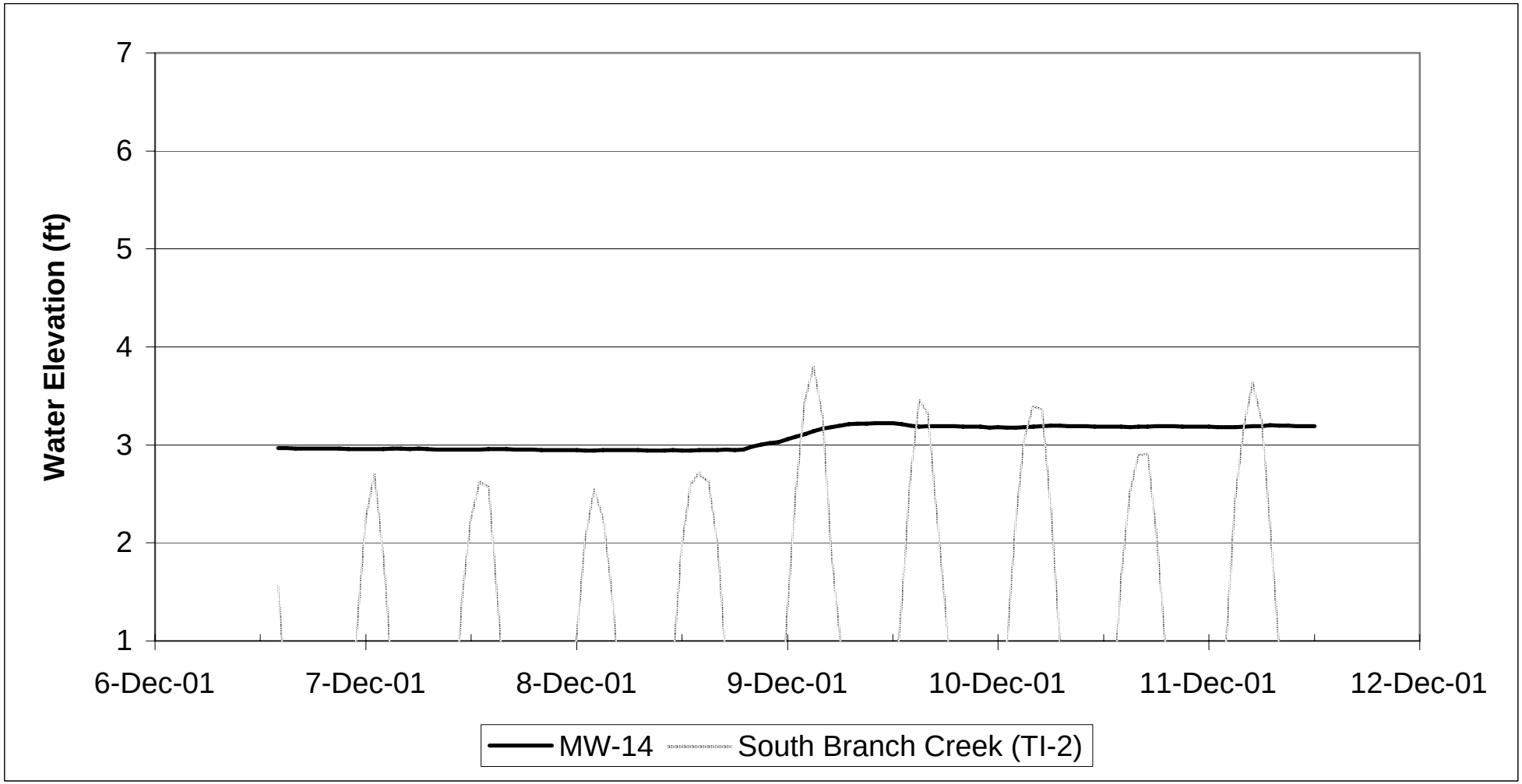
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-10
9/5/2007

131369



HYDROGRAPH FOR MW-14

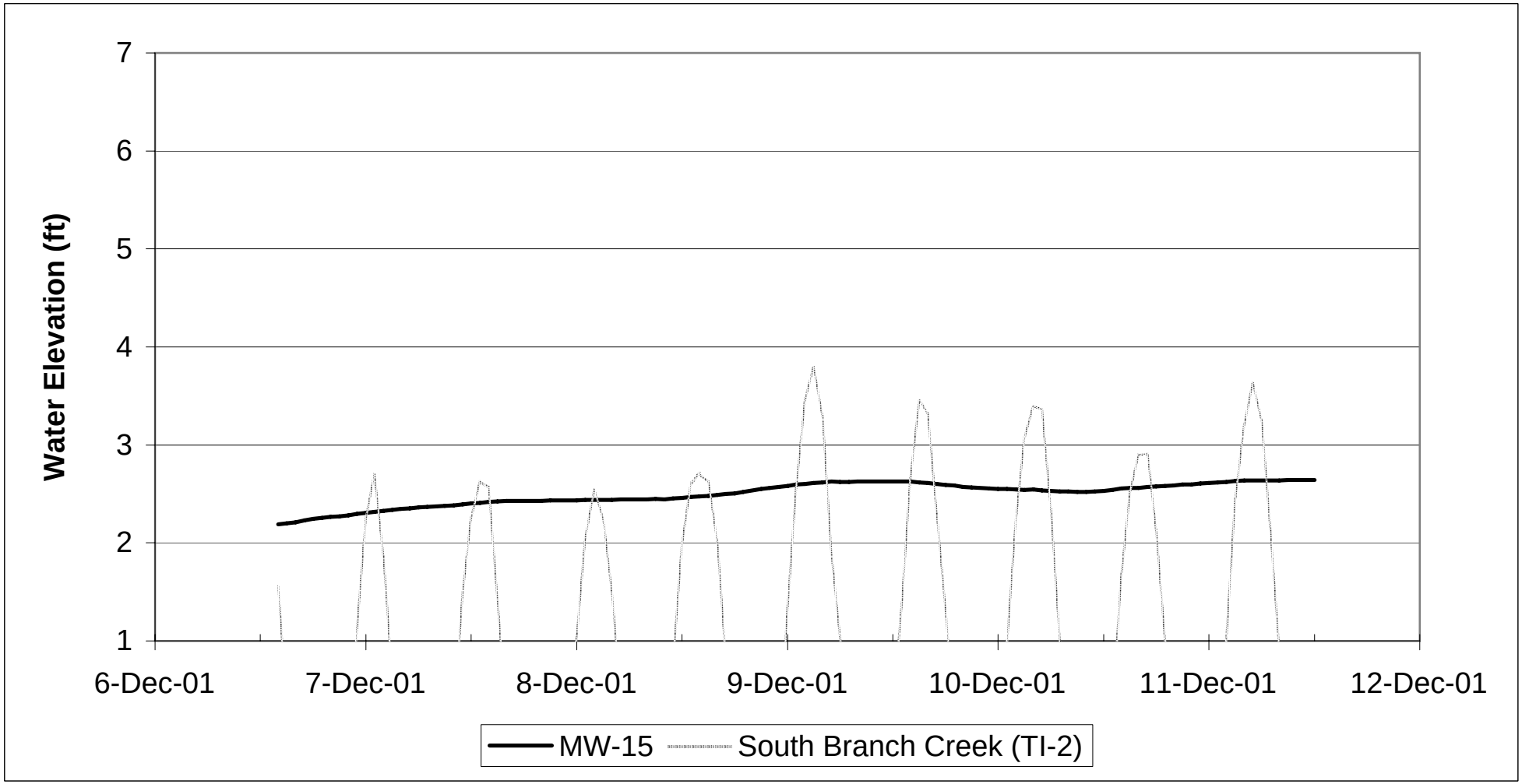
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-14
9/5/2007

131369



HYDROGRAPH FOR MW-15

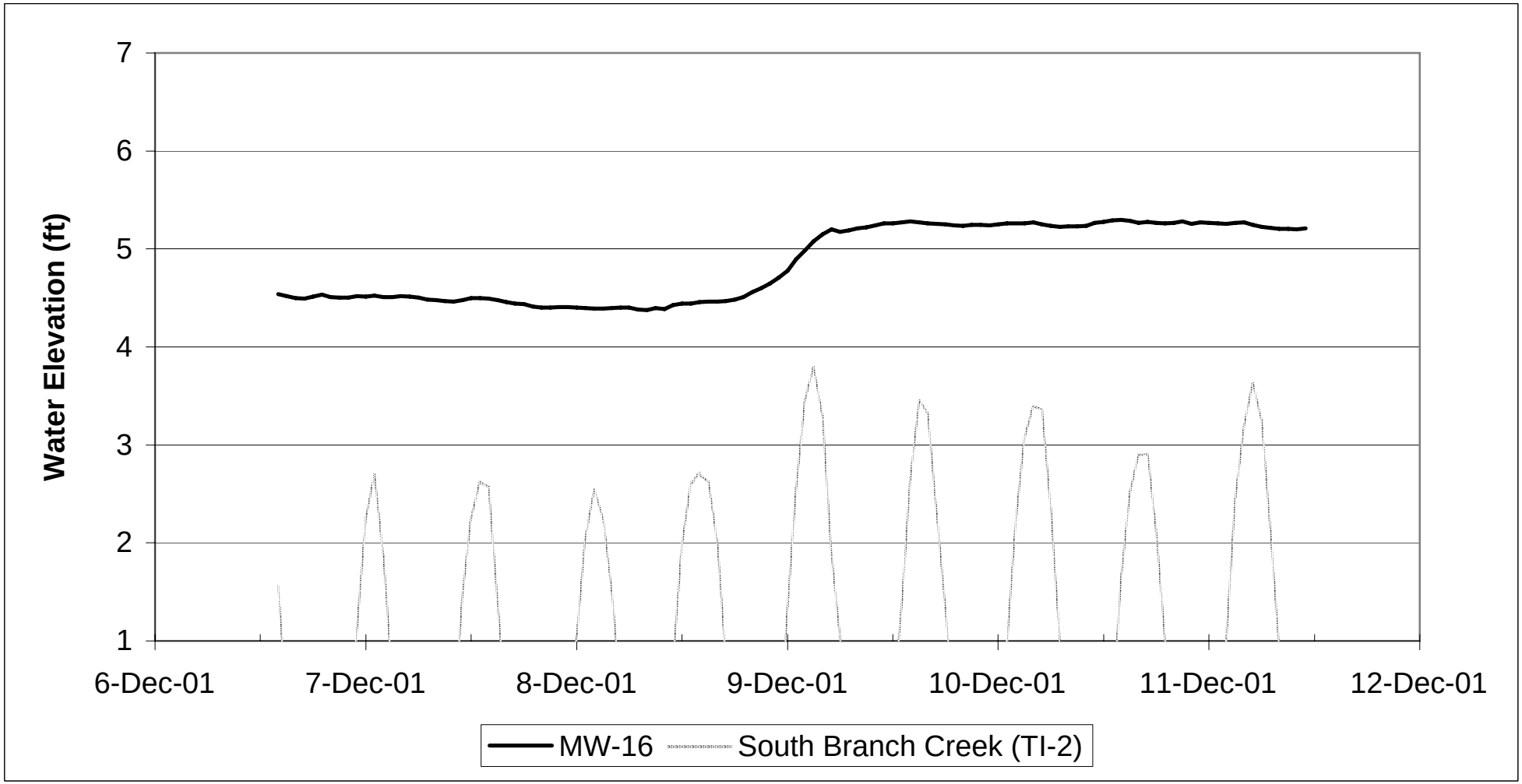
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-15
9/5/2007

131369



HYDROGRAPH FOR MW-16

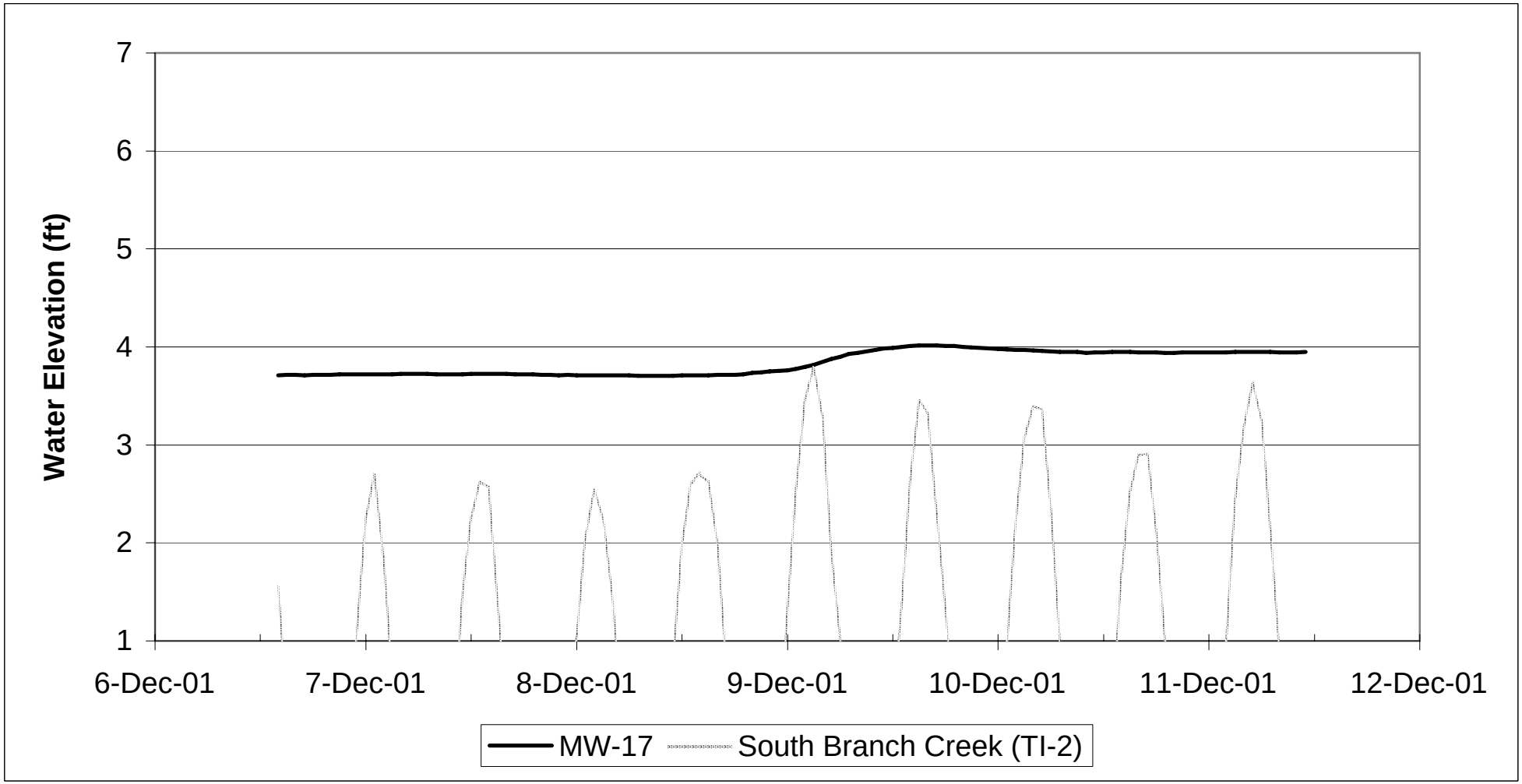
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-16
9/5/2007

131369



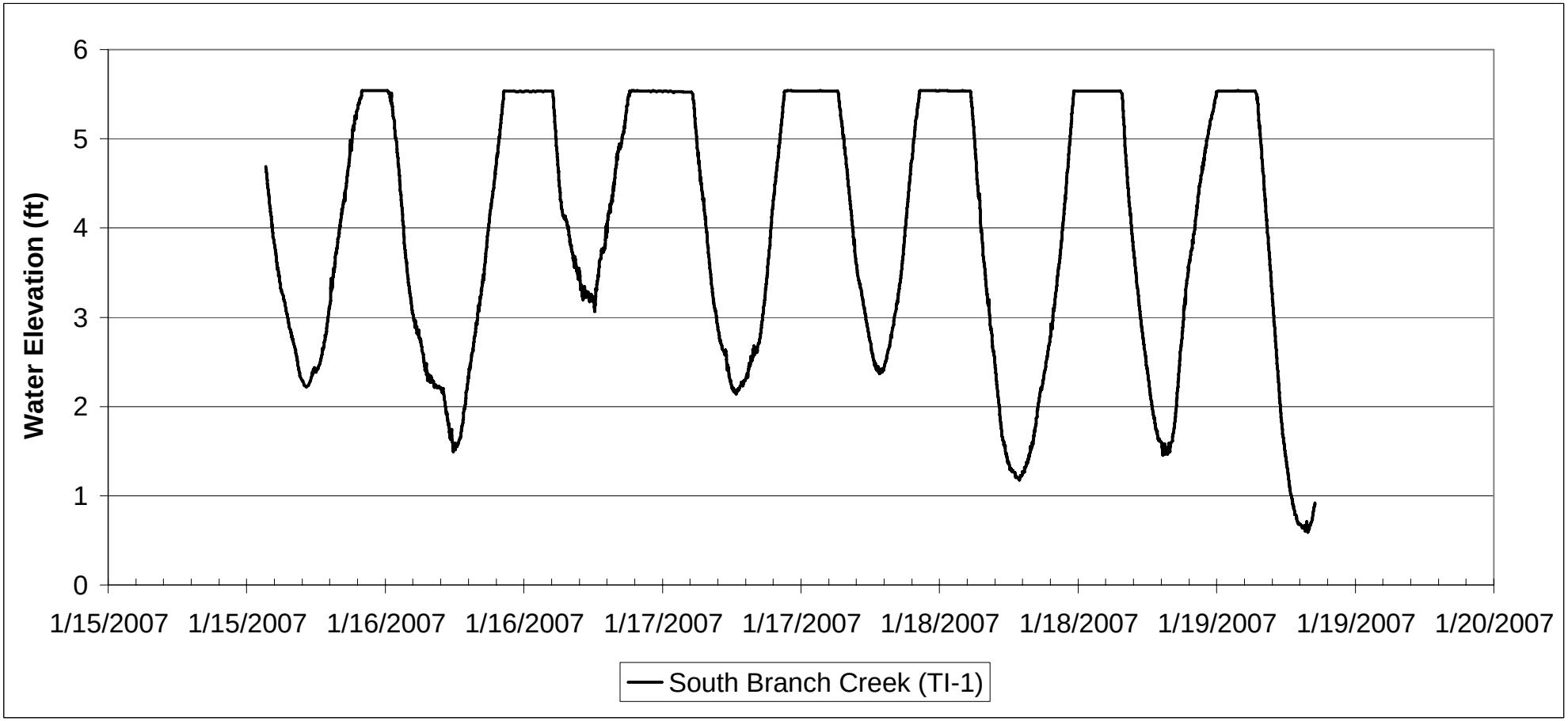
HYDROGRAPH FOR
MW - 17

LCP Inc. Superfund Site
Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhI_Hydrograph_.xls\MW-17
9/5/2007

131369



HYDROGRAPH FOR
South Branch Creek (TI-1)

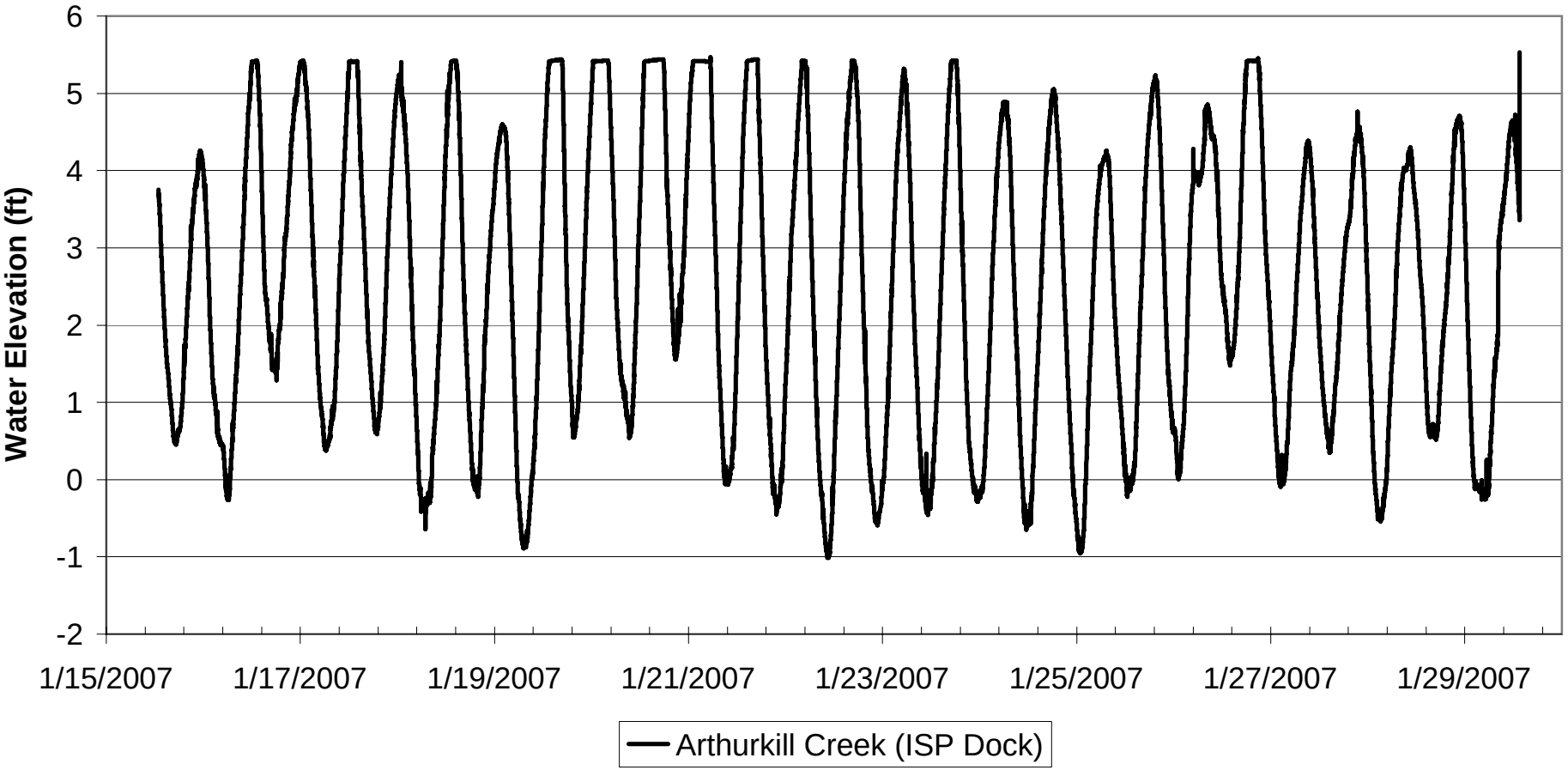
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhII_Hydrograph_.xls\SBC (TI-1)
9/5/2007

131369



HYDROGRAPH FOR
Arthur Kill (ISP Dock)

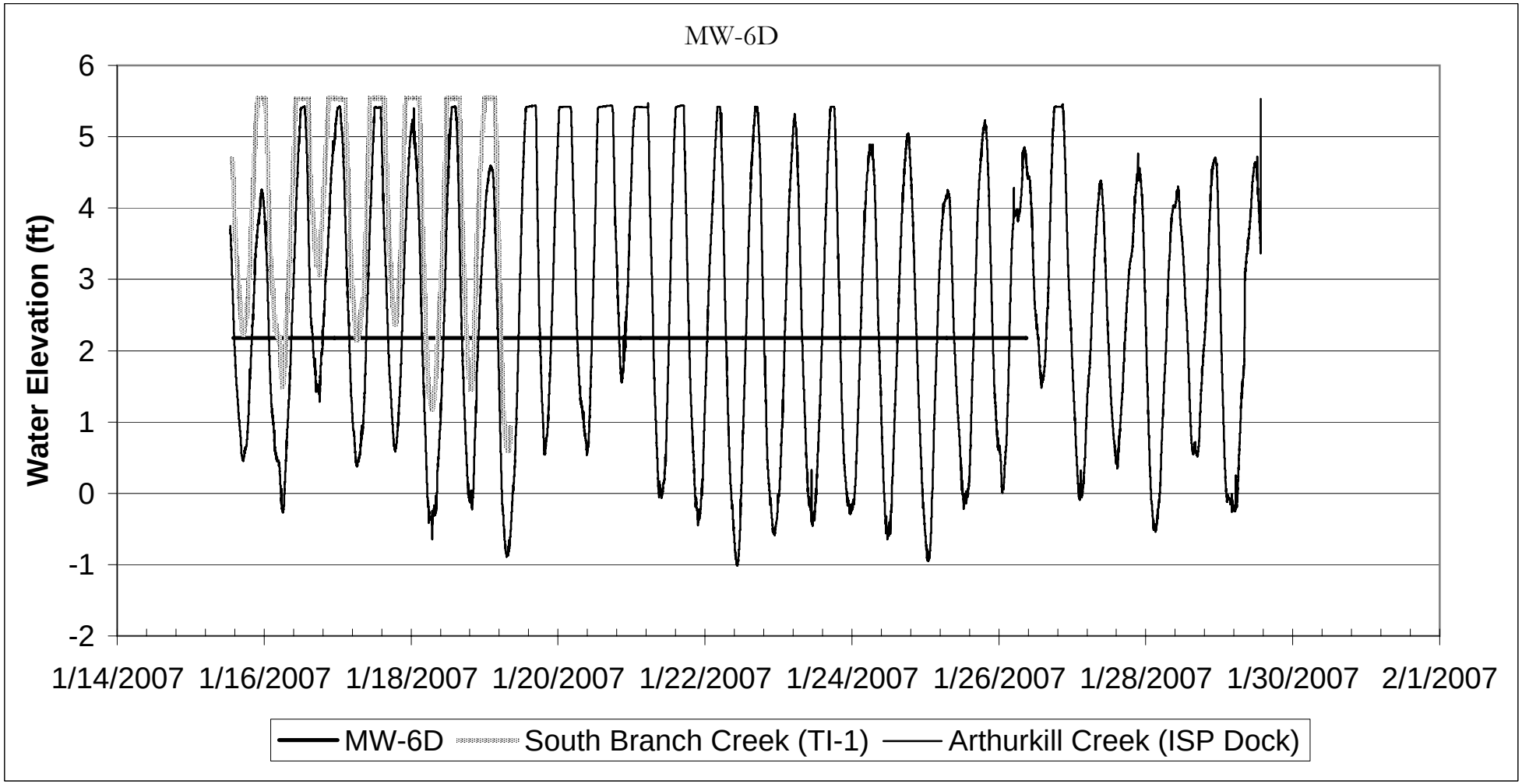
LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhII_Hydrograph_.xls\Arthurkill Creek (ISP Dock)
9/5/2007

131369



HYDROGRAPH FOR
MW- 6D

LCP Inc. Superfund Site
Linden, New Jersey

BROWN AND CALDWELL

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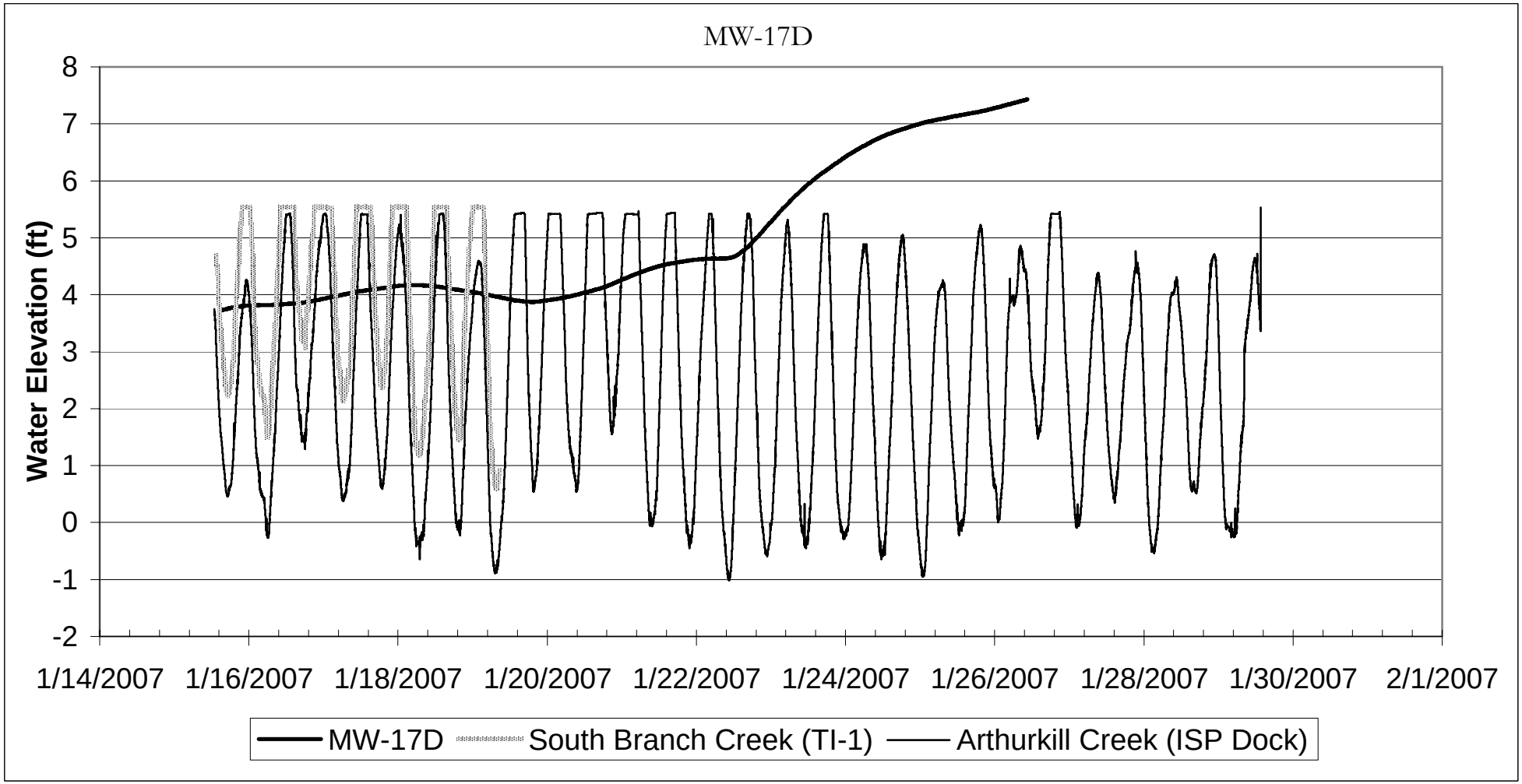

HYDROGRAPH FOR MW-17D

LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

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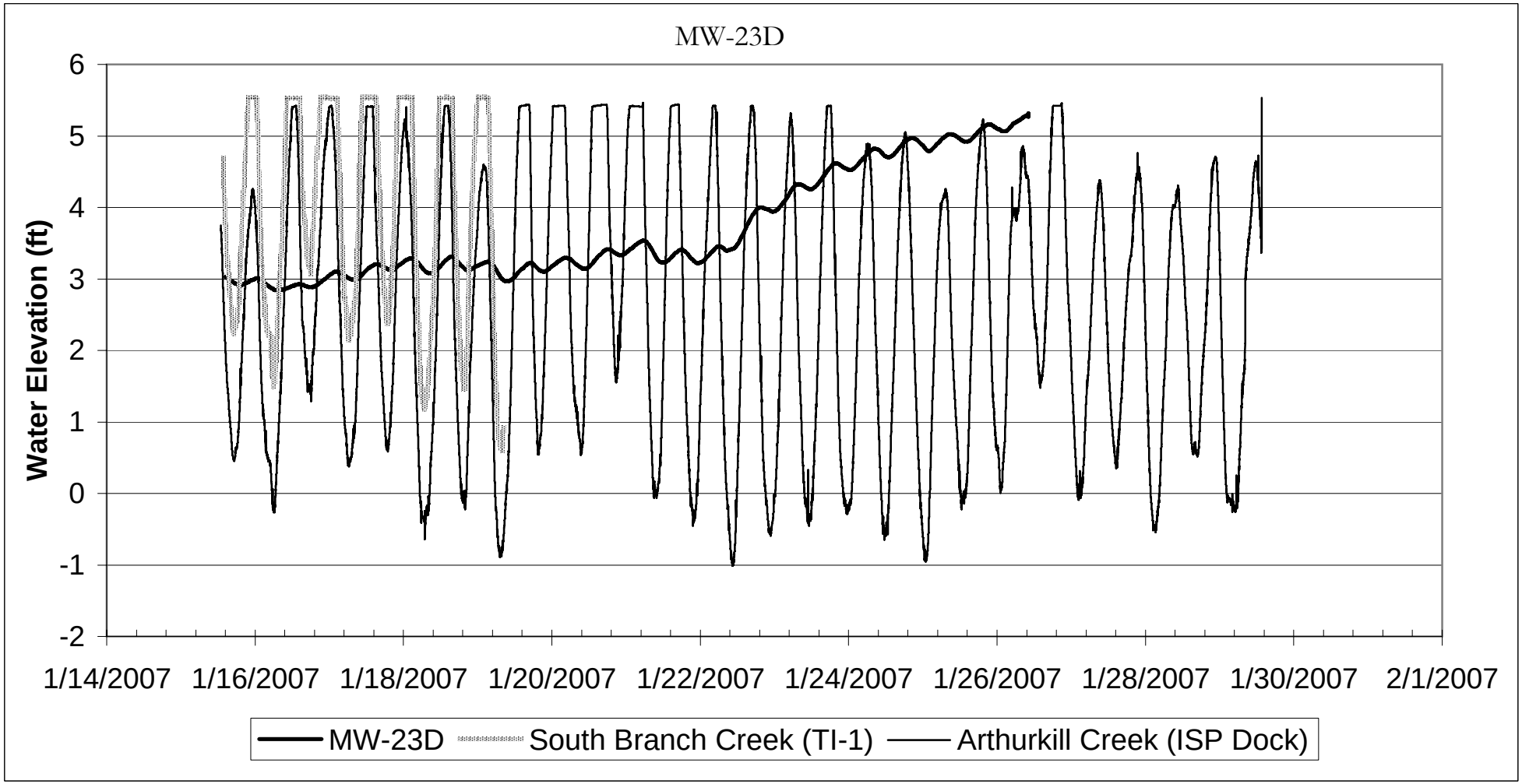


HYDROGRAPH FOR MW-23D

LCP Inc. Superfund Site

Linden, New Jersey

BROWN AND CALDWELL

P:\LCP\131369(Ph_II_RI)\SCSR_II(Ph_II-Rpt)\Appendices\Apx_B_(Hyd_Cond_Tst)\B-2_Hydrographs\PhII_Hydrograph_.xls\MW-23D
9/5/2007

Appendix E: Wetland Delineation

SDM

RECEIVED
FEB 22 2007
D. McNICHOL

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Land Use Regulation
P.O. Box 439, Trenton, NJ 08625-0439
Fax # (609) 777-3656
www.state.nj.us/dep/landuse

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

FEB 16 2007

Michael Kovacs
EcolSciences, Inc.
75 Fleetwood Drive – Suite 250
Rockaway, NJ 07866

RE: Letter of Interpretation; Line Verification
File No.: 2009-02-0005.3FWW060001
Applicant: ISP Environmental Services, Inc.
Block: 587; Lots: 3.01, 3.02 & 3.03
Linden City, Union County

Dear Mr. Kovacs:

This letter is in response to your request for a Letter of Interpretation to verify the jurisdictional boundary of the freshwater wetlands and waters on the referenced property.

In accordance with agreements between the State of New Jersey Department of Environmental Protection, the U.S. Army Corps of Engineers Philadelphia and New York Districts, and the U.S. Environmental Protection Agency, the NJDEP, Division of Land Use Regulation is the lead agency for establishing the extent of State and Federally regulated wetlands and waters. The USEPA and/or USACOE retains the right to reevaluate and modify the jurisdictional determination at any time should the information prove to be incomplete or inaccurate.

Based upon the information submitted, the Division of Land Use Regulation has determined that the wetlands and waters boundary line(s) as shown on the plan map entitled "TOPOGRAPHIC SURVEY LCP CHEMICALS & PLASTICS, INC. BLOCK 587 LOTS 3.01, 3.02 & 3.03 CITY OF LINDEN, UNION COUNTY, NEW JERSEY", dated March 14, 2001, last revised October 17, 2006, and prepared by Keller & Kirkpatrick is accurate as shown.

Any activities regulated under the Freshwater Wetlands Protection Act proposed within the wetlands or transition areas or the deposition of any fill material into any water area, will require a permit from this office unless exempted under the Freshwater Wetlands Protection Act, N.J.S.A. 13:9B-1 et seq., and implementing rules, N.J.A.C. 7:7A. A copy of this plan, together with the information upon which this boundary determination is based, has been made part of the Division's public records.

Pursuant to the Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A-1 et seq.), you are entitled to rely upon this jurisdictional determination for a period of five years from the date of this letter.

The freshwater wetlands and waters boundary line(s), as determined in this letter, must be shown on any future site development plans. The line(s) should be labeled with the above LUR file number and the following note:

"Freshwater Wetlands/Waters Boundary Line as verified by NJDEP."

In addition, the Department has determined that the wetlands on the subject property are of intermediate resource value. The standard transition area or buffer required adjacent to intermediate resource value wetlands is 50 feet. This classification may affect the requirements for an Individual Wetlands Permit (see N.J.A.C. 7:7A-7), the types of Statewide General Permits available for the wetlands portion of this property (see N.J.A.C. 7:7A-5) and the modification available through a transition area waiver (see N.J.A.C. 7:7A-6). Please refer to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) and implementing rules for additional information.

It should be noted that this determination of wetlands classification is based on the best information presently available to the Department. The classification is subject to change if this information is no longer accurate, or as additional information is made available to the Department, including, but not limited to, information supplied by the applicant. Under NJSA 13:9B-7a)(2), if the Department has classified a wetland as exceptional resource value, based on a finding that the wetland is documented habitat for threatened and endangered species that remains suitable for use for breeding, resting or feeding by such species, an applicant may request a change in this classification. Such requests for a classification change must demonstrate that the habitat is no longer suitable for the documented species because there has been a change in the suitability of this habitat. Requests for resource value classification changes and associated documentation should be submitted to the Division of Land Use Regulation, P.O. Box 439, Trenton, New Jersey 08625.

This letter in no way legalizes any fill which may have been placed, or other regulated activities which may have occurred on-site. Also this determination does not affect your responsibility to obtain any local, State, or Federal permits which may be required.

In accordance with N.J.A.C. 7:7A-1.7, any person who is aggrieved by this decision may request a hearing within 30 days of the decision date by writing to:

New Jersey Department of Environmental Protection
Office of Legal Affairs
Attention: Adjudicatory Hearing Requests
401 East State Street
P.O. Box 402
Trenton, NJ 08625-0402

This request must include a completed copy of the Administrative Hearing Request Checklist.

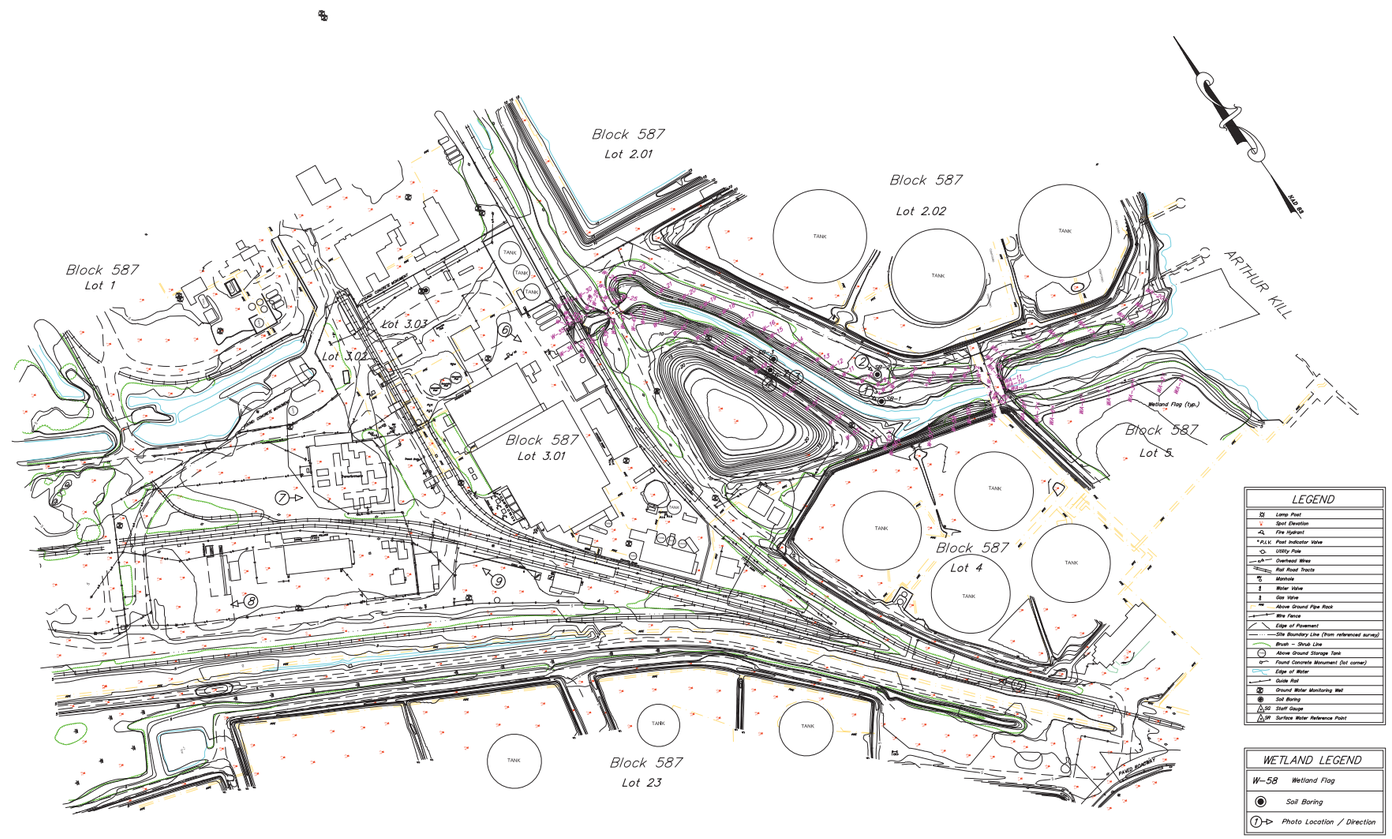
Please contact Tina Wolff of our staff at (609) 633-6754 or e-mail at Tina.Wolff@dep.state.nj.us should you have any questions regarding this letter. Be sure to indicate the Division's file number in all communication.

Sincerely,

Christopher Jones
Section Chief
Bureau of Inland Regulation

c:

Linden City Municipal Construction Official



LEGEND

	Lamp Post
	Spot Elevation
	Fire Hydrant
	Post Indicator Valve
	Utility Pole
	Overhead Wires
	Rail Road Tracks
	Manhole
	Water Valve
	Gas Valve
	Above Ground Pipe Rack
	Wire Fence
	Edge of Pavement
	Site Boundary Line (from referenced survey)
	Brush – Shrub Line
	Above Ground Storage Tank
	Found Concrete Monument (lot corner)
	Edge of Water
	Guide Rail
	Ground Water Monitoring Well
	Soil Boring
	Staff Gauge
	Surface Water Reference Point

WETLAND LEGEND

W-58	Wetland Flag
	Soil Boring
	Photo Location / Direction

SURVEY NOTES:

THE WORD CERTIFY, AS USED HEREON, IS UNDERSTOOD TO BE AN EXPRESSION OF PROFESSIONAL OPINION BY THE SURVEYOR, WHICH IS BASED ON HIS BEST KNOWLEDGE, INFORMATION AND BELIEF. AS SUCH, IT CONSTITUTES NEITHER A GUARANTEE NOR A WARRANTY, EXPRESSED OR IMPLIED.

THE NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS PROHIBITS ENGINEERING OR SURVEYING DOCUMENTS PREPARED BY ONE LICENSEE FROM BEING ALTERED, AMENDED, EXPANDED, FINALIZED OR OTHERWISE ADJUSTED BY ANOTHER LICENSEE WHO WAS NOT IN RESPONSIBLE CHARGE OF THE INITIAL WORK PRODUCT. THE ONLY EXCEPTION TO THE PROHIBITION IS THE USE OF PLANS PREPARED BY OTHERS FOR AS-BUILT PURPOSES WHERE THE NATURE OF AS-BUILT ALONE THE AS-BUILT DATA TO BE ADDED TO THE PREVIOUSLY PREPARED PLAN WHERE THERE IS, THEREFORE, NO NEED TO ADJUST OR CHANGE THE UNDERLYING DESIGN DOCUMENT.

IF THIS SURVEY DOES NOT CONTAIN THE RAISED SEAL OF THE SURVEYOR, IT IS AN UNAUTHORIZED REPRODUCTION OF THE SURVEY.

THE WETLAND DELINEATION SHOWN HEREON IS AS MARKED BY ECOLSCIENCES, INC. IN MAY, 2006 AND LOCATED BY KELLER & KIRKPATRICK ON MAY 17 & 18, 2006.

THE BOUNDARY LINES SHOWN HEREON ARE TAKEN FROM A MAP ENTITLED "RESUBDIVISION MAP OF LOT 3 IN BLOCK 587 OF THE TAX MAP OF THE CITY OF LINDEN, UNION COUNTY, N.J.- INTO THREE LOTS". SAID MAP WAS PREPARED BY GRASSMANN, KREH & MIXER, UNION, N.J. DATED OCT. 26, 1976.

LOT AND BLOCK NUMBERS SHOWN HEREON ARE BASED UPON THE CURRENT TAX MAPS OF THE CITY OF LINDEN, SHEET No. 128.

PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON SUPPLIED BY ATLANTIS AERIAL SURVEY CO. , INC. PER AERIAL PHOTOGRAPHY DATED DECEMBER 5, 2000.

HORIZONTAL DATUM BASED ON NAD83, VERTICAL DATUM BASED ON NGVD29 ESTABLISHED USING GLOBAL POSITIONING METHODS. HOLDING NJ1 COORS STATION AS FIXED.

KELLER & KIRKPATRICK DID NOT PERFORM A BOUNDARY SURVEY ON THE ABOVE PARCEL.

LOT LINES SHOWN HEREON ARE APPROXIMATE.

IF DIGITAL INFORMATION IS ALSO SUPPLIED, IT IS DONE SO FOR INFORMATIONAL PURPOSES, ONLY. THE ORIGINAL SIGNED AND SEALED DOCUMENT IS THE DOCUMENT OF RECORD.

UTILITY LOCATIONS SHOWN HEREON ARE FROM ABOVE GROUND OBSERVATIONS THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. THE LISTED FIRM SURVEYED IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATIONS AS TO THE TYPE AND LOCATIONS OF UNDERGROUND AND OTHER UTILITIES AS MAY BE NECESSARY.

SOIL BORING LOCATIONS ARE AS MARKED IN THE FIELD BY ECKENFELDER, BROWN & CALDWELL PERSONNEL AND LOCATED BY KELLER & KIRKPATRICK.

ELEVATIONS ON STAFF GAUGES ARE TO REFERENCE MARKS ON WOODEN SUPPORTS.

SOIL BORING LOCATIONS SB-1 TO SB-4 AND PHOTO LOCATION AND DIRECTION POSITIONS WERE PROVIDED TO KELLER & KIRKPATRICK BY ECOLSCIENCES, INC.

AREA CHART:

TOTAL TRACT (INCLUDING AREA WITHIN ARTHUR KILL)	25.83± ACRES
WETLANDS (EXCLUDING AREA WITHIN ARTHUR KILL)	2.01± ACRES
UPLANDS (EXCLUDING AREA WITHIN ARTHUR KILL)	23.42± ACRES
AREA WITHIN ARTHUR KILL	0.40± ACRES

REVISIONS		
6		
5		
4	ADD PHOTO/BORING LOCATIONS	9/18/06
3	ADD WETLAND FLAGS	5/18/06
2	ADD WELLS, BORINGS & REFS.	12/14/01
1	ADJ. LOT LINES 3.02 & 3.03	6/01/01

DATE: 3/14/01 SCALE: 1"=100' F.D. Bk.: 56-52
PROJ.: 2001202.01 CHKD.: PAGE:

0 50 100 200 400

Keller & Kirkpatrick Certificate of Authorization #24GA28000300
CONSULTING ENGINEERS 800 Lakeview Plaza, Parsippany, N.J. 07054 973-887-0205
LAND SURVEYORS LANDSCAPE ARCHITECTS PLANNERS

Preliminary

ROBERT C. KIRKPATRICK, Jr. Professional Engineer and Land Surveyor, Lic. 11969
STEVEN R. HAAS, Professional Engineer, Lic. 24GE02040900

TOPOGRAPHIC SURVEY
LCP Chemicals & Plastics, Inc.
BLOCK 587
LOTS 3.01, 3.02 & 3.03
CITY OF LINDEN, UNION COUNTY, NEW JERSEY

SHEET No. 1 OF 1

N:\2001202\DWG\SURVEY\LCP_WETLANDS.dwg

Appendix F: Habitat Assessment Report

Ecological Assessment Report

LCP Chemicals Inc. Superfund Site

City of Linden
Union County, New Jersey

August 23, 2007

THE Chazen COMPANIES®

Engineers / Surveyors
Planners
Environmental Scientists
Landscape Architects

Prepared for:

ISP Environmental Services, Inc.
1361 Alps Road
Wayne, New Jersey 07470

Ecological Assessment Report

LCP Chemicals Inc. Superfund Site

City of Linden
Union County, New Jersey

August 23, 2007

Prepared by:

Chazen Engineering, Land Surveying & Landscape Architecture Co., P.C.
or
Chazen Environmental Services, Inc.
356 Meadow Avenue
Newburgh, New York 12550
(845) 567-1133

Dutchess County	*Orange County*	*Capital District*	*North Country*
(845) 454-3980	*(845) 567-1133*	*(518) 273-0055*	*(518) 812-0513*

EXECUTIVE SUMMARY

This Ecological Assessment (EA) Report was completed by The Chazen Companies (TCC) for ISP Environmental Services, Inc. as part of the Phase II Remedial Investigation of the 26-acre LCP Chemicals Inc. Superfund Site in the City of Linden, Union County, New Jersey. The following sections of this report describe the methodologies used in the EA and provide a detailed description of the Site and the ecological resources present within the project area.

The methodology utilized to complete this EA consisted of gathering information from federal, state, and local agencies, supplemented by site visits designed to identify and characterize the Site's flora and fauna. Additionally, the Site was studied for the presence of endangered, threatened, and/or rare (ETR) species and their habitats.

The Site is a 26-acre abandoned chlor-alkali chemical plant. A man-made ditch (South Branch Creek) with associated wetlands is located in the eastern portion of the Site. The creek flows to the east, connecting to the Arthur Kill. Pralls Island, located approximately 1,200 feet to the east of the Site, is an uninhabited island owned by the NYC Department of Parks and Recreation and is part of the Harbor Herons Rookery Complex.

During this EA, 79 species of plants, 42 species of wildlife, and 3 ecological communities were identified within the Site. No ETR species or significant ecological communities were identified within the Site.

Correspondence with the New Jersey Department of Environmental Protection (NJDEP) indicated that there are no records of any rare wildlife or plant species or ecological communities within the Site. The NJDEP reported that foraging habitat for black (*Nycticorax nycticorax*) and yellow-crowned night herons (*Nyctanassa violacea*) and colonial waterbirds was located within ¼ mile of the Site. Based on information from the NJDEP, no records of any rare plants or ecological communities were recorded within ¼ mile of the Site. According to the New York State Department of Environmental Conservation (NYSDEC), yellow-crowned night herons and pied-billed grebes (*Podilymbus podiceps*) are located within ¼ mile of the Site. These species were not observed during the EA.

A review of the Comprehensive List of Endangered and Threatened species provided on the USFWS's website indicated that the federally-threatened bog turtle (*Glyptemys muhlenbergii*) and the federally-endangered Indiana bat (*Myotis soldalis*) historically occurred in Union County, New Jersey. These species were not observed, nor was any suitable habitat for these species observed during the EA.

Overall, the flora and fauna found on the Site are species typically found in heavily industrialized areas within intertidal marsh ecosystems. Vegetative species found within the Site are very common to highly disturbed areas and possess no Federal or New Jersey State protection.

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1.0 Introduction

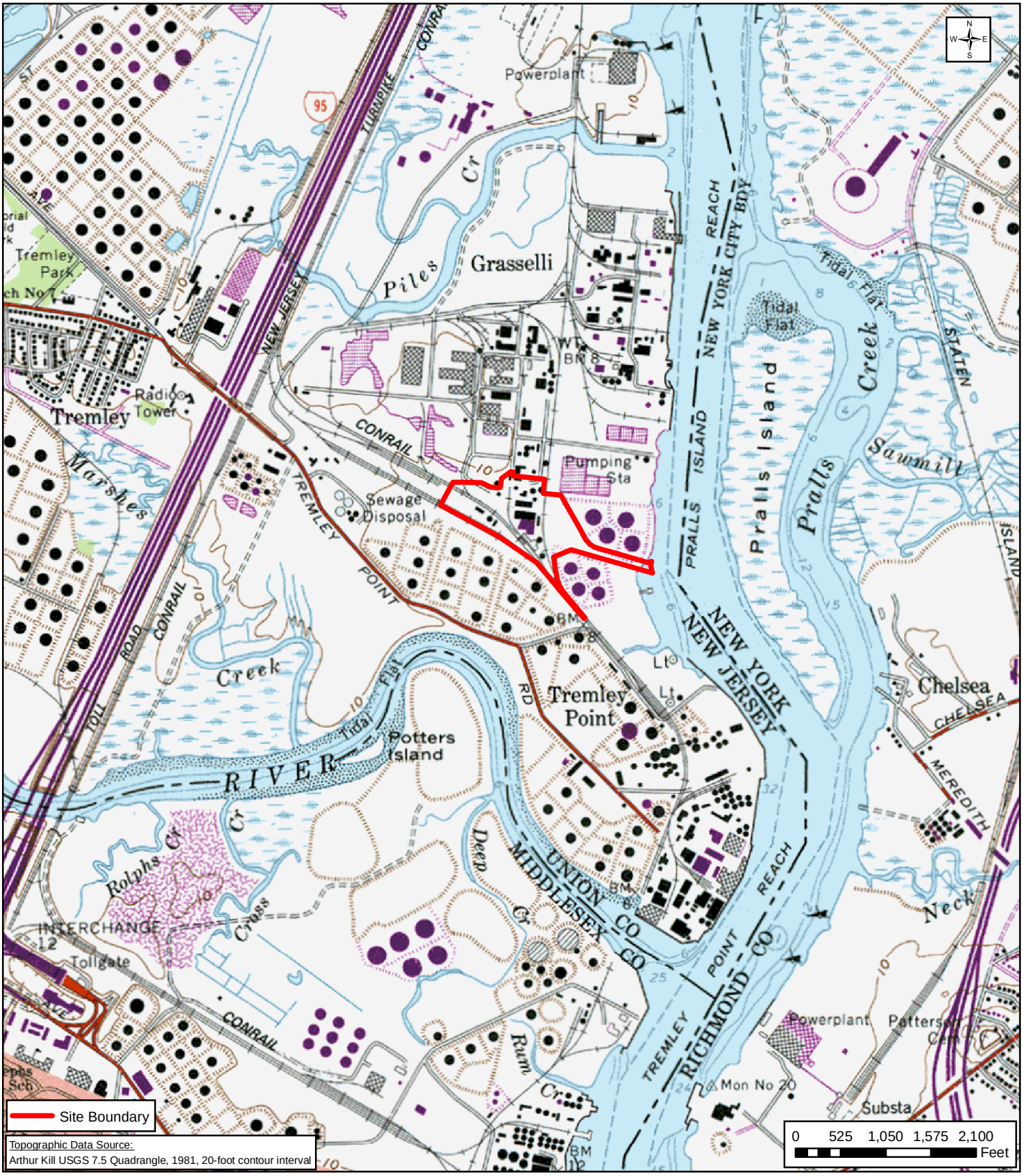
This Ecological Assessment (EA) Report was completed by The Chazen Companies (TCC) for ISP Environmental Services, Inc. as part of the Phase II Remedial Investigation of the 26-acre LCP Chemicals Inc. Superfund Site located in the City of Linden, Union County, New Jersey (hereafter "Site"). Figure 1.0-1, "Site Location Map," illustrates the "Site" on the *USGS Arthur Kill River, NY-NJ (1966, photorevised 1981) Topographic Quadrangle*.

The Site is located on Tremley Point along the Arthur Kill in the City of Linden. The site area has historically been developed for heavy industrial use. The coordinates of the center of the Site are Latitude 40.6032, Longitude -74.21163. The Arthur kill is located immediately east of the Site and receives flow from the Site, through South Branch Creek.

Currently, the Site is vacant, containing several abandoned industrial buildings in the western portion of the Site. A former brine sludge lagoon containing an impervious cap approximately 1.6 acres in size is located in the eastern-central portion of the Site adjacent to South Branch Creek.

South Branch Creek is a man-made tidal ditch that originates near the east-central portion of the Site and flows approximately 1,200 feet to the east, discharging into the Arthur Kill. The ditch is approximately 15 feet wide at the head of the stream and becomes as wide as 30 feet on the eastern end of the Site. The tidal flux of the Arthur Kill and South Branch Creek is approximately four to five feet. The substrate consists of very soft, organic muck up to three feet in depth. Some rip-rap is present along the banks of the creek and some construction debris along the bottom and banks of the creek.

The following sections of this report describe the methodologies used in the EA and provide a detailed description of the Site, surrounding area, and the ecological resources present at the Site.



THE Chazen COMPANIES

Engineers/Surveyors
Planners
Environmental Scientists
GIS Consultants

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

Dutchess County Office:	Orange County Office:	Capital District Office:	North Country Office:
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Poughkeepsie, NY 12601	Newburgh, NY 12550	Troy, NY 12180	Glens Falls, NY 12801
Phone: (845) 454-3980	Phone: (845) 567-1133	Phone: (518) 273-0055	Phone: (518) 812-0513

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LCP Chemicals

Figure 1.0-1
Site Location Map

City of Linden
Union County, New Jersey

Created by:	JFT
Date:	09/14/06
Scale:	1:17,987
Project #:	70620.00

1.1 Surrounding Landscape

The primary active land use in the surrounding area is bulk storage and transport of petroleum products and aggregate. The transport of these materials occurs by ship and barge using on-site dockage on the Arthur Kill as well as by truck and pipeline. Other active facilities in the area include a municipal wastewater treatment plant, trucking and warehousing, and truck repair. A number of large chemical manufacturing facilities formerly operated within one mile of the site, each of which is currently inactive and in various stages of demolition and site remediation. The industrial properties located immediately adjacent to the LCP site include:

- Valero Linden Terminal located north and south of South Branch Creek along the Arthur Kill.

- The former GAF Chemicals chemical manufacturing facility to the north which is currently being remediated by ISPESI. The site remediation included demolition of site structures, grading and drainage improvements, construction of a fully circumferential shallow groundwater barrier and groundwater collection system, installation of bedrock groundwater extraction wells, and the construction and operation of a groundwater conveyance and treatment system.

- Citgo Petroleum Corp, Linden Transload Terminal located to the south and southwest.

Various undeveloped areas are located within one mile of the Site, much of which is either vacant former chemical manufacturing facilities or tidal wetlands. The only area of residential development within one mile of the Site is the Tremley section of Linden which is located west of the New Jersey turnpike approximately 4,700 feet from the center of the Site. Zoning regulations are in effect for the City of Linden. All of the land located west of the New Jersey Turnpike on Tremley Point is zoned H1 - Heavy Industrial. Figure 1.1-1, "Surrounding Land Use Map" depicts the land-use patterns surrounding the Site.

Several watercourses are located in the area surrounding the Site. Piles Creek is located approximately 2350 feet north of the Site and the Rahway River is located approximately 1550 feet to the south. Both watercourses have tidal marshes associated with them. Piles Creek and Rahway River are mapped as estuarine, subtidal, unconsolidated bottom, subtidal rivers [E1UBL] by the National Wetland Inventory (NWI) program. The tidal marshes associated with Piles Creek are mapped as estuarine, intertidal, emergent, persistent, irregularly flooded, partially drained/ditched wetlands [E2EM1Pd]. According to the NJDEP, Piles Creek is

classified as a SE3 watercourse. The SE3 classification is given to estuarine waters designated for secondary contact recreation, maintenance and migration of fish populations, migration of diadromous fish, maintenance of wildlife, and any other reasonable uses.[1] The section of the Rahway River nearest to the Site is classified as SE3.

The Arthur Kill is located immediately east of the Site. The Arthur kill is a large river, approximately 300-600 feet wide and greater than 30 feet deep that flows from north to south, discharging into the Raritan Bay. The Arthur Kill is frequently dredged to maintain a passageway for commercial ships. It is mapped as an estuarine, unconsolidated bottom, subtidal river [E1UBL]. According to the NJDEP, the Arthur Kill is classified as a SE3 watercourse. The stretch of the Arthur Kill adjacent to the Site is classified as SD by the NYSDEC. The SD classification is for saline waters that are suitable for fish survival. This classification is given to waters that, because of natural or man-made conditions, cannot meet the requirements for primary and secondary contact recreation and fish propagation.[2]

Pralls Island is located approximately 1,200 feet to the east of the Site within the Arthur Kill. It is an approximately 80-acre uninhabited island that was created from former dredge spoil deposits. The central portion of the island is forested and dominated primarily by tree-of-heaven (*Ailanthus altissima*), gray birch (*Betula populifolia*), and black cherry (*Prunus serotina*), all less than 30 feet in height. Tree-of-heaven is an aggressive invasive species. The perimeter of the island contains tidal wetlands. The wetlands are mapped as estuarine, intertidal, emergent, persistent, regularly exposed [E1EM1N]; and estuarine, intertidal, unconsolidated shore, sand, irregularly flooded wetlands [E1US2P]. The island is owned by the City of New York Department of Parks and Recreation and is part of the Harbor Herons Sanctuary.

Since 1987, the New York City Audubon Society has overseen a study on the breeding success of wading birds on this island. According to a 1989 study by the NYS DOS Division of Coastal Resources, there was an estimated 200 pairs of herons nesting on the island, including 7 pairs of cattle egrets (*Bubulcus ibis*), 88 pairs of glossy ibis (*Plegadis falcinellus*), and 77 pairs of black-crowned night herons (*Nycticorax nycticorax*)[3]. Over the past sixteen years, the number of herons nesting on the island has significantly decreased. During the NYC Audubon's Harbor Herons 2005 Interim Nesting Survey, a total of 39 black-crowned night heron nests were located[4]. Five of the nests were occupied and 34 of the nests were inactive[5].

---

[1] N.J.A.C. 7:9B-1.12(f)
[2] 6 NYCRR Article 890, Part 890.6
[3] NYS DOS Division of Coastal Resources. 1989. Designated Habitat: Pralls Island.
[4] Bernick, A.J. 2005. New York City Audubon's Harbor Herons Project: 2005 Interim Nesting Survey.

The island is subject to chemicals (i.e., heavy metals, DDT, and petrochemicals), nutrient pollution stresses, and stormwater and sewage discharges[6]. All of these pollutants have negative effects on the habitat used by the herons and may be a cause for their decreased use of the island.

Other avian species observed on Pralls Island include great blue (*Ardea herodias*) and little blue herons (*Egretta caerulea*); great (*Ardea alba*), cattle, and snowy egrets (*E. thula*); glossy ibis; yellow- (*Nyctanassa. violacea*) and black-crowned night herons; herring (*Larus argentatus*) and great black-backed gulls (*Larus marinus*); water fowl species such as American black duck (*Anas rubripes*), gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), and Canada geese (*Branta canadensis*); and American woodcocks (*Scolopax minor*).

[5] Ibid
[6] NYS DOS Division of Coastal Resources. 1989. Significant Habitats and Habitat Complexes of the New York Bight Watershed: Arthur Kill Complex.

THE Chazen COMPANIES
Engineers/Surveyors
Planners
Environmental Scientists
GIS Consultants

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

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Capital District Office:
547 River Street
Troy, NY 12180
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North Country Office:
110 Glen Street
Glens Falls, NY 12801
Phone: (518) 812-0513

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LCP Chemicals

Figure 1.1-1
Surrounding Land Use Map

City of Linden
Union County, New Jersey

Created by:	JFT
Date:	02/16/2007
Scale:	1:11,650
Project #:	70620.00

2.0 Methodology

As part of this EA, information was gathered from federal, state, and local agencies and was supplemented by a literature review and an on-site field investigation. The field investigation was designed to catalog the Site's flora and fauna. A brief description of the methods used follows.

2.1 Federal and State Agencies and Literature Review

The NJDEP was contacted on August 8, 2006, and the NYSDEC was contact on October 3, 2006, to obtain information concerning known occurrences of endangered, threatened, and/or rare (ETR) species located on, or within the vicinity of, the Site. Copies of these letters are included in Appendix A, "Correspondence." On August 31, 2006, the NJDEP Natural Heritage Program responded in a letter stating that no rare wildlife or plant species, or ecological communities were located within the Site. Within a ¼ mile of the Site, the NJDEP has records of foraging habitat for black and yellow-crowned night herons and colonial waterbirds. However, no records of any rare plants or ecological communities were reported within a ¼ mile of the Site.

On October 27, 2006, the NYSDEC responded in a letter stating that the New Jersey State-endangered pied-billed grebe (*Podilymbus podiceps*), and New Jersey State-threatened yellow-crowned night herons were located within a ¼ mile of the LCP Chemicals Inc. Superfund Site. In addition, several endangered and threatened vascular plants including rose-pink (*Sabatia angularis*), persimmon (*Diospyros virginiana*), Nantucket juneberry (*Amelanchier nantucketensis*), sweetbay magnolia (*Magnolia virginiana*), featherfoil (*Hottonia inflata*), thicket sedge (*Carex abscondita*), glaucous sedge (*Carex glaucodea*), primrose-leaf violet (*Viola primulifolia*), southern dodder (*Cuscuta obtusiflora* var. *glandulosa*), swamp cottonwood (*Populus heterophylla*), possum-haw (*Viburnum nudam* var. *nudum*), and American strawberry bush (*Euonymus americanus*) were recorded within two miles of the Site (Confidential correspondence with NYSDEC). Due to the sensitivity of some of the information provided within this letter, pages describing the locations of species will not be provided.

To determine if any federally-listed species occur in the project area, TCC reviewed the Comprehensive List of Endangered and Threatened species as provided on the USFWS's New Jersey Field Office website.[7] This list identifies federally-listed species by the counties and municipalities in which they occur. According to this document, the federally-threatened bog turtle (*Clemmys muhlenbergii*) and the federally-endangered Indiana bat (*Myotis soldalis*) are known to occur in Union County. However, bog turtles are known to only occur in four municipalities in

[7] http://www.fws.gov/northeast/njfieldoffice/Endangered/munlist.pdf

Union County: Berkeley Heights Township, Mountainside Borough, Scotch Plains Township, and Summit City. The Site is located in the City of Linden municipality, which does not border any of the abovementioned municipalities. Indiana bats may occur in any municipality in Union County; therefore, they may occur in the vicinity of the Site. However, suitable habitat was not found on-site except for several abandoned buildings.

Below, TCC presents a brief review of the habitat requirements of the ETR species identified as potentially occurring in the project area.

2.2 Endangered and Threatened Species

Indiana Bat

Indiana bat habitat is composed of both hibernacula and summer roosting areas. Hibernacula typically are located in abandoned mines or caves. Summer roosting habitat is characterized by wooded areas with trees that have a southern exposure, are ≥ 5 inches in diameter, and that exhibit specific physical characteristics (e.g., exfoliating bark, crevices, dead limbs, snags) that provide refuge for bats during the day for both resting and maternity purposes.[8]

Pied-billed Grebe

Primary nesting habitat typically includes dense stands of emergent vegetation or low-lying aquatic vegetation. Open water is usually found near nesting habitat. Pied-billed grebes may nest in heavily populated areas as along as nesting-habitat requirements are met.[9] During the nonbreeding season, they can be found in a variety of habitats including brackish marshes and tidal creeks.

Yellow-crowned Night Heron

Yellow-crowned night herons typically nest and roost on dredge spoils, barrier and bay islands that contain forested wetlands and shrub thickets.[10] Nesting areas with insufficient cover are usually avoided; however, recently yellow-crowned night herons have been observed nesting in residential neighborhoods, parks, and other areas near humans.[11] Primary foraging habitat includes the shores of tidal creeks and pools within salt and brackish tidal marshes dominated by smooth cordgrass (*Spartina alternifolia*).[12]

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[8] Indiana Bat Project Review Fact Sheet. USFWS New York Field Office. August 2005.
9 Muller, M.J. and R.W. Stoner. 1999. Pied-billed Grebe (Podilymbus podiceps). *In* The Birds of North America, No. 410 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
[10] Yellow-crowned night heron fact sheet. NJDEP.
[11] Ibid
[12] Ibid

2.3 Field Investigation

Biologists from The Chazen Companies (TCC) conducted on-site investigations of the Property on the following dates, shown below.

Table 2.3.1 Work Field Days

LCP Chemicals Inc. Superfund Site Work Field Days and Activity Sheet			
Dates	**Staff**	**Man Hours**	**Work Conducted**
07/20/2006		10	Habitat Assessment
08/24/2006		24	Habitat Assessment and Pilot Biota Sampling
09/18/2006		16	Habitat Assessment and Biota Sampling
09/19/2006		23	Habitat Assessment and Biota Sampling
09/20/2006		23	Habitat Assessment and Biota Sampling
09/21/2006		12	Habitat Assessment and Biota Sampling
09/26/2006		10	Habitat Assessment
09/27/2006		10	Habitat Assessment
Total Field Days		8	
Total Man Hours		136	*Total man hours does not include drive time

During the field investigations, plant and animal species were inventoried to characterize existing populations, habitats, and communities. The potential for rare plants and animals, as well as general observations regarding overall plant community composition and structure, wetlands and watercourses, the degree of site disturbance, and other site characteristics were noted and recorded during the site inspection. The Site was transected in its entirety excluding entering hazard zones (i.e., on-site buildings) to ensure that each vegetative community type was surveyed.

In addition to investigating the Site, other areas within a half mile perimeter from the Site were investigated to document vegetation and the presence of wildlife species which live in the area.

Moreover, a literature review was conducted to provide supporting documentation for use in the EA. Information gathered included topographic maps, soil and geology maps, aerial photographs, pertinent plant and animal species information (i.e., known species in the area, characteristics required for identification, etc.), historical information, and information on the Pralls Island heron rookery.

2.3.1 Ecological Communities

Community (habitat) types described herein generally follow those utilized by the NJDEP and New York Natural Heritage Programs as described in *A Preliminary*

Natural Community Classification For New Jersey[13] and *Ecological Communities of New York.*[14] Vegetation identified within the Site is described in the following sections in terms of strata (layers – "overstory;" "understory;" and "groundcover").

Overstory vegetation represents the canopy tree species greater than six inches in diameter. Understory/shrub vegetation is comprised of woody tree species between two and six inches in diameter, and saplings and shrubs less than two inches in diameter and three to 12 feet in height. Ground layer vegetation consists of both woody and herbaceous vegetation less than three feet in height.

During the Site evaluation, the distributions of various communities were noted along with the vegetative species composition, plant structure (i.e., layers), and other vegetative characteristics. This information was used to provide a written description of each community type as presented below. Additionally, aerial photographic interpretation was used to assist in preparing a depiction of the ecological communities of the Site.

Plants species were field-identified to genus and species, when possible. Unidentified plant species were collected for later identification. Upon the compilation of the species list, plants identified at the Site were reviewed to determine if any federally- or state-listed plants were documented. Finally, species were categorized by location and general habitat characteristics were documented.

2.3.2 Wildlife

On-site field surveys of wildlife species were conducted for reptiles, amphibians, mammals, fish, bird, and crustacean species. An area of approximately ½ mile from the Site was also surveyed to document species living within close proximity to the Site. The following discussion outlines the methods used.

Reptiles and Amphibians

Methods used to conduct the reptiles and amphibian surveys include turning debris, and large stones to reveal herpetological species underneath.

---

[13] Breden. T.F. A preliminary natural community classification for New Jersey. Repinted from: Karlin, E.F. [editor]. 1989. New Jersey's Rare and Endangered Plants and Animals. Institute for Environmental Studies, Ramapo College, Mahwah, NJ. 280p.

[14] Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.136 pgs.

Mammals

Methods to detect mammals were based on visual encounters, vocalization, tracks, scat, remains, or other signs.

Birds

Bird species were identified throughout the Site either visually, by song, and/or by nest evaluations. Associations between bird species and their corresponding preferred habitat types were noted during the investigation.

Fish and Crustaceans

Fish and crustacean species were identified by seining and visual observation in the South Branch Creek. Seining occurred at several locations along the stretch of the South Branch Creek located on-site.

3.0 Existing physical conditions

The Site consists primarily of abandoned industrial buildings. Many of the buildings are decrepit and falling down. Several dirt roads and railroad tracks bisect the Site. A former brine sludge lagoon containing an impervious cap approximately 1.6 acres in size is located in the eastern portion of the Site adjacent to the South Branch Creek. The following section describes the Site's topography, soils, hydrology including wetland mapping, and vegetative communities.

3.1 Topography

According to the *USGS Arthur Kill NY-NJ (1966, photorevised 1981) Topographic Quadrangle* map, the Site is flat and is less than 10 feet above mean sea level (msl). Figure 1.0-1 provides an illustration of the overall Site topography.

3.2 Hydrology and Wetland Mapping

3.2.1 Watercourses

South Branch Creek is a man-made brackish tidal ditch originating in the central portion of the Site and flowing east over 1,200 feet before discharging into the Arthur Kill. The watercourse is approximately 15 feet wide at the head of the stream and becomes as wide as 30 feet on the eastern end of the Site. The substrate consists of very soft, organic muck up to three feet in depth. South Branch Creek has a large tidal change from low to high tide (i.e., 4-5 feet).

3.2.2 Wetland Mapping

NWI Mapping

According to the National Wetland Inventory (NWI) digital data provided by the USFWS there are several watercourses and wetlands mapped within the project area. Only one NWI wetland is mapped within the boundaries of the Site. The wetland is mapped in the locality of South Branch Creek. The wetland is mapped as an estuarine, intertidal, emergent, mesohaline, irregularly flooded wetland [E2EM5P]. A wetland mapped located immediately adjacent to the northwestern Site boundary is mapped as an Estuarine, subtidal, unconsolidated bottom, subtidal, excavated wetland [E1UB1x].

NJDEP Wetland Mapping

According to a Geographic Information System (GIS) dataset provided by the NJDEP, no NJDEP wetlands are mapped on the Site. The closest NJDEP wetland is mapped approximately 100 feet south of the southwestern corner of the Site. This wetland is mapped as a palustrine, emergent, persistent, saturated wetland [PEM1B].

The wetlands and watercourses on-site were delineated by the EcolSciences, Inc. of Rockaway, New Jersey. According to the delineation, one wetland was identified in the eastern portion of the Site and it was delineated with flagging labeled W1 - W62, and WA-1 – WA-20. A Letter of Interpretation was received from the NJDEP and the wetland delineation line was determined to be correct. In addition, the NJDEP determined that the onsite wetland (i.e., South Branch Creek) is of intermediate resource value, thus a 50 foot regulatory buffer is required. Figure 3.2-2, "Wetlands Map", provides an illustration of the mapped wetlands on and adjacent to the Site.

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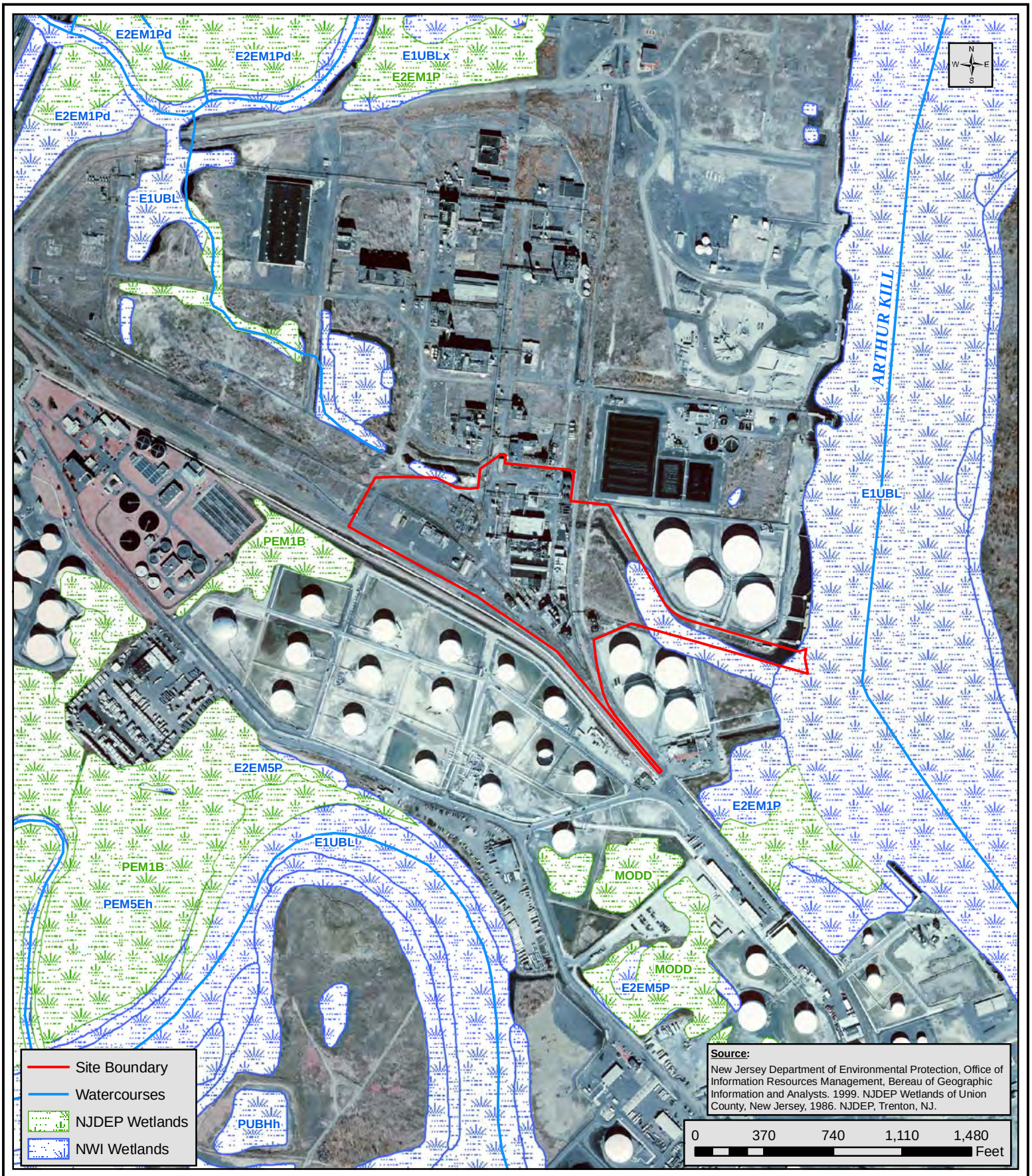
Figure 3.0-1 Aerial Map

City of Linden
Union County, New Jersey

Created by:	JFT
Date:	09/14/06
Scale:	1:5,152
Project #:	70620.00



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LCP Chemicals

Figure 3.2-2 Wetlands Map

City of Linden
Union County, New Jersey

Created by:	JFT
Date:	09/14/06
Scale:	1:8,192
Project #:	70620.00

4.0 Results

The Site is a heavily developed area consisting of abandoned industrial buildings and a capped brine sludge lagoon. South Branch Creek is a man-made tidal ditch that originates near the east-central portion of the Site and flows east before discharging into the Arthur Kill. The Site primarily consists of three ecological communities including an urban vacant lot, capped brine sludge lagoon, and brackish tidal marsh.

The following sections provide descriptions of the types of ecological communities located within the Site. Section 4.2 describes the Site's fauna and habitat characteristics.

4.1 Ecological Communities

TCC staff identified 79 plant species within three ecological communities as described in *Ecological Communities of New York*[15] *and A Preliminary Natural Community Classification for New Jersey.*[16] Many of the plant species observed within the urban vacant lot and capped brine sludge lagoon (i.e., successional old field) communities were also observed in adjacent open fields. The mowed fields are located adjacent to the north and northeastern portions of the Site. These fields consist primarily of early successional species. Figure 4.1-1 "Ecological Communities Map" illustrates the approximate location of each of the community types on the Site. Representative photographs of each community type are included as Appendix B "Site Photographs".

During this EA, no federally and/or state endangered or threatened plant species were observed within the boundaries of the Site. The following presents a general description of the ecological communities observed within the Site.

Urban Vacant Lot, With Structures – The community type is located throughout the Site and consists of exposed soil, rubble, and derelict buildings. This community type makes up most of the Site as the Site is completely disturbed and has been abandoned since the early 1990's. Vegetation was sparse and consisted mostly of first successional recruitment species and invasive species typically found in urban areas. Trees are generally sparse and many exist as small saplings. Shrubs

[15] Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.136 pgs.
[16] Breden. T.F. A preliminary natural community classification for New Jersey. Repinted from: Karlin, E.F. [editor]. 1989. New Jersey's Rare and Endangered Plants and Animals. Institute for Environmental Studies, Ramapo College, Mahwah, NJ. 280p.

account for approximately 1-5% coverage in this community. The dominant shrub species include groundsel tree (*Baccharis halimifolia*), staghorn sumac (*Rhus typhina*), and white mulberry (*Morus alba*). The groundlayer accounts for approximately 20-25% of this community and is composed of common milkweed (*Asclepias syriaca*), spotted knapweed (*Centaurea maculosa*), pokeweed (*Phytolacca americana*), and common plantain (*Plantago major*). Table 4.1.1 provides a list of the species encountered within the urban vacant lot community.

Table 4.1.1 List of Species observed within the Urban Vacant Lot Community

Scientific Name	**Common Name**
Trees	
Ailanthus altissima	Tree of heaven
Acer rubrum	Red maple (saplings)
Catalpa speciosa	Northern catalpa
Liquidambar styraciflua	Sweet gum
Populus deltoides	Eastern cottonwood (saplings)
Populus tremuloides	Quaking aspen (saplings)
Robinia pseudoacacia	Black locust
Quercus rubra	Red oak
Shrubs	
Baccharis halimifolia	Groundsel tree
Clethra alnifolia	Coastal sweetpepperbush
Diospyros virginiana	Common persimmon
Elaeagnus umbellate	Autumn olive
Morus alba	White mulberry
Polygonum cuspidatum	Japanese knotweed
Rhus copallinum	Winged sumac
Rhus typhina	Staghorn sumac
Rosa multiflora	Multiflora rose
Rubus allegheniensis	Common blackberry
Viburnum recognitum	Southern arrowwood
Herbs	
Apocynum cannabinum	Indian hemp
Asclepias syriaca	Common milkweed
Aster spp.	Aster
Centaurea maculosa	Spotted knapweed
Chenopodium album	Pigweed
Chicorium intybus	Chicory
Cirsium arvense	Canada thistle
Newcomb, Lawrence. 1977. Newcomb's Wildflower Guide. Little, Brown and Company. Boston. Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.136 pgs.	

Table 4.1.1 List of Species observed within the Urban Vacant Lot Community (cont.)

Scientific Name	**Common Name**
Herbs (cont.)	
Cirsium vulgare	Bull thistle
Commelina communis	Asiatic dayflower
Daucus carota	Queen Anne's lace
Fragaria spp.	Strawberry
Hypericum perforatum	Common St. Johnswort
Lactusa serriola	Prickly lettuce
Lepidium virginicum	Wild peppergrass
Leucanthemum vulgare	Oxeye daisy
Linaria vulgaris	Butter-and-eggs
Lychnis alba	White campion
Lycopus americanus	American water horehound
Melilotus officinalis	Yellow sweet clover
Oxalis stricta	Yellow wood-sorrel
Phytolacca americana	Pokeweed
Plantago major	Common plantain
Polygonum hydropiper	Water pepper
Polygonum lapathifolium	Curlytop knotweed
Polygonum persicaria	Lady's thumb
Potentilla simplex	Common cinquefoil
Ranunculus acris	Tall buttercup
Rumex crispus	Curly dock
Solanum dulcamara	Bittersweet nightshade
Solidago canadensis	Canada goldenrod
Solidago juncea	Early goldenrod
Vines	
Celastrus scandens	American bittersweet
Convolvulus sepium	Hedge bindweed
Echinocystis lobata	Wild cucumber
Ipomoea purpurea	Common morning glory
Parthenocissus quinquefolia	Virginia creeper
Toxicodendron radicans	Poison ivy
Vitis aestivalis	Summer grape
Grasses and Sedges	
Cyperus esculentus	Yellow nutsedge
Cyperus strigosus	Strawcolored flatsedge
Digitaria spp.	Crabgrass
Elymus repens	Quackgrass
Phleum pratense	Timothy

Newcomb, Lawrence. 1977. Newcomb's Wildflower Guide. Little, Brown and Company. Boston.
Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.136 pgs.

Successional Old Field (i.e., Brine Sludge Lagoon) – This community is located in the east-central portion of the Site. It consists of a capped brine sludge lagoon that has become vegetated with early successional species. The former brine sludge lagoon has a clean cover and it is a closed RCRA lagoon. It is not part of the contaminated site. Over the years, the cap has become vegetated with early successional species such as daisy fleabane (*Erigeron strigosus*), narrowleaf plantain (*Plantago lanceolata*), clover (*Trifolium* spp.), and brome grass (*Bromus* sp.). A woodchuck (*Marmota monax*) burrow was observed at the western edge of the former brine sludge lagoon.

Table 4.1.1 List of Species observed within the Successional Old Field Community

Scientific Name	Common Name
Herbs	
Brassica spp.	Mustard
Chamaesyce maculata	Prostrate spurge
Erigeron strigosus	Daisy fleabane
Leontodon autumnalis	Fall dandelion
Linaria vulgaris	Butter-and-eggs
Lotus corniculatus	Birdsfoot trefoil
Plantago lanceolata	Narrowleaf plantain
Plantago major	Common plantain
Taraxacum officinale	Common dandelion
Trifolium pratense	Red clover
Trifolium repens	White clover
Verbascum thapsus	Common mullein
Vicia villosa	Winter vetch
Grasses and Sedges	
Aleopecurus spp.	Foxtail
Bromus spp.	Brome grass
Digitaria spp.	Crabgrass
Elymus repens	Quackgrass
Phleum pratense	Timothy

Newcomb, Lawrence. 1977. Newcomb's Wildflower Guide. Little, Brown and Company. Boston.
Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.136 pgs.

Brackish Tidal Marsh – This community is located in the eastern portion of the Site and includes South Branch Creek and its banks. South Branch Creek is a man-made ditch that has been excavated in artificial fill and a brackish tidal marsh. Over the years, the ditch has been filled and realigned to its current state. Vegetation within this community was dense and dominated by tall graminoids. Vegetation along the sides of the ditch consists primarily of common reed (*Phragmites australis*) and smooth cordgrass (*Spartina alternifolia*). Several bird

species including a little blue heron (*Egretta caerulea*), green heron (*Butorides virescens*), and swamp sparrow (*Melospiza georgiana*) were observed in this community. Mummichogs (*Fundulus* sp.), fiddler crabs (*Uca pugnax*), and ribbed mussels (*Geukensia demissa*) were relatively abundant in the marsh. Blue crabs (*Callinectes sapidus*) were also noted further out in South Branch Creek, closer to the Arthur Kill.

Table 4.1.2 List of Species observed within the Brackish Tidal Marsh Community

Scientific Name	**Common Name**
Grasses and Sedges	
Lythrum salicaria	Purple loosestrife
Phragmites australis	Common reed
Spartina alternifolia	Smooth cordgrass
Newcomb, Lawrence. 1977. Newcomb's Wildflower Guide. Little, Brown and Company. Boston. Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.136 pgs.	

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LCP Chemicals

Figure 4.1-1
Ecological Communities Map

City of Linden
Union County, New Jersey

Created by:	JFT
Date:	09/14/06
Scale:	1:4,219
Project #:	70620.00

4.2 Fauna

The fauna of the Site was also cataloged during the on-site investigation. In all, 42 species of wildlife were observed during the Site visits.

4.2.1 Mammals

Six mammalian species were either observed or recognized by their sign on or within the immediate vicinity of the Site (Table 4.2.1). A woodchuck burrow was observed at the former sludge lagoon; a mouse (*Peromyscus* sp.) nest was observed near an abandoned building; a raccoon (*Procyon lotor*) track was observed along the main access road through the site; a whitetail deer (*Odocoileus virginianus*) was observed near the abandoned buildings; a red fox (*Vulpes vulpes*) was observed along the railroad tracks; and an eastern cottontail (*Sylvilagus floridanus*) was observed in the vicinity of the Site. No aquatic mammals or endangered, threatened, or special concern mammalian species were observed within the Site.

Table 4.2.1 Mammal Species Observed

Scientific Name	Common Name	Habitat
Marmota monax	Woodchuck	SOF
Odocoileus virginanus	Whitetail deer	UVL
Peromyscus sp.	Mouse	UVL
Procyon lotor	Raccoon	UVL
Vulpes vulpes	Red fox	UVL
Sylvilagus floridanus	Eastern cottontail	OF (Adjacent to Site)
Ecological Communities: **SOF**- Successional Old Field, **UVL**- Urban Vacant Lot		

4.2.2 Reptiles and Amphibians

One reptile and one amphibian species were observed at the Site (Table 4.2.2). No endangered, threatened, or special concern reptile or amphibian species were observed within the Site.

Table 4.2.2 Reptile and Amphibian Species Observed

Scientific Name	Common Name	Habitat
Bufo americanus	American toad	UVL
Thamnophis sirtalis	Common garter snake	UVL
Ecological Communities: **BTM**- Brackish Tidal Marsh, **UVL**- Urban Vacant Lot		

4.2.3 Fish and Crustaceans

Three species of fish and eight species of crustaceans were observed during the field investigation (Table 4.2.3). No endangered, threatened, or special concern fish or crustacean species were observed within the Site.

Table 4.2.3 Fish and Crustaceans Species Observed

Scientific Name	Common Name	Habitat
Fish		
Fundulus diaphanous	Banded killifish	BTM
Fundulus heteroclitus	Mummichog	BTM
Fundulus majalis	Striped mummichog	BTM
Crustaceans		
Balanus spp.	Barnacle	BTM
Callinectes sapidus	Blue crab	BTM
Carcinus maenas	Green crab	BTM
Geukensia demissa	Ribbed mussel	BTM
Neopanopeus sayi	Black-fingered mud crab	BTM
Palaemontetes spp.	Grass shrimp	BTM
Uca minax	Red-jointed fiddler crab	BTM
Uca pugnax	Atlantic Marsh fiddler crab	BTM
Ecological Communities: **BTM**- Brackish Tidal Marsh, **UVL**- Urban Vacant Lot		

4.2.4 Birds

Twenty-three species of birds were observed on or within the immediate vicinity of the Site (Table 4.2.4). Thirteen of the species were observed on-site and 10 species were observed in tidal marshes within ½ mile of the Site. Associations between bird species and their corresponding preferred habitat types were noted during the investigation. All avian species observed are common in New Jersey/New York and are typically found within the communities they were observed in. No ETR bird species were observed during the field investigation.

Since the Site is located within the Atlantic coast migration corridor, numerous migrating land and water birds could potentially use the site or surrounding area as a stopover/overwintering site. The Atlantic coast is regularly used by migrating birds and approximately 50 different kinds of landbirds travel this flyway.[17] Flocks of Canada geese (*Branta canadensis*) and mourning doves (*Zenaida macroura*) were observed in mowed fields adjacent to the Site during the field investigations.

[17] Peterson, S.R. 1979. Atlantic Coast Route and Tributaries. Migration of Birds. Fish and Wildlife Service, Circular 16. pg. 70.

Table 4.2.4 Bird Species Observed

Scientific Name	Common Name	Habitat
Birds		
Agelaius phoeniceus	Red-winged blackbird	BTM
Anas platyrhynchos	Mallard	Arthur kill
Anas rubripes	American black duck	Piles Creek
Ardea herodias	Great blue heron	Piles Creek
Botaurus lentiginosus	American bittern	Rahway Creek
Branta canadensis	Canada goose	UVL, Arthur Kill
Butorides virescens	Green heron	BTM
Calidris minutilla	Least sandpiper	Piles Creek
Casmerodius albus	Great egret	Piles Creek
Charadrius vociferus	Killdeer	UVL
Dumetella carolinensis	Gray catbird	UVL
Egretta caerulea	Little blue heron	BTM
Egretta thula	Snowy egret	Piles Creek
Hirundo rustica	Barn swallow	UVL
Larus atricilla	Laughing gull	Piles Creek
Larus argentatus	Herring gull*	UVL
Melospiza georgiana	Swamp sparrow	BTM
Melospiza melodia	Song sparrow	UVL
Mimus polyglottos	Northern mockingbird	UVL
Phalacrocorax auritus	Double-crested cormorant	Arthur kill
Sterna hirundo	Common tern	Rahway Creek
Sturnus vulgaris	European starling	UVL
Zenaida macroura	Mourning dove	UVL
Ecological Communities: **BTM**- Brackish Tidal Marsh, **UVL**- Urban Vacant Lot * denotes a flyover		

4.2.5 Endangered, Threatened, and Rare Wildlife Species

During this EA, no ETR species were found on the Site. According to the Comprehensive List of Federally Listed, Threatened, and Endangered Species of New Jersey, the Indiana bat (*Myotis soldalis*) is the only federally protected ETR species known historically to be in the City of Linden municipality. Based upon the habitat found within the Site, it is unlikely that Indiana bats are found in the project area. The abandoned buildings throughout the Site could provide suitable habitat for Indiana bats; however, no bats were observed during the site visits.

Indiana bat roosts typically are identified by trees with exfoliating bark in open tree canopies where there is significant exposure to sunlight. There are very few trees on the Site, and the closest black locust was a single tree approximately 1,000 feet north of the Site. Several black locust trees were identified along the Rahway River corridor approximately ½ mile away. These trees were approximately 15 feet high with insufficient diameters and physical structures for roosting.

According to the NYSDEC, pied-billed grebes and yellow-crowned night herons are recorded approximately ¼ from the Site. Based upon the habitat found within the Site, potential nonbreeding habitat for pied-billed grebes and foraging habitat for yellow-crowned night herons exists within the Site. The brackish tidal marsh community located in the eastern portion of the Site is dominated by common reed and smooth cordgrass, which is commonly associated with yellow-crowned night heron foraging habitat. Nesting habitat for both of these species was not observed within the Site.

5.0 CONCLUSIONS

The project area is an abandoned industrial site consisting of deteriorating buildings and disturbed land. One watercourse (i.e., South Branch Creek) flows east, discharging into the Arthur Kill, which eventually flows into the Raritan Bay.

The wildlife species observed during this EA are all fairly common to the area. Pralls Island, located approximately 1,200 feet to the east of the project within the Arthur Kill is part of a Harbor Herons Sanctuary, owned by the NYC Department of Parks and Recreation. The uninhabited island provides a nesting habitat for numerous birds, including herons, shorebirds, gulls, waterfowl, and songbirds. However, declining populations of herons have been noted on this island.

In regards to ETR species, there were no ETR species or significant ecological communities observed within or in the immediate vicinity of the project area. The brackish tidal marsh community, located in the eastern portion of the Site, is the only area onsite which may provide suitable nonbreeding and foraging habitat for the state-endangered pied-billed grebe and state-threatened yellow-crowned night heron. Although this community may provide low-grade habitat for these species, plenty of similar habitat is located in the surrounding area (i.e., Piles Creek, Rahway River). Since both species are highly mobile and because the Site does not provide nesting habitat, it is expected that the both species would migrate and use similar habitat in the surrounding area.

As this Site has been subject to highly industrialized previous land uses, it is highly modified and disturbed. This has led to a species assemblage of generalists and/or early successional/weedy/invasive species. The flora and fauna species found on the site are typical species that would be found in heavily industrialized areas within intertidal marsh ecosystems. As most of the species found on-site are mobile, it is anticipated that they will migrate to higher quality habitat in the surrounding areas such as Piles Creek and the Arthur Kill. Vegetative species found within the Site are very common to highly disturbed areas and possess no special protection. All species observed or documented in the intertidal marsh community are common species in this habitat type and are secure in the region.

Appendix A: Correspondence

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

Poughkeepsie Office
Phone: (845) 454-3980

Capital District Office
Phone: (518) 273-0055

356 Meadow Avenue, Newburgh, New York 12550
Phone: (845) 567-1133 Fax: (845) 567-1925
Email: newburgh@chazencompanies.com
Web: www.chazencompanies.com

North Country Office
Phone: (518) 812-0513

August 8, 2006

Office of Natural Lands Management
Natural Heritage Program
PO Box 404
22 South Clinton Avenue
Trenton, NJ 08625-0404

Re: Freedom of Information Request, Threatened or Endangered Species
26 Acre Site Located at the foot of South Wood Avenue
City of Linden, Union County, New Jersey

Dear Sir or Madam:

The Chazen Companies are in the process of conducting a natural resource inventory at the above referenced property. The approximately 26-acre site is located at the foot of South Wood Avenue in the City of Linden, Union County, New Jersey. The tax parcel map for this area identifies the property as parcel #'s (i.e., Block and Lot number): 587 3.1, 587 3.2, and 587 3.3. Please find the enclosed USGS topographic map (Arthur Kill Quadrangle) illustrating the approximate location of the subject property.

The project site has been designated a superfund site by the Environmental Protection Agency (EPA). As part of a Phase II Remedial Investigation at the LCP Chemicals Superfund Site, an on site habitat assessment will be conducted. All species will be inventoried on the property.

Please provide any information you have concerning known occurrences of endangered, threatened and/or special concern wildlife species as well as rare plant, animal, natural community occurrences, or other significant habitats either on the site or in the immediate surrounding area. This information will help us focus on habitat which may be critical to endangered or threatened species.

If you have any questions, please do not hesitate to contact me at (845) 567-1133 if you have any questions. Thank you for your assistance.

Sincerely,

Jason Tourscher

Jason Tourscher
Wetland Scientist/Biologist

Enclosure

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

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

August 31, 2006

Jason Tourscher
The Chazen Companies
356 Meadow Avenue
Newburgh, NY 12550

Re: LCP Chemicals Superfund Site

Dear Mr. Tourscher:

Thank you for your data request regarding rare species information for the above referenced project site in Linden City, Union County.

Searches of the Natural Heritage Database and the Landscape Project (Version 2) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Request for Data into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

Neither the Natural Heritage Database nor the Landscape Project has records for any rare wildlife species on the referenced site.

We have also checked the Natural Heritage Database and the Landscape Project habitat mapping for occurrences of any rare wildlife species or wildlife habitat within 1/4 mile of the referenced site. Please see the table below for species list and conservation status.

Species within 1/4 mile of referenced site.

Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
black-crowned night-heron foraging habitat	*Nycticorax nycticorax*		T/S	G5	S3B,S4N
colonial waterbird foraging habitat					
yellow-crowned night-heron foraging habitat	*Nyctanassa violacea*		T/T	G5	S2B

We have also checked the Natural Heritage Database for occurrences of rare plant species or ecological communities. The Natural Heritage Database does not have any records for rare plants or ecological communities on or within 1/4 mile of the site.

Attached is a list of rare species and ecological communities that have been documented from Union County. If suitable habitat is present at the project site, these species have potential to be present.

Status and rank codes used in the tables and lists are defined in the attached EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS.

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

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

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

Sincerely,

Herbert A. Lord

Herbert A. Lord
Data Request Specialist

cc: Robert J. Cartica
Lawrence Niles
NHP File No. 06-4007452

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the database. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, P.O. Box 401, Trenton, NJ 08625-0401.

The Landscape Project was developed by the Division of Fish & Wildlife, Endangered and Nongame Species Program in order to map critical habitat for rare animal species. Natural Heritage Database response letters will also list all species (if any) found during a search of the Landscape Project. However, this office cannot answer any inquiries about the Landscape Project. All questions should be directed to the DEP Division of Fish and Wildlife, Endangered and Nongame Species Program, P.O. Box 400, Trenton, NJ 08625-0400.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

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

UNION COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
*** Vertebrates						
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1B
CLEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3
CLEMMYS MUHLENBERGII	BOG TURTLE	LT	E		G3	S2
EURYCEA LONGICAUDA LONGICAUDA	LONGTAIL SALAMANDER		T		G5T5	S2
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2B,S4N
STERNA ANTILLARUM	LEAST TERN		E		G4	S1B
STRIX VARIA	BARRED OWL		T/T		G5	S3B
*** Ecosystems						
TRAPROCK GLADE/ROCK OUTCROP COMMUNITY	TRAPROCK GLADE/ROCK OUTCROP COMMUNITY				G2	S1
*** Invertebrates						
ALASMIDONTA UNDULATA	TRIANGLE FLOATER		T		G4	S3
PAPAIPEMA AERATA	A BORER MOTH				GH	SH
POLITES MYSTIC	LONG DASH				G5	S3?
PONTIA PROTODICE	CHECKERED WHITE		T		G4	S1
*** Other types						
COASTAL HERON ROOKERY	COASTAL HERON ROOKERY				GU	S3
*** Vascular plants						
CAREX BEBBII	BEBB'S SEDGE				G5	S2
CAREX POLYMORPHA	VARIABLE SEDGE		E		G3	S1
CYNOGLOSSUM VIRGINIANUM VAR VIRGINIANUM	WILD COMFREY				G5T5	S2
LEMNA VALDIVIANA	PALE DUCKWEED		E		G5	S1
LIATRIS SCARIOSA VAR NOVAE-ANGLIAE	NORTHERN BLAZING-STAR		E		G5?T3	SH

UNION COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
MIMULUS ALATUS	WINGED MONKEY-FLOWER				G5	S3
MONARDA CLINOPODIA	BASIL BEEBALM		E		G5	SH
MUHLENBERGIA CAPILLARIS	LONG-AWN SMOKE GRASS		E		G5T?	S1
PHLOX PILOSA	DOWNY PHLOX		E		G5T5	SH
RANUNCULUS PUSILLUS VAR PUSILLUS	LOW SPEARWORT				G5T4?	S2
VIOLA CANADENSIS	CANADIAN VIOLET		E		G5T?	S1

24 Records Processed

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

LE	Taxa formally listed as endangered.
LT	Taxa formally listed as threatened.
PE	Taxa already proposed to be formally listed as endangered.
PT	Taxa already proposed to be formally listed as threatened.
C	Taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
S/A	Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (NSSA 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

D	Declining species-a species which has exhibited a continued decline in population numbers over the years.
E	Endangered species-an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors - a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.
EX	Extirpated species-a species that formerly occurred in New Jersey, but is not now known to exist within the state.
I	Introduced species-a species not native to New Jersey that could not have established itself here without the assistance of man.
INC	Increasing species-a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.
T	Threatened species-a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.
P	Peripheral species-a species whose occurrence in New Jersey is at the extreme edge of its present natural range.
S	Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.
U	Undetermined species-a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

Special Concern applies to animal species that warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a Threatened species. This category would also be applied to species that meet the foregoing criteria and for which there is little understanding of their current population status in the state.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS AND ECOLOGICAL COMMUNITIES

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

HL Indicates taxa or ecological communities protected by the Highlands Water Protection and Planning Act within the jurisdiction of the Highlands Preservation Area.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy has developed a ranking system for use in identifying elements (rare species and natural communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

GLOBAL ELEMENT RANKS

G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout it's range; with the number of occurrences in the range of 21 to 100.

G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.

G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.

GH Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

GU Possibly in peril range-wide but status uncertain; more information needed.

GX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? Species has not yet been ranked.

GNR Species has not yet been ranked.

STATE ELEMENT RANKS

S1 Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.

S3 Rare in state with 21 to 100 occurrences (plant species and ecological communities in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 Apparently secure in state, with many occurrences.

S5 Demonstrably secure in state and essentially ineradicable under present conditions.

SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.

SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.

SP Element has potential to occur in New Jersey, but no occurrences have been reported.

SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.

SRF Elements erroneously reported from New Jersey, but this error persists in the literature.

SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.

SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.

SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.

SZ Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.

Typically, the SZ rank applies to a non-breeding population (N) in the state - for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.

Although the SZ rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an SZ rank. SZ will only apply when the migrants occur in an irregular, transitory and dispersed manner.

B Refers to the breeding population of the element in the state.

N Refers to the non-breeding population of the element in the state.

T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.

Q Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.

.1 Elements documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

Y Identification has been verified and is indicative of significant habitat.

BLANK Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.

? Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

Capital District Office
Phone: (518) 273-0055

Orange County Office
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21 Fox Street, Poughkeepsie, New York 12601
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Email: poughkeepsie@chazencompanies.com
Web: www.chazencompanies.com

North Country Office
Phone: (518) 812-0513

October 3, 2006

Ms. Jean Pietrusiak
NYSDEC - Information Services
NY Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4754

Re: Freedom of Information Request, Threatened or Endangered Species
Site Located adjacent to Old Place Creek
South of Port Ivory, Richmond County, New York

Dear Ms. Pietrusiak:

The Chazen Companies are in the process of conducting a Phase II Remedial Investigation and Ecological Risk Assessment (ERA) of a 26-acre site in the City of Linden, Union County, New Jersey. As part of the remediation process, a reference stream within the vicinity of the site is being studied.

The reference stream is located along Old Place Creek, which is located south of Port Ivory, Richmond County, New York. Old Place Creek is located below the Goethals Bridge which connects New Jersey and Staten Island. Please find the enclosed USGS topographic maps (Arthur Kill and Elizabeth Quadrangle) illustrating the approximate location of the site and reference stream. The land use surrounding the site and reference stream is industrial. Brackish tidal marshes are located adjacent to the reference stream.

Please provide any information you have concerning known occurrences of endangered, threatened and/or special concern wildlife species as well as rare plant, animal, natural community occurrences, or other significant habitats either at the reference stream site or in the immediate surrounding area. Also, although the 26-acre site is located within New Jersey, we are requesting any information you may have for the portion of New York (i.e., Chelsea, New York) which is located east of the site.

If at all possible, please fax the requested information to me at (845) 567-1925. Please do not hesitate to contact me at (845) 567-1133 if you have any questions.

Thank you for your assistance.

Sincerely,

Jason Tourscher

Jason Tourscher
Wetland Scientist/Biologist

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • FAX: (518) 402-8925
Website: www.dec.state.ny.

Denise M. Sheehan
Commissioner

October 27, 2006

Jason Tourscher
Chazen Engineering
21 Fox Street
Poughkeepsie, NY 12601

Dear Mr. Tourscher:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed 26-acre Phase II Remedial Investigation and Ecological Risk Assessment, area along Old Place Creek below Goethals Bridge which connects New Jersey and Staten Island, area as indicated on the map you provided, located in Richmond County, New York State.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and should not be released to the public without permission from the New York Natural Heritage Program.

The presence of rare species may result in this project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Seoane

Tara Seoane, Information Services
NY Natural Heritage Program

Enc.
cc: Reg. 2, Wildlife Mgr
Reg. 2, Fisheries Mgr.
Peter Nye, Endangered Species Unit, Albany
Jack Cooper, Fish and Wildlife, Albany

COMPREHENSIVE LIST OF NEW JERSEY MUNICIPALITIES WITH EXTANT AND HISTORIC OCCURRENCES OF FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES, AND CANDIDATE SPECIES, PURSUANT TO THE ENDANGERED SPECIES ACT OF 1973
(87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*)

{Revised June 2004; Bald eagle data revised July 2005}

1. SPECIES OCCURRENCES BY COUNTY AND MUNICIPALITY

Index of symbols used in the tables:

T – Federally listed as threatened.
E – Federally listed as endangered.
X – Known occurrence of extant federally listed or candidate species.
H – Historic occurrence of federally listed or candidate species.
W – Wintering foraging habitat for bald eagles.

2. FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES AND CANDIDATE SPECIES IN NEW JERSEY UNDER U.S. FISH AND WILDLIFE SERVICE JURISDICTION (Species Narratives)

LISTED SPECIES - PLANTS
- Swamp pink (*Helonias bullata*)
- Knieskern's beaked-rush (*Rhynchospora knieskernii*)
- Sensitive joint-vetch (*Aeschynomene virginica*)
- American chaffseed (*Schwalbea americana*)
- Small whorled pogonia (*Isotria medeoloides*)
- Seabeach amaranth (*Amaranthus pumilus*)

LISTED SPECIES - INVERTEBRATES
- Dwarf wedgemussel (*Alasmidonta heterodon*)
- Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*)

LISTED SPECIES - REPTILES
- Bog turtle (*Clemmys muhlenbergii*)

LISTED SPECIES - BIRDS
- Bald eagle (*Haliaeetus leucocephalus*)
- Piping plover (*Charadrius melodus*)
- Roseate tern (*Sterna dougallii*)

LISTED SPECIES - MAMMALS
- Indiana bat (*Myotis sodalis*)

CANDIDATE SPECIES
- Bog asphodel (*Narthecium americanum*)
- Hirst's panic grass (*Dichanthelium hirstii*)

DELISTED SPECIES
- Peregrine falcon (*Falco peregrinus*)

UNION COUNTY

The species listed below are known to occur in at least one of the Union County municipalities listed below.

Species
Bog Turtle
Indiana Bat (*)

Municipalities
Berkeley Heights Township
Mountainside Borough
Scotch Plains Township
Summit City

(*) Indiana bats may occur in any municipality within Union County

Appendix B:
Site Photographs

Photo #1
Northern view of the urban vacant lot ecological community located throughout the majority of the Site.

Photo #2
Southern view of abandoned buildings located within the central portion of the Site

Photo #3
Eastern view of South Branch Creek

Photo #4
View of fiddler crabs within South Branch Creek

Photo #5
View of the eastern shore of Pralls Island and the Arthur Kill

Photo #6
View of successional fields surrounding the Site. Bulk petroleum storage tanks are located in the distance.

Photo #7
View of the urban vacant lot community along the southern Site boundary

Photo #8
View of the eastern slope of the capped sludge lagoon

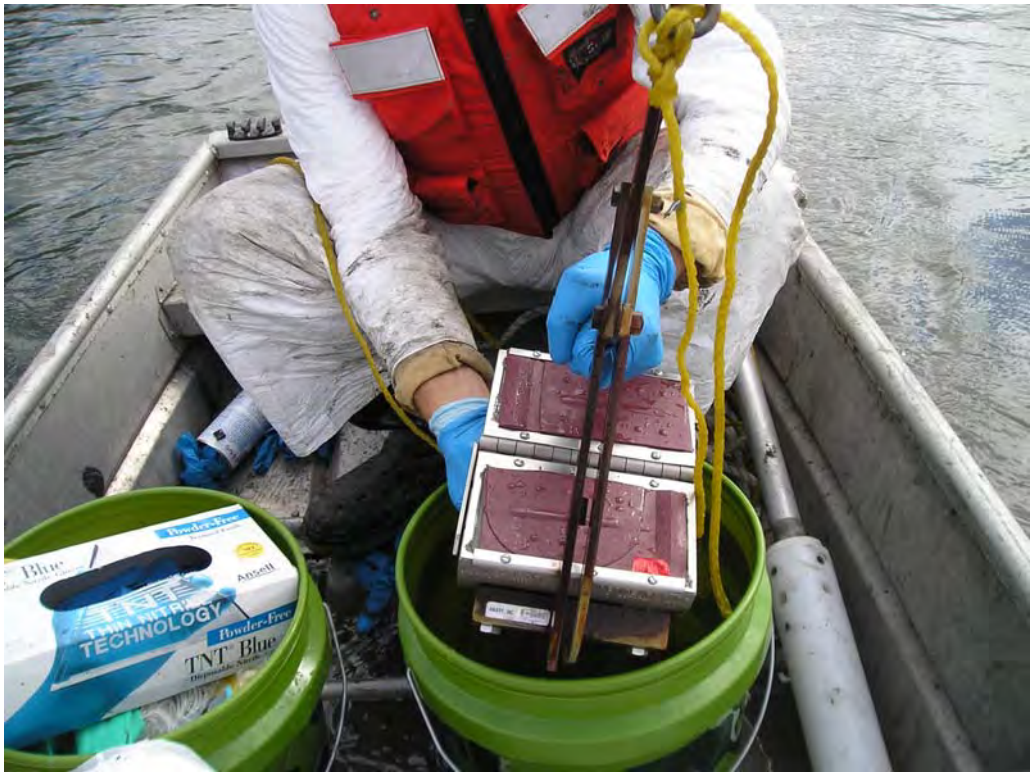
Photo #9
Northeastern view of Pile's Creek. The DuPont chemical plant is in the background

Photo #10
Southeastern view of Rahway Creek. Valero LP petroleum storage tanks are displayed in the background.

Appendix G: Representative Photographic Logs

Photograph #1 – Use of coring device for sediment sampling.

Photograph #2–Detachment of core during sediment sampling.



Photograph #3 – Use of Petite Ponar dredge for sediment sampling.

Photograph #4 – Grab sample during surface water sampling.

Photograph #5 – Surface water grab sample collection.

Photograph #6 – Low marsh soil sampling.

Photograph #7 – Homogenizing low marsh soil sample.

Photograph #8 – Collecting fiddler crabs.

Photograph #9 – Fiddler crab yield for two sample stations.

Photograph #10 – Weighing fiddler crabs.

Photograph #11 – Baited traps for mummichog.

Photograph #12 – Baited trap in water at transect.

Photograph #13 – Fish yield at transect.

Photograph #14 – Measuring fish samples.

Photograph #1 – Deep soil drilling with hollow-stem auger rig.

Photograph #2 – Deep soil sampling, split-tube samples.

Photograph #3 – Shallow soil using GeoProbe direct push sampler.

Photograph #4 – Shallow soil using GeoProbe direct push sampler.

Photograph #5 – Horizontal boring drill rods advanced into shallow trench before proceeding beneath Buildings 230 and 240.

Photograph #6 – Horizontal drilling rig. Drill rods being advanced into and through shallow trench.

Photograph #7 – Elemental mercury from sample HB-105A.

Photograph #8 – Elemental mercury beads on soil (in lower right-hand corner) discovered while digging shallow trench for HB-103. Trench was abandoned and area taped off.

Photograph #9 – Groundwater sample collection.

Photograph #10 – Groundwater sample collection.

Photograph #11 – Mercury soil vapor screening using a Jerome 431B mercury vapor analyzer.

Photograph #12 – Collection of mercury soil vapors via method IO-5. Gold-bead traps are placed inside heated-tube (bottom left of photo)to reduce moisture in sample.

Photograph #13 – Ambient air sample collected in six-liter summa canister.

Photograph #14 – Purging soil vapor probe and monitoring mercury vapors for health and safety purposes.

Photograph #15 – Collection of duplicate soil vapor samples in 1-liter summa canister.