December 29, 2015 Reference No. 007830

Ms. Ruth Curley
Environmental Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B Section A
625 Broadway, 12th Floor
Albany, New York
U.S.A. 12233 7016

Dear Ms. Curley:

Re: Revised Work Plan for Monitoring Well Installation and Decommissioning Sterling Drug Site 3 (Site 442011), East Greenbush, New York

As requested by the New York State Department of Environmental Conservation, this letter presents a limited scope work plan for the installation of monitoring wells MW-25 and MW-26, and the decommissioning and reinstallation of monitoring wells MW-3SR, MW-11B and MW-22B at Sterling Site 3 (Site 442011) (Site) in East Greenbush, New York. Monitoring well MW-8B has an obstruction, and this monitoring well will be decommissioned and replaced, if the obstruction cannot be successfully removed. All of these monitoring wells are included in the proposed monitoring well network in the revised Site Management Plan (SMP). An additional ten monitoring wells (MW-1S, MW-5B, MW-6A, MW-6B, MW-9A, MW-9B, MW-13A, MW-13B, MW-15B and MW-18B) that are not part of the groundwater monitoring well network in the SMP will be decommissioned. The revised SMP was submitted under separate cover. The Site location is presented on Figure 1. The monitoring well locations are presented on Figure 2.

1. Health and Safety Plan

The project Health and Safety Plan (HASP) is presented in the SMP (Appendix C). Drilling will not occur through the soil cover system in Operable Unit 1 (OU-1), and volatile emissions are anticipated to be minimal, but air monitoring of the worker breathing zone will be performed.

The HASP was prepared consistent with applicable governmental and non-governmental regulations and guidelines including OSHA Subpart H of Part 1910 (Title 29 Code of Federal Regulations (CFR) Part 1910.120).

Contractors will be required to provide Health and Safety Plans for their employees working at the Site that meet the minimum standards of the HASP.

GHD Limited
651 Colby Drive Waterloo Ontario N2V 1C2 Canada
T 519 884 0510 **F** 519 884 0525 **W** www.ghd.com

2. Inspection of MW-8B

Monitoring well MW-8B will be inspected to determine whether the obstruction in the monitoring well can be removed while maintaining the integrity of the monitoring well. If the monitoring well is considered compromised or will be compromised by attempting to remove the obstruction or the obstruction cannot be removed, the monitoring well will be decommissioned and reinstalled.

3. Equipment Cleaning

Prior to the mobilization of the drill rig to the Site, it shall be thoroughly cleaned to remove oil, grease, mud, and other foreign matter. Subsequently, before initiating drilling at each borehole, samplers, drill steel, hollow-stem auger sections, and associated equipment will be cleaned to prevent cross-contamination from the previous drilling location. Cleaning will be accomplished by cleaning the components to remove solid material followed by a high-pressure water wash. Special attention will be given to the threaded sections of the drill rods and equipment that contacts impacted materials. Drilling equipment that may have potentially contacted contaminated media will be decontaminated prior to leaving the Site.

4. Well Decommissioning

The monitoring wells MW-3SR, MW-8B (if necessary), MW-11B and MW-22B will be decommissioned in accordance with procedures described in “CP-43: Groundwater Monitoring Well Decommissioning Policy”, NYSDEC, November 2009.

The PVC riser will be pulled while the monitoring well is grouted using a tremie pipe from the bottom upwards. If the riser breaks while being pulled, the remaining portion of the monitoring well will be augered out and grouted. If the riser cannot be pulled out, the monitoring well will be overdrilled and the riser pulled, and then the hole will be grouted using a tremie pipe from the bottom upwards. The well logs for monitoring wells MW-3SR, MW-8B, MW-11B and MW-22B are presented in Attachment A. The monitoring wells, that will be decommissioned but not replaced, will be decommissioned following similar procedures that are outlined above. The well logs for monitoring wells MW-1S, MW-5B, MW-6A, MW-6B, MW-9A, MW-9B, MW-13A, MW-13B, MW-15B and MW-18B, that will be decommissioned but not replaced, are presented in Attachment B.

5. Replacement Monitoring Well Installations

The borings for the monitoring wells MW-3SR, MW-8B (if necessary), MW-11B, and MW-22 will be advanced to the target depths identified in Table 1. Each boring will be completed as follows:

1) The replacement boring location will be located approximately 15 feet from the original well location. The boring location will be finalized in the field and marked.

2) Utility locates will be performed, if required. If necessary, the location of the boring may be field adjusted.

3) Air monitoring of the worker breathing zone in accordance with the HASP will be performed.

4) Downhole equipment will be steam cleaned prior to use.

5) Boring will be advanced using hollow stem augers or other standard drilling methods to the target depth.

7) Notes on sample depth and drilling conditions will be recorded.

The boring will be completed as a monitoring well as follows:

1) The well will be constructed of 2-inch, threaded, Schedule 40 PVC well screen and riser pipe. The well screen will be as identified on Table 2. The riser will be completed with a stickup that is approximately 3 feet in height.

2) The sand pack will consist of clean, inert, siliceous material. The sand pack will be completed from 0.5 feet below the screen to 2 feet above the well screen. The top 0.5 feet of the sand pack will consist of finer sand than the remainder of the sand pack. The sand pack will be placed using a tremie line.

3) A 2-foot thick bentonite seal will be placed above the sand pack. The bentonite seal will be placed using a tremie line.

4) The annulus above the bentonite seal will be filled with cement-bentonite grout to approximately 2 feet below ground surface. The cement-bentonite grout will be placed using a tremie line.

5) A lockable, protective surface casing will be set in a concrete surface seal. A drain will be drilled near the base of the protective casing.

6) Well installation details will be recorded.

7) The top of riser will be marked for subsequent water level measurements.

8) The well ID will be marked on the protective casing.

9) The protective casing will be locked.

6. New Monitoring Well Installations – MW-25 and MW-26

The borings for the monitoring wells MW-25 and MW-26 will be advanced to an approximate maximum target depth of 7 feet below ground surface as identified in Table 2. Each boring will be completed as follows:

1) The boring location will be finalized in the field and marked.

2) Utility locates will be performed, if required. If necessary, the location of the boring may be field adjusted.

3) Air monitoring of the worker breathing zone in accordance with the HASP will be performed.

5) Downhole equipment will be steam cleaned prior to use.

6) Boring will be advanced using hollow stem augers or other standard drilling methods to the target depth. Continuous split spoon or cores will be collected.

7) Notes regarding sample depth, blow counts, sample recovery, PID readings, soil descriptions, stratigraphy, moisture and water conditions, drilling conditions will be recorded appropriate to the drilling method.

The boring will be completed as a monitoring well as follows:

1) The well will be constructed of 4-inch, threaded, Schedule 40 PVC well screen and riser pipe. The well screen will be a minimum of two feet long with No. 10 slots. The riser will be completed with a stickup that is approximately 3 feet in height.

2) The sand pack will consist of clean, inert, siliceous material. The sand pack will be completed from the bottom of the screen to a minimum of 0.5 feet above the well screen. The sand pack will consist of 20-40 sand or equivalent.

3) A minimum 0.5-foot thick hydrated bentonite seal will be placed above the sand pack.

4) The annulus above the bentonite seal will be filled with cement-bentonite grout to approximately 2 feet below ground surface. The final well completion details will be finalized in the field based on encountered field conditions.

5) A lockable, protective surface casing will be set in a concrete surface seal. A drain will be drilled near the base of the protective casing.

6) Well installation details will be recorded.

7) The top of riser will be marked for subsequent water level measurements.

8) The well ID will be marked on the protective casing.

9) The protective casing will be locked.

7. Well Development

The newly installed monitoring wells will be developed after the bentonite seal and grout have set. After each well volume is removed, a volume will be collected and field analyzed for turbidity, temperature, pH, and conductivity. Development will continue until two consecutive and consistent readings of temperature, pH, and conductivity are obtained and the turbidity is less than 50 NTUs, if possible. Readings will be considered consistent if consecutive conductivity, temperature, and pH values are within 10 percent of each other. In the event that these field conditions cannot be met, development will continue to a silt-free condition of less than 50 NTUs or until a maximum of ten well volumes have been removed.

8. Snap Samplers

A Snap Sampler assembly will be installed in the monitoring well a minimum of one week after well development.

9. Soil Cuttings and Purged Groundwater

The soil cuttings and purged water will be containerized, staged on Site, and sampled for disposal purposes. All coveralls, gloves, etc. will be collected in plastic bags for disposal off of the Site.

10. Surveying

The location and elevations (top of riser and ground surface) of the newly installed monitoring wells will be surveyed. The elevation of the reference point (top of the inner riser) will be measured to the nearest 0.01 foot.

11. Schedule

The scope of work will commence after NYSDEC's approval of this work plan. The scope of work will be scheduled for the Spring of 2016. The schedule will depend on the timing of agency approval, contractor procurement, contractor availability, and Site access conditions. NYSDEC will be notified in advance of the schedule for field activities.

Please feel free to contact Mr. Bryan Gallagher at 585-588-7483, if you have any questions or would like to discuss the project.

Sincerely,

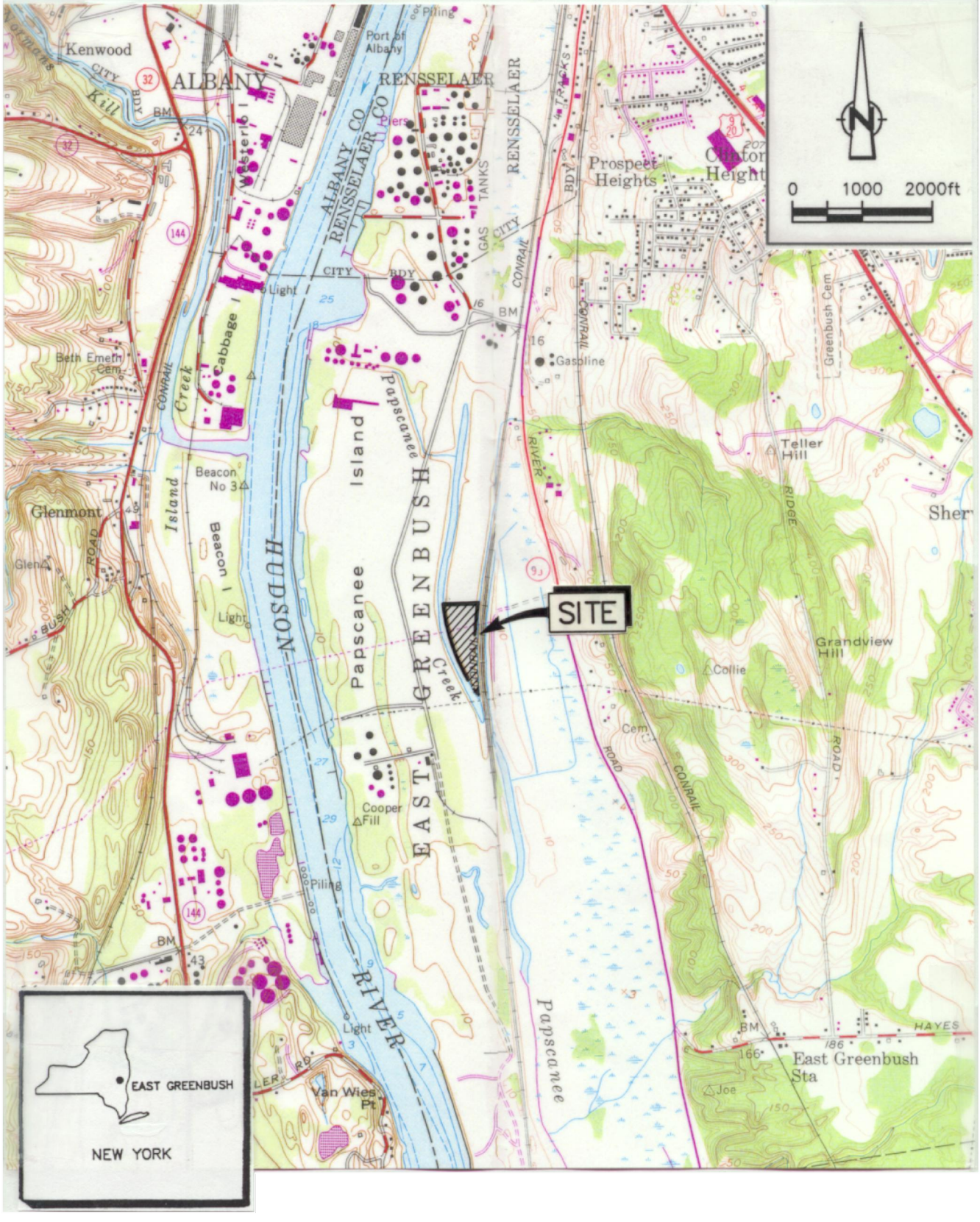
GHD

Michael A. Okamoto

MO/kf/7

Encl.

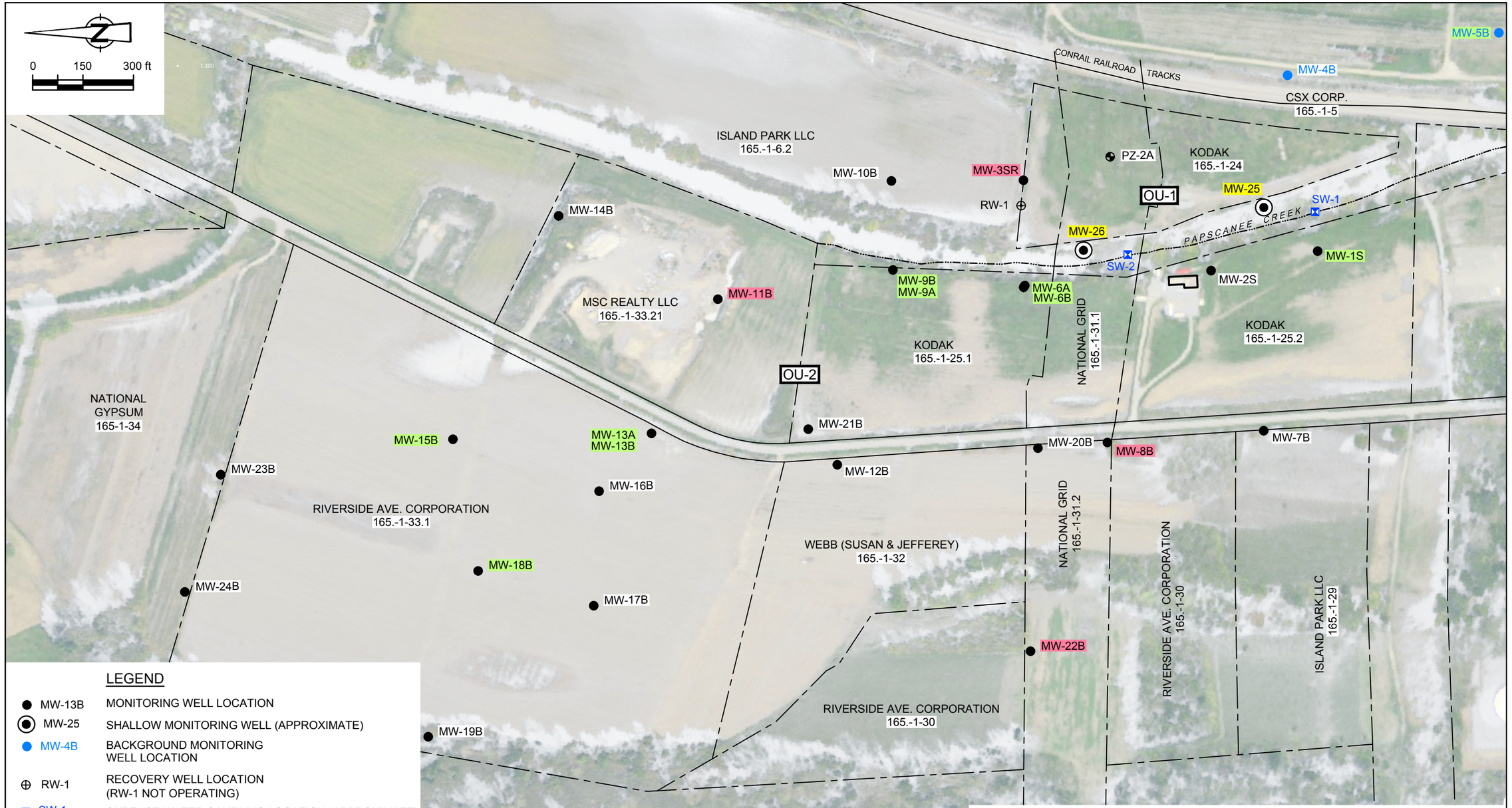
cc: M. Komoroske (NYSDEC)
J. Deming/R. Ockerby (NYSDOH)
D. Tuohy (NYSDEC)
Bryan Gallagher (Kodak – electronic copy)



SOURCE:
U.S.G.S. TOPOGRAPHIC MAP QUADRANGLE
DELMAR AND EAST GREENBUSH, N.Y.

figure 1

SITE LOCATION
STERLING SITE 3
East Greenbush, New York



SOURCE: DAMES & MOORE
WILLOW GROVE, PENNSYLVANIA
AERIAL: 2011, USDA NAIP, 1m RESOLUTION.

figure 2

NEW, REPLACEMENT, AND TO BE DECOMMISSIONED MONITORING WELL LOCATIONS STERLING SITE 3

East Greenbush, New York

07830-2015(CURL007)GN-WA002 DEC 22, 2015

Table 1

Existing and Proposed Monitoring Well Completion Details
Sterling Drug Site 3
East Greenbush, New York

	Existing Monitoring Well					Proposed New/Replacement Monitoring Well **					
Well Location	Depth of Borehole (ft. B.G.S.)	Screen Length (feet)	Diameter of Well (inches)	Depth of Screen Top (ft. B.G.S.)	Depth of Screen Bottom (ft. B.G.S.)	Depth of Borehole (ft. B.G.S.)	Screen Length (feet)	Diameter of Well (inches)	Depth of Screen Top (ft. B.G.S.)	Depth of Screen Bottom (ft. B.G.S.)	Continuous Sampling?
New Monitoring Wells to be Installed											
MW-25	NA	NA	NA	NA	NA	7 *	2	4	5	7	Yes
MW-26	NA	NA	NA	NA	NA	7 *	2	4	5	7	Yes
Monitoring Wells to be Re-installed											
MW-3SR	50	45	2	4	49	26.5	15	2	11	26	No
MW-8B ***	46.5	20	4	26.2	46.2	46.5	20	2	26	46	No
MW-11B	82	20	4	50.5	70.5	70.5	20	2	50	70	No
MW-22B	38	20	2	16	36	36.5	20	2	16	36	No
Monitoring Wells to be Decommissioned											
MW-1S	47	40	3	7	47	NA	NA	NA	NA	NA	NA
MW-5B	64	20	4	43	63	NA	NA	NA	NA	NA	NA
MW-6A	34	25	4	7	32	NA	NA	NA	NA	NA	NA
MW-6B	50	21	4	28	49	NA	NA	NA	NA	NA	NA
MW-9A	34	25	4	7	32	NA	NA	NA	NA	NA	NA
MW-9B	61	20	4	40	60	NA	NA	NA	NA	NA	NA
MW-13A	33	25	4	7	32	NA	NA	NA	NA	NA	NA
MW-13B	108	20	4	87	107	NA	NA	NA	NA	NA	NA
MW-15B	63	21	4	41	62	NA	NA	NA	NA	NA	NA
MW-18B	63	21	4	41	62	NA	NA	NA	NA	NA	NA

Notes:

NA = Not Applicable
* = Maximum depth of boring
** = Final installation details to be determined in the field.
*** = Removal of obstruction will be attempted first. If unsuccessful, the monitoring well will be decommissioned and re-installed.

Attachment A
Well Construction Details for Monitoring Wells to be Re-installed
MW-3SR, MW-8B, MW-11B and MW-22B

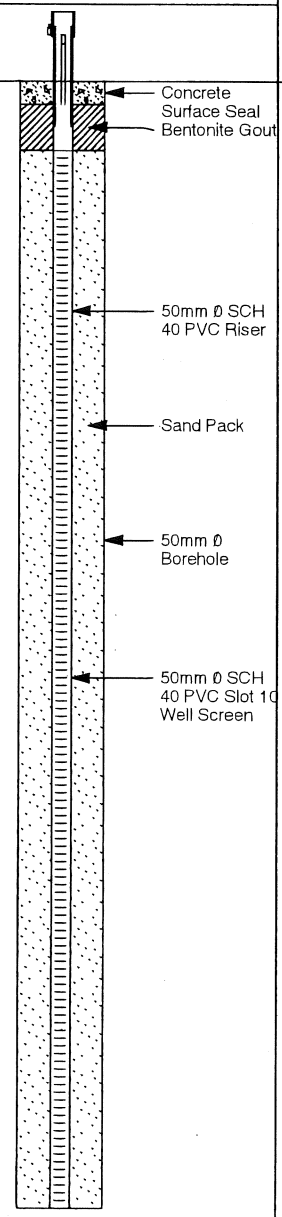
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Sterling Site 3
PROJECT NUMBER: 7830
CLIENT: NPEC, Inc.
LOCATION: East Greenbush, New York

HOLE DESIGNATION: MW-3SR
DATE COMPLETED: November 5, 2001
DRILLING METHOD: 4.25" HSA
FIELD PERSONNEL: B. Pickert

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft ft ASL
	TOP OF CASING	11.71
	TOP OF RISER	11.61
	GROUND SURFACE	8.60
	ML - SILT, trace to little fine sand, trace clay, light brown to brown (some roots, organics from 0 - 1.5 ft bgs)	
5	ML - SILT, trace to little fine sand, trace clay, light brown to brown, dry to fairly dry, very loose	3.60
	SP - SAND, fine grained, wet, gray-brown, trace silt	2.60
10	SW - SAND, well graded, fine to coarse grained, trace silt, gray-brown, wet, running sand, slight odour (strong chemical odour from 12.5 to 14.5 ft BGS)	-0.30
15		
	SW - SAND, well graded, fine to coarse grained, trace silt, trace gravel, gray-brown, wet, running sand, slight odour	-7.60
20		
	SW - SAND, fine to coarse grained, well graded, trace to little gravel, trace silt, gray-brown, wet, (sand becoming fine to medium with depth)	-13.80
25	- Slight odor at 26.2ft BGS	
30		
35		
40	SP - SAND, poorly graded, fine to medium grained, trace gravel, grey-brown, wet, very loose	-31.00
	- Trace silt at 41.0ft BGS	
45	GP - GRAVEL, little to some medium grained sand, trace fine grained sand, trace silt, gray-brown, wet, very loose	-35.40
	Heaving sand	
50	END OF BOREHOLE @ 50.0ft BGS	-41.40
55		

Monitoring Well



WELL DETAILS
Screened interval:
4.60 to -40.40ft ft ASL
4.00 to 49.00ft BGS
Length: 45ft
Diameter: 2in
Slot Size: 10
Material: SCH 40 PVC
Seal:
7.60 to 5.60ft ft ASL

SAMPLE NUMBER	INTERVAL	REC (ft)	'N' VALUE	PID
1		2.0	18	0
2		0.5	15	0.2
3		0.0	8	NA
4		0.8	8	0
5		2.0	5	0
6		2.0	8	0.2
7		0.8	6	11.6
8		2.0	4	1.8
9		1.5	5	0
10		1.5	6	3.2
11		1.7	5	1.4
12		2.0	6	9.8
13		2.0	3	1.6
14		2.0	6	12.2
15		2.0	6	0
16		1.0	5	1.8
17		0.0	5	NA
18		2.0	5	0.6
19		2.0	7	0
20		2.0	6	0
21		1.7	3	0
22		2.0	4	0
23		0.3	6	0
24		2.0	10	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

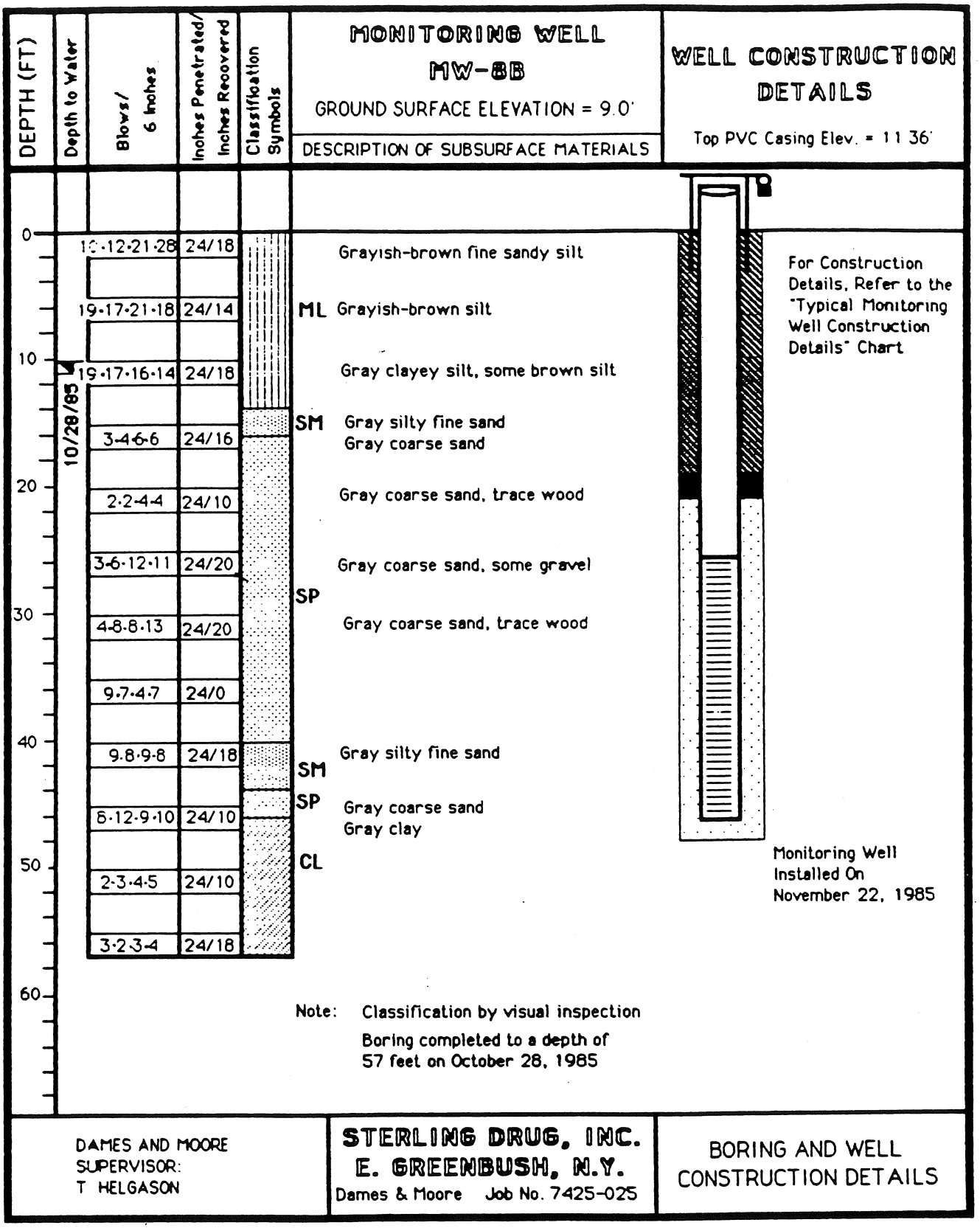
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

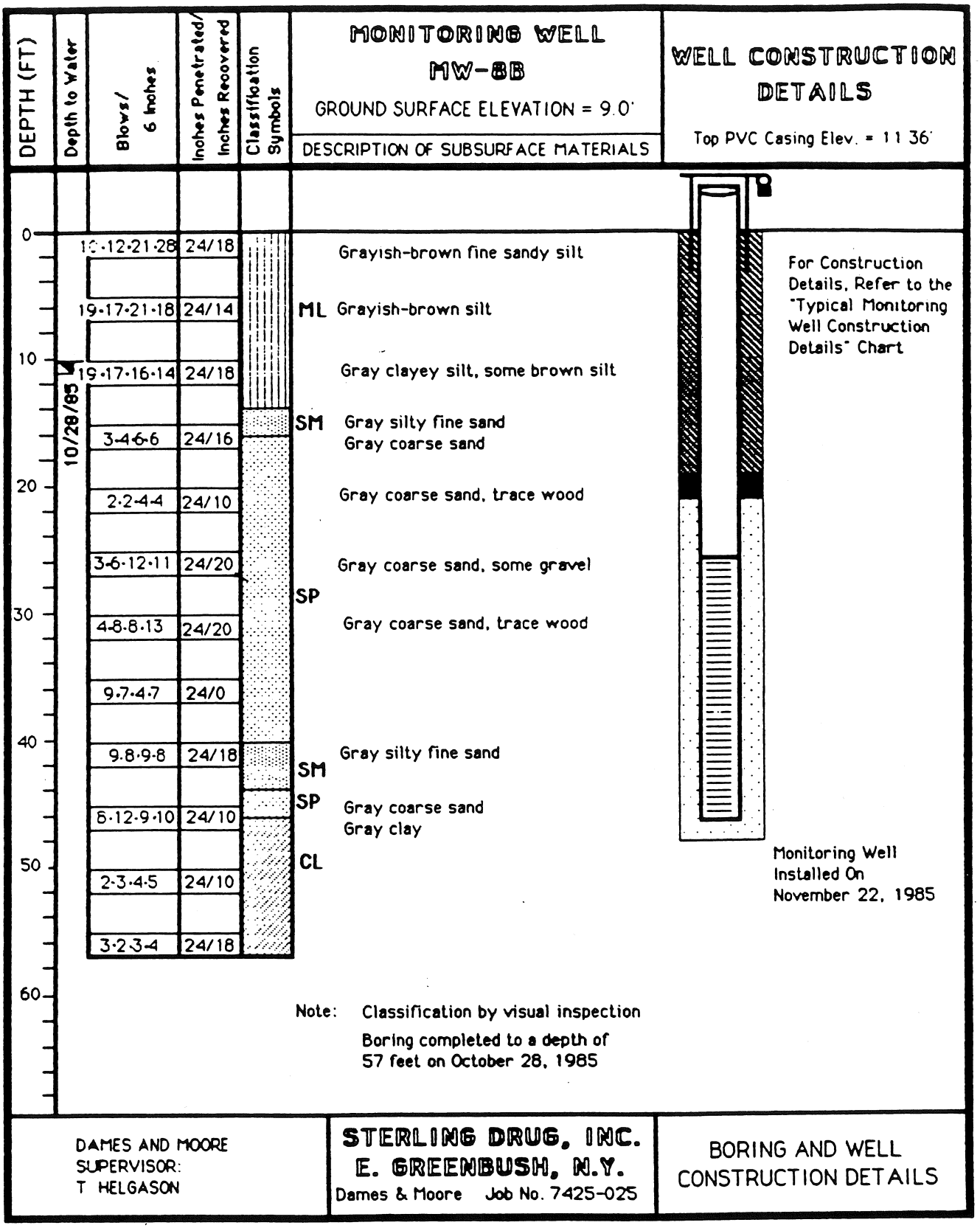
PROJECT NAME: Sterling Site 3
PROJECT NUMBER: 7830
CLIENT: NPEC, Inc.
LOCATION: East Greenbush, New York

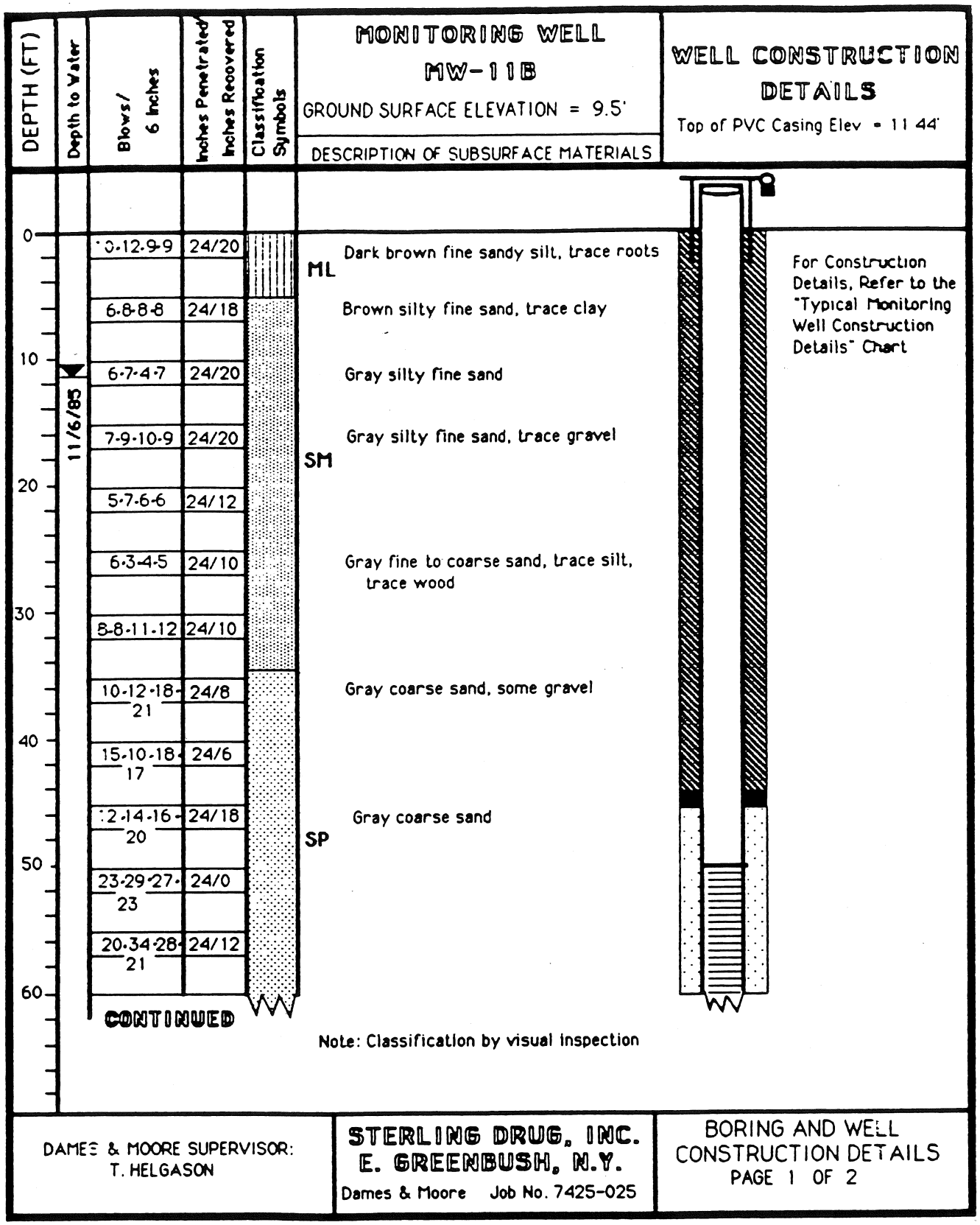
HOLE DESIGNATION: MW-3SR
DATE COMPLETED: November 5, 2001
DRILLING METHOD: 4.25" HSA
FIELD PERSONNEL: B. Pickert

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft ft ASL	Monitoring Well	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE 'N' VALUE	SAMPLE PID
65			1.00 to 3.00ft BGS Material: Bentonite grout Sand Pack: 5.60 to -40.40ft ft ASL 3.00 to 49.00ft BGS Material: No. 2 Silica Sand					
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								

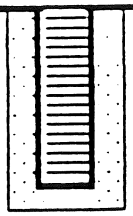
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE


DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
MONITORING WELL MW-8B
GROUND SURFACE ELEVATION = 9.0'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top PVC Casing Elev. = 11.36'
0
10
20
30
40
50
60
10/28/85
10-12-21-28 24/18
19-17-21-18 24/14
19-17-16-14 24/18
3-4-6-6 24/16
2-2-4-4 24/10
3-6-12-11 24/20
4-8-8-13 24/20
9-7-4-7 24/0
9-8-9-8 24/18
6-12-9-10 24/10
2-3-4-5 24/10
3-2-3-4 24/18
Grayish-brown fine sandy silt
ML Grayish-brown silt
Gray clayey silt, some brown silt
SM Gray silty fine sand
Gray coarse sand
Gray coarse sand, trace wood
Gray coarse sand, some gravel
SP
Gray coarse sand, trace wood
Gray silty fine sand
SM
SP Gray coarse sand
Gray clay
CL
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On November 22, 1985
Note: Classification by visual inspection
Boring completed to a depth of 57 feet on October 28, 1985
DAMES AND MOORE
SUPERVISOR:
T HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
MONITORING WELL MW-8B
GROUND SURFACE ELEVATION = 9.0'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top PVC Casing Elev. = 11.36'
0
10
20
30
40
50
60
10/28/85
10-12-21-28 24/18
19-17-21-18 24/14
19-17-16-14 24/18
3-4-6-6 24/16
2-2-4-4 24/10
3-6-12-11 24/20
4-8-8-13 24/20
9-7-4-7 24/0
9-8-9-8 24/18
6-12-9-10 24/10
2-3-4-5 24/10
3-2-3-4 24/18
Grayish-brown fine sandy silt
ML Grayish-brown silt
Gray clayey silt, some brown silt
SM Gray silty fine sand
Gray coarse sand
Gray coarse sand, trace wood
Gray coarse sand, some gravel
SP
Gray coarse sand, trace wood
Gray silty fine sand
SM
SP Gray coarse sand
Gray clay
CL
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On November 22, 1985
Note: Classification by visual inspection
Boring completed to a depth of 57 feet on October 28, 1985
DAMES AND MOORE
SUPERVISOR:
T HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-11B
GROUND SURFACE ELEVATION = 9.5'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev = 11.44'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
11/6/85
0-12-9-9 24/20
6-8-8-8 24/18
6-7-4-7 24/20
7-9-10-9 24/20
5-7-6-6 24/12
6-3-4-5 24/10
8-8-11-12 24/10
10-12-18-21 24/8
15-10-18-17 24/6
12-14-16-20 24/18
23-29-27-23 24/0
20-34-28-21 24/12
CONTINUED
ML
Dark brown fine sandy silt, trace roots
Brown silty fine sand, trace clay
Gray silty fine sand
SM
Gray silty fine sand, trace gravel
Gray fine to coarse sand, trace silt, trace wood
Gray coarse sand, some gravel
SP
Gray coarse sand
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Note: Classification by visual inspection
DAMES & MOORE SUPERVISOR: T. HELGASON
STERLING DRUG, INC. E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS
PAGE 1 OF 2

DEPTH (FT)	Depth to Water	Blows/ 6 Inches	Inches Penetrated/ Inches Recovered	Classification Symbols	MONITORING WELL MW-11B (CON'T)	WELL CONSTRUCTION DETAILS
					GROUND SURFACE ELEVATION = 9.5	Top of PVC Casing Elev. = 11.44
					DESCRIPTION OF SUBSURFACE MATERIALS	
		CONTINUED				
60		18-12-14-18	24/8		Gray coarse sand	
		21-10-10-12	24/12	SP		
70		20-18-22-6	24/18		Gray Clay	
		6-5-4-5	24/24	CL		
80		3-6-6-6	24/24			



For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart

Monitoring Well Installed on December 3, 1985

Note: Classification by visual inspection

Boring completed to a depth of 82 feet on November 6, 1985

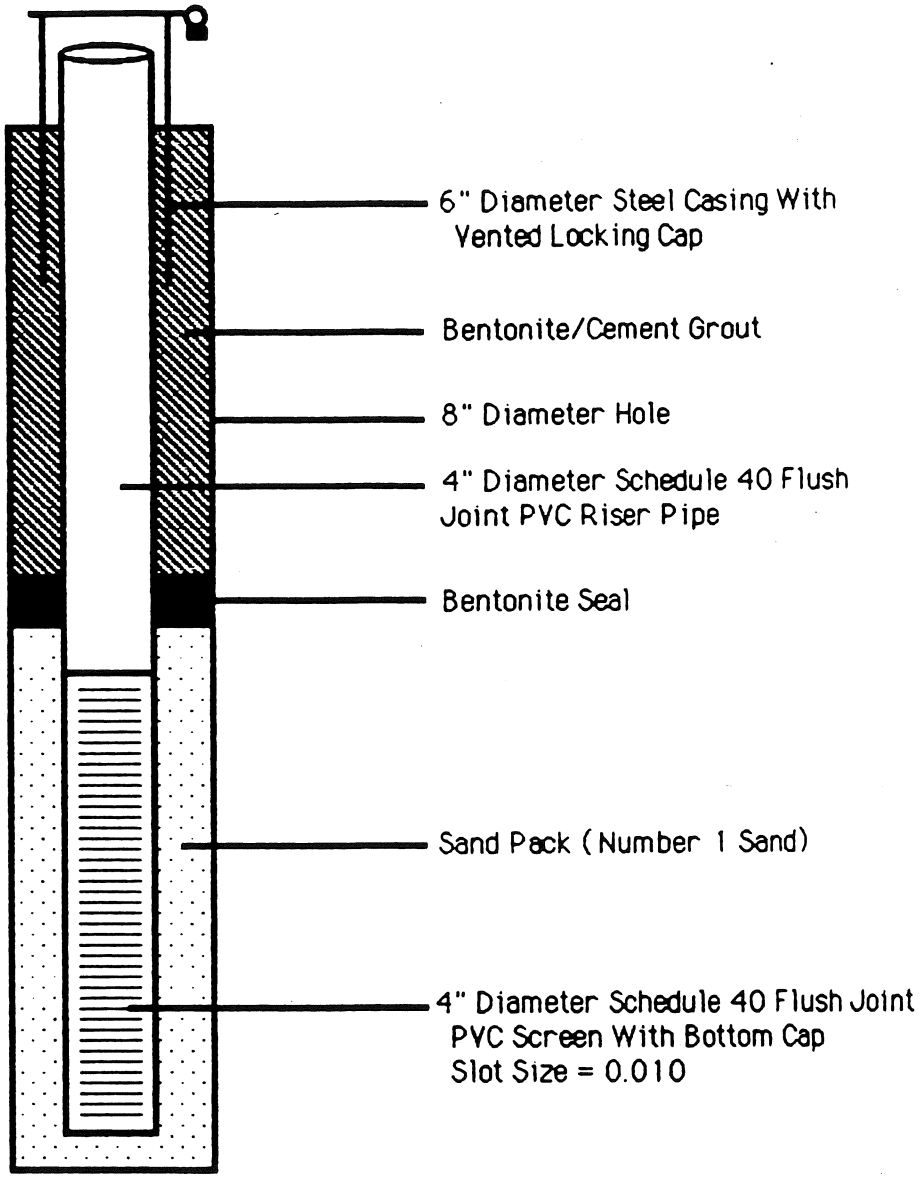
DAMES & MOORE SUPERVISOR: T. HELGASON

STERLING DRUG, INC. E. GREENBUSH, N.Y.

Dames & Moore Job No. 7425-025

BORING AND WELL CONSTRUCTION DETAILS PAGE 2 OF 2

TYPICAL MONITORING WELL CONSTRUCTION DETAILS
STERLING ORGANICS -- SITE 3
EAST GREENBUSH, NEW YORK



NOTE: At each well cluster location, one boring was drilled to evaluate the overburden srtatigraphy at that location. All monitoring wells at a well cluster location were installed, at a later date, within 6 feet of the boring location. At well cluster locations 5, 8, 10 and 13 (locations with bedrock monitoring wells) an additional boring was drilled for the purpose of installing the bedrock well.

As-Built construction details for each monitoring well are provided adjacent to each boring log. All elevations refer to National Geodetic Vertical Datum, 1929.

Dames & Moore

Unified Soil Classification System

Major Divisions			Graph Symbol	Letter Symbol	Typical Descriptions
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravels (Little or no fines)		GW	Well graded gravels, gravel - sand mixtures, little or no fines
	More than 50% of coarse fraction RETAINED on No.4 sieve			GP	Poorly graded gravels, gravel - sand mixtures, little or no fines
		Gravels with Fines (Appreciable amount of fines)		GM	Silty gravels, gravel - sand - silt mixtures
				GC	Clayey gravels, gravel - sand - clay mixtures
More than 50% of material is LARGER than No.200 sieve size	Sand and Sandy Soils	Clean Sand (Little or no fines)		SW	Well - graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
	More than 50% of coarse fraction PASSING No.4 sieve	Sands with Fines (Appreciable amount of fines)		SM	Silty sands, sand - silt mixtures
				SC	Clayey sands, sand - clay mixtures
Fine Grained Soils	Silts and Clays	Liquid limit LESS than 50		ML	Inorganic silts and very fine sands or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity
More than 50% of material is SMALLER than No.200 sieve size				OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays	Liquid limit GREATER than 50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
Highly Organic Soils				PT	Peat, humus, swamp soils with high organic contents

Notes:

1. Dual symbols are used to indicate borderline classifications.
2. When shown on the boring logs, the following terms are used to describe the consistancy of cohesive soils and the relative compactness of cohesionless soils.

Cohesive Soils

	(approximate shearing strength in KSF)
very soft	less than 0.25
soft	0.25 to 0.5
medium stiff	0.5 to 1.0
stiff	1.0 to 2.0
very stiff	2.0 to 4.0
hard	greater than 4.0

Cohesionless Soils

very loose loose medium dense dense very dense	These are usually based on an examination of soil samples, penetration resistance, and soil density data.

Dames & Moore Figure X

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: STERLING SITE 3
PROJECT NUMBER: 007830
CLIENT: NPEC INC.
LOCATION: EAST GREENBUSH, NY

HOLE DESIGNATION: MW-22B
DATE COMPLETED: September 7, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: B. PICKERT

NORTHING: 1373027
EASTING: 692207.26

TOP OF CASING 10.21
TOP OF RISER 10.20
GROUND SURFACE 7.62

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft
0	ML-SILT, little clay, trace organics, trace sand, brown, moist	
4.52	ML/CL-SILT AND CLAY, trace fine sand, brown, moist - fine sand increasing with depth at 4.0ft BGS - becoming very moist at 6.0ft BGS	
0.42	SP-SAND, fine grained, gray, wet	
-1.78	GP-GRAVEL, little to trace fine sand, gray, wet	
-3.68	SP-SAND, trace gravel, fine to medium grained, gray, wet	
-8.38	SP/GP-SAND AND GRAVEL, trace silt, gray, wet	
-12.58	SW-SAND, little gravel, trace silt, medium to coarse grained, dark brown gray, wet	
-17.58	SW-SAND, fine to medium grained, trace silt, gray, wet	
-24.88	ML-SILT, some fine sand, trace gravel, gray, wet	
-25.38	SP-SAND, trace silt, fine grained, gray, wet	

MONITORING WELL: CEMENT/BENTONITE GROUT; 2" PVC WELL CASING; 6" BOREHOLE; BENTONITE CHIPS; CHOKER SAND; 2" PVC WELL SCREEN; SAND PACK

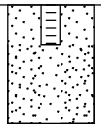
SAMPLE NUMBER	INTERVAL	REC (ft)	'N' VALUE	PID (ppm)
1SS		1.8	3	0.0
2SS		1.4	7	0.0
3SS		1.9	1	0.0
4SS		1.8	5	0.0
5SS		1.8	5	0.0
6SS		1.2	7	0.0
7SS		0.8	7	0.0
8SS		1.5	4	0.0
9SS		1.0	5	0.0
10SS		0.8	5	0.0
11SS		1.9	6	0.0
12SS		1.0	5	0.0
13SS		1.0	5	0.1
14SS		1.1	4	0.0
15SS		0.8	8	0.0
16SS		1.1	5	0.2
17SS		1.3	5	0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: STERLING SITE 3
PROJECT NUMBER: 007830
CLIENT: NPEC INC.
LOCATION: EAST GREENBUSH, NY

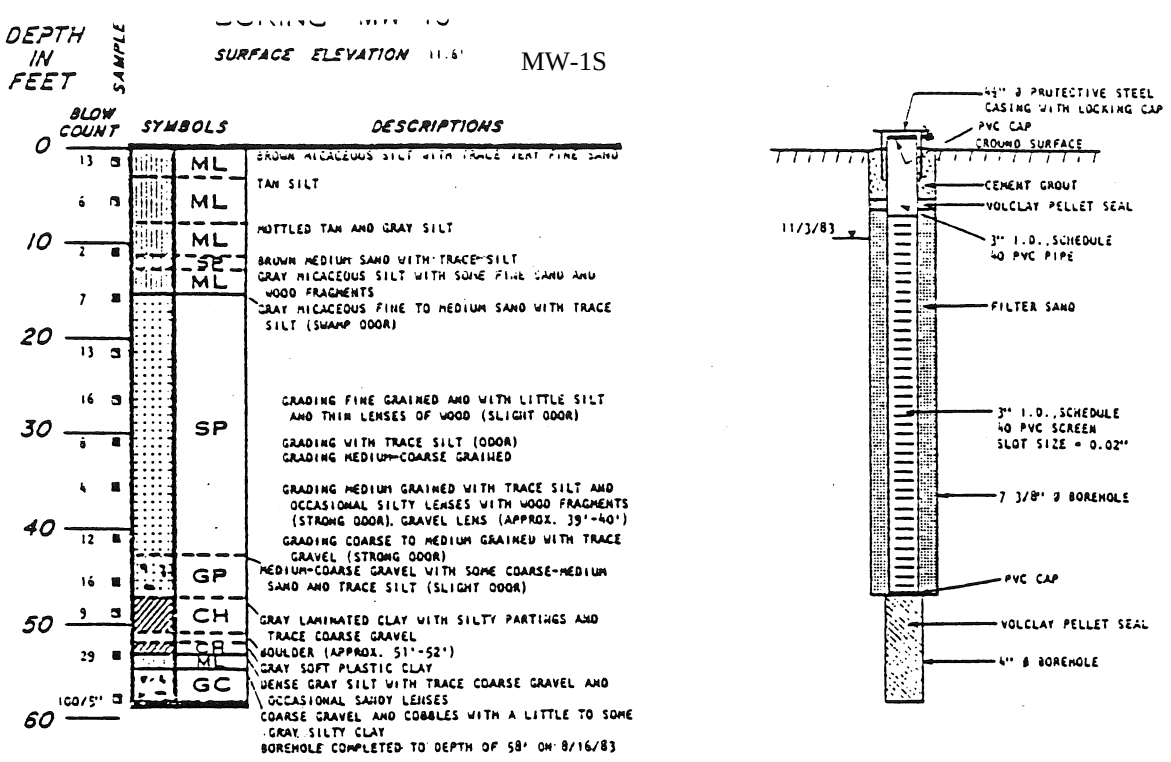
HOLE DESIGNATION: MW-22B
DATE COMPLETED: September 7, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: B. PICKERT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
36	SP-SAND, trace silt, fine to medium grained, gray, wet	-27.68		18SS		1.2	9	0.0
	CH-CLAY, trace silt, fat, gray	-28.78		19SS		1.9	5	0.0
38	END OF BOREHOLE @ 38.0ft BGS	-30.38						
40								
42								
44								
46								
48								
50								
52								
54								
56								
58								
60								
62								
64								
66								
68								

WELL DETAILS
Screened interval:
-8.38 to -28.38ft
16.00 to 36.00ft BGS
Length: 20ft
Diameter: 2in
Slot Size: 0.010
Material: PVC
Seal:
-3.38 to -5.78ft
11.00 to 13.40ft BGS
Material: BENTONITE CHIPS
Sand Pack:
-6.38 to -30.38ft
14.00 to 38.00ft BGS
Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

Attachment B
Well Construction Details for Monitoring Wells to be Decommissioned
MW-1S, MW-5B, MW-6A, MW-6B, MW-9A MW-9B, MW-13A, MW-13B, MW-15B, MW-18B



LOG OF BORINGS AND MONITORING WELL SCHEMATICS

NOTES: 1. REFER TO TEXT FOR DISCUSSION AND INTERPRETATION OF THE STRATIGRAPHY, AND FIGURE 2 FOR LOCATIONS.

2. THE FIGURES IN THE COLUMN LABELED "BLOW COUNT" REFER TO THE NUMBER OF BLOWS REQUIRED TO DRIVE THE DAMES & MOORE SOIL SAMPLER (2½" I.D.) OR A SPLIT-SPOON SAMPLER (2" I.D.) A DISTANCE OF ONE FOOT USING A 300 POUND DRIVE WEIGHT FALLING APPROXIMATELY 30 INCHES.

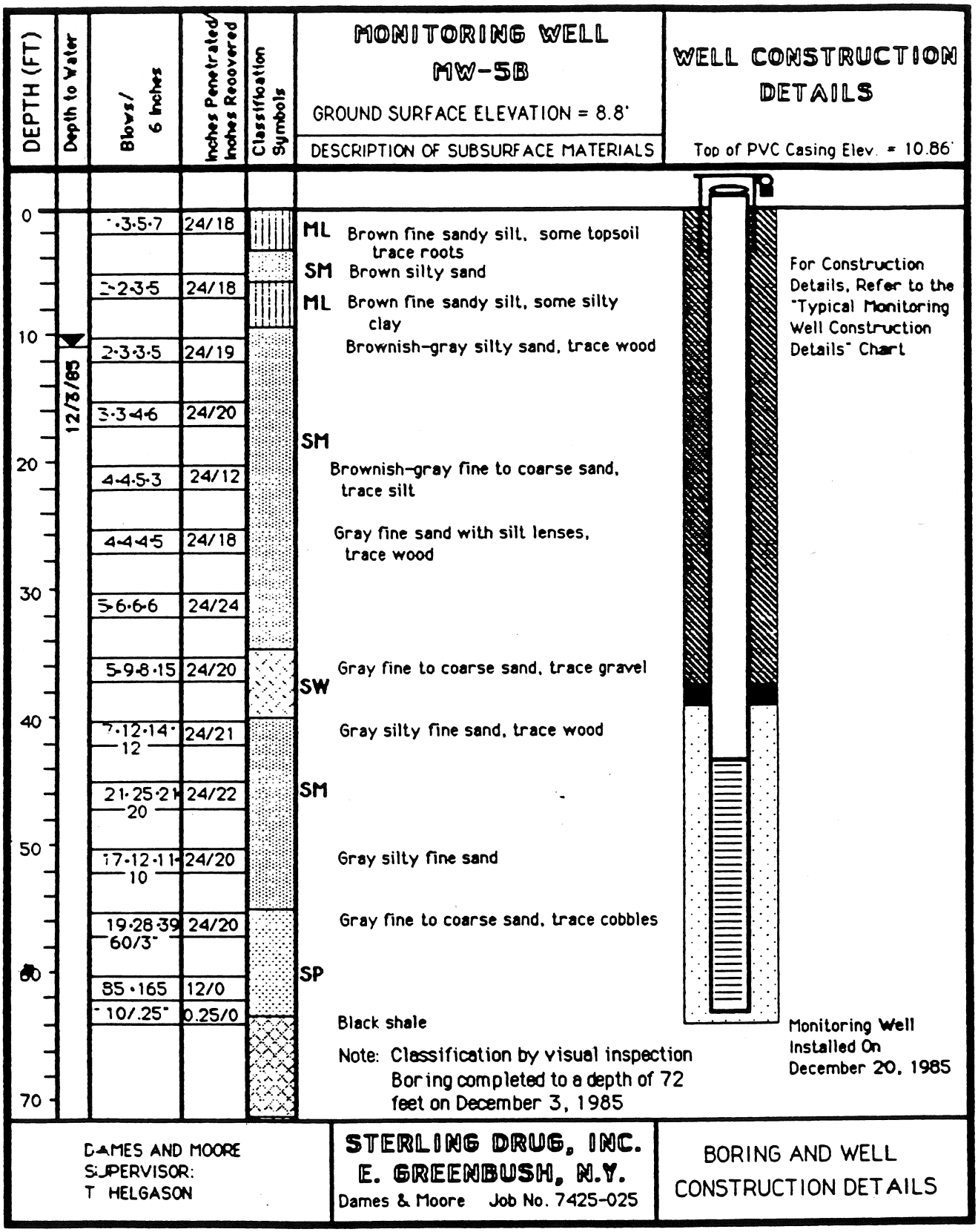
3. SAMPLE SYMBOLS: ▭ SPLIT-SPOON SAMPLE
■ DCM SAMPLE
▨ NO SAMPLE RECOVERED

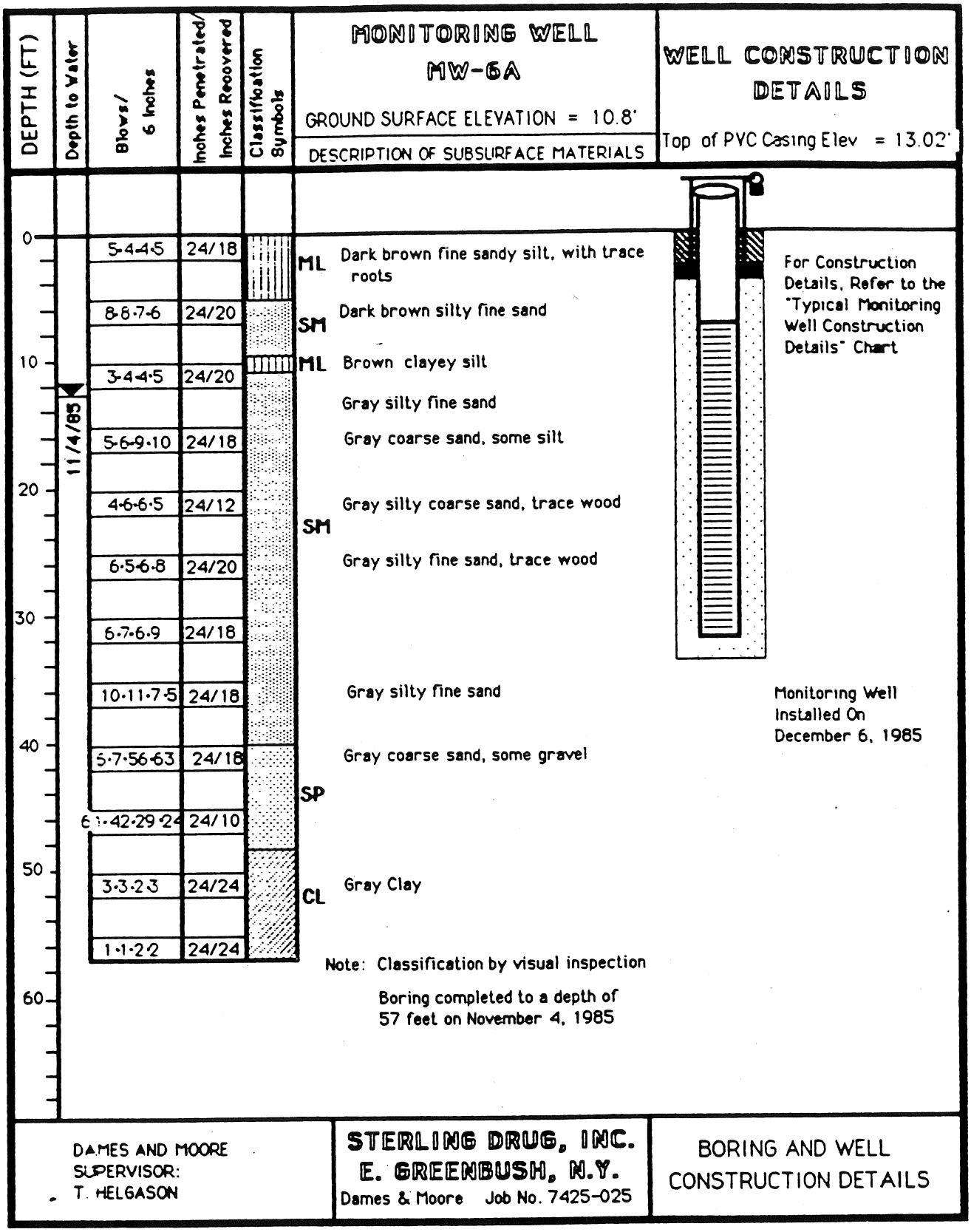
4. PERCENT FIGURES IN THE "PERCENT RECOVERY" COLUMN INDICATE THE PERCENT OF THE ROCK CORE RECOVERED USING AN NX-CORE BARREL FOR A CORE RUN LENGTH AS SHOWN. PERCENT FIGURES IN "RQD" COLUMN INDICATE THE PERCENT OF A CORE RUN FOR WHICH THE RECIEVED PIECES OF ROCK CORE ARE EACH 4" OR MORE IN LENGTH.

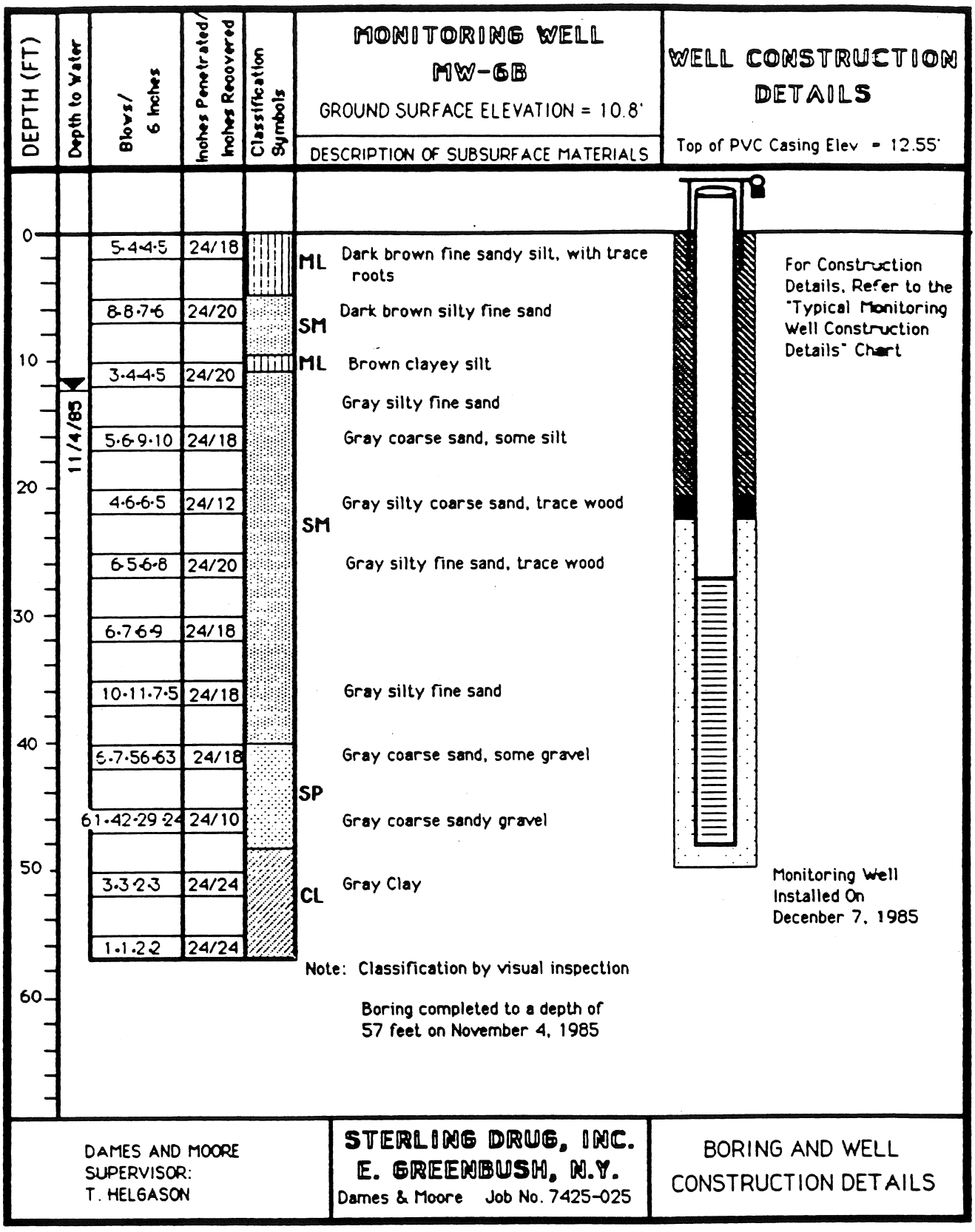
5. ELEVATIONS REFER TO FEET ABOVE MEAN SEA LEVEL.

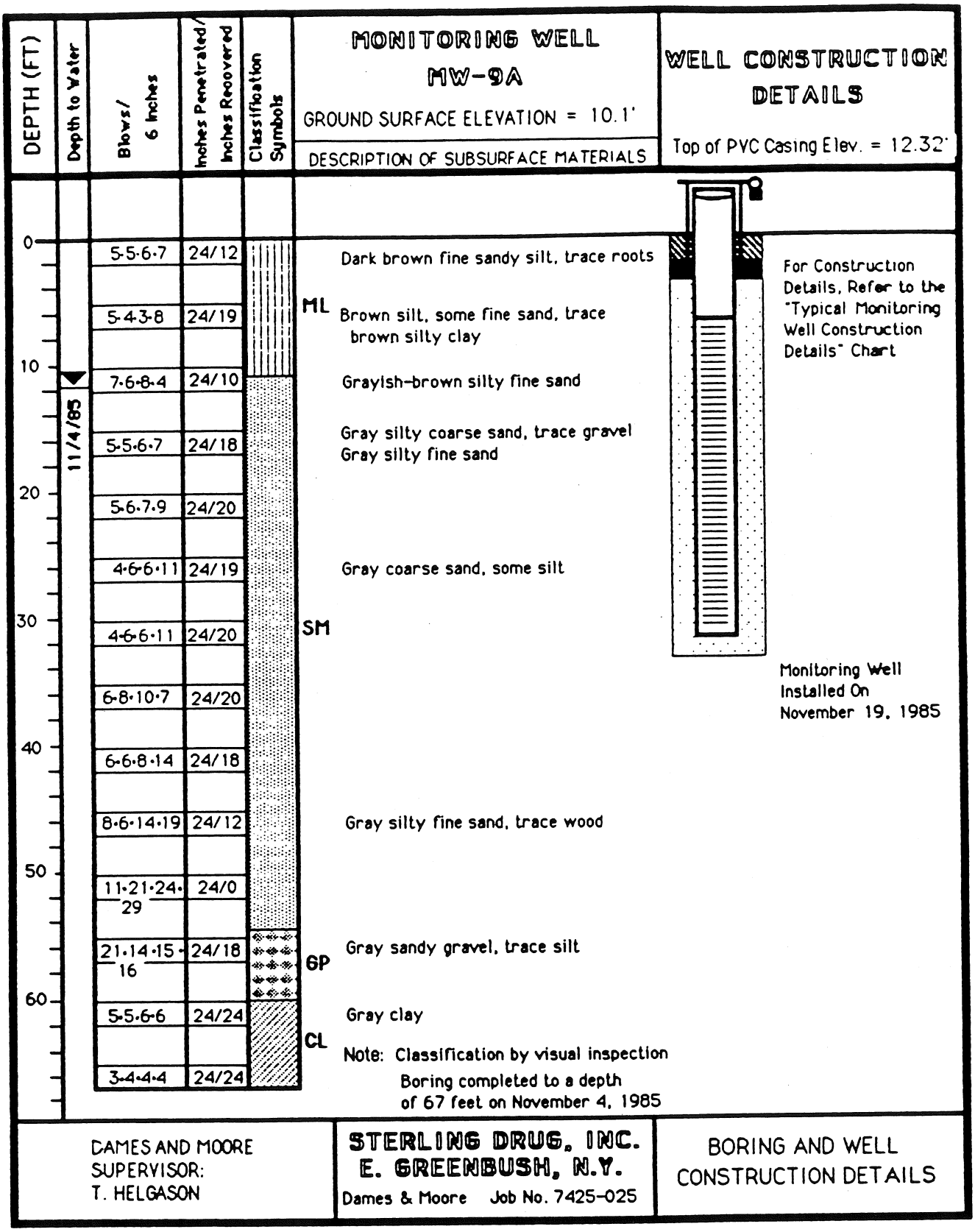
Dames & Moore

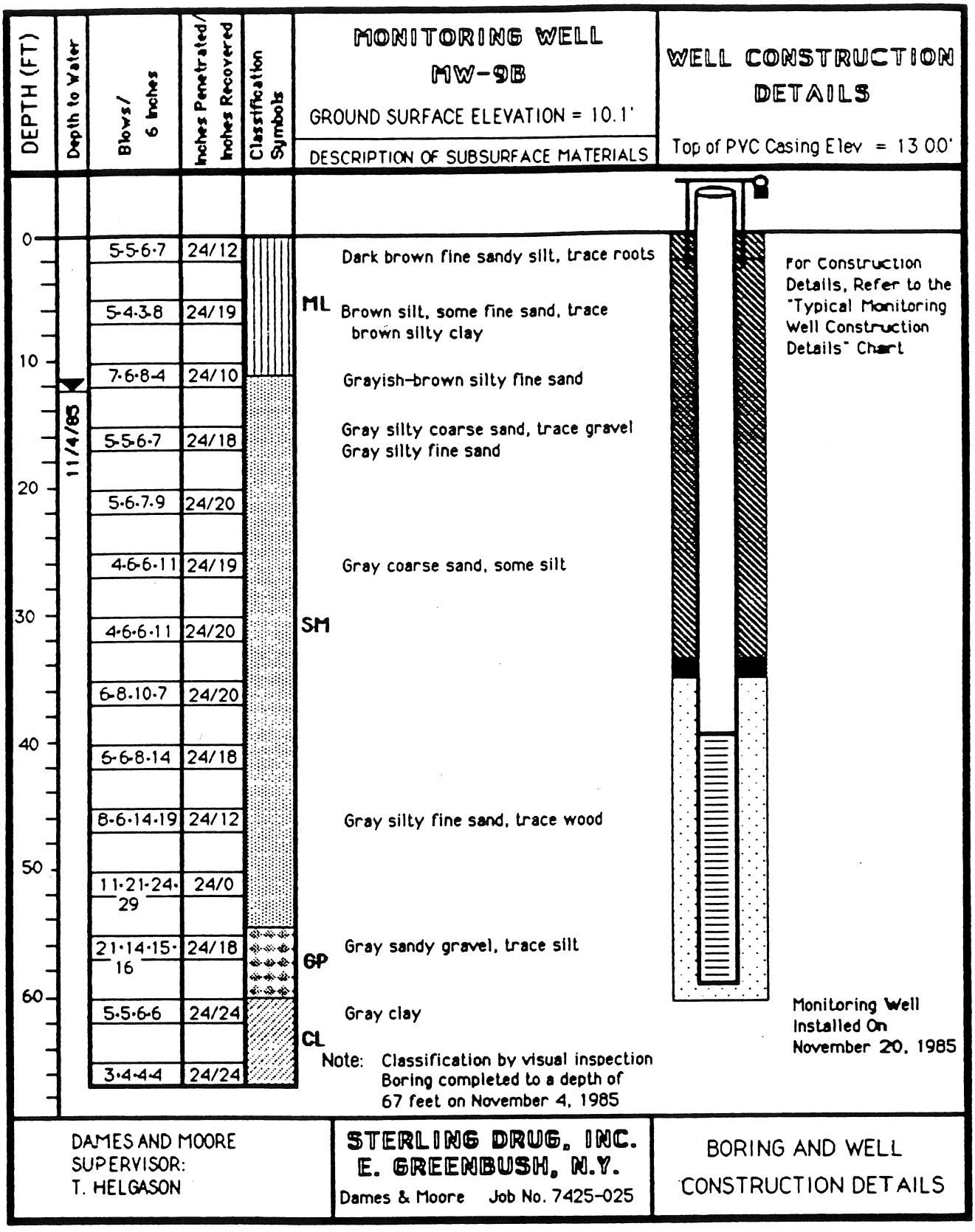
FIGURE 3


DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
MONITORING WELL MW-5B
GROUND SURFACE ELEVATION = 8.8'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev. = 10.86'
0
10
20
30
40
50
60
70
12/3/85
3-5-7 24/18
2-3-5 24/18
2-3-3-5 24/19
3-3-4-6 24/20
4-4-5-3 24/12
4-4-4-5 24/18
5-6-6-6 24/24
5-9-8-15 24/20
7-12-14 12 24/21
21-25-21 20 24/22
17-12-11 10 24/20
19-28-39 60/3" 24/20
85-165 12/0
10/.25" 0.25/0
ML Brown fine sandy silt, some topsoil trace roots
SM Brown silty sand
ML Brown fine sandy silt, some silty clay
Brownish-gray silty sand, trace wood
SM
Brownish-gray fine to coarse sand, trace silt
Gray fine sand with silt lenses, trace wood
Gray fine to coarse sand, trace gravel
SW
Gray silty fine sand, trace wood
SM
Gray silty fine sand
Gray fine to coarse sand, trace cobbles
SP
Black shale
Note: Classification by visual inspection
Boring completed to a depth of 72 feet on December 3, 1985
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On December 20, 1985
DAMES AND MOORE
SUPERVISOR:
T HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-6A
GROUND SURFACE ELEVATION = 10.8'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev = 13.02'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
11/4/85
5-4-4-5 24/18
8-8-7-6 24/20
3-4-4-5 24/20
5-6-9-10 24/18
4-6-6-5 24/12
6-5-6-8 24/20
6-7-6-9 24/18
10-11-7-5 24/18
5-7-56-63 24/18
61-42-29-24 24/10
3-3-2-3 24/24
1-1-2-2 24/24
ML Dark brown fine sandy silt, with trace roots
SM Dark brown silty fine sand
ML Brown clayey silt
Gray silty fine sand
Gray coarse sand, some silt
SM Gray silty coarse sand, trace wood
Gray silty fine sand, trace wood
Gray silty fine sand
SP Gray coarse sand, some gravel
CL Gray Clay
Note: Classification by visual inspection
Boring completed to a depth of 57 feet on November 4, 1985
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On December 6, 1985
DAMES AND MOORE SUPERVISOR: T. HELGASON
STERLING DRUG, INC. E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-6B
GROUND SURFACE ELEVATION = 10.8'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev = 12.55'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
11/4/85
5-4-4-5 24/18
8-8-7-6 24/20
3-4-4-5 24/20
5-6-9-10 24/18
4-6-6-5 24/12
6-5-6-8 24/20
6-7-6-9 24/18
10-11-7-5 24/18
6-7-56-63 24/18
61-42-29-24 24/10
3-3-2-3 24/24
1-1-2-2 24/24
ML Dark brown fine sandy silt, with trace roots
SM Dark brown silty fine sand
ML Brown clayey silt
Gray silty fine sand
Gray coarse sand, some silt
SM Gray silty coarse sand, trace wood
Gray silty fine sand, trace wood
Gray silty fine sand
SP Gray coarse sand, some gravel
Gray coarse sandy gravel
CL Gray Clay
Note: Classification by visual inspection
Boring completed to a depth of 57 feet on November 4, 1985
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On Decenber 7, 1985
DAMES AND MOORE
SUPERVISOR:
T. HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-9A
GROUND SURFACE ELEVATION = 10.1'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev. = 12.32'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
11/4/85
5-5-6-7 24/12
5-4-3-8 24/19
7-6-8-4 24/10
5-5-6-7 24/18
5-6-7-9 24/20
4-6-6-11 24/19
4-6-6-11 24/20
6-8-10-7 24/20
6-6-8-14 24/18
8-6-14-19 24/12
11-21-24-29 24/0
21-14-15-16 24/18
5-5-6-6 24/24
3-4-4-4 24/24
Dark brown fine sandy silt, trace roots
ML
Brown silt, some fine sand, trace brown silty clay
Grayish-brown silty fine sand
Gray silty coarse sand, trace gravel
Gray silty fine sand
Gray coarse sand, some silt
SM
Gray silty fine sand, trace wood
Gray sandy gravel, trace silt
GP
Gray clay
CL
Note: Classification by visual inspection
Boring completed to a depth of 67 feet on November 4, 1985
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On November 19, 1985
DAMES AND MOORE
SUPERVISOR:
T. HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-9B
GROUND SURFACE ELEVATION = 10.1'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev = 13.00'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
11/4/85
5-5-6-7 24/12
5-4-3-8 24/19
7-6-8-4 24/10
5-5-6-7 24/18
5-6-7-9 24/20
4-6-6-11 24/19
4-6-6-11 24/20
6-8-10-7 24/20
6-6-8-14 24/18
8-6-14-19 24/12
11-21-24-29 24/0
21-14-15-16 24/18
5-5-6-6 24/24
3-4-4-4 24/24
Dark brown fine sandy silt, trace roots
ML
Brown silt, some fine sand, trace brown silty clay
Grayish-brown silty fine sand
Gray silty coarse sand, trace gravel
Gray silty fine sand
Gray coarse sand, some silt
SM
Gray silty fine sand, trace wood
Gray sandy gravel, trace silt
GP
Gray clay
CL
Note: Classification by visual inspection
Boring completed to a depth of 67 feet on November 4, 1985
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On November 20, 1985
DAMES AND MOORE
SUPERVISOR:
T. HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS

MONITORING WELL MW-13A

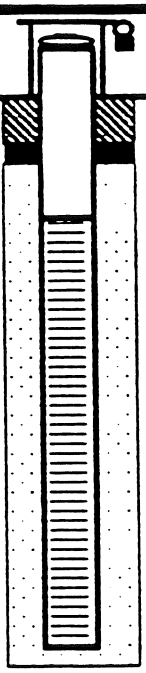
GROUND SURFACE ELEVATION = 10.5'

DESCRIPTION OF SUBSURFACE MATERIALS

WELL CONSTRUCTION DETAILS

Top of PVC Casing Elev. = 12.52'

DEPTH (FT)	Depth to Water	Blows/ 6 Inches	Inches Penetrated/ Inches Recovered	Classification Symbols	DESCRIPTION OF SUBSURFACE MATERIALS
0		7-8-10-15	24/18		Blackish-brown silty gravel, with some clayey silt
				GM	
		11-11-12	24/24		Brownish-gray clayey silt, trace fine sand
		16		ML	
10	10/31/85	4-3-4-5	24/22		Brownish-gray silty sand
					Gray clayey silt
		6-5-5-8	24/20		Gray silty fine sand
20		4-5-5-5	24/22		
		7-5-8-9	24/12		
30		7-8-8-11	24/14		
				SM	
		6-8-10-10	24/20		
40		9-11-10-1	24/20		Gray fine to coarse sand; some silt, trace gravel
		7-10-11-9	24/20		
50		9-10-11-1	24/18		
		10-8-9-11	24/24		
60		CONTINUED			



For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart

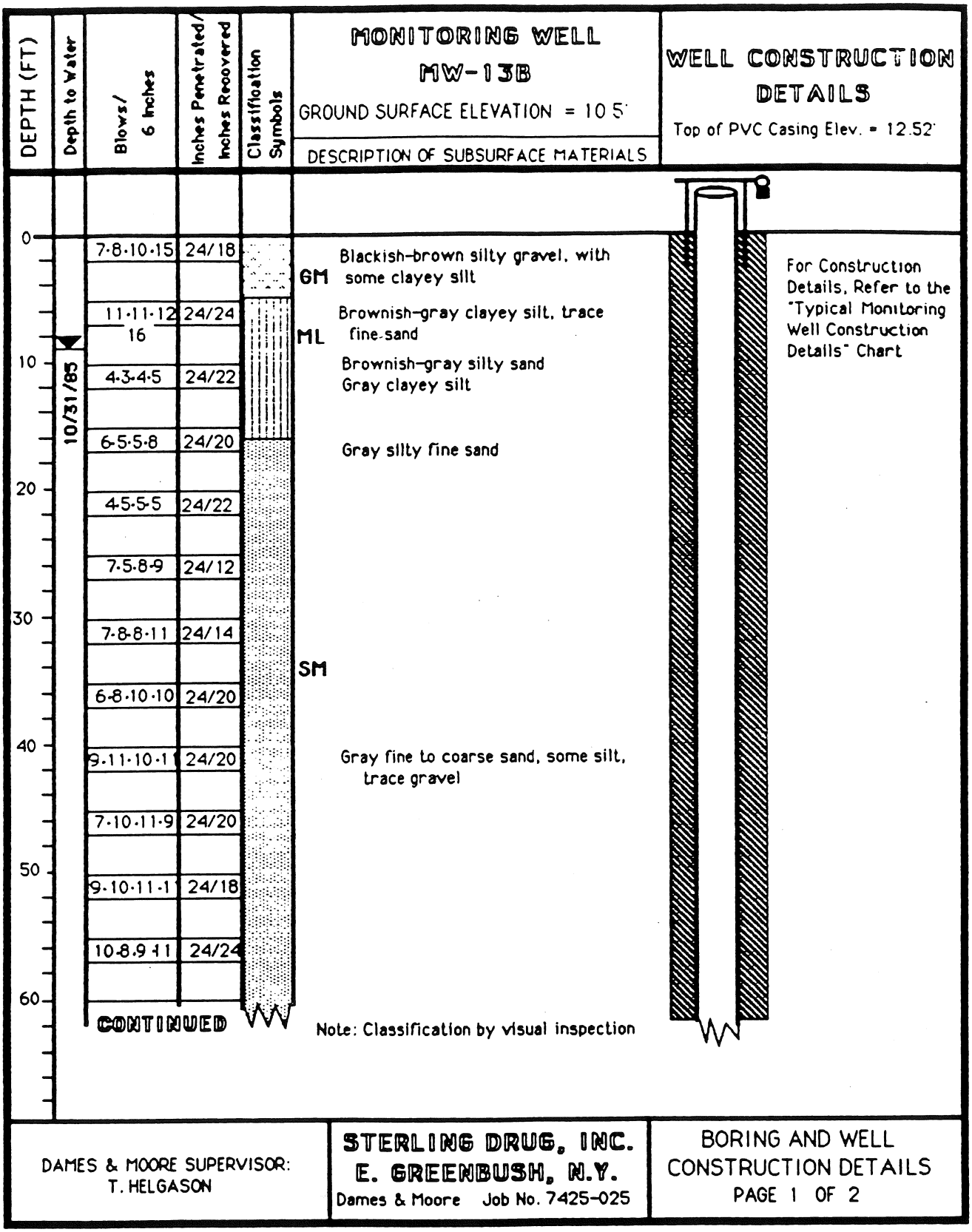
Monitoring Well Installed On December 14, 1985

Note: Classification by visual inspection

DAMES & MOORE SUPERVISOR: T. HELGASON

STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025

BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-13B
GROUND SURFACE ELEVATION = 10 5'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev. = 12.52'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
10/31/85
7-8-10-15
24/18
11-11-12
16
24/24
4-3-4-5
24/22
6-5-5-8
24/20
4-5-5-5
24/22
7-5-8-9
24/12
7-8-8-11
24/14
6-8-10-10
24/20
9-11-10-11
24/20
7-10-11-9
24/20
9-10-11-11
24/18
10-8-9-11
24/24
CONTINUED
GM
Blackish-brown silty gravel, with some clayey silt
ML
Brownish-gray clayey silt, trace fine sand
Brownish-gray silty sand
Gray clayey silt
Gray silty fine sand
SM
Gray fine to coarse sand, some silt, trace gravel
Note: Classification by visual inspection
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
DAMES & MOORE SUPERVISOR:
T. HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS
PAGE 1 OF 2

MONITORING WELL MW-13B (CON'T)

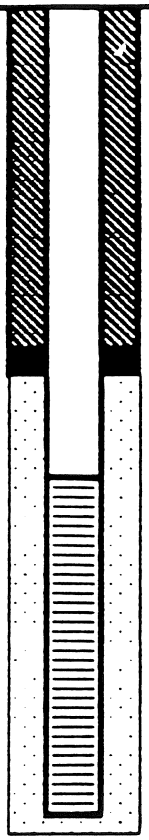
GROUND SURFACE ELEVATION = 10.5'

DESCRIPTION OF SUBSURFACE MATERIALS

WELL CONSTRUCTION DETAILS

Top of PVC Casing Elev. = 12.52'

DEPTH (FT)	Depth to Water	Blows/ 6 Inches	Inches Penetrated/ Inches Recovered	Classification Symbols	
		CONTINUED			
60		7-11-14-19	24/10		Gray silty fine sand
		11-7-8-12	24/0		
70		9-8-11-24	24/20		Gray silty fine sand, trace wood
		18-20-21-16	24/10		
80		14-15-13-13	24/20	SM	Gray coarse sand, some silt
		10-12-15-13	24/16		
90		20-18-21-23	24/18		
		38-28-30-36	24/12	SP	Gray coarse sand, some cobbles, trace silt
100		85-125	12/1	GP	Gray coarse sandy gravel, some cobbles, trace fine sand
		70-45-55-78	24/18	SP	Gray coarse sand, some gravel
110		3-4-5-5	24/24	CL	Gray Clay
		3-2-2-2	24/24		
120					



For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart

Monitoring Well Installed On January 10, 1986

Note: Classification by visual inspection

Boring completed to a depth of 117 feet on October 31, 1985

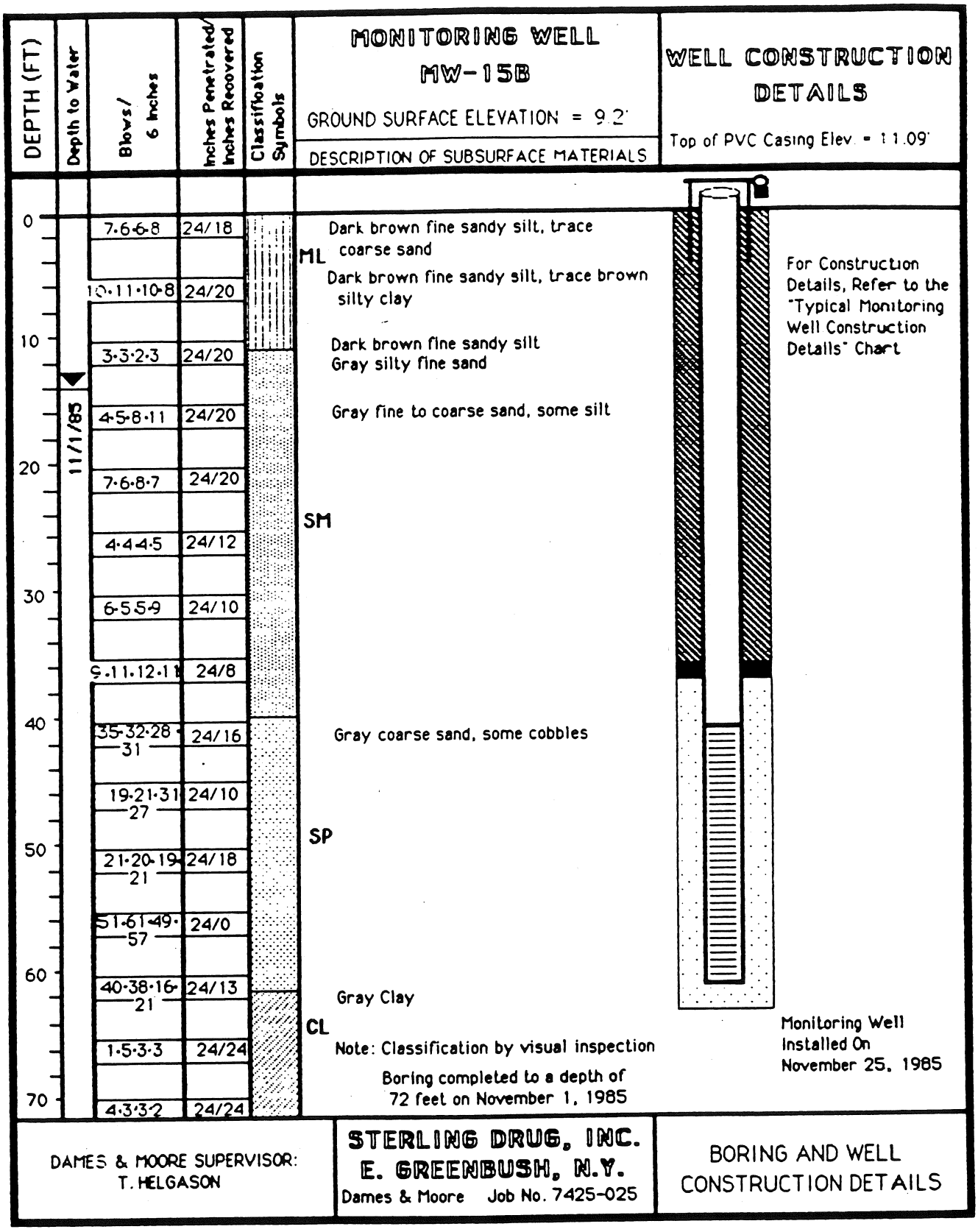
DAMES & MOORE SUPERVISOR: T. HELGASON

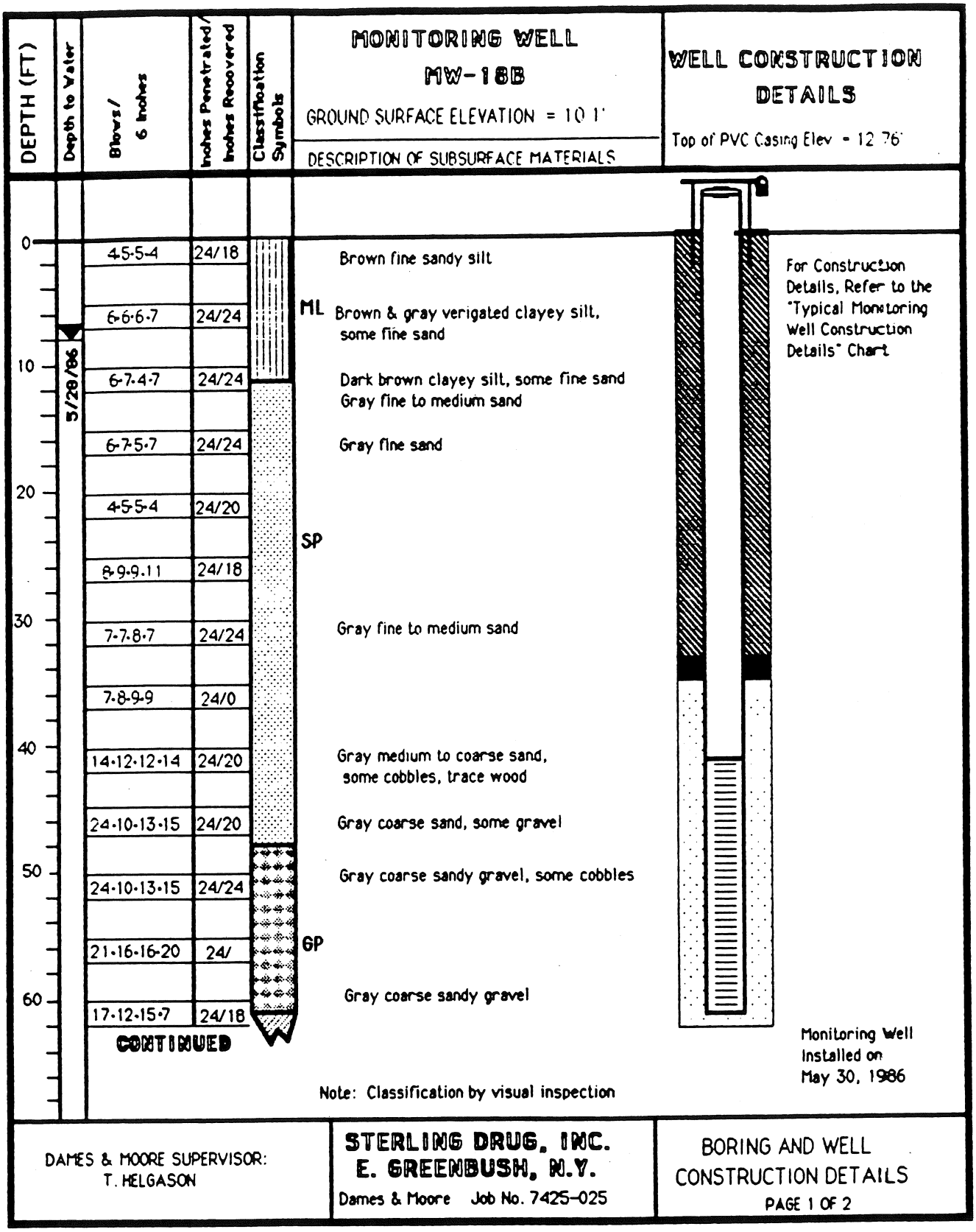
STERLING DRUG, INC. E. GREENBUSH, N.Y.

Dames & Moore Job No. 7425-025

BORING AND WELL CONSTRUCTION DETAILS

PAGE 2 OF 2


MONITORING WELL
MW-15B
GROUND SURFACE ELEVATION = 9.2'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev. = 11.09'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
11/1/85
7-6-6-8 24/18
10-11-10-8 24/20
3-3-2-3 24/20
4-5-8-11 24/20
7-6-8-7 24/20
4-4-4-5 24/12
6-5-5-9 24/10
9-11-12-11 24/8
35-32-28-31 24/16
19-21-31-27 24/10
21-20-19-21 24/18
51-61-49-57 24/0
40-38-16-21 24/13
1-5-3-3 24/24
4-3-3-2 24/24
0
10
20
30
40
50
60
70
ML
SM
SP
CL
Dark brown fine sandy silt, trace coarse sand
Dark brown fine sandy silt, trace brown silty clay
Dark brown fine sandy silt
Gray silty fine sand
Gray fine to coarse sand, some silt
Gray coarse sand, some cobbles
Gray Clay
Note: Classification by visual inspection
Boring completed to a depth of 72 feet on November 1, 1985
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed On November 25, 1985
DAMES & MOORE SUPERVISOR:
T. HELGASON
STERLING DRUG, INC.
E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS


MONITORING WELL
MW-16B
GROUND SURFACE ELEVATION = 10 1'
DESCRIPTION OF SUBSURFACE MATERIALS
WELL CONSTRUCTION DETAILS
Top of PVC Casing Elev = 12 76'
DEPTH (FT)
Depth to Water
Blows/ 6 Inches
Inches Penetrated/ Inches Recovered
Classification Symbols
5/28/86
4-5-5-4 24/18
6-6-6-7 24/24
6-7-4-7 24/24
6-7-5-7 24/24
4-5-5-4 24/20
8-9-9-11 24/18
7-7-8-7 24/24
7-8-9-9 24/0
14-12-12-14 24/20
24-10-13-15 24/20
24-10-13-15 24/24
21-16-16-20 24/
17-12-15-7 24/18
CONTINUED
ML
SP
GP
Brown fine sandy silt
Brown & gray verigated clayey silt, some fine sand
Dark brown clayey silt, some fine sand
Gray fine to medium sand
Gray fine sand
Gray fine to medium sand
Gray medium to coarse sand, some cobbles, trace wood
Gray coarse sand, some gravel
Gray coarse sandy gravel, some cobbles
Gray coarse sandy gravel
For Construction Details, Refer to the "Typical Monitoring Well Construction Details" Chart
Monitoring Well Installed on May 30, 1986
Note: Classification by visual inspection
DAMES & MOORE SUPERVISOR: T. HELGASON
STERLING DRUG, INC. E. GREENBUSH, N.Y.
Dames & Moore Job No. 7425-025
BORING AND WELL CONSTRUCTION DETAILS
PAGE 1 OF 2

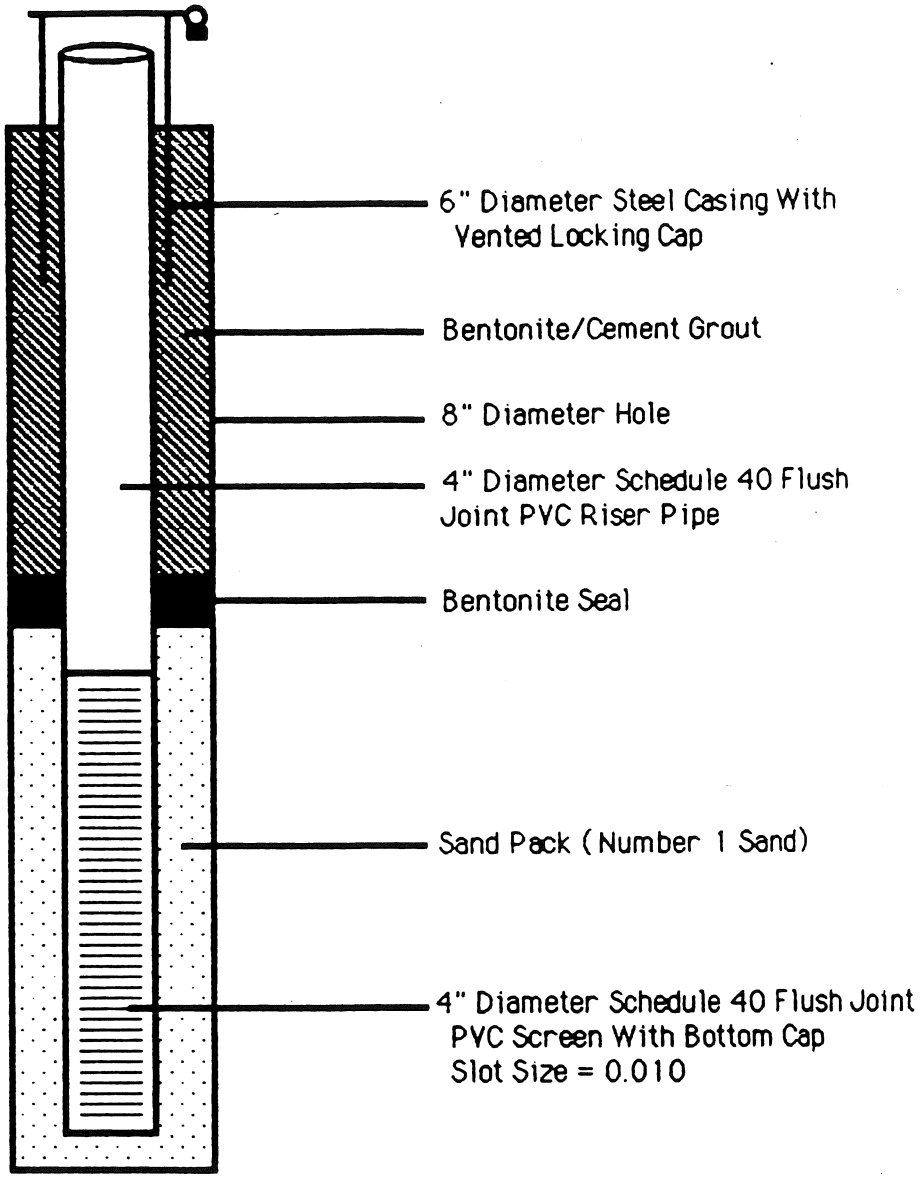
DEPTH (FT)	Depth to Water	Blows/ 6 inches	Inches Penetrated/ Inches Recovered	Classification Symbols	MONITORING WELL MW-18B (CON'T)	WELL CONSTRUCTION DETAILS
					GROUND SURFACE ELEVATION = 10.1'	Top of PVC Casing Elev. = 12.76'
					DESCRIPTION OF SUBSURFACE MATERIALS	
		CONTINUED				
60						
		7-3-4-4	24/18	CL	Gray silty clay	
70						
80						
90					Black shale	
100						
110						
120						

Note: Classification by visual inspection

Boring completed to a depth of 104 feet on May 28, 1986

DAMES & MOORE SUPERVISOR: T. HELGASON	STERLING DRUG, INC. E. GREENBUSH, N.Y. Dames & Moore Job No. 7425-025	BORING AND WELL CONSTRUCTION DETAILS PAGE 2 OF 2

TYPICAL MONITORING WELL CONSTRUCTION DETAILS
STERLING ORGANICS -- SITE 3
EAST GREENBUSH, NEW YORK



NOTE: At each well cluster location, one boring was drilled to evaluate the overburden srtatigraphy at that location. All monitoring wells at a well cluster location were installed, at a later date, within 6 feet of the boring location. At well cluster locations 5, 8, 10 and 13 (locations with bedrock monitoring wells) an additional boring was drilled for the purpose of installing the bedrock well.

As-Built construction details for each monitoring well are provided adjacent to each boring log. All elevations refer to National Geodetic Vertical Datum, 1929.

Dames & Moore

Unified Soil Classification System

Major Divisions			Graph Symbol	Letter Symbol	Typical Descriptions
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravels (Little or no fines)		GW	Well graded gravels, gravel - sand mixtures, little or no fines
	More than 50% of coarse fraction RETAINED on No.4 sieve			GP	Poorly graded gravels, gravel - sand mixtures, little or no fines
		Gravels with Fines (Appreciable amount of fines)		GM	Silty gravels, gravel - sand - silt mixtures
				GC	Clayey gravels, gravel - sand - clay mixtures
More than 50% of material is LARGER than No.200 sieve size	Sand and Sandy Soils	Clean Sand (Little or no fines)		SW	Well - graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
	More than 50% of coarse fraction PASSING No.4 sieve	Sands with Fines (Appreciable amount of fines)		SM	Silty sands, sand - silt mixtures
				SC	Clayey sands, sand - clay mixtures
Fine Grained Soils	Silts and Clays	Liquid limit LESS than 50		ML	Inorganic silts and very fine sands or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity
More than 50% of material is SMALLER than No.200 sieve size				OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays	Liquid limit GREATER than 50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
Highly Organic Soils				PT	Peat, humus, swamp soils with high organic contents

Notes:

1. Dual symbols are used to indicate borderline classifications.
2. When shown on the boring logs, the following terms are used to describe the consistancy of cohesive soils and the relative compactness of cohesionless soils.

Cohesive Soils

	(approximate shearing strength in KSF)
very soft	less than 0.25
soft	0.25 to 0.5
medium stiff	0.5 to 1.0
stiff	1.0 to 2.0
very stiff	2.0 to 4.0
hard	greater than 4.0

Cohesionless Soils

very loose loose medium dense dense very dense	These are usually based on an examination of soil samples, penetration resistance, and soil density data.

Dames & Moore Figure X