VOLUME V OF VIII
MOTTOLO SITE
REMEDIAL INVESTIGATION REPORT
APPENDICES B-3 THROUGH B-7

Submitted to:

United States Environmental Protection Agency
Region I
John F. Kennedy Federal Building
Boston, Massachusetts 02203

Prepared on behalf of:

K. J. Quinn & Company, Inc.
195 Canal Street
Malden, Massachusetts 02148

Prepared by:

BALSAM ENVIRONMENTAL CONSULTANTS, INC.
5 Industrial Way
Salem, New Hampshire 03079

September 28, 1990
Balsam Project 6185/818

(S4324COV)

APPENDIX B-3

SOIL BORING LOGS, WELL COMPLETION LOGS, ROCK DRILLING LOGS, AND ROCK CORING LOGS

BORING LOG LEGEND

The items shown on the Boring Logs refer to the following:

1. **Depth** - Depth below the reference elevation or ground surface

2. **Sample** - Designation and pertinent sampling information

   S1 - Sample number 1 obtained by driving a 2-inch diameter split-spoon sampler

   UT2 - Undisturbed tube sample number 2 obtained by pushing a 2.8-inch I.D. thin-wall tube

   A3 - Sample number 3 obtained from auger cuttings or wash water for classification purposes only

   Pen - The length of sampler penetration in inches

   Rec - The length of recovered soil in the sampler

   Blows - Indicates the number of blows per 6 inches of sample penetration when driven by a 140 pound hammer falling freely a distance of 30 inches. WOR indicates sample penetration under weight of drill rods. WOH indcates sampler penetration under weight of drill rods and 140-lb. hammer without blows.

3. **Sample Description** - Soil samples retrieved from the soil borings have been described using the Burmister Classification system. The description sequence for this system is as follows: 1. Density or consistency, 2. color, 3. major soil component, 4. minor soil components, 5. soil modifiers, 6. moisture indication, and geologic formation.

4. **Stratum Description** - Stratum descriptions are determined based on similar soil classifications for a given depth interval. A solid line indicates strata breaks which were visually confirmed in the soil sampler. Dashed lines indicate approximate strata breaks between dissimilar soil samples.

5. **Field screening** - Indicates results of field screening of soil samples using a HNu model PI-101 photoionization detector.

6. **Remarks** - Pertinent observations made by inspector during drilling operations including but not limited to type of boring, drilling effort, refusal depth, etc.

(7/90:301)

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-1

Sheet: 1 of: 1

Date: 6/20/85

Boring Company: Soils Engineering, Inc. Boring Location: NW Corner of Piggery Bldg.

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 6/20/85 Ending Date: 6/26/85

SAMPLER

Type NX Core Barrel

Hammer Wt. NA

Fall NA

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
6/26	9.5'	gr sfc	7:10
6/28	9'1 1/2"	TOC	14:45

SAMPLE

Depth	Casing Bl/ft.	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
							dry brown medium sand and gravel, some cobbles, little silt (fill)	3" steel protective casing; 1 1/2" PVC
		S-1	0-5'6"					
5								
		RUN 1	5'6"- 8'7"	37/34			bedrock	
			8'7"-	16/20				
10		RUN 2	9'11"				biotite schist, quartz and granite	
		RUN 3	9'11"- 12'4"	29/26				
		RUN 4	12'4"- 14'7"	27/25				
15		RUN 5	14'7"- 18'8"	49/47				
							bottom of hole	
20								
25								
30								

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. S-1 obtained from auger cuttings.
2. 4'11" of machine slotted well screen, 010 slot size sch 40, 14'9" of 1 1/2" sch 40 pvc solid pipe.
3. Silica sand pack from 8'2" to 18'8".
4. Bentonite pellets from 8'2" to 6'10", cement surfac seal.

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-2S

Sheet: 1 of: 1

Date: 6/28/85

Boring Company: Soils Engineering, Inc Boring Location: Leachate Seep Area - North limit

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 6/28/85 Ending Date: 6/28/85

SAMPLER

Type See MO-2D

Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
6/28	2'6"	TOC	15:03
7/1	2'9½"	TOC	15:03

SAMPLE

Depth	Casing Bl/ft.	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
							organic topsoil	3" steel protective casing; 1½" PVC
							moist dark grey fine to medium sand, trace silt	
5							wet tan medium to coarse sand	
							wet tan very fine sand	
10							bottom of hole	
15								
20								
25								
30								

KEY:

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. 5' of 1½" PVC sch 40 screen, 010 machine slots, 6' 1½" PVC solid sch 40.
2. 10 lbs of Bentonite pellets, cement sfc. seal.
3. Silica sand pack from 3'6" to 9'0".

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-2D

Sheet: 1 of: 1

Date: 6/26/85

Boring Company: Soils Engineering, Inc. Boring Location: Leachate Seep Area

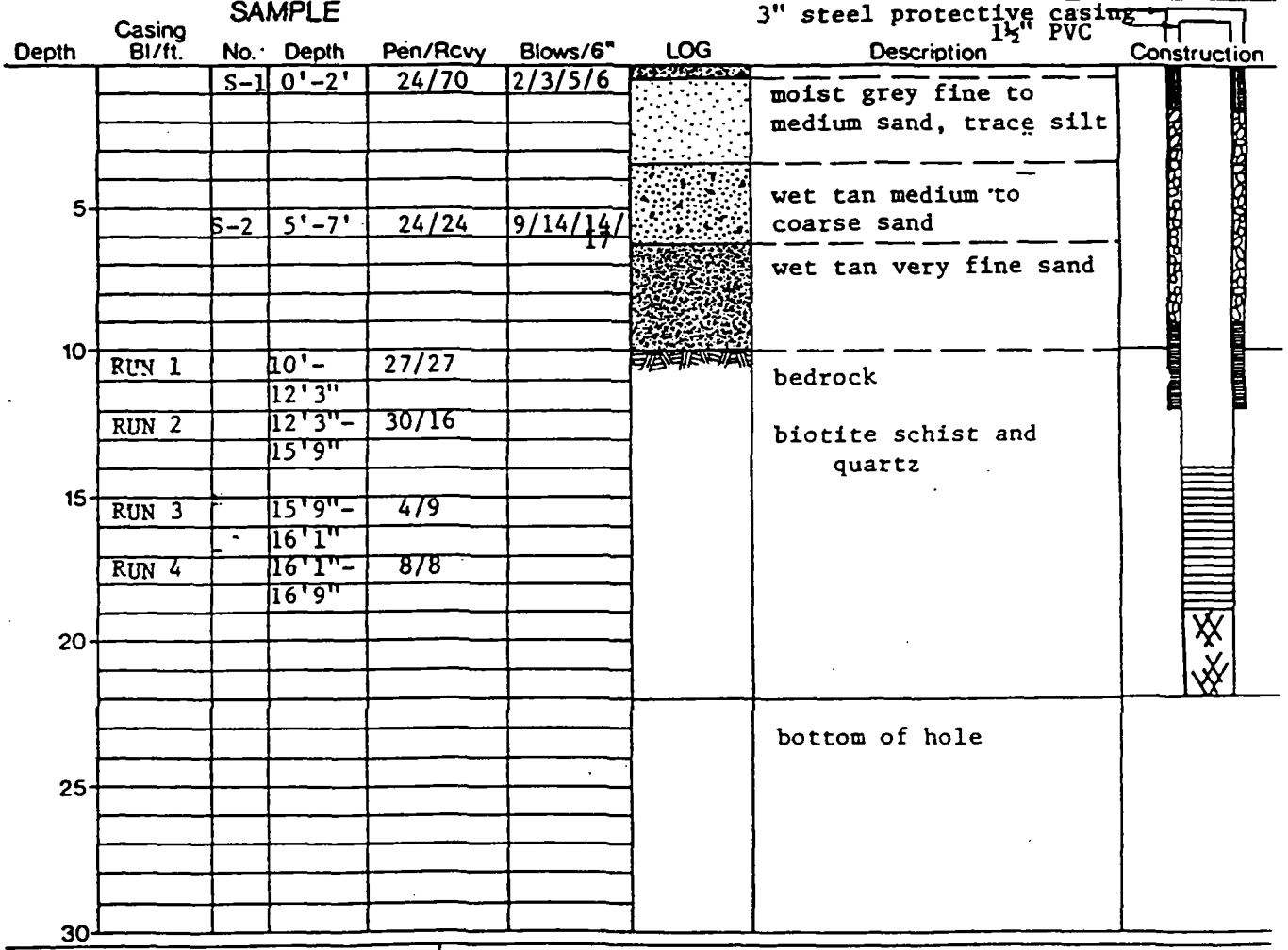
Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 6/26/85 Ending Date: 6/26/85

SAMPLER
Type 1 3/8" Split Spoon
Hammer Wt. 140 lbs.
Fall 30 inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
6/28	2'4"	TOC	14:55
7/1	2'6"	TOC	15:06



KEY:

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:
1. NX corebarrel used to 16'9", 3" tricone rollo-bit used from 16'9" to 22'0".
2. 5' of 1½" machine slotted, 010 slots, sch 40 PVC well screen, 16' of 1½" sch 40 solid pipe.
3. Bentonite grout from 9' to 12', cement surface seal.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MO-2DR
SHEET 1 OF 2
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G. Garfield/ S. Sokol

BORING LOCATION 50' north of swale at Brook A
GROUND SURFACE ELEVATION 188.4 DATUM MSL
DATE START 12/16/88 DATE END 12/27/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
2/28	1.7	GS	63 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	Rt MARKS
	S-1	24/8	0-2	1	Very loose, brown, fine SAND, trace Silt. Moist.				1.
				2					
				2					
				2		FINE TO MEDIUM SAND			
	S-2	24/20	2-4	8	Medium dense, brown, fine to medium SAND, trace Silt, with occasional iron staining. Wet.				
				14					
				14					
				43		4		SEE WELL COMPLETION LOG	
	S-3	24/20	4-6	15	Dense, gray, fine SAND and SILT. Wet.				
5				21					
				27					
				16		SILTY SAND			
	S-4	24/22	6-8	8	Dense, gray, fine SAND, some Silt. Wet.				
				8					
				38					
				26					
						8			
						BOULDER			2.
	S-5	24/24	8.5-9	16	S-5: Very dense, tan, fine to medium SAND, trace Silt. Wet.	F/M SAND			
	S-5a		9-10.5	65	S-5a: Olive green, fine to coarse SAND some Gravel, little Silt. Wet.	SAND AND GRAVEL			
				48					
10				61					
	S-6	17/17	10.5-11	44	S-6: Olive green, fine to medium SAND, trace Silt. Wet.	F/M SAND			
	S-6a		11-11.9	36	S-6a: Olive green, fine to coarse SAND and GRAVEL, trace Silt. Wet.	SAND & GRAVEL			
				100/5"					
					(For bedrock description see the Rock Coring Log for boring MO-2DR.)	11.9			
						BEDROCK			
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.

2. Drilled through boulder from 8.0 to 8.5 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MO-2DR
SHEET 2 OF 2
FILE NO. 6185/813
CHKD. BY

DEPTH (ft.)	SAMPLE NO.	SAMPLE PEN. (in)/REC	SAMPLE DEPTH (ft.)	SAMPLE BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REM.
					(For bedrock description see the Rock Coring Log for boring MO-2DR.)				
20						BEDROCK			
25									
						26.9			4.
					Bottom of boring at 26.9'.				
30									

REMARKS:
4. Boring terminated at 26.9 feet, approximately 15 feet into bedrock.

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-3S

Sheet: 1 of: 1

Date: 6/28/85

Boring Company: Soils Engineering, Inc. Boring Location: Leachate Seep Area

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 6/28/85 Ending Date: 6/28/85

SAMPLER

Type 1 3/8" Split Spoon

Hammer Wt. 140 lbs.

Fall 30 inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
6/28	3'3"	TOC	15:10
7/1	3'3"	TOC	15:30

3" steel protective casing

1½" PVC

Depth	Casing Bl/ft.	SAMPLE No.	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
		S-2	0'-2'	24/18	2/3/8/8		organic layer wet grey medium to coarse sand, trace silt	
5		S-1	5'-7'	24/24	27/90/35/26			
10							Bottom of hole	
15								
20								
25								
30								

KEY:

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Some stones and cobbles from 0'-4'.
2. 5' of 1½" machine slotted, 010 slots, sch 40 PVC well screen, 6' of 1½" sch 40 PVC risor pipe.
3. Bentonite pellets from 2' to 3', surface cement seal.
4. Silica sandpack 3' to 10'.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MO-3SR
SHEET 1 OF 2
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M. Jacobs

BORING LOCATION 30' south of swale at Brook A
GROUND SURFACE ELEVATION 187.5 DATUM MSL
DATE START 12/22/88 DATE END 12/22/88

SAMPLER
TYPE: -
HAMMER: - lb.
FALL: - in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/22	GS	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
					(Soil boring MO-3SR was drilled without sampling to approximately 10.3' below ground surface. For strata description see the log of soil boring MO-3DR.)	TOPSOIL			1.
						FINE TO MEDIUM SAND		SEE WELL COMPLETION LOG	
5									
10					(For bedrock description see the Rock Coring Log for boring MO-3SR.)	10.3 BEDROCK			2.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Augered 6" into bedrock and began NX coring at 10.9 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MO-3SR
SHEET 2 OF 2
FILE NO. 6185/813
CHKD. BY

DEPTH (ft.)	SAMPLE NO.	SAMPLE PEN. (in)/REC	SAMPLE DEPTH (ft.)	SAMPLE BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REM.
					(For bedrock description see the Rock Coring Log for boring MO-3SR.)	BEDROCK			
20									
						22.0	<1		3.
					Bottom of boring at 22 feet.				4. 5.
25									
30									

REMARKS:

3. Boring MO-3SR terminated at 22 feet, approximately 11.7 feet into bedrock.
4. Upon completion of rock coring and prior to well completion the corehole was sealed with 3/8" bentonite pellets to 10 feet below ground surface.
5. Auger cuttings screened for VOC's in the field with a HNu PI-101 photoionization detector upon completion of monitoring well.

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-3D

Sheet: 1 of: 1

Date: 7/1/85

Boring Company: Soils Engineering, Inc. Boring Location: Leachate Seep Area

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 7/1/85 Ending Date: 7/2/85

SAMPLER

Type NX Core Barrel

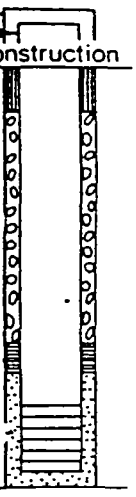
Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Depth	Casing Bl/ft.	SAMPLE No.	SAMPLE Depth	SAMPLE Pen/Rcvy	SAMPLE Blows/6"	LOG	Description	Construction
							organic layer	3" steel protective casing; 1½" PVC
5							wet grey medium to coarse sand, trace silt	
10			9'-11'9"	33/33			bedrock	
			11'9"-13'	15/9			basalt	
			13'-13'2½"	2½/1				
15			13'2½"- 13'11"	8½/10			bottom of hole	
20								
25								
30								



KEY:

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. NX core barrel used, soil samples collected for MO-3 S
2. 2' of 1½" machine slotted, 010 slots, sch 40 PVC well screen and 14' of 1½" sch 40 PVC solid pipe.
3. Bentonite pellets from 9' to 10', surface cement seal, silica sandpack 10' to 13'.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MO-3DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER S.Sokol/G.Garfield

BORING LOCATION 20' south of swale at Brook A
GROUND SURFACE ELEVATION 188.1 DATUM MSL
DATE START 12/20/88 DATE END 12/23/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/23	0.0	GS	EOB

DEPTH (ft)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/18	0-2	2		TOPSOIL	<1		2.
				1	Very loose, gray, fine to medium SAND, little Silt. Moist.	0.5			
				1					
				6					
	S-2	24/18	2-4	8	Very dense, gray, fine to medium SAND, little Silt. Cobble in bottom 3 inches of samples. Moist.			SEE WELL COMPLETION LOG	
				15					
				41					
				22					
						FINE TO MEDIUM SAND			3.
5									
	S-3	24/3	5.5-7.5	24	Dense, gray fine to medium SAND, little Silt. Wet.				
				24					
				24					
				24					
	S-4	24/12	7.5-9.5	17	Dense, olive brown, fine to medium SAND, little Silt, little Gravel. Wet.				
				20					
				17					
				16					
10						10.4			
					(For bedrock description see the Rock Coring Log for boring MO-3SR.)				
						BEDROCK			
15									
		NOTE SCALE CHANGE							
25					Bottom of boring at 24.7 feet	24.7			4.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Soil sample was screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 4 feet. Relocated soil boring and continued sampling approx. 2 feet east of original location.
4. Boring MO-3DR terminated at 24.7 feet, approximately 14 feet into bedrock.

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-4S

Sheet: 1 of: 1

Date: 7/3/85

Boring Company: Soils Engineering, Inc. Boring Location: Between JB-7 and JB-8

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 7/3/85 Ending Date: 7/3/85

SAMPLER

Type 1 3/8" Split Spoon

Hammer Wt. 140 lbs.

Fall 30 inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

SAMPLE

Depth	Casing Bl/ft.	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
		S-1	0'-2'	24/11	1/1/3/7		wet grey medium to coarse sand	3" steel protective casing; 1½" PVC
5		S-2a	5'-6'	24/24	11/15/31		wet grey medium sand	
		S-2	6'-7'		39		wet grey and tan fine sand	
10		S-3	9'-11'	24/16	31/45/33		wet grey glacial till	
					35			
							bottom of hole	
15								
20								
25								
30								

KEY:

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. 5' of 1½" machine slotted, 010 slots, sch 40 PVC well screen, and 6½" of 1½" sch 40 solid PVC pipe.
2. Bentonite pellet seal 2' to 3'. cement surface seal.
3. Silica sand pack from 3' to 10'.

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-4D

Sheet: 1 of: 1

Date: 7/2/85

Boring Company: Soils Engineering, Inc. Boring Location: Between JB-7 and JB-8

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 7/2/85 Ending Date: 7/3/85

SAMPLER

Type NX Core Barrel

Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Depth	Casing Bl/ft.	SAMPLE No.	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
							wet grey medium to coarse sand	3" steel protective casing; 1½" PVC
5							wet grey medium sand	
							wet grey and tan fine sand	
10	RUN 1		9'6"-12'8"	38/15			wet grey fine to coarse sand, some gravel and silt (glacial till)	
							bedrock	
15	RUN 2		14'6"-15'6"	12/10			quartz and biotite schist	
20							bottom of hole	
25								
30								

KEY:

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Soil samples collected for MO-4S.
2. Run 1 cored boulders, used auger to ground bedrock from 13' to 14'6", roller bit from 15'6" to 19'6".
3. 2' of 1½" machine slotted, 010 slots, sch 40 PVC well screen, 19' of sch 40 PVC solid pipe.
4. Bentonite pellet seal from 13' to 14'5" surface cement seal.
5. Silica sand pack from 14'5" to 18'10".

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-5S

Sheet: 1 of: 1

Date: 7/8/85

Boring Company: Soils Engineering, Inc. Boring Location: Downstream of seeps

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 7/8/85 Ending Date: 7/8/85

SAMPLER

Type 1 3/8" Split Spoon

Hammer Wt. 140 lbs.

Fall 30 inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

3" steel protective casing

1 1/2" PVC

Depth	Casing Bl/ft.	SAMPLE No.	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
		S-1	0-2	24/12	0/1/2/3		moist grey fine sand, some silt	
5		S-2	5-6'3"	24/24	8/10/10/		wet brown coarse sand	
		S-2a	6'3"-7'		13		wet tan fine and very fine sand	
10		S-3	9'-11'	24/24	13/32/48/ 42		wet grey silty sand little gravel (glacial till)	
15								
20								
25								
30								

KEY:

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. 4'9" of 1 1/2" machine slotted, 010 slots, sch 40 PVC well screen, 6'3" of sch 40 PVC solid pipes.
2. Bentonite pellet seal from 2'9" to 3'9", cement surface seal.
3. Silica sand pack from 3'9" to 9'.

NHWS&PCC BORING LOG

SITE

Mottolo Site

Raymond

Boring No: MO-5D

Sheet: 1 of: 1

Date: 7/4/85

Boring Company: Soils Engineering, Inc. Boring Location: Downstream of Seeps

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 7/4/85 Ending Date: 7/5/85

SAMPLER

Type NX Core Barrel

Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/8	33½"	TOC	12:23

SAMPLE

Depth	Casing Bl/ft.	No.	Depth	Pen/Rcvy	Blows/6"
5					
10					
	RUN 1		12'6" - 13'1"	7/5	
15					
20					
25					
30					

LOG

Description

3" steel protective casing

1½" PVC

Construction

moist grey fine sand, some silt

wet brown coarse sand

wet tan fine and very fine sand, some silt

wet grey silty sand little gravel (glacial till)

bedrock quartz

bottom of hole

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS: 1. Soil samples collected for MO-5S.
2. 2' of 1½" machine slotted, 010 slots, sch 40 PVC well screen; 17' of 1½" sch 40 PVC solid pipe.
3. NX core from 12'6" to 13'1", 3" tricone roller bit fr 13'1" to 13'6", 2" tricone roller bit from 13'6" to 17'6".
4. Bentonite pellet seal from 11'6" to 13'6" cement surface seal.
5. Silica sand pack from 13'6" to 17'3".

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MO-5DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

BORING LOCATION 210' north of MW-12D
GROUND SURFACE ELEVATION 181.9 DATUM MSL
DATE START 12/7/88 DATE END 12/20/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/7	1.0	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1a	24/13	0-1	1	S-1a: Very loose, light brown, fine SAND some Silt with Organics. Wet.	TOPSOIL	5		1. 2.
				1					
	S-1b		1-2	1	S-1b: Gray, fine SAND, some Silt. Wet.	1.0	5		
				5					
	S-2	24/14	2-4	5	Medium dense, light gray, fine SAND, little Silt. Wet.	FINE SAND	<1	SEE WELL COMPLETION LOG	
				7					
				9					
				9					
	S-3	24/14	4-6	5	Medium dense, light gray, fine SAND, little Silt. Wet.		3		
5				7					
				8					
				12					
	S-4a	24/19	6-8	8	S-4a: Dense, light brown, fine SAND, little Silt. Wet.		2		
				12					
	S-4b			25	S-4b: Brown, fine SAND and SILT, trace coarse Gravel. Wet.		1		
				40		8.1			3.
					(For bedrock description see the Rock Coring Log for boring MO-5DR.)				
10		NOTE SCALE CHANGE							
						BEDROCK			
15									
20									
						23.2			4.
25					Bottom of boring at 23.2 feet.				

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Core barrel advanced approx. 6" in 30 seconds from 8.5-9.0 feet.
4. Boring MO-5DR terminated at 23.2 feet, approximately 15 feet into bedrock.

NHWS&PCC BEDROCK WELL LOG

SITE
Mottolo Site
Raymond

Boring No: MO-6
Sheet: 1 of: 2
Date: 7/4/85

Drilling Company: Tasker Well Company
Foreman: Daniel Tasker
Geologist/Engineer: John Regan

Boring Location: Off of Randy Lane
Ground/Casing Elevation:
Starting Date: 7/4/85 Ending Date: 7/4/85

SAMPLER
Type Chips screened from drilling water

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

SAMPLE

Depth	Advancement Time	No.	Depth	Fracture/Water Bearing?	LOG	Description	Construction
		S-1	1'-3'			Fine sand and silt, some rocks (glacial till)	
						bedrock	
20		S-2	24'-27'			Biotite schist	
		S-3	33'-36'				
40							
		S-4	50'-56'				
60		S-5	64'-67'				
		S-6	70'-73'				
		S-7	75'-78'				
80		S-8	80'-82'				
		S-8a	87'-90'				
		S-8b	92'-95'				
		S-9	99'-102'				
100							
		S-10	104'-107'				
		S-11	107'-113'				
		S-11a	113'-119'				
120							

REMARKS:

1. Rock chips collected from drilling water using a screen.
2. 20'8" of six inch steel casing with drive shoe installed, 12" of stick-up.
3. Used bentonite slurry drilling through the overburden with tricone roller-bit.

NHWS&PCC BEDROCK WELL LOG

SITE

Mottolo Site

Raymond

Boring No: MO-6

Sheet: 2 of: 2

Date: 7/4/85

Drilling Company: Tasker Well Company

Boring Location: Off of Randy Lane

Foreman: Daniel Tasker

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/4/85 Ending Date: 7/4/85

SAMPLER

Type Chips screened from drilling water

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilizatic
7/4	Flowing	TOC	14:30

SAMPLE

Depth	Advancement Time	No.	Depth	Fracture/Water Bearing?	LOG	Description	Construct
		S-12	121'-124'	water zone			
		S-13	124'-127'				
		S-14	128'-130'				
120						bottom of hole	
140							
160							
180							
200							
220							

REMARKS:

1. Picked water at 124'
2. Blow test at 124' = 30 gpm
3. Blow test at 130' = 20 gpm

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-7S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/T.Stone/E.Wood

BORING LOCATION 90' west of concrete pad
GROUND SURFACE ELEVATION 228.6 DATUM MSL
DATE START 11/18/88 DATE END 11/21/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/21	1.8	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	24/15	0-0.6	5	S-1: Medium dense, dark brown, fine SAND, little Silt. Dry. TOPSOIL.	TOPSOIL			1.
	S-1a		0.6-2.0	5	S-1a: Light brown, fine to medium SAND, little Silt, trace coarse Gravel. Dry.	0.6 F/M SAND			2.
				6					
				15		2.0			
	S-2	6/4	2-2.5	22	Light brown, fine SAND, little Silt, trace Gravel, Dry.				3.
	S-3	6/5	4-4.5	100	Light brown, fine to medium SAND, little Silt, trace Gravel with iron staining. Dry.	FINE TO MEDIUM SAND		SEE WELL COMPLETION LOG	4.
5									5.
									6.
						7.5			
					(For bedrock description see the Rock Coring Log for boring MW-7S.)				
10		NOTE SCALE CHANGE							
						BEDROCK			
15									
						18.0			
					Bottom of boring at 18 feet.				
20									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Blow counts suspect due to limited freefall of hammer.
3. Obstruction encountered at 2.5 feet. Advanced augers to 4 feet.
4. Split spoon refusal encountered at 4.5 feet. Relocated boring 10 feet north of original boring and drilled without sampling to 7.5'.
5. Upon completion of rock coring, coring bit was lost in borehole. Relocated boring 10 feet east of second hole and drilled without sampling to 6.1 feet.
6. Open holes were backfilled to the ground surface with 3/8-inch Bentonite pellets.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-8S
SHEET 1 OF 2
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

BORING LOCATION 20' south of concrete pad
GROUND SURFACE ELEVATION 230.3 DATUM MSL
DATE START 11/22/88 DATE END 11/29/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/23	5.1	GS	During drilling
11/29	11.0	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/9	0-2	5	Medium dense, brown, fine SAND, trace Silt with organics. Dry.	TOPSOIL	<1		1.
				9		0.5			2.
				5					
				8					
	S-2	24/12	2-4	6	Loose, orangish brown, fine SAND, trace Silt. Dry.		<1		3.
				4					
				3		FINE TO MEDIUM SAND			
				4					
	S-3	24/15	4-6	4	Dense, brown, fine to coarse SAND, trace Silt with a 2-inch seam of fine to medium SAND grading to fine SAND, some Silt, trace Gravel in last 6 inches of sample. Moist.		<1		
5				14					
				20					
				40		6.0			
	S-4	24/18	6-8	44	Very dense, brown, fine SAND, some Silt, trace Gravel. Moist.		<1	SEE WELL COMPLETION LOG	4.
				50					
				67		SILTY SAND			
				65					
	S-5	9/9	8-8.6	28	Brown, fine SAND, some Silt, trace Gravel. Moist.	8.6	<1		5.
				50/3					
10									6.
	S-6	2/2	12-12.2	69/2	Brown, fine SAND, some Silt, trace Gravel. Moist.	SILTY SAND AND COBBLES AND BOULDERS	<1		
	S-7	18/11	14-15.5	20	Brown, fine SAND, some Silt, trace Gravel. Moist.		<1		
				27					
15				100/6					7.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Cobbles at 2 feet below ground surface.
4. Auger and split spoon refusal at 9.9 feet. Driller noted cobbles and boulders from 8.6 feet to 9.7 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-8S
SHEET 2 OF 2
FILE NO. 6185/813
CHKD. BY

DEPTH (ft.)	SAMPLE NO.	SAMPLE PEN. (in)/REC	SAMPLE DEPTH (ft.)	SAMPLE BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REM.
20						20.3			8.
					Bottom of boring at 20.3 feet.				9.
25									
30									

REMARKS:

5. Drilled through boulders and cobbles from 9.9 feet to 19.9 feet with core barrel.
6. Could not advance auger through boulders and cobbles. Relocated boring three times before being able to auger to 12.3 feet.
7. Roller bit advancement from 15.6 feet to 17.5 feet followed by NX coring from 17.5 feet to 19.5 feet.
8. Advanced auger to 20.3 feet prior to installation of overburden well.
9. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-9S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

BORING LOCATION 100' southeast of piggery
GROUND SURFACE ELEVATION 218.6 DATUM MSL
DATE START 11/9/88 DATE END 11/10/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/9	4.0	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/8	0-2	2	Dense, brown, fine to medium SAND, little Silt, trace Gravel with a broken gravel fragment in tip of sampler. Organic matter to 3 inches. Dry.	F/M SAND	<1		1. 2.
				2					
				40		1.0			
				48					
	S-2	24/16	2-4	20	Dense, gray, fine to coarse SAND and GRAVEL, little Silt. Dry.		<1		
				28		SAND AND GRAVEL			
				18					
				27					
	S-3	11/10	4-5	28	Brown GRAVEL and fine to coarse Sand, little Silt. Wet.		<1	SEE WELL COMPLETION LOG	5.
5				120/5"		5.0			3.
					(For bedrock description see the Rock Coring Log for boring MW-9D.)				
									4.
10						BEDROCK			
15						15.5			
					Bottom of boring at 15.5 feet.				

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Split spoon refusal encountered at 5 feet and confirmed with augers at 5.5 feet.
4. Core bit lost in boring between 7.15 and 15.5 feet. Boring sealed with bentonite to 1 foot below ground surface.
5. Boring MW-9S relocated 5 feet south of former location and was drilled without sampling to 5 feet prior to the completion of overburden monitoring well.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-9D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G.Garfield/S. Sokol

BORING LOCATION 100' southeast of piggery
GROUND SURFACE ELEVATION 219.0 DATUM MSL
DATE START 11/10/88 DATE END 12/1/88

SAMPLER
TYPE:
HAMMER: lb.
FALL: in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/17	6.0	GS	68 days

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
					Brown, fine to medium SAND, little Gravel trace Silt. Dry.	FINE TO MEDIUM SAND			1. 2.
						SAND AND GRAVEL			
5						5.0			
					(For bedrock description see the Rock Coring Log for boring MW-9D.)			SEE WELL COMPLETION LOG	
						BEDROCK			
10									
15					NOTE SCALE CHANGE				
						18.4			3.
20					Bottom of boring at 18.4 feet.				

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil classification based on auger cuttings surfacing during boring advancement.
3. Boring terminated at 18 feet. Bedrock well completed approximately 13 feet into bedrock.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-10S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

BORING LOCATION Blake Road Extension
GROUND SURFACE ELEVATION 257 DATUM MSL
DATE START 12/19/88 DATE END 12/20/88

SAMPLER
TYPE: 2" O.D.Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/20	Dry	GS	18 hours

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	9/8	0-0.75	24	Light brown, fine SAND, little Gravel, trace Silt, FILL, changing to fine to medium SAND, little Silt, trace Gravel at 1.5 feet.	FILL	<1		1. 2.
				50/3"					
						1.5			
5	S-2	24/14	5-7	10	Dense, greenish gray, fine to medium SAND, little Silt, trace Gravel, with iron staining.	FINE TO MEDIUM SAND	<1	NO EQUIPMENT INSTALLED	
				20					
				29					
				28					
10	S-3	12/11	10-11	10	Greenish gray, fine to medium SAND, little Silt, trace Gravel with weathered rock fragments in tip of sampler.		<1		
				30		11.0			3.
				50/0"	Bottom of boring at 11 feet.				4.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger and split spoon refusal encountered at 11 feet.
4. Borehole abandoned due to not encountering ground water. Borehole backfilled with 1 foot of bentonite followed by compacted cutting materials to 2' beneath ground surface, then bentonite to ground surface.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-11D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

BORING LOCATION 140' north of swale
GROUND SURFACE ELEVATION 220.2 DATUM MSL
DATE START 11/30/88 DATE END 12/7/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
2/28	7.7	GS	83 days

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/16	0-2	4	Medium dense, light brown, fine SAND, trace Silt, trace Gravel, grading to gray fine SAND, little Silt, little Gravel at 2.3 feet. Moist.		<1		1.
				5					
				8					
				11					
	S-2	24/24	2-4	9	Dense, light brown, fine to medium SAND, little Silt, little Gravel.	FINE TO MEDIUM SAND	<1	SEE WELL COMPLETION LOG	2.
				15					3.
				26					4.
				55					5.
	S-3	10/8	4-4.8	28	Highly weathered bedrock.		<1		6.
				100/4		4.8			
5					(For bedrock description see the Rock Coring Log for boring MW-11D.)				
10	NOTE SCALE CHANGE					BEDROCK			
15									
20					Bottom of boring at 20 feet.	20.0			7.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-10 photoionization detector.
3. Plastic sheeting observed in cutting at approximately 2 feet.
4. Auger cuttings screened <1ppm with HNu.
5. Auger refusal encountered at 5 feet. Confirmed refusal in adjacent boring with auger refusal at 3 feet.
6. Adjacent boring backfilled with 3/8" bentonite pellets to ground surface.
7. Boring terminated at 20 feet, approximately 15 feet into bedrock.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-12S
SHEET 1 OF 2
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

BORING LOCATION 20' east of Brook A at toe of slope
GROUND SURFACE ELEVATION 188.7 DATUM MSL
DATE START 11/18/88 DATE END 11/21/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
2/28	3.9	GS	99 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	9/19	0-0.8	1	Orangish brown, fine to medium SAND, some Silt. Occasional root fibers. Moist.	FINE TO MEDIUM SAND			1. 2.
				50/3"					
						1.5			
						FINE TO MEDIUM SAND			3.
5	S-2	24/14	5.3-7.3	9	Very dense, olive gray, fine to medium SAND, little Gravel, little Silt. Wet.		<1	SEE WELL COMPLETION LOG	4.
				39					
				88					
				46					
	S-3	24/12	7.3-9.3	7	Very dense, olive gray, fine to medium SAND and GRAVEL, little Silt. Wet.	7.3	<1		
				35					
				64					
				45		SAND AND GRAVEL			
10	S-4	24/15	10-12	20	Very dense, olive gray, fine to medium SAND and GRAVEL, little Silt. Wet.		<1		5.
				40					
				27					
				35		12			
	S-5	23/22	12-13.9	16	Very dense, olive gray, fine to medium SAND, little Gravel, little Silt. Wet.	F/M SAND	<1		
				32					
				45					
				120/5"		13.9			6.
15					(For bedrock description see the Rock Coring Log for boring MW-12S.)	BEDROCK			

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Split spoon refusal encountered at 0.8 feet. Moved rig north approximately 10 feet.
3. Obstruction encountered 2 to 4 feet.
4. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
5. Overdrilled 1 foot to attain even interval.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-12S
SHEET 2 OF 2
FILE NO. 6185/813
CHKD. BY

DEPTH (ft.)	SAMPLE NO.	SAMPLE PEN. (in)/REC	SAMPLE DEPTH (ft.)	SAMPLE BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REM.
					(For bedrock description see the Rock Coring Log for boring MW-12S.)				
20						BEDROCK			
						23.9			7.
					Bottom of boring at 23.9 feet.				8.
25									
30									

REMARKS:

6. Rock coring performed using a series 4 diamond impregnated core bit.
7. Boring MW-12S terminated at 23.9 feet, approximately 10 feet into bedrock.
8. Core hole filled with bentonite to 13.9 feet upon completion of coring and prior to completion of overburden monitoring well.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-12D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

BORING LOCATION 20' east of Brook A at toe of slope
GROUND SURFACE ELEVATION 186.9 DATUM MSL
DATE START 12/2/88 DATE END 12/9/88

SAMPLER
TYPE: -
HAMMER: - lb.
FALL: - in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/7	Flowing	GS	1 day

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
					Soil boring MW-12D was drilled without sampling to 12.8 feet below ground surface. For soil description see the Soil Boring Log MW-12S.	F/M SAND			1.
						1.5			
5						FINE TO MEDIUM SAND			
						7.3			
10						SAND AND GRAVEL		SEE WELL COMPLETION LOG	
						12.8			
15					(For bedrock description see the Rock Coring Log for boring MW-12S.)				
20						BEDROCK			
25						27.8			3.
					Bottom of boring at 27.8 feet.				
30									
35									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Artesian condition observed on 12/7/88.
3. Boring terminated at 27.8 feet, approximately 15 feet into bedrock.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-13S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER M. Jacobs/E. Wood

BORING LOCATION 400' north of MW-12D, 5' east of Brook A
GROUND SURFACE ELEVATION 182.3 DATUM MSL
DATE START 11/16/88 DATE END 11/17/88

SAMPLER
TYPE: -
HAMMER: - lb.
FALL: - in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/17/89	1.3	GS	61 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
					(Soil boring MW-13S was drilled without sampling to approximately 15 feet below ground surface. For strata description see the log of soil boring MW-13D.)	TOPSOIL 0.5			1. 2.
						FINE TO MEDIUM SAND	<1		3.
5						6.0 SILTY SAND 8.5		SEE WELL COMPLETION LOG	
						CLAYEY SILT			
						F/M SAND	<1		
10						10 CLAYEY SILT			
						12 F/M SAND			
						C. SILT	<1		
						SILTY SAND 15			
15					Bottom of boring at 15 feet.				4.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil sampling performed during drilling of adjacent boring MW-13D.
3. HNu screening results for VOC's taken from auger cuttings which surfaced during drilling.
4. Boring MW-13S terminated at 15 feet. No refusal encountered.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-13D
SHEET 1 OF 2
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER M. Jacobs/E. Wood /G.Garfield

BORING LOCATION 400' north of MW-12D, 5' east of Brook A
GROUND SURFACE ELEVATION 181.5 DATUM MSL
DATE START 11/14/88 DATE END 11/30/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/16	1.0'	GS	1.5 days
11/22	1.0'	GS	8.0 days

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/9	0-2	1	Very loose, brown, fine to medium SAND, little Silt. Organics to 0.5'. Moist.	TOPSOIL	<1		1.
				2		0.5			2.
				1					
				7					
	S-2	24/19	2-4	9	Dense, light brown, fine to medium SAND, trace Silt. Wet.		<1		
				16		FINE			
				16		TO			
				19		MEDIUM			
	S-3	24/14	4-6	8	Medium dense, light brown, fine SAND, little Silt with iron staining. Wet.	SAND	<1	SEE WELL COMPLETION LOG	
5				9					
				9					
				10		6			
	S-4	24/19	6-8	11	Medium dense, orange-brown, fine SAND some Silt with iron staining. Wet.		<1		
				13		SILTY			
				10		SAND			
				13					
	S-5a	24/19	8-8.5	4	S-5a: Medium dense, brown, fine to	8.5	<1		
	S-5b		8.5-10	7	medium SAND, trace Silt from 8-8.5 feet. Iron staining in SAND. Wet.	CLAYEY SILT			
				5	S-5b: Light brown, Clayey SILT from 8.5-9.2 feet changing to light brown, fine	F/M SAND	<1		
				12					
10	S-6	24/19	10-12	7	to medium SAND, trace Silt below 9.2 ft. Very stiff, light brown, Clayey SILT	10	<1		
				10	with few iron-stained fine SAND pockets. Wet.	CLAYEY			
				14		SILT			
				13		12			
	S-7	24/14	12-14	8	Medium dense, light brown, fine to	FINE	<1		3.
				8	medium SAND, trace Silt grading to light brown, Clayey SILT with approximately	TO			
				10	5-10% fine SAND from 13.5-14 feet. Wet.	MEDIUM SAND			
				18		C.SILT			
	S-8	24/14	14-16	6	Medium dense, light brown, fine SAND,	14	<1		
				3	some Silt, trace Gravel. Wet.				
15				13					
				32		SILTY SAND			
	S-9	18/15	16-17.5	27	Very dense, brown, fine SAND, some Clayey		<1		4.
				70	SILT, trace Gravel. Wet.				
				100					

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Wash assumed in first 10" of sampler.
4. Hole cleaned out with 5 3/4" roller bit and potable water before coring commenced.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-13D
SHEET 2 OF 2
FILE NO. 6185/813
CHKD. BY

DEPTH (ft.)	SAMPLE NO.	SAMPLE PEN. (in) / REC	SAMPLE DEPTH (ft.)	SAMPLE BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REM.
						SILTY SAND			
						19			
					For bedrock description see the Rock Coring Log for boring MW-13D.				
20									
									5.
25						BEDROCK			
30									
						34			6.
					Bottom of Boring at 34'.				
35									

REMARKS:
5. Drillers note rock is fractured from 21.5 below ground surface to 23 feet below ground surface.
6. Boring MW-13D was completed 16 days after drilling began due to weather and equipment constraints.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-14S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

BORING LOCATION 60' west of Brook A at lower access road.
GROUND SURFACE ELEVATION 182.8 DATUM MSL
DATE START 1/16/89 DATE END 1/19/89

SAMPLER
TYPE: -
HAMMER: - lb.
FALL: - in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
2/28	1.8	GS	40 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
					For strata description see the log of soil boring MW-14D.	FINE SAND 2.6			1. 2.
						BOULDER 4.0			
						F/M SAND 6.0			
						F.SAND			
						F/M SAND			
						COBBLES 10.0			
10						F.SAND 10.7			
						SAND AND GRAVEL 14.5		SEE WELL COMPLETION LOG	
						FINE SAND 19.5			
20						BOULDER 21			
						SAND 25.2			
						BOULDER			
						SAND 27.8			
						ROCK			3.
30					Bottom of boring at 29 feet.	29			

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Stratum description based on soil descriptions from MW-14D unless drilling conditions indicated otherwise.
3. Boring terminated at 29 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-14D
SHEET 1 OF 2
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield

BORING LOCATION 60 feet west of Brook A at lower access road
GROUND SURFACE ELEVATION 181.5 DATUM MSL
DATE START 1/9/89 DATE END 1/13/89

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/10	4.0	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/16	0-2	1	Loose, brown, fine SAND, little Silt, with occasional iron staining. Moist. Topsoil to 0.5 feet.	TOPSOIL 0.5	<1		1.
				2					
				3		FINE SAND			
				7					
	S-2	8/6	2-2.6	10	Brown, fine SAND, little Silt with occasional iron staining. Moist.	2.6	<1		2.
				40/2		BOULDER			
						4.0			
	S-3	24/12	4-6	20	Dense, brown, fine to medium SAND, little Gravel, little Silt, with uniform iron staining. Wet.	F/M SAND		SEE WELL COMPLETION LOG	
5				20					
				25					
				36		6.0			
	S-4	17/17	6-7.4	31	Brown, fine SAND, trace Silt, trace Gravel, with occasional iron staining, changing to fine to medium SAND, little Silt, little Gravel at 7 feet.	FINE SAND 7.0	<1		
				13		F/M SAND			3.
				100/5		8.0			
						NESTED COBBLES AND BOULDERS			
10						10.0			4.
						FINE SAND 10.7			
	S-5	24/14	11-13	20	Very dense, brown, fine to coarse SAND, some Gravel, little Silt, with occasional iron staining. Wet.		<1		
				25					
				33		F/C SAND AND GRAVEL			
				41					5.
									6.
						14.5			
15	S-6	18/18	14.5-16	19	Very dense, brown, fine SAND, trace Silt, grading to fine to medium SAND, trace Silt at 15.2 feet, underlain by brown SILT and fine SAND with iron staining at 15.4 feet. Wet.		<1		
				53					
				120		FINE SAND			

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Obstruction encountered from 2.6 feet to 4 feet. Moved boring northeast approximately 5 feet. Again obstruction encountered at 5 feet. Move boring west 5 feet. Drilled through obstruction at 4.1 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-14D
SHEET 2 OF 2
FILE NO. 6185/813
CHKD. BY

DEPTH (ft)	SAMPLE NO.	SAMPLE PEN. (in)/REC	SAMPLE DEPTH (ft.)	SAMPLE BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REM.
						FINE SAND			
						18.7			7.
20						BOULDER			
					Greenish-gray, CLAY and SILT, with approximately 25-30% fine to coarse Gravel and 5-10% fine to medium Sand. Wet.	23			8.
25									
30						29.8			
					For bedrock description see the Rock Coring Log for boring MW-14D.	BEDROCK			
40					NOTE SCALE CHANGE	42			
					Bottom of boring at 42 feet.				9.
45									10.

REMARKS:

4. Auger refusal encountered at 8 feet.
5. Strata description from 10 feet to 10.7 feet based on sand observed in rock core barrel.
6. Spun casing from 13 feet to 14.5 feet.
7. Boulder encountered while spinning casing at 18.7 feet.
8. Soil description from 23 to 29.8 feet based on soil obtained in core barrel and drilling behavior.
9. Boring terminated at 42 feet, approximately 12.2 feet into bedrock.
10. Previous boreholes backfilled with cuttings and filter sand upon completion of well installation.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-15S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

BORING LOCATION South side of Randy Lane
GROUND SURFACE ELEVATION 180.7 DATUM MSL
DATE START 12/20/88 DATE END 12/23/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/20	10.3'	GS	During Drilling
12/21	5.5'	GS	16 hours

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/12	0-2	14	Dense, dark brown, fine SAND,	TOPSOIL			1.
				29	trace Silt, trace coarse Gravel, with	0.3	<1		2.
				9	organic matter, changing to reddish brown				
				10	fine to medium SAND, trace fine Gravel,				
					trace Silt at 0.3 feet. Dry.	FINE TO MEDIUM SAND			
						5.0			
5	S-2	8/4	5-5.6	65	Light brown, fine to coarse SAND,		<1	SEE WELL COMPLETION LOG	3.
				50/2"	little Gravel, trace Silt. Moist.				4.
						FINE TO COARSE SAND			
						10.0			
10	S-3	0/0	10.0	50/0	For bedrock description see the Rock				5.
		NOTE SCALE CHANGE			Coring Log for boring MW-15S.				
						BEDROCK			
20						20.7			6.
					Bottom of boring at 20.7 feet.				

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Boring MW-15S sampled at 5-foot intervals.
4. Split spoon refusal encountered at 5.6 feet. Obstruction drilled through and augering continued to 10 feet.
5. Split spoon refusal encountered at 10 feet.
6. Boring MW-15S backfilled with bentonite to 9.5 feet below ground surface prior to well construction.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-18S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

BORING LOCATION Jennifer Lane at Huckleberry Lane
GROUND SURFACE ELEVATION 164.2 DATUM MSL
DATE START 1/11/89 DATE END 1/12/89

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/11	5.5	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/18	0-2	29-43	Very dense, light brown, fine SAND, some Silt, with organics. Dry.		2		1. 2.
				24- 7					
5	S-2	24/19	5-7	4-3	Loose, light brown, fine SAND, little Silt, becoming wet at 6 feet.		<1		
				5-6		FINE TO MEDIUM SAND			
10	S-3	24/24	10-12	4-6	Medium dense, light brown, fine to medium SAND, trace Silt, changing color to orangish-red at 11 feet.		<1	SEE WELL COMPLETION LOG	
				7-10					
15	S-4	24/19	15-17	13-17	Dense, orangish brown, fine to medium SAND, trace Silt, trace fine Gravel, changing to gray-brown, fine SAND and SILT, little Gravel at 15.5 feet.	15.5	<1		
				17-15					
20	S-5	24/14	20-22	9-11	Medium dense, fine SAND and SILT with two rust-colored, fine to medium SAND, little Silt seams.	SILT AND SAND	<1		
				15-30					
						23.5			
25					For bedrock description see the Rock Coring Log for boring MW-18S				3.
						BEDROCK			
30									4. 5.
						33			
35					Bottom of boring at 33 feet.				6.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Bedrock fracture encountered at 26 feet.
4. During well installation bentonite dropped into well screen. Removed screen and restarted boring approximately 5 feet from original location.
5. Auger refusal encountered at 23.5 feet.
6. Original borehole backfilled with grout to ground surface.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, New Hampshire

BORING NO. MW-20S
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG

BORING CO. AVALANCHE SOIL EXPLORATION, INC.
FOREMAN S. Doucette
BALSAM ENGINEER G. Garfield/D. Coleman

BORING LOCATION approx. 70 feet southeast of MW-8D
GROUND SURFACE ELEVATION 223.7 DATUM MSL
DATE START 9/26/89 DATE END 9/26/89

SAMPLER
TYPE: 2" OD Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
									1
								SEE WELL COMPLETION LOG	
						FINE TO COARSE SAND			
5	S-1	18/18	5-6.5	11	Medium dense, brown, fine to coarse SAND, little Gravel, trace Silt. Wet.				
				22					
				21					
10	S-2	2/2	10-10.2	50/2	No recovery				
						12.0			2
					Bottom of boring at 12.0 feet.				3
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced using an Mobile B-47 drill rig mounted on a four-wheel-drive Unimog.
2. Auger refusal encountered at 12.0 feet.
3. Soil screening with a HNu PI-101 photoionization detector not performed due to inclement weather.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, New Hampshire

BORING NO. MW-20D
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY TSS/GMG

BORING CO. AVALANCHE SOIL EXPLORATION, INC.
FOREMAN S. Doucette
BALSAM ENGINEER G. Garfield/D. Coleman
BORING LOCATION 73 feet southwest of MW-8D
GROUND SURFACE ELEVATION 223.6 DATUM MSL
DATE START 9/25/89 DATE END 9/26/89

SAMPLER
TYPE: Not sampled
HAMMER: _____ lb.
FALL: _____ in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
9-27	7.0	PVC	24 hours

DEPTH (ft.)	SAMPLE NO.	PEN. (in.) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
					Boring advanced to 17.2' using an ODEX air hammer. Followed by bedrock from 17.2 to 22.4 feet. Boring advanced from 22.4 feet to 45.9 feet using a 4 1/4 inch diameter air hammer in open hole.	FINE TO COARSE SAND		SEE WELL COMPLETION LOG	1, 2
10									
						13.6			
					For classification of rock core, see rock coring log of boring MW-20D.				
20									
30						BEDROCK			
40						45.9			3, 4
					Bottom of boring at 45.9 feet.				
50									
60									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile drill B-47 drill rig mounted on a four-wheel-drive Unimog.
2. Stratum description based on cuttings returned to the surface during air rotery drilling.
3. Boring MW-20D terminated 32.3 feet into bedrock.
4. Soil screening with a HNu PI-101 photoionization detector not performed due to inclement weather.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, New Hampshire

BORING NO. MW-21S
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY TSS/GMG

BORING CO. AVALANCHE SOIL EXPLORATION, INC.
FOREMAN S. Doucette
BALSAM ENGINEER G. Garfield
BORING LOCATION 67 feet southeast of MW-8D
GROUND SURFACE ELEVATION 228.8 DATUM MSL
DATE START 9/28/89 DATE END 9/28/89

SAMPLER
TYPE: 2" OD Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	24/8	0-2	4	Medium dense, orangish brown, fine to medium SAND, trace Silt, trace Gravel. Dry. Top 4" is organics.				1
				7					2
				13		FINE TO MEDIUM SAND		SEE WELL COMPLETION LOG	
				11					
						3			
5	S-2	17/14	5-6.5	57	Very dense, orangish brown, fine to coarse SAND, little Grave, trace Silt, with iron staining and occasional fine sand partings & seams.				
				53					
				76/5"		FINE TO COARSE SAND			
						8.5			
						Boulder			
					Bottom of boring at 9.0 feet.				3
10									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced using an Mobile B-47 drill rig mounted a four-wheel-drive Unimog.
2. No field screening performed due to weather.
3. Boring MW-21S terminated at 9.0 feet in boulder.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, New Hampshire

BORING NO. MW-21D
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG/TSS

BORING CO. AVALANCHE SOIL EXPLORATION, INC.
FOREMAN S. Doucette
BALSAM ENGINEER G. Garfield

BORING LOCATION 70 feet southwest of MW-8D
GROUND SURFACE ELEVATION 228.7 DATUM MSL
DATE START 9/27/89 DATE END 9/27/89

SAMPLER
TYPE: No samples taken
HAMMER: _____ lb.
FALL: _____ in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
					Boring advance to 11.3' using an ODEX air hammers followed by coring from 11.8 to 16.9 feet. Boring advanced from 16.9 to 41.4 using a 4 1/4" O.D. air hammer in a open hole.	FINE TO COARSE SAND		SEE WELL COMPLETION LOG	1, 2
						4.5			
						BOULDER			
10						10.0			
					See rock coring log of boring MW-21D.	FINE TO COARSE SAND			
						10.5			
20						BEDROCK			
30									
						41.4			
40					Bottom of boring at 41.4 feet.				3, 4

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced using an Mobile B-47 drill rig mounted on a four-wheel-drive Unimog.
2. Auger refusal encountered at 12.0 feet.
3. Boring MW-21D terminated 30.9 feet into bedrock.
4. Soil screening with a HNu PI-101 photoionization detector not performed due to inclement weather.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. OW-2SR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M. Jacobs

BORING LOCATION 150' north of piggery at top of slope
GROUND SURFACE ELEVATION 209.7 DATUM MSL
DATE START 12/14/88 DATE END 12/15/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/14	4.0	GS	During Drilling
12/15	3.0	GS	19 hours

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/4	0-2	2	Loose, dark brown, fine SAND and SILT with organics. Moist.	TOPSOIL	<1		1. 2.
				2					
				4		1.0			
				7					
	S-2	24/10	2-4	9	Medium dense, brown, fine SAND, trace Silt, trace Gravel, with iron and dark gray staining.		10		
				8					
				13					
				23				SEE WELL COMPLETION LOG	
	S-3	21.5/16	4-5.7	32	Very dense, gray, fine SAND, little Silt, trace Gravel. Wet.		30		
5				51		FINE TO MEDIUM SAND			
				62					
				60/3.5"					
	S-4	12/12	6-7	42	Gray, fine SAND, little Silt, trace Gravel. Wet.		25		
				43		7			
				50/0"					
						COBBLES			3.
	S-5	24/21	8-10	25	Very dense, gray, fine SAND, little Silt, trace Gravel. Wet.	8	48		
				58					
				41					
				82					
10	S-6	24/18	10-12	37	Very dense, gray, fine to coarse SAND, little Silt, little Gravel. Wet.		50		
				42		FINE TO MEDIUM SAND			
				41					
				60					
	S-7	21.5/14	12-13.7	17	Very dense, gray, fine to medium SAND, little Silt, trace Gravel. Wet.		20		
				42					
				51					
				100/3.5"					
	S-8	12/10	14-15	28	Very dense, fine SAND, little Silt, little Gravel. Wet.		40		
				120		15			4.
15					Bottom of boring at 15 feet.				5.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Cobbles present during augering from 7 to 8 feet.
4. Auger and split spoon refusal encountered at 15 feet.
5. Auger cuttings screened upon completion found to read 2 ppm using an HNu.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. OW-2DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G. Garfield

BORING LOCATION 160' north of piggery at top of slope
GROUND SURFACE ELEVATION 209.3 DATUM MSL
DATE START 12/29/88 DATE END 1/9/88

SAMPLER
TYPE: -
HAMMER: - lb.
FALL: - in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
2/28	4.8	GS	49 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) OVA	EQUIPMENT INSTALLED	REMARKS
					(Soil boring OW-2DR was drilled without sampling to approximately 18 feet below ground surface. For strata description see the log of soil boring OW-2SR.)	TOPSOIL			1.
						1.0			
						FINE TO MEDIUM SAND		SEE WELL COMPLETION LOG	
10									
							25		2.
						18	9		
					(For bedrock description see the Rock Coring Log for boring OW-2DR.)		<1		3.
20						BEDROCK			
30									
35					Bottom of boring at 35 feet.	35	<1		4. 5.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Annular space inside hollow stem augers screened for VOC's with a Foxboro OVA Model 128 upon completion of augering.
3. During drilling wash water was screened with OVA.
4. Wash water was screened on site after one hour of warming in van.
5. Boring OW-2DR terminated at 35 feet, approximately 17 feet into bedrock.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. OW-3R
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M. Jacobs/E. Wood

BORING LOCATION 280' north of piggery
GROUND SURFACE ELEVATION 221.5 DATUM MSL
DATE START 12/2/88 DATE END 12/8/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/17	7.4	GS	39 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/14	0-2	3		TOPSOIL	<1		
				4					
				5	Loose, light brown, fine SAND, little Silt. Dry.	1.0			
				7					
	S-2	24/19	2-4	7		FINE SAND	<1		
				9					
				15	Medium dense, gray, fine to medium SAND, trace Silt, trace coarse Gravel. Dry.	3.0			
				22					
	S-3	24/16	4-6	19	Very dense, gray, fine to medium SAND, trace Silt, trace coarse Gravel. Moist.	FINE TO MEDIUM SAND	<1	SEE WELL COMPLETION LOG	2.
				28					
5				30					
				36					
	S-4	8/4	6-6.6	30	Gray, fine to medium SAND, trace coarse Gravel. Wet.	6.6	<1		3.
				51/2	(For bedrock description see the Rock Coring Log for boring OW-3R.)				
10		NOTE SCALE CHANGE				BEDROCK			
15						19			4.
20					Bottom of boring at 19 feet.				

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 6.6 feet. Note: Drillers lost the auger plug in the hole. Augers were withdrawn and boring was backfilled with 3/8" Pelonite pellets to the ground surface. Soil boring OW-3R was redrilled to 3.8 feet where bedrock was encountered approximately 5 feet north of the original location.
4. Boring OW-3R terminated at 19 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. OW-4SR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs/G.Garfield

BORING LOCATION 100' north of piggery
GROUND SURFACE ELEVATION 218.0 DATUM MSL
DATE START 12/9/88 DATE END 12/9/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/9	4.0	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu (OVA)	EQUIPMENT INSTALLED	REMARKS
	S-1	24/4	0-2	2	Very loose. red-brown, fine to medium SAND, little Silt, trace Gravel. Dry.	TOPSOIL	<1		1.
				1		0.5	(<1)		2.
				1					
				4					
	S-2	24/16	2-4	6	Dense, light brown, fine to medium SAND, trace Silt, little Gravel, with two 1" Gravel fragments in bottom 6" of spoon. Dry.	FINE TO MEDIUM SAND	<1	SEE WELL COMPLETION LOG	
				14			(<1)		
				20					
				22	Dense, greenish-gray, fine to coarse SAND, little Gravel, trace Silt. Iron-stained. Wet.	4			
	S-3	24/18	4-6	22			<1		
5				28			(<1)		
				21		FINE TO COARSE SAND			
				23					
	S-4	24/19	6-7.5	79	S-4: Dense, greenish-gray, fine to coarse SAND, little Gravel, trace Silt. Wet.		<1		
				25			(<1)		
				20		7.5			
	S-4a		7.5-8.0	29	S-4a: Fine to medium SAND, trace Gravel, trace Silt. Wet.				3.
	S-5	10/0	8.8-9.6	15	No recovery.	FINE TO MEDIUM SAND			4.
				100/4"					
10	S-6	11.5/0	10.0-11	16	No recovery.				
				100/5.5"					
						12			5.
					Bottom of boring at 12 feet.				
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector. Screening results in () indicate results from the same samples screened with a Foxboro Co. Model 128 OVA.
3. Flowing sand observed at 8 feet.
4. Split spoon refusal encountered at 9.6 feet. Moved boring location to confirm bedrock. Original borehole sealed with bentonite to ground surface.
5. Split spoon refusal encountered at 11 feet. Drilled through obstruction and encountered auger refusal at 12.0'.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. OW-4DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

BORING LOCATION 100' north of piggery
GROUND SURFACE ELEVATION 217.6 DATUM MSL
DATE START 12/13/88 DATE END 12/15/88

SAMPLER
TYPE: -
HAMMER: - lb.
FALL: - in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/17	6.0	GS	33 days

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
					(Soil boring OW-4DR was drilled without sampling to approximately 12.7 feet below ground surface. For strata description see the log of soil boring OW-4SR.)	F/M SAND			1.
							<1		2.
						4.0			
						F/C SAND			
						7.5			
10						F/M SAND		SEE WELL COMPLETION LOG	
							14		2.
						12.7			
					(For bedrock description see the Rock Coring Log for boring OW-4DR.)				3. 4.
20						BEDROCK			
						28.2			5.
					Bottom of boring at 28.2 feet.				
30									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0–4	V. LOOSE
4–10	LOOSE
10–30	M. DENSE
30–50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2–4	SOFT
4–8	M. STIFF
8–15	STIFF
15–30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 6 1/4" I.D. hollow stem augers.
2. Annular space inside augers was screened for VOC's in the field using an HNu PI-101 photoionization detector.
3. Less than 1 ppm measured in the breathing zone using HNu
4. Four-inch I.D. steel casing spun 0.5' into bedrock. Rock coring conducted using recirculated potable water.
5. Boring OW-4DR terminated at 28.2 feet, approx. 15.5 feet into bedrock.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-1
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G. Garfield

BORING LOCATION Approximately 60' north of piggery
GROUND SURFACE ELEVATION 224.4 DATUM MSL
DATE START 11/8/88 DATE END 11/8/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/8	3.0	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/6	0-2	2	Medium dense, brown, fine to medium SAND, little Silt, trace Gravel. Organic matter throughout sample. Dry.	FINE TO MEDIUM SAND	2		1.
				8					
				4					
				4					
	S-2	13/6	2-3.1	2	Brown, fine to medium SAND, little Silt, trace Gravel. Wet.		2		
				5					
				120/1"		3.1			2.
					Bottom of boring at 3.1 feet.				3.
									4.
5									
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/2" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Split spoon refusal encountered at 3.1 feet and confirmed by augers at 3.2 feet.
4. Boring BE-1 was backfilled with cuttings upon completion of sampling

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-2
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G. Garfield/S. Sokol

BORING LOCATION Approximately 55' north of piggery
GROUND SURFACE ELEVATION 225.4 DATUM MSL
DATE START 11/8/88 DATE END 11/8/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/8	7.0	GS	1 hour

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/8	0-2	9	Medium dense, brown, fine to coarse SAND, little Silt, little Gravel. Containing organic matter to 0.5 feet. Dry.		<1		1.
				10					
				10					
				12					
	S-2	24/8	2-4	6	Medium dense, brown, fine to medium SAND, little Silt, trace Gravel with a 2" factured gravel fragment in center of sample. Dry.		<1		
				7					
				8					
				7					
	S-3	24/3	4-6	4	Loose, brown, fine to medium SAND, little Silt, trace Gravel. Dry.	FINE TO MEDIUM SAND			
5				4					
				3					
				60					2.
	S-4	24/8	6-8	4	Medium dense, brown, fine to medium SAND, little Silt. Wet.		60		
				5					
				8					
				15					
	S-5	16/8	8-9.3	11	Brown, fine to medium SAND, little Silt, trace Gravel. Wet.		75		
				15					
				120/4"		9.3			
10									
	S-6	24/12	10-12	60	Very dense, gray, fine to coarse SAND, some Gravel, little Silt. Occasional black staining with septic-like odor. Wet.		75		
				68					
				48		SAND AND GRAVEL			
				14					
	S-7	24/18	12-14	31	Very dense, olive gray, fine to coarse SAND, some Gravel, little Silt with a 3" fine to medium SAND seam at 14 feet. Slight septic-like odor.		40		
				37					
				25					
				27		14			3.
					Bottom of boring at 14 feet.				
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 14 feet. Boring BE-2 backfilled with cuttings upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-3
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G. Garfield/S. Sokol

BORING LOCATION Approximately 30' south of swale
GROUND SURFACE ELEVATION 218.9 DATUM MSL
DATE START 11/8/88 DATE END 11/8/88

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/8	4.3'	GS	15 minutes

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	S-1	24/16	0-2	1	Medium dense, brown, fine to medium SAND, little Silt, trace Gravel. Top 6" contains roots and organic vegetation. Moist.		65		1.
				4					
				7					
				8					
	S-2	24/24	2-4	6	Medium dense, brown, fine to medium SAND, little Silt, grading to fine SAND, trace Silt at 3 feet. Wet.		40		
				8					
				7					
				10		FINE TO MEDIUM SAND			
	S-3	24/24	4-6	19	Very dense, brown, fine to medium SAND trace Gravel grading to fine SAND, little Silt at 5.8 feet. Wet.		3		
5				27					
				24					
				39					
	S-4	24/24	6-8	26	Dense, olive gray, fine to medium SAND grading to fine SAND, some Silt at 7 feet. Wet.		<1		
				22					
				17		7.0			
				8					
	S-5	24/20	8-10	4	Medium dense, olive gray, fine SAND and SILT. Occasional Silt seams varying in thickness from 1/8 to 1/4".		<1		
				4					
				10					
				18					
10	S-6	24/10	10-12	8	Dense, olive gray, fine SAND and SILT.	SAND AND SILT	1		
				18					
				20					
				18					
	S-7	8/0	12-12.6	13	No recovery.	12.6			2.
				120/2"	Bottom of boring at 12.6 feet.				3. 4.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-10 photoionization detector.
3. Split spoon refusal encountered at 12.6 feet and confirmed with augers at 12.6 feet.
4. Boring BE-3 backfilled with cuttings upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-4
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER S.Sokol/D. Seiken

BORING LOCATION Approximately 60' north of piggery
GROUND SURFACE ELEVATION 224.2 DATUM MSL
DATE START 11/9/88 DATE END 11/9/88

SAMPLER
TYPE: 2"O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
11/9	6.6	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
			0-4						1. 2.
					For sample descriptions from 0-4 feet see boring BE-1.	FINE TO MEDIUM SAND			
						4.0			
	S-1	24/10	4-6	6	Medium dense, gray, fine to coarse SAND and Silt, some Gravel. Wet.		230		
5				11					
				12					
				27		GRAVELLY SILTY SAND			
	S-2	9/9	6-6.7	27	Gray, fine to coarse SAND and Silt, some Gravel. Wet.		150		
				100/3"					
	S-3	24/10	8-10	20	Dense, fine to medium SAND, some Gravel, little Clayey SILT.		95		
				27					
				23					
10				73					3.
						10.3'			
					Bottom of boring at 10.3 feet.				
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 track-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 10.3 feet. Boring BE-4 backfilled with cuttings upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-5
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER E.Wood/M. Jacobs/S.Sokol

BORING LOCATION Adjacent to parking area
GROUND SURFACE ELEVATION 230.7 DATUM MSL
DATE START 12/27/88 DATE END 12/27/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/27	Dry	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) (HNu)	EQUIPMENT INSTALLED	REMARKS
	001	27/24	0-2.3	10	Loose, light brown, fine to medium SAND and GRAVEL. Dry.	SAND AND GRAVEL	<1		1. 2.
				5					
				5	Reddish brown, fine SAND, little Silt, trace Gravel. Dry.	1.0 FINE SAND			
				13					
				32/3					
	002	5/3	2.5-2.9	100/5	Reddish brown, fine SAND, little Silt, trace Gravel. Dry.	3.0	<1		3. 4.
	002a	30/24	2.5-5.0	90	Very dense, brown and gray, fine SAND and GRAVEL, little Silt changing to gray at 4 feet then changing to brown at 4.5 feet Dry.	SAND AND GRAVEL	<1		
				39					
				25					
5				19-16		5.0			
	003	21/21	5.0-6.8	14	Dense, brown, fine to medium SAND, little Silt, trace fine Gravel, Iron stained. Moist.	F/M SAND	<1		
				25					
				44		6.5			
				17/3"					
	004	24/20	6.8-8.8	45	Very dense, light brown fine SAND, some Silt, trace Gravel. Iron stained. Moist.	SILTY SAND	<1		
				34					
				29					
				79					
	005	17/9	9.3-10.7	9	Light brown, fine SAND, some Silt, trace Gravel. Iron stained. Moist.		<1		
				15					
10				100/5					
						10.7			
					Bottom of boring at 10.7 feet.				5.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Coarse gravel fragments lodged in bottom of samples.
4. Obstruction encountered at 2.5 feet. Sample 002a obtained from third attempt located approximately 4 feet northeast of original ho
5. Split spoon refusal encountered at 10.7 feet. Boring grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-6
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood/S.Sokol

BORING LOCATION North of piggery
GROUND SURFACE ELEVATION 230.2 DATUM MSL
DATE START 12/28/88 DATE END 12/28/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/28	Dry	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/18	0-2	19	Very dense, brown, fine to medium SAND, little Silt, little Gravel. Dry.		<1		1.
				19					2.
				33		FINE TO MEDIUM SAND			
				39					
							<1		3.
	002	17/15	2.3-3.7	5	Light brown, fine SAND, little Silt, little Gravel with weathered biotite granofels fragments in tip of sampler.				
				41					
				100/5"		3.7			4.
					Bottom of boring at 3.7 feet.				
5									
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-10 photoionization detector.
3. Auger refusal encountered at 2.5 feet. Boring was relocated approximately 10 feet west of original borehole and sampling was continued. Split spoon refusal encountered at 3.7 feet.
4. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-7
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood/S.Sokol

BORING LOCATION Fifteen to twenty feet north of piggery
GROUND SURFACE ELEVATION 226.9 DATUM MSL
DATE START 12/27/88 DATE END 12/28/88

SAMPLER
TYPE: 2"I.D. Split spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/28	Dry	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	001	27/21	0-2.3	30	Medium dense, gray-brown, fine to medium SAND, little Silt, trace Gravel, with iron stains changing to fine SAND, little Gravel at 1.5 feet. Dry.	TOPSOIL	<1		1. 2.
				61		F/M SAND			
				34					
				50		1.5			
	002	12/5	2.3-3.3	14	Brown, fine SAND, little Gravel. Dry.	FINE SAND	2		
				100					
		5/0	3.3-3.7	100/5	No recovery.				
						4.0			
	003	21/9	4.3-6	7	Dense, light brown, fine to medium SAND, little Gravel. Dry. Gravel fragments in tip of sampler.		<1		
5				67		FINE TO MEDIUM SAND			
				81					
				51/3					
	004	3/3	6.0-6.3	100/3	Light brown, fine to medium SAND, little Gravel. Moist.	6.3	<1		3. 4. 5.
					Bottom of boring at 6.3 feet.				
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-10 photoionization detector.
3. Auger cutting screened with HNu measured <1ppm.
4. Auger refusal encountered at 6.3 feet. Boring BE-7 terminated after three attempts to drill past 7 feet.
5. Bore holes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-8
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M. Jacobs

BORING LOCATION Approximately 65' north of piggery
GROUND SURFACE ELEVATION 228.4 DATUM MSL
DATE START 1/5/89 DATE END 1/5/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/5	11.0	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/17	0-2	22	Brown, fine to medium SAND, little Silt with Organics. TOPSOIL.	TOPSOIL	<1		1. 2.
				12		0.9			
				9	Medium dense, brown, fine to medium SAND, little Silt, trace Gravel. Dry.				
				8					
	002	24/12	2-4	5	Loose, brown, fine to medium SAND, little Silt, trace Gravel with Organics. Dry.		<1		
				3					
				4		FINE TO MEDIUM SAND			
				4					
	003	24/9	4-6	7	Medium dense, brown, fine to medium SAND, little Silt, trace Gravel, iron staining, black mottling. Organics. Dry.		<1		
5				10					
				11					3.
				4					
	004	24/6	6.1-8.1	48	Dense, brown, fine to medium SAND, little Gravel, little Silt with Organics. Moist.		<1		
				24					
				12					
				12					
	005	24/21	8-10	19	Very dense, brown, fine to medium SAND, little Gravel, some Silt. Moist.		<1		4.
				66					
				85					
				50					
10	006	24/17	10-12	8	Very dense, brown, fine to medium SAND, little Gravel changing to gray, fine to medium SAND, some Silt from 10.5 to 11.5 feet. Reddish brown GRAVEL, some fine to medium SAND, little Silt from 11.5 to 12 feet. Moist.	10.5	<1		
				99		SILTY SAND			
				79					
				48		SANDY GRAVEL			
	007	13/13	12-13.1	38			1		5.
				36	Dense, brown, fine to medium SAND, little Gravel, trace Silt. Wet.	F/M SAND			6.
				100/1	Bottom of boring at 13.1 feet.				
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-10 photoionization detector.
3. Auger refusal encountered at 7 feet. Relocated boring approximately 4 feet west and continued sampling below 8 feet.
4. Gravel fragment in tip of sampler.
5. Auger refusal encountered at 13.1 feet below ground surface.
6. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-9
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

BORING LOCATION Approximately 80' north of piggery
GROUND SURFACE ELEVATION 219.5 DATUM MSL
DATE START 1/10/89 DATE END 1/10/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/10	6.0	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/24	0-2	55	Very dense, brown, fine to coarse SAND,		154		1.
				69	some Silt, little Gravel, iron stained	FINE			2.
				81	with red flakes of inorganic material.	TO			
				45	Dry.	COARSE SAND			
	002	24/12	2-4	19		2.0	540		3.
				13	Medium dense, gray, fine SAND, some Silt,				
				13	changing color to brown at 3.5 feet. Dry.				
				16					
	003	24/18	4-6	8	Dense, brown, fine to medium SAND, little	SILTY	100		
5				13	Silt, changing color to black in bottom	SAND			
				20	5 inches of sample. Moist.				
				31					
	004	8/7	6-6.6	70	Black, fine to medium SAND,		10		
				50/2	some Silt, little Gravel. Wet.				
						7.5			
	005	24/17	7.5-9.5	27	Very dense, grayish-brown, fine to coarse		20		
				35	SAND and SILT, some Gravel with gray-				
				34	black staining. Wet.				
				38		SILTY			4.
	006	17/12	9.5-10.9	46	Very dense, grayish-brown, fine to coarse	GRAVELLY	12		
10				90	SAND and SILT, some Gravel, with black	SAND			
				100/5	staining. Wet.				
						11.5			5.
					Bottom of boring at 11.5 feet.				
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Field screening of breathing zone measured <1ppm.
4. Gravel fragment lodged in tip of sampler.
5. Auger refusal encountered at 11.5 feet below ground surface. Bore hole grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-10
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs

BORING LOCATION Approximately 80' north of piggery
GROUND SURFACE ELEVATION 220.2 DATUM MSL
DATE START 1/4/89 DATE END 1/5/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/4	5.0'	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/17	0-2	10	Medium dense, brown, fine SAND, little Silt with red and blue staining. Dry.	TOPSOIL	2		1. 2.
				24					
				4		FINE SAND			
				5		2.0			
	002	24/11	2-4	9	Dense, dark brown, fine to medium SAND, little Silt, trace Gravel with Organics and red staining. Moist.		19		
				13					
				20					
				16					
	003	24/18	4-6	5	Medium dense, brown, fine to medium SAND, little Silt with yellow chips in sampler. Wet.	FINE TO MEDIUM SAND	230		
5				5					
				13					
				14					
	004	28/20	6-8.3	17	Very dense, brown, fine to medium SAND, little Silt changing to fine to coarse SAND, some Silt at 8 feet.		210		
				25					
				43					
				42		8.0			
				56/4		SILT AND SAND			
	005	24/24	8.3-10.3	39	Dense, brown SILT and fine SAND, with a 3" fine to coarse SAND seam (TILL) in center of sampler. Iron staining. Moist.	9.5	70		
				41					
10				27		SILT & FINE SAND	120		
				58					
	006	24/18	10.5-12.5	114	Very dense, brown, fine to medium SAND and GRAVEL, little Silt grading to fine to coarse SAND, little Gravel, trace Silt at 12 feet.	11	70		
				60		SAND AND GRAVEL			
				41					
				37		12.0			
						F/C SAND			
	007	4/0	13-13.3	100/4	No recovery.				3.
					Bottom of boring at 13.3 feet.	13.3			
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened forVOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 13.3 feet below ground surface. Bore hole grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-11
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER G.Garfield/M.Jacobs/S.Sokol

BORING LOCATION Approximately 45 feet north of piggery
GROUND SURFACE ELEVATION 228.8 DATUM MSL
DATE START 1/6/89 DATE END 1/6/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/6	Dry	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/20	0-2	20	Brown, fine SAND, little Silt from 0-1.5 feet grading to fine to coarse SAND, little Silt, trace Gravel. Organics present to 2 feet. Occasional iron staining. Dry. FILL.	F/C SAND (FILL)	<1		1. 2. 3.
				32					
				7					
				12					
	002	24/0	2-4	6	Very dense, dark brown, fine to coarse SAND, some Gravel, trace Silt with sand-sized blue chips. FILL.	2.0	<1		4.
	002A	24/16	2-4	48			<1		
				12					
				16		SAND AND GRAVEL (FILL)			
	003	24/0	4-6	11	Medium dense, dark brown, fine to coarse SAND, some Gravel, little Silt with wood fragments and red chips. Moist. FILL.		<1		5.
5	003A	24/10	4-6	11			<1		
				6					
				8		6.0			
	004	24/12	6-8	25	Medium dense, light brown, fine SAND, little Silt grading to fine SAND, trace Silt, little Gravel. Moist.		<1		
				18					
				8					
				33		FINE SAND			
	005	24/23	8-10	35	Very dense, dark brown, fine SAND, little Silt, little Gravel with a tacky consistancy from 8-9 feet. Wet. Gray, powdered gravel from 9-10 feet. Moist.		<1		
				37		9.0			
				59					
				66		FINE TO COARSE SAND AND GRAVEL			
10	006	24/18	10-12	24	Very dense, light brown, fine to coarse SAND, some Gravel, little Silt, intermixed with gravel fragments. Moist.		<1		
				30					
				41					
				51					
						12.2			
					Bottom of boring at 12.2 feet.				6. 7.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Frost penetration observed to 1.2 feet.
3. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
4. No recovery. Sample description from adjacent boring approximately 1.5 feet north of BE-11.
5. No recovery of undisturbed sample. Approximately 4" of soil from upper strata had fallen in hole prior to a gravel fragment being lodged in sampler. Sample description based on adjacent boring.
6. Auger refusal encountered at 12.2 feet.
7. Bore holes grouted to ground surface upon completion of sampling

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-12
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/S.Sokol/T.Stone

BORING LOCATION Ten feet north of berm and 40 feet west of BE-3.
GROUND SURFACE ELEVATION 218.6 DATUM MSL
DATE START 12/30/88 DATE END 12/30/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/30	GS	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	001	23/12	0-1.9	4	Loose, light brown, fine to coarse SAND, little Silt, with red staining. Wet.		<1		1. 2.
				3					
				4					
				100/5		FINE TO COARSE SAND			
	002	24/19	2-4	13	Dense, light brown, fine to coarse SAND, little Silt with red staining, black mottling. Wet.		<1		3.
				16					
				24					
				90					
	003	24/20	4-6	51	Dense, fine to coarse SAND, trace Silt with approximately 9 inches of fractured biotic granofels (boulder) changing to fine SAND and SILT.		<1		
5				25		5.2			
				28					
				25					
	004	24/19	6-8	15	Medium dense, brown, fine SAND and SILT with red staining. Wet.	FINE SAND AND SILT	1		
				15					
				15					
				19					
						8.5	<1		
	005	24/14	8.5-10.5	14	Dense, fine SAND, some Gravel, little Silt. Wet.	GRAVELLY SAND			
				17					
10				20					
				23		10.5	1		4.
	006	22/19	10.5-12.5	17	Very dense, brown, fine SAND, some Silt, little Gravel. Wet.	SILTY SAND			
				21					
				42					
				100/4					5.
					Bottom of boring at 12.5 feet.				6.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 2.5 feet. Relocated boring approx. 4 feet north of original location and continued sampling below 2.5'.
4. Gravel fragment lodged in tip of sampler.
5. Auger refusal encountered at 12.5 feet.
6. Bore holes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-13
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M. Jacobs

BORING LOCATION Ten feet south of berm at access road
GROUND SURFACE ELEVATION 218.0 DATUM MSL
DATE START 1/4/89 DATE END 1/5/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/4	2.0	GS	During drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	001	24/19	0-2	5	Medium dense, brown, fine to coarse SAND, little Gravel, changing to brown, fine to medium SAND at 1.5 feet. Organics. Moist.	TOPSOIL			1.
				6					
				7		F/C SAND			
				5		2.0			
	002	24/16	2-4	14	Very dense, brown, fine to medium SAND and GRAVEL, trace Silt. Iron stained. Wet.				2.
				55		SAND AND GRAVEL			3.
				86					
				83					
	003	30/24	4-6.5	16	Very dense, dark brown, fine to medium SAND and fine to coarse GRAVEL, changing to fine to medium SAND, trace Gravel, trace Silt at 4.7 feet, then changing to gray SILT and fine SAND at 5.5 feet. Moist.	4.7			
5				27		F/M SAND			
				18		5.5			
				33		SILT & SAND			
				44					
	004	24/16	6.5-7.5	15	Very dense, gray, fine to coarse SAND, some Silt, some Gravel, changing to fine SAND and SILT, some Gravel at 8 feet. Black mottling. Wet.	SILTY SAND			
				21					
				29		8.0			
				31		SAND/SILT			
	005	24/16	8.5-10.5	24	Dense, gray, fine to medium SAND and GRAVEL, some Silt, with black mottling.	8.5			
				19		SAND AND GRAVEL			
10				26					
				29					
	006	20.5/13	10.5-12.2	23	Very dense, gray and brown, fine SAND, little Silt, trace Gravel. Wet.	10.5			
				28		FINE SAND			
				68					
				50/2.5		12.3			
	007	1.5/1.5	12.3/12.5	50/1.5	Gray, fine to coarse SAND, little Silt, trace Gravel. Wet.	F/C SAND			
					Bottom of boring at 13.5 feet	13.5			4.
									5.
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Auger refusal encountered at 2.5 feet. Relocated soil boring and continued sampling below 2.5 feet.
3. Gravel fragment lodged in tip of sampler.
4. Auger refusal encountered at 13.5 feet.
5. Bore holes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-14
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood/S.Sokol

BORING LOCATION Approximately 40' south of swale
GROUND SURFACE ELEVATION 217.5 DATUM MSL
DATE START 1/3/89 DATE END 1/4/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/3	3.0	GS	During drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (In)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/12	0-2	3	Dense, brown, fine to medium SAND, trace Silt, trace Gravel, with plastic facets and red staining. Dry. FILL.	FINE TO MEDIUM SAND (FILL)	2		1. 2.
				21					
				11					
				10					
	002	24/19	2-4	7	Dense, grayish black, fine SAND, little Silt, trace Gravel with Organics, changing to fine to coarse SAND, some Gravel at 3.7 feet. Wet.	2.5 FINE SAND	110		
				17					
				30					
				73					4.
	003	8/5	4-4.7	71	Grayish brown, fine to coarse SAND, little Gravel. Wet.	F/C SAND	60		
5				50/2					3.
	004	21/13	5.8-7.6	9	Very dense, gray, fine to medium SAND, little Silt with mottling and red staining, changing to olive-gray SILT and fine SAND, at 6.5 feet. Wet.	5.8 F/M SAND	200		
				5					
				48		6.5 SILTY SAND			
				50/3		8.0			
	005	24/17	7.8-9.8	10	Very dense, olive-gray, fine to coarse SAND, little Gravel, trace Silt. Wet.		180		5.
				30					
				23					
				19					
10	006	24/17	9.8-11.8	17	Very dense, olive-gray, fine to medium SAND, some Gravel, trace Silt, with black staining.	GRAVELLY SAND	30		
				27					
				40					
				41		12.5			
	007	24/14	12.5-14.5	32	Very dense, olive, fine SAND, some Silt, trace Gravel. Wet.		15		
				32					
				44		SILTY SAND			
				63					
15	008	10/0	14.5-15.3	28	No recovery.	15.3			6.
				100/4					
					Bottom of boring at 15.3 feet.				7.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Auger refusal encountered at 5 feet. Relocated boring 4 feet west of original location and continued sampling.
4. Obstruction augered through from 4.5 to 5.5 feet.
5. Gravel fragment lodged in tip of sampler.
6. Split spoon refusal encountered at 15.3 feet.
7. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-15
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs

BORING LOCATION 110' north of piggery at rock pile
GROUND SURFACE ELEVATION 215.2 DATUM MSL
DATE START 1/9/89 DATE END 1/9/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/9	4.5	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/22	0-2	15	Medium dense, brown, fine to medium SAND some Silt, trace Gravel. Moist below 1.5 feet.	TOPSOIL 0.5	10		1. 2.
				9					
				6					
				4					
	002	24/16	2-4	3	Loose, brown, fine to medium SAND, some Silt, trace Gravel, grading to fine to medium Sand, trace Silt, trace Gravel with iron staining from 3 to 3.5 feet.		300		
				4		SILTY SAND			
				6		3.5			
				7	Bottom 7 inches of sample contained gray, fine SAND, little Silt, trace Gravel. Moist.				
	003	4/4	4-4.3	100/4			260		
5					Gray, fine SAND, little Silt, trace Gravel. Moist.				
						FINE SAND			
	004	24/13	6-8	17	Very dense, gray, fine SAND, little Silt, trace Gravel with black mottling in last 5 inches of sample. Wet.		240		
				27					
				30					
				27		8.0			
	005	24/13	8-10	24	Very dense, gray, fine to medium SAND, some Gravel, little Silt with black mottling.		20		
				35					
				60					
				48					
10		11/0	10-10.9	27	No recovery.				3.
				100/5		GRAVELLY SAND			
		2/0	12-12.2	100/2	No recovery.				
		9/0	13-13.7	42	No recovery.	14.0			
				100/3	Bottom of boring at 14 feet.				
15									4. 5.

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Approximately 6" plug in augers prior to sampling. Wash in spoon.
4. Auger refusal encountered at 14 feet.
5. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-16
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs, E.Wood, S.Sokol

BORING LOCATION Center of access road, north of swale.
GROUND SURFACE ELEVATION 217.3 DATUM MSL
DATE START 12/29/88 DATE END 12/29/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/29	3.0	GS	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/10	0-2	11	Organics, leaf litter, topsoil.	TOPSOIL	2		3.
				4	Medium dense, brown, fine SAND, little Silt, trace Gravel, with gray and black mottling and iron staining in lower 6" of sample. Moist.	0.5 FINE SAND			
				7					
				9					
	002	10/8	2-2.8	12	Medium dense, brown, fine SAND, little Silt, with iron staining, black mottling. Moist.	3.0	1		
				100/4					
	003	24/24	3.1-5.1	3	Medium dense, brown, fine SAND, little Silt, grading to gray fine SAND and SILT, trace Gravel with organics and black mottling. Moist. Iron stained in bottom 2" of sample.	SAND AND SILT	<1		4.
				4					
				14					
				31					
5	004	16/12	5-6.3	8	Brown, fine SAND and SILT, trace Gravel, with iron staining, changing to fine to coarse SAND, some Gravel with iron stains and black mottling in bottom 6" of sample Wet.	6.0 GRAVELY SAND	1		5. 6.
				41					
				100/4					
					Bottom of boring at 6.5 feet.	6.5			7. 8.
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Top 6 inches, brick-colored staining in soil and plastic sheeting.
4. Top 5 inches in spoon, most likely blow in.
5. Blow count could be indication of wash in augers.
6. Cobble in bottom of spoon.
7. Auger refusal encountered at 6.5 feet. Moved boring north 5 feet and attempted to auger past 6.5 feet. Refusal encountered at 5 feet. Boring terminated.
8. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-17
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood /S.Sokol

BORING LOCATION 85' north of swale
GROUND SURFACE ELEVATION 220.1 DATUM MSL
DATE START 12/29/88 DATE END 12/29/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/29	Dry	GS	E.O.B.

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/21	0-2	16	Loose,brown, fine to medium SAND, little Silt, with Organics. Dry.	TOPSOIL	<1		1. 2.
				4		.5 FINE TO MEDIUM SAND			
				4					
				4					
	002	16/15	2-3.3	10	Very dense, brown, fine SAND, little Silt trace fine Gravel, with color changing to grayish brown in bottom 6" of sample.	2.0	<1		3.
				72		FINE SAND			
				100/4					
						4.0			4.
5					Bottom of boring at 4.5 feet	4.5			5. 6.
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Cobble lodged in tip of sampler.
4. Hit obstruction at 3.5 feet while augering.
5. Auger refusal at 4.5 feet.
6. Borehole grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-18
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood /S.Sokol

BORING LOCATION SW corner of clearing, 10 feet north of swale
GROUND SURFACE ELEVATION 219.5 DATUM MSL
DATE START 12/29/88 DATE END 12/29/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/29	2.3	GS	one hour

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/19	0-2	9	Medium dense, reddish brown, fine to medium SAND, trace Gravel, trace Silt, iron stained. Dry to one foot.		<1		1. 2.
				7					
				16		FINE TO MEDIUM SAND			
				16					
	002	9/8	2-2.7	27	Medium dense, reddish brown, fine to medium SAND, trace Gravel, trace Silt, with gray mottling. Wet.		<1		3.
				50/3		2.7 BOULDER			
						3.1			
	003	24/15	4-6	24	Very dense, brown, fine to coarse SAND, trace Gravel. Wet.		<1		
5				24		FINE TO			
				28		COARSE SAND			
				34					
	004	10/10	6-6.8	23	Brown, fine to coarse SAND, some Silt, little Gravel. Wet.		1		4.
				100/4					
						8.2			5.
					Bottom of boring at 8.2 feet.				6. 7.
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Obstruction encountered from 2.7 to 3.1 feet.
4. Approximately 7 inches of wash in sampler.
5. Auger refusal encountered at 8.2 feet. Relocated boring approximately 2 feet northeast of original location.
6. Auger refusal encountered at 3 feet. Relocated boring 5 feet southeast of original location. Refusal encountered at 4 feet.
7. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-19
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

BORING LOCATION 30 feet north of piggery, east of access road.
GROUND SURFACE ELEVATION 229.3 DATUM MSL
DATE START 12/28/88 DATE END 12/28/88

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
12/28	Dry	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/16	0-2	29	Very dense, brown, fine to medium SAND, some Gravel, trace Silt. Dry.	TOPSOIL	<1		1.
				97		0.3 GRAVELLY SAND			2. 3.
				30					
				12		2.0			
	002	24/15	2-4	9	Loose, brown, fine SAND, little Silt, trace Gravel, changing color to dark brown in bottom 6" of sample.		<1		
				3					
				2					
				1					
	003	24/12	4-6.5	6	Medium dense, reddish brown, fine SAND, little Silt, trace Gravel. Moist.	FINE SAND	<1		
5				13					
				13					
				16					
	004	16/8	6.5-7.8	19	Brown, fine SAND, little Silt, little Gravel. Moist.		<1		
				51					
				100/4					
		0/0	8.0	100/0	No recovery.	8.0			4.
					Bottom of boring at 8 feet.				
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using a HNu PI-101 photoionization detector.
3. Cobble in bottom of spoon.
4. Split spoon refusal encountered at 8 feet. Boring terminated and borehole grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. BE-20
SHEET 1 OF 1
FILE NO. 6185/812
CHKD. BY

BORING CO. Soil Exploration Corp.
FOREMAN M. Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

BORING LOCATION 57 feet north of the piggery
GROUND SURFACE ELEVATION 218.9 DATUM MSL
DATE START 1/13/89 DATE END 1/13/89

SAMPLER
TYPE: 2" I.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
1/13	Dry	GS	EOB

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM) HNu	EQUIPMENT INSTALLED	REMARKS
	001	24/24	0-2	16	Brown, fine to coarse SAND, some Silt with organics. TOPSOIL.	TOPSOIL	1		1.
				35	Very dense, brown, fine SAND and SILT, little Gravel, with red and green coloration in last 12" of sample. Dry.	FINE SAND AND SILT			2.
				17					
				12		2.5			
	002	24/15	2-4	12	Very dense, brown, fine SAND and SILT, little Gravel with iron staining, changing to fine to coarse Gravel, some fine to coarse SAND, trace Silt in last 9" of sample. Dry.		<1		
				20		SANDY GRAVEL			
				44					
				43		4.0			
	003	15/8	4-5.3	25	Very dense, light brown, fine to coarse SAND and GRAVEL, trace Silt. Dry.	SAND & GRAVEL	<1		3.
5				46					
				50/3		5.3			
	004	15/8	5.3-6.6	19	Dense, light brown, fine SAND, some Silt. Dry.	SILTY SAND	<1		
				38					
				50/2		6.5			
						COBBLES AND BOULDERS			
						9.0			4.
					Bottom of boring at 9 feet.				
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a Mobile B-53 tire-mounted drill rig using 4 1/4" I.D. hollow stem augers.
2. Soil samples were screened for VOC's in the field using HNu PI-101 photoionization detector.
3. Auger refusal encountered at 5.5 feet. Note: 3 additional attempts were made to advance Boring BE-20, all within an approx. 10' radius. Due to tightly nested cobbles and boulders, BE-20 was terminated at 9'
4. Boreholes grouted to ground surface upon completion of sampling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, NH

BORING NO. BE-21
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG

BORING CO. Avalance Soil Exploration, Inc.
FOREMAN Scott Boucette
BALSAM ENGINEER G. Garfield

BORING LOCATION West End of Concrete Pad
GROUND SURFACE ELEVATION 230.0 DATUM MSL
DATE START 9/19/89 DATE END 9/19/89

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
9/19	Dry	GS	End of Boring

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	24/8	0-2	5	Medium dense, orangish Brown, fine to		ND		1
				9	coarse SAND, light Gravel, trace of Silt.				2
				9	Dry.				
				8					
	S-2	24/0	2-4	9	No recovery	FINE TO COARSE SAND			
				11					
				12					
				14					
	S-3	18/18	4-5.5	4	Medium dense, orangish brown, fine to		ND		
				7	medium SAND, trace Silt, changing to				
5				17	orange in bottom 6" of sample.				3
	S-4	18/18	5.5-7.0	16	Very dense, brown, fine to coarse SAND,		ND		
				31	light Gravel, trace Silt with occassional				
				90	silt pockets. Dry.				
	S-5	0/0	7.0	50/0"					
						7.5			4
					Bottom of boring at 7.5 feet.				

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a track mounted Mobile B-47 drill rig using 3 1/4-inch hollow stem augers.
2. Soil samples screened for VOCs using an HNu PI-101 photoionization detector. ND = VOCs not detected above background.
3. Gravel fragment in tip of spoon.
4. Split spoon refusal encountered at 7.0 feet and confirmed with augers at 7.5 feet.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, NH

BORING NO. BE-22
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG

BORING CO. Avalanche Soil Exploration, Inc.
FOREMAN Scott Boucette
BALSAM ENGINEER Gary Garfield

BORING LOCATION South side of concrete and adjacent to MW8D
GROUND SURFACE ELEVATION 230.1 DATUM MSL
DATE START 9/19/89 DATE END 9/19/89

SAMPLER
TYPE: 2" O.D. SPlit Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
9/19	7.5	G.S.	During Drilling

DEPTH (ft.)	SAMPLE NO.	PEN. (in) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	18/12	0-1.5	4	Dense, brown, fine to coarse SAND and		ND		1
				31	Gravel. Trace Silt. Dry.				2
				14					
	S-2	24/8	1.5-3.5	7	Dense, brown, fine to coarse SAND,		ND		
				14	little Gravel, trace Silt. Dry				
				28					
				20		FINE TO COARSE SAND			
	S-3	18/18	3.5-5.0	10	Dense, orangish brown, fine to medium		ND		
				17	SAND, little Gravel, trace Silt. Dry.				
				13					
5				50/0"		5.5			
	S-4	21/21	5.5-2.3	25	Very dense, brown to light brown, fine				
				58	to coarse SAND and GRAVEL, trace Silt.	SAND AND GRAVEL			
				40	Dry.				
				50/3"		7.5			
	S-5	24/15	7.5-9.5	25	Very dense, brown, fine to medium SAND,		ND		
				40	little Gravel, trace Silt. Wet.	FINE TO MEDIUM SAND			
				40					
				20					
10	S-6	9/9	9.5-10.3	14	Brown, fine to medium SAND, little		ND		
				50/3"	Grave, trace Silt. Wet.				
						11.0			
					Bottom of boring at 11.0 feet.				3
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a track mounted Mobile B-47 drill rig using 3 1/4-inch hollow stem augers.
2. Soil samples screened for VOCs using an HNu PI-101 Photoionization detector. ND = VOCs not detected above background.
3. Split spoon refusal encountered at 10.3 feet, confirmed with auger at 11.0 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, NH

BORING NO. BE-23
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG

BORING CO. Avalanche Soil Exploration, Inc.
FOREMAN Scott Boucette
BALSAM ENGINEER G. Garfield/D. Coleman
BORING LOCATION Southeast corner of concrete pad
GROUND SURFACE ELEVATION 230.7 DATUM MSL
DATE START 9/19/89 DATE END 9/19/89

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
9/19	Dry	GS	End of boring

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	SAMPLE DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	24/16	0-2	6	Medium dense, brown, fine SAND, trace		ND		1
				7	Silt, trace Gravel with organics in				2
				6	top 3 inches. Dry. FILL.				
				14		FINE SAND			
	S-2	24/14	2-4	6	Dense, brown and tan, fine SAND, trace		ND		
				12	Silt, trace Gravel. Dry. FILL.				
				24					
				14					
	S-3	9/4	4-4.8	40	Tan, fine SAND, little Gravel, trace		ND		
5				50/3"	Silt. Moist				3
						5.5			
					Bottom of boring at 5.5 feet.				4
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:
1. Boring advanced with a track mounted Mobile B-47 drill rig using 3 1/4-inch hollow stem augers.
2. Soil samples screened for VOCs using an HNu PI-101 Photoionization detector. ND = VOCs not detected above background.
3. Rain and humidity appear to be affecting HNu. Sample S-3 screened in the field for VOCs using Foxboro Model 128 OVA.
4. Split spoon refusal encountered at 4.5 feet and confirmed with auger refusal at 5.5 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, NH

BORING NO. BE-24
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG

BORING CO. Avalanche Soil Exploration, Inc.
FOREMAN Scott Boucette
BALSAM ENGINEER G. Garfield/D. Coleman

BORING LOCATION East side of concrete pad
GROUND SURFACE ELEVATION 230.6 DATUM MSL
DATE START 9/19/89 DATE END 9/19/89

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
9/19	Dry	GS	End of Boring

DEPTH (ft.)	SAMPLE NO.	PEN. (In) / REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	21/6	0-1.8	12	Medium dense, brown, fine to medium SAND,		ND		1
				20	little Gravel, trace Silt with organics				2
				19	in top 2 inches. Dry. FILL.				
				50/3"					
	S-2	24/19	2-4	30	Very dense, brown, fine to medium SAND,	FINE TO	ND		3
				50	little Gravel, trace Silt. Dry. FILL.	COARSE			
				30		SAND			
				58		(FILL)			
	S-3	11/10	4-4.9	40	Brown to tan, fine to coarse SAND, little		ND		
				64/5"	Gravel, trace Silt. Dry. FILL.				
5	S-4	18/16	5-6.5	35	Very dense, brown, fine to coarse SAND,		ND		
				50	little Gravel. Concrete fragments.				
				102	Dry. FILL.				
						7.0			
					Bottom of boring at 7.0 feet.				4
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a track mounted Mobile B-47 drill rig using 3 1/4-inch hollow stem augers.
2. Soil samples screened for VOCs in the field using a Foxboro Model 128 OVA. ND = VOCs not detected above background.
3. Split spoon refusal encountered at 1.8 feet. Moved 5 feet east and drilled without sampling to 2.0 feet.
4. Split spoon refusal encountered at 6.5 feet and confirmed with augers at 7.0 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

SOIL BORING LOG

PROJECT: Mottolo RI/FS
Raymond, NH

BORING NO. BE-25
SHEET 1 OF 1
FILE NO. 6185/817
CHKD. BY GMG

BORING CO. Avalance Soil Exploration, Inc.
FOREMAN Scott Boucette
BALSAM ENGINEER G. Garfield/D. Coleman

BORING LOCATION North side of concrete pad
GROUND SURFACE ELEVATION 229.9 DATUM MSL
DATE START 9/19/89 DATE END

SAMPLER
TYPE: 2" O.D. Split Spoon
HAMMER: 140 lb.
FALL: 30 in.

GROUND WATER READINGS

DATE	DEPTH	REFERENCE	STABILIZATION TIME
9/19/9	Dry	GS	End of boring

DEPTH (ft.)	SAMPLE NO.	PEN. (in)/REC	DEPTH (ft.)	BLOWS / 6"	SAMPLE DESCRIPTION	STRATM DESC.	FIELD SCREENING (PPM)	EQUIPMENT INSTALLED	REMARKS
	S-1	8/8	0-8	6	Brown, fine to coarse SAND, little Gravel, trace Silt. Dry. FILL.	FINE TO COARSE SAND	ND		1 2
				50/2"					
						1.5			
					Bottom of boring at 1.5 feet.				3
5									
10									
15									

GRANULAR SOILS

BLOWS/ft.	DENSITY
0-4	V. LOOSE
4-10	LOOSE
10-30	M. DENSE
30-50	DENSE
>50	V. DENSE

COHESIVE SOILS

BLOWS/ft.	CONSISTANCY
<2	V. SOFT
2-4	SOFT
4-8	M. STIFF
8-15	STIFF
15-30	V. STIFF
>30	HARD

REMARKS:

1. Boring advanced with a track mounted Mobile B-47 drill rig using 3 1/4-inch hollow stem augers.
2. Soil samples screened for VOCs in the field using a Foxboro Model 128 OVA. ND = VOCs not detected above background.
3. Split spoon refusal encountered at 0.8 feet and confirmed at 1.5 feet with augers. Bedrock exposed at ground surface within 8 feet.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

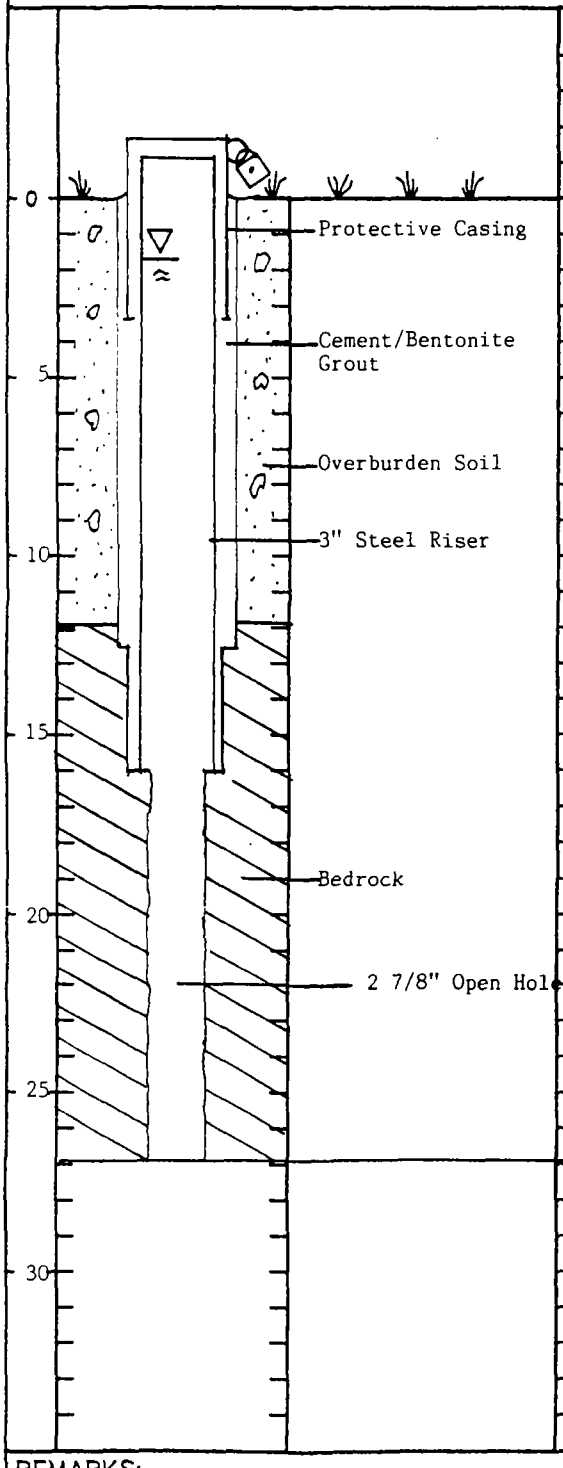
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MO-2DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S.Sokol

WELL LOCATION 50' north of swale at Brook A
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/16/88 DATE COMPLETED 12/27/88



El.	STRATUM DESCRIPTION
191.0	
190.1	
188.4	
	F/M SAND
4.0	
	SILTY SAND
8.0	
	SAND AND GRAVEL
11.9	
172.4	
	BEDROCK
161.5	26.9

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 191.0
TOP OF INNER CASING= 190.1
GROUND SURFACE= 188.4

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: - gal.
RISER PIPE: 17.7 ft.; SCHED. - ; DIA. 3 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 75 gal; RATIO:(cement/bentonite) 6: 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 1.9 ft. below ground surface
BOTTOM OF WELL= 26.9 ft. below ground surface
TOTAL FEET OF WATER= 25 ft.
VOLUME OF WATER= 9.2 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped with a Moyno pump for 30 minutes

VOLUME OF WATER EVACUATED 46 gal.
ESTIMATED YIELD gpm
STABILIZED ph: - CONDUCTIVITY: 0.13 mu/cm
CLARITY/COLOR: Clear

SCREENING RESULTS 8-90 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS No data available to estimate well yield.

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

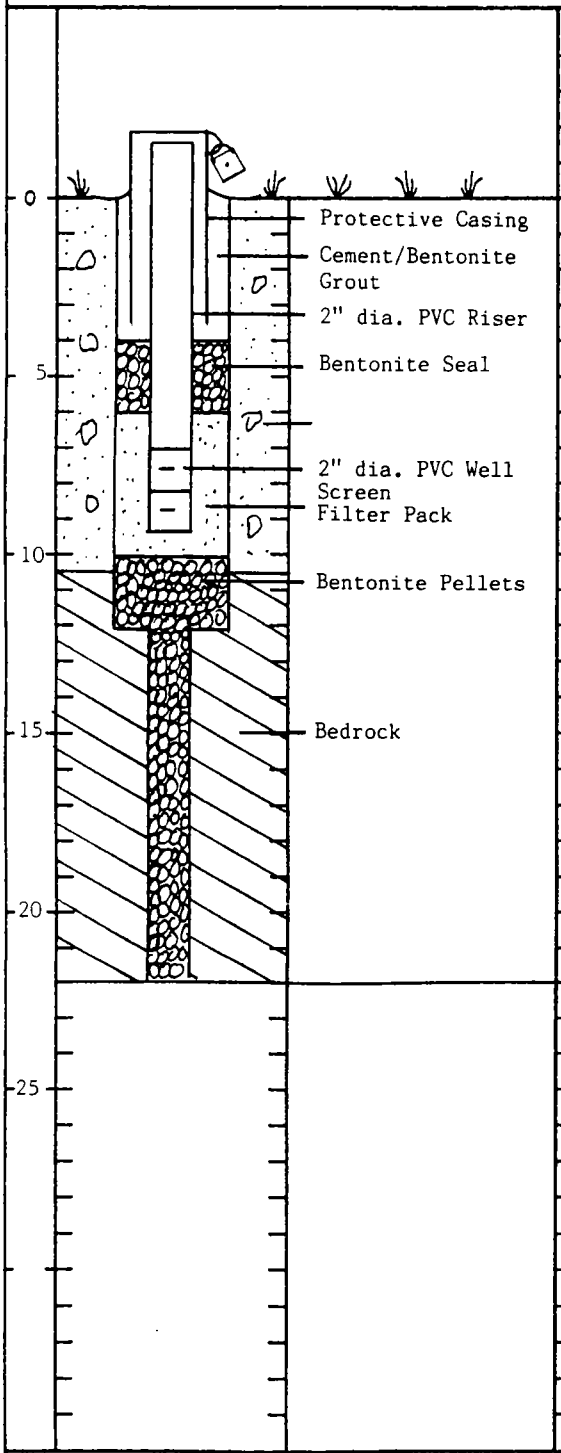
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MO-3SR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION 30' south of swale at Brook A
PURPOSE OF WELL Downgradient Monitoring Well
DATE STARTED 12/22/88 DATE COMPLETED 12/22/88



El.	STRATUM DESCRIPTION
189.6	
189.3	
187.5	
183.5	
181.5	
180.5	F/M SAND
178.0	10.3
175.5	
165.5	22.0 BEDROCK

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 189.6
TOP OF INNER CASING= 189.3
GROUND SURFACE= 187.5

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 8 gal.
RISER PIPE: 8.8 ft.; SCHED. 40; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 2.5 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S.Silica - Mystic White
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 50 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 0.7 ft. below ground surface
BOTTOM OF WELL= 9.5 ft. below ground surface
TOTAL FEET OF WATER= 8.8 ft.
VOLUME OF WATER= 1.4 gal.
DATE DEVELOPED 04/06/89
METHOD OF DEVELOPMENT 1 1/4" bailer

VOLUME OF WATER EVACUATED 17 gal.
ESTIMATED YIELD 0.1 gpm
STABILIZED ph: 6.2 CONDUCTIVITY: -
CLARITY/COLOR: Slightly silty/gray

SCREENING RESULTS - ppm
SCREENING INSTRUMENT -
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

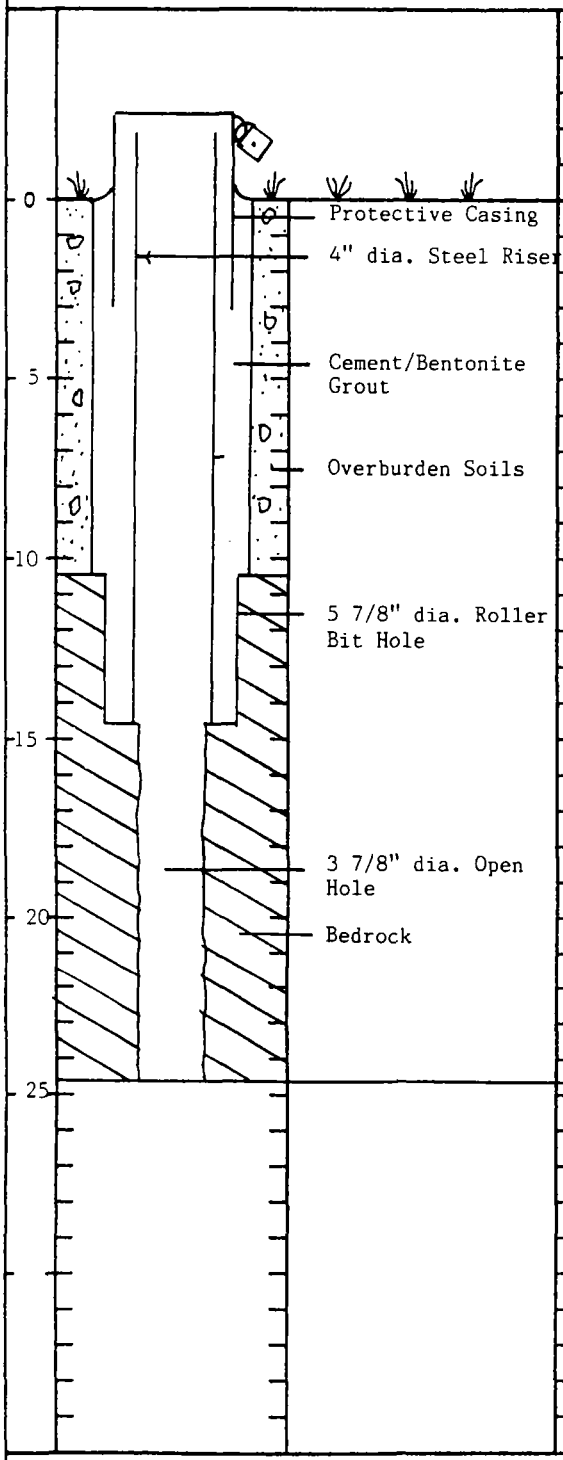
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MO-3DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S.Sokol

WELL LOCATION 20' south of swale at Brook A
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/20/88 DATE COMPLETED 12/23/88



El.	STRATUM DESCRIPTION
191.2	
191.0	
188.1	
	F/M SAND
177.7	10.4
173.4	BEDROCK
163.4	24.7

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 191.2
TOP OF INNER CASING= 191.0
GROUND SURFACE= 188.1

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: - gal.
RISER PIPE: 17.6 ft.; SCHED. - ; DIA. 4 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 55± gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= +2.98 ft. above ground surface
BOTTOM OF WELL= 24.7 ft. below ground surface
TOTAL FEET OF WATER= 27.6 ft.
VOLUME OF WATER= 18.0 gal.
DATE DEVELOPED Well flowing on 04/11/89.
METHOD OF DEVELOPMENT Flowing well developed naturally.
VOLUME OF WATER EVACUATED - gal.
ESTIMATED YIELD - gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: Clear
SCREENING RESULTS - ppm
SCREENING INSTRUMENT -
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

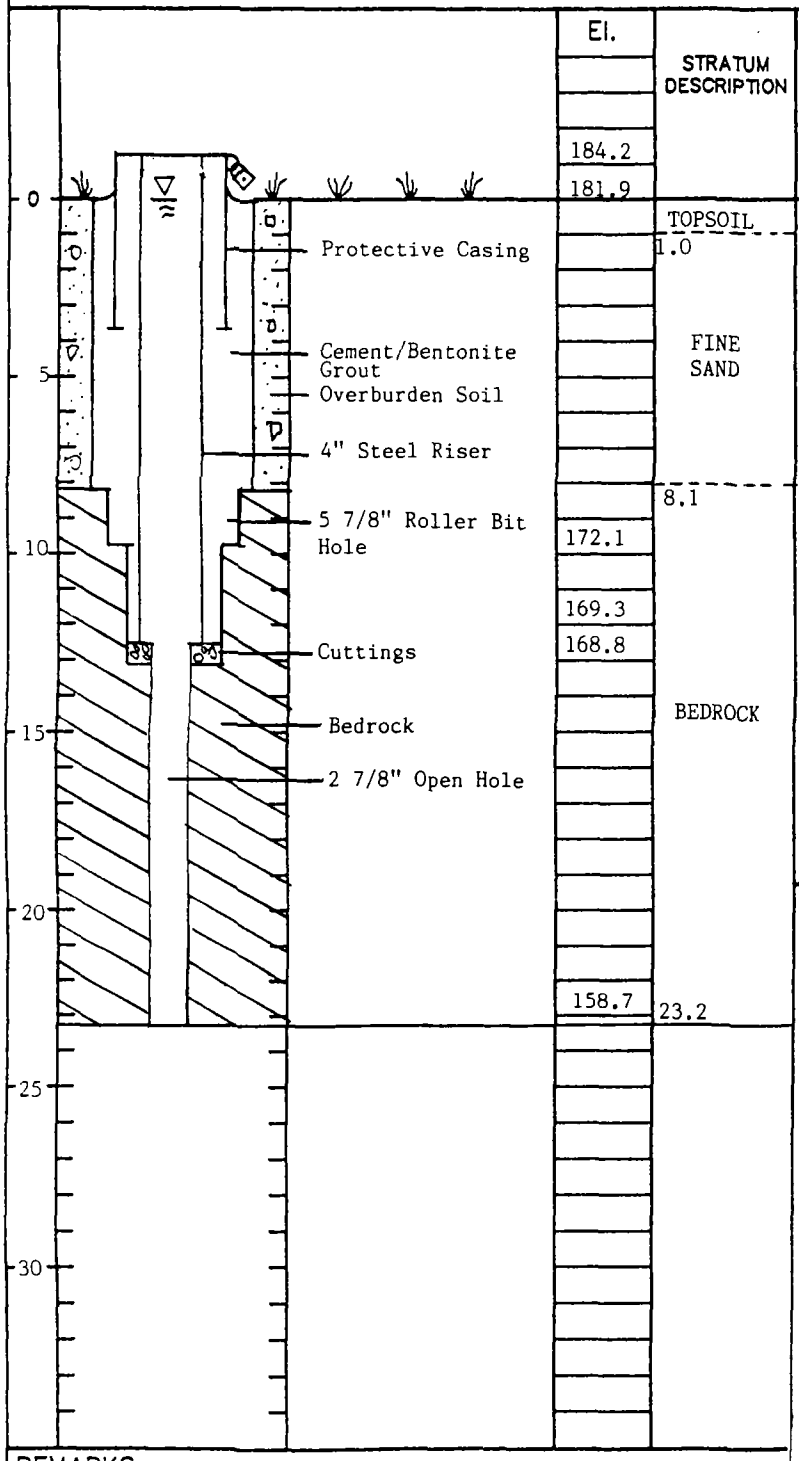
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MO-5DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S.Sokol

WELL LOCATION 210' north of MW-12D
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/7/88 DATE COMPLETED 12/20/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 184.1
TOP OF INNER CASING= 184.2
GROUND SURFACE= 181.9

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: _____ gal.
RISER PIPE: 14.9 ft.; SCHED. - ; DIA. 3 in.
MATERIAL TYPE: Steel
MANUFACTURER: _____
WELL SCREEN: - ft.; SLOT SIZE _____ in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 65 gal; RATIO: (cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER: _____

WELL DEVELOPMENT DETAILS

WATER LEVEL= 0.3 ft. below ground surface
BOTTOM OF WELL= 23.2 ft. below ground surface
TOTAL FEET OF WATER= 22.9 ft.
VOLUME OF WATER= 12 gal.
DATE DEVELOPED 1/20/89
METHOD OF DEVELOPMENT
Pumped with a Moyno pump for 70 minutes

VOLUME OF WATER EVACUATED 110 gal.
ESTIMATED YIELD 1 gpm
STABILIZED ph: 5.7 CONDUCTIVITY: 0.26 mu cm
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS Purged water placed in 55 gallon drums and screened 3 days after well development.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

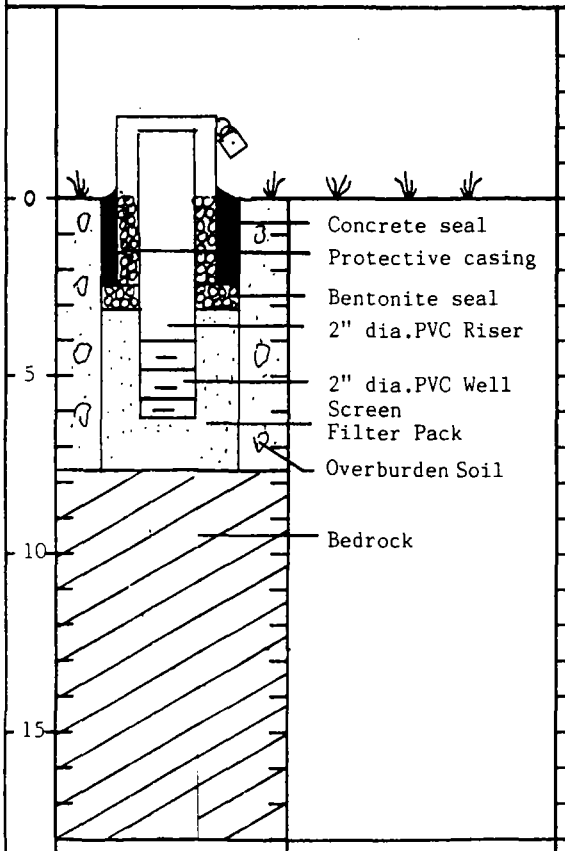
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-7S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY M.Jacobs/T.Stone

WELL LOCATION 90' west of concrete pad
PURPOSE OF WELL Monitoring well
DATE STARTED 11/18/88 DATE COMPLETED 11/21/88



El.	STRATUM DESCRIPTION
230.8	
229.8	
228.6	
	F/M SAND
226.1	2.0
225.4	F/M SAND
224.6	
222.5	
221.1	7.5
	BEDROCK
210.6	18.0

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 230.8
TOP OF INNER CASING= 229.8
GROUND SURFACE= 228.6

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 5 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 5 gal.
RISER PIPE: 5.2 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 2.1 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 75 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 2.9 ft. below ground surface
BOTTOM OF WELL= 5.6 ft. below ground surface
TOTAL FEET OF WATER= 2.7 ft.
VOLUME OF WATER= 0.4 gal.
DATE DEVELOPED 04/07/89
METHOD OF DEVELOPMENT 1 1/4" bailer

VOLUME OF WATER EVACUATED 2.3 gal.
ESTIMATED YIELD NA gpm
STABILIZED ph: 7.3 CONDUCTIVITY: -
CLARITY/COLOR: clear

SCREENING RESULTS - ppm
SCREENING INSTRUMENT -
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

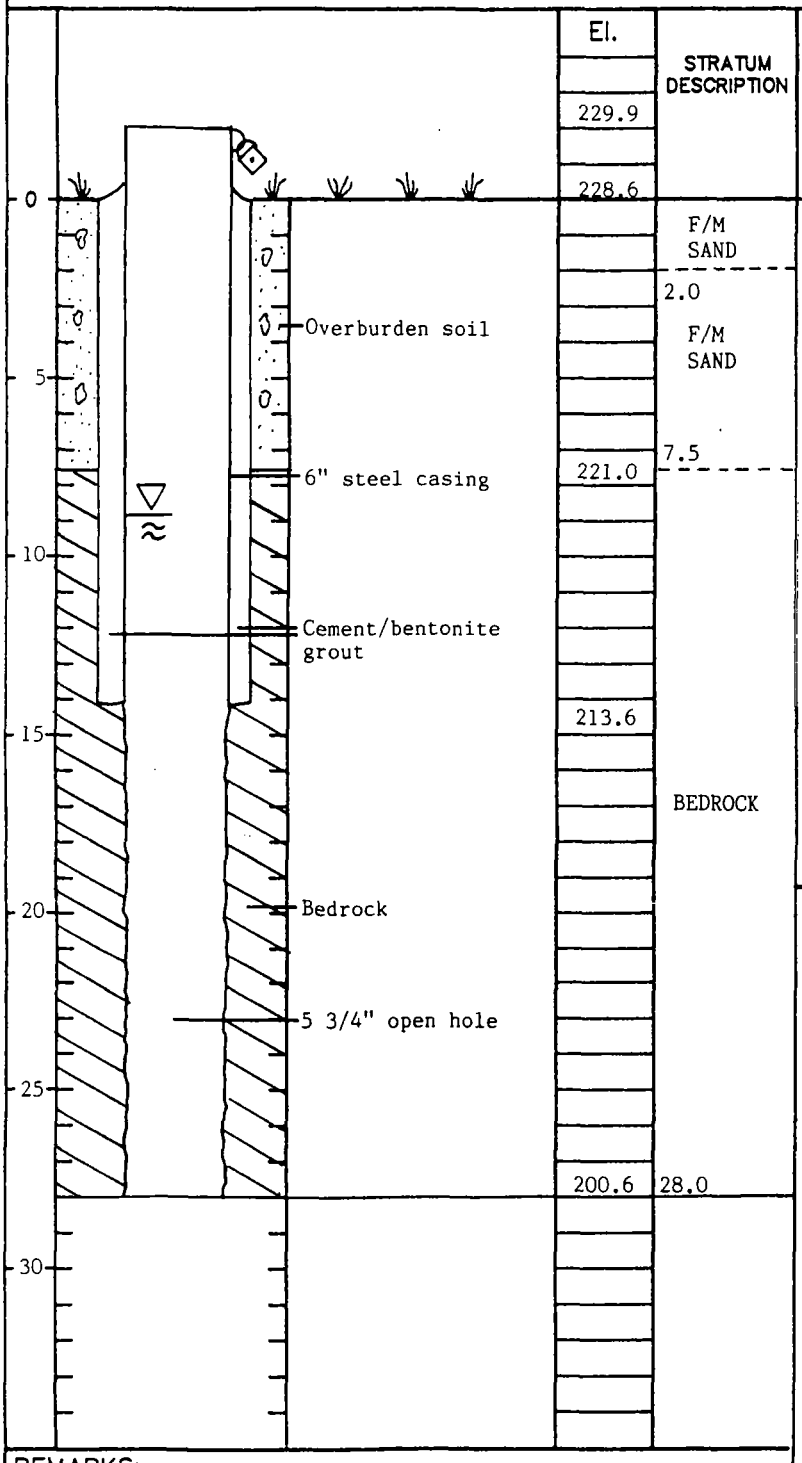
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-7D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY R. Wozmak

WELL LOCATION 80' west of concrete pad
PURPOSE OF WELL Upgradient Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/6/88



El.	STRATUM DESCRIPTION
229.9	
228.6	F/M SAND
2.0	F/M SAND
7.5	
221.0	
213.6	BEDROCK
200.6	28.0

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 229.9
TOP OF INNER CASING= None installed
GROUND SURFACE= 228.7

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: - ft; INSIDE DIA. - in.
CONCRETE SEAL: - gal.
RISER PIPE: 15.3 ft.; SCHED. - ; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER: -
WELL SCREEN: - ft.; SLOT SIZE - in.
COUPLINGS: TYPE -
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 45 gal; RATIO: (cement/bentonite) 20 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 9.0 ft. below ground surface
BOTTOM OF WELL= 28.0 ft. below ground surface
TOTAL FEET OF WATER= 19.0 ft.
VOLUME OF WATER= 28 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped dry with a Moyno pump after 15 minutes.
No recharge after 25 minutes
VOLUME OF WATER EVACUATED 27 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: -

SCREENING RESULTS 4 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

REMARKS:

Stratum description obtained from log of soil boring MW-7S.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

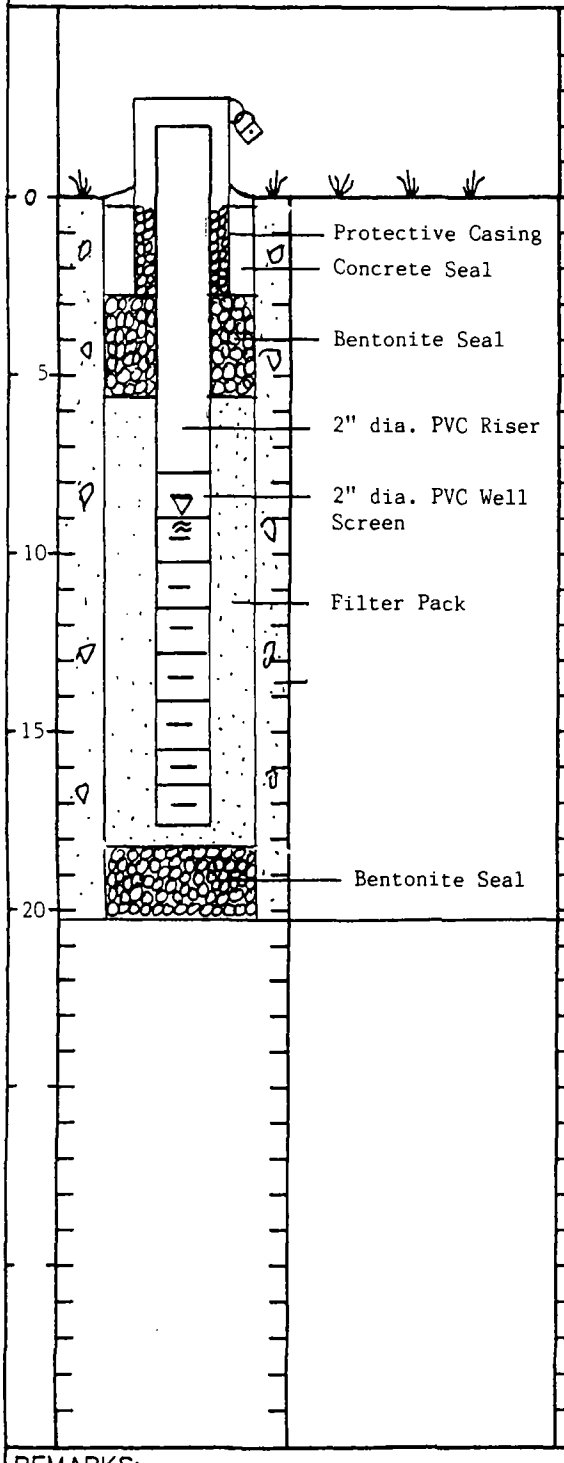
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-8S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION 20' south of concrete pad
PURPOSE OF WELL Upgradient Monitoring Well
DATE STARTED 11/22/88 DATE COMPLETED 11/29/88



El.	STRATUM DESCRIPTION
232.2	
231.5	
230.3	
227.5	F/M SAND
224.5	6.0
222.5	SILTY SAND
	8.6
	SILTY SAND, COBBLES AND BOULDERS
212.5	
212.2	
210.0	20.3

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 232.2
TOP OF INNER CASING= 231.5
GROUND SURFACE= 230.3

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 5 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 5 gal.
RISER PIPE: 9 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 10 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO: (cement/bentonite) - : -
BENTONITE SEAL: 150 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 8.8 ft. below ground surface
BOTTOM OF WELL= 18.3 ft. below ground surface
TOTAL FEET OF WATER= 9.6 ft.
VOLUME OF WATER= 1.6 gal.
DATE DEVELOPED 1/20/89
METHOD OF DEVELOPMENT Bailed 1 hour and pumped for 37 minutes with a 1½" centrifugal pump

VOLUME OF WATER EVACUATED 28 gal.
ESTIMATED YIELD 0.2 gpm
STABILIZED ph: 6.8 CONDUCTIVITY: 0.16 $\frac{mu}{cm}$
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

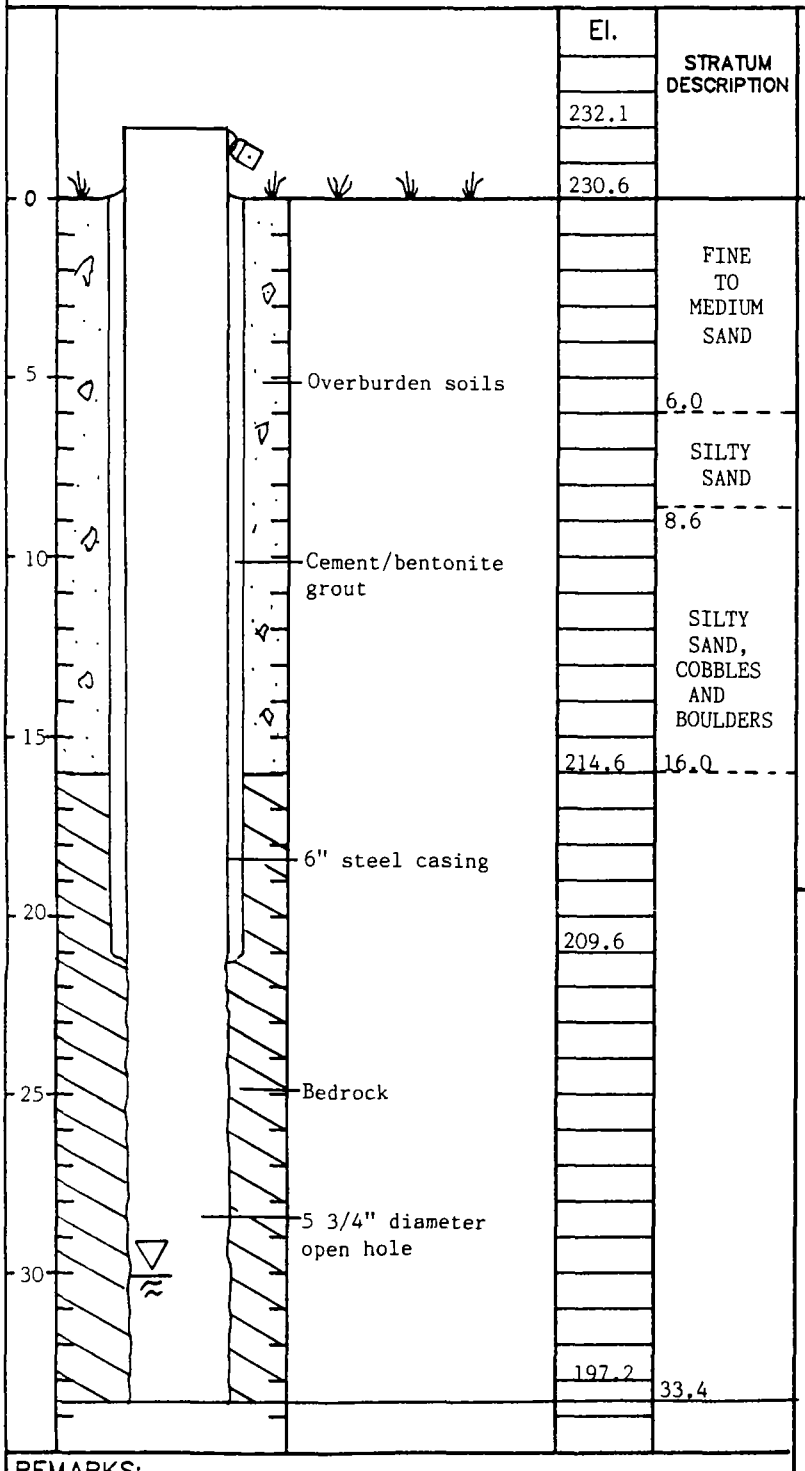
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-8D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY R.Wozmak

WELL LOCATION ' 20' south of concrete pad
PURPOSE OF WELL Upgradient Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/6/88



REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 232.1
TOP OF INNER CASING= None installed
GROUND SURFACE= 230.6

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: - ft; INSIDE DIA. - in.
CONCRETE SEAL: - gal.
RISER PIPE: 22.5 ft.; SCHED. - ; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER: -
WELL SCREEN: - ft.; SLOT SIZE - in.
COUPLINGS: TYPE -
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 45 gal; RATIO:(cement/bentonite) 20 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 30.2 ft. below ground surface
BOTTOM OF WELL= 33.4 ft. below ground surface
TOTAL FEET OF WATER= 3.2 ft.
VOLUME OF WATER= 4.3 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Hand bailed with a 3" PVC bailer
VOLUME OF WATER EVACUATED 8 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: -
SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

REMARKS:

Bedrock encountered approximated 4.3 feet deeper than in boring MW-8S.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

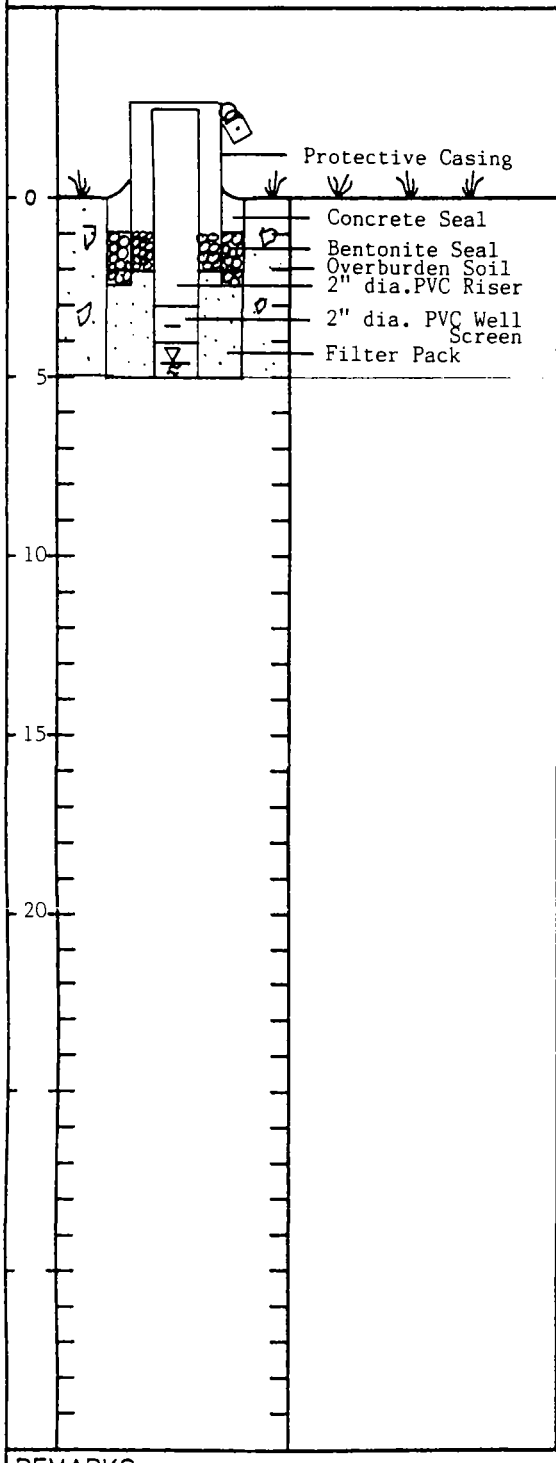
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-9S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield

WELL LOCATION 100' southeast of piggery
PURPOSE OF WELL Upgradient Monitoring Well
DATE STARTED 11/9/88 DATE COMPLETED 11/10/88



El.	STRATUM DESCRIPTION
221.4	
221.3	
218.6	
217.6	F/M SAND
215.6	SAND AND GRAVEL
213.6	BEDROCK

1.0
5.0

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 221.4
TOP OF INNER CASING= 221.3
GROUND SURFACE= 218.6

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 5 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 3 gal.
RISER PIPE: 5.7 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 2 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 30 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 4.5 ft. below ground surface
BOTTOM OF WELL= 4.8 ft. below ground surface
TOTAL FEET OF WATER= 0.3 ft.
VOLUME OF WATER= .05 gal.
DATE DEVELOPED 12/12/88
METHOD OF DEVELOPMENT
Hand bailed with a 1 1/4" PVC bailer

VOLUME OF WATER EVACUATED <1 gal.
ESTIMATED YIELD <.1 gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS - ppm
SCREENING INSTRUMENT -
ADDITIONAL COMMENTS MW-9S bailed dry

REMARKS:

Depth to bedrock based on adjacent boring MW-9D.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

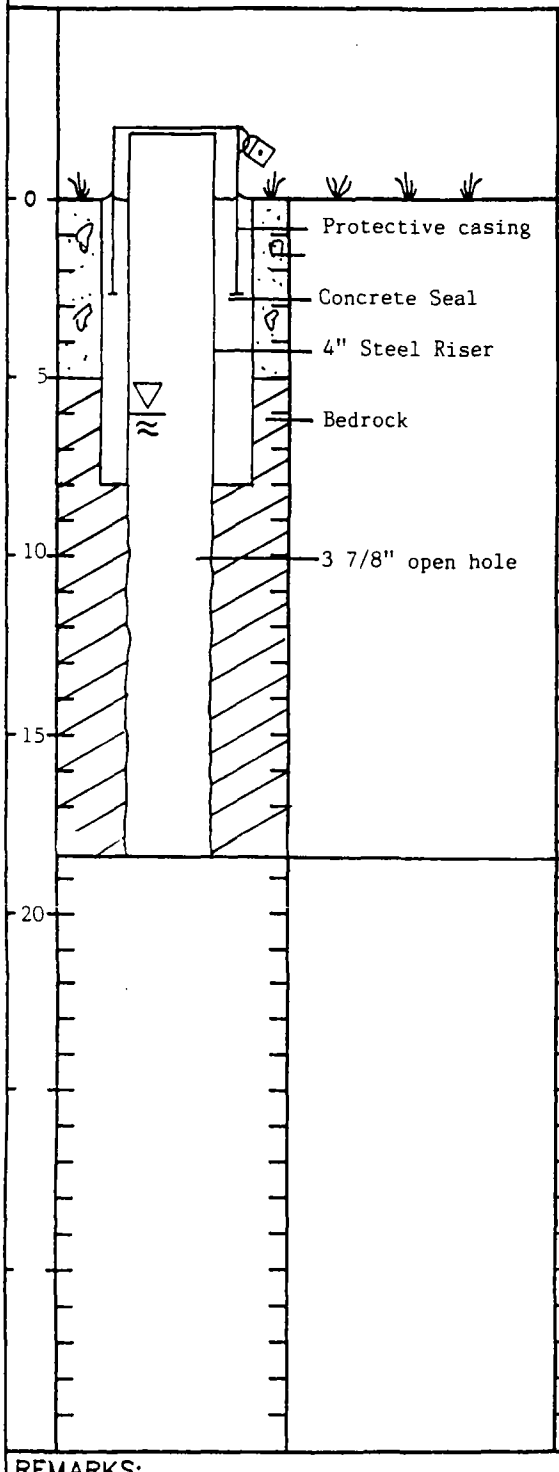
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-9D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield

WELL LOCATION 100' southeast of piggery
PURPOSE OF WELL Upgradient monitoring well
DATE STARTED 11/10/88 DATE COMPLETED 12/1/88



El.	STRATUM DESCRIPTION
221.5	
219.0	F/M SAND
	1.0 SAND AND GRAVEL
214.0	5.0
211.0	BEDROCK
200.6	18.4

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 221.4
TOP OF INNER CASING= 221.5
GROUND SURFACE= 219.0

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 5 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: 45 gal.
RISER PIPE: 10.5 ft.; SCHED. ; DIA. 4 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: - gal; RATIO:(cement/bentonite) :
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 6.1 ft. below ground surface
BOTTOM OF WELL= 17.3 ft. below ground surface
TOTAL FEET OF WATER= 11.2 ft.
VOLUME OF WATER= 7 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped intermittantly for 30 minutes with centrifugal pump
VOLUME OF WATER EVACUATED 11 gal.
ESTIMATED YIELD 0.1 gpm
STABILIZED ph: 6.8 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT OVA - 128
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

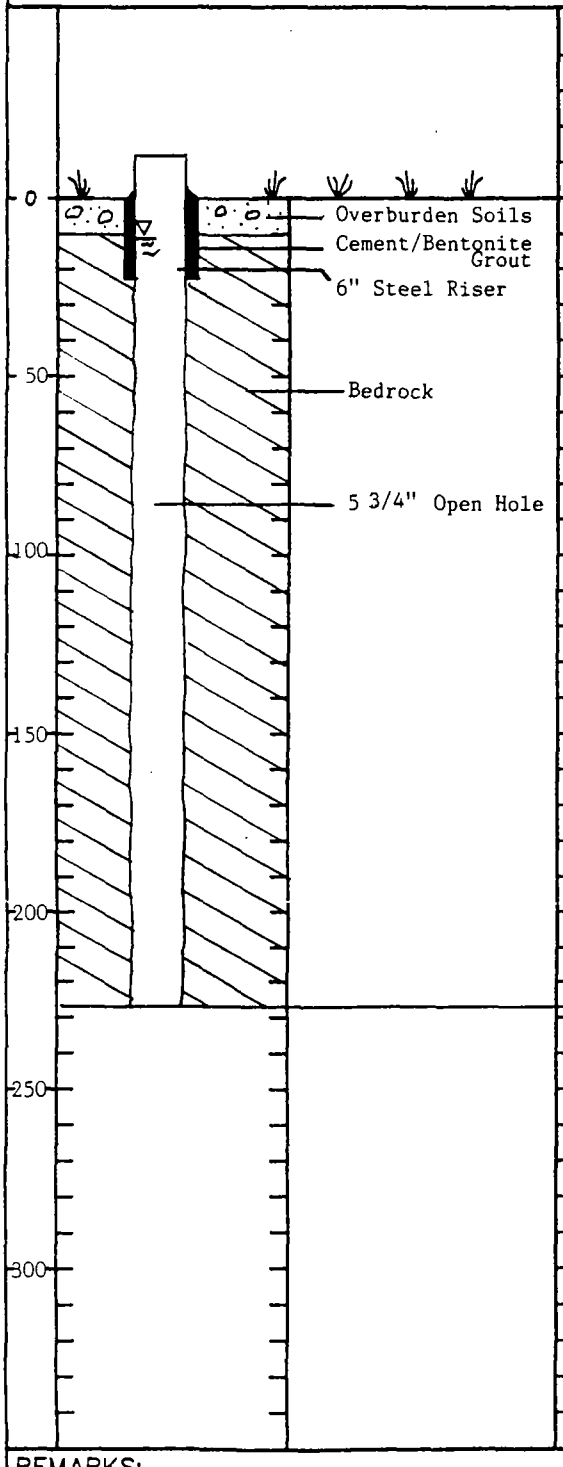
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-10D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY T. Stone/R. Wozmak

WELL LOCATION Blake Road Extension
PURPOSE OF WELL Off-site Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/7/88



El.	STRATUM DESCRIPTION
258.0	
257.0	
	OVERBURDEN
234.5	11.0
	BEDROCK
30.58	
	226.4

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 258.0
TOP OF INNER CASING= None installed
GROUND SURFACE= 257.0

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: - ft; INSIDE DIA. ____ in.
CONCRETE SEAL: - gal.
RISER PIPE: 23.5 ft.; SCHED. - ; DIA. 6.0 in.
MATERIAL TYPE: Steel
MANUFACTURER: ____
WELL SCREEN: - ft.; SLOT SIZE ____ in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 85 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER: ____

WELL DEVELOPMENT DETAILS

WATER LEVEL= 11.8 ft. below ground surface
BOTTOM OF WELL= 226.4 ft. below ground surface
TOTAL FEET OF WATER= 214.6 ft.
VOLUME OF WATER= 290 gal.
DATE DEVELOPED 1/25/89
METHOD OF DEVELOPMENT
Pumped for 75 minutes with a Grundfos 4" submersible pump. Pump at well bottom.
VOLUME OF WATER EVACUATED 540 gal.
ESTIMATED YIELD 2 gpm
STABILIZED ph: 9.5 CONDUCTIVITY: 0.14
CLARITY/COLOR: Slightly turbid

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS ____

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

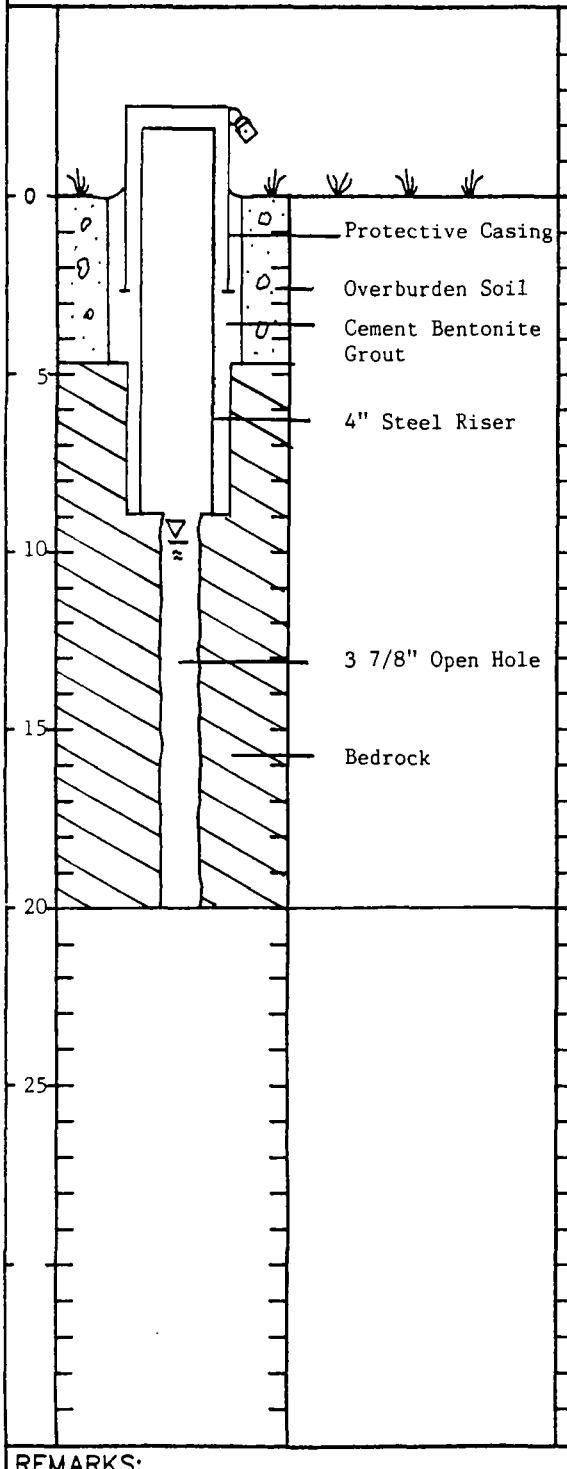
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-11D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION 140' north of swale
PURPOSE OF WELL On-site monitoring well
DATE STARTED 11/30/88 DATE COMPLETED 12/7/88



El.	STRATUM DESCRIPTION
222.9	
221.7	
220.2	FINE TO MEDIUM SAND
215.4	4.8
211.2	BEDROCK
200.2	20.0

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 222.9
TOP OF INNER CASING= 221.7
GROUND SURFACE= 220.2

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: - gal.
RISER PIPE: 10.3 ft.; SCHED. ; DIA. 4 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 30 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 9.7 ft. below ground surface
BOTTOM OF WELL= 17.6 ft. below ground surface
TOTAL FEET OF WATER= 7.9 ft.
VOLUME OF WATER= 5.2 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for approximately 15 minutes.
VOLUME OF WATER EVACUATED 25 gal.
ESTIMATED YIELD 1 gpm
STABILIZED ph: 6.1 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT OVA - 128
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

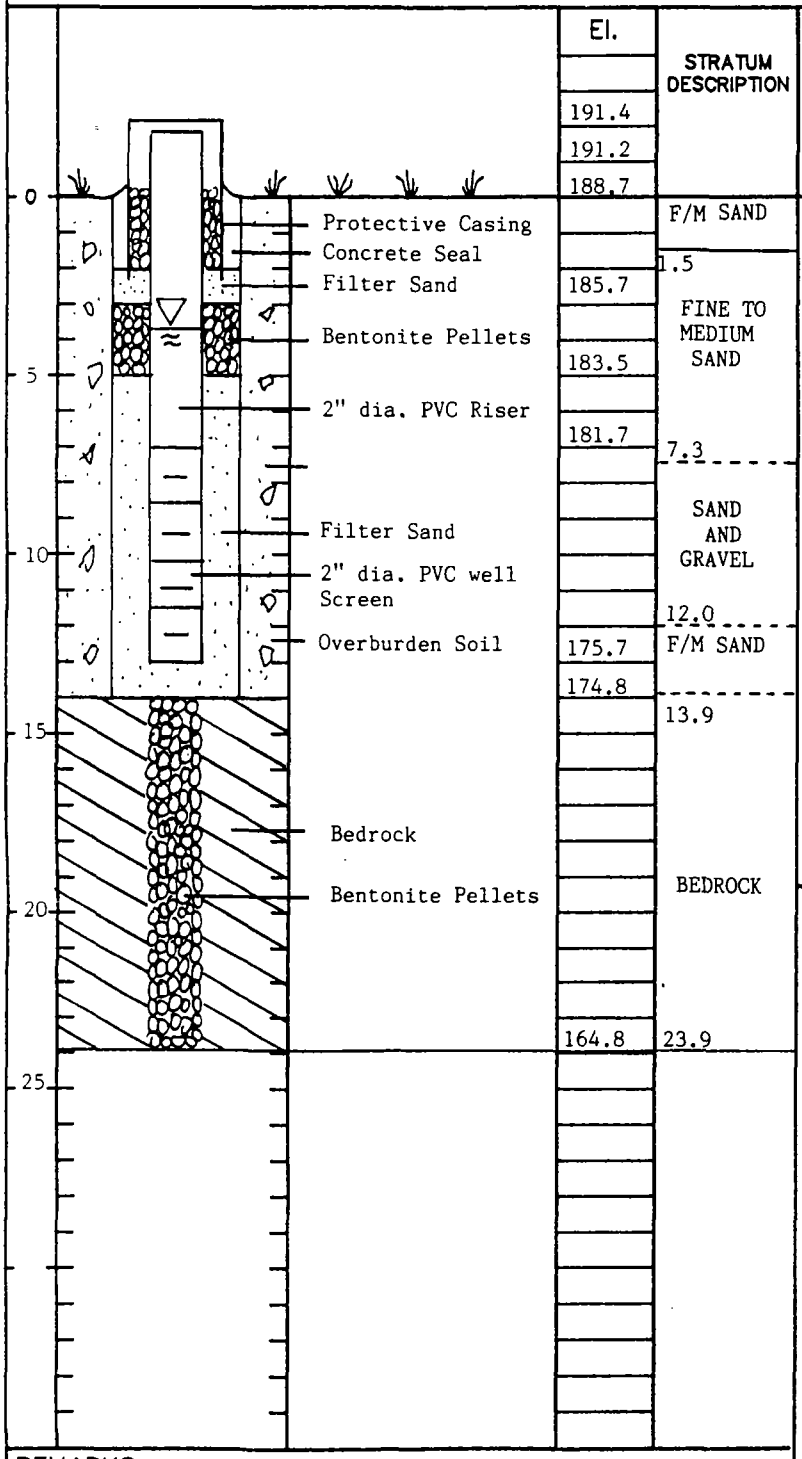
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-12S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S.Sokol

WELL LOCATION Toe of slope adjacent to Brook A
PURPOSE OF WELL Downgradient Monitoring Well
DATE STARTED 11/18/88 DATE COMPLETED 11/21/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 191.4
TOP OF INNER CASING= 191.2
GROUND SURFACE= 188.7

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 5 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 7 gal.
RISER PIPE: 9.5 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 6 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 65 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 3.9 ft. below ground surface
BOTTOM OF WELL= 12.9 ft. below ground surface
TOTAL FEET OF WATER= 9.0 ft.
VOLUME OF WATER= 1.5 gal.
DATE DEVELOPED 1/20/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for 42 minutes.
VOLUME OF WATER EVACUATED 15 gal.
ESTIMATED YIELD 0.1 gpm
STABILIZED ph: 5.7 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 to 4.5 ppm
SCREENING INSTRUMENT OVA - 128
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

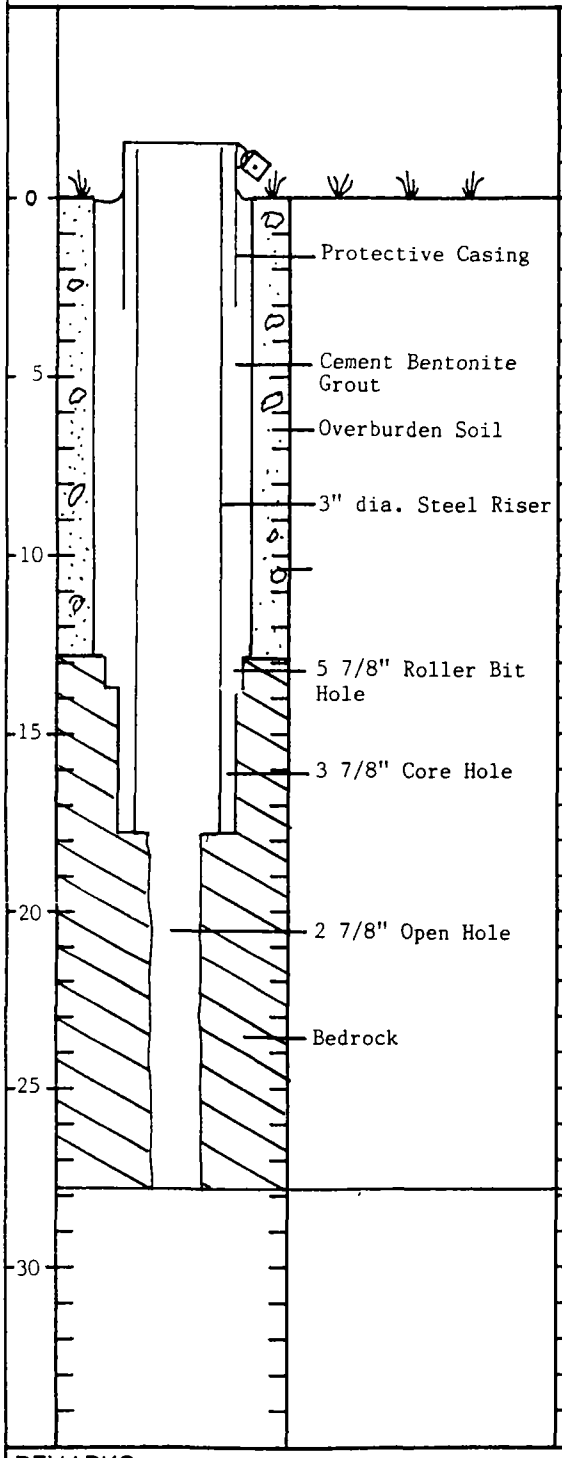
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-12D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S.Sokol

WELL LOCATION 20' east of Brook A at toe of slope
PURPOSE OF WELL Downgradient Monitoring Well
DATE STARTED 12/2/88 DATE COMPLETED 12/9/88



El.	STRATUM DESCRIPTION
189.7	
189.6	
186.9	F/M SAND
	1.5
	F/M SAND
	7.3
	SAND AND GRAVEL
	12.0
174.1	F/M SAND
	13.9
169.1	BEDROCK
159.1	27.8

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 189.7
TOP OF INNER CASING= 189.6
GROUND SURFACE= 186.9

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: _____ gal.
RISER PIPE: 20.5 ft.; SCHED. ___; DIA. 3 in.
MATERIAL TYPE: Steel
MANUFACTURER: _____
WELL SCREEN: - ft.; SLOT SIZE _____ in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 65 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER: _____

WELL DEVELOPMENT DETAILS

WATER LEVEL= +2.8 ft. above ground surface
BOTTOM OF WELL= 27.8 ft. below ground surface
TOTAL FEET OF WATER= 30.57 ft.
VOLUME OF WATER= 16.3 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Artesian well was surged with a bailer for approximately 5 minutes
VOLUME OF WATER EVACUATED NA gal.
ESTIMATED YIELD - gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS
MW-12D flowing on 01/24/89 (0.1 gpm) with hydraulic head at >2.77 feet above ground surface.

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

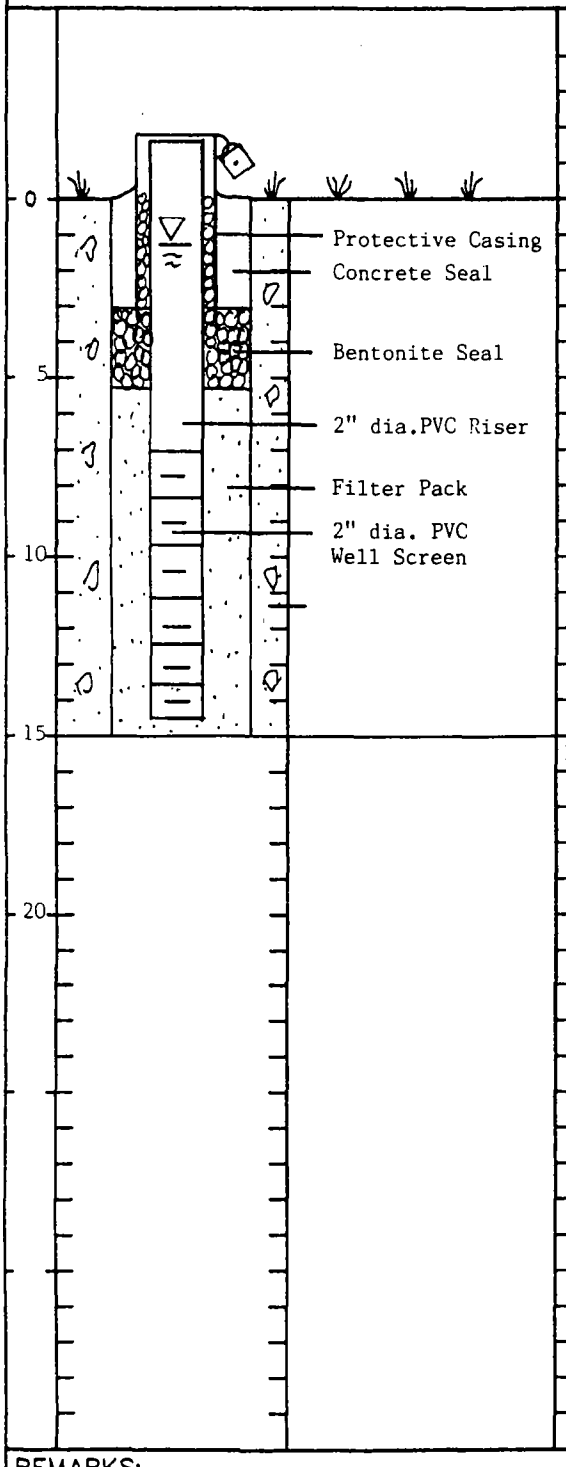
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-13S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY M.Jacobs/E.Wood

WELL LOCATION 5' south of MW-13D
PURPOSE OF WELL Downgradient Monitoring Well
DATE STARTED 11/16/88 DATE COMPLETED 11/17/88



El.		STRATUM DESCRIPTION
184.2		
184.0		
182.3		
179.3		F/M SAND
177.0	6.0	
175.3		SILTY SAND
	8.5	
173.8		CLAYEY SILT
180.3	12.0	
		SILTY F/M SAND
167.8	15.0	
167.3		

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 184.20
TOP OF INNER CASING= 183.99
GROUND SURFACE= 182.28

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 5 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 10 gal.
RISER PIPE: 8.7 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 7.5 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO: (cement/bentonite) - : -
BENTONITE SEAL: 20 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 1.3 ft. below ground surface
BOTTOM OF WELL= 14.3 ft. below ground surface
TOTAL FEET OF WATER= 13.0 ft.
VOLUME OF WATER= 2.1 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for 87 minutes
VOLUME OF WATER EVACUATED 20 gal.
ESTIMATED YIELD 0.2 gpm
STABILIZED ph: 5.6 CONDUCTIVITY: -
CLARITY/COLOR: slightly turbid

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT OVA - 128
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

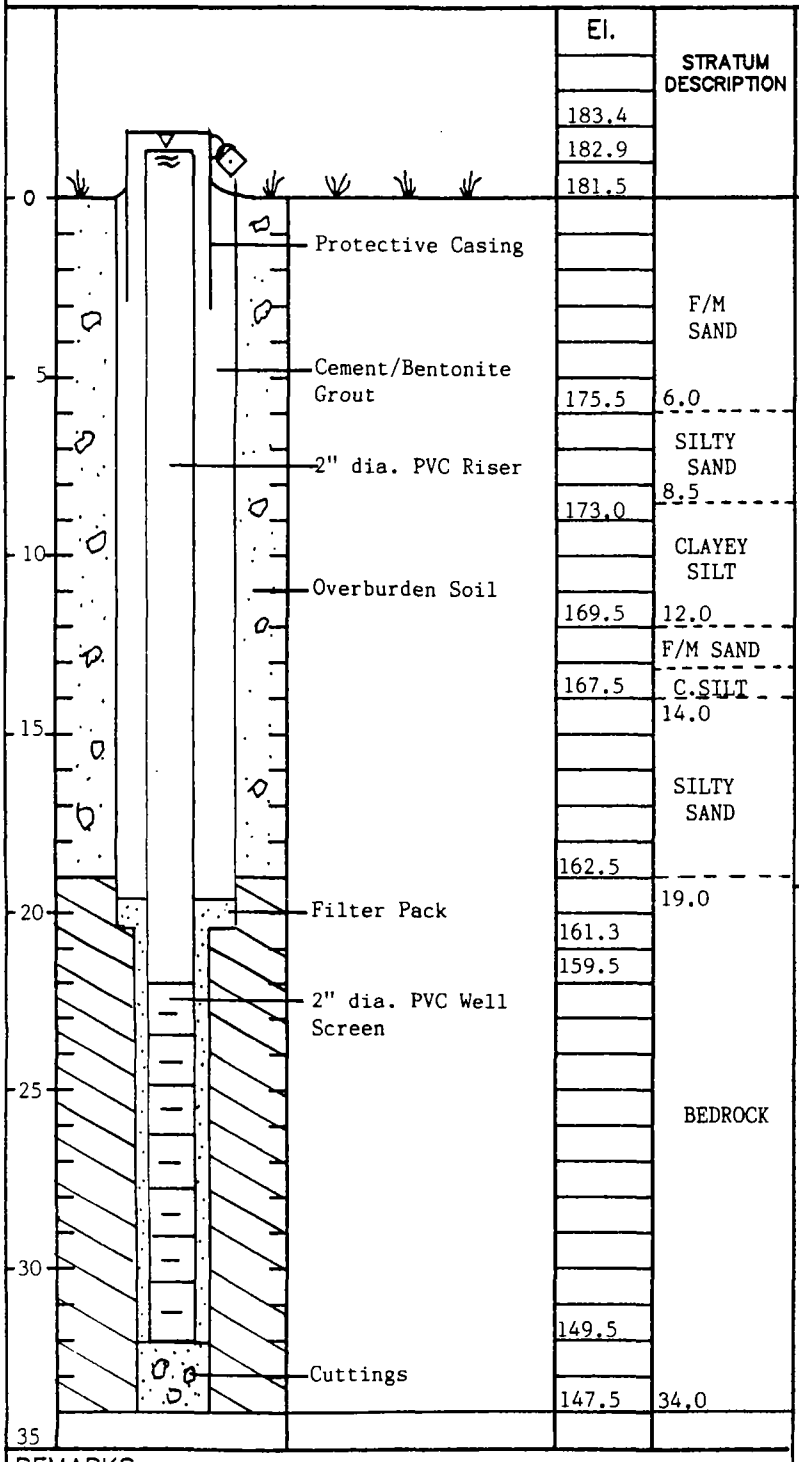
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-13D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S.Sokol

WELL LOCATION 400' north of MW-12D, 5' east of Brook A
PURPOSE OF WELL Downgradient Monitoring Well
DATE STARTED 11/14/88 DATE COMPLETED 11/30/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 183.4
TOP OF INNER CASING= 182.9
GROUND SURFACE= 181.5

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: - gal.
RISER PIPE: 23.4 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 10 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: 115gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= +1.4 ft.above ground surface
BOTTOM OF WELL= 32.0 ft. below ground surface
TOTAL FEET OF WATER= 33.4 ft.
VOLUME OF WATER= 5.5 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Artesian well surged with bailer for approximately 5 minutes
VOLUME OF WATER EVACUATED NA gal.
ESTIMATED YIELD - gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

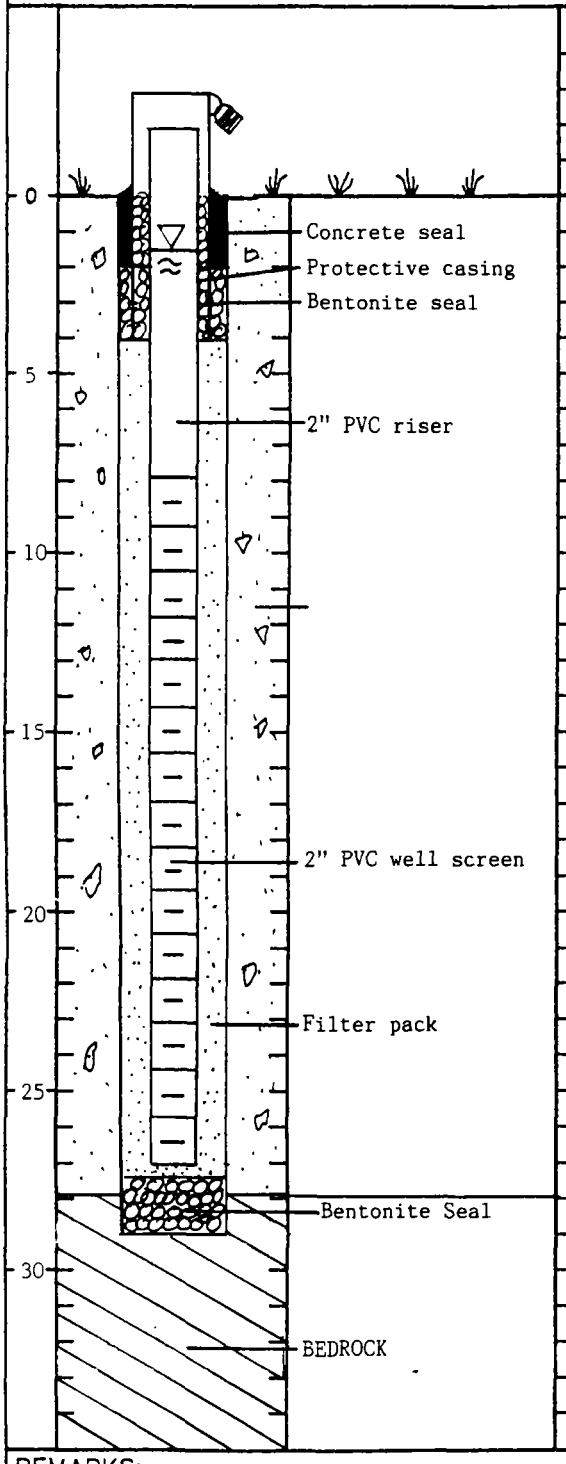
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-14S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield/S. Sokol

WELL LOCATION 60' west of Brook A on 2nd access road
PURPOSE OF WELL North property line Monitoring Well
DATE STARTED 1/16/89 DATE COMPLETED 1/19/89



El.	STRATUM DESCRIPTION
184.6	
184.1	
182.8	
	FINE SAND
181.5	
	2.6
	BOULDER
178.8	4.0
	F/M SAND
	6.0
	F.SAND
175.0	F/M SAND
	COBBLES
	10.0
	F.SAND
	10.7
	SAND AND GRAVEL
	14.5
	FINE SAND
	19.5
	BOULDER
	21
	SAND
	BOULDER
	SAND
155.5	
155.0	
154.0	
	BEDROCK

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 184.6
TOP OF INNER CASING= 184.1
GROUND SURFACE= 182.8

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 5 gal.
RISER PIPE: 9.1 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 19.5 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S.Silica - Mystic White
GROUT: - gal; RATIO: (cement/bentonite) - : -
BENTONITE SEAL: 40± lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 1.6 ft. below ground surface
BOTTOM OF WELL= 28.6 ft. below ground surface
TOTAL FEET OF WATER= 27 ft.
VOLUME OF WATER= 4.4 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for approximately 50 minutes
VOLUME OF WATER EVACUATED 26 gal.
ESTIMATED YIELD 0.1 gpm
STABILIZED ph: 5.3 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

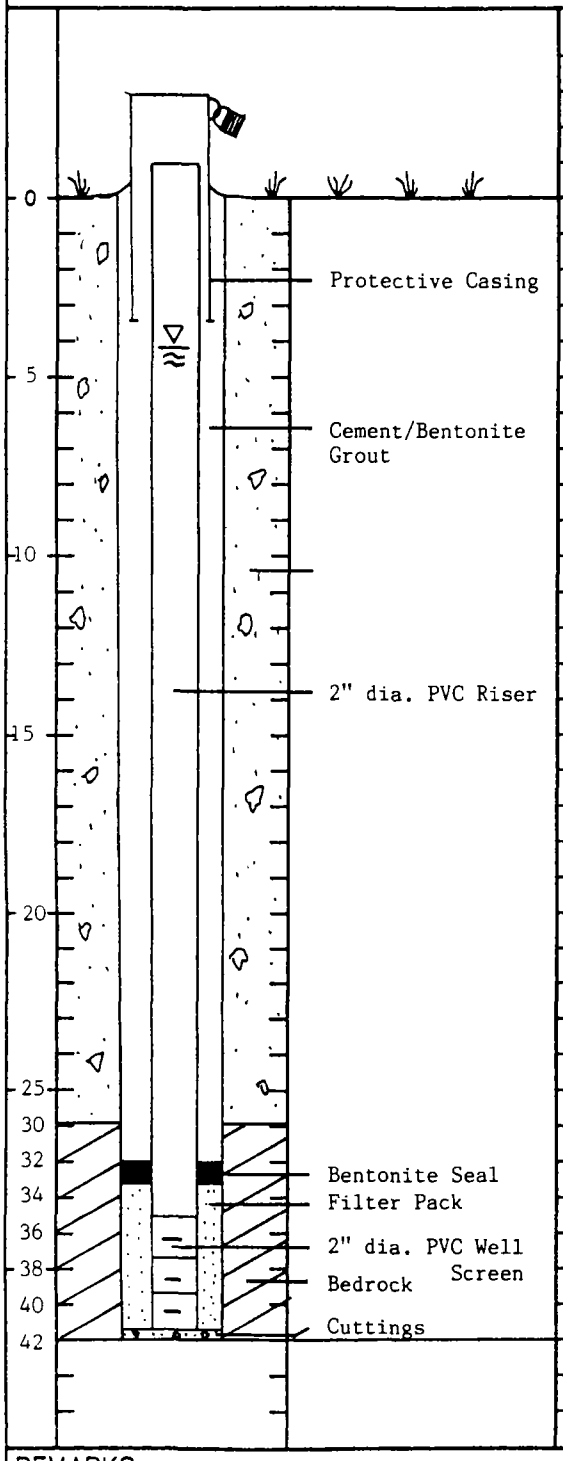
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-14D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield

WELL LOCATION 60' west of Brook A at lower access road
PURPOSE OF WELL Monitoring well
DATE STARTED 1/9/89 DATE COMPLETED 1/13/89



El.	STRATUM DESCRIPTION
183.8	
182.0	
181.5	
	FINE SAND
2.6	
177.8	BOULDER
4.0	
	F/M SAND
6.0	
	F.SAND
	F/M SAND
	COBBLES AND BOULDERS
	F.SAND
10.7	
	SAND AND GRAVEL
14.5	
	FINE SAND
18.7	
	BOULDER
23.0	
	SAND
29.8	
149.4	
148.5	
146.8	BEDROCK
139.7	
139.5	42.0

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 183.8
TOP OF INNER CASING= 182.1
GROUND SURFACE= 181.5

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: - gal.
RISER PIPE: 35.2 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 7.1 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: 125 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: 20 lbs; DIA. 3/8" in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 4.2 ft. below ground surface
BOTTOM OF WELL= 42 ft. below ground surface
TOTAL FEET OF WATER= 37.8 ft.
VOLUME OF WATER= 6.1 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for 10 minutes then switched to 1 1/4" bailer.
VOLUME OF WATER EVACUATED 19 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: 9.8 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

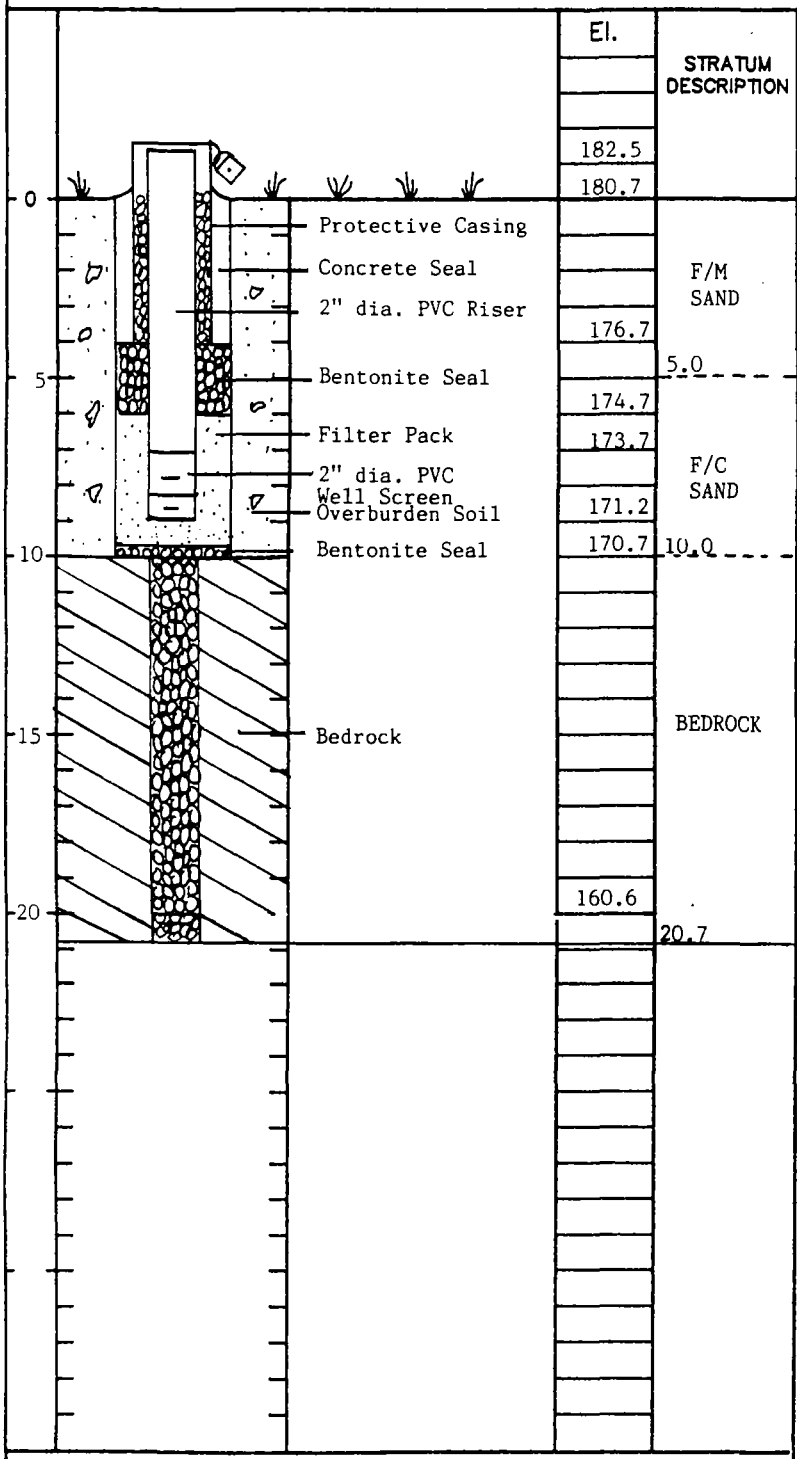
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-15S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographic
WELL INSTALLATION BY M.Jacobs/E.Wood

WELL LOCATION South side of Randy Lane
PURPOSE OF WELL Off-site Monitoring Well
DATE STARTED 12/20/88 DATE COMPLETED 12/23/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 182.54
TOP OF INNER CASING= 182.50
GROUND SURFACE= 180.70

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 10 gal.
RISER PIPE: 8.8 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 2.5 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - mystic white
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 50 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= Dry ft. below ground surface
BOTTOM OF WELL= 9.0 ft. below ground surface
TOTAL FEET OF WATER= - ft.
VOLUME OF WATER= - gal.
DATE DEVELOPED Not developed, dry hole
METHOD OF DEVELOPMENT

VOLUME OF WATER EVACUATED gal.
ESTIMATED YIELD gpm
STABILIZED ph: CONDUCTIVITY:
CLARITY/COLOR:

SCREENING RESULTS ppm
SCREENING INSTRUMENT
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

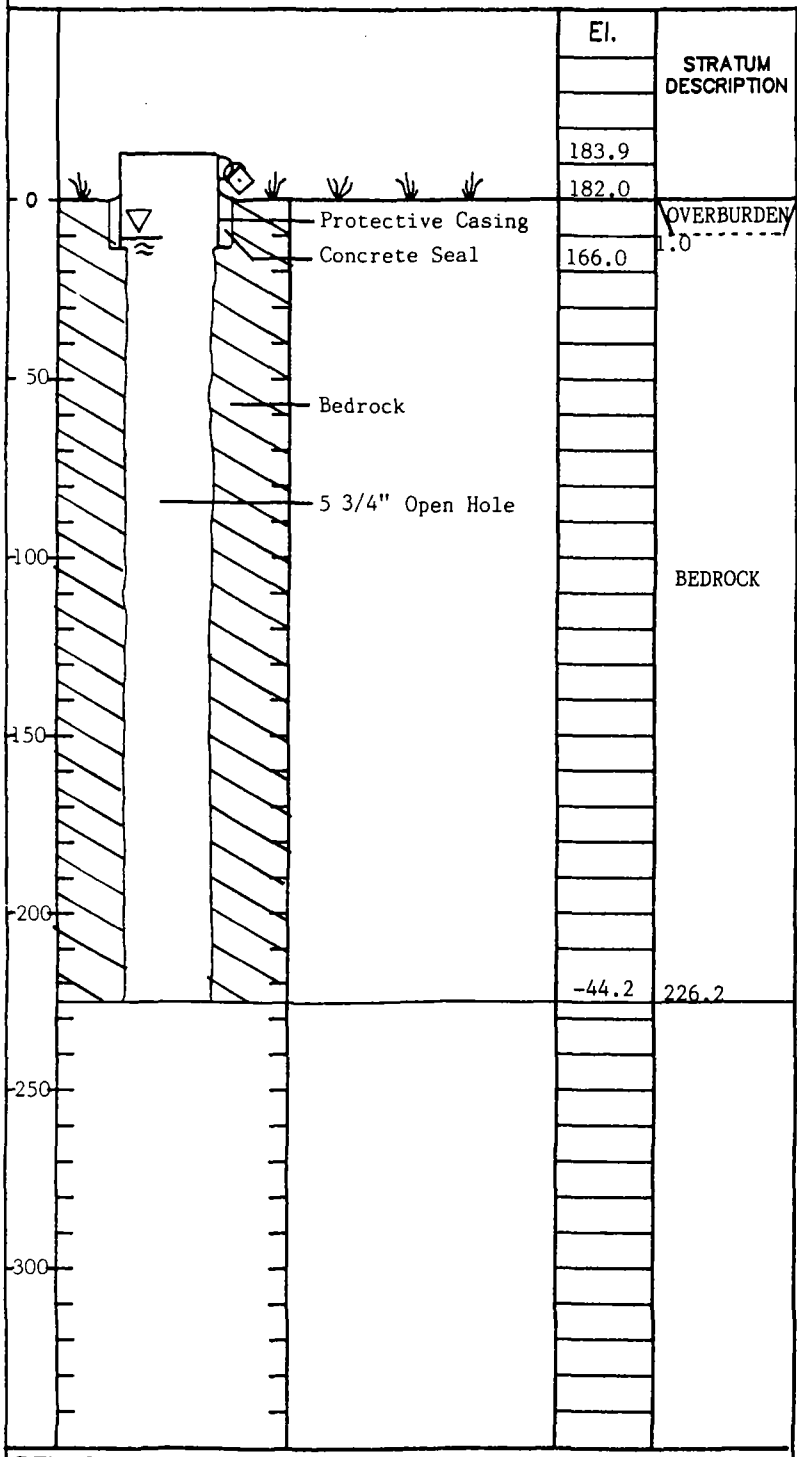
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-15D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY M. Devling/R. Wozmak

WELL LOCATION South side of Randy Lane
PURPOSE OF WELL Deep Bedrock Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/9/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 183.89
TOP OF INNER CASING= Not installed
GROUND SURFACE= 182.01

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: ____ ft; INSIDE DIA. ____ in.
CONCRETE SEAL: - gal.
RISER PIPE: 17.9 ft.; SCHED. ____; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER: ____
WELL SCREEN: - ft.; SLOT SIZE ____ in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 45 gal; RATIO: (cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER: ____

WELL DEVELOPMENT DETAILS

WATER LEVEL= 12.6 ft. below ground surface
BOTTOM OF WELL= 226.2 ft. below ground surface
TOTAL FEET OF WATER= 213.6 ft.
VOLUME OF WATER= 288 gal.
DATE DEVELOPED 1/25/89
METHOD OF DEVELOPMENT
Pumped with a 4" Grundfos submersible pump for 120 minutes. Pump at well bottom.
VOLUME OF WATER EVACUATED 800 gal.
ESTIMATED YIELD 5 gpm
STABILIZED ph: 7.1 CONDUCTIVITY: 0.09 mu/cm
CLARITY/COLOR: slightly turbid

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS Cannot pump water level lower than 183 feet bgs.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

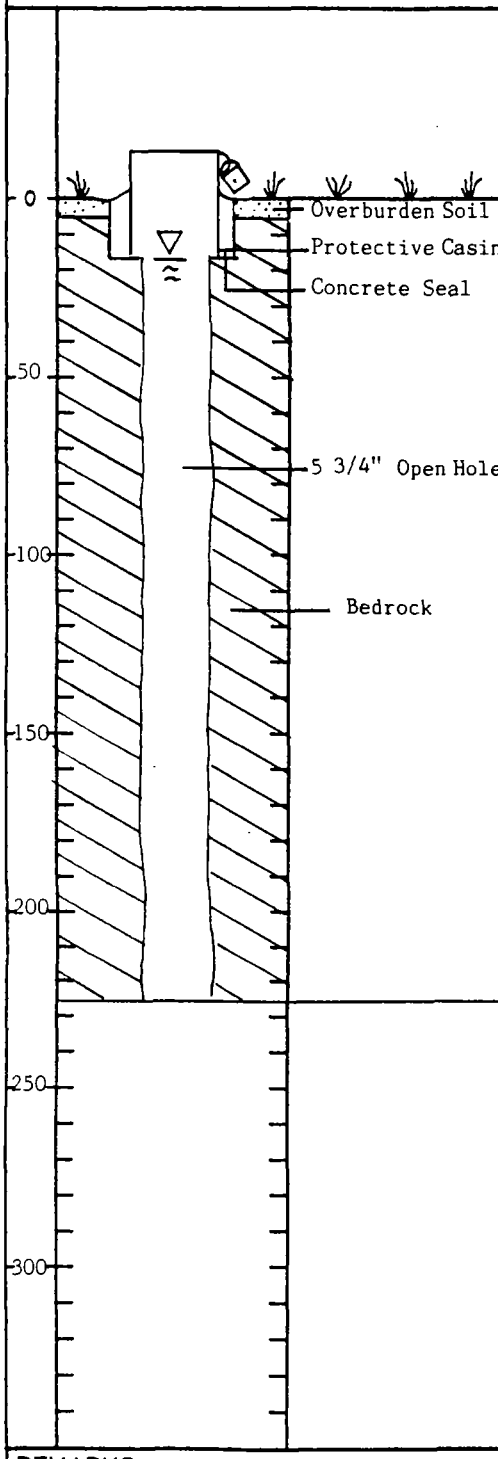
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-16D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY M.Deyling/R. Wozmak

WELL LOCATION Jennifer Lane
PURPOSE OF WELL Deep Bedrock Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/8/88



El.	STRATUM DESCRIPTION
199.2	
197.5	OVERBURDEN
181.5	7.0
	BEDROCK
-28.4	225.9

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 199.2
TOP OF INNER CASING= None installed
GROUND SURFACE= 197.5

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: - ft; INSIDE DIA. - in.
CONCRETE SEAL: - gal.
RISER PIPE: 17.7 ft.; SCHED. ___; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER: ___
WELL SCREEN: - ft.; SLOT SIZE ___ in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 45 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER: ___

WELL DEVELOPMENT DETAILS

WATER LEVEL= 16.8 ft. below ground surface
BOTTOM OF WELL= 225.9 ft. below ground surface
TOTAL FEET OF WATER= 209.1 ft.
VOLUME OF WATER= 282 gal.
DATE DEVELOPED 1/26/89
METHOD OF DEVELOPMENT
Pumped with a Grundfos 4" submersible pump for 80 minutes. Pump at well bottom.
VOLUME OF WATER EVACUATED 400 gal.
ESTIMATED YIELD 7 gpm
STABILIZED ph: 6.9 CONDUCTIVITY: 0.11 mu cm
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS Cannot pump water level lower than 150 feet bgs.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

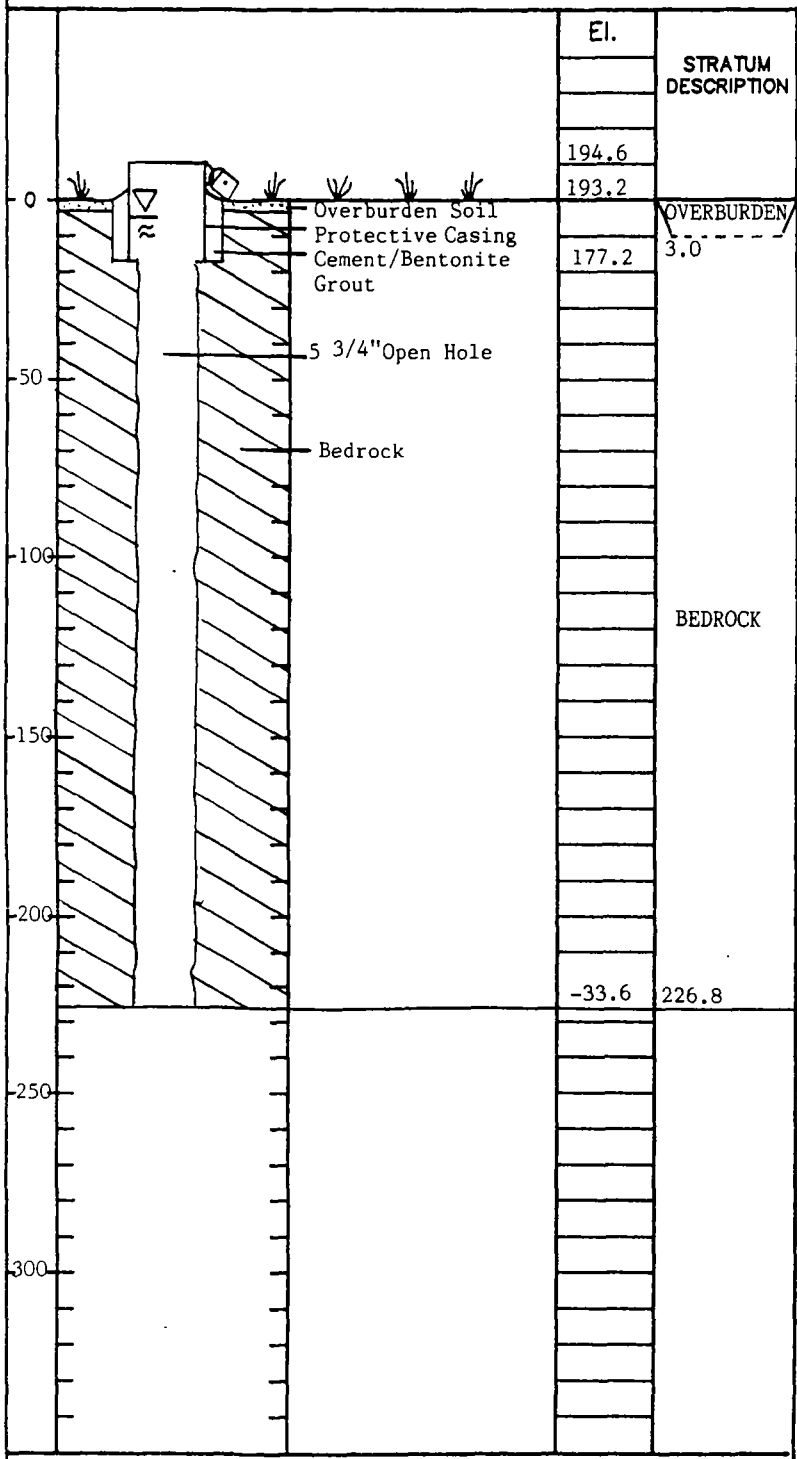
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-17D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY M.Deyling/R. Wozmak

WELL LOCATION NW corner of Blackberry & Huckleberry
PURPOSE OF WELL Deep Bedrock Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/9/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 195.6
TOP OF INNER CASING= None installed
GROUND SURFACE= 193.2

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: - ft; INSIDE DIA. - in.
CONCRETE SEAL: - gal.
RISER PIPE: 17.4 ft.; SCHED. ; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 40 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 4.8 ft. below ground surface
BOTTOM OF WELL= 226.8 ft. below ground surface
TOTAL FEET OF WATER= 222.0 ft.
VOLUME OF WATER= 300 gal.
DATE DEVELOPED 1/26/89
METHOD OF DEVELOPMENT
Pumped with a Grundfos 4" submersible pump for 120 minutes. Pump at well bottom.
VOLUME OF WATER EVACUATED 500 gal.
ESTIMATED YIELD 5 gpm
STABILIZED ph: - CONDUCTIVITY: 0.11 mu/cm
CLARITY/COLOR: slightly turbid/orange

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS Cannot pump water level lower than 205 feet bgs. Water has orange color while pumping from 83 feet bgs. to approximately 200 bgs.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

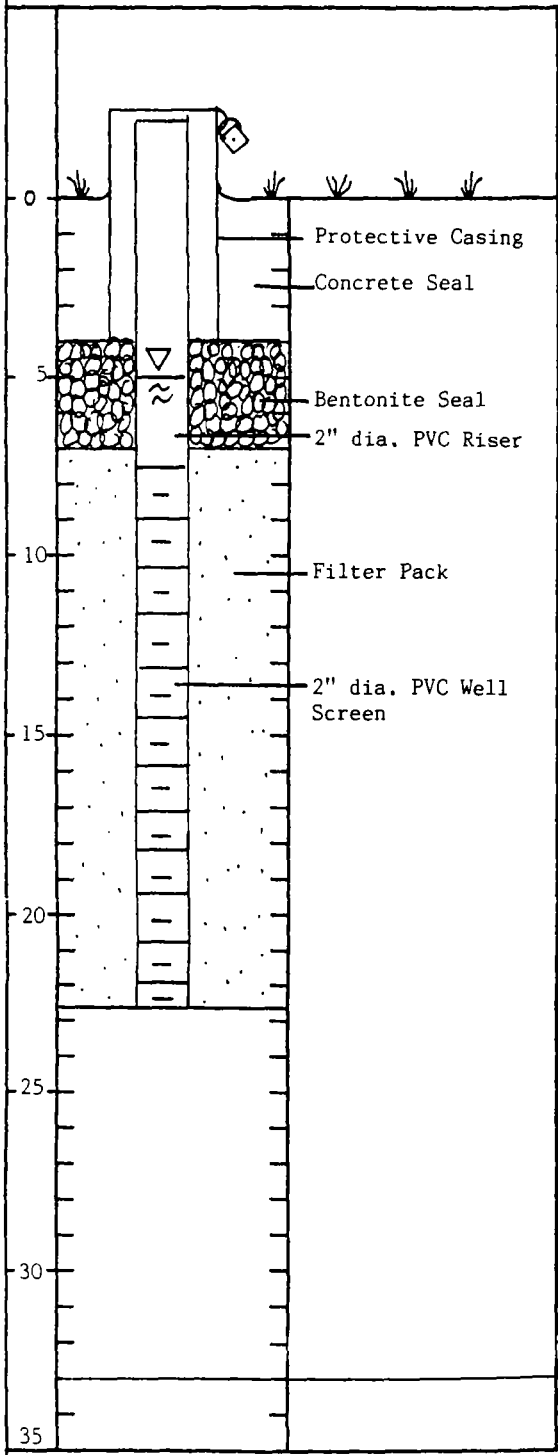
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-18S
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION Jennifer Lane at Huckleberry Lane
PURPOSE OF WELL Off-site Monitoring Well
DATE STARTED 1/11/89 DATE COMPLETED 1/12/89



El.	STRATUM DESCRIPTION
166.0	
165.8	
164.2	
160.2	
157.2	
156.7	F/M SAND
15.5	
	SILT AND SAND
141.7	
23.5	
	BEDROCK
33.0	

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 166.0
TOP OF INNER CASING= 165.8
GROUND SURFACE= 164.2

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 8 gal.
RISER PIPE: 9.1 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 15 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 75 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 5.0 ft. below ground surface
BOTTOM OF WELL= 22.5 ft. below ground surface
TOTAL FEET OF WATER= 17.5 ft.
VOLUME OF WATER= 2.8 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT 14 gallons bailed on 1/14/89. Pumped with a 1 1/2" centrifugal pump for 130 minutes on 1/24/89.
VOLUME OF WATER EVACUATED 60 gal.
ESTIMATED YIELD 0.5 gpm
STABILIZED ph: - CONDUCTIVITY: 0.15 mu cm
CLARITY/COLOR: Slightly turbid/rust colored

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

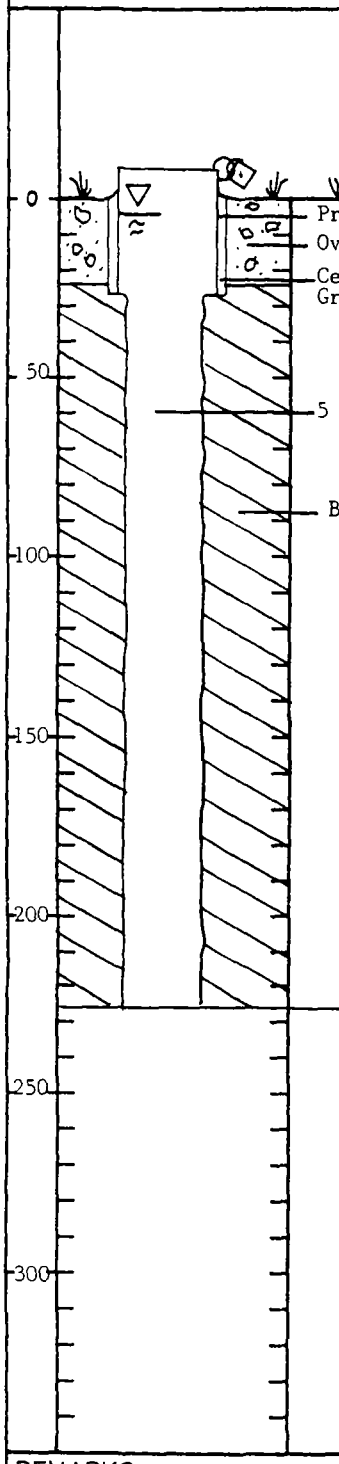
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-18D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY T.Stone/M. Devling

WELL LOCATION Jennifer Lane and Huckleberry Lane
PURPOSE OF WELL Off-site Monitoring Well
DATE STARTED 12/6/88 DATE COMPLETED 12/10/88



El.	STRATUM DESCRIPTION
165.8	
164.5	
	OVERBURDEN
136.5	23.5
	BEDROCK
-61.9	226.4

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 165.8
TOP OF INNER CASING= None installed
GROUND SURFACE= 164.5

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: - ft; INSIDE DIA. - in.
CONCRETE SEAL: - gal.
RISER PIPE: 29.3 ft.; SCHED. ; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 150 gal; RATIO: (cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 4.0 ft. below ground surface
BOTTOM OF WELL= 226.4 ft. below ground surface
TOTAL FEET OF WATER= 222.4 ft.
VOLUME OF WATER= 300 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Pumped with a Grundfos 4" submersible pump for 110 minutes. Pump at well bottom.
VOLUME OF WATER EVACUATED 750 gal.
ESTIMATED YIELD <0.5 gpm
STABILIZED ph: - CONDUCTIVITY: 0.20 mu cm
CLARITY/COLOR: Clear

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

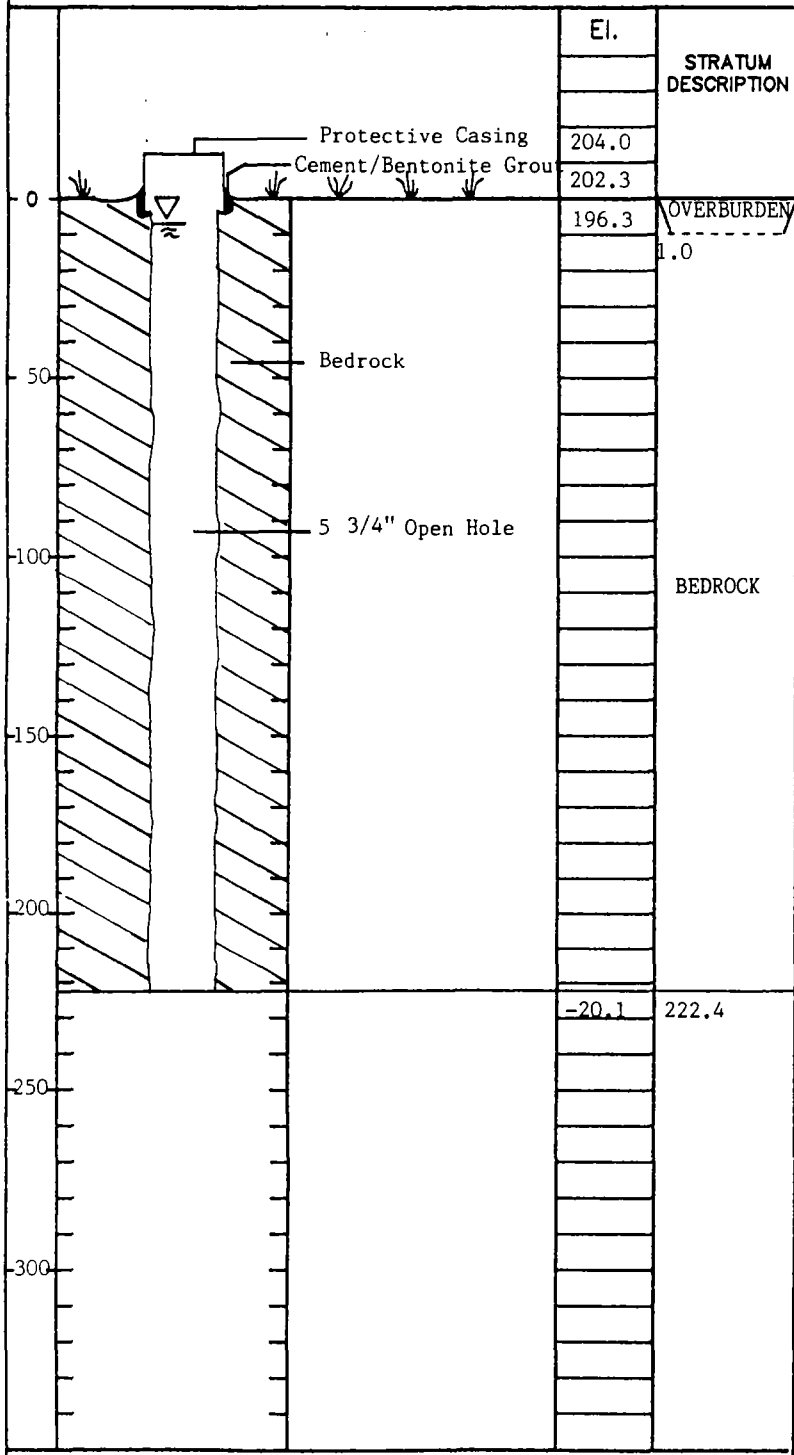
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. MW-19D
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY T.Stone/R. Wozmak

WELL LOCATION Blueberry Hill Road
PURPOSE OF WELL Off-site Monitoring Well
DATE STARTED 12/5/88 DATE COMPLETED 12/7/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 204.0
TOP OF INNER CASING= None installed
GROUND SURFACE= 202.3

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: ft; INSIDE DIA. in.
CONCRETE SEAL: - gal.
RISER PIPE: 7.7 ft.; SCHED. -; DIA. 6 in.
MATERIAL TYPE: Steel
MANUFACTURER: -
WELL SCREEN: - ft.; SLOT SIZE - in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 10 gal; RATIO: (cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 9.2 ft. below ground surface
BOTTOM OF WELL= 222.4 ft. below ground surface
TOTAL FEET OF WATER= 213.2 ft.
VOLUME OF WATER= 288 gal.
DATE DEVELOPED 12/15/88
METHOD OF DEVELOPMENT
Pumped with a Moyno pump for approximately 120 minutes. Intake at well bottom and lifted periodically.
VOLUME OF WATER EVACUATED 200 gal.
ESTIMATED YIELD >50 gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS - ppm
SCREENING INSTRUMENT -
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

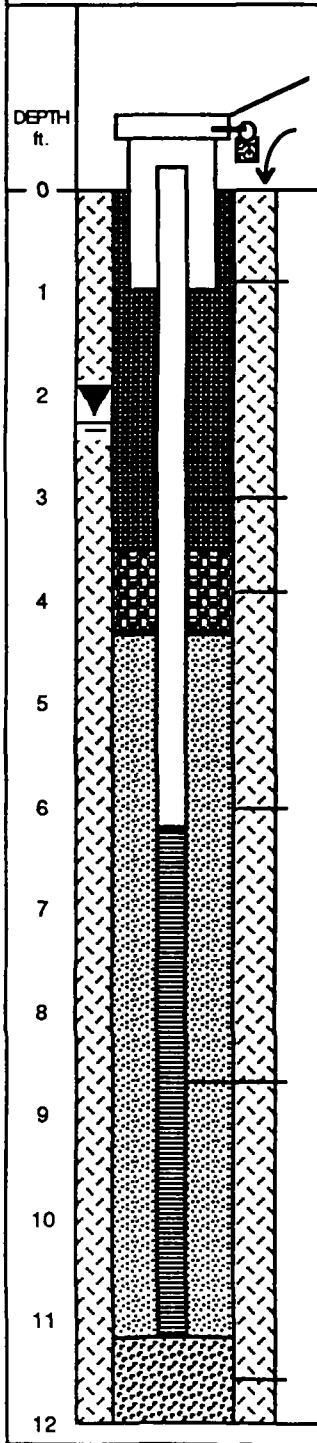
WELL COMPLETION LOG

Project: Mottolo RI/FS
Location: Raymond, New Hampshire

Well No.: MW-20S
Sheet: 1 **Of:** 1
Project Number: 6185/817
Chkd. By: GMG

Drilling Co.: Avalanche Soil Exploration, Inc.
Surveyor: Balsam Environmental Consultants, Inc.
Balsam Eng./Geol.: G. Garfield/D. Coleman

Well Location: Approximately 70' southwest of MW-8D
Purpose of Well: Upgradient property line monitoring well
Date Started: 9/26/89 **Date Completed:** 9/26/89



STRATUM DESCRIPTION

FINE TO COARSE SAND (0-12.0')

DRILLING METHOD
ODEX

REFERENCE ELEVATIONS
Top of Protective Casing: 226.67
Top of Inner Casing: 226.51
Ground Surface: 223.70

WELL MATERIAL DETAILS
Lock Type: Master **Serial No.:** 0536
Curb Box: Length N/A ft. **Dia.** N/A in.
Protective Casing:
Length 6.5 ft. **Inside Dia.** 3 in.
Concrete Seal: - gal.
Riser Pipe: 6.2 ft.; **Sched.** 40 **DIA.** 2 in
Material Type: PVC
Manufacturer: Atlantic Screen
Well Screen: 5 ft. **Slot Size** .01 in.
Coupling type: Threaded Flush Joint
Filter Type: Sand **Size** 0.02+ in.
Manufacturer: Sable A Filtration
Grout: - gal. **Ratio:(cement: bent.)** -
Bentonite Seal: 30 lbs. **Dia.** 1/2 in.
Other:

WELL DEVELOPMENT DETAILS
Water Level: ▼ 2.2 ft. below ground surface
Bottom of Well: 11.2 ft. below ground surface
Total Feet of Water: 9 ft.
Volume of Water: 1.5 gal.
Date Developed: 9/25/89
Method of Development:
Bailed with a 1 1/4" PVC Bailer.

Volume of Water Evacuated: – gal.
Stabilized pH: – **Conductivity:** -
Clarity/Color: -
Screening Results: - ppm
Screening Instrument: -
Additional Comments:
-

Notes:
-

Document: W127

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

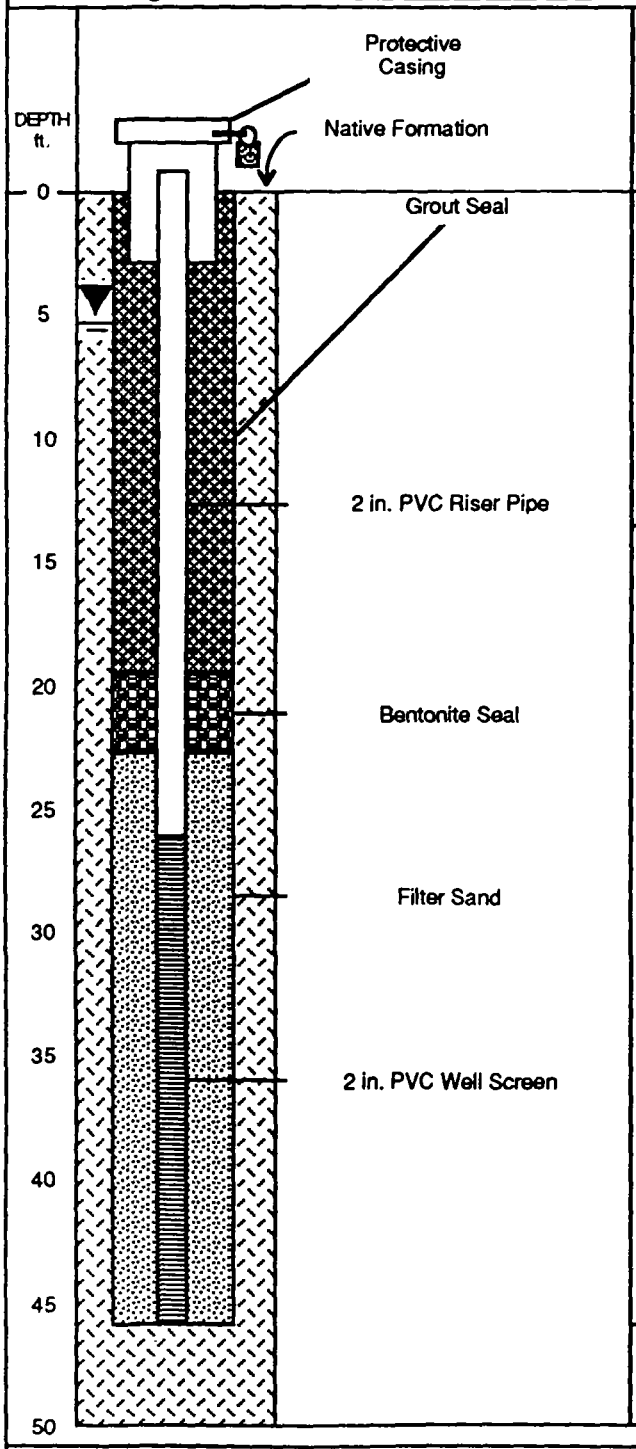
WELL COMPLETION LOG

Project: Mottolo RI/FS
Location: Raymond, New Hampshire

Well No.: MW-20D
Sheet: 1 **Of:** 1
Project Number: 6185/817
Chkd. By: GMG

Drilling Co.: Avalanche Soil Exploration, Inc.
Surveyor: Balsam Environmental Consultants, Inc.
Balsam Eng./Geol.: G. Garfield/D. Coleman

Well Location: 73' Southwest of MW-8D
Purpose of Well: Upgradient monitoring well
Date Started: 9/25/89 **Date Completed:** 9/26/89



STRATUM DESCRIPTION

FINE TO COARSE SAND (0-13.6')

BEDROCK (13.6-45.9')

Notes:
-

DRILLING METHOD
ODEX

REFERENCE ELEVATIONS
Top of Protective Casing: 225.62
Top of Inner Casing: 225.27
Ground Surface: 223.60

WELL MATERIAL DETAILS
Lock Type: Master **Serial No.:** 0536
Curb Box: **Length** N/A ft. **Dia.** N/A in.
Protective Casing:
Length 6.5 ft. **Inside Dia.** 3 in.
Concrete Seal: - gal.
Riser Pipe: 29.1 ft.; **Sched.** 40 **DIA.** 2 in
Material Type: PVC
Manufacturer: Atlantic Screen
Well Screen: 20 ft. **Slot Size** 0.01 in.
Coupling type: Threaded Flush Joint
Filter Type: Sand **Size** 0.02+ in.
Manufacturer: Sable A Filtration
Grout: 35 gal. **Ratio:(cement: bent.)** 10:1
Bentonite Seal: 20 lbs. **Dia.** 1/2 in.
Other:

WELL DEVELOPMENT DETAILS
Water Level: ▼ 5.1 ft. below ground surface
Bottom of Well: 45.9 ft. below ground surface
Total Feet of Water: 40.8 ft.
Volume of Water: 6.7 gal.
Date Developed: 9/25/89
Method of Development:
Bailed with a 1 1/4" PVC Bailer.

Volume of Water Evacuated: 15 gal.
Stabilized pH: - **Conductivity:** -
Clarity/Color: Clear
Screening Results: - ppm
Screening Instrument: -
Additional Comments:
-

Document: W127

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

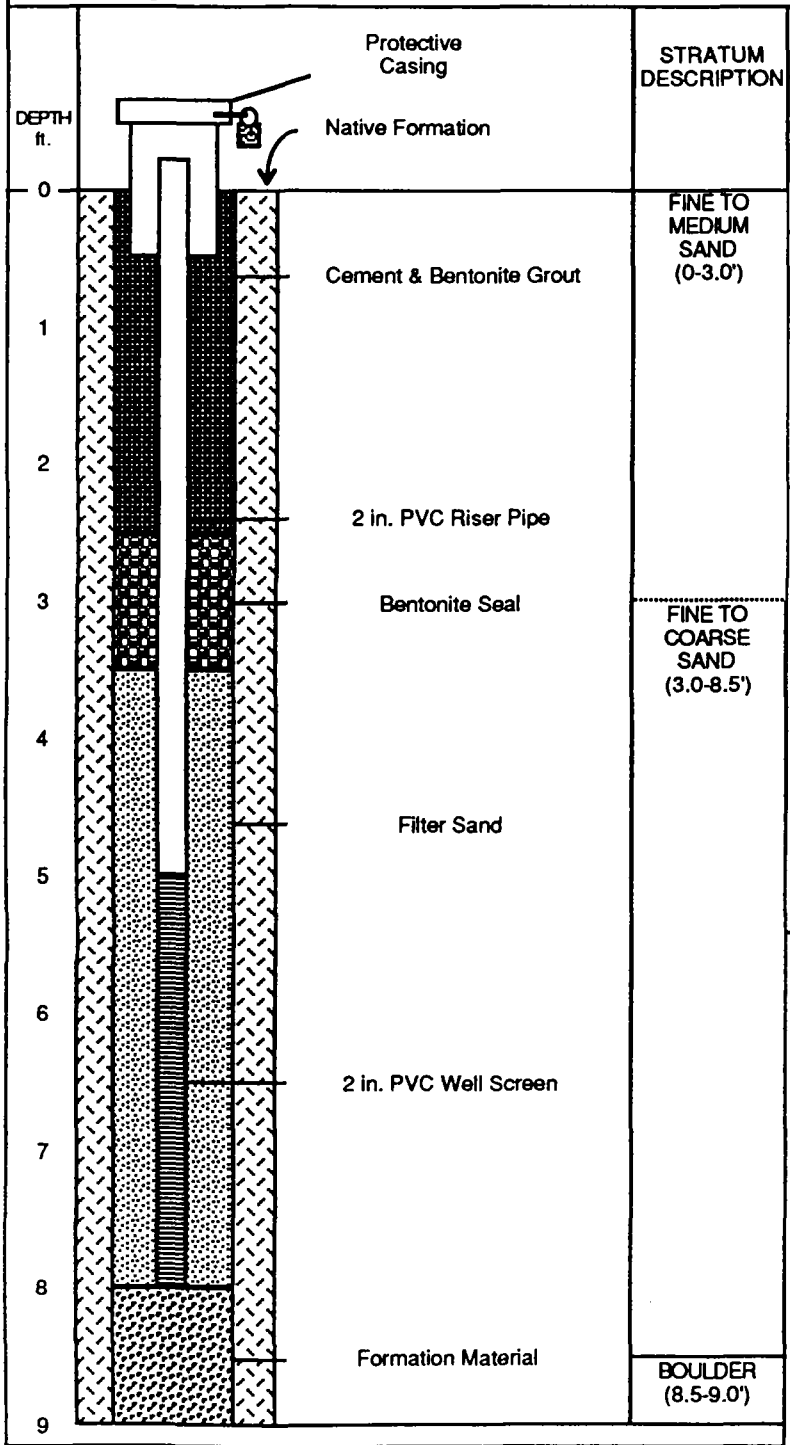
WELL COMPLETION LOG

Project: Mottolo RI/FS
Location: Raymond, New Hampshire

Well No.: MW-21S
Sheet: 1 **Of:** 1
Project Number: 6185/817
Chkd. By: GMG

Drilling Co.: Avalanche Soil Exploration, Inc.
Surveyor: S. Doucette
Balsam Eng./Geol.: G. Garfield

Well Location: 7' Southeast of MW-8D
Purpose of Well: Upgradient monitoring well
Date Started: 9/28/89 **Date Completed:** 9/28/89



Notes:
-

DRILLING METHOD
ODEX

REFERENCE ELEVATIONS
Top of Protective Casing: 231.93
Top of Inner Casing: 231.48
Ground Surface: 228.80

WELL MATERIAL DETAILS
Lock Type: Master **Serial No.:** 0536
Curb Box: **Length** N/A ft. **Dia.** N/A in.
Protective Casing:
Length 6.5 ft. **Inside Dia.** 3 in.
Concrete Seal: - gal.
Riser Pipe: 7.7 ft.; **Sched.** 40 **DIA.** 2 in
Material Type: PVC
Manufacturer: Atlantic Screen
Well Screen: 3 ft. **Slot Size** 0.01 in.
Coupling type: Threaded Flush Joint
Filter Type: Sand **Size** 0.02+ in.
Manufacturer: Sable A Filtration
Grout: 5 gal. **Ratio:(cement: bent.)** 10:1
Bentonite Seal: 15 lbs. **Dia.** 1/2 in.
Other:

WELL DEVELOPMENT DETAILS
Water Level: ▼ 2 ft. below ground surface
Bottom of Well: 8 ft. below ground surface
Total Feet of Water: 6 ft.
Volume of Water: 1 gal.
Date Developed: 9/27/89
Method of Development:
Bailed with a 1-1/4 inch PVC Bailer.

Volume of Water Evacuated: - gal.
Stabilized pH: - **Conductivity:** -
Clarity/Color: -
Screening Results: - ppm
Screening Instrument: -
Additional Comments:
-

Document: W127

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

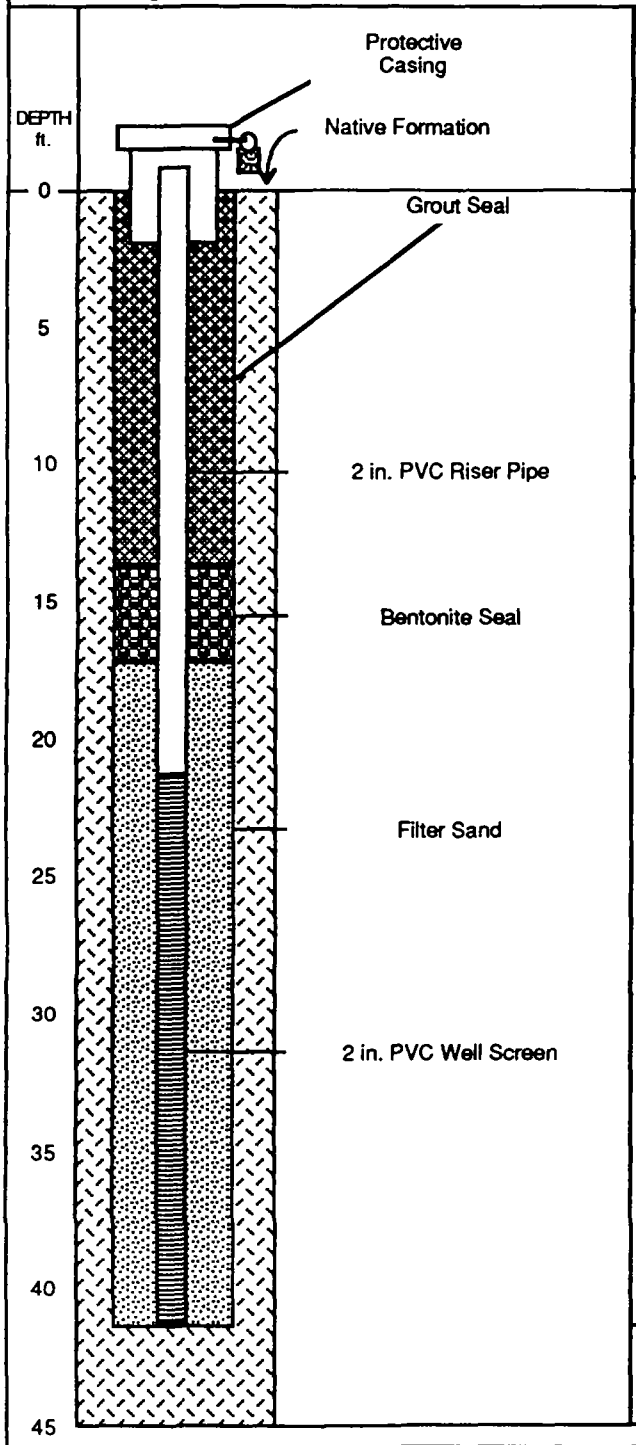
WELL COMPLETION LOG

Project: Mottolo RI/FS
Location: Raymond, New Hampshire

Well No.: MW-21D
Sheet: 1 **Of:** 1
Project Number: 6185/817
Chkd. By: GMG

Drilling Co.: Avalanche Soil Exploration, Inc.
Surveyor: Balsam Environmental Consultants, Inc.
Balsam Eng./Geol.: G. Garfield

Well Location: 70' Southwest of MW-8D
Purpose of Well: Monitoring well
Date Started: 9/27/89 **Date Completed:** 9/28/89



Notes:
-

DRILLING METHOD
ODEX

REFERENCE ELEVATIONS
Top of Protective Casing: 231.89
Top of Inner Casing: 231.72
Ground Surface: 228.70

WELL MATERIAL DETAILS
Lock Type: Master **Serial No.:** 0536
Curb Box: **Length** N/A ft. **Dia.** N/A in.
Protective Casing:
Length 6.5 ft. **Inside Dia.** 3 in.
Concrete Seal: - gal.
Riser Pipe: 25 ft.; **Sched.** 40 **DIA.** 2 in
Material Type: PVC
Manufacturer: Atlantic Screen
Well Screen: 20 ft. **Slot Size** 0.01 in.
Coupling type: Threaded Flush Joint
Filter Type: Sand **Size** 0.02+ in.
Manufacturer: Sable A Filtration
Grout: 25 gal. **Ratio:(cement: bent.)** 10:1
Bentonite Seal: 30 lbs. **Dia.** 1/2 in.
Other:

WELL DEVELOPMENT DETAILS
Water Level: ▼ 7 ft. below ground surface
Bottom of Well: 41 ft. below ground surface
Total Feet of Water: 34 ft.
Volume of Water: 5.5 gal.
Date Developed: 9/27/90
Method of Development:
Bailed with a 1-1/4 inch PVC Bailer.

Volume of Water Evacuated: - gal.
Stabilized pH: - **Conductivity:** -
Clarity/Color: -
Screening Results: - ppm
Screening Instrument: -
Additional Comments:
-

Document: W127

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

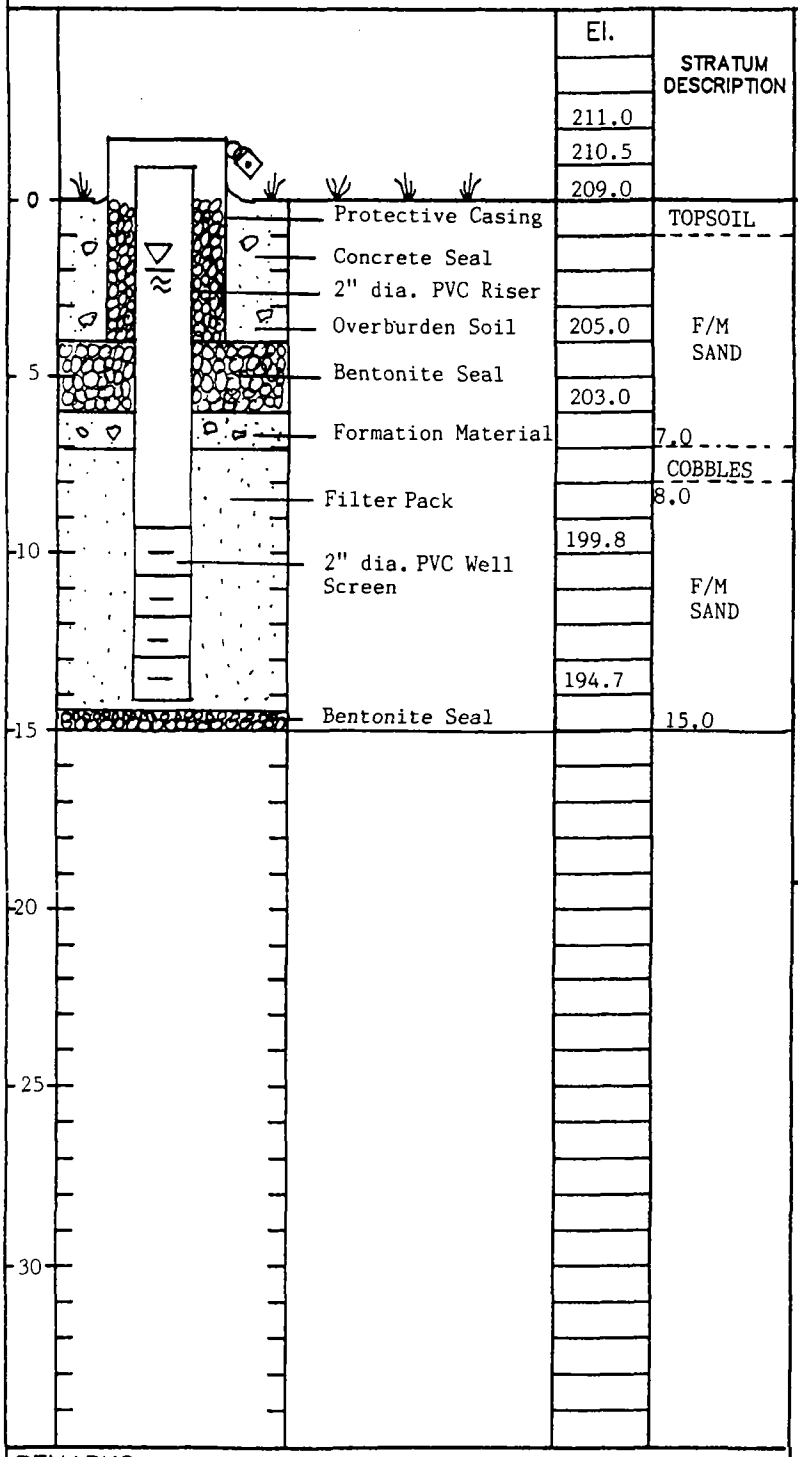
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. OW-2SR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION 150' north of piggery at top of slope
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/14/88 DATE COMPLETED 12/15/88



REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 211.0
TOP OF INNER CASING= 210.5
GROUND SURFACE= 209.0

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 8 gal.
RISER PIPE: 10.7 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 5.1 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO:(cement/bentonite) - : -
BENTONITE SEAL: 50 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 2.0 ft. below ground surface
BOTTOM OF WELL= 14.0 ft. below ground surface
TOTAL FEET OF WATER= 12.0 ft.
VOLUME OF WATER= 2 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for 40 minutes
VOLUME OF WATER EVACUATED 5 gal.
ESTIMATED YIELD 0.3 gpm
STABILIZED ph: 5.8 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS 200 ppm
SCREENING INSTRUMENT OVA - 128
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

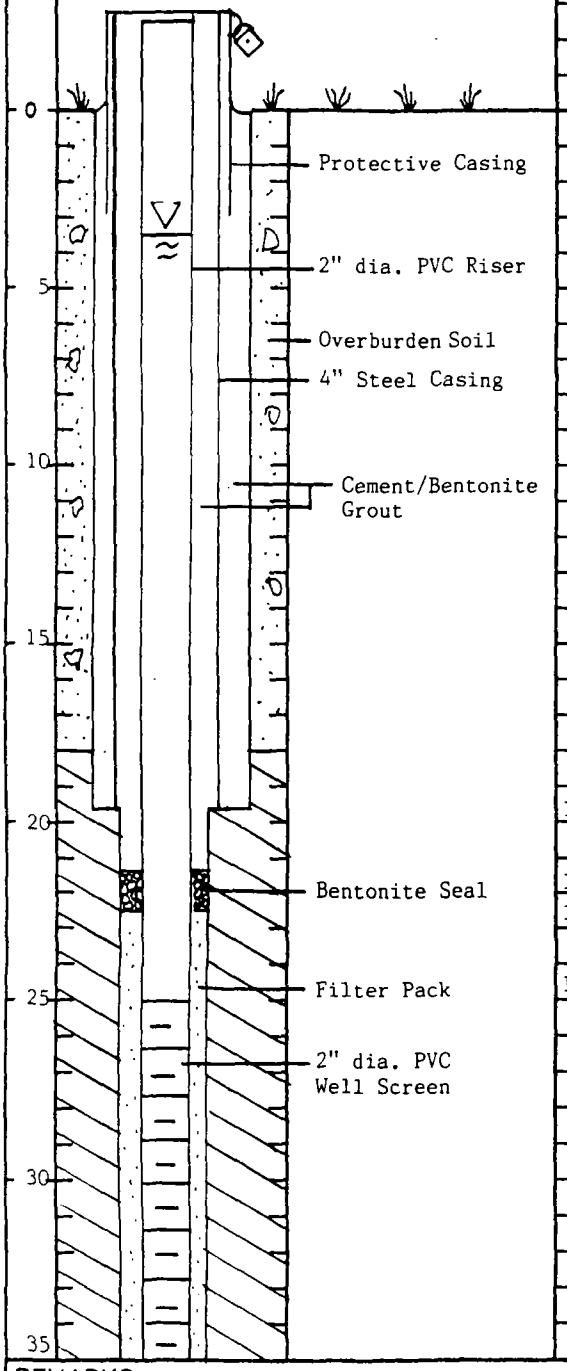
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. OW-2DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY G.Garfield

WELL LOCATION 160' north of piggery at top of slope
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/29/88 DATE COMPLETED 1/9/89



El.	STRATUM DESCRIPTION
211.8	
211.6	
209.3	
	TOPSOIL
1.0	
	F/M SAND
190.3	18.0
189.8	
185.8	
186.8	
184.3	BEDROCK
174.3	35.0

REMARKS:

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 211.8
TOP OF INNER CASING= 211.6
GROUND SURFACE= 209.3

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: - gal.
RISER PIPE: 27.3 ft.; SCHED. 40 ; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 10 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: 120 gal; RATIO:(cement/bentonite) 6 :1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER: 4" steel casing grouted 1.5' into Bedrock.

WELL DEVELOPMENT DETAILS

WATER LEVEL= 3.6 ft. below ground surface
BOTTOM OF WELL= 32.4 ft. below ground surface
TOTAL FEET OF WATER= 28.8 ft.
VOLUME OF WATER= 4.7 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for approximately 60 minutes
VOLUME OF WATER EVACUATED 6 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: 12.0 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS 6 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

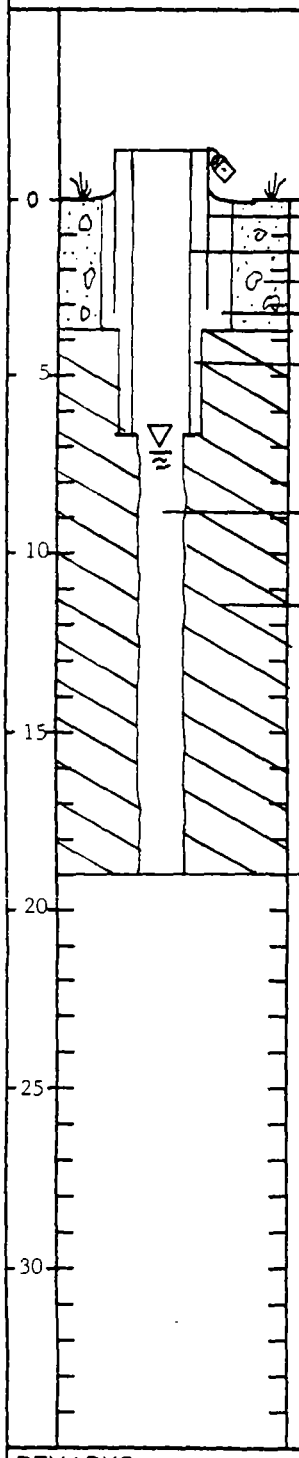
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. OW-3R
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY M.Jacobs/G.Garfield

WELL LOCATION 280' north of piggery
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/2/88 DATE COMPLETED 12/8/88



El.	STRATUM DESCRIPTION
224.0	
221.5	TOPSOIL
	1.0 F/SAND
	3.8
214.7	
	BEDROCK
202.5	19.0

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 223.9
TOP OF INNER CASING= 224.0
GROUND SURFACE= 221.5

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 6 in.
CONCRETE SEAL: - gal.
RISER PIPE: 9.3 ft.; SCHED. - ; DIA. 4 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE - in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 10 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 7.3 ft. below ground surface
BOTTOM OF WELL= 19 ft. below ground surface
TOTAL FEET OF WATER= 11.7 ft.
VOLUME OF WATER= 7 gal.
DATE DEVELOPED 1/23/89
METHOD OF DEVELOPMENT
Pumped with a Moyno pump for 45 minutes

VOLUME OF WATER EVACUATED 7 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS 8 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS Well pumped dry.

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

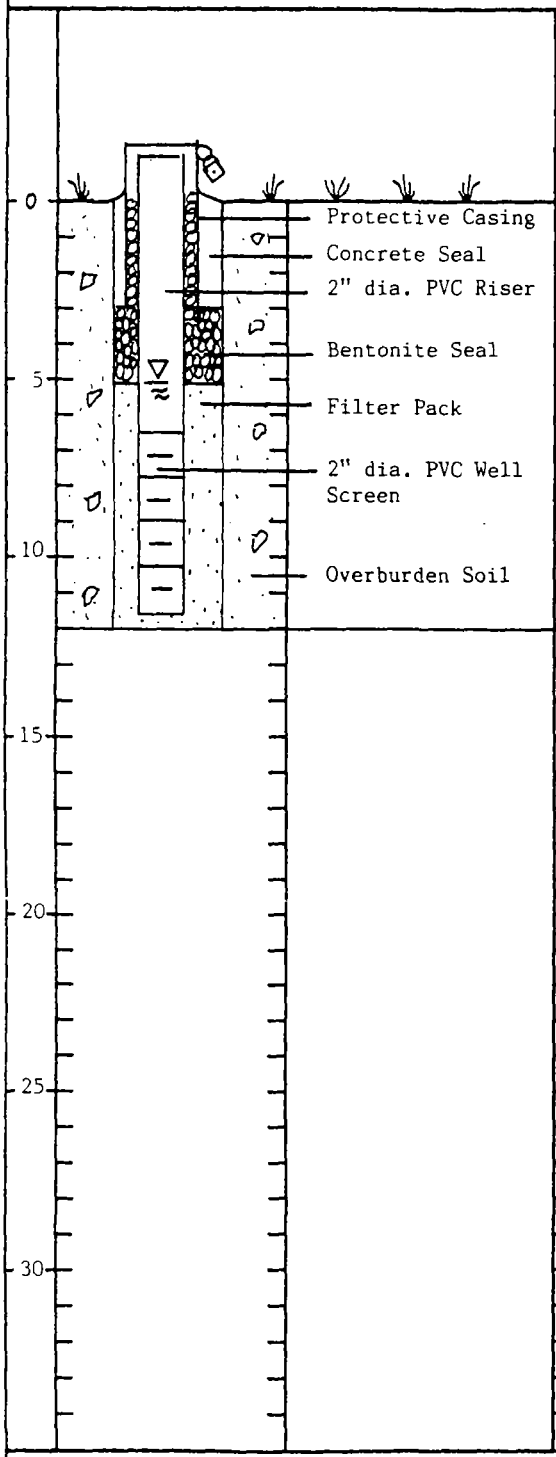
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. OW-4SR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION 100' north of piggery
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/9/88 DATE COMPLETED 12/9/88



El.	STRATUM DESCRIPTION
219.9	
219.3	
218.0	TOPSOIL
215.0	F/M SAND
4.0	
213.0	F/C SAND
211.4	
7.5	
206.4	F/M SAND
206.0	12.0

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 219.9
TOP OF INNER CASING= 219.3
GROUND SURFACE= 218.0

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: 8 gal.
RISER PIPE: 7.9 ft.; SCHED. 40; DIA. 2 in.
MATERIAL TYPE: PVC
MANUFACTURER: Atlantic Screen
WELL SCREEN: 5 ft.; SLOT SIZE 0.01 in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: Sand SIZE 0.02 in.
MANUFACTURER: U.S. Silica - Mystic White
GROUT: - gal; RATIO: (cement/bentonite) - : -
BENTONITE SEAL: 50 lbs; DIA. 3/8 in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 5.0 ft. below ground surface
BOTTOM OF WELL= 11.4 ft. below ground surface
TOTAL FEET OF WATER= 6.4 ft.
VOLUME OF WATER= gal.
DATE DEVELOPED 1/20/89
METHOD OF DEVELOPMENT
Pumped with a 1 1/2" centrifugal pump for 36 minutes
VOLUME OF WATER EVACUATED 20 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: 6.1 CONDUCTIVITY: -
CLARITY/COLOR: Clear

SCREENING RESULTS 20 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

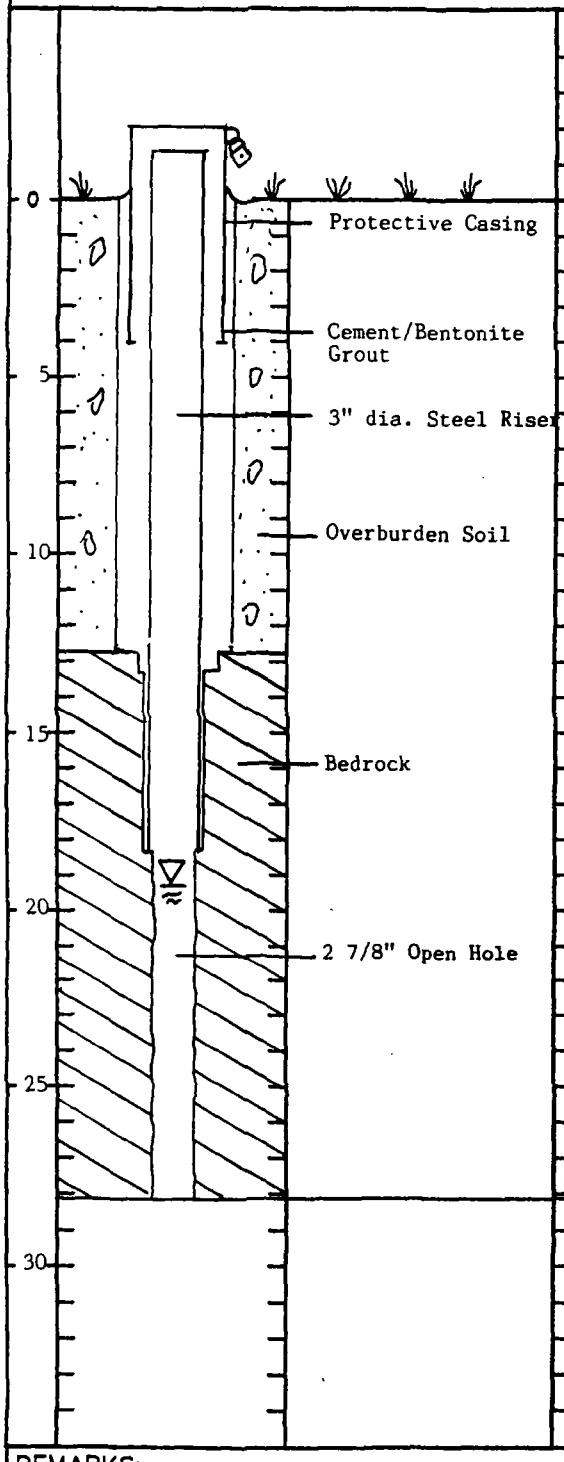
WELL COMPLETION LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

WELL NO. OW-4DR
SHEET 1 OF 1
FILE NO. 6185/813
CHKD. BY

DRILLER Soil Exploration Corp.
SURVEYOR Eastern Topographics
WELL INSTALLATION BY E.Wood/M.Jacobs

WELL LOCATION 100' north of piggery
PURPOSE OF WELL On-site Monitoring Well
DATE STARTED 12/13/88 DATE COMPLETED 12/15/88



El.	STRATUM DESCRIPTION
219.5	
219.4	
217.6	TOPSOIL
0.5	F/M SAND
4.0	F/C SAND
7.5	F/M SAND
12.7	
199.4	BEDROCK
189.4	28.2

REFERENCE ELEVATIONS

TOP OF PROTECTIVE CASING= 219.5
TOP OF INNER CASING= 219.4
GROUND SURFACE= 217.6

WELL MATERIAL DETAILS

LOCK TYPE: Master SERIAL NO: 0536
CURB BOX; LENGTH: - ft.; DIA. - in.
PROTECTIVE CASING:
LENGTH: 6 ft; INSIDE DIA. 4 in.
CONCRETE SEAL: - gal.
RISER PIPE: 20.0 ft.; SCHED. - ; DIA. 3 in.
MATERIAL TYPE: Steel
MANUFACTURER:
WELL SCREEN: - ft.; SLOT SIZE - in.
COUPLINGS: TYPE Threaded Flush Joint
FILTER PACK: TYPE: - SIZE - in.
MANUFACTURER: -
GROUT: 110 gal; RATIO:(cement/bentonite) 6 : 1
BENTONITE SEAL: - lbs; DIA. - in.
OTHER:

WELL DEVELOPMENT DETAILS

WATER LEVEL= 19.3 ft. below ground surface
BOTTOM OF WELL= 28.2ft. below ground surface
TOTAL FEET OF WATER= 8.9 ft.
VOLUME OF WATER= 3.3 gal.
DATE DEVELOPED 1/24/89
METHOD OF DEVELOPMENT
Pumped with 1 3/4" Keck mini-submersible for 60 minutes. Pump on well bottom.
VOLUME OF WATER EVACUATED 5 gal.
ESTIMATED YIELD <0.1 gpm
STABILIZED ph: - CONDUCTIVITY: -
CLARITY/COLOR: -

SCREENING RESULTS <1 ppm
SCREENING INSTRUMENT HNu PI-101
ADDITIONAL COMMENTS
Well pumped dry. No recovery after 1 hour.

REMARKS:

Stratum description from soil boring OW-4SR

ROCK CORING LOG LEGEND

The items shown on the Rock Coring Logs refer to the following:

1. **Depth** - Depth below ground surface

2. **Sampling Interval** - Generally referred to as Run Number, the Sampling Interval or Run Number is defined as the number of times the core barrel is lowered into the bore hole and coring is performed.

3. **Drilling Rate** - Drilling rate is equal to the time required to advance the core barrel a distance of one foot.

4. **Rock Type** - Based on geologist's interpretation.

5. **Weathering** - Weathering abbreviations are defined as follows:

   FR = Fresh Rock. Minerals are clear with little to no clay mineralization on feldspathic phases. Joint surfaces may appear to be slightly stained. Crystalline rock rings when struck with a hammer.

   SW = Slightly Weathered Rock. Rock generally fresh but joint surfaces are stained and discolored and may contain clay minerals. Feldspar minerals occasionally appear to be dull or discolored. Rock rings when struck with a hammer.

   MW = Moderately Weathered Rock. Significant portions of rock appear to be discolored and dull; feldspars are clayey. Rock emits a dull sound when struck with a hammer.

   HW = Highly Weathered Rock. All minerals, except quartz, appear to be dull and discolored. Feldspars are disintegrated to clay minerals. Rock exhibits severe loss of strength and makes a dull noise when struck with a hammer.

   XW = Extremely Weathered Rock. Strength of rock reduced to strong soil. Some fragments of rock usually remain.

6. **Description of Rock Material** - Rock cores retrieved from the boring have been described using the following sequence: 1. color 2. grain size 3. mineralogy 4. bedding/foliation, and 5. other pertinent geologic features.

7. **Rock Defects** - Description of rock defects include, but are not limited to, types, orientation alterations, roughness, staining and/or coating.

8. **Percent RQD** - RQD stands for "Rock Quality Designation" and is obtained by summing the length of rock core greater than 4" in a given run, and dividing that length by the total length of core recovered.

9. **Fracture Per Foot** - Fracture per foot is defined as the number of horizontal and vertical fracture which occur per foot of recovered core.

10. **Lift and Core Recovery** - Lift and Core Recovery is defined as the ratio of length of core recovered to the total length of the core run.

11. **Drilling Behavior** -

    Feed: Generally refers to downward pressure applied to the cutting surface.

    Water: Generally refers to the water pressure used to transport cuttings to the surface and cool the cutting bit.

12. **Remarks** - Additional comments and observations made with respect to drilling behavior.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MO-2DR
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

CORING LOCATION 50' north of swale at Brook A
GROUND SURFACE ELEVATION 188.4 DATUM MSL
DATE START 12/27/88 DATE END 12/28/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR SW MW HW XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	FRACTURES PER FOOT (1 4 16 64)	LET & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10												
11.9	1		Granite with Biotite granofels inclusions		Granite: gray, coarse grained, feldspar, quartz, muscovite, massive. Biotite granofels: gray, fine to medium grained biotite, feldspar, quartz, massive.	Iron-stained fracture surface			<50%			1. 2.
16.9	2	8:38	Granite		Gray, coarse grained, feldspar, quartz, muscovite massive.	Some iron-stained phases.			83%			3.
18.2	3	5:50										
		5:18										
20		3:59							92%	FEED= 1200-1400PSI ROT= 900-1000PSI		
		7:41										
	4	10:38										
		19:25										
		8:06							73%			
		5:38										
		6:34										
					Bottom of core hole at 26.9' below ground surface.							
30												

REMARKS:

1. Used a Series 4 NX diamond core bit for first run.
2. Core out of sequence in first run.
3. Used a Series 8 4" core barrel for second and third runs.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MO-3SR
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

CORING LOCATION 30' south of swale at Brook A
GROUND SURFACE ELEVATION 187.5 DATUM MSL
DATE START 12/22/88 DATE END 12/22/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (SW FR, HW MW, XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	FRACTURES PER FOOT (1 4 16 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10												
												1.
12.4		2:55	Biotite granofels with granitic inclusions		Gray, fine to medium grained, biotite, feldspar, quartz, slightly foliated, with pods of granite: coarse grained, feldspar, quartz, biotite, massive.							
	1	3:50										
		3:01										
15		2:57							31%			
		3:37	*Granite*		*Gray/white, coarse grained* feldspar, quartz, muscovite, biotite, massive							2.
		5:48										3.
	2	8:17	Bio.gran.									
20		8.40	Granite						95%			
		8:16										
		12:34	Bio.granofels									4.
					Bottom of core hole at 22' below ground surface							
25												
30												
35												

REMARKS:

1. Bedrock encountered at 10.3' below ground surface. Began rock coring with a Series 4 NX diamond core bit at 12.4' below ground surface.
2. At end of first run the depth of the well was measured at 12.6' below ground surface.
3. First 3" of run consists of fragments of biotite granofels ½" diameter.
4. Bottom of core hole is at 22' below ground surface at end of second run.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MO-5DR
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

CORING LOCATION 210' north of MW-12D
GROUND SURFACE ELEVATION 181.9 DATUM MSL
DATE START 12/7/88 DATE END 11/20/88

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR, SW, MW, HW, XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	FRACTURES PER FOOT (1 4 16 64+)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
8.1					Gray, coarse grained, feldspar, quartz, muscovite, biotite, massive.							
	1	4:05	Granite									1.
10		4:30	Biotite granofels with granitic inclusions and calc-silicate layers		Gray, medium to coarse grained, biotite, feldspar, quartz, slightly foliated granite - similar to above	Some iron stained fractures						
		4:15										
		5:40							77%			
		6:35			Calc-silicate, green, fine grained feldspar, chlorite, biotite, slightly foliated.							
	2	6:30										2.
		4:30										
		3:50							78%			
		3:50										
		11:20										
	3	6:30	Granite		Gray, coarse grained, feldspar, quartz, muscovite, biotite, massive.							
20		6:40										
		12:30							102%			
		17:35										
		26:55										
					Bottom of core hole at 23.2' below ground surface.							
30												

REMARKS:

1. Used Series 4-inch and NX core barrel.
2. Lost water circulation from 17.5' to 18.1' below ground surface.

GARY4

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-7S
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

CORING LOCATION 90' west of concrete pad
GROUND SURFACE ELEVATION 228.6 DATUM MSL
DATE START 11/18/88 DATE END 11/21/88

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (SW / MW / HW / XW / FR)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 / 75 / 50 / 25 / 0)	FRACTURES PER FOOT (1 / 4 / 10 / 64)	CORE LIFT & RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
7.5												
	1	10:00	Biotite granofels		Gray, fine to medium grained, biotite, feldspar, quartz with calc-silicate layers and quartz pods, massive.	Iron stain on fracture surface.			100%	FEED= 600PSI ROT = 1200PSI		1.
10		8:20										
10.3	2	3:46										2.
		6:00										
		6:00							90%			
		4:30										
	3	7:07										
		5:30										
		8:45							85%			
		9:00										
		8:00										
		1:00/2										
					Bottom of core hole at 18' below ground surface.							
20												
30												

REMARKS:

1. Core hole advanced using a Series 4 NX diamond coring bit.
2. Changed core bit to new diamond bit at 10'. below ground surface.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-9D
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

CORING LOCATION 100' southeast of piggery
GROUND SURFACE ELEVATION 219.0 DATUM MSL
DATE START 11/10/88 DATE END 12/1/88

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (SW, MW, HW, XW; FR)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	FRACTURES PER FOOT (1 4 10 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
5	1	5:00	Biotite granofels with calc-silicate layers		Gray, fine grained, biotite, feldspar, quartz, slightly foliated with quartz stringers. Calc-silicate: green, fine grained, feldspar, chlorite, biotite, slightly foliated.	Iron stained fractures.			63%	FEED= 1000PSI ROT= 600 PSI		1. 2.
		6:00										
		7:00										
	2	4:14				Large vertical fracture with extensive iron staining extends for 3' of run #2.			91%			3.
10		4:49										
		5:05										
		5:04										
		5:36										
14.2		5:09										
15	3	2:54	Bottom 4' of core Granite		Gray, course grained, feldspar, quartz, biotite, muscovite, massive.	Nearly vertical fractures with iron staining between 1-2' of bottom of core.			76%			
		5:05										
		5:45										
18.4		9:20										
					Bottom of core hole at 18.4'.							
20												
30												

REMARKS:

1. Core hole advanced using a Series 4 NX core barrel for first run.
2. Roller bit from 5' below ground surface to 8' below ground surface prior to coring second run.
3. Series 8 4" diamond core bit was used for runs 2 and 3.

GARY4

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-11D
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

CORING LOCATION 140' north of swale
GROUND SURFACE ELEVATION 220.2 DATUM MSL
DATE START 11/30/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR / SW / MW / HW / XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 / 75 / 50 / 25 / 0)	FRACTURES PER FOOT (1 / 4 / 10 / 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10	1	10:00	Biotite granofels with Granitic Pods		Biotite granofels: gray, fine grained, biotite, feldspar, quartz, slightly foliated. Granite: gray, medium grained, feldspar, quartz, biotite, muscovite, massive.	Iron-stained fracture surfaces and weathered biotite			66%			1.
		7:25										
		6:33										
		11:00										
	↓	19:24										2.
15	2	12:20	Granite with Biotite granofels inclusions		Granite, gray, medium to coarse grained, feldspar, quartz, biotite, muscovite, slightly foliated.	Iron stained fractures.			86%			3.
		16:07										
		22:00										
		21:26										
	↓	18:52										
20	3	7:50	Granite		Pink/gray, medium grained feldspar, quartz, biotite, slightly foliated.	(Slightly to moderately weathered along fracture)			67%			
		7:10										
		10:56										
		8:29										
	↓	7:34										
					Bottom of core hole at 20' below ground surface.							
25												

REMARKS:

1. New Series 4 diamond NX core bit used once before. Pulled out core barrel after 4'.
2. After first run, removed 4¼" HSA and advanced hole to 5' below ground surface with 6¼" HSA in order to use 5 5/8" roller bit and 4" core barrel. Advanced roller bit to 9' below ground surface. Evacuated borehole and constructed well using displacement grouting with 4" steel casing. Casing set at 9' below ground surface.
3. Top 2' of core run had previously been sampled with NX core. Runs 2 and 3 were cored using a 4" core barrel.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-12S
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield/S.Sokol

CORING LOCATION 20' east of Brook A at toe of slope
GROUND SURFACE ELEVATION 188.7 DATUM MSL
DATE START 11/18/88 DATE END 11/21/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR / SW / MW / HW / XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 / 75 / 50 / 25 / 0)	FRACTURES PER FOOT (1 / 4 / 16 / 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10												
13.9	1	6:00	Granite		Gray, coarse-grained feldspar, quartz, muscovite biotite, quartz, massive to slightly foliated.	Iron stain on fracture surfaces			80%	1200 PSI		1.
		7:00										
		8:00										
		9:25										
18.4		10:08										
	2	5:30							95%	1200 PSI		
20		7:20										
		6:20										
		6:40										
24.9		14:00			Bottom of core hole at 23.9' below ground surface.							
30												

REMARKS:

1. Core hole was advanced using a Series 4 NX core barrel.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-13D
SHEET 1 OF 2
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER M.Jacobs/E.Wood

CORING LOCATION 400' north of MW-12D, 5' east of Brook A
GROUND SURFACE ELEVATION 181.5 DATUM MSL
DATE START 11/14/88 DATE END 11/30/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR / SW / MW / HW / XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 / 75 / 50 / 25 / 0)	+ FRACTURES PER FOOT (1 / 16 / 64)	LFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
15												
19	1	5:55	Granite		Green-gray, coarse grained quartz, biotite, feldspar, calcite, massive.	Weathered feldspar top of core				900 PSI		1.
20		5:10	Quartz		Green, very fine grained, plagioclase, quartz, sulfide, massive.							
		12:55							60%	600 PSI		2.
		16:00			Gray, coarse grained feldspar, quartz, muscovite, massive.	Iron stained fracture surface.						
		6:24	Granite							900 PSI		3.
	2	4:50	Biotite granofels with intrusive		Gray, medium grained, biotite, quartz, feldspar, surfide flow banding.							
25		5:50	Granitic gneiss		Gray, medium grained, feldspar, quartz, garnet, slightly foliated.	Iron stained fractures.			70%			
		7:30										
		10:40										
		10:30										
	3	7:15										
30		6:05							105%			4.
		18:00	Biotite granofels		Bottom 2 feet of core: biotite, quartz, feldspar, garnet, flow banding.							
		10:05										

REMARKS:

1. Used Longyear Series 4 NX core barrel.
2. Changed to 600 PSI feed pressure due to jumping core barrel, at 21.5 to 23 feet below ground surface.
3. Changed back to 900 PSI at 23 feet below ground surface.
4. Some core from second run may have been recovered in the third run.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-13D
SHEET 2 OF 2
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER M.Jacobs/E.wood

CORING LOCATION 400' north of MW-12D, 5' east of Brook A
GROUND SURFACE ELEVATION 181.5 DATUM MSL
DATE START 11/14/88 DATE END 11/30/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR, SW, MW, HW, XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100, 75, 50, 25, 0)	# FRACTURES PER FOOT (1, 4, 16, 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
34		5:30			Bottom of core hole 34'.							

REMARKS:

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-14D
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G. Juinta
BALSAM ENGINEER G.Garfield

CORING LOCATION 60 feet west of Brook A at lower access road.
GROUND SURFACE ELEVATION 181.5 DATUM MSL
DATE START 1/9/89 DATE END 1/13/89

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR SW MW HW XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	FRACTURES PER FOOT (1 4 16 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
29.8												
30	1	4:31	Granite		Light gray, coarse grained calcite, feldspar, quartz, muscovite, massive.							1.
		3:40							100%			
		6:07										
		9:22	Bio.Granofels		Dark gray, medium to fine grained, calcite, feldspar, biotite, quartz.	Clay in fractures						
		8:00										
	2	6:16	Granite			Iron stained fractures						
		8:10							100%			
		7:50										
		6:20										
40		5:20										
	3	15:37				Tourmaline Vein						
		19:57							100%			
					Bottom of core hole at 42' below ground surface.							
50												

REMARKS:

1. Core hole was advanced using a Series 8, 4" diamond bit.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-15S
SHEET 1 OF 1
PROJECT NO. 6185
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

CORING LOCATION South side of Randy Lane
GROUND SURFACE ELEVATION 180.7 DATUM MSL
DATE START 12/20/88 DATE END 12/23/88

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR / SW / MW / HW / XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 / 75 / 50 / 25 / 0)	FRACTURES PER FOOT (1 / 4 / 16 / 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10												
	1	11:05	Granite		Gray, coarse grained, feldspar, quartz, muscovite, biotite, quartz, massive to slightly foliated.	Iron-stain fractures			100%			1.
	2	4:40										
		9:40							52%			
		6:20										
		5:12										
	3	5:05										
									50%			
20												2.
20.7					Bottom of core hole at 20.7' below ground surface							
30												

REMARKS:

1. Core hole advanced using a Series 4 NX diamond core bit.
2. Water loss from 19'9" to 20'1".

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. MW-18S
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

CORING LOCATION Jennifer Lane at Huckleberry Road
GROUND SURFACE ELEVATION 164.2 DATUM MSL
DATE START 1/11/89 DATE END 1/11/89

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR / SW / MW / HW / XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 / 75 / 50 / 25 / 0)	FRACTURES PER FOOT (1 / 4 / 10 / 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
20												
23.5		1:51	Biotite granofels		Gray, fine to medium grained, biotite, feldspar quartz, chlorite, slightly foliated.	Some weathered fracture surfaces						1. 2.
		4:21										
		8:08										
		5:45							62%			
		3:26										
	2	6:30										
30		6:24										
		8:44										
		5:04							83%			
		7:47										
					Bottom of core hole at 33' below ground surface.							
40												

REMARKS:

1. Core not in sequence in first run.
2. Core hole advanced using a Series 4 NX diamond core bit.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: Mottolo RI/FS
Raymond, New Hampshire

CORING NO. MW-20D
SHEET 1 OF 1
PROJECT NO. 6185
CHKD. BY MFJ/TSS

CORING CO. AVALANCHE SOIL EXPLORATION
FOREMAN S. Doucette
BALSAM ENGINEER G. Garfield

CORING LOCATION 73 feet southwest of MW-8D
GROUND SURFACE ELEVATION 223.6 DATUM MSL
DATE START 9/25/89 DATE END 9/25/89

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MIN/FT)	ROCK TYPE	WEATHERING (SW FR, MW, HW, XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (0, 25, 50, 75, 100)	FRACTURES PER FOOT (1, 4, 16, 64)	CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
5												
10												
15												
20	1	5:00	Biotite Granofels		Gray, fine to medium grained, biotite quartz, feldspars moderate foliation.	Highly weathered zone 17.2-19.0feet, numerous fractures. Iron staining on fractures quartz veins.			58%			
	1	2:10										
	1	1:56										
	1	3:08										
	1	4:52										
25												
30												

REMARKS:

1. Rock coring performed with a Mobile B-47 drill rig mounted on a four-wheel- drive Unimog truck.
2. Rockcore obtained using a 2 7/8-inch NX core barrel.

CARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: Mottolo RI/FS
Raymond, New Hampshire

CORING NO. MW-21D
SHEET 1 OF 1
PROJECT NO. 6185
CHKD. BY MFJ/TSS

CORING CO. AVALANCHE SOIL EXPLORATION, INC.
FOREMAN S. Doucette
BALSAM ENGINEER G. Garfield

CORING LOCATION 70 feet southwest of MW-8D
GROUND SURFACE ELEVATION 228.7 DATUM MSL
DATE START 9/27/89 DATE END 9/27/89

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (MINUTES)	ROCK TYPE	WEATHERING (SW, MW, HW; FR, I, MW, I, XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (0, 25, 50, 75, 100)	FRACTURES PER FOOT (1, 4, 16, 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: ROT	REMARKS
5												
10												
15	1	9:44	Biotite Granofels		Gray, fine to medium grained biotite, quartz feidspar and feldspathic intrusive. Moderate foliation.	Iron stain on fracture at bottom of core.			100%	300	900	1. 2.
	1	9:48										
	1	5:19										
	1	5:58										
	1	4:53										
20					Bottom of core hole 16.9 feet below ground surface.							
25												
30												

REMARKS:

1. Rock coring performed with a Mobile B-47 drill rig mounted on a Unimog four wheel drive truck.
2. Rockcore obtained using a 2 7/8-inch NX core barrel.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. OW-2DR
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN G.Juinta
BALSAM ENGINEER G.Garfield

CORING LOCATION 160' north of piggery at top of slope
GROUND SURFACE ELEVATION 209.3 DATUM MSL
DATE START 12/29/88 DATE END 1/9/89

ELEVATION / DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (SW, MW, HW, XW; FR)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	FRACTURES PER FOOT (1 4 16 64)	LIFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10												
18					Gray, very fine grained, quartz, massive							1.
20		6:38	Quartzite		Gray, medium to coarse grained, feldspar quartz, biotite, garnet.	Fractures are iron stained						2.
21.4	1	11:45	Granite Biotite granofels with granitic inclusions		Gray, meidum grained, biotite, feldspar, quartz, slightly foliated. Granitic inclusions at bottom 1/2-foot of core.							2a.
	2	2:47										3.
		4:44							100%			
		3:43										
24.2	3	4:23										
		3:48										4.
		2:56										
		3:06										
		2:26										
30		4:14							68%			5.
		3:12										
		3:13										
		2:42										
		3:32										
		3:36										
35					Bottom of core hole at 35' below ground surface.							
40												

REMARKS:

1. Roller bit from 18' below ground surface to 20' below ground surface.
2. Core retrieved with a Series 8, 4" diamond core bit.
2a. Runs 1 and 2 not separated, so RQD and REC represent Runs 1 and 2.
3. Removed core barrel from hole due to jamming while attempting to core.
4. Graphite presumed to be from the formation observed in recirculation water.
5. Added 5' of rods without breaking core barrel.

GARY4

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. OW-3R
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER M.Jacobs/E.Wood

CORING LOCATION 260' north of piggery
GROUND SURFACE ELEVATION 221.5 DATUM MSL
DATE START 12/2/88 DATE END 12/8/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (SW, MW, HW, FR, XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100, 75, 50, 25, 0)	FRACTURES PER FOOT (1, 4, 10, 64)	LFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
3.8												
	1	3:28	Biotite granofels		Gray, fine to medium grained, biotite, feldspar, quartz, slightly foliated.	Iron-stained fracture surfaces						1.
		4:58										
		4:09										
		6:30										
		7:40							40%			
10	2	12:45	Biotite granofels		Gray, fine to medium grained biotite, feldspar, quartz, slightly foliated							2.
		13:20										
		13:13										
		9:26							100%			
		29:38	Granitic Inclusions		Granitic pods, gray, fine grained, feldspar, quartz, biotite, massive.							
	3	21:08	Biotite granofels		Gray, fine to medium grained, biotite, feldspar, quartz, slightly foliated.							
		8:06										
		4:32							52%			
		4:80										
		11:20										
20					Bottom of core hole at 19' below ground surface.							
30												

REMARKS:
1. Used Series 4 NX core barrel for first run, roller bit from 3.8' to 9'.
2. Used Series 8, 4" core barrel for second and third runs.

GARY4

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK CORING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

CORING NO. OW-4DR
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

CORING CO. Soil Exploration Corp.
FOREMAN M.Camacho
BALSAM ENGINEER E.Wood/M.Jacobs

CORING LOCATION 100' north of piggery
GROUND SURFACE ELEVATION 217.6 DATUM MSL
DATE START 12/13/88 DATE END 12/15/88

ELEVATION DEPTH	SAMPLING INTERVAL	DRILLING RATE (IN MINUTES)	ROCK TYPE	WEATHERING (FR SW MW HW XW)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	DESCRIPTION OF ROCK DEFECTS (TYPE ORIENTATION ALTERATION, ROUGHNESS, COATING ETC.)	PERCENT RQD (100 75 50 25 0)	+ FRACTURES PER FOOT (1 16 64)	LEFT & CORE RECOVERY	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	REMARKS
10												
12.7					Gray, fine to medium grained, biotite, feldspar quartz, chlorite, foliated with layers of calc-silicate, feldspar, chlorite, quartz.							1.
13.2	1	6:06	Biotite granofels									
		7:17										
15		10:24			Gray, medium grained, feldspar, quartz, biotite, slightly foliated.				100%			
		17:03	Granite		See Biotite granofels description above.							
		3:12	Biotite gran Granite		See Granite description above.							
18.2	2	5:00										
20		4:30										
		5:45							98%			
		4:13										
23.2		4:19										
	3	4:55										
		3:09										
		2:34							82%			
		7:52										
28.2		5:36	Biotite gran		Bottom of core hole at 28.2 below ground surface.							
30												

REMARKS:

1. Bedrock was encountered at 12.7' below ground surface then roller bitted to 13.2'. Rock coring began at 13.2' below ground surface.
2. Spun 4-inch casing 1/2' into rock. Used 4-inch core barrel - cored to 18' bgs. Placed 3-inch casing, pulled out 4-inch casing, grouted, drilled thru 3-inch casing with NX to 28.2 bgs.

GARY4

ROCK DRILLING LOG LEGEND

The items shown on the Rock Drilling Logs refer to the following:

1. **Depth** - Depth below ground surface

2. **Rock Type** - Based on geologist's interpretation

3. **Description of Rock Material** - Rock cores retrieved from the boring have been described using the following sequence: 1. color 2. grain size 3. mineralogy 4. bedding/foliation, and 5. other pertinent geologic features.

4. **Weathering** - Weathering abbreviations are defined as follows:

   FR = Fresh Rock. Minerals are clear with little to no clay mineralization on feldspathic phases. Joint surfaces may appear to be slightly stained. Crystalline rock rings when struck with a hammer.

   SW = Slightly Weathered Rock. Rock generally fresh but joint surfaces are stained and discolored and may contain clay minerals. Feldspar minerals occasionally appear to be dull or discolored. Rock rings when struck with a hammer.

   MW = Moderately Weathered Rock. Significant portions of rock appear to be discolored and dull; feldspars are clayey. Rock emits a dull sound when struck with a hammer.

   HW = Highly Weathered Rock. All minerals, except quartz, appear to be dull and discolored. Feldspars are disintegrated to clay minerals. Rock exhibits severe loss of strength and makes a dull noise when struck with a hammer.

   XW = Extremely Weathered Rock. Strength of rock reduced to strong soil. Some fragments of rock usually remain.

5. **Drilling Behavior** - (See Remarks)

6. **Drilling Rate** - Drilling rate is equal to the time required to advance the core barrel a distance of one foot.

7. **Remarks** - Additional comments and observations made with respect to drilling behavior.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-7D
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER R. Wozmak

BORING LOCATION 80' west of concrete pad
GROUND SURFACE ELEVATION 228.7 DATUM MSL
DATE START 12/6/88 DATE END 12/6/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, HW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
			Overburden Soil - see log of soil boring MW-7S for descriptions.						1.
10		Granite	Gray/white, medium grained, quartz, feldspar, biotite, muscovite, massive.					SEE WELL COMPLETION LOG	
		Quartzite	Gray, fine grained, quartz, massive.						2. 3.
20		Quartzite							
		Quartzite							
		Quartzite							
			Bottom of boring at 28.0'.						
30									
40									
50									
60									
70									

REMARKS:

1. Hole advanced with a 5 7/8" Air hammer (Reich 650 AF rotary drill rig).
2. 6" diameter casing set at 14 feet below ground surface.
3. Samples collected from rock chips obtained during drilling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-8D
SHEET 1 OF 1
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER R. Wozmak

BORING LOCATION 20' south of concrete pad
GROUND SURFACE ELEVATION 230.6 DATUM MSL
DATE START 12/6/88 DATE END 12/6/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING XW HW MW SW FR	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
10			Overburden Soil - see log of soil boring MW-8S for description.					SEE WELL COMPLETION LOG	1. 2. 3.
20		Granite	Gray, medium grained quartz, feldspar, biotite, muscovite, massive.						4.
		Biotite schist	Black, fine grained, biotite, *feldspar, quartz, foliated.*						
		Biotite schist							
		Biotite schist							
30		Biotite schist							
			Bottom of Boring at 33.4'.						
40									
50									
60									
70									

REMARKS:

1. Hole advanced with a 5 7/8" air hammer (Reich 650 Air rotary drill rig).
2. 6" diameter steel casing set at 21.0' below ground surface.
3. Drilling fluid changed from air to Quick-Gel Bentonite at 6 feet due to formation collapse.
4. Samples collected from rock chips obtained during drilling.

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-10D
SHEET 1 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone

BORING LOCATION Blake Road Extension
GROUND SURFACE ELEVATION 257.0 DATUM MSL
DATE START 12/6/88 DATE END 12/7/88

ELEVATION / DEPTH (BGS)	SAMPLING INTERVAL	ROCK TYPE (S)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
			Overburden Soil - see the log of soil boring MW-10S for description.	XW / HW / MW / SW / FR					1.
10			Bedrock at 11 feet						
20								SEE WELL COMPLETION LOG	
30		Biotite schist	Black/gray, fine to medium grained biotite, quartz, feldspar, sulfide, well foliated with quartz veins parallel to foliation.						2,3.
40		Biotite granofels	Gray, fine grained, biotite, quartzite, feldspar, slightly foliated.						4.
50		Quartzite	White quartz, with minor biotite, massive, some biotite granofels (5%)				17		5. 6.
60		Biotite granofels and quartzite	50% biotite granofels, 50% quartzite.						
70							20		

REMARKS:
1. Hole advanced using a 5 7/8" air hammer (Reich 650 Air Rotary drill rig).
2. Samples collected from rock chips collected during drilling. Casing set 23 feet below ground surface.
3. Bleeding 1.5 gpm potable water into air line.
4. Vegetable oil used to lubricate bit poured directly into drill rod.
5. Reich Drill T-650 drill rig bit oiler shut off.
6. Adding 1.5 gpm potable water to air line.

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-10D
SHEET 2 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone

BORING LOCATION Blake Road Extension
GROUND SURFACE ELEVATION 257.0 DATUM MSL
DATE START 12/6/88 DATE END 12/7/88

ELEVATION (DEPTH) B.G.S.	SAMPLING INTERVAL	ROCK TYPE(S)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
		Gneiss, Biotite Granofels, Quartzite	Gray/green, quartz, biotite, chlorite, feldspar, sulfide, well foliated. 65 gneiss, 25% biotite granofels, 10% quartzite.	XW PW HW MW SW FR			20		
80		Biotite schist Gneiss Quartzite	40% biotite schist 35% gneiss 25% quartzite						
90		Gneiss Biotite schist Quartzite	34% gneiss 33% bio. schist 33% quartzite				19		
100		Gneiss Biotite schist Quartzite	50% gneiss 30% bio.schist 20% quartzite						
110		Quartzite Biotite schist	90% quartzite 10% bio.schist				19		
120		Biotite schist Quartzite Gneiss	50% bio.schist 35% quartzite 15% gneiss						
130		Biotite schist Quartzite Gneiss	75% bio.schist 15% quartzite 10% gneiss				20		
140									

REMARKS:

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-10D
SHEET 3 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone

BORING LOCATION Blake Road Extension
GROUND SURFACE ELEVATION 257.0 DATUM MSL
DATE START 12/6/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE(S)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
		Biotite schist Quartzite	85% bio.schist 15% quartzite						
150		Biotite schist Quartzite	80% bio.schist 20% quartzite				19		
160		Biotite schist Quartzite	85% biotite schist 15% quartzite						
170		Biotite schist Quartzite Gneiss	75% bio.schist 15% quartzite 10% gneiss				21		
180		Biotite schist Quartzite Gneiss	75% bio.schist 20% quartzite 5% gneiss						
190		Biotite schist Gneiss Quartzite	34% bio.schist 33% gneiss 33% quartzite				20		
200		Biotite schist Quartzite Gneiss	40% bio.schist 35% quartzite 25% gneiss						
210							22		

REMARKS:

CORLOG

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-10D
SHEET 4 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone

BORING LOCATION Blake Road Extension
GROUND SURFACE ELEVATION 257.0 DATUM MSL
DATE START 12/6/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE(S)	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
		Biotite schist Gneiss Quartzite	50% bio.schist 40% gneiss 10% quartzite	XW CW MW SW FR			22		
220		Gneiss Quartzite Biotite schist	75% gneiss 15% quartzite 10% bio.schist				5		7.
			Bottom of open rock hole 226.4 feet.						
230									

REMARKS:

7. Blew out hole for 5 minutes. <1 gpm yield.

CORLOG

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-15D
SHEET 1 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION South side of Randy Lane
GROUND SURFACE ELEVATION 182.0 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW HW MW SW FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
			Overburden Soil - see log of soil boring MW-15S for description.					SEE WELL COMPLETION LOG	1.
10									2.
		Granite	White, medium-grained, quartz, feldspar, muscovite, massive, iron stained.				3		3.
20		Granite					6		
		Granite	Biotite Schist: Black, fine-grained biotite, feldspar, quartz 85%, foliated with calcite-silicate layers, green, fine-grained chlorite, feldspar quartz, slightly foliated.				2		
30		Biotite Schist Quartzite	Quartzite: White, fine-grained granite, massive. 15%				3		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
40		Biotite Schist Quartzite	Biotite Schist 98% Quartzite 2%				4		
		Quartzite Biotite Schist	Quartzite 85% Biotite Schist 15%				4		
50		Quartzite Biotite Schist	Quartzite 85% Biotite Schist 15%				2		
		Biotite Schist Quartzite					4		
60		Biotite Schist Quartzite	Biotite Schist 75% Quartzite 25%				4		
		Biotite Schist					3		
70									

REMARKS:
1. Drilling conducted with 5 7/8" diameter air hammer (Reich Drill 650 air rotary rig).
2. Casing set at 16 feet below ground surface.
3. Samples taken from rock chips collected during drilling.

CORLOG

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-15D
SHEET 2 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION South side of Randy Lane
GROUND SURFACE ELEVATION 182.0 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
70		Biotite Schist Quartzite	Biotite Schist 75% Quartzite 25%				3		
		Biotite Schist Quartzite	Biotite Schist 75% Quartzite 25%				2		
80		Biotite Schist Quartzite	Biotite Schist 80% Quartzite 20%				3		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				4		
90		Biotite Schist Quartzite	Biotite Schist 50% Quartzite 50%				3		
		Quartzite					4		
100		Quartzite					5		
		Biotite Schist Quartzite	Biotite Schist 50% Quartzite 50%				4		
110		Biotite Schist with calcite-silicate					5		4.
		Biotite Schist with calcite-silicate					5		
120		Biotite Schist with calcite-Quartzite	Biotite Schist with calcite-silicate 95% Quartzite 5%				7		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				4		
130		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Quartzite Biotite Schist	Quartzite 85% Biotite Schist 15%				4		
140									

REMARKS:

4. Sample chips very fine grained for intervals 110 - 125 feet.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-15D
SHEET 3 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION South side of Randy Lane
GROUND SURFACE ELEVATION 182.0 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, HW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
140		Quartzite Biotite Schist	Quartzite 90% Biotite Schist 10%				6		
		Quartzite Biotite Schist	Quartzite 90% Biotite Schist 10%				4		
150		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				4		
		Biotite Schist Quartzite	Biotite Schist 75% Quartzite 25%				4		
160		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				7		
		Biotite Schist					5		
170		Biotite Schist					3		
		Quartzite Biotite Schist	Quartzite 50% Biotite Schist 50%				5		
180		Quartzite Biotite Schist	Quartzite 50% Biotite Schist 50%				6		
		Quartzite Biotite Schist	Quartzite 75% Biotite Schist 25%				5		
190		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				3		
		Biotite Schist with calcite-silicate Quartzite	Biotite Schist 75% Quartzite 25%				6		
200		Quartzite					5		5.
		Quartzite					3		
210									

REMARKS:

5. Sample chips very fine grained.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-15D
SHEET 4 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION South side of Randy Lane
GROUND SURFACE ELEVATION 182.0 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
210		Biotite Schist with calcite-silicate	Biotite Schist 50% Quartzite 50%				4		
		Quartzite							
		Quartzite	Quartzite 90%						
		Biotite Schist	Biotite Schist 10%				4		
220		Quartzite					7		6.
			Bottom of boring at 226.2 feet below ground surface.						

REMARKS:

6. Blew out hole after drilling.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-16D
SHEET 1 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Jennifer Lane
GROUND SURFACE ELEVATION 197.5 DATUM MSL
DATE START 12/6/88 DATE END 12/8/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
10		Biotite Schist Quartzite	Biotite Schist: Gray/green, fine to medium grained biotite, quartzite, chlorite, feldspar, foliated. Quartzite: white, fine grained quartzite, massive.	XW / CW / MW / SW / FR			4		1. 2. 3.
20		Biotite Schist Quartzite	Biotite Schist 95% Quartzite <5%				3	SEE WELL COMPLETION LOG	
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite <5%				4		
30		Biotite Schist Quartzite	Biotite Schist 85% Quartzite 15%				3		
		Biotite Schist Quartzite	Biotite Schist 80% Quartzite 20%				4		
40		Biotite Schist Quartzite	Biotite Schist 50% Quartzite 50%				4		
		Biotite Schist Quartzite	Biotite Schist 50% Quartzite 50%				4		
50		Biotite Schist Quartzite	Biotite Schist 75% Quartzite 25%				4		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				7		
60		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				4		
		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				4		
70									

REMARKS:
1. Hole advanced using a 5 7/8" air hammer (Reich 650 air rotary drill rig).
2. Casing set at 16 feet below ground surface.
3. Samples taken from rock chips collected during drilling.

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-16D
SHEET 2 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Jennifer Lane
GROUND SURFACE ELEVATION 197.5 DATUM MSL
DATE START 12/6/88 DATE END 12/8/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
70		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				4		
80		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Biotite Schist					5		
90		Biotite Schist					4		
		Biotite Schist					7		
100		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
110		Biotite Schist					4		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
120		Biotite Schist Quartzite	Biotite Schist 85% Quartzite 15%				5		
		Quartzite Biotite Schist	Quartzite 75% Biotite Schist 25%				4		
130		Biotite Schist					5		
		Biotite Schist					4		
140									

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-16D
SHEET 3 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak
BORING LOCATION Jennifer Lane
GROUND SURFACE ELEVATION 197.5 DATUM MSL
DATE START 12/6/88 DATE END 12/8/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
140		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				5		
		Biotite Schist					5		
150		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				5		
160		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				7		
		Biotite Schist Quartzite	Biotite Schist 80% Quartzite 20%				5		
170		Quartzite Biotite Schist	Quartzite 85% Biotite Schist 15%				5		
		Quartzite Biotite Schist	Quartzite 90% Biotite Schist 10%				4		
180		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				6		
190		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				4		
200		Biotite Schist					6		
		Biotite Schist					6		
210									

REMARKS:

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-16D
SHEET 4 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Jennifer Lane
GROUND SURFACE ELEVATION 197.5 DATUM MSL
DATE START 12/6/88 DATE END 12/8/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
210		Biotite Schist					5		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
220		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				6		4.
			Bottom of well at 225.9 feet.						
230									

REMARKS:

4. Well yields approximately 2 gpm based on air lift pumping at completion.

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-17D
SHEET 1 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Northeast corner of Blackberry & Huckleberry
GROUND SURFACE ELEVATION 193.2 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING XW CW MW SW FR	DRILLING BEHAVIOR FEED	DRILLING BEHAVIOR WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
								SEE WELL COMPLETION LOG	
10									
		Granite	White/gray, medium grained quartz, feldspar, muscovite, biotite, slightly foliated, iron staining.				5		1. 3. 4.
20		Granite					9		
		Granite	White/gray, fine to medium grained feldspar, quartz, biotite, muscovite, foliated, iron staining.				3		
30		Granite					5		
		Granite	White/gray, medium grained quartz, feldspar, muscovite, biotite, massive, iron staining.				5		2.
40		Granite	Gray, fine grained quartz, feldspar, biotite, muscovite, slightly foliated.				5		
		Biotite Schist	Black/gray, fine grained biotite, quartz, feldspar, foliated, with calcite-silicate layers.				5		
50		Biotite Schist	Black/gray, fine grained biotite, quartz, feldspar, foliated, with calcite-silicate layers.				3		
		Granite	White/gray, medium to coarse grained feldspar, quartz, muscovite, biotite, massive.				4		
60		Granite	White/gray, medium to coarse grained feldspar, quartz, muscovite, garnet, massive.				6		
		Granite	White/gray, medium to coarse grained feldspar, quartz, muscovite, garnet, massive. Iron stained.				4		

REMARKS:

1. Hole advanced using a 5 7/8" air hammer (Reich 650 air rotary drill rig).
2. Geologist reports fractured rock at 39 feet below ground surface.
3. Samples collected from rock chips obtained during drilling.
4. 6" casing set 16 feet below ground surface.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-17D
SHEET 2 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Northeast corner of Blackberry & Huckleberry
GROUND SURFACE ELEVATION 193.2 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING XW HW MW SW FR	DRILLING BEHAVIOR FEED	DRILLING BEHAVIOR WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
70		Biotite Schist Granite	Biotite Schist 35% Granite: Gray, fine-grained, feldspar, quartz, biotite, garnet, slightly foliated, iron stained (65%)				3		
		Granite Quartzite	Granite: White/gray, medium to coarse grained, feldspar, quartz, muscovite, biotite, quartz, massive, iron stained 85% Quartzite 15%				4		
80		Quartzite Granite	Granite: White, fine to medium grained feldspar, quartz, biotite, garnet, massive, iron stained. Quartzite 50%, Granite 50%				5		
		Biotite Schist					4		
90		Biotite Schist Quartzite	Biotite Schist 80% Quartzite 20%				3		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				4		
100		Biotite Schist					5		
		Biotite Schist Granite	Biotite Schist 35% Granite: iron-stained 65%				4		
110		Granite Biotite Schist	Granite: gray 80% Biotite Schist 20%				4		
		Biotite Schist					5		
120		Biotite Schist Granite	Biotite Schist 50% Granite: gray, slightly foliated 50%				5		
		Biotite Schist Granite	Biotite Schist 50% Granite: gray 50%				5		
130		Biotite Schist					5		
		Biotite Schist Quartzite	Biotite Schist 98% Quartzite 2%				6		
140									

REMARKS:

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-17D
SHEET 3 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Northeast corner of Blackberry & Huckleberry
GROUND SURFACE ELEVATION 193.2 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, DW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
140		Biotite Schist					7		
		Biotite Schist Quartzite	Biotite Schist 98% Quartzite 2%				4		
150		Biotite Schist Quartzite	Biotite Schist 98% Quartzite 2%				5		
		Biotite Schist Quartzite	Biotite Schist 98% Quartzite 2%				5		
160		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				7		
		Quartzite Biotite Schist	Quartzite 75% Biotite Schist 25%				5		5.
170		Biotite Schist Quartzite	Biotite Schist 98% Quartzite 2%				4		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%				5		
180		Biotite Schist					8		
		Biotite Schist					3		
190		Biotite Schist					4		
		Biotite Schist Quartzite	Biotite Schist 80% Quartzite 20%				6		
200		Quartzite					6		
		Quartzite					4		
210									

REMARKS:

5. Sample may be mixed with samples from previous interval.

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLOT RI/FS
Raymond, NH

BORING NO. MW-17D
SHEET 4 OF 4
PROJECT NO. 6185.813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER M. Deyling/R. Wozmak

BORING LOCATION Northeast corner of Blackberry & Huckleberry
GROUND SURFACE ELEVATION 193.2 DATUM MSL
DATE START 12/6/88 DATE END 12/9/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, HW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
210		Quartzite					5		
		Quartzite Biotite Schist	Quartzite 50% Biotite Schist 50%				6		
220		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				6		6.
			Bottom of well at 226.8 feet.						
230									

REMARKS:
6. Blew out hole after drilling completed.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-18D
SHEET 1 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone/M. Deyling

BORING LOCATION Jennifer Lane and Huckleberry Lane
GROUND SURFACE ELEVATION 164.5 DATUM MSL
DATE START 12/6/88 DATE END 12/10/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
			Overburden Soil - see the log of soil boring MW-18S for description.					SEE WELL COMPLETION LOG	
10									
20									
									2.
30		Biotite Schist with calcite-silicate Quartzite	Biotite Schist: Black/gray, fine to medium grained biotite, feldspar, quartz, foliated with calcite-silicate; green, fine-grained chlorite, feldspar, quartz, laminated. 95% *Quartzite: White, fine-grained quartz massive.* 5%				11		
40		Biotite Schist with calcite-silicate Quartzite	Biotite Schist 90% Quartzite 10%						3.
50		Biotite Schist with calcite-silicate Quartzite	Biotite Schist 95% Quartzite 5%				16		
									3a.
60		Quartzite Biotite Schist	Quartzite 75% Biotite Schist 25%						
		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%				15		3. 4.
70									

REMARKS:
1. Six-inch casing set at 31' on 12/6/88. Driller spun casing and lost seal 12/8/88. New casing set to 28' below grade on 12/8/88. Drilling fluid changed from Air to Quick-Gel Bentonite while setting new casing.
2. Drilled out grout from 3 to 28' below ground surface.
3. Samples were collected in 5' intervals and combined if rock types appeared similar.
3a. Drilling water color lightened.
4. Run interval is timed from 60'-80' below ground surface.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-18D
SHEET 2 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone/M. Deyling

BORING LOCATION Jennifer Lane & Huckleberry Lane
GROUND SURFACE ELEVATION 164.3 DATUM MSL
DATE START 12/6/88 DATE END 12/10/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
70		Biotite Schist with calcite-silicate Quartzite	Biotite Schist 85% Quartzite 15%						3.
80		Quartzite Biotite Schist	Quartzite 95% Biotite Schist 5%						
		Biotite Schist with calcite-silicate Quartzite	Biotite Schist 90% Quartzite 10%				13		
90		Biotite Schist with calcite silicate Quartzite	Biotite Schist 95% Quartzite 5%						
100		Biotite Schist Quartzite Quartz mylonite	Biotite Schist 90% Quartzite 5% Quartz mylonite; green, very fine-grained quartz, massive 5%						
110		Biotite Schist Quartzite	Biotite Schist 50% Quartzite 50%				19		
120		Quartzite Biotite Schist	Quartzite 90% Biotite Schist 10%						
		Granite	*White, medium-grained feldspar, quartz, biotite, massive.*						
130		Granite Biotite Schist	Granite 90% Biotite Schist 10%				14		
140									

REMARKS:

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-18D
SHEET 3 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone/M. Deyling

BORING LOCATION Jennifer Lane & Huckleberry Lane
GROUND SURFACE ELEVATION 164.3 DATUM MSL
DATE START 12/6/88 DATE END 12/10/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW HW MW SW FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
140		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%						
		Quartzite Biotite Schist	Quartzite: Gray, very fine-grained quartz, biotite (<2%), slightly foliated 90% Biotite Schist 10%						
150							18		
		Biotite Schist Quartzite	Biotite Schist 75% Quartzite 25%						3.
160									
		Biotite Schist Quartzite	Biotite Schist 90% Quartzite 10%						3.
170							16		
									3.
180									
		Granite Biotite Schist	Granite 90% Biotite Schist 10%						
190							19		
		Biotite Schist Quartzite	Biotite Schist 95% Quartzite 5%						
		Granite Biotite Schist	Granite 60% Biotite Schist 40%						
200									
		Granite							
		Granite Biotite Schist	Granite 50% Biotite Schist 50%				16		5.
210									

REMARKS:

5. Interval is timed from 200' to 220' below ground surface.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-18D
SHEET 4 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone/M. Devling

BORING LOCATION Jennifer Lane & Huckleberry Lane
GROUND SURFACE ELEVATION 164.3 DATUM MSL
DATE START 12/6/88 DATE END 12/10/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
210		Biotite Schist with calcite-silicate Quartzite	Biotite Schist 98% Quartzite 2%	XW HW MW SW FR					
220		Biotite Schist with calcite-silicate					4		6.
			Bottom of well at 226.4 feet below ground surface.						

REMARKS:

6. Blow out hole for 10 minutes after drilling.

CORLOG

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-19D
SHEET 1 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T.Stone

BORING LOCATION Blueberry Hill Road
GROUND SURFACE ELEVATION 202.3 DATUM MSL
DATE START 12/5/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, DW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
								SEE WELL COMPLETION LOG	
10		Granite	Gray, fine to medium grained feldspar, quartz, biotite, garnet, slightly foliated.						1.
		Biotite Schist Quartzite	Biotite schist, black, fine grained, biotite, feldspar, quartz, foliated (85%).						2.
20			Quartzite, white, fine grained, quartz, massive (15%)						3.
		Granite Weathered biotite schist fragments	Granite 90% Biotite schist 10%						
		Granite Weathered biotite schist fragments	Granite 95% Biotite schist 5%						
30		Biotite schist Quartzite	Biotite schist 75% Quartzite 25%						
									4.
40									
		Biotite Schist Quartzite	Biotite schist 65%, non-stain Quartzite 35%						
50							18		
		Quartzite Biotite schist	Quartzite 65% Biotite schist 35%						
60		Biotite schist Quartzite	Biotite schist 75% Quartzite 25%						
							19		5.
70									

REMARKS:
1. 6" casing set at 6 feet below ground surface on 12/5/88.
2. Fracture with water at 19 feet below ground surface reported by driller.
3. Fracture with water at 21 feet below ground surface reported by driller.
4. Samples collected in 5-foot intervals and combined if rock types appeared similar.
5. Timed interval is from 60 feet below ground surface to 80 feet below ground surface.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-19D
SHEET 2 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone/R. Wozmak

BORING LOCATION Blueberry Hill Road
GROUND SURFACE ELEVATION 202.3 DATUM MSL
DATE START 12/5/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, HW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
70		Biotite Schist Quartzite	Biotite schist 90% Quartzite 10%						
80		Biotite schist Quartzite	Biotite schist 90% Quartzite 10%						
90		Biotite schist Quartzite Quartz Mylonite	Biotite schist 90% Quartzite 8% Quartz Mylonite, green, very fine grained, quartz, slightly foliated 2%				17		
100		Biotite schist Granite Quartz Mylonite	Biotite schist 90% Granite 5% Quartz Mylonite 5%						
110							17		
		Quartz Mylonite Biotite schist	Quartz Mylonite 75% Biotite schist 25%						
		Quartz Mylonite Biotite schist	Quartz Mylonite 90% Biotite schist 10%						
120		Quartz Mylonite Biotite schist	Quartz Mylonite 75% Biotite schist 25%						
		Biotite schist Quartzite Quartz Mylonite	Biotite schist 75% Quartzite 20% Quartz Mylonite 5%						
130							16		
		Biotite schist Quartz Mylonite Quartzite	Biotite schist 45% Quartz Mylonite 45% Quartzite 10%						
140									6.

REMARKS:

6. Fracture with water at 140 feet below ground surface reported by driller.

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-19D
SHEET 3 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T. Stone/R. Wozmak

BORING LOCATION Blueberry Hill Road
GROUND SURFACE ELEVATION 202.3 DATUM MSL
DATE START 12/5/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
140		Biotite schist Quartz Mylonite Quartzite	Biotite schist 34% Quartz Mylonite 33% Quartzite 33%						
		Biotite schist							
150		Biotite schist Quartzite	Biotite schist 95% Quartzite 5%				20		
160		Biotite schist Quartzite	Biotite schist 65% Quartzite 35%						
170		Biotite schist Quartzite	Biotite schist 75% Quartzite 25%				18		
180		Biotite schist							
		Quartzite Biotite schist	Quartzite 80% Biotite schist 20%						
190		Quartz Mylonite					29		7.
200		Biotite schist Quartz Mylonite	Biotite schist 90% Quartz Mylonite 10%						
210							28		8.

REMARKS:

7. Drilling slows due to increase in water (>50gpm), need to increase air pressure.
8. Interval is timed from 200 feet below ground surface to 220 feet below ground surface.

BALSAM
ENVIRONMENTAL CONSULTANTS, INC.

ROCK DRILLING LOG

PROJECT: MOTTOLO RI/FS
Raymond, NH

BORING NO. MW-19D
SHEET 4 OF 4
PROJECT NO. 6185/813
CHKD. BY

DRILLING CO. Gap Mountain Drilling
FOREMAN P. Williams
BALSAM ENGINEER T.Stone/R. Wozmak

BORING LOCATION Blueberry Hill Road
GROUND SURFACE ELEVATION 202.3 DATUM MSL
DATE START 12/5/88 DATE END 12/7/88

ELEVATION / DEPTH	SAMPLING INTERVAL	ROCK TYPE	DESCRIPTION OF ROCK MATERIAL (COLOR, GRAIN, SIZE, TEXTURE, MINERALOGY, BEDDING/FOLIATION, ETC.)	WEATHERING (XW, DW, MW, SW, FR)	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING RATE (MIN.)	WELL CONSTRUCTION	REMARKS
210		Biotite schist Quartzite	Biotite schist 95% Quartzite 5%				28		
220		Biotite schist Quartz Mylonite	Biotite schist 85% Quartz Mylonite 15%						
			Bottom of boring at 222.4 feet below ground surface.						10.

REMARKS:
10. Blew hole for 5 minutes after drilling completed. Well yields >50 gpm.

CORLOG

APPENDIX B-4

GRAIN SIZE ANALYSES, EMPIRICAL HYDRAULIC CONDUCTIVITY ESTIMATES, FALLING HEAD PERMEAMETER TESTS

TRANSMITTAL LETTER

RECEIVED DEC 04 1989

MILLER ENGINEERING & TESTING, INC.

TO:

•BALSAM ENVIRONMENTAL CONSULTANTS, INC.
•ATTN: MINDI JACOBS
• 59 STILES ROAD
• SALEM NH 03079

Date: 12/1/89
Job No.: 90717.01
Project: PROJECT NO. 61851830-Q.C.
Location: Raymond, NH

Attached, we are sending you the following:

☒ Reports ☐ Prints ☐ Specifications ☐ Copy of Letter
☐ Plans ☐ Samples ☐ Change Order ☐ Other _____

COPIES	DATE	DESCRIPTION
1	11/20/89	Grain Size Distribution-Aggregate Grading (L891011 A-G) *

Remarks: * Resent to you per your request.

Copies to:

Very truly yours,

MILLER ENGINEERING & TESTING, INC.

by: EC

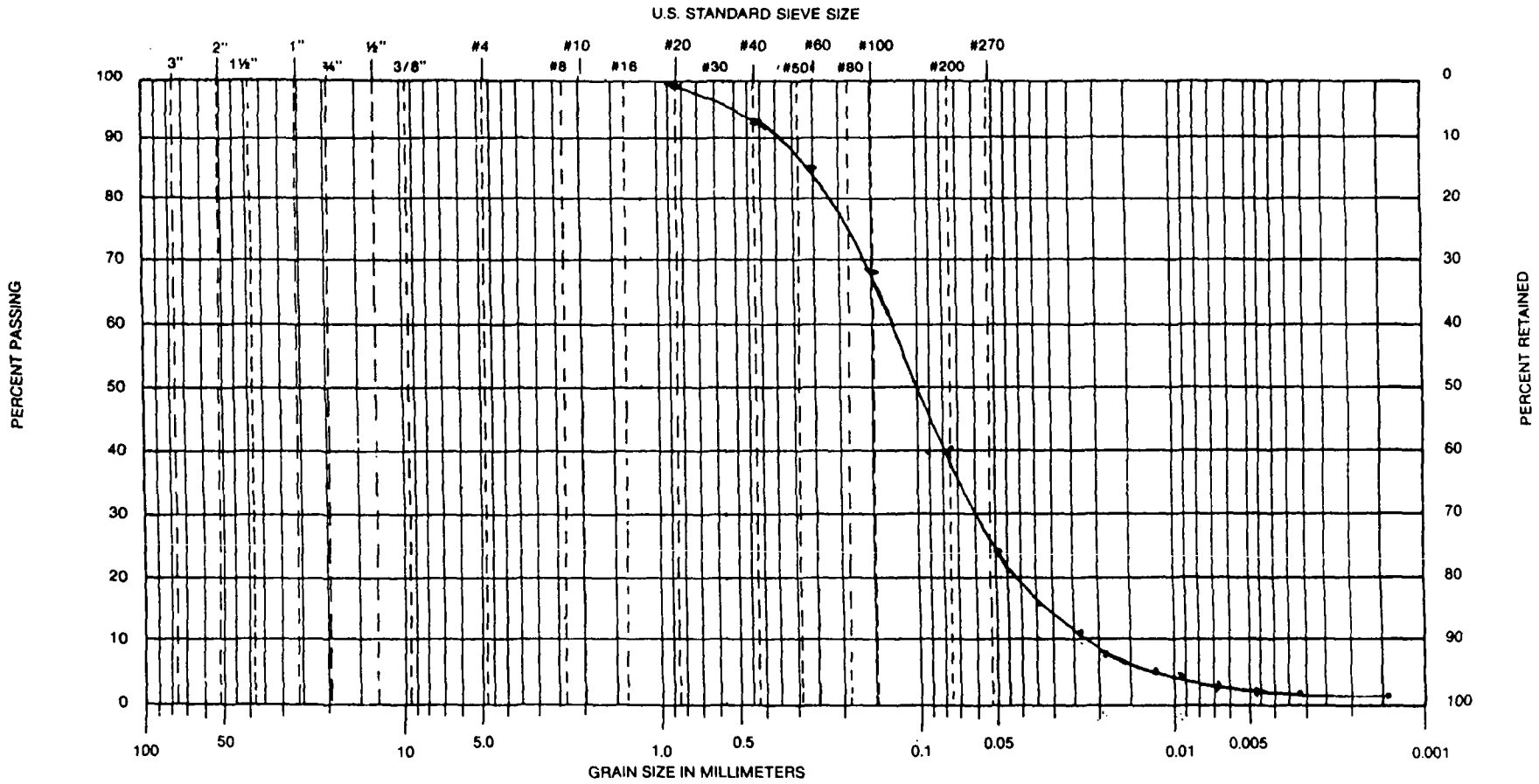
CORPORATE OFFICE: 100 SHEFFIELD ROAD • P.O. BOX 4776 • MANCHESTER, NEW HAMPSHIRE 03108• TELEPHONE (603) 668-8018
50 FOUNDRY STREET • P.O. BOX 145 • WATERBURY, VERMONT 05676 • TELEPHONE (802) 244-5111
130 EAST MAIN STREET • P.O. BOX 11 • NORTHBOROUGH, MASSACHUSETTS 01532• TELEPHONE (617) 393-2607
21 MARKARYLN STREET • P.O. BOX 1087 • AUBURN, MAINE 04210 • TELEPHONE (207) 786-4249

GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.
Raymond, NH
Project No. 90717.01 Date 11/20/89

Sample No. L891011G
Location MO2DR S-4
Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Sand, silt

Remarks Total weight 210.9 GM

M-3/4-88

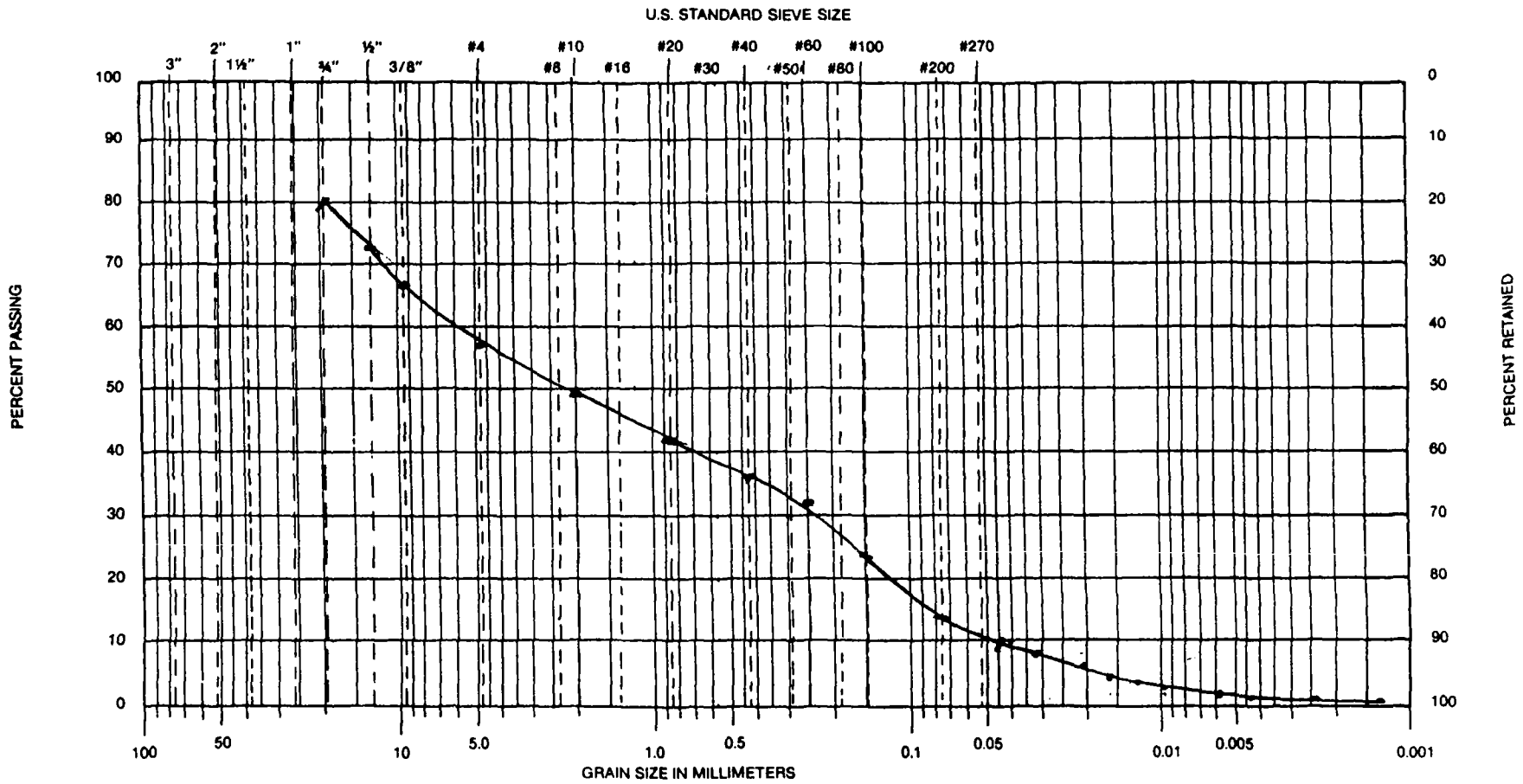
GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.
Raymond, NH

Project No. 90717.01 Date 11/20/89

Sample No. L891011C
Location MO3DR S-4
Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Gravel and sand, little silt

Remarks Total weight 271.2 GM

GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.

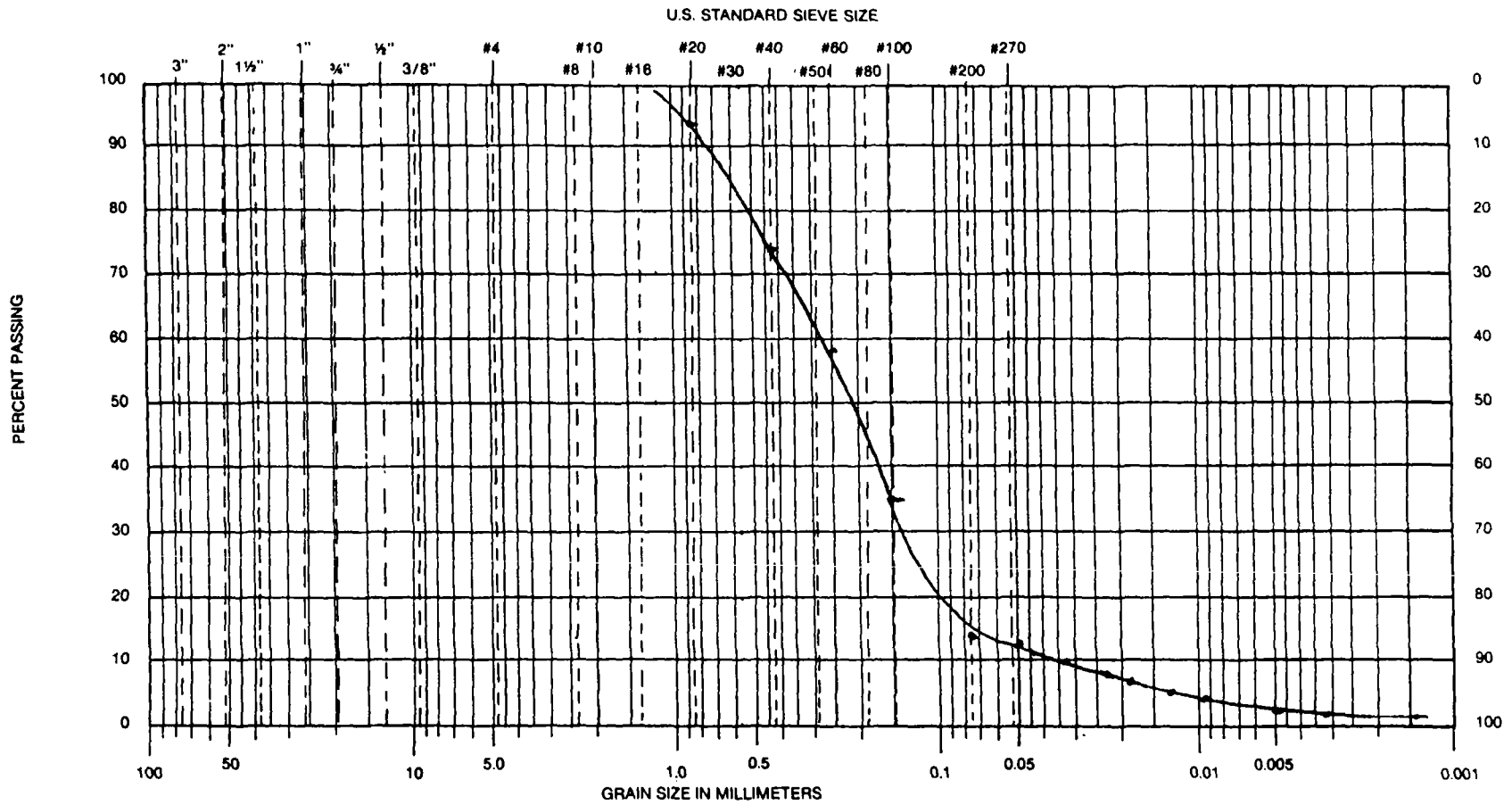
Raymond, NH

Project No. 90717.01 Date 11/20/89

Sample No. L891011F

Location MO5DR S-3

Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Sand, little silt

Remarks Total weight 267.4 GM

M-3/4-88

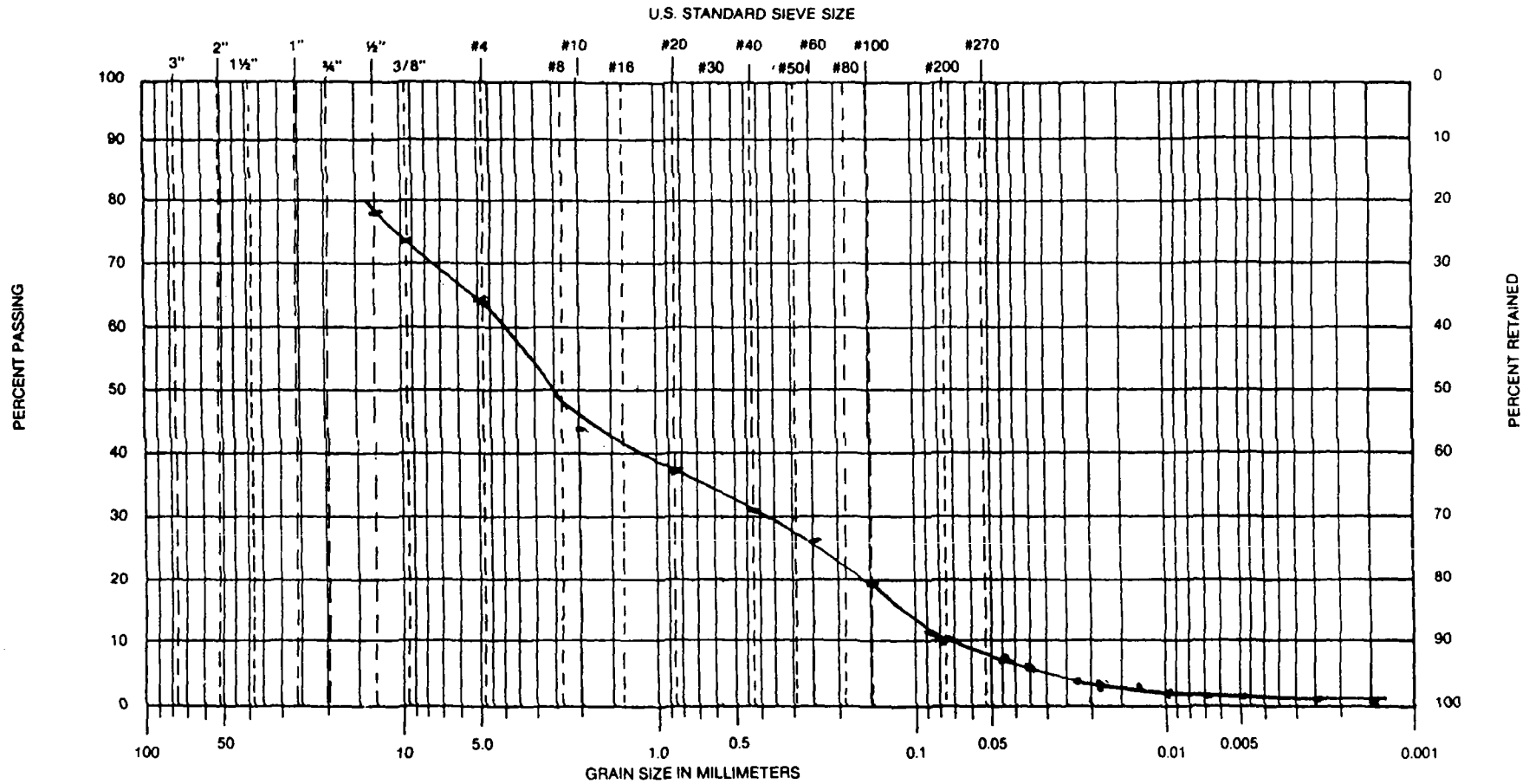
GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.
Raymond, NH

Project No. 90717.01 Date 11/20/89

Sample No. L891011D
Location MW-85 S-7 (ESW)
Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Sand, gravel, little silt

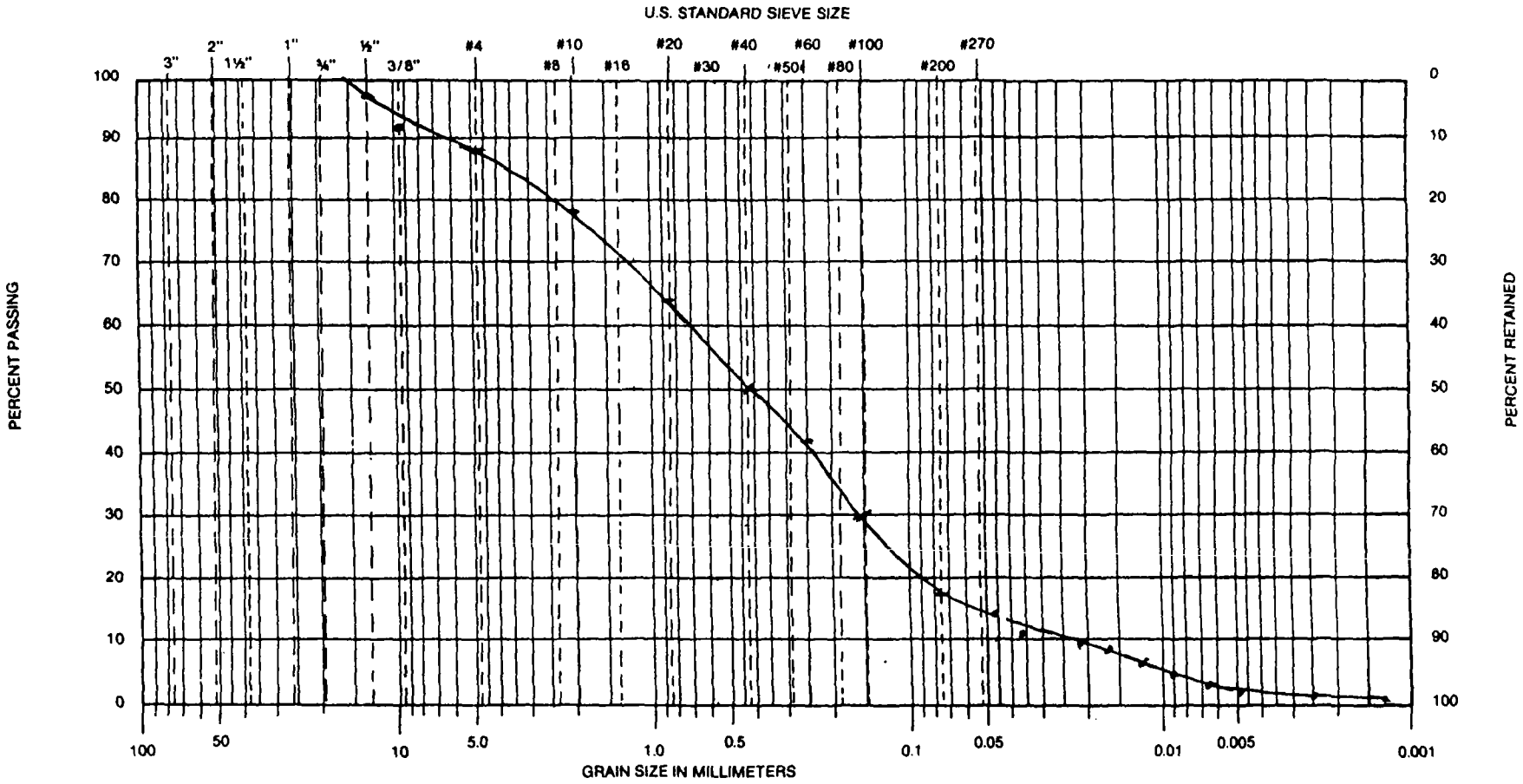
Remarks Total weight 132.4 GM

GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.
Raymond, NH
Project No. 90717.01 Date 11/20/89

Sample No. L891011B
Location OW2SR S-6
Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Sand, little gravel and silt

Remarks Total weight 159.3 GM

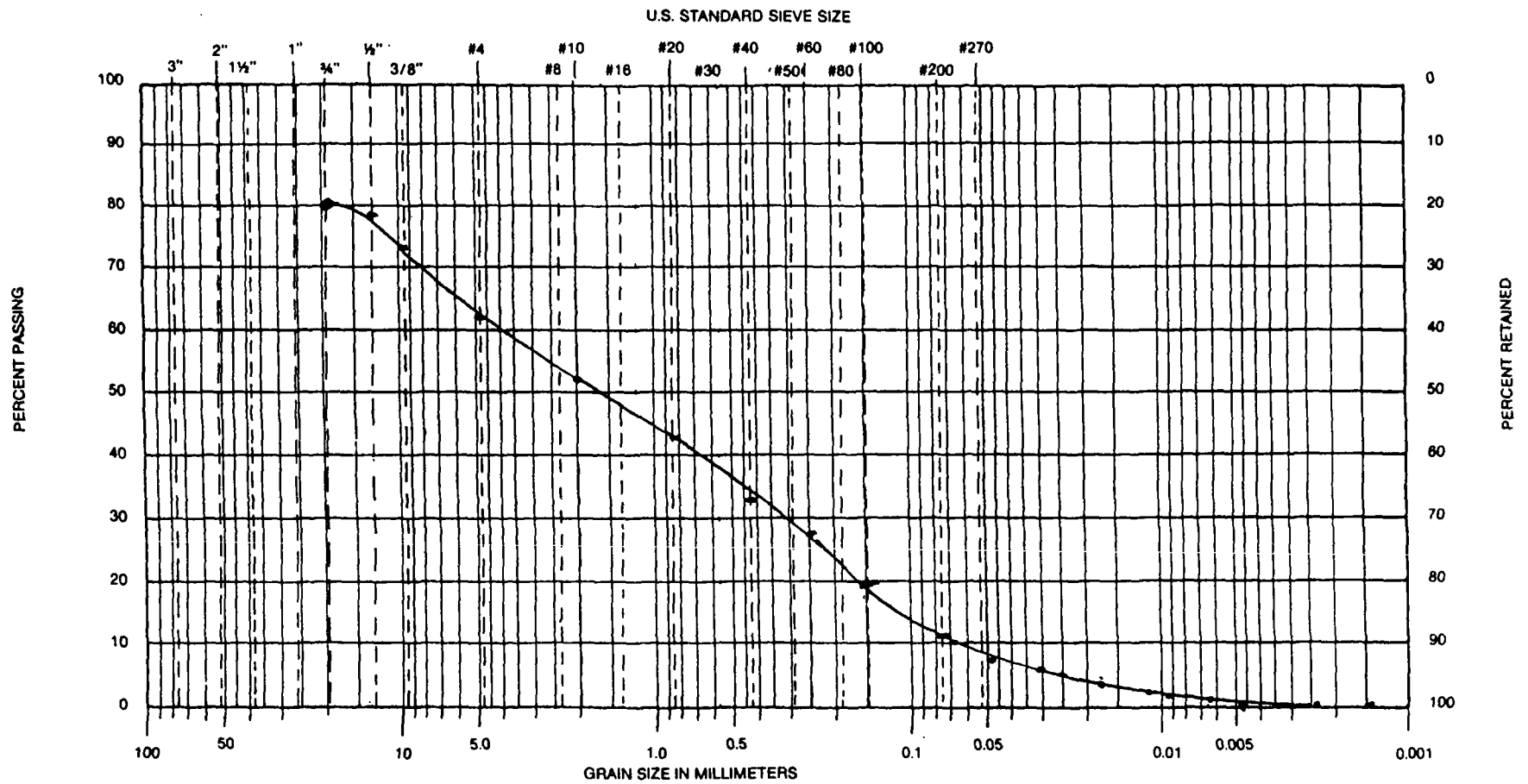
M-3/4-88

GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.
Raymond, NH
Project No. 90717.01 Date 11/20/89

Sample No. 1891011A
Location OW [redacted]4SR S-4 (ESW)
Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Sand and gravel, little silt

Remarks Sample total weight 174.5 GM

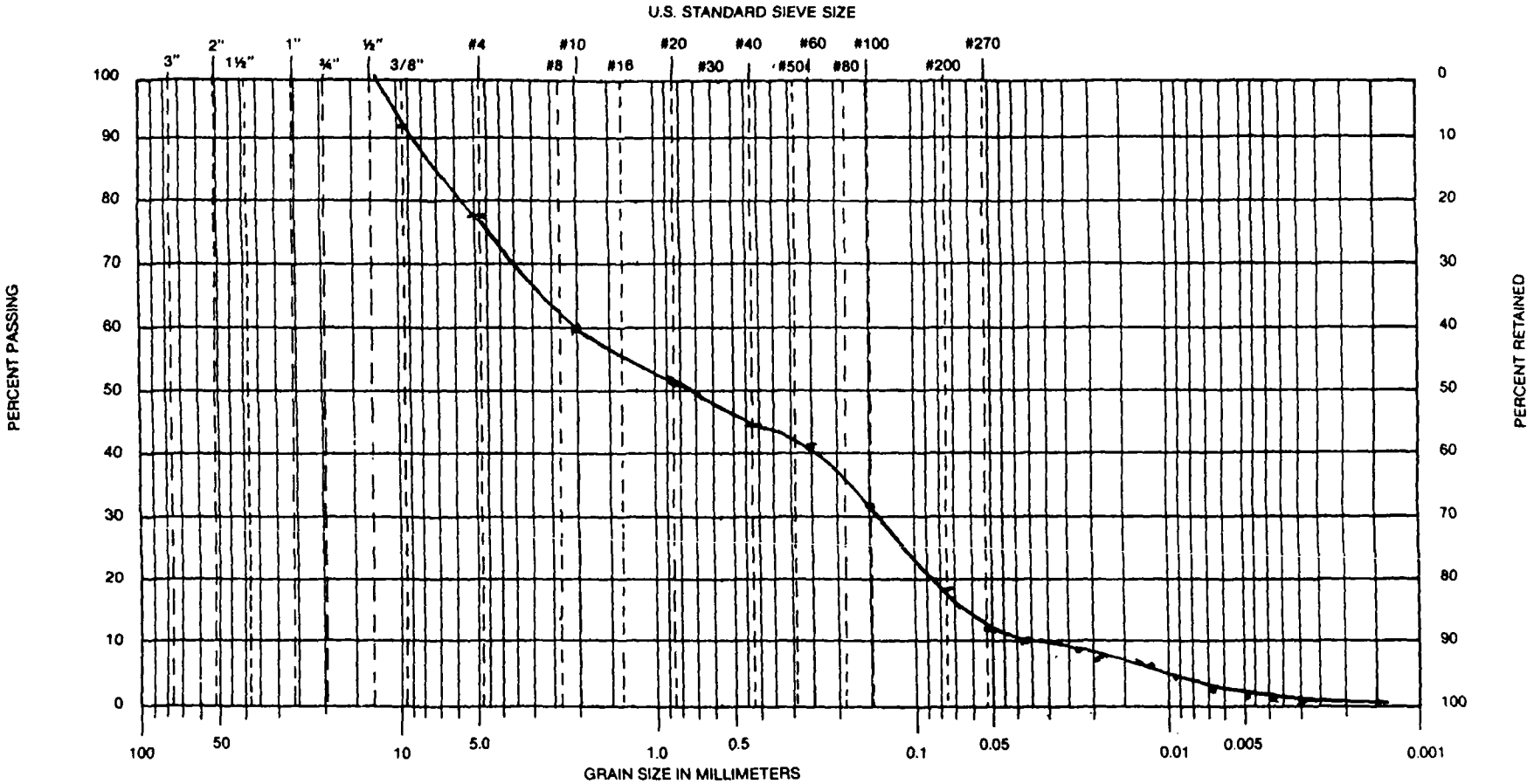
M-3/4-88

GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING

MILLER ENGINEERING & TESTING, INC.

Project PROJECT NO. 61851830-Q.C.
Raymond, NH
Project No. 90717.01 Date 11/20/89

Sample No. L891011E
Location BE9-005
Tested By D.G.



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

Classification Sand, some gravel, little silt

Remarks Total weight 89.0 GM

M-3/4-88

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

Project 6165 Page 1 of 1

Client Mo Hollo RI/FS Date 5/18/90 By TES

Subject hydraulic conductivity estimates Checked 5/18/90 By ESW

Approved 5/18/90 By [illegible]

Hazen equation

$K = 1.0 (d_{10})^2$ d_{10} = cm K = cm/sec

Sample identification

MO-2DR S-2 d_{10} = .975 mm = .0975 cm
$K = 100 (.0075)^2 = 5.62 \times 10^{-3}$

MO-3DR UT-1 d_{10} = .0419 mm = .00419 cm
$K = 100 (.00419)^2 = 1.75 \times 10^{-3}$

MW13 UT-1 d_{10} = .0139 mm = .00139 cm
$K = 100 (.00139)^2 = 1.9 \times 10^{-4}$

MO-5DR UT-1 d_{10} = .1037 mm = .010037 cm
$K = 100 (.010037)^2 = 1.05 \times 10^{-2}$

OW45R S-4 d_{10} = .067 mm = .0067 cm
$K = 100 (.0067)^2 = 4.48 \times 10^{-3}$

OW25R S-6 d_{10} = .023 mm = .0023 cm
$K = 100 (.0023)^2 = 5.20 \times 10^{-4}$

MO3DR S-4 d_{10} = .045 mm = .0045 cm
$K = 100 (.0045)^2 = 2.03 \times 10^{-3}$

MW 8S S-7 d_{10} = .078 = .0078
$K = 100 (.0078)^2 = 6.08 \times 10^{-3}$

BEG-005 d_{10} = .0375 mm = .00375 cm
$K = 100 (.00375)^2 = 1.4 \times 10^{-3}$

MO5DR S-3 d_{10} = .039 mm = .0039 cm
$K = 100 (.0039)^2 = 1.52 \times 10^{-3}$

MO2DR S-4 (6'-8') d_{10} = .022 mm = .0022
$K = 100 (.0022)^2 = 4.8 \times 10^{-4}$

GEI Consultants, Inc.

1021 Main Street
Winchester, MA 01890-1943
617•721•4000

Revised May 26, 1989
January 17, 1989
Project 88308

Mr. Gary M. Garfield
Balsam Environmental Consultants, Inc.
59 Stiles Rd.
Salem, NH 03079

Dear Mr. Garfield:

Re: Laboratory Tests
Balsam Project 6185

The purpose of this letter is to transmit the results of laboratory tests performed on samples for the above project. All samples were delivered to our laboratory by Balsam.

Test Program

The test program consisted of grain size tests and falling head permeameter tests on undisturbed samples. Grain size analyses were performed on 2 undisturbed Shelby tube samples (MW-13, UT-1 and MO-5-DR, UT-1). Falling head permeameter tests were also performed on two undisturbed samples. Dry unit weights were determined for both of the undisturbed samples.

The falling head permeameter tests were performed in the Shelby tubes. The tubes were cut and the soil was trimmed to convenient lengths. Packers were placed on both ends of the sample and were expanded to seal against the wall of the tube. The top packer was connected to a 65 cc capacity burette. The bottom packer had small diameter holes to allow flow of water to and from the sample. To run the test, the bottom of the tube was immersed in a reservoir of distilled water and a small vacuum (5 inches of Hg) was applied to the top of the sample to draw water up into the sample to saturate the soil. After saturating the sample, a falling head permeability test was performed. Three trials were run to check the repeatability of the test.

Results

The grain size curves are shown in Figs. 1 and 2. The dry unit weights, moisture contents, and permeabilities of the undisturbed samples are summarized in Table 1. We have calculated the porosity of the samples assuming a specific gravity, as you requested. The estimated specific gravity is 2.70, however, no tests were performed to confirm this.

Test Reports for the falling head permeameter tests are also attached.

We will be returning the excess samples to you for final disposition. Please call me if you have any questions.

Sincerely yours,

GEI CONSULTANTS, INC.

R. Lee Wooten, P.E.
Project Manager

RLW:lmg

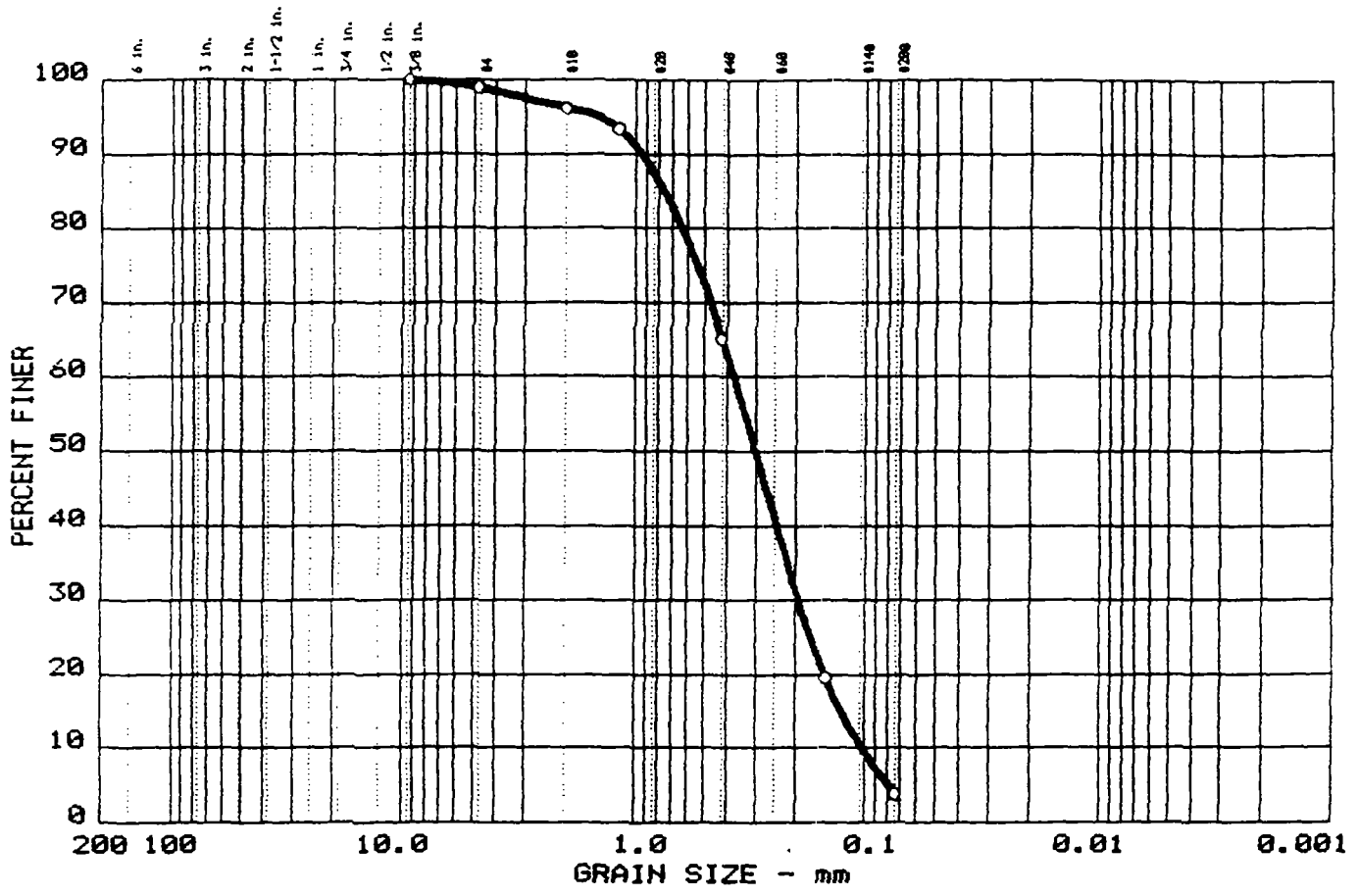
Enclosures

TABLE 1 - SUMMARY OF LABORATORY TEST RESULTS
Balsam Environmental Project 6185

Boring	Sample	Depth ft.	Dry Unit Weight pcf	Porosity (1)	Natural Water Content %	Permeability cm/sec	Type of Test
MW-13	UT-1	4 to 6	105.2	0.376	19.0	8.70E-03	Permeameter - Falling Head
MO-5-DR	UT-1	4 to 5.5	110.3	0.345	12.1	5.70E-03	Permeameter - Falling Head

Note:
1) Porosity based on assumed specific gravity of 2.70.

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% FINES
○	0.0	1.1	95.2	3.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.75	0.37	0.30	0.196	0.1278	0.1027	1.00	3.6

MATERIAL DESCRIPTION	USCS	AASHTO
○ Narrowly graded sand	SP	

Project No.: 88308
Project: Balsam Environmental
○ Location: MO-5 DR, UT-1 (4-5.5')

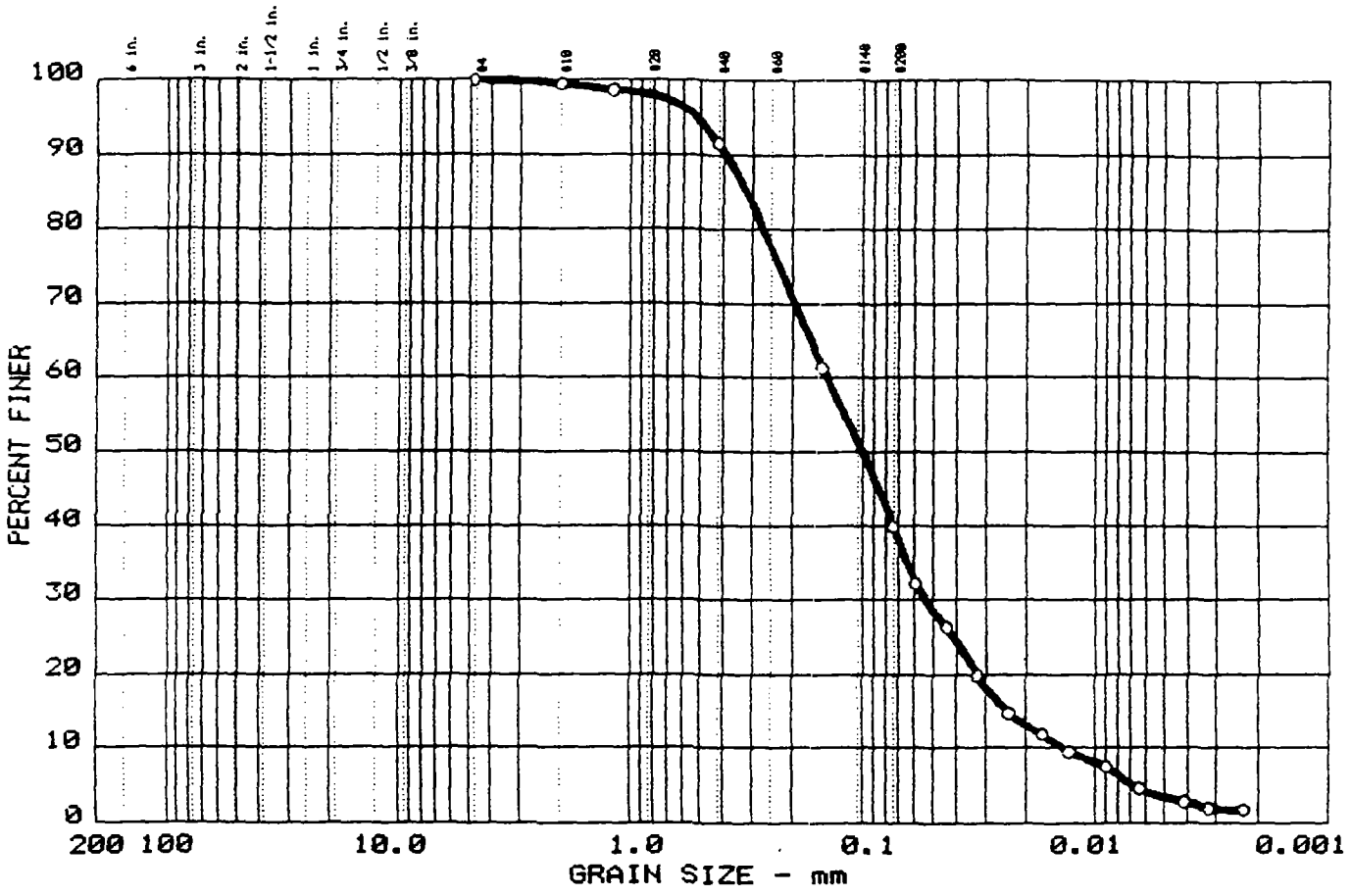
Date: January 10, 1988

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT
GEI CONSULTANTS, INC., WINCHESTER, MA

Figure No. 2

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% FINES
○	0.0	0.0	60.2	39.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.32	0.14	0.10	0.055	0.0242	0.0139	1.51	10.3

	MATERIAL DESCRIPTION	USCS	AASHTO
○	Silty sand	SM	

Project No.: 88308
Project: Balsam Environmental
○ Location: MW13 UT-1, 4-6'

Date: January 11, 1988

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT
GEI CONSULTANTS, INC., WINCHESTER, MA

Figure No. 1

RESULTS OF FIXED WALL PERMEAMETER TEST

TEST NO. FW1

Boring MW-13, Sample UT-1, 4.0 to 6.0 ft.

SOIL

Description: Silty Sand (SM)

Maximum Size: No. 4

Percent Fines: 39.8 %

TEST DETAILS

Sample Dia.:	2.86 in.
Sample Ht.:	5.13 in.
Dry Density:	105.2 pcf
Natural Moisture:	19.0 %
Type of Test:	Falling Head Permeameter
Pore Fluid:	Natural + Distilled Water

Procedure: Reference U.S. Army Corps of Engineers Manual EM 1110-2-1906, Chap. VII.

TEST RESULT

Permeability: 8.7×10^{-3} cm/sec

G E I Consultants, Inc.

January 13, 1989
Project 88308

RESULTS OF FIXED WALL PERMEAMETER TEST

TEST NO. FW2

Boring MO-5-DR, Sample UT-1, 4.0 to 5.5 ft.

SOIL

Description: Narrowly Graded Sand (SP)

Maximum Size: 0.375 inch

Percent Fines: 3.7 %

TEST DETAILS

Sample Dia.:	2.88 in.
Sample Ht.:	4.89 in.
Dry Density:	110.3 pcf
Natural Moisture:	12.1 %
Type of Test:	Falling Head Permeameter
Pore Fluid:	Natural + Distilled Water

Procedure: Reference U.S. Army Corps of Engineers Manual EM 1110-2-1906, Chap. VII.

TEST RESULT

Permeability: 5.7×10^{-3} cm/sec

G E I Consultants, Inc.

January 13, 1989
Project 88308

GEI Consultants, Inc.

1021 Main Street
Winchester, MA 01890-1943
617•721•4000

April 7, 1989
Project 88308

Mr. Gary M. Garfield
Balsam Environmental Consultants, Inc.
59 Stiles Road
Salem, NH 03079

Dear Mr. Garfield:

Re: **Laboratory Tests**
Balsam Project 6185

The purpose of this letter is to transmit the results of laboratory tests performed on samples for the above project. All samples were delivered to our laboratory by Balsam.

Test Program

The test program consisted of two grain size tests and a falling head permeameter test. Grain size analyses were performed on one undisturbed Shelby tube sample (MO-2DR, UT-1) and on one jar sample (MO-2DR, S-2). A falling head permeameter test was also performed on the undisturbed sample (MO-2DR, UT-1).

The falling head permeameter test was performed in the Shelby tube. The tube was cut and the soil was trimmed to a convenient length. Packers were placed on both ends of the sample and were expanded to seal against the wall of the tube. The top packer was connected to a 65 cc capacity burette. The bottom packer had small diameter holes to allow flow of water to and from the sample. To run the test, the bottom of the tube was immersed in a reservoir of distilled water and a small vacuum (% inches of Hg) was applied to the top of the sample to draw water up into the sample to saturate the soil. After saturating the sample, a falling head permeability test was performed. Four trials were run to check the repeatability of the test.

Results

The grain size curves are shown in Figs. 1 and 2. The test report for the falling head permeameter is attached.

We will be returning the excess samples to you for final disposition. Please call me if you have any questions.

Sincerely yours,

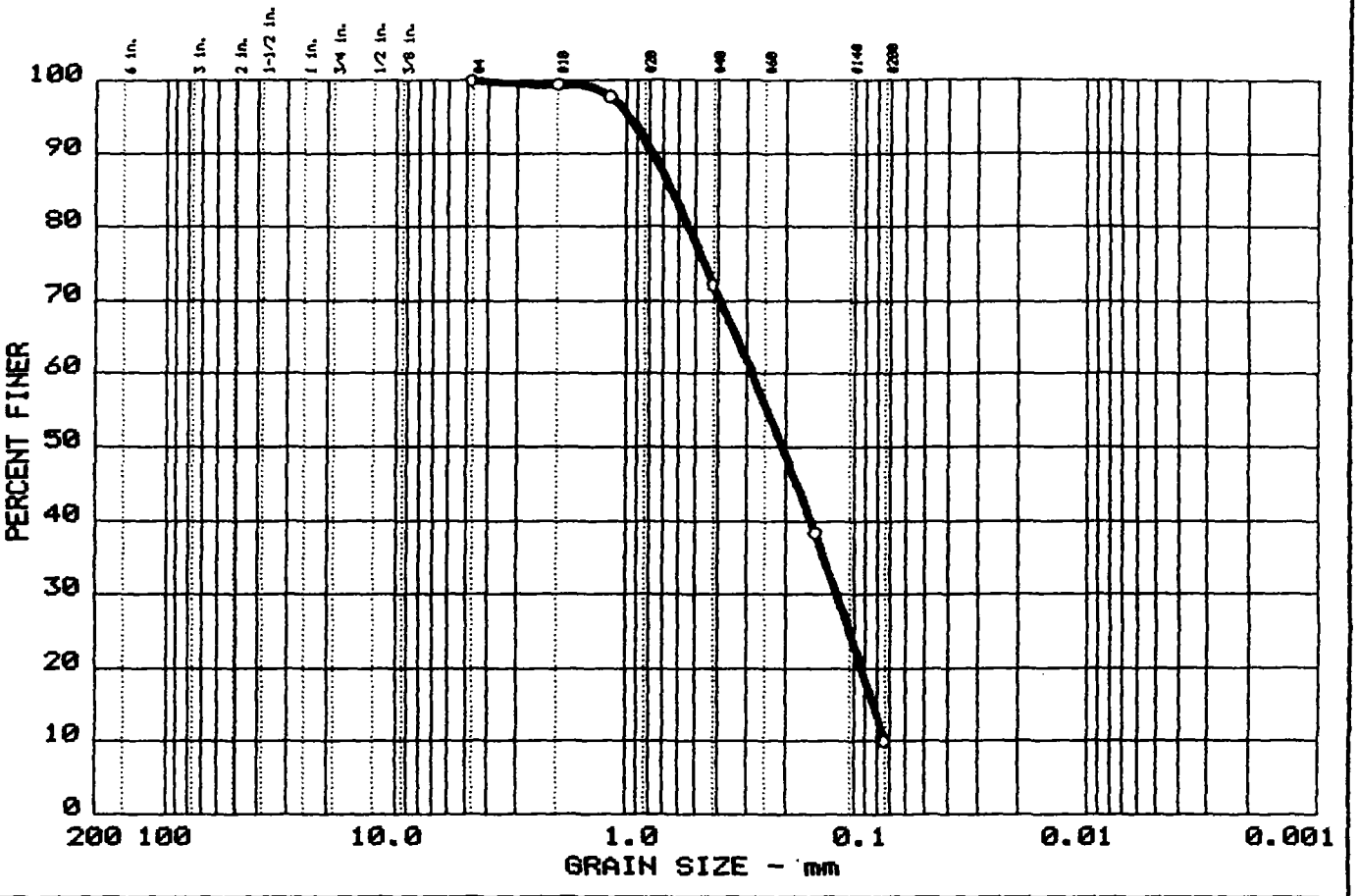
GEI CONSULTANTS, INC.

R. Lee Wooten, P.E.
Project Manager

RLW:lmg

Enclosures

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% FINES
○	0.0	0.0	90.0	10.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.64	0.28	0.21	0.120	0.0834			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Narrowly graded sand with silt	SP-SM	

Project No.: 88308
Project: Balsam Environmental Consultants, Inc.
○ Location: Boring MO-2DR, Sample S-2

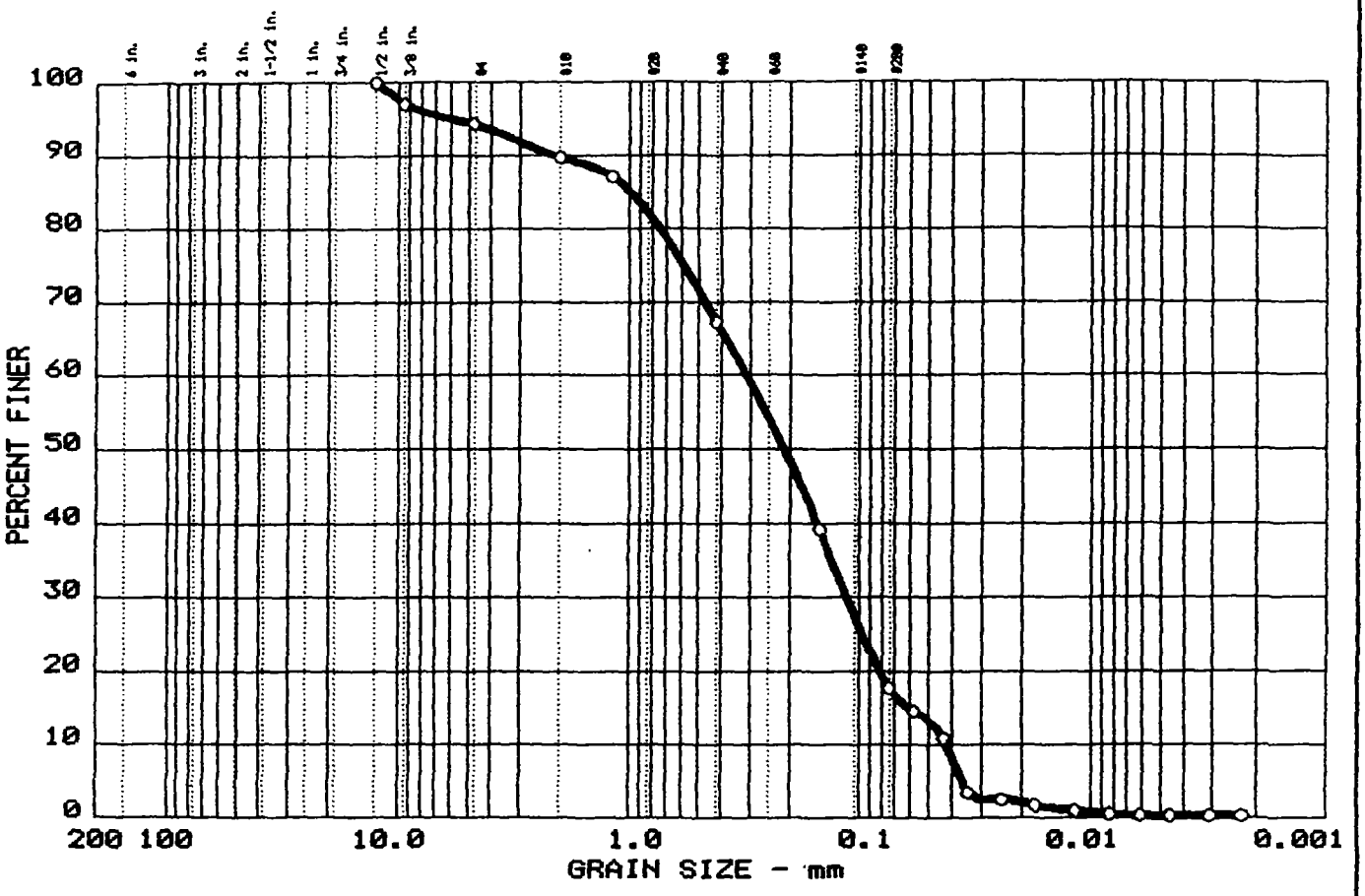
Date: April 5, 1989

GRAIN SIZE DISTRIBUTION TEST REPORT
GEI CONSULTANTS, INC., WINCHESTER, MA

Remarks:

Figure No. 2

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% FINES
○	0.0	5.7	76.7	17.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.99	0.31	0.21	0.114	0.0613	0.0419	1.00	7.4

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty Sand	SM	

Project No.: 88308
Project: Balsam Environmental Consultants, Inc.
○ Location: Boring MO-2DR, Sample UT-1

Date: April 5, 1989

GRAIN SIZE DISTRIBUTION TEST REPORT

GEI CONSULTANTS, INC., WINCHESTER, MA

Remarks:

Figure No. 1

RESULTS OF FIXED WALL PERMEAMETER TEST

TEST NUMBER FW-3
Boring MO-2DR, Sample UT-1

SOIL

Sample Type: Undisturbed Shelby Tube

Description: Silty Sand (SM)

Maximum Size: No. 3/8" Sieve

Percent Fines: 17.6% Passing #200 Sieve

TEST DETAILS

Sample Dia.:	2.87 in.
Sample Ht.:	5.16 in.
Dry Density:	76.7 pcf
Water Content:	22.1 %
Type of Test:	Falling Head Permeameter
Pore Fluid:	Distilled Water

Procedure: Reference U.S. Army Corps of Engineers Manual EM 1110-2-1906, Chap. VII, May 1, 1980.

TEST RESULT

Permeability: 6.7×10^{-3} cm/sec

G E I Consultants, Inc.

April 6, 1989
Project 88308

APPENDIX B-5

IN SITU HYDRAULIC CONDUCTIVITY ANALYSES

APPENDIX B-5

The equation to determine hydraulic conductivity from the Bouwer and Rice (1976) method is:

$$K = \left[\frac{r_c^2 \ln (R_e/r_w)}{2 (L)(t)} \right] \ln (Y_o/Y_t)$$

where:

K	=	hydraulic conductivity (L/T);
R_e	=	effective radius (L);
r_c	=	monitoring well casing radius (L);
r_w	=	borehole radius (L);
L	=	saturated screen length (L);
t	=	time (T);
Y_o	=	initial water level (L);
Y_t	=	water level at time t (L); and
ln	=	natural logarithm.

The value R_e is related to the well aquifer geometry by the equations:

$$\ln (R_e/r_w) = \left[\frac{1.1}{\ln(H/r_w)} + \frac{A+B \ln \{(D-H)/r_w\}}{L/r_w} \right]^{-1}$$

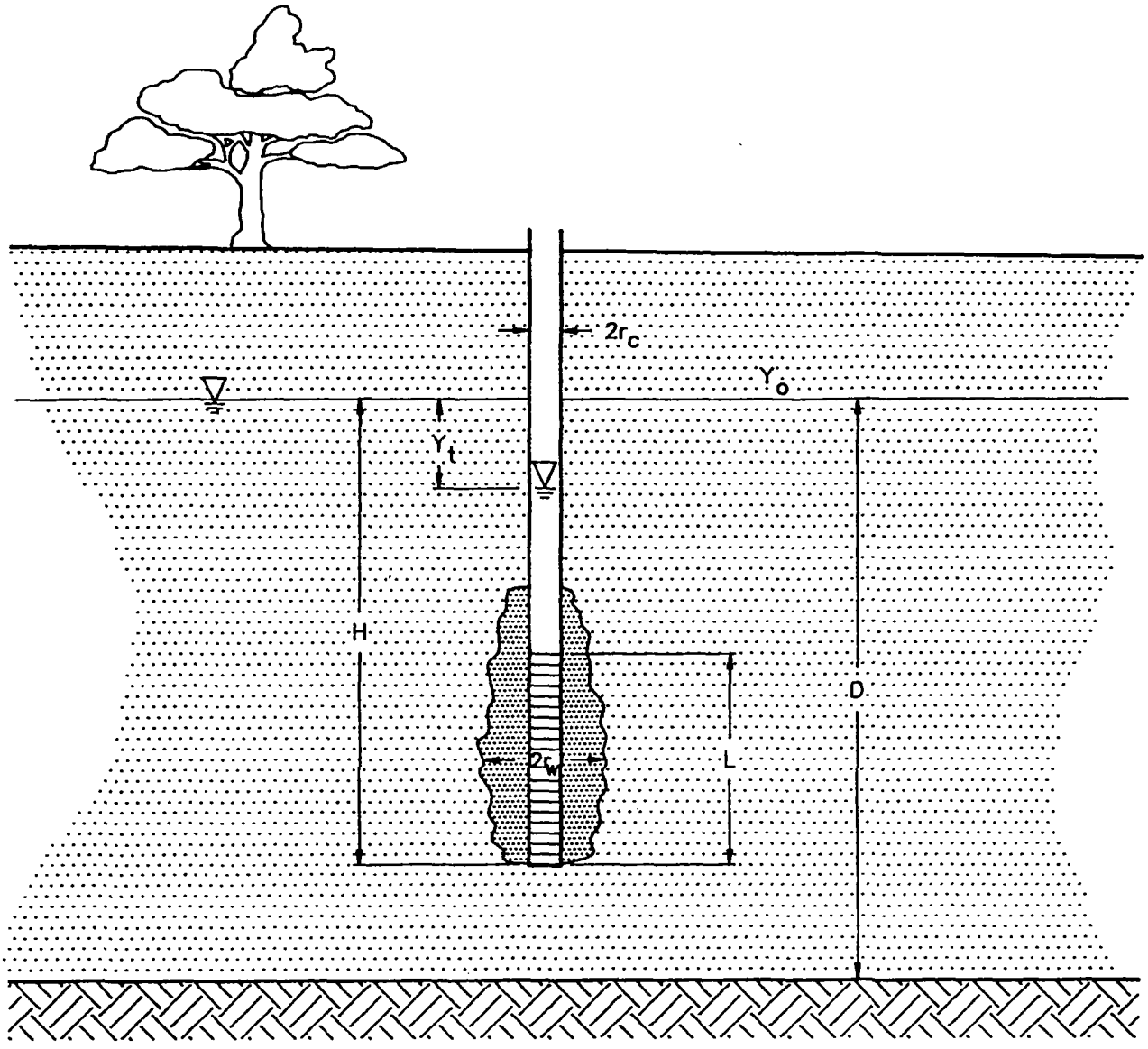
for partially penetrating well screens; and

$$\ln (R_e/r_w) = \left[\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w} \right]^{-1}$$

June 11, 1990
Balsam Project 6185/818:3854

for fully penetrating screens, where: D is the saturated thickness of the aquifer (L); H is the length between the bottom of the screen and the water table (L); and A, B, and C are dimensionless coefficients that are functions of L/r_w (Bouwer and Rice, 1976). Figure B-1 illustrates these variables for a hypothetical monitoring well.

MONITORING WELL VARIABLES FOR SLUG TESTING



NOTES:

1. GEOMETRIES AND RELATIVE DIMENSIONS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY.
2. FIGURE BASED UPON BOUWER AND RICE (1976) AND BOUWER (1989) IN-SITU PERMEABILITY TESTING METHODS.

BALSAM ENVIRONMENTAL CONSULTANTS, INC. 5 INDUSTRIAL WAY, SALEM, NH 03079			CLIENT: K.J. QUINN & COMPANY, INC.	
			TITLE: MONITORING WELL VARIABLES FOR SLUG TESTING	
DATE: 4/11/90	DRAWN: E.S.W.	CHECKED: E.S.W.	PROJECT: MOTTOLO RI/FS	
SCALE: N.T.S.	FILE NO: RI34	APPROVED: TSS	FIGURE NO: B-1	PROJECT NO: 6185/818

DATA SET: MO2DRSI

CLIENT:	STARK AND PELTONEN	DATE:	12/20/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-2DR
COUNTY:	ROCKINGHAM	WELL DEPTH:	26.42 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	2.430 ft
AQUIFER:	BEDROCK	THICKNESS:	23.99 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.120 ft
SCREEN TOP:	16.000 ft	SCREEN BASE:	26.42 ft
INITIAL HEAD:	3.728 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.99008square cm/sec

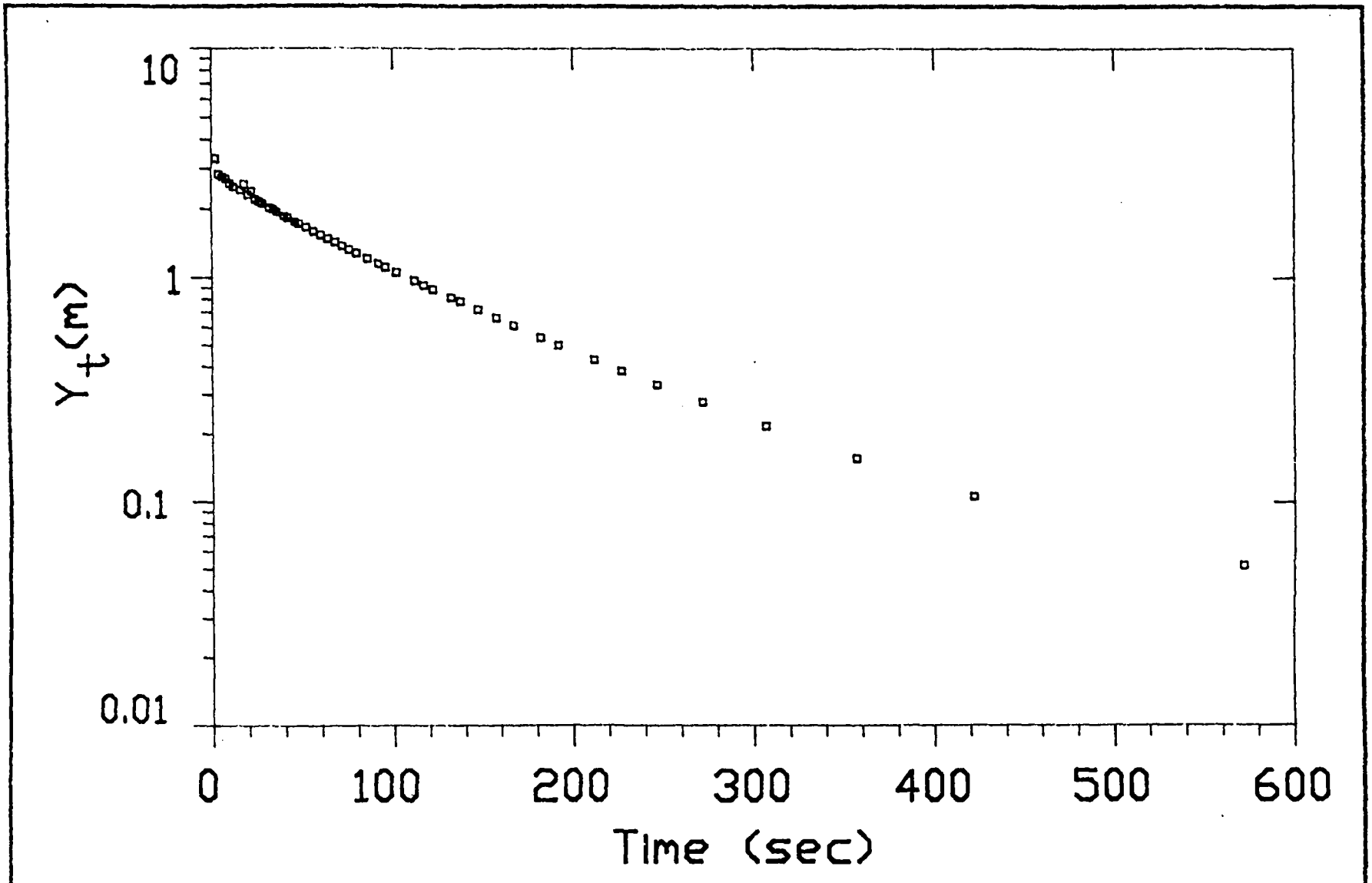
CONDUCTIVITY: 0.00135 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	2.00	3.32		
2	4.00	2.84	2.82	0.640
3	6.00	2.77	2.76	0.344
4	8.00	2.72	2.69	0.788
5	10.00	2.59	2.63	-1.65
6	12.00	2.51	2.57	-2.78
7	16.00	2.42	2.46	-1.50
8	18.00	2.57	2.41	6.47
9	20.00	2.31	2.35	-1.69
10	22.00	2.40	2.30	4.30
11	24.00	2.21	2.25	-1.61
12	26.00	2.16	2.20	-1.58
13	28.00	2.12	2.15	-1.40
14	32.00	2.03	2.05	-1.15
15	34.00	2.00	2.01	-0.519
16	36.00	1.95	1.96	-0.630
17	40.00	1.87	1.87	-0.222
18	42.00	1.83	1.83	0.159
19	46.00	1.76	1.75	0.641
20	48.00	1.73	1.71	0.962
21	52.00	1.66		
22	56.00	1.60		
23	60.00	1.54		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	64.00	1.48		
25	68.00	1.43		
26	72.00	1.37		
27	76.00	1.33		
28	80.00	1.28		
29	86.00	1.21		
30	92.00	1.15		
31	96.00	1.11		
32	102.0	1.05		
33	112.0	0.968		
34	117.0	0.928		
35	122.0	0.888		
36	132.0	0.818		
37	137.0	0.786		
38	147.0	0.722		
39	157.0	0.663		
40	167.0	0.613		
41	182.0	0.543		
42	192.0	0.503		
43	212.0	0.433		
44	227.0	0.385		
45	247.0	0.334		
46	272.0	0.279		
47	307.0	0.218		
48	357.0	0.157		
49	422.0	0.106		
50	572.0	0.0520		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .001354 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MO-2DR
TRANSMISSIVITY: .9901 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 3.728 ft	AQUIFER: BEDROCK	RAYMOND, NH
Data Set: MO2DRSI Date: 12/20/89	THICKNESS: 23.99	
	SCREEN: top: 16.00 base: 26.42	
	DIAMETER: casing: .2400 intake: .2400	
	DEPTH: Water Table: 2.430 TD: 26.42	

DATA SET: MO2DRSO

CLIENT:	STARK AND PELTONEN	DATE:	12/20/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-2DR
COUNTY:	ROCKINGHAM	WELL DEPTH:	26.42 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	2.430 ft
AQUIFER:	BEDROCK	THICKNESS:	25.28 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.120 ft
SCREEN TOP:	16.000 ft	SCREEN BASE:	26.42 ft
INITIAL HEAD:	3.281 ft	TRANS. RATIO:	1.0000

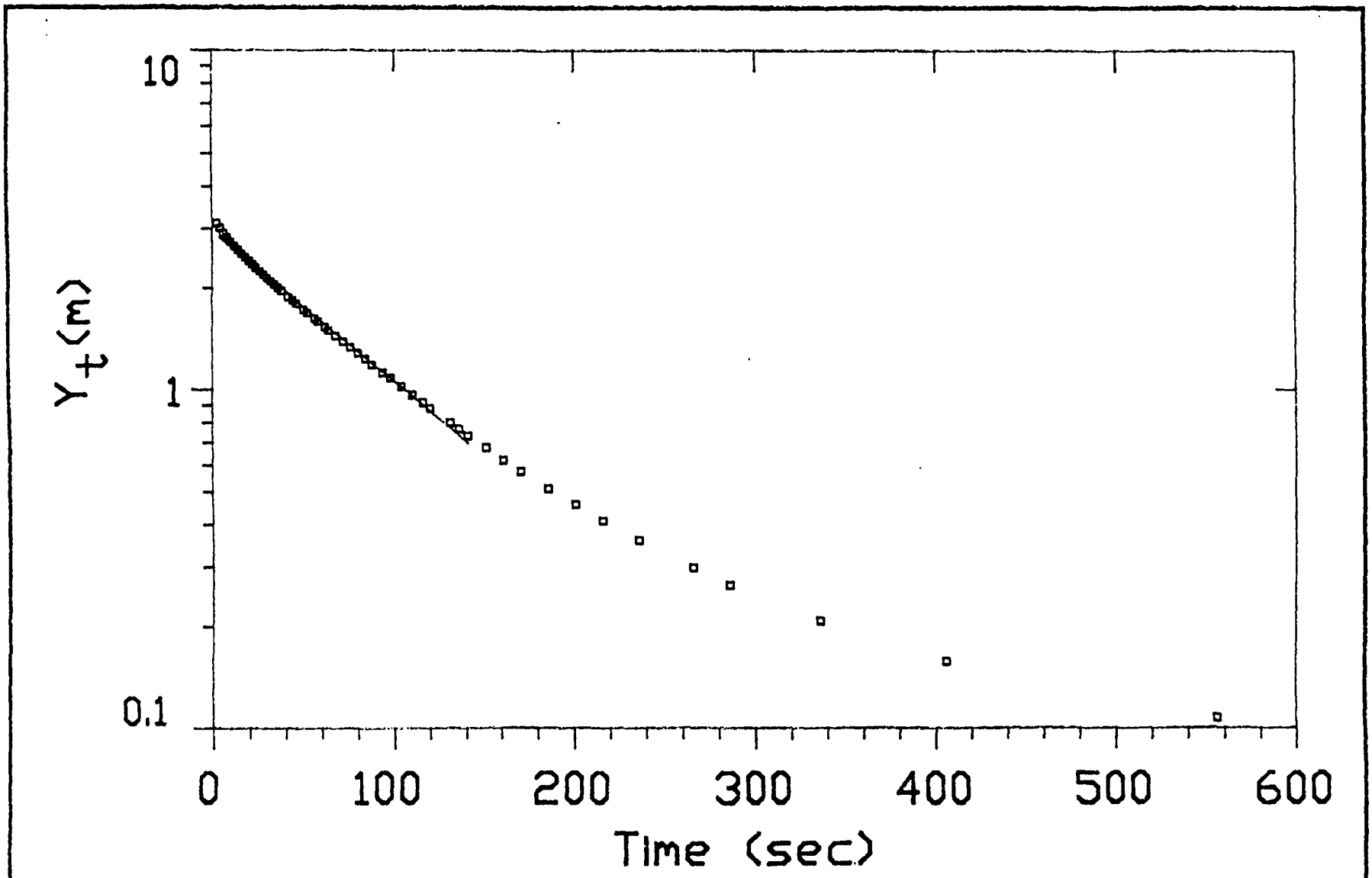
MODEL PARAMETERS:

TRANSMISSIVITY: 0.65024square cm/sec

CONDUCTIVITY: 0.00084 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	3.10		
2	4.00	3.01	2.81	6.47
3	6.00	2.89	2.75	4.81
4	8.00	2.81	2.70	3.81
5	10.00	2.73	2.64	3.06
6	12.00	2.65	2.59	2.33
7	14.00	2.58	2.54	1.74
8	16.00	2.52	2.49	1.24
9	18.00	2.46	2.44	0.756
10	20.00	2.40	2.39	0.364
11	22.00	2.34	2.34	0.0397
12	24.00	2.29	2.29	-0.299
13	26.00	2.23	2.25	-0.608
14	28.00	2.18	2.20	-0.882
15	30.00	2.13	2.16	-1.11
16	32.00	2.09	2.11	-1.26
17	34.00	2.04	2.07	-1.50
18	36.00	2.00	2.03	-1.64
19	38.00	1.95	1.99	-1.84
20	42.00	1.87	1.91	-2.00
21	44.00	1.83	1.87	-2.12
22	46.00	1.79	1.83	-2.30
23	50.00	1.72	1.76	-2.32



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .0008439 cm/sec

TRANSMISSIVITY: .6502 sq. cm/sec

INITIAL HEAD: 3.281 ft

Data Set: MO2DRSD | Date: 12/20/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: BEDROCK

THICKNESS: 25.28

SCREEN: top: 16.00 base: 26.42

DIAMETER: casing: .2400 intake: .2400

DEPTH: Water Table: 2.430 TD: 26.42

Slug Out Test

Well: MO-2DR

MOTTOLO RI/FS
RAYMOND, NH

DATA SET: MO2SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-2S
COUNTY:	ROCKINGHAM	WELL DEPTH:	9.24 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	0.810 ft
AQUIFER:	F/M SAND	THICKNESS:	9.18 ft
INTAKE RADIUS:	0.310 ft	CASING RADIUS:	0.063 ft
SCREEN TOP:	3.990 ft	SCREEN BASE:	9.24 ft
INITIAL HEAD:	1.658 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.18452square cm/sec

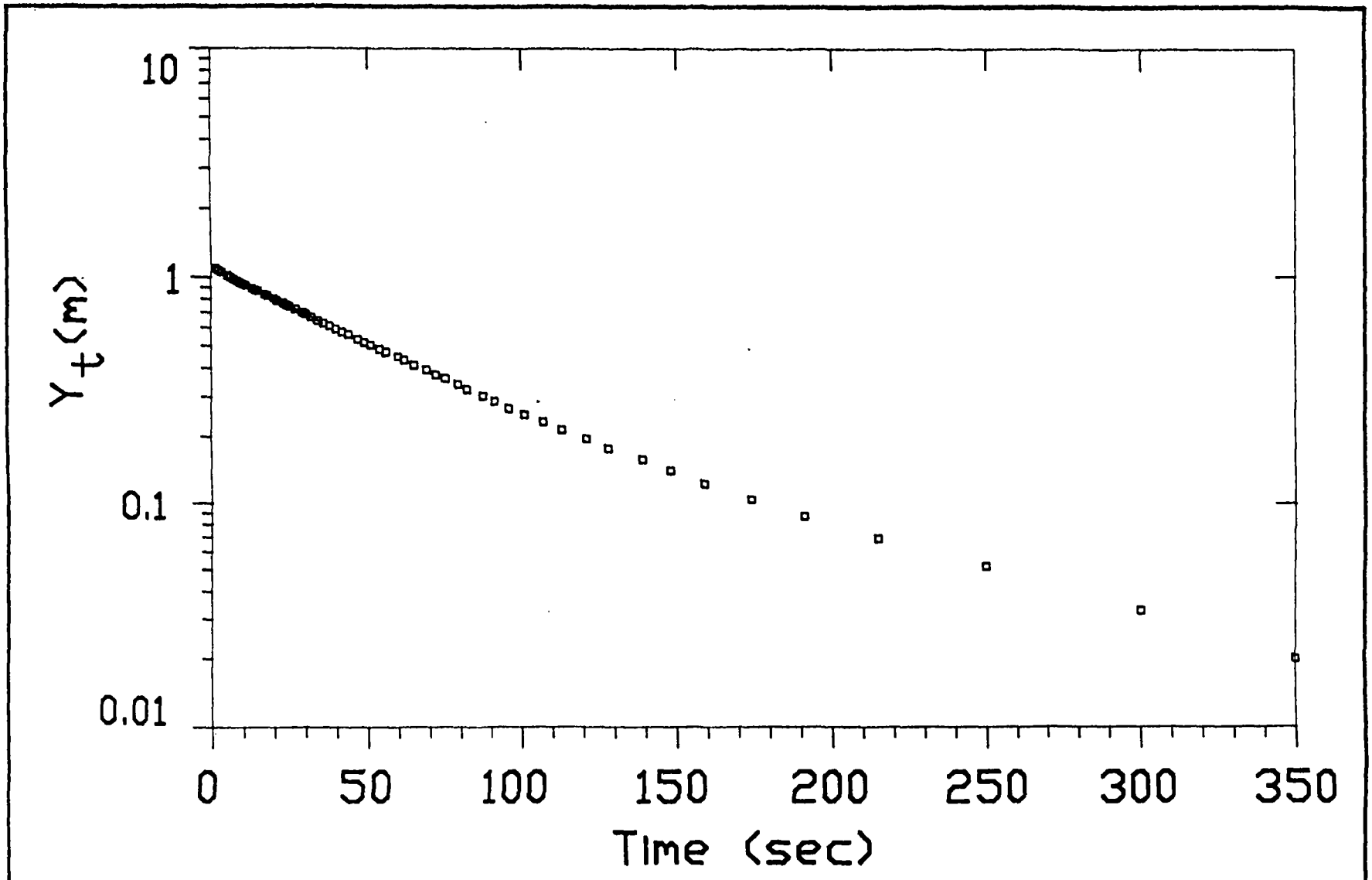
CONDUCTIVITY: 0.00066 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.09		
2	2.00	1.07		
3	3.00	1.04		
4	5.00	1.01		
5	6.00	0.995		
6	7.00	0.978	0.975	0.220
7	8.00	0.962	0.960	0.148
8	9.00	0.946	0.946	-0.0344
9	10.00	0.931	0.931	-4.797E-04
10	11.00	0.917	0.917	-0.0766
11	13.00	0.891	0.889	0.140
12	14.00	0.872	0.876	-0.445
13	15.00	0.865	0.863	0.274
14	17.00	0.835	0.836	-0.230
15	18.00	0.823	0.824	-0.118
16	20.00	0.800	0.799	0.169
17	21.00	0.783	0.787	-0.467
18	23.00	0.766	0.763	0.383
19	24.00	0.749	0.751	-0.257
20	25.00	0.739	0.740	-0.0774
21	27.00	0.718	0.717	0.0994
22	29.00	0.697	0.696	0.189
23	30.00	0.685	0.685	0.0193

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	32.00	0.666	0.664	0.204
25	34.00	0.643	0.644	-0.191
26	36.00	0.625	0.625	0.0427
27	38.00	0.609		
28	40.00	0.591		
29	42.00	0.573		
30	44.00	0.558		
31	47.00	0.532		
32	49.00	0.516		
33	51.00	0.502		
34	54.00	0.482		
35	56.00	0.467		
36	60.00	0.447		
37	62.00	0.433		
38	65.00	0.410		
39	69.00	0.390		
40	72.00	0.372		
41	75.00	0.359		
42	79.00	0.339		
43	82.00	0.322		
44	87.00	0.301		
45	91.00	0.286		
46	96.00	0.266		
47	101.0	0.250		
48	107.0	0.232		
49	113.0	0.214		
50	121.0	0.195		
51	128.0	0.176		
52	139.0	0.158		
53	148.0	0.140		
54	159.0	0.122		
55	174.0	0.104		
56	191.0	0.0869		
57	215.0	0.0689		
58	250.0	0.0517		
59	300.0	0.0329		
60	350.0	0.0200		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0006595 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MO-2S
TRANSMISSIVITY: .1845 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 1.658 ft	AQUIFER: F/M SAND	RAYMOND, NH
Data Set: MO2SSI | Date: 6/22/89	THICKNESS: 9.180	
	SCREEN: top: 3.990 base: 9.240	
	DIAMETER: casing: .1260 intake: .6200	
	DEPTH: Water Table: .8100 TD: 9.240	

DATA SET: MO2SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-2S
COUNTY:	ROCKINGHAM	WELL DEPTH:	9.24 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	0.810 ft
AQUIFER:	F/M SAND	THICKNESS:	9.18 ft
INTAKE RADIUS:	0.310 ft	CASING RADIUS:	0.062 ft
SCREEN TOP:	3.990 ft	SCREEN BASE:	9.24 ft
INITIAL HEAD:	1.658 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.11142square cm/sec

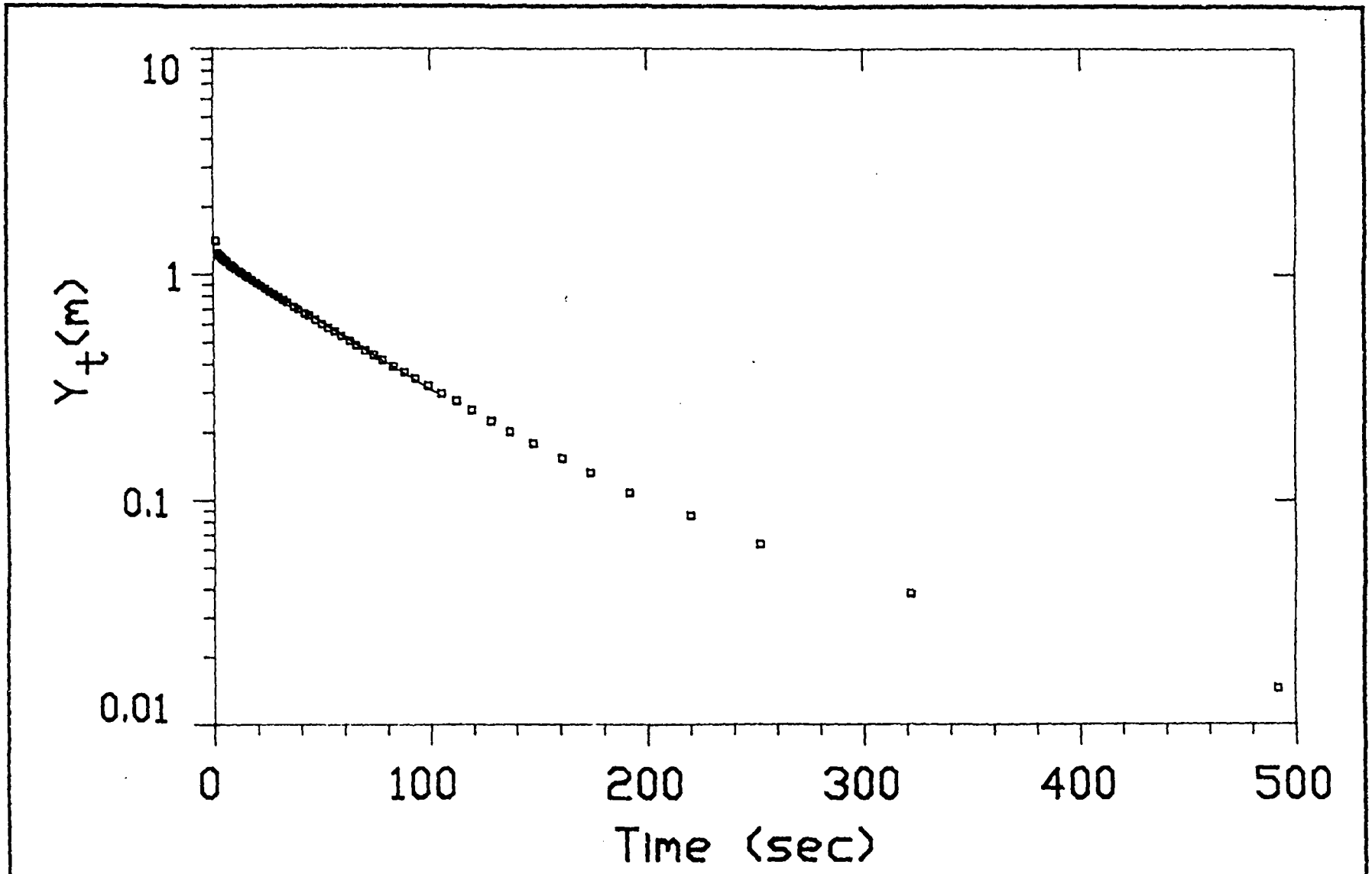
CONDUCTIVITY: 0.00040 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.40		
2	2.00	1.23		
3	3.00	1.20	1.15	3.91
4	4.00	1.18	1.14	3.19
5	5.00	1.15	1.12	2.43
6	6.00	1.13	1.11	2.10
7	8.00	1.09	1.08	0.980
8	9.00	1.07	1.06	0.819
9	10.00	1.05	1.05	0.353
10	12.00	1.02	1.02	0.221
11	13.00	1.01	1.01	0.0402
12	15.00	0.979	0.983	-0.385
13	16.00	0.966	0.970	-0.393
14	18.00	0.939	0.944	-0.550
15	20.00	0.911	0.919	-0.783
16	22.00	0.886	0.894	-0.844
17	24.00	0.861	0.870	-0.998
18	26.00	0.836	0.847	-1.22
19	28.00	0.814	0.824	-1.15
20	30.00	0.792	0.802	-1.25
21	32.00	0.771	0.780	-1.23
22	34.00	0.750	0.759	-1.19
23	37.00	0.718	0.729	-1.47

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	39.00	0.699	0.709	-1.52
25	42.00	0.672	0.681	-1.31
26	44.00	0.655	0.663	-1.18
27	47.00	0.628	0.636	-1.36
28	50.00	0.603	0.611	-1.35
29	53.00	0.581	0.586	-0.967
30	56.00	0.560	0.563	-0.602
31	59.00	0.536	0.540	-0.793
32	63.00	0.509	0.512	-0.595
33	66.00	0.487	0.491	-0.915
34	70.00	0.463	0.465	-0.569
35	74.00	0.440	0.441	-0.156
36	78.00	0.418	0.417	0.180
37	83.00	0.392	0.390	0.435
38	88.00	0.369	0.364	1.26
39	93.00	0.345	0.340	1.47
40	99.00	0.321	0.314	2.36
41	105.0	0.297	0.289	2.65
42	112.0	0.276		
43	119.0	0.251		
44	128.0	0.226		
45	137.0	0.202		
46	148.0	0.179		
47	161.0	0.153		
48	174.0	0.132		
49	192.0	0.108		
50	220.0	0.0853		
51	252.0	0.0634		
52	322.0	0.0384		
53	492.0	0.0144		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0003982 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .1114 sq. cm/sec	WELL DATA: Units: ft	Well: MO-2S
INITIAL HEAD: 1.657 ft	AQUIFER: F/M SAND	MOTTOLO RI/FS
Data Set: MO2SSD Date: 6/22/89	THICKNESS: 9.180	RAYMOND, NH
	SCREEN: top: 3.990 base: 9.240	
	DIAMETER: casing: .1250 intake: .6200	
	DEPTH: Water Table: .8100 TD: 9.240	

DATA SET: MO3SRSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-3SR
COUNTY:	ROCKINGHAM	WELL DEPTH:	9.62 ft
PROJECT:	MOTTLO RI/FS	WATER TABLE:	-0.370 ft
AQUIFER:	F/M SAND	THICKNESS:	10.31 ft
INTAKE RADIUS:	0.310 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.010 ft	SCREEN BASE:	9.62 ft
INITIAL HEAD:	2.916 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.06331square cm/sec

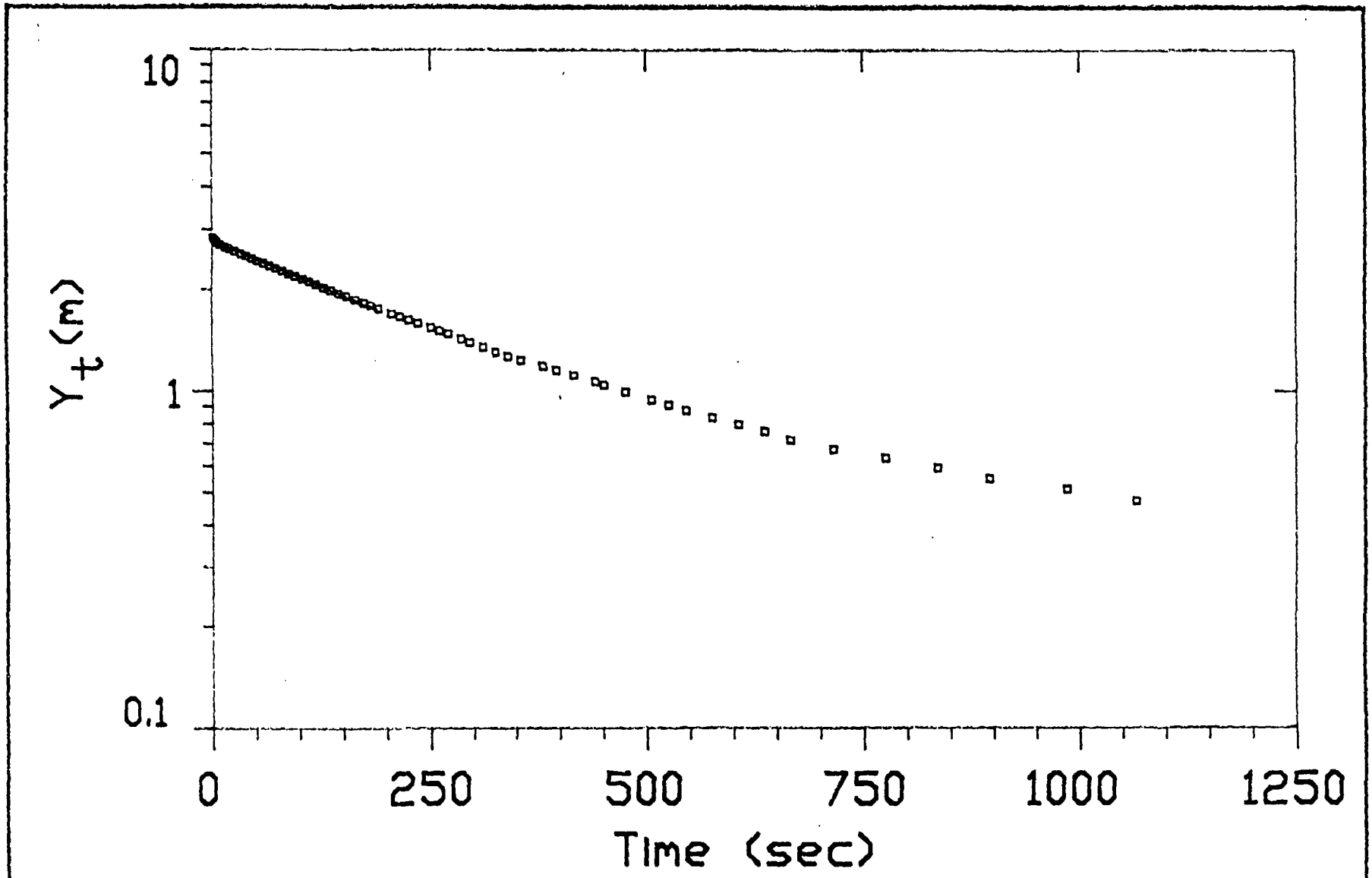
CONDUCTIVITY: 0.00020 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	2.82	2.75	2.28
2	3.00	2.77	2.74	1.13
3	5.00	2.74	2.73	0.631
4	9.00	2.70	2.70	0.0221
5	15.00	2.66	2.66	-0.191
6	20.00	2.62	2.63	-0.374
7	26.00	2.58	2.59	-0.396
8	33.00	2.54	2.55	-0.383
9	39.00	2.50	2.51	-0.452
10	46.00	2.46	2.47	-0.462
11	52.00	2.42	2.43	-0.519
12	59.00	2.38	2.39	-0.454
13	66.00	2.34	2.35	-0.515
14	73.00	2.30	2.31	-0.472
15	81.00	2.26	2.27	-0.351
16	88.00	2.22	2.23	-0.371
17	96.00	2.18	2.19	-0.316
18	104.0	2.14	2.15	-0.260
19	112.0	2.10	2.10	-0.282
20	120.0	2.06	2.06	-0.154
21	128.0	2.02	2.02	-0.253
22	136.0	1.98	1.99	-0.151
23	145.0	1.94	1.94	-0.0883

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	154.0	1.90	1.90	0.0547
25	164.0	1.86	1.86	0.401
26	174.0	1.82	1.81	0.486
27	182.0	1.79	1.78	0.598
28	191.0	1.75	1.74	0.785
29	206.0	1.69		
30	216.0	1.66		
31	226.0	1.62		
32	236.0	1.59		
33	251.0	1.54		
34	261.0	1.50		
35	271.0	1.47		
36	286.0	1.42		
37	296.0	1.39		
38	311.0	1.35		
39	326.0	1.30		
40	341.0	1.26		
41	356.0	1.23		
42	381.0	1.18		
43	396.0	1.15		
44	416.0	1.11		
45	441.0	1.06		
46	451.0	1.04		
47	476.0	0.995		
48	506.0	0.943		
49	526.0	0.910		
50	546.0	0.877		
51	576.0	0.835		
52	606.0	0.796		
53	636.0	0.759		
54	666.0	0.716		
55	716.0	0.674		
56	776.0	0.635		
57	836.0	0.593		
58	896.0	0.552		
59	986.0	0.514		
60	1066.0	0.473		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .0002014 cm/sec

TRANSMISSIVITY: .06330 sq. cm/sec

INITIAL HEAD: 2.916 ft

Data Set: M03SRSD | Date: 6/22/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: F/M SAND

THICKNESS: 10.31

SCREEN: top: 7.010 base: 9.620

DIAMETER: casing: .1660 intake: .6200

DEPTH: Water Table: -.3700 TD: 9.620

Slug Out Test

Well: MO-3SR

MOTTOLO RI/FS
RAYMOND, NH

DATA SET: MO4SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-4S
COUNTY:	ROCKINGHAM	WELL DEPTH:	8.79 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	-0.120 ft
AQUIFER:	F/M SAND	THICKNESS:	12.99 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.062 ft
SCREEN TOP:	4.490 ft	SCREEN BASE:	8.79 ft
INITIAL HEAD:	1.685 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.24605square cm/sec

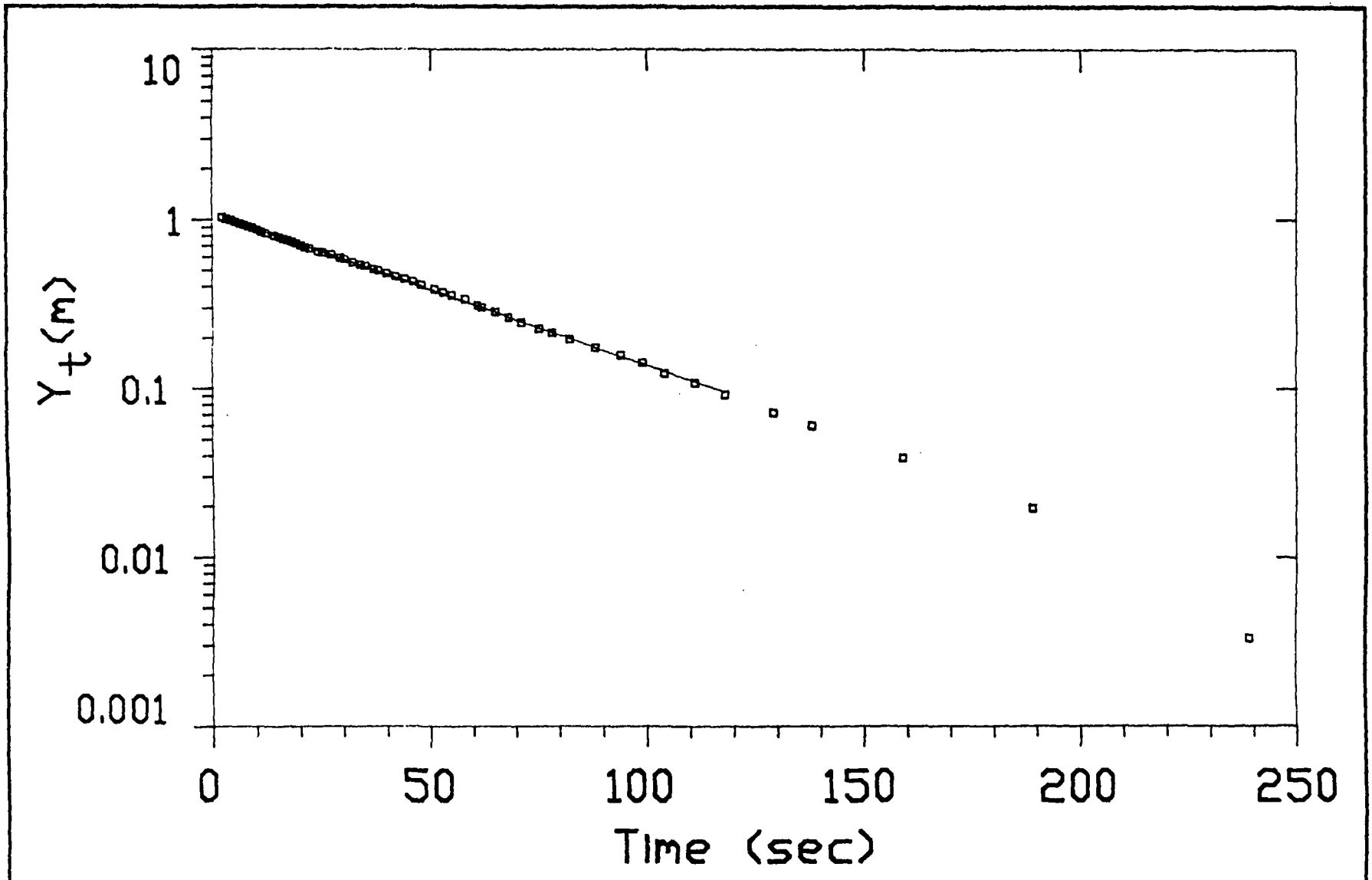
CONDUCTIVITY: 0.00062 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	1.03		
2	3.00	1.00		
3	4.00	0.990		
4	5.00	0.966		
5	6.00	0.948	0.950	-0.188
6	7.00	0.930	0.931	-0.0519
7	8.00	0.908	0.912	-0.381
8	9.00	0.890	0.893	-0.408
9	10.00	0.871	0.875	-0.490
10	11.00	0.848	0.857	-1.16
11	12.00	0.826	0.840	-1.73
12	14.00	0.802	0.806	-0.506
13	15.00	0.786	0.790	-0.518
14	16.00	0.768	0.774	-0.784
15	17.00	0.755	0.758	-0.370
16	18.00	0.737	0.743	-0.730
17	19.00	0.721	0.728	-0.928
18	20.00	0.704	0.713	-1.29
19	21.00	0.684	0.698	-2.06
20	22.00	0.672	0.684	-1.84
21	24.00	0.645	0.657	-1.78
22	25.00	0.637	0.643	-0.933
23	27.00	0.618	0.617	0.182

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	29.00	0.594	0.592	0.297
25	30.00	0.581	0.580	0.0884
26	32.00	0.557	0.557	0.0671
27	34.00	0.540	0.535	0.906
28	35.00	0.530	0.524	1.19
29	37.00	0.506	0.503	0.621
30	38.00	0.500	0.492	1.43
31	40.00	0.479	0.473	1.27
32	42.00	0.459	0.454	1.22
33	44.00	0.444	0.435	1.84
34	46.00	0.426	0.418	1.99
35	48.00	0.408	0.401	1.81
36	51.00	0.386	0.377	2.25
37	53.00	0.370	0.362	2.23
38	55.00	0.354	0.347	2.01
39	58.00	0.337	0.326	3.17
40	61.00	0.310	0.307	0.945
41	62.00	0.302	0.301	0.423
42	65.00	0.284	0.283	0.479
43	68.00	0.265	0.266	-0.196
44	71.00	0.248	0.250	-0.732
45	75.00	0.229	0.230	-0.691
46	78.00	0.215	0.216	-0.514
47	82.00	0.197	0.199	-1.01
48	88.00	0.176	0.176	0.0189
49	94.00	0.158	0.156	1.57
50	99.00	0.143	0.140	1.49
51	104.0	0.123	0.127	-3.01
52	111.0	0.108	0.110	-1.37
53	118.0	0.0915	0.0954	-4.31
54	129.0	0.0719		
55	138.0	0.0602		
56	159.0	0.0391		
57	189.0	0.0195		
58	239.0	0.00330		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .0006214 cm/sec

TRANSMISSIVITY: .2460 sq. cm/sec

INITIAL HEAD: 1.685 ft

Date: 6/22/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: F/M SAND

THICKNESS: 12.99

SCREEN: top: 4.490 base: 8.790

DIAMETER: casing: .1250 intake: .6600

DEPTH: Water Table: -.1200 TD: 8.790

Slug In Test

Well: MO-4S

MOTTOLO RI/FS

RAYMOND, NH

DATA SET: MO4SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-4S
COUNTY:	ROCKINGHAM	WELL DEPTH:	8.79 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	-0.120 ft
AQUIFER:	F/M SAND	THICKNESS:	12.99 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.062 ft
SCREEN TOP:	4.490 ft	SCREEN BASE:	8.79 ft
INITIAL HEAD:	1.352 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.19345square cm/sec

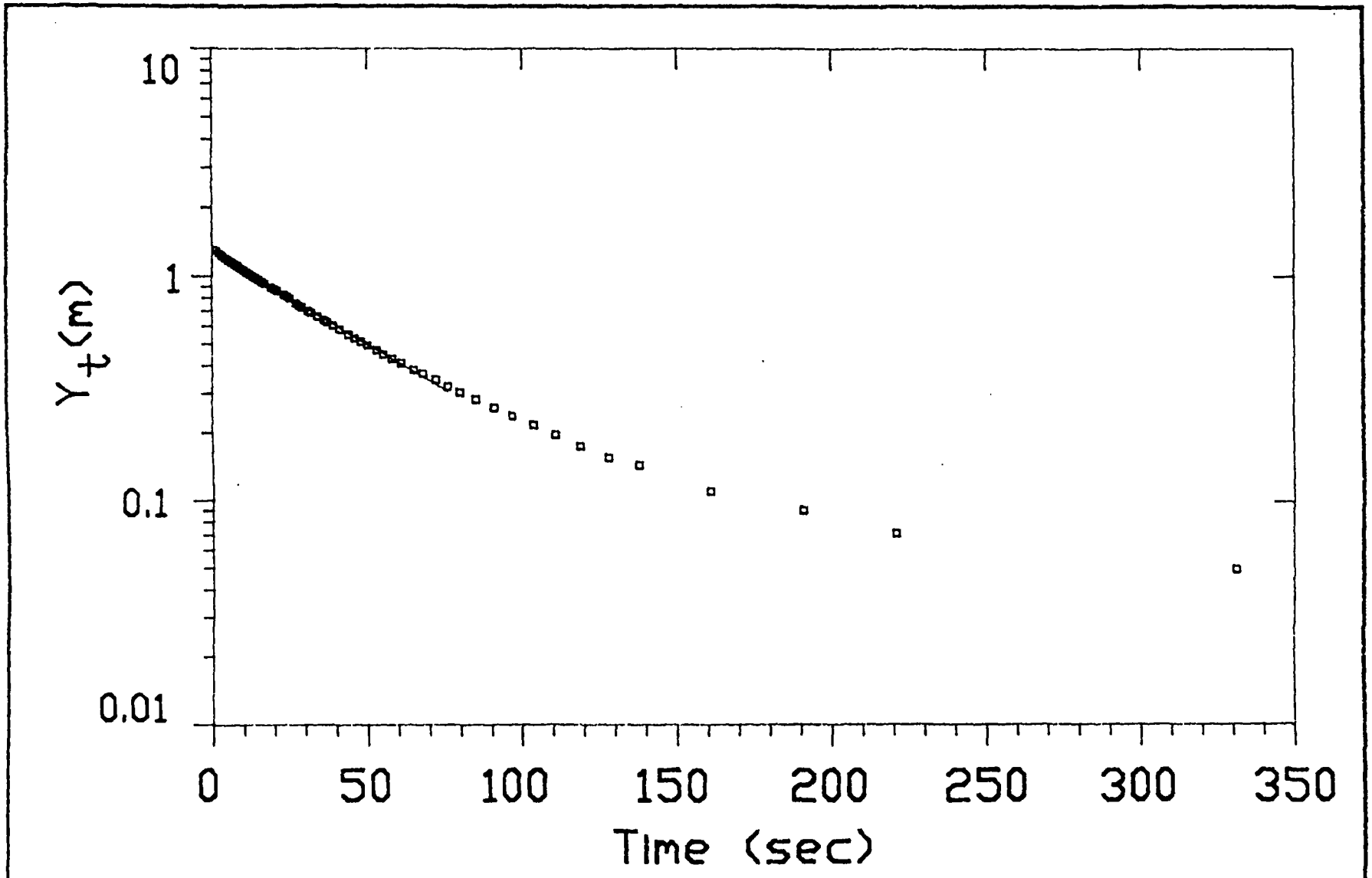
CONDUCTIVITY: 0.00049 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.29	1.25	3.65
2	2.00	1.26	1.22	2.61
3	3.00	1.23	1.20	2.17
4	4.00	1.20	1.18	1.67
5	5.00	1.17	1.16	1.24
6	6.00	1.15	1.13	1.15
7	7.00	1.12	1.11	0.973
8	8.00	1.10	1.09	0.665
9	9.00	1.08	1.07	0.465
10	10.00	1.06	1.05	0.286
11	11.00	1.03	1.03	0.0649
12	12.00	1.01	1.01	0.0343
13	13.00	0.999	0.999	0.0372
14	14.00	0.980	0.980	-0.0769
15	15.00	0.961	0.962	-0.137
16	16.00	0.941	0.945	-0.406
17	17.00	0.924	0.927	-0.384
18	19.00	0.889	0.893	-0.447
19	20.00	0.873	0.877	-0.362
20	21.00	0.858	0.860	-0.297
21	23.00	0.827	0.829	-0.280
22	24.00	0.811	0.813	-0.319
23	25.00	0.795	0.798	-0.407

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	27.00	0.759	0.769	-1.30
25	28.00	0.741	0.755	-1.95
26	29.00	0.726	0.741	-2.00
27	31.00	0.698	0.714	-2.22
28	32.00	0.687	0.701	-2.04
29	34.00	0.662	0.675	-1.90
30	36.00	0.639	0.650	-1.76
31	37.00	0.626	0.638	-1.87
32	39.00	0.603	0.615	-1.97
33	41.00	0.581	0.592	-1.93
34	44.00	0.551	0.560	-1.57
35	46.00	0.532	0.539	-1.43
36	48.00	0.513	0.520	-1.30
37	50.00	0.497	0.501	-0.809
38	53.00	0.470	0.473	-0.711
39	55.00	0.450	0.456	-1.39
40	58.00	0.431	0.431	-0.0562
41	61.00	0.411	0.408	0.911
42	65.00	0.384	0.378	1.48
43	68.00	0.368	0.358	2.90
44	72.00	0.346	0.332	3.98
45	76.00	0.322	0.308	4.42
46	80.00	0.304		
47	85.00	0.283		
48	91.00	0.260		
49	97.00	0.239		
50	104.0	0.218		
51	111.0	0.197		
52	119.0	0.175		
53	128.0	0.156		
54	138.0	0.144		
55	161.0	0.110		
56	191.0	0.0911		
57	221.0	0.0716		
58	331.0	0.0496		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0004886 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .1934 sq. cm/sec	WELL DATA: Units: ft	Well: MO-4S
INITIAL HEAD: 1.351 ft	AQUIFER: F/M SAND	
Data Set: MO4SSO Date: 6/22/89	THICKNESS: 12.99	MOTTOLO RI/FS
	SCREEN: top: 4.490 base: 8.790	RAYMOND, NH
	DIAMETER: casing: .1240 intake: .6600	
	DEPTH: Water Table: -.1200 TD: 8.790	

DATA SET: MO5SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-5S
COUNTY:	ROCKINGHAM	WELL DEPTH:	8.83 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	0.500 ft
AQUIFER:	F/C SAND	THICKNESS:	12.00 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.063 ft
SCREEN TOP:	4.000 ft	SCREEN BASE:	8.83 ft
INITIAL HEAD:	1.759 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.18707square cm/sec

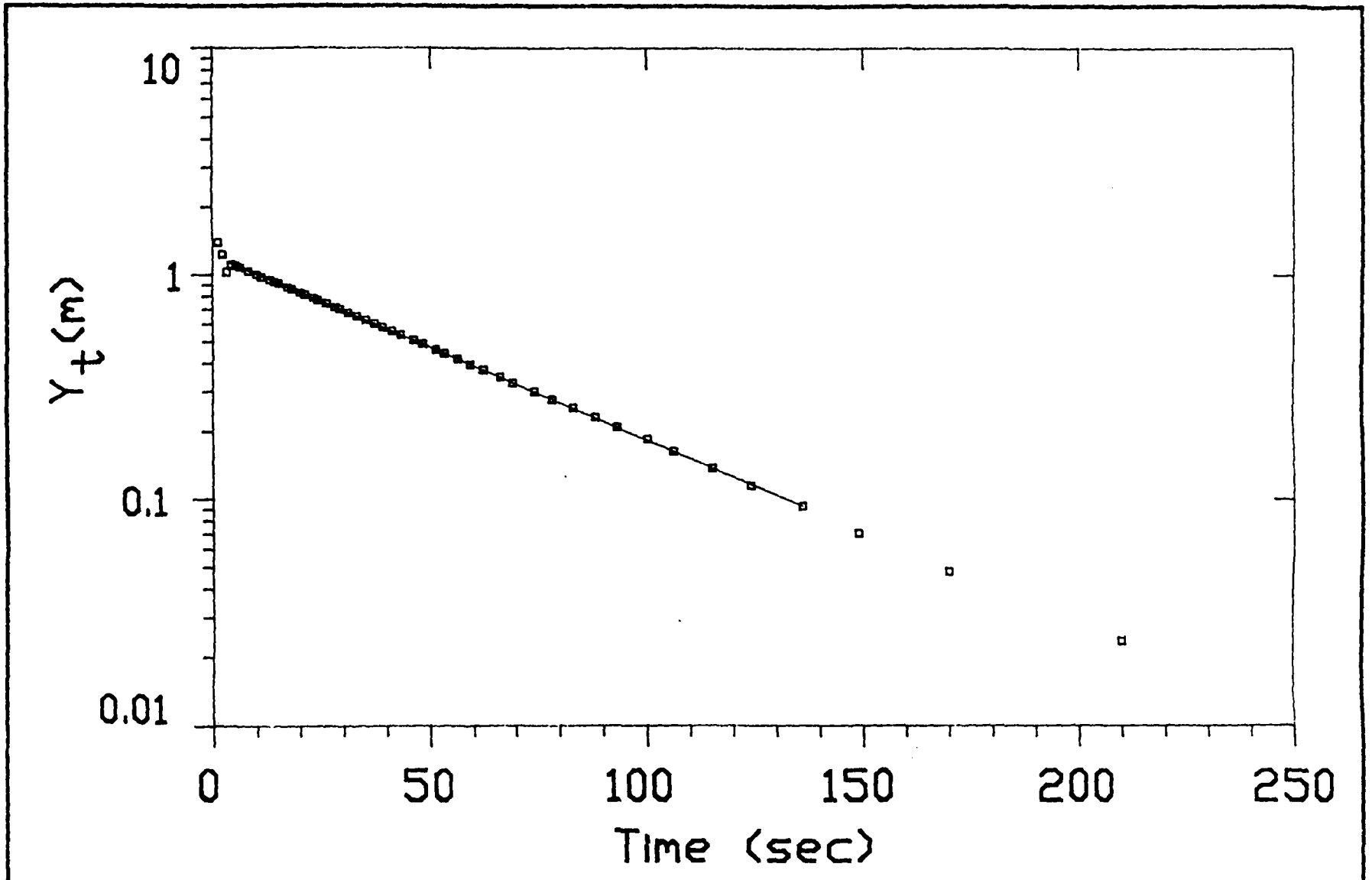
CONDUCTIVITY: 0.00051 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.39		
2	2.00	1.23		
3	3.00	1.02		
4	4.00	1.11	1.12	-1.36
5	5.00	1.10	1.10	-0.245
6	6.00	1.08	1.08	-0.220
7	8.00	1.03	1.04	-0.431
8	10.00	1.00	1.00	0.0429
9	11.00	0.977	0.986	-0.910
10	13.00	0.948	0.949	-0.137
11	14.00	0.932	0.932	0.0780
12	15.00	0.915	0.914	0.101
13	17.00	0.882	0.880	0.133
14	18.00	0.864	0.864	-0.0436
15	20.00	0.833	0.832	0.144
16	21.00	0.817	0.816	0.0302
17	23.00	0.789	0.786	0.401
18	24.00	0.772	0.771	0.0852
19	26.00	0.746	0.743	0.351
20	28.00	0.716	0.715	0.0591
21	29.00	0.704	0.702	0.296
22	31.00	0.678	0.676	0.218
23	33.00	0.654	0.651	0.460

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	35.00	0.628	0.627	0.225
25	37.00	0.607	0.604	0.564
26	39.00	0.584	0.581	0.407
27	41.00	0.561	0.560	0.215
28	43.00	0.540	0.539	0.155
29	46.00	0.511	0.509	0.313
30	48.00	0.491	0.491	0.176
31	51.00	0.463	0.464	-0.0501
32	53.00	0.446	0.446	-0.0591
33	56.00	0.420	0.422	-0.355
34	59.00	0.397	0.399	-0.421
35	62.00	0.377	0.377	-0.0358
36	66.00	0.350	0.349	0.215
37	69.00	0.328	0.330	-0.582
38	74.00	0.301	0.300	0.137
39	78.00	0.277	0.278	-0.410
40	83.00	0.255	0.253	0.489
41	88.00	0.232	0.231	0.594
42	93.00	0.210	0.210	0.123
43	100.0	0.186	0.184	1.09
44	106.0	0.164	0.164	-0.0897
45	115.0	0.138	0.138	-0.195
46	124.0	0.115	0.117	-1.21
47	136.0	0.0931	0.0934	-0.402
48	149.0	0.0704		
49	170.0	0.0478		
50	210.0	0.0235		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0005114 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MO-5S
TRANSMISSIVITY: .1870 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 1.759 ft	AQUIFER: F/C SAND	RAYMOND, NH
Data Set: MO5SS1 Date: 6/22/89	THICKNESS: 12.00	
	SCREEN: top: 4.000 base: 8.830	
	DIAMETER: casing: .1260 intake: .6600	
	DEPTH: Water Table: .5000 TD: 8.830	

DATA SET: MO5SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MO-5S
COUNTY:	ROCKINGHAM	WELL DEPTH:	8.83 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	0.500 ft
AQUIFER:	F/C SAND	THICKNESS:	12.00 ft
INTAKE RADIUS:	0.335 ft	CASING RADIUS:	0.063 ft
SCREEN TOP:	4.000 ft	SCREEN BASE:	8.83 ft
INITIAL HEAD:	1.316 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.16236square cm/sec

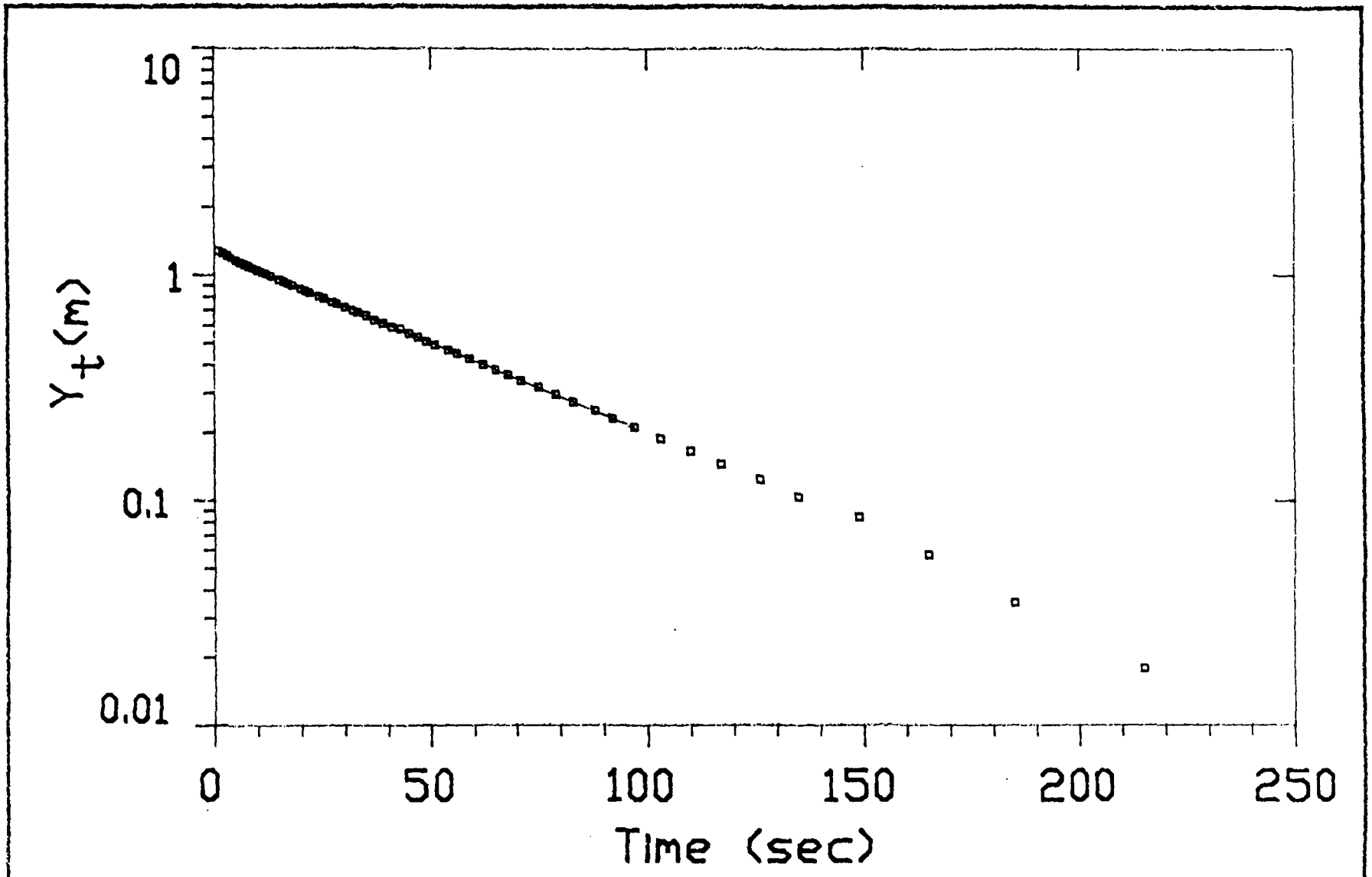
CONDUCTIVITY: 0.00044 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.27		
2	2.00	1.24		
3	3.00	1.21	1.19	2.24
4	4.00	1.18	1.16	1.68
5	5.00	1.15	1.14	1.00
6	6.00	1.13	1.12	0.664
7	7.00	1.11	1.10	0.482
8	8.00	1.08	1.08	0.267
9	9.00	1.06	1.06	0.290
10	10.00	1.04	1.04	-0.0832
11	11.00	1.02	1.02	-0.136
12	12.00	1.00	1.00	-0.136
13	13.00	0.987	0.990	-0.343
14	15.00	0.951	0.954	-0.369
15	16.00	0.932	0.937	-0.527
16	17.00	0.914	0.920	-0.638
17	18.00	0.899	0.903	-0.430
18	20.00	0.867	0.870	-0.385
19	21.00	0.852	0.855	-0.361
20	22.00	0.834	0.839	-0.659
21	24.00	0.805	0.809	-0.407
22	25.00	0.791	0.794	-0.434
23	27.00	0.761	0.765	-0.584

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	28.00	0.748	0.751	-0.508
25	30.00	0.721	0.724	-0.451
26	32.00	0.695	0.698	-0.415
27	33.00	0.683	0.685	-0.389
28	35.00	0.662	0.661	0.151
29	37.00	0.633	0.637	-0.636
30	39.00	0.610	0.614	-0.610
31	41.00	0.588	0.591	-0.568
32	43.00	0.576	0.570	1.07
33	45.00	0.551	0.549	0.186
34	47.00	0.529	0.530	-0.191
35	49.00	0.508	0.510	-0.426
36	51.00	0.489	0.492	-0.658
37	54.00	0.465	0.466	-0.233
38	56.00	0.448	0.449	-0.146
39	59.00	0.425	0.425	0.0134
40	62.00	0.400	0.402	-0.355
41	65.00	0.380	0.380	-0.0345
42	68.00	0.361	0.360	0.442
43	71.00	0.340	0.340	-0.0760
44	75.00	0.318	0.316	0.664
45	79.00	0.295	0.294	0.366
46	83.00	0.273	0.273	0.0201
47	88.00	0.251	0.249	0.864
48	92.00	0.232	0.231	0.156
49	97.00	0.212	0.211	0.526
50	103.0	0.188		
51	110.0	0.165		
52	117.0	0.145		
53	126.0	0.124		
54	135.0	0.103		
55	149.0	0.0843		
56	165.0	0.0570		
57	185.0	0.0350		
58	215.0	0.0178		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0004439 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MO-5S
TRANSMISSIVITY: .1623 sq. cm/sec	WELL DATA: Units: ft	
INITIAL HEAD: 1.316 ft	AQUIFER: F/C SAND	MOTTOLO RI/FS
Data Set: MO5SSO | Date: 6/22/89	THICKNESS: 12.00	RAYMOND, NH
	SCREEN: top: 4.000 base: 8.830	
	DIAMETER: casing: .1260 intake: .6700	
	DEPTH: Water Table: .5000 TD: 8.830	

DATA SET: MO5DRSI

CLIENT:	STARK AND PELTONEN	DATE:	12/18/89
LOCATION:	RAYMOND	WELL NO.:	MO-5DR
COUNTY:	ROCKINGHAM	WELL DEPTH:	23.23 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	0.700 ft
AQUIFER:	BEDROCK	THICKNESS:	22.53 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.120 ft
SCREEN TOP:	12.600 ft	SCREEN BASE:	23.23 ft
INITIAL HEAD:	1.647 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 3.79733square cm/sec

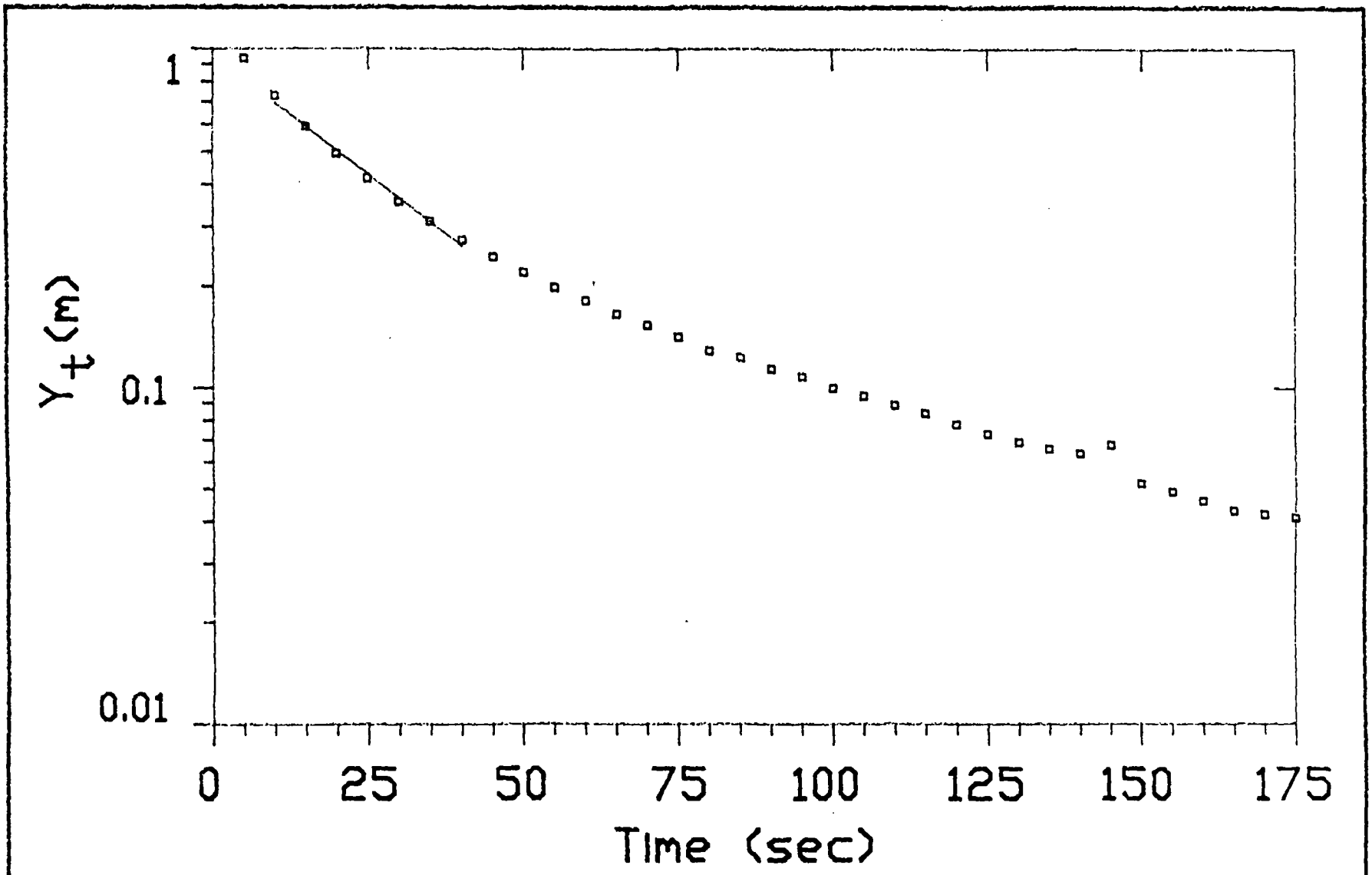
CONDUCTIVITY: 0.00553 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	5.00	0.937		
2	10.00	0.731	0.697	4.54
3	15.00	0.591	0.593	-0.394
4	20.00	0.491	0.504	-2.74
5	25.00	0.415	0.428	-3.36
6	30.00	0.355	0.364	-2.74
7	35.00	0.311	0.310	0.279
8	40.00	0.275	0.263	4.10
9	45.00	0.245		
10	50.00	0.221		
11	55.00	0.199		
12	60.00	0.182		
13	65.00	0.166		
14	70.00	0.154		
15	75.00	0.142		
16	80.00	0.129		
17	85.00	0.123		
18	90.00	0.114		
19	95.00	0.108		
20	100.0	0.100		
21	105.0	0.0950		
22	110.0	0.0890		
23	115.0	0.0840		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	120.0	0.0780		
25	125.0	0.0730		
26	130.0	0.0690		
27	135.0	0.0660		
28	140.0	0.0640		
29	145.0	0.0680		
30	150.0	0.0520		
31	155.0	0.0490		
32	160.0	0.0460		
33	165.0	0.0430		
34	170.0	0.0420		
35	175.0	0.0410		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .005529 cm/sec

TRANSMISSIVITY: 3.797 sq. cm/sec

INITIAL HEAD: 1.647 ft

Date: 12/18/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: BEDROCK

THICKNESS: 22.53

SCREEN: top: 12.60 base: 23.23

DIAMETER: casing: .2400 intake: .2400

DEPTH: Water Table: .7000 TD: 23.23

Slug In Test

Well: MO-5DR

MOTTOLO RI/FS

RAYMOND, NH

DATA SET: MO5DRSO

CLIENT:	STARK AND PELTONEN	DATE:	12/18/89
LOCATION:	RAYMOND	WELL NO.:	MO-5DR
COUNTY:	ROCKINGHAM	WELL DEPTH:	23.23 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	0.700 ft
AQUIFER:	BEDROCK	THICKNESS:	22.53 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.120 ft
SCREEN TOP:	12.600 ft	SCREEN BASE:	23.23 ft
INITIAL HEAD:	2.712 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 7.44123square cm/sec

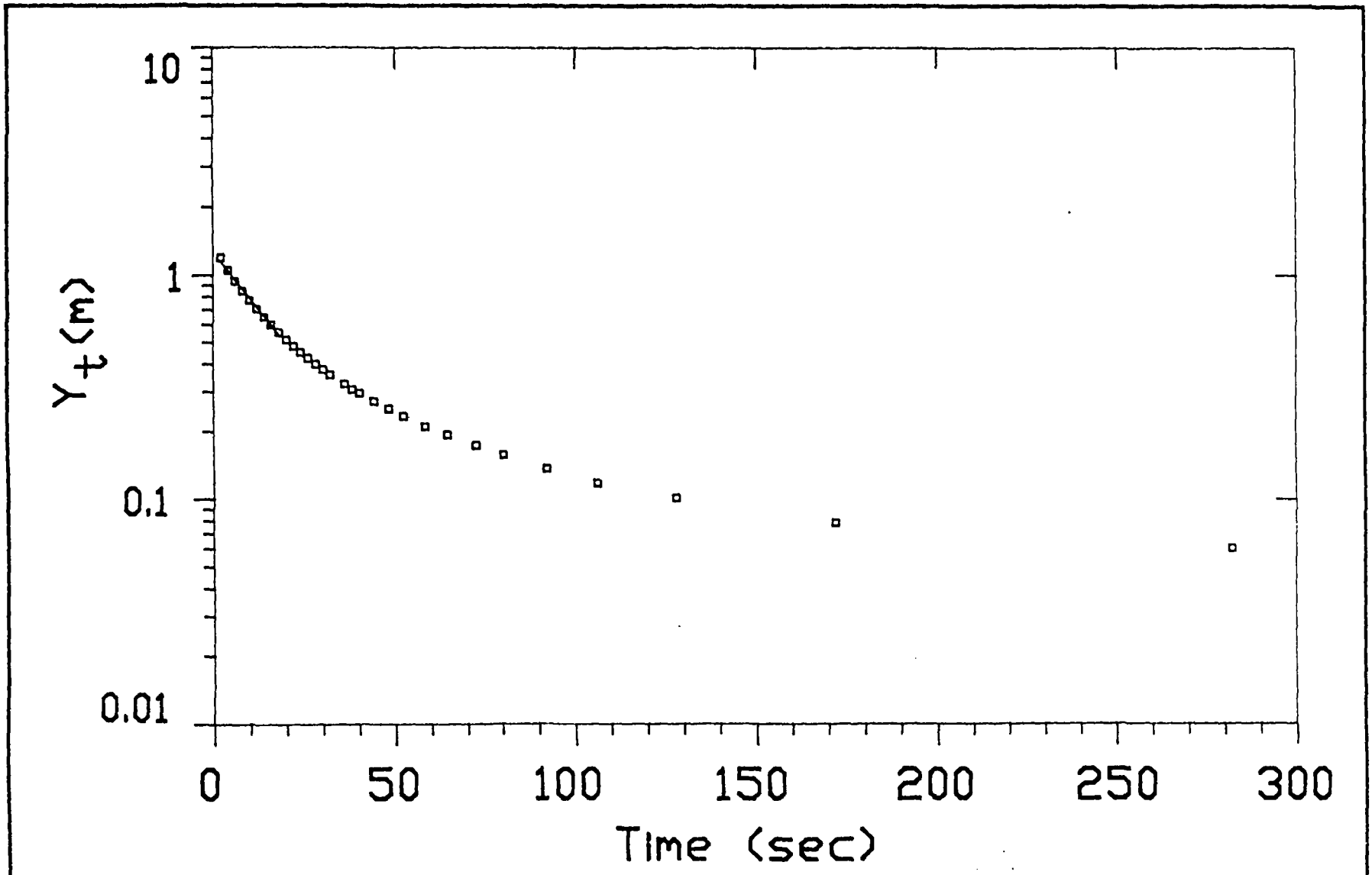
CONDUCTIVITY: 0.01084 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	1.19	1.15	3.87
2	4.00	1.04	1.04	0.154
3	6.00	0.939	0.952	-1.44
4	8.00	0.849	0.866	-2.04
5	10.00	0.771	0.787	-2.20
6	12.00	0.705	0.716	-1.65
7	14.00	0.648	0.651	-0.587
8	16.00	0.598	0.592	0.866
9	18.00	0.555	0.539	2.85
10	20.00	0.514		
11	22.00	0.481		
12	24.00	0.451		
13	26.00	0.425		
14	28.00	0.399		
15	30.00	0.378		
16	32.00	0.358		
17	36.00	0.324		
18	38.00	0.307		
19	40.00	0.296		
20	44.00	0.272		
21	48.00	0.252		
22	52.00	0.234		
23	58.00	0.211		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	64.00	0.194		
25	72.00	0.174		
26	80.00	0.158		
27	92.00	0.137		
28	106.0	0.118		
29	128.0	0.101		
30	172.0	0.0780		
31	282.0	0.0600		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .01083 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MO-5DR
TRANSMISSIVITY: 7.441 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 2.712 ft	AQUIFER: BEDROCK	RAYMOND, NH
Data Set: MO5DRSD | Date: 12/18/89	THICKNESS: 22.53	
	SCREEN: top: 12.60 base: 23.23	
	DIAMETER: casing: .2400 intake: .2400	
	DEPTH: Water Table: .7000 TD: 23.23	

DATA SET: MW8SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-8S
COUNTY:	ROCKINGHAM	WELL DEPTH:	18.31 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	6.440 ft
AQUIFER:	SILTY SAND	THICKNESS:	11.87 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.780 ft	SCREEN BASE:	18.31 ft
INITIAL HEAD:	13.323 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 1.72296square cm/sec

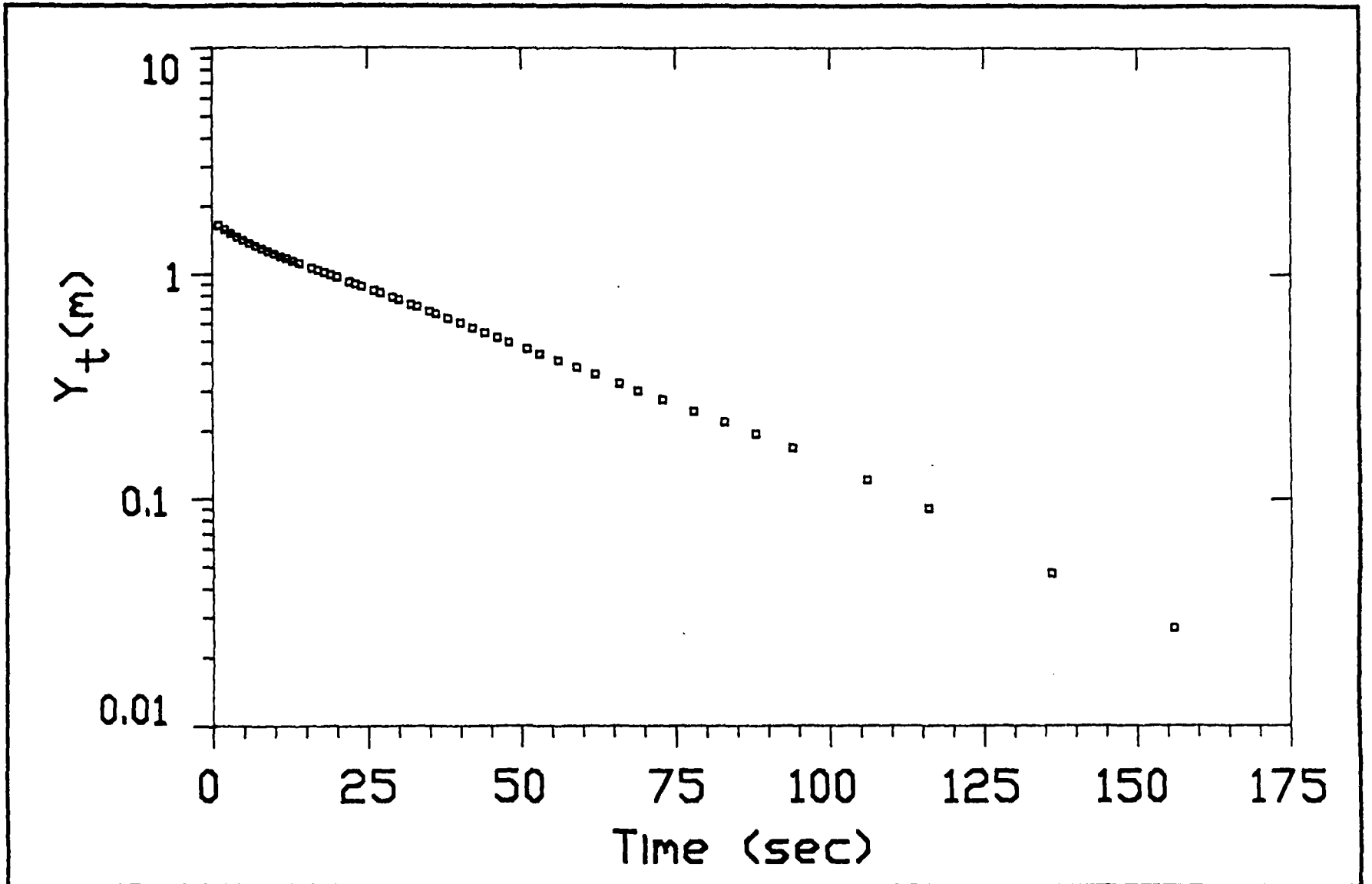
CONDUCTIVITY: 0.00476 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.65	1.61	2.56
2	2.00	1.58	1.56	0.966
3	3.00	1.51	1.52	-0.0811
4	4.00	1.46	1.47	-0.755
5	5.00	1.41	1.43	-1.14
6	6.00	1.37	1.39	-1.12
7	7.00	1.33	1.35	-1.13
8	8.00	1.29	1.31	-0.988
9	9.00	1.26	1.27	-0.849
10	10.00	1.23	1.23	-0.382
11	11.00	1.20	1.20	-0.0653
12	12.00	1.17	1.16	0.520
13	13.00	1.14	1.13	0.874
14	14.00	1.11	1.09	1.51
15	16.00	1.06		
16	17.00	1.04		
17	18.00	1.01		
18	19.00	0.994		
19	20.00	0.972		
20	22.00	0.928		
21	23.00	0.909		
22	24.00	0.887		
23	26.00	0.850		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	27.00	0.829		
25	29.00	0.792		
26	30.00	0.773		
27	32.00	0.736		
28	33.00	0.718		
29	35.00	0.684		
30	36.00	0.667		
31	38.00	0.635		
32	40.00	0.606		
33	42.00	0.577		
34	44.00	0.549		
35	46.00	0.525		
36	48.00	0.499		
37	51.00	0.466		
38	53.00	0.442		
39	56.00	0.412		
40	59.00	0.385		
41	62.00	0.359		
42	66.00	0.327		
43	69.00	0.303		
44	73.00	0.277		
45	78.00	0.246		
46	83.00	0.220		
47	88.00	0.195		
48	94.00	0.169		
49	106.0	0.122		
50	116.0	0.0910		
51	136.0	0.0470		
52	156.0	0.0270		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .004762 cm/sec

TRANSMISSIVITY: 1.723 sq. cm/sec

INITIAL HEAD: 13.32 ft

Data Set: MW8SSI | Date: 6/22/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: SILTY SAND

THICKNESS: 11.87

SCREEN: top: 7.780 base: 18.31

DIAMETER: casing: .1660 intake: .6600

DEPTH: Water Table: 6.440 TD: 18.31

Slug In Test

Well: MW-8S

MOTTOLO RI/FS

RAYMOND, NH

DATA SET: MW8SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-8S
COUNTY:	ROCKINGHAM	WELL DEPTH:	18.31 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	6.440 ft
AQUIFER:	SILTY SAND	THICKNESS:	11.87 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.780 ft	SCREEN BASE:	18.31 ft
INITIAL HEAD:	1.178 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.17934square cm/sec

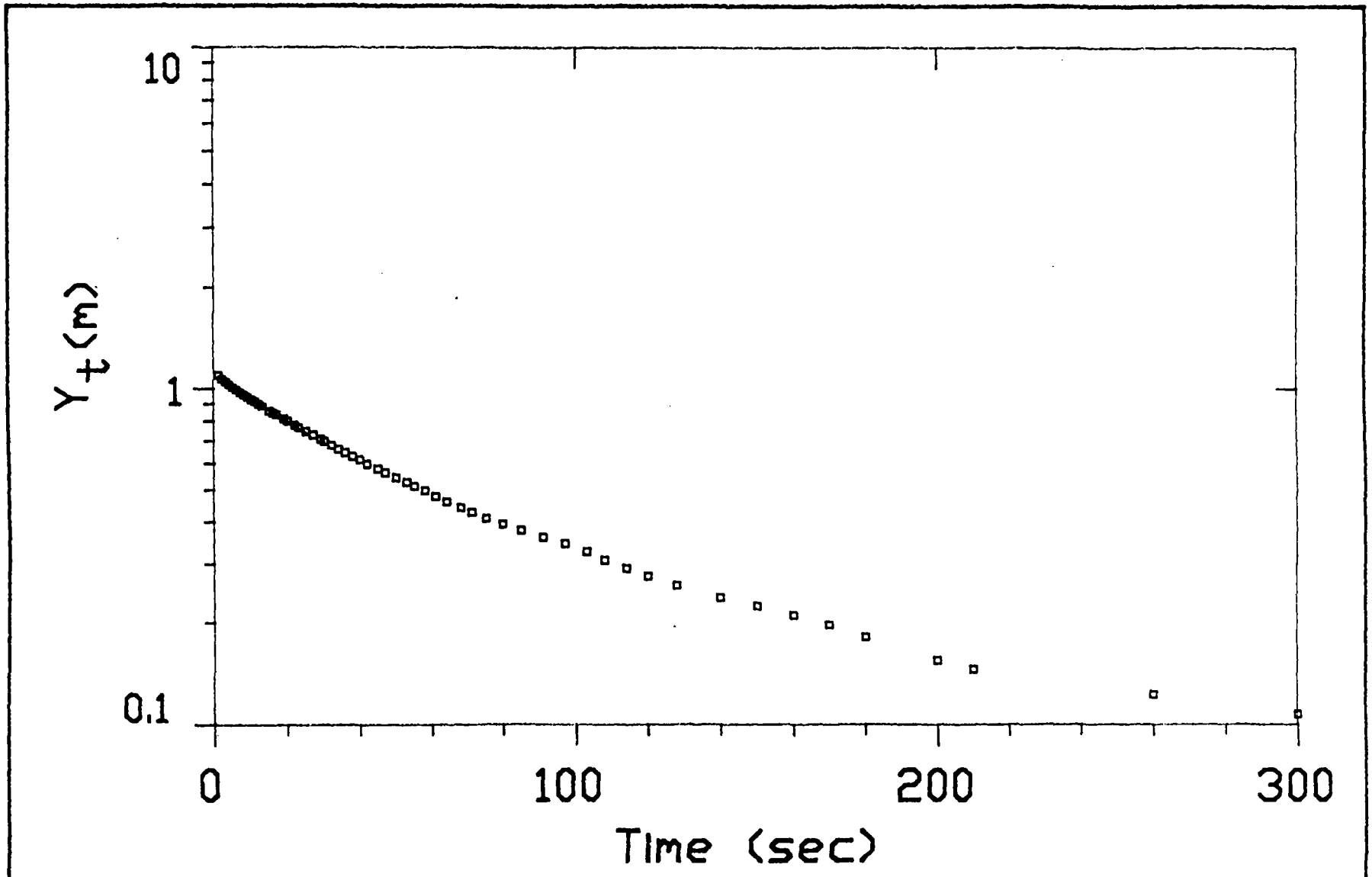
CONDUCTIVITY: 0.00050 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	1.00	1.10		
2	2.00	1.07	1.05	1.40
3	3.00	1.05	1.04	0.887
4	4.00	1.03	1.02	0.517
5	5.00	1.01	1.00	0.01000
6	6.00	0.995	0.994	0.0625
7	7.00	0.976	0.979	-0.316
8	8.00	0.960	0.964	-0.421
9	9.00	0.944	0.949	-0.553
10	10.00	0.928	0.934	-0.715
11	11.00	0.915	0.920	-0.576
12	12.00	0.899	0.906	-0.792
13	13.00	0.887	0.892	-0.586
14	15.00	0.860	0.864	-0.579
15	16.00	0.848	0.851	-0.435
16	17.00	0.837	0.838	-0.191
17	19.00	0.815	0.813	0.243
18	20.00	0.802	0.800	0.184
19	22.00	0.779	0.776	0.371
20	23.00	0.768	0.764	0.497
21	25.00	0.748	0.740	0.953
22	27.00	0.729		
23	29.00	0.709		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	30.00	0.699		
25	32.00	0.681		
26	34.00	0.663		
27	36.00	0.647		
28	38.00	0.629		
29	40.00	0.616		
30	42.00	0.598		
31	45.00	0.578		
32	47.00	0.563		
33	50.00	0.544		
34	53.00	0.527		
35	55.00	0.513		
36	58.00	0.497		
37	61.00	0.478		
38	64.00	0.460		
39	68.00	0.442		
40	71.00	0.428		
41	75.00	0.410		
42	80.00	0.394		
43	85.00	0.377		
44	91.00	0.360		
45	97.00	0.345		
46	103.0	0.326		
47	108.0	0.308		
48	114.0	0.291		
49	120.0	0.276		
50	128.0	0.259		
51	140.0	0.238		
52	150.0	0.224		
53	160.0	0.210		
54	170.0	0.197		
55	180.0	0.181		
56	200.0	0.154		
57	210.0	0.145		
58	260.0	0.122		
59	300.0	0.107		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0004957 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .1793 sq. cm/sec	WELL DATA: Units: ft	Well: MW-8S
INITIAL HEAD: 1.178 ft	AQUIFER: SILTY SAND	
Data Set: MW8SSO Date: 6/22/89	THICKNESS: 11.87	MOTTOLO RI/FS
	SCREEN: top: 7.780 base: 18.31	RAYMOND, NH
	DIAMETER: casing: .1660 intake: .6600	
	DEPTH: Water Table: 6.440 TD: 18.31	

DATA SET: MW11DSO

CLIENT:	STARK AND PELTONEN	DATE:	12/6/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-11D
COUNTY:	ROCKINGHAM	WELL DEPTH:	17.58 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	9.710 ft
AQUIFER:	BEDROCK	THICKNESS:	7.87 ft
INTAKE RADIUS:	0.167 ft	CASING RADIUS:	0.167 ft
SCREEN TOP:	9.000 ft	SCREEN BASE:	17.58 ft
INITIAL HEAD:	1.020 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 3.13996square cm/sec

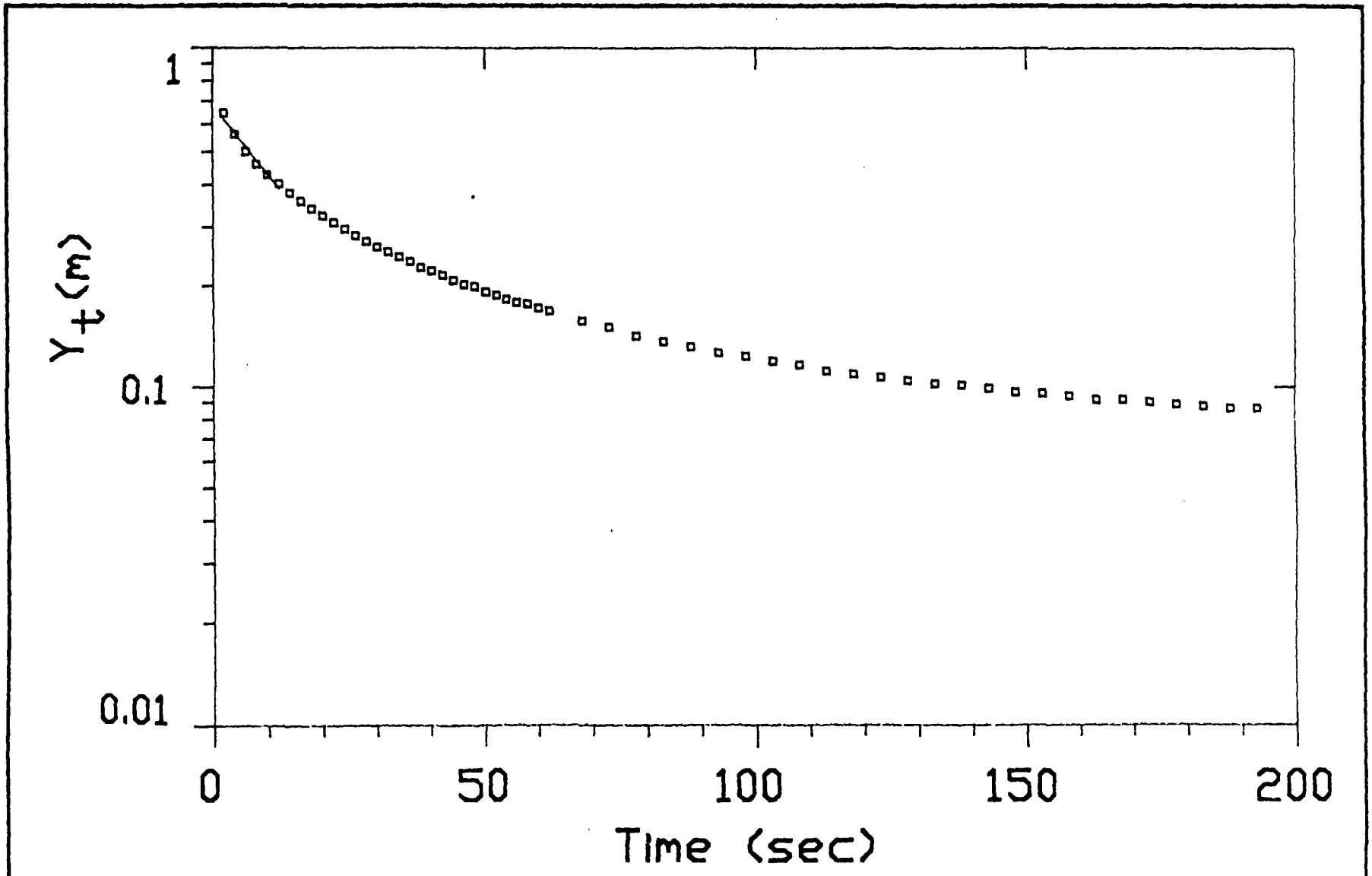
CONDUCTIVITY: 0.01309 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	0.647	0.622	3.91
2	4.00	0.559	0.566	-1.25
3	6.00	0.499	0.516	-3.39
4	8.00	0.459	0.470	-2.37
5	10.00	0.426	0.428	-0.273
6	12.00	0.402	0.389	3.16
7	14.00	0.378		
8	16.00	0.357		
9	18.00	0.339		
10	20.00	0.324		
11	22.00	0.309		
12	24.00	0.296		
13	26.00	0.283		
14	28.00	0.272		
15	30.00	0.262		
16	32.00	0.253		
17	34.00	0.244		
18	36.00	0.237		
19	38.00	0.226		
20	40.00	0.222		
21	42.00	0.215		
22	44.00	0.208		
23	46.00	0.202		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	48.00	0.199		
25	50.00	0.192		
26	52.00	0.188		
27	54.00	0.182		
28	56.00	0.178		
29	58.00	0.177		
30	60.00	0.171		
31	62.00	0.168		
32	68.00	0.157		
33	73.00	0.150		
34	78.00	0.142		
35	83.00	0.136		
36	88.00	0.131		
37	93.00	0.126		
38	98.00	0.123		
39	103.0	0.119		
40	108.0	0.116		
41	113.0	0.111		
42	118.0	0.109		
43	123.0	0.106		
44	128.0	0.104		
45	133.0	0.102		
46	138.0	0.101		
47	143.0	0.0989		
48	148.0	0.0966		
49	153.0	0.0958		
50	158.0	0.0942		
51	163.0	0.0919		
52	168.0	0.0919		
53	173.0	0.0903		
54	178.0	0.0887		
55	183.0	0.0879		
56	188.0	0.0864		
57	193.0	0.0864		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .01308 cm/sec

TRANSMISSIVITY: 3.140 sq. cm/sec

INITIAL HEAD: 1.019 ft

Date: 12/6/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: BEDROCK

THICKNESS: 7.872

SCREEN: top: 9.000 base: 17.58

DIAMETER: casing: .3340 intake: .3340

DEPTH: Water Table: 9.710 TD: 17.58

Slug Out Test

Well: MW-11D

MOTTOLO RI/FS
RAYMOND, NH

DATA SET: MW12SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-12S
COUNTY:	ROCKINGHAM	WELL DEPTH:	12.92 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	3.800 ft
AQUIFER:	TILL	THICKNESS:	10.06 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	6.960 ft	SCREEN BASE:	12.92 ft
INITIAL HEAD:	3.299 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.09150square cm/sec

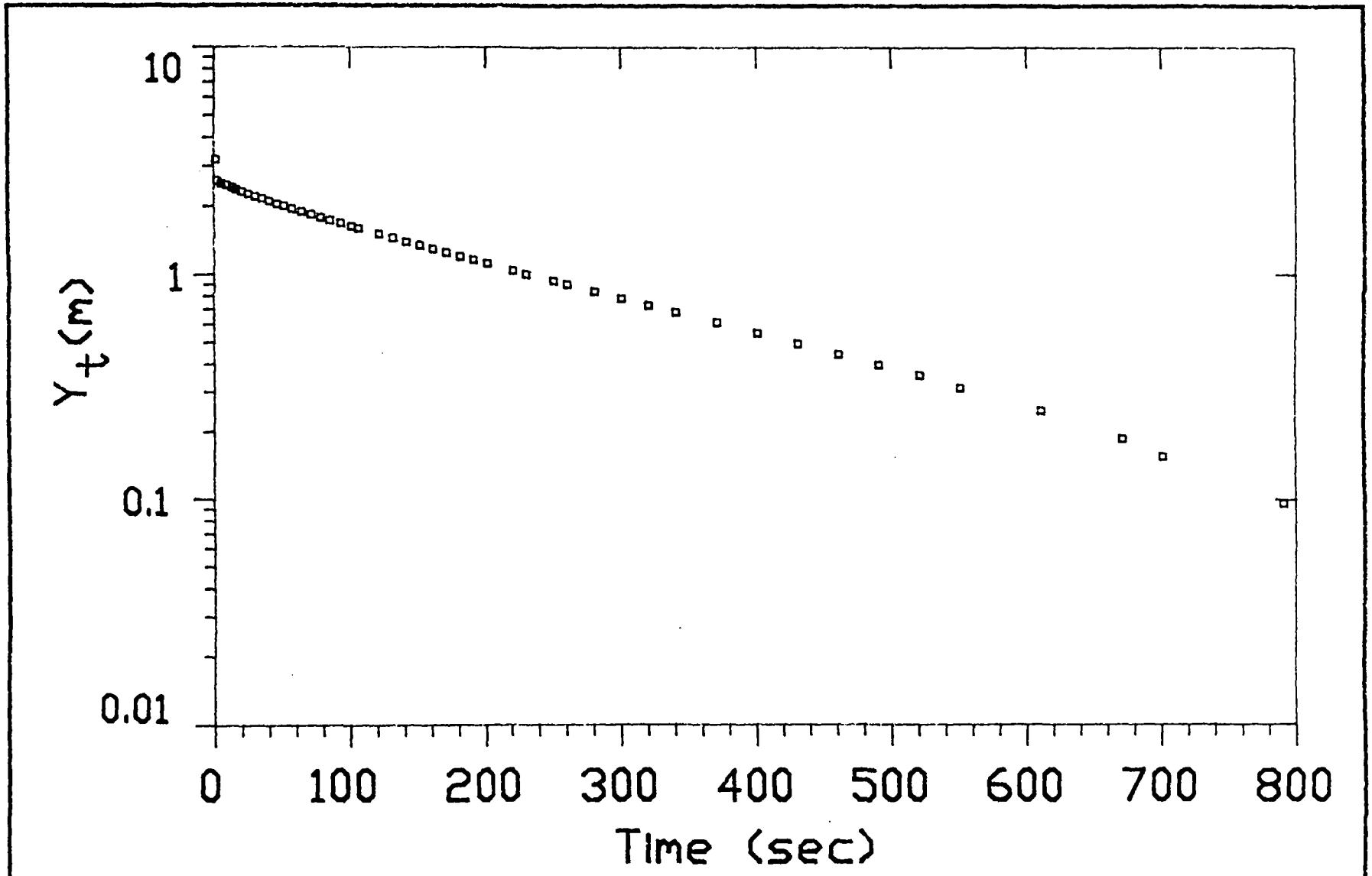
CONDUCTIVITY: 0.00030 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	3.21	2.65	17.57
2	2.00	2.60	2.63	-1.32
3	5.00	2.52	2.59	-2.81
4	9.00	2.48	2.54	-2.42
5	13.00	2.42	2.48	-2.37
6	16.00	2.37	2.44	-3.05
7	20.00	2.32	2.39	-3.01
8	25.00	2.26	2.32	-2.78
9	30.00	2.21	2.26	-2.47
10	35.00	2.15	2.20	-2.17
11	40.00	2.10	2.14	-1.84
12	46.00	2.04	2.07	-1.47
13	51.00	2.00	2.02	-0.873
14	57.00	1.95	1.95	-0.344
15	64.00	1.89	1.88	0.488
16	71.00	1.83	1.81	1.33
17	78.00	1.78	1.74	2.24
18	85.00	1.73	1.68	3.18
19	93.00	1.68		
20	101.0	1.63		
21	106.0	1.59		
22	121.0	1.50		
23	131.0	1.45		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	141.0	1.39		
25	151.0	1.34		
26	161.0	1.29		
27	171.0	1.24		
28	181.0	1.19		
29	191.0	1.15		
30	201.0	1.11		
31	221.0	1.04		
32	231.0	1.00		
33	251.0	0.934		
34	261.0	0.903		
35	281.0	0.840		
36	301.0	0.781		
37	321.0	0.728		
38	341.0	0.679		
39	371.0	0.614		
40	401.0	0.549		
41	431.0	0.494		
42	461.0	0.442		
43	491.0	0.397		
44	521.0	0.356		
45	551.0	0.313		
46	611.0	0.248		
47	671.0	0.187		
48	701.0	0.155		
49	791.0	0.0956		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0002984 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .09150 sq. cm/sec	WELL DATA: Units: ft	Well: MW-12S
INITIAL HEAD: 3.298 ft	AQUIFER: TILL	
	THICKNESS: 10.06	
	SCREEN: top: 6.960 base: 12.92	MOTTOLO RI/FS
	DIAMETER: casing: .1660 intake: .6600	RAYMOND, NH
Data Set: MW12SSI Date: 6/22/89	DEPTH: Water Table: 3.800 TD: 12.92	

DATA SET: MW12SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-12S
COUNTY:	ROCKINGHAM	WELL DEPTH:	12.92 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	3.800 ft
AQUIFER:	TILL	THICKNESS:	10.06 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	6.960 ft	SCREEN BASE:	12.92 ft
INITIAL HEAD:	3.022 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.03950square cm/sec

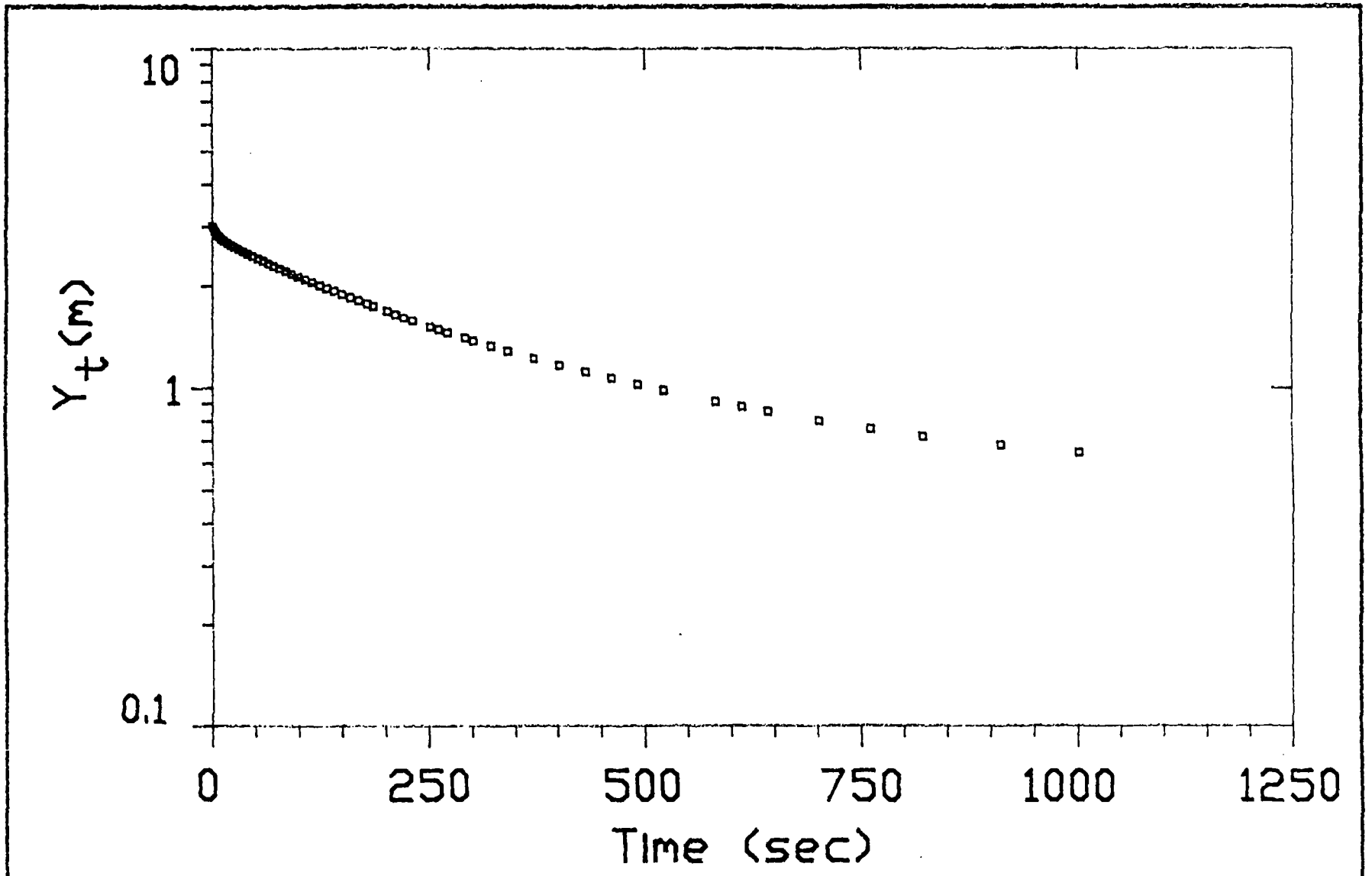
CONDUCTIVITY: 0.00013 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	1.00	3.00		
2	2.00	2.96	2.84	3.98
3	3.00	2.92	2.83	2.83
4	4.00	2.90	2.82	2.45
5	6.00	2.84	2.81	1.22
6	8.00	2.81	2.79	0.621
7	11.00	2.76	2.77	-0.0973
8	14.00	2.72	2.74	-0.589
9	18.00	2.68	2.71	-1.09
10	22.00	2.64	2.67	-1.29
11	26.00	2.60	2.64	-1.49
12	31.00	2.56	2.60	-1.59
13	36.00	2.52	2.56	-1.62
14	41.00	2.49	2.53	-1.63
15	47.00	2.44	2.48	-1.53
16	53.00	2.40	2.44	-1.45
17	59.00	2.36	2.39	-1.31
18	65.00	2.32	2.35	-1.07
19	71.00	2.28	2.31	-1.02
20	78.00	2.24	2.26	-0.708
21	85.00	2.20	2.21	-0.458
22	92.00	2.16	2.17	-0.138
23	99.00	2.12	2.12	0.190

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	107.0	2.08	2.07	0.633
25	115.0	2.04	2.02	1.10
26	124.0	2.00	1.97	1.65
27	132.0	1.96	1.92	2.12
28	141.0	1.92		
29	150.0	1.88		
30	160.0	1.84		
31	169.0	1.80		
32	179.0	1.76		
33	186.0	1.73		
34	202.0	1.67		
35	212.0	1.64		
36	222.0	1.60		
37	232.0	1.57		
38	252.0	1.51		
39	262.0	1.48		
40	272.0	1.45		
41	292.0	1.40		
42	302.0	1.37		
43	322.0	1.33		
44	342.0	1.28		
45	372.0	1.22		
46	402.0	1.16		
47	432.0	1.11		
48	462.0	1.06		
49	492.0	1.02		
50	522.0	0.983		
51	582.0	0.912		
52	612.0	0.883		
53	642.0	0.854		
54	702.0	0.802		
55	762.0	0.761		
56	822.0	0.723		
57	912.0	0.682		
58	1002.0	0.647		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0001288 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MW-12S
TRANSMISSIVITY: .03949 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 3.022 ft	AQUIFER: TILL	RAYMOND, NH
Data Set: MW12SSD Date: 6/22/89	THICKNESS: 10.06	
	SCREEN: top: 6.960 base: 12.92	
	DIAMETER: casing: .1660 intake: .6600	
	DEPTH: Water Table: 3.800 TD: 12.92	

DATA SET: MW13SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-13S
COUNTY:	ROCKINGHAM	WELL DEPTH:	14.39 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	1.120 ft
AQUIFER:	SILT AND SAND	THICKNESS:	17.86 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	6.980 ft	SCREEN BASE:	14.39 ft
INITIAL HEAD:	2.595 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.31537square cm/sec

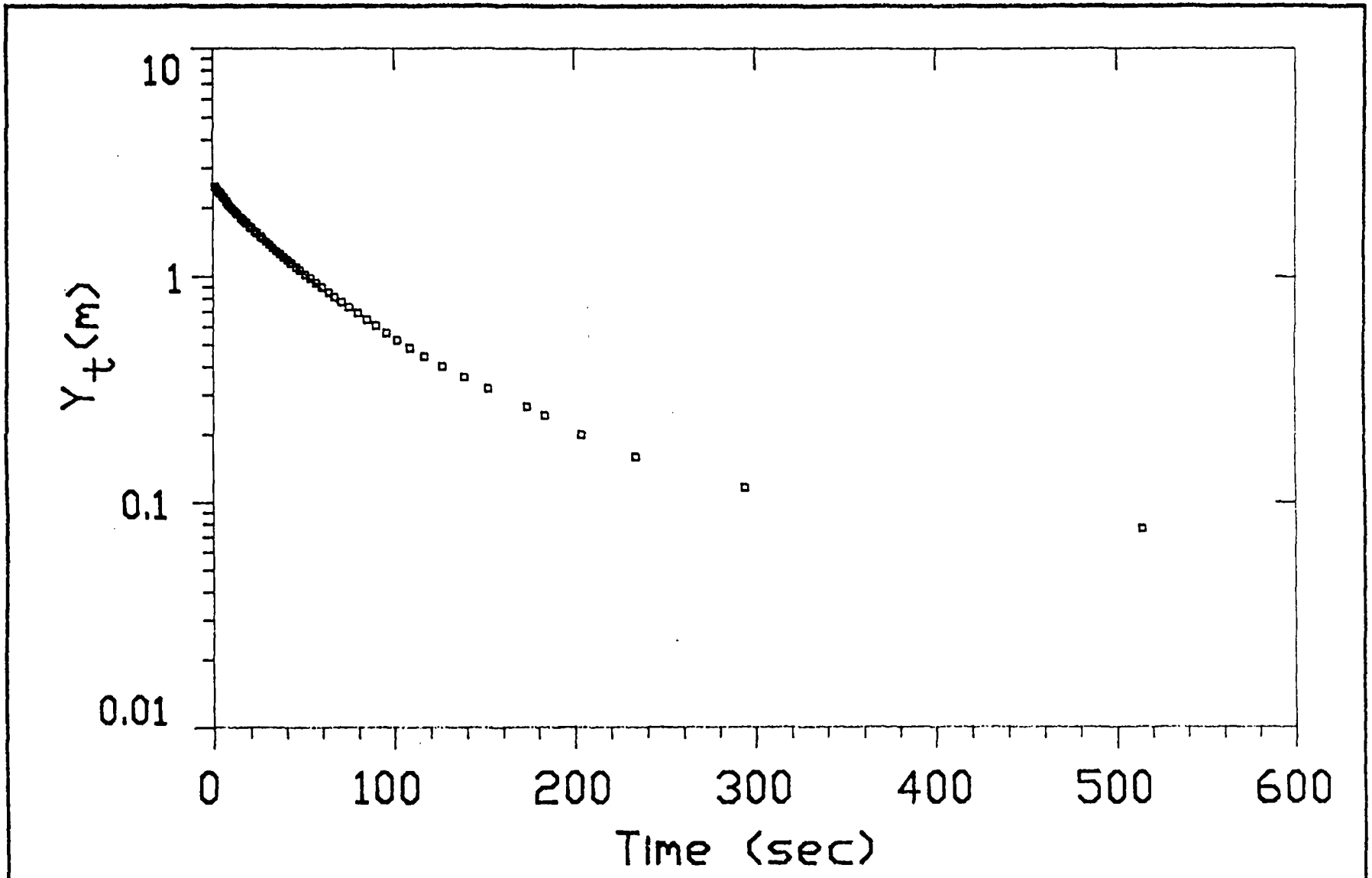
CONDUCTIVITY: 0.00058 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	2.48		
2	2.00	2.40		
3	3.00	2.35		
4	4.00	2.32	2.18	5.81
5	5.00	2.26	2.15	5.00
6	6.00	2.21	2.11	4.35
7	7.00	2.13	2.08	2.49
8	8.00	2.07	2.05	1.17
9	9.00	2.03	2.01	1.02
10	10.00	1.99	1.98	0.623
11	11.00	1.95	1.95	0.176
12	12.00	1.92	1.92	0.0485
13	13.00	1.88	1.89	-0.430
14	15.00	1.81	1.82	-0.918
15	16.00	1.78	1.80	-0.905
16	17.00	1.75	1.77	-1.20
17	18.00	1.71	1.74	-1.48
18	20.00	1.65	1.68	-1.80
19	21.00	1.63	1.65	-1.81
20	23.00	1.57	1.60	-2.00
21	24.00	1.54	1.58	-2.11
22	26.00	1.49	1.53	-2.07
23	27.00	1.47	1.50	-2.27

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	29.00	1.42	1.45	-2.33
25	31.00	1.37	1.41	-2.29
26	33.00	1.33	1.36	-2.28
27	35.00	1.29	1.32	-2.15
28	37.00	1.25	1.27	-1.96
29	39.00	1.21	1.23	-1.94
30	41.00	1.18	1.19	-1.61
31	43.00	1.14	1.16	-1.46
32	46.00	1.09	1.10	-1.04
33	48.00	1.06	1.07	-0.764
34	51.00	1.01	1.01	-0.413
35	54.00	0.976	0.970	0.543
36	57.00	0.933	0.924	0.911
37	60.00	0.895	0.880	1.61
38	64.00	0.848	0.825	2.70
39	67.00	0.812	0.785	3.22
40	71.00	0.772	0.736	4.61
41	75.00	0.732		
42	80.00	0.687		
43	85.00	0.646		
44	90.00	0.607		
45	96.00	0.564		
46	102.0	0.525		
47	109.0	0.485		
48	117.0	0.446		
49	127.0	0.402		
50	139.0	0.361		
51	152.0	0.321		
52	174.0	0.266		
53	184.0	0.244		
54	204.0	0.200		
55	234.0	0.160		
56	294.0	0.117		
57	514.0	0.0760		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0005793 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .3153 sq. cm/sec	WELL DATA: Units: ft	Well: MW-13S
INITIAL HEAD: 2.595 ft	AQUIFER: SILT AND SAND	
	THICKNESS: 17.86	
	SCREEN: top: 6.980 base: 14.39	MOTTOLO RI/FS
	DIAMETER: casing: .1660 intake: .6600	RAYMOND, NH
Data Set: MW13SSD Date: 6/22/89	DEPTH: Water Table: 1.120 TD: 14.39	

DATA SET: MW14SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-14S
COUNTY:	ROCKINGHAM	WELL DEPTH:	27.48 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	1.020 ft
AQUIFER:	F/C SAND	THICKNESS:	28.02 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.840 ft	SCREEN BASE:	27.48 ft
INITIAL HEAD:	2.715 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.34835square cm/sec

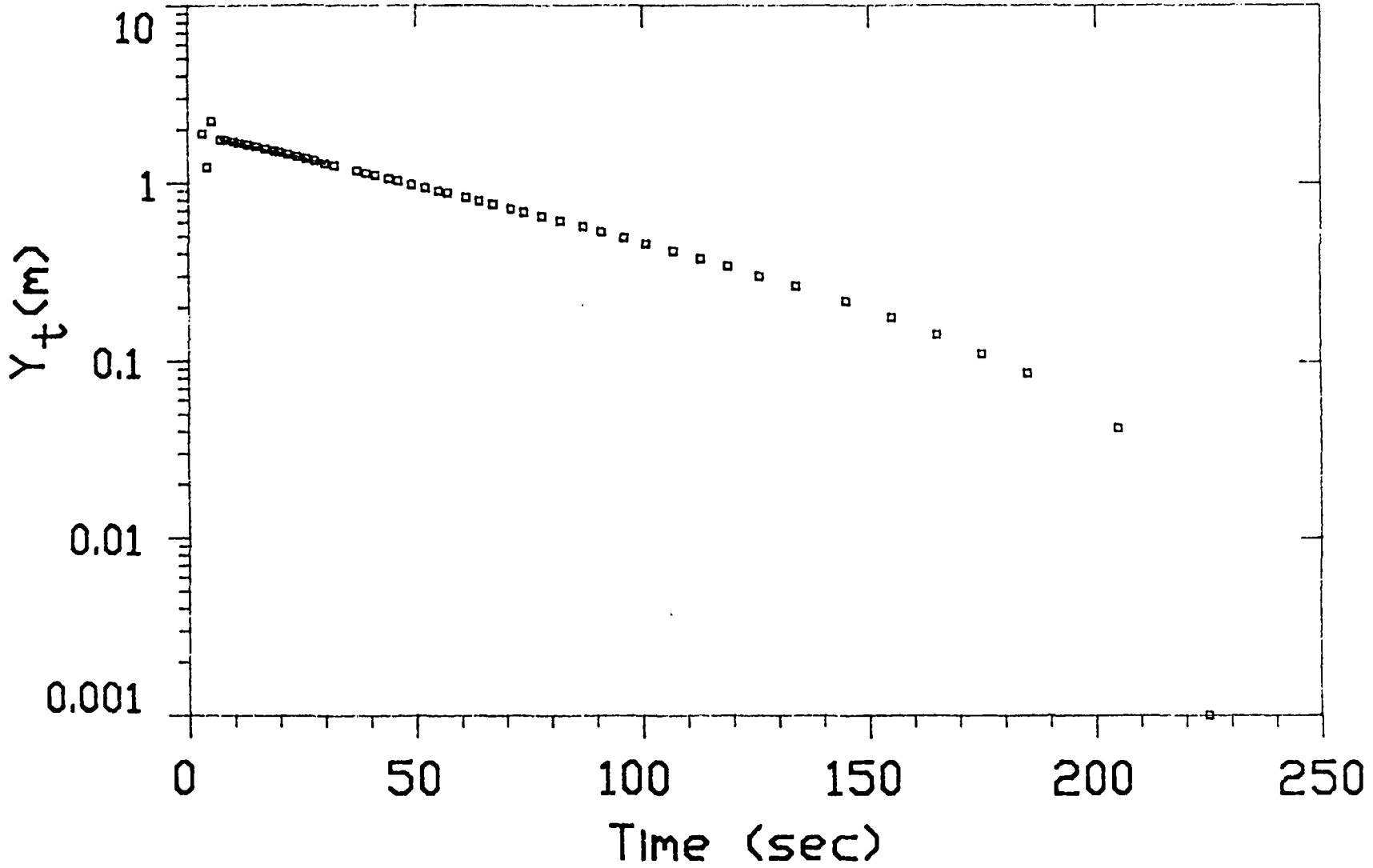
CONDUCTIVITY: 0.00041 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
1	3.00	1.90		
2	4.00	1.22		
3	5.00	2.23		
4	7.00	1.75	1.77	-1.36
5	8.00	1.75	1.75	0.226
6	10.00	1.71	1.70	0.447
7	11.00	1.67	1.68	-0.147
8	13.00	1.64	1.63	0.326
9	15.00	1.59	1.59	0.437
10	17.00	1.55	1.54	0.287
11	19.00	1.51	1.50	0.251
12	20.00	1.48	1.48	0.0712
13	22.00	1.45	1.44	0.189
14	24.00	1.41	1.40	0.0276
15	26.00	1.37	1.37	-0.146
16	28.00	1.33	1.33	-0.255
17	30.00	1.29	1.29	-0.368
18	32.00	1.25		
19	37.00	1.17		
20	39.00	1.14		
21	41.00	1.10		
22	44.00	1.06		
23	46.00	1.03		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	49.00	0.986		
25	52.00	0.945		
26	55.00	0.906		
27	57.00	0.880		
28	61.00	0.831		
29	64.00	0.794		
30	67.00	0.762		
31	71.00	0.717		
32	74.00	0.687		
33	78.00	0.648		
34	82.00	0.610		
35	87.00	0.568		
36	91.00	0.534		
37	96.00	0.494		
38	101.0	0.457		
39	107.0	0.416		
40	113.0	0.378		
41	119.0	0.343		
42	126.0	0.302		
43	134.0	0.265		
44	145.0	0.217		
45	155.0	0.177		
46	165.0	0.142		
47	175.0	0.110		
48	185.0	0.0860		
49	205.0	0.0420		
50	225.0	0.00100		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0004079 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MW-14S
TRANSMISSIVITY: .3483 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 2.715 ft	AQUIFER: F/C SAND	RAYMOND, NH
Data Set: MW14SSI / Date: 6/22/89	THICKNESS: 28.02	
	SCREEN: top: 7.840 base: 27.48	
	DIAMETER: casing: .1660 intake: .6600	
	DEPTH: Water Table: 1.020 TD: 27.48	

DATA SET: MW14SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-14S
COUNTY:	ROCKINGHAM	WELL DEPTH:	27.48 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	1.020 ft
AQUIFER:	F/C SAND	THICKNESS:	28.02 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.840 ft	SCREEN BASE:	27.48 ft
INITIAL HEAD:	5.629 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.34052square cm/sec

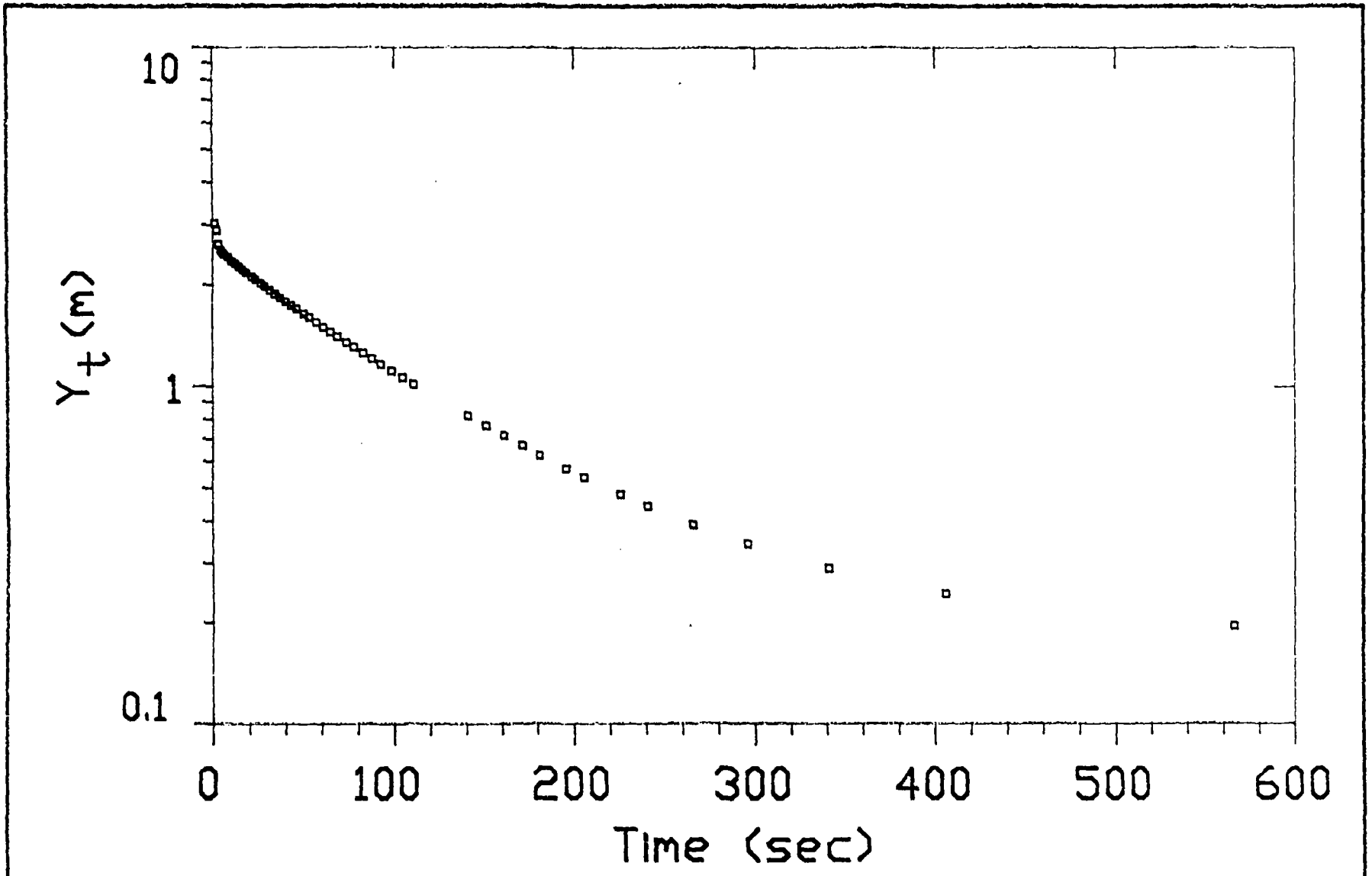
CONDUCTIVITY: 0.00040 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	3.03		
2	2.00	2.90		
3	3.00	2.63	2.53	3.83
4	4.00	2.52	2.50	0.885
5	5.00	2.49	2.48	0.308
6	6.00	2.46	2.46	0.148
7	8.00	2.42	2.41	0.281
8	10.00	2.35	2.36	-0.579
9	12.00	2.30	2.32	-0.701
10	14.00	2.26	2.28	-0.842
11	16.00	2.21	2.23	-0.962
12	18.00	2.17	2.19	-1.03
13	21.00	2.11	2.13	-0.945
14	23.00	2.07	2.09	-0.964
15	26.00	2.01	2.03	-0.863
16	28.00	1.98	1.99	-0.770
17	31.00	1.93	1.94	-0.643
18	34.00	1.87	1.88	-0.484
19	37.00	1.83	1.83	-0.235
20	40.00	1.78	1.78	0.112
21	43.00	1.74	1.73	0.338
22	46.00	1.69	1.68	0.612
23	50.00	1.64	1.62	1.03

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	53.00	1.59	1.57	1.33
25	57.00	1.54		
26	61.00	1.49		
27	65.00	1.44		
28	69.00	1.40		
29	74.00	1.34		
30	78.00	1.30		
31	83.00	1.25		
32	88.00	1.20		
33	93.00	1.16		
34	99.00	1.11		
35	105.0	1.06		
36	111.0	1.01		
37	141.0	0.819		
38	151.0	0.765		
39	161.0	0.715		
40	171.0	0.670		
41	181.0	0.626		
42	196.0	0.571		
43	206.0	0.538		
44	226.0	0.479		
45	241.0	0.441		
46	266.0	0.389		
47	296.0	0.341		
48	341.0	0.289		
49	406.0	0.243		
50	566.0	0.194		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0003987 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .3405 sq. cm/sec	WELL DATA: Units: ft	Well: MW-14S
INITIAL HEAD: 5.629 ft	AQUIFER: F/C SAND	
Data Set: MW14SSD Date: 6/22/89	THICKNESS: 28.02	MOTTOLO RI/FS
	SCREEN: top: 7.840 base: 27.48	RAYMOND, NH
	DIAMETER: casing: .1660 intake: .6600	
	DEPTH: Water Table: 1.020 TD: 27.48	

DATA SET: MW18SSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-18S
COUNTY:	ROCKINGHAM	WELL DEPTH:	19.04 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	4.250 ft
AQUIFER:	F/M SAND	THICKNESS:	19.28 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.530 ft	SCREEN BASE:	19.04 ft
INITIAL HEAD:	2.582 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.54056square cm/sec

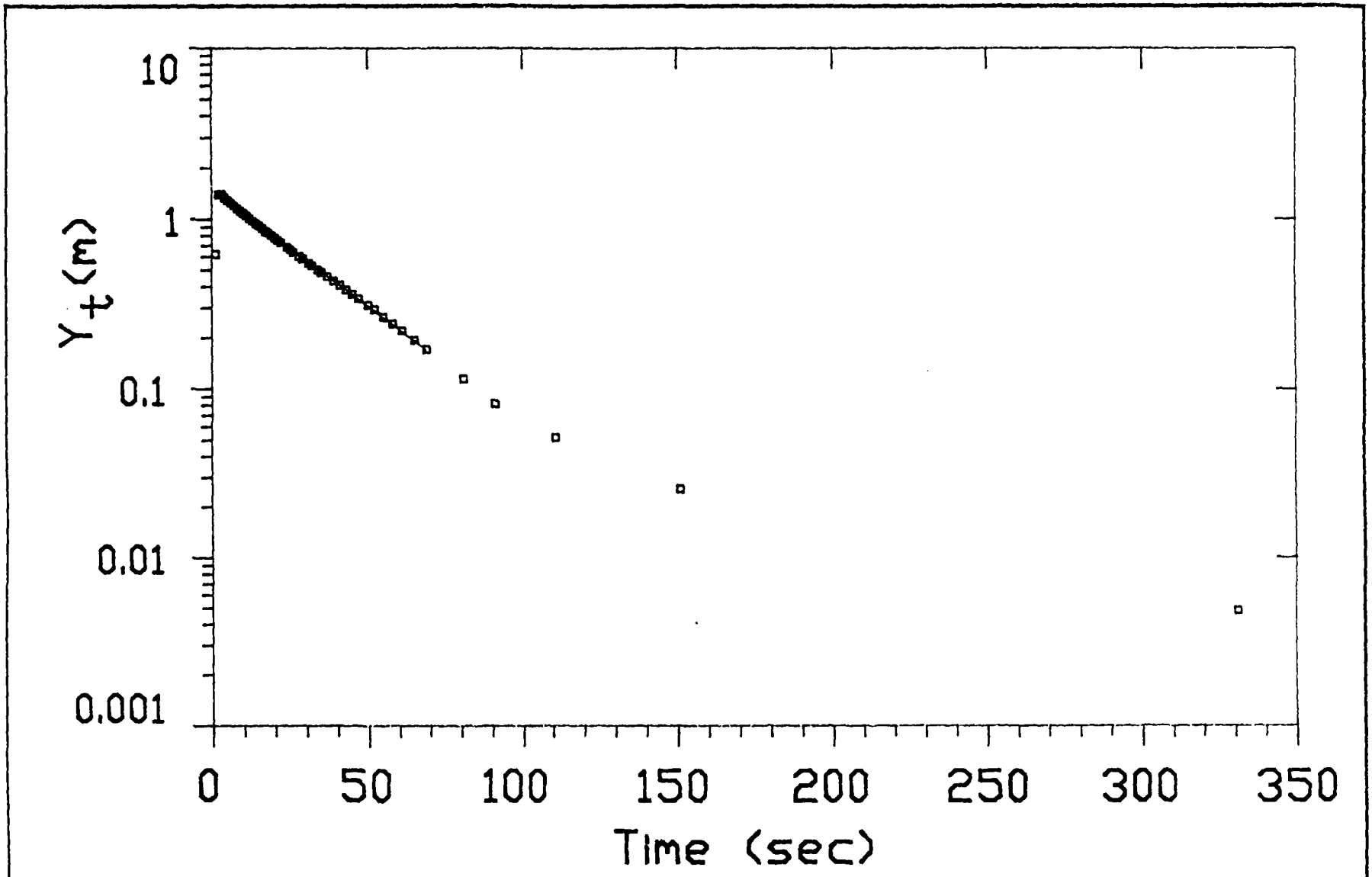
CONDUCTIVITY: 0.00092 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	0.623		
2	2.00	1.40	1.38	1.11
3	3.00	1.40	1.34	4.44
4	4.00	1.34	1.30	2.90
5	5.00	1.29	1.26	2.34
6	6.00	1.24	1.22	1.94
7	7.00	1.20	1.18	1.58
8	8.00	1.15	1.14	0.919
9	9.00	1.12	1.11	0.726
10	10.00	1.08	1.07	0.602
11	11.00	1.04	1.04	0.274
12	12.00	1.01	1.01	-0.180
13	13.00	0.978	0.981	-0.359
14	14.00	0.945	0.951	-0.590
15	15.00	0.919	0.921	-0.302
16	16.00	0.884	0.893	-0.982
17	17.00	0.847	0.865	-2.20
18	18.00	0.830	0.838	-1.00
19	19.00	0.802	0.812	-1.32
20	20.00	0.774	0.787	-1.76
21	21.00	0.751	0.763	-1.58
22	22.00	0.727	0.739	-1.73
23	24.00	0.682	0.694	-1.78

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	25.00	0.660	0.673	-1.90
25	26.00	0.640	0.652	-1.88
26	28.00	0.602	0.612	-1.78
27	29.00	0.583	0.593	-1.80
28	31.00	0.549	0.557	-1.47
29	32.00	0.532	0.540	-1.51
30	34.00	0.502	0.507	-0.963
31	35.00	0.484	0.491	-1.64
32	37.00	0.459	0.462	-0.656
33	39.00	0.431	0.433	-0.531
34	41.00	0.408	0.407	0.150
35	43.00	0.383	0.382	0.107
36	45.00	0.361	0.359	0.499
37	47.00	0.340	0.337	0.728
38	50.00	0.311	0.307	1.51
39	52.00	0.293	0.288	1.57
40	55.00	0.264	0.262	0.884
41	58.00	0.242	0.238	1.38
42	61.00	0.220	0.217	1.28
43	65.00	0.194	0.191	1.38
44	69.00	0.171	0.169	1.12
45	81.00	0.114		
46	91.00	0.0819		
47	111.0	0.0521		
48	151.0	0.0255		
49	331.0	0.00480		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0009199 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .5405 sq. cm/sec	WELL DATA: Units: ft	Well: MW-18S
INITIAL HEAD: 2.582 ft	AQUIFER: F/M SAND	
	THICKNESS: 19.28	MOTTOLO RI/FS
Data Set: MW18SSI Date: 6/22/89	SCREEN: top: 7.530 base: 19.04	RAYMOND, NH
	DIAMETER: casing: .1660 intake: .6600	
	DEPTH: Water Table: 4.250 TD: 19.04	

DATA SET: MW18SSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-18S
COUNTY:	ROCKINGHAM	WELL DEPTH:	19.04 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	4.250 ft
AQUIFER:	F/M SAND	THICKNESS:	19.28 ft
INTAKE RADIUS:	0.330 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	7.530 ft	SCREEN BASE:	19.04 ft
INITIAL HEAD:	2.112 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.45743square cm/sec

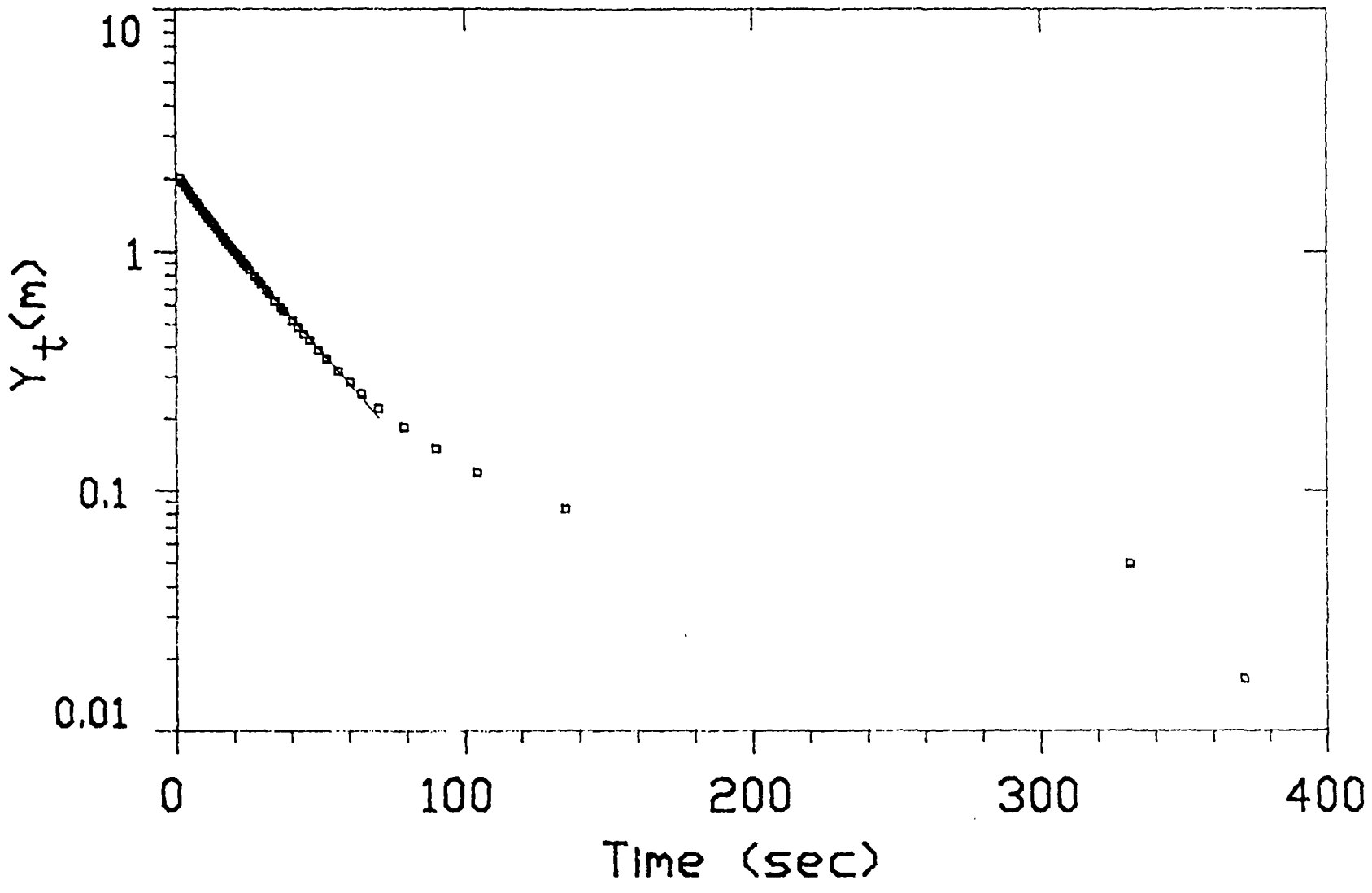
CONDUCTIVITY: 0.00078 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	2.01		
2	2.00	1.93		
3	3.00	1.85		
4	4.00	1.78		
5	5.00	1.71		
6	6.00	1.65		
7	7.00	1.59		
8	8.00	1.53		
9	9.00	1.48		
10	10.00	1.42		
11	11.00	1.37	1.32	3.62
12	12.00	1.32	1.28	3.00
13	13.00	1.28	1.24	2.76
14	14.00	1.23	1.20	2.28
15	15.00	1.19	1.16	1.98
16	16.00	1.14	1.13	1.43
17	17.00	1.10	1.09	1.15
18	18.00	1.07	1.06	0.811
19	19.00	1.03	1.02	0.572
20	20.00	0.998	0.996	0.142
21	21.00	0.965	0.965	-0.0306
22	22.00	0.932	0.935	-0.330
23	23.00	0.898	0.906	-0.825

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	24.00	0.871	0.877	-0.742
25	25.00	0.841	0.850	-1.03
26	27.00	0.787	0.798	-1.31
27	28.00	0.760	0.773	-1.67
28	29.00	0.735	0.748	-1.84
29	31.00	0.689	0.702	-1.86
30	32.00	0.667	0.680	-2.03
31	34.00	0.624	0.638	-2.34
32	36.00	0.585	0.599	-2.46
33	37.00	0.567	0.580	-2.40
34	40.00	0.515	0.527	-2.41
35	42.00	0.484	0.495	-2.31
36	44.00	0.453	0.464	-2.46
37	46.00	0.427	0.436	-1.95
38	49.00	0.388	0.396	-2.21
39	52.00	0.355	0.360	-1.29
40	56.00	0.316	0.317	-0.468
41	60.00	0.284	0.279	1.79
42	64.00	0.255	0.246	3.45
43	70.00	0.221	0.203	8.06
44	79.00	0.184		
45	90.00	0.150		
46	104.0	0.118		
47	135.0	0.0837		
48	331.0	0.0492		
49	371.0	0.0163		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .0007784 cm/sec

TRANSMISSIVITY: .4574 sq. cm/sec

INITIAL HEAD: 2.111 ft

Data Set: MW18SSD | Date: 6/22/89

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: F/M SAND

THICKNESS: 19.28

SCREEN: top: 7.530 base: 19.04

DIAMETER: casing: .1660 intake: .6600

DEPTH: Water Table: 4.250 TD: 19.04

Slug Out Test

Well: MW-18S

MOTTOLO RI/FS

RAYMOND, NH

DATA SET: MW20DSI

CLIENT:	STARK AND PELTONEN	DATE:	12/6/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-20D
COUNTY:	ROCKINGHAM	WELL DEPTH:	44.23 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	3.000 ft
AQUIFER:	BEDROCK	THICKNESS:	41.20 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	25.900 ft	SCREEN BASE:	44.23 ft
INITIAL HEAD:	3.757 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.27683square cm/sec

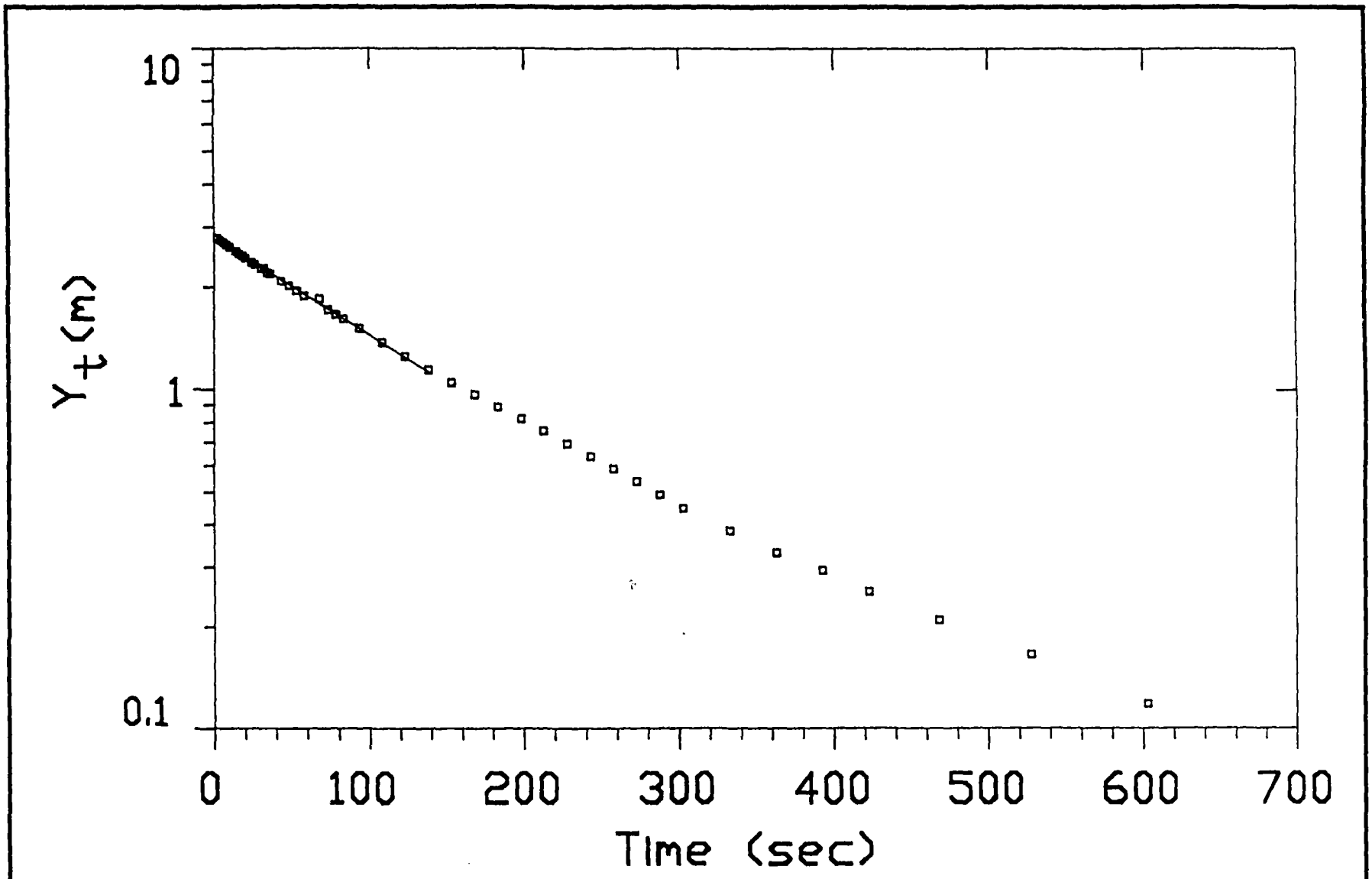
CONDUCTIVITY: 0.00022 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	2.78	2.74	1.40
2	4.00	2.74	2.71	1.19
3	6.00	2.70	2.67	0.999
4	8.00	2.66	2.64	0.706
5	10.00	2.62	2.60	0.462
6	14.00	2.54	2.54	0.134
7	16.00	2.50	2.50	-0.183
8	18.00	2.47	2.47	-0.202
9	20.00	2.43	2.44	-0.364
10	24.00	2.36	2.37	-0.498
11	26.00	2.33	2.34	-0.595
12	30.00	2.26	2.28	-0.938
13	32.00	2.27	2.25	0.722
14	34.00	2.20	2.22	-1.23
15	36.00	2.18	2.20	-0.606
16	43.00	2.08	2.10	-1.00
17	48.00	2.01	2.03	-0.905
18	53.00	1.94	1.96	-1.06
19	58.00	1.88	1.90	-1.19
20	68.00	1.84	1.78	3.15
21	73.00	1.71	1.72	-0.731
22	78.00	1.66	1.67	-0.540
23	83.00	1.61	1.61	-0.261

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	93.00	1.51	1.51	-0.186
25	108.0	1.37	1.37	0.200
26	123.0	1.25	1.24	0.409
27	138.0	1.14	1.12	1.00
28	153.0	1.04		
29	168.0	0.964		
30	183.0	0.889		
31	198.0	0.820		
32	213.0	0.756		
33	228.0	0.694		
34	243.0	0.638		
35	258.0	0.587		
36	273.0	0.540		
37	288.0	0.492		
38	303.0	0.447		
39	333.0	0.384		
40	363.0	0.331		
41	393.0	0.293		
42	423.0	0.254		
43	468.0	0.209		
44	528.0	0.165		
45	603.0	0.118		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0002204 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MW-20D
TRANSMISSIVITY: .2768 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 3.757 ft	AQUIFER: BEDROCK	RAYMOND, NH
Data Set: MW20DSI Date: 12/6/89	THICKNESS: 41.20	
	SCREEN: top: 25.90 base: 44.23	
	DIAMETER: casing: .1660 intake: .2400	
	DEPTH: Water Table: 3.000 TD: 44.23	

DATA SET: MW20DSO

CLIENT:	STARK AND PELTONEN	DATE:	12/6/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-20D
COUNTY:	ROCKINGHAM	WELL DEPTH:	44.23 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	3.000 ft
AQUIFER:	BEDROCK	THICKNESS:	41.20 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	25.900 ft	SCREEN BASE:	44.23 ft
INITIAL HEAD:	6.801 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.37758square cm/sec

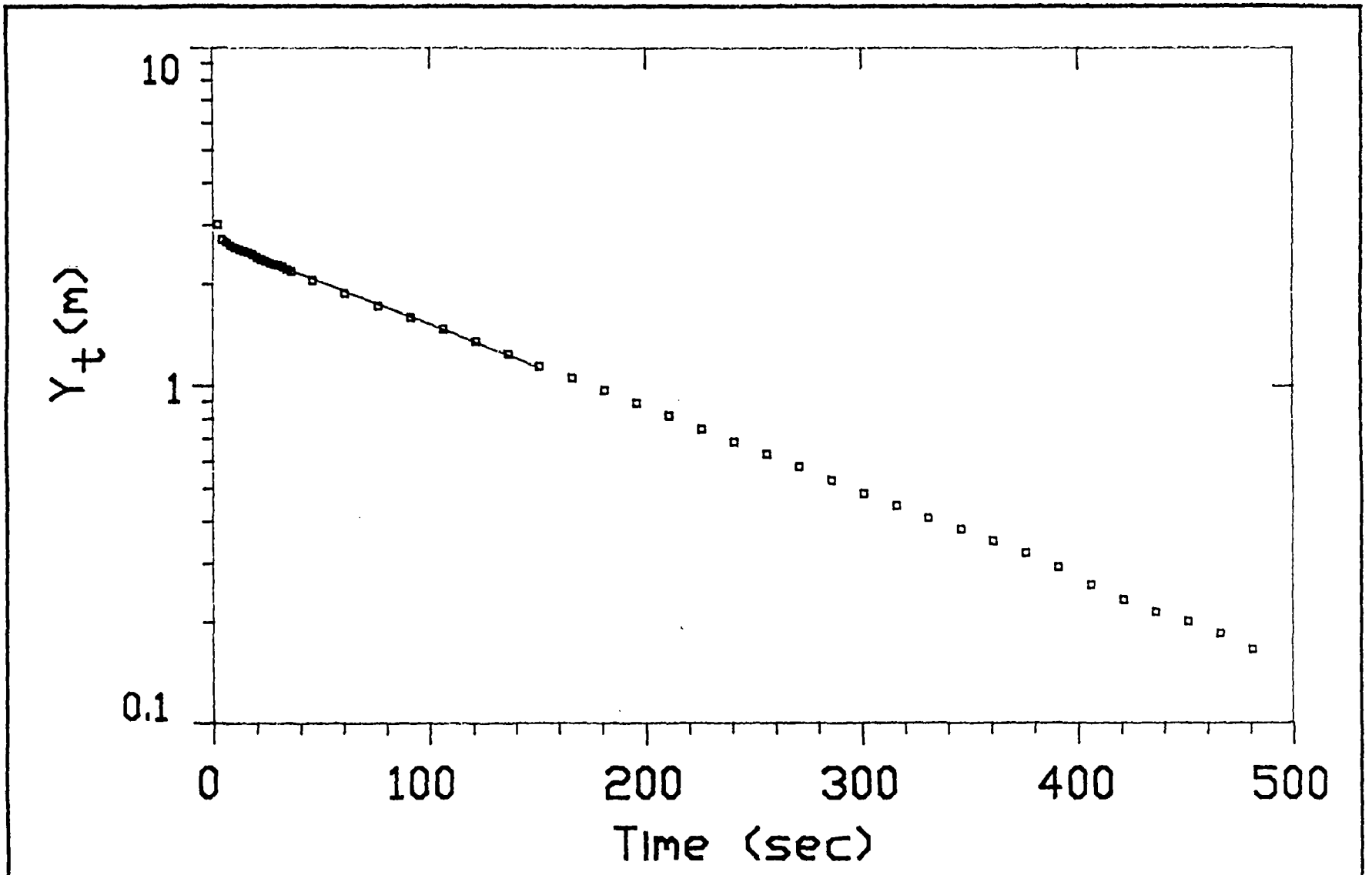
CONDUCTIVITY: 0.00030 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	3.01		
2	4.00	2.72	2.65	2.56
3	6.00	2.67	2.62	1.81
4	8.00	2.61	2.59	0.754
5	10.00	2.57	2.56	0.372
6	12.00	2.54	2.53	0.319
7	14.00	2.51	2.50	0.252
8	16.00	2.48	2.47	0.530
9	18.00	2.45	2.44	0.436
10	20.00	2.40	2.41	-0.376
11	22.00	2.37	2.39	-0.809
12	24.00	2.34	2.36	-0.923
13	26.00	2.31	2.33	-0.837
14	28.00	2.29	2.30	-0.630
15	30.00	2.28	2.28	-0.0811
16	32.00	2.25	2.25	0.108
17	34.00	2.21	2.22	-0.656
18	36.00	2.18	2.20	-1.09
19	46.00	2.05	2.07	-1.44
20	61.00	1.87	1.90	-1.56
21	76.00	1.72	1.74	-1.19
22	91.00	1.59	1.60	-0.506
23	106.0	1.47	1.46	0.229

No.	TIME (secs)	Head, H (ft) DATA	Head, H (ft) SYNTHETIC	DIFFERENCE (percent)
24	121.0	1.35	1.34	0.642
25	136.0	1.24	1.23	0.871
26	151.0	1.14	1.13	1.10
27	166.0	1.05		
28	181.0	0.971		
29	196.0	0.890		
30	211.0	0.817		
31	226.0	0.747		
32	241.0	0.685		
33	256.0	0.631		
34	271.0	0.579		
35	286.0	0.529		
36	301.0	0.484		
37	316.0	0.445		
38	331.0	0.410		
39	346.0	0.379		
40	361.0	0.350		
41	376.0	0.322		
42	391.0	0.292		
43	406.0	0.259		
44	421.0	0.233		
45	436.0	0.214		
46	451.0	0.201		
47	466.0	0.185		
48	481.0	0.166		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE .



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0003006 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	Well: MW-20D
TRANSMISSIVITY: .3775 sq. cm/sec	WELL DATA: Units: ft	MOTTOLO RI/FS
INITIAL HEAD: 6.801 ft	AQUIFER: BEDROCK	RAYMOND, NH
Data Set: MW20DSD Date: 12/6/89	THICKNESS: 41.20	
	SCREEN: top: 25.90 base: 44.23	
	DIAMETER: casing: .1660 intake: .2400	
	DEPTH: Water Table: 3.000 TD: 44.23	

DATA SET: MW21DSO

CLIENT:	STARK AND PELTONEN	DATE:	12/6/89
LOCATION:	RAYMOND, NH	WELL NO.:	MW-21D
COUNTY:	ROCKINGHAM	WELL DEPTH:	38.38 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	7.700 ft
AQUIFER:	BEDROCK	THICKNESS:	30.68 ft
INTAKE RADIUS:	0.120 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	21.400 ft	SCREEN BASE:	38.38 ft
INITIAL HEAD:	1.948 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.16448square cm/sec

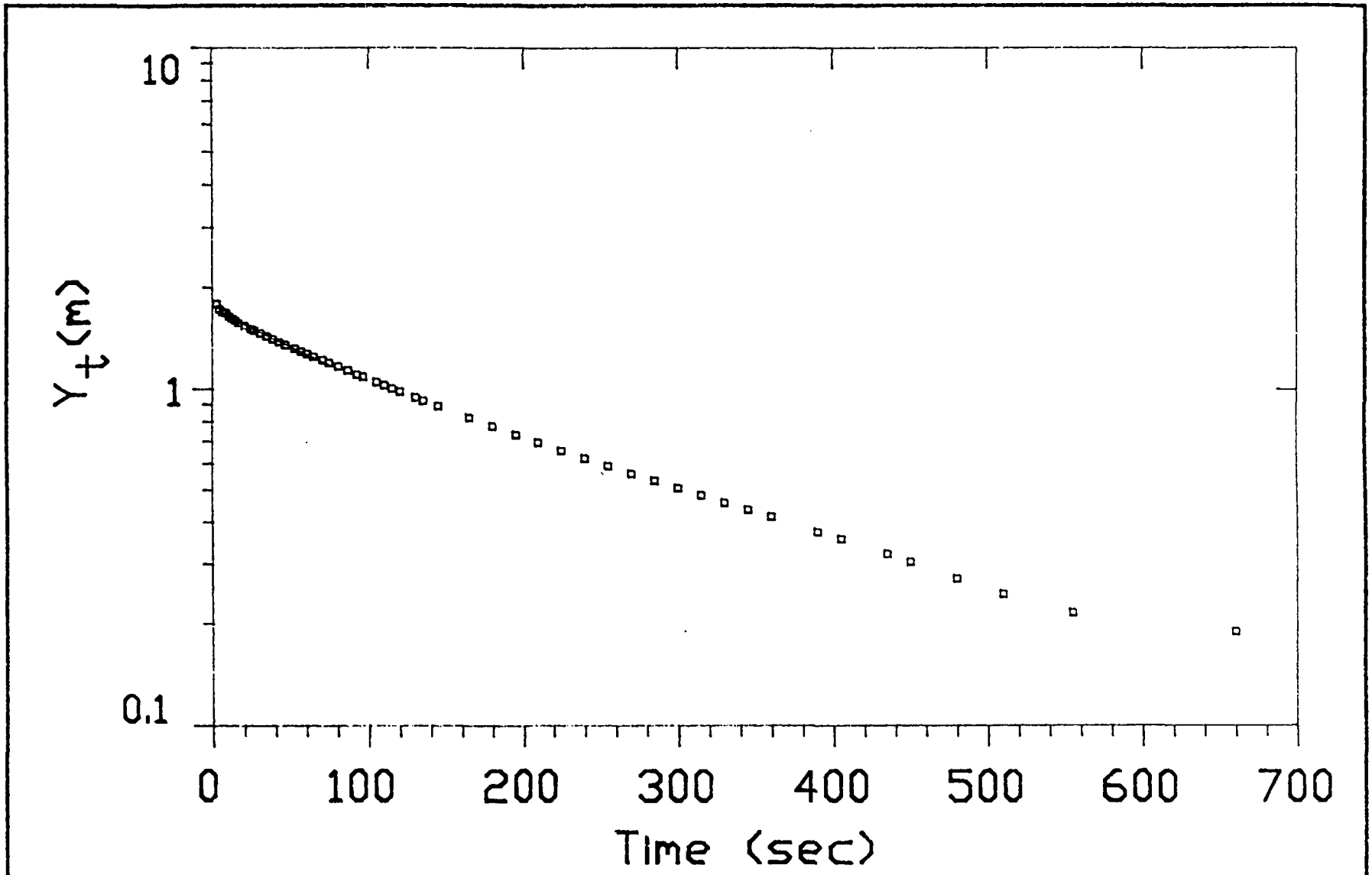
CONDUCTIVITY: 0.00018 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	2.00	1.78		
2	4.00	1.72	1.69	2.04
3	6.00	1.69	1.67	1.15
4	8.00	1.68	1.65	1.81
5	10.00	1.64	1.64	0.279
6	12.00	1.62	1.62	0.0820
7	14.00	1.60	1.60	-0.318
8	16.00	1.57	1.59	-0.997
9	20.00	1.54	1.55	-1.00
10	24.00	1.51	1.52	-1.04
11	26.00	1.49	1.51	-1.01
12	30.00	1.46	1.48	-0.994
13	34.00	1.43	1.45	-0.942
14	38.00	1.41	1.42	-0.788
15	42.00	1.38	1.39	-0.670
16	46.00	1.35	1.36	-0.592
17	52.00	1.32	1.32	-0.130
18	56.00	1.29	1.29	0.00868
19	60.00	1.27	1.27	0.267
20	64.00	1.25	1.24	0.493
21	70.00	1.22	1.20	1.05
22	74.00	1.19	1.18	1.19
23	80.00	1.16		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	86.00	1.13		
25	92.00	1.10		
26	96.00	1.08		
27	105.0	1.04		
28	110.0	1.02		
29	115.0	1.00		
30	120.0	0.983		
31	130.0	0.944		
32	135.0	0.924		
33	145.0	0.890		
34	165.0	0.823		
35	180.0	0.775		
36	195.0	0.731		
37	210.0	0.694		
38	225.0	0.656		
39	240.0	0.622		
40	255.0	0.591		
41	270.0	0.560		
42	285.0	0.534		
43	300.0	0.507		
44	315.0	0.482		
45	330.0	0.458		
46	345.0	0.436		
47	360.0	0.415		
48	390.0	0.373		
49	405.0	0.355		
50	435.0	0.321		
51	450.0	0.304		
52	480.0	0.271		
53	510.0	0.244		
54	555.0	0.215		
55	660.0	0.189		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0001758 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .1644 sq. cm/sec	WELL DATA: Units: ft	Well: MW-21D
INITIAL HEAD: 1.948 ft	AQUIFER: BEDROCK	
Data Set: MW21DSD Date: 12/6/89	THICKNESS: 30.68	MOTTOLO RI/FS
	SCREEN: top: 21.40 base: 38.38	RAYMOND, NH
	DIAMETER: casing: .1660 intake: .2400	
	DEPTH: Water Table: 7.700 TD: 38.38	

DATA SET: OW2SRSI

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	OW-2SR
COUNTY:	ROCKINGHAM	WELL DEPTH:	14.18 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	2.290 ft
AQUIFER:	F/M SAND	THICKNESS:	12.68 ft
INTAKE RADIUS:	0.285 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	9.270 ft	SCREEN BASE:	14.18 ft
INITIAL HEAD:	6.845 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.28391square cm/sec

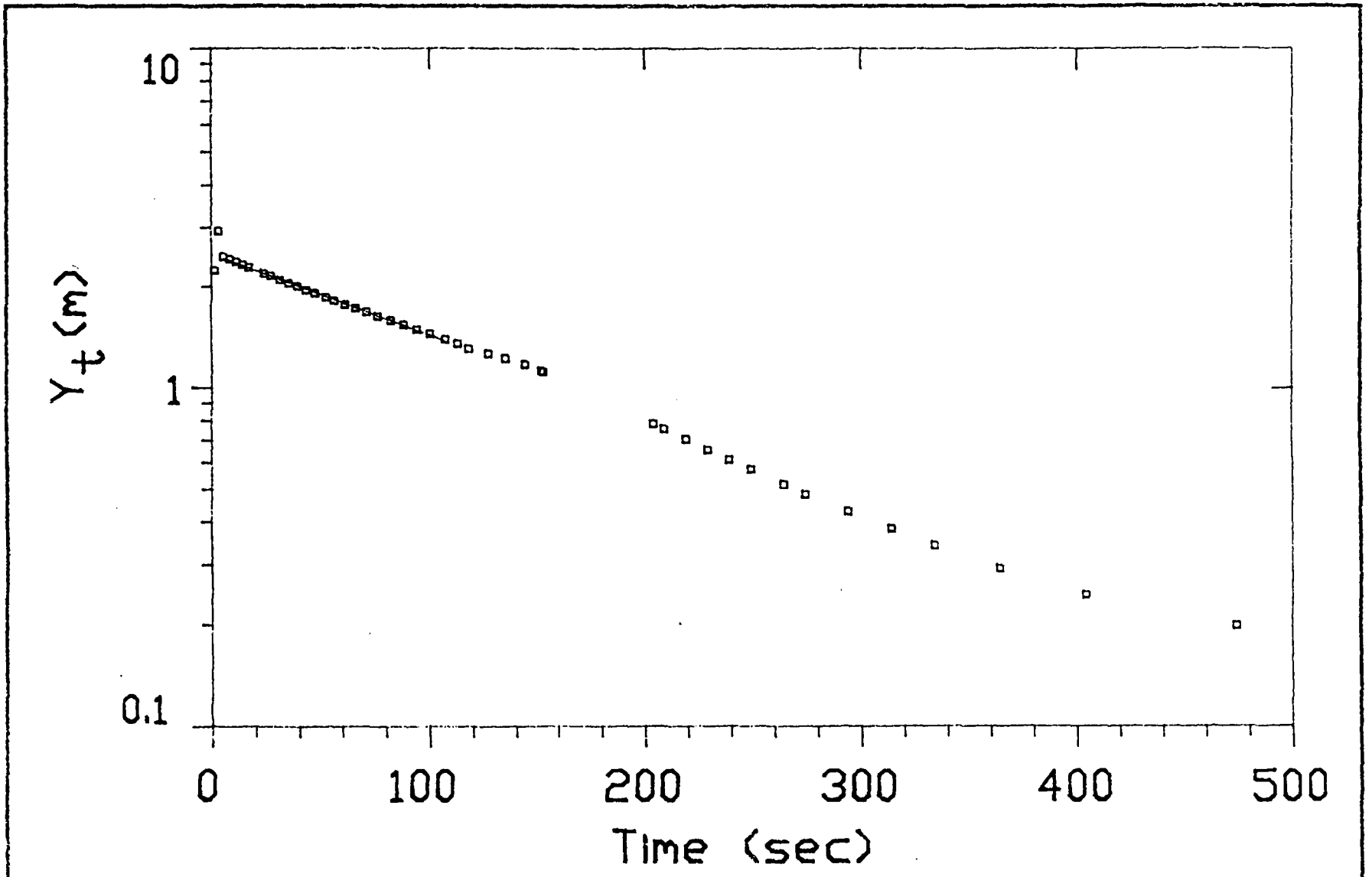
CONDUCTIVITY: 0.00073 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	2.23		
2	3.00	2.92		
3	5.00	2.45	2.43	0.933
4	8.00	2.41	2.39	1.07
5	11.00	2.37	2.35	0.867
6	14.00	2.32	2.31	0.533
7	17.00	2.28	2.27	0.246
8	24.00	2.18	2.18	-0.123
9	27.00	2.14	2.15	-0.165
10	31.00	2.09	2.10	-0.396
11	35.00	2.04	2.05	-0.541
12	39.00	2.00	2.01	-0.543
13	43.00	1.95	1.96	-0.699
14	47.00	1.91	1.92	-0.755
15	52.00	1.85	1.87	-0.737
16	56.00	1.81	1.83	-0.747
17	61.00	1.76	1.78	-0.703
18	66.00	1.72	1.73	-0.561
19	71.00	1.67	1.68	-0.371
20	76.00	1.63	1.63	-0.373
21	82.00	1.58	1.58	-0.0246
22	88.00	1.53	1.53	0.231
23	94.00	1.49	1.48	0.655

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	100.0	1.44	1.43	0.924
25	107.0	1.39	1.37	1.22
26	113.0	1.35		
27	118.0	1.30		
28	127.0	1.26		
29	135.0	1.21		
30	144.0	1.17		
31	152.0	1.12		
32	153.0	1.11		
33	204.0	0.781		
34	209.0	0.755		
35	219.0	0.703		
36	229.0	0.655		
37	239.0	0.611		
38	249.0	0.572		
39	264.0	0.517		
40	274.0	0.482		
41	294.0	0.428		
42	314.0	0.382		
43	334.0	0.340		
44	364.0	0.291		
45	404.0	0.244		
46	474.0	0.198		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug In Test
CONDUCTIVITY: .0007346 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .2839 sq. cm/sec	WELL DATA: Units: ft	Well: OW-2SR
INITIAL HEAD: 6.845 ft	AQUIFER: F/M SAND	
	THICKNESS: 12.68	MOTTOLO RI/FS
	SCREEN: top: 9.270 base: 14.18	RAYMOND, NH
Data Set: OW2SRS1 Date: 6/22/89	DIAMETER: casing: .1660 intake: .5700	
	DEPTH: Water Table: 2.290 TD: 14.18	

DATA SET: OW2SRSO

CLIENT:	STARK AND PELTONEN	DATE:	6/22/89
LOCATION:	RAYMOND, NH	WELL NO.:	OW-2SR
COUNTY:	ROCKINGHAM	WELL DEPTH:	14.18 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	2.290 ft
AQUIFER:	F/M SAND	THICKNESS:	12.68 ft
INTAKE RADIUS:	0.285 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	9.270 ft	SCREEN BASE:	14.18 ft
INITIAL HEAD:	4.200 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 0.18202square cm/sec

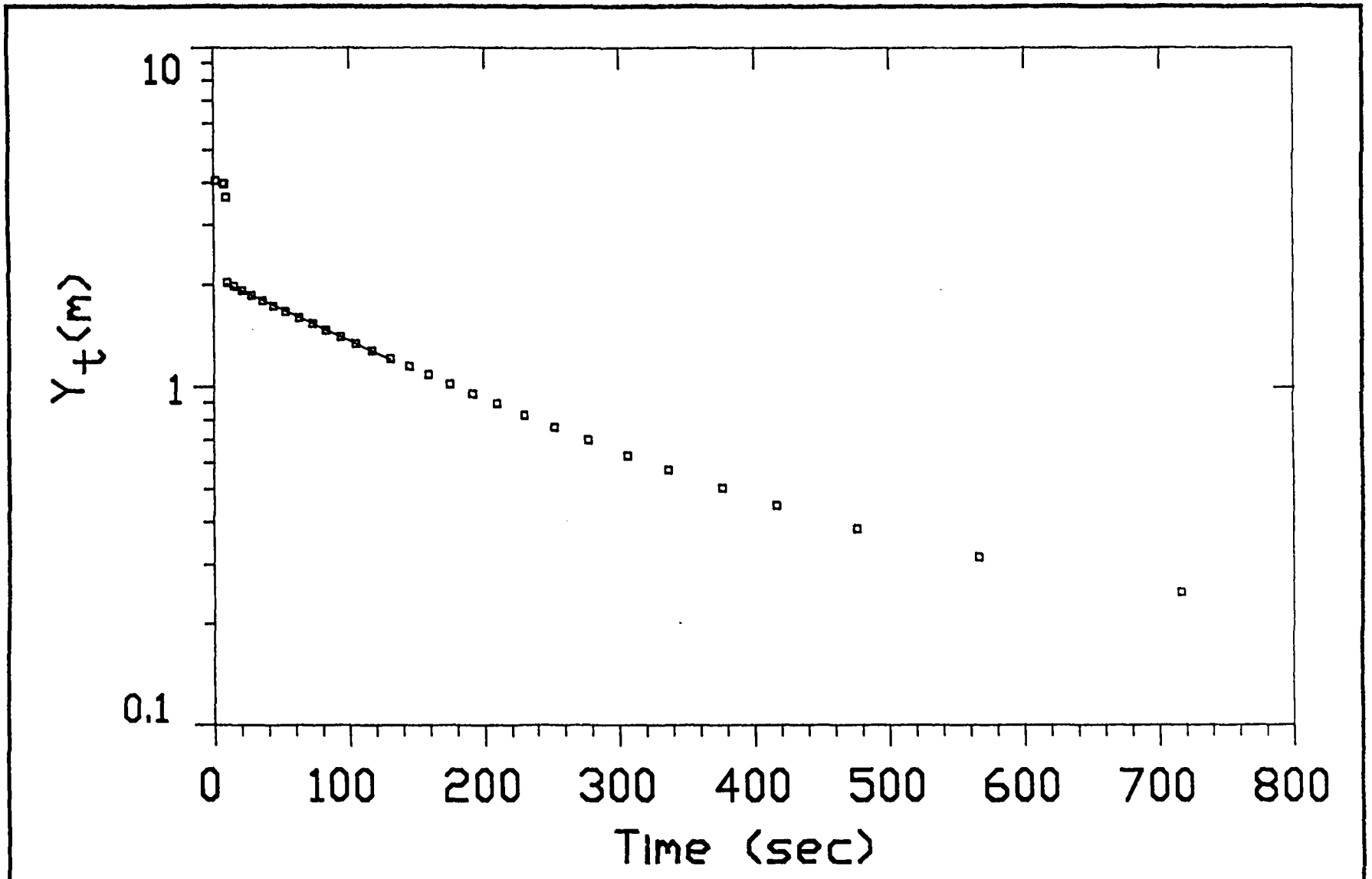
CONDUCTIVITY: 0.00047 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	4.05		
2	7.00	3.98		
3	8.00	3.97		
4	9.00	3.63		
5	10.00	2.03	2.01	1.03
6	15.00	1.98	1.97	0.652
7	21.00	1.92	1.92	0.107
8	28.00	1.86	1.86	-0.154
9	36.00	1.79	1.80	-0.532
10	44.00	1.73	1.74	-0.603
11	53.00	1.66	1.67	-0.515
12	63.00	1.60	1.60	-0.440
13	73.00	1.53	1.54	-0.295
14	83.00	1.47	1.47	-0.275
15	94.00	1.40	1.40	-0.0170
16	105.0	1.34	1.34	0.0930
17	117.0	1.27	1.27	0.221
18	130.0	1.21	1.20	0.709
19	144.0	1.15		
20	158.0	1.08		
21	174.0	1.02		
22	191.0	0.956		
23	209.0	0.895		

No.	TIME (secs)	Head, H (ft) DATA	SYNTHETIC	DIFFERENCE (percent)
24	229.0	0.829		
25	252.0	0.764		
26	277.0	0.700		
27	306.0	0.628		
28	336.0	0.570		
29	376.0	0.504		
30	416.0	0.447		
31	476.0	0.382		
32	566.0	0.316		
33	716.0	0.248		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .0004709 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: .1820 sq. cm/sec	WELL DATA: Units: ft	Well: OW-2SR
INITIAL HEAD: 4.200 ft	AQUIFER: F/M SAND	
Data Set: OW2SRSO Date: 6/22/89	THICKNESS: 12.68	MOTTOLO RI/FS
	SCREEN: top: 9.270 base: 14.18	RAYMOND, NH
	DIAMETER: casing: .1660 intake: .5700	
	DEPTH: Water Table: 2.290 TD: 14.18	

DATA SET: OW4SRSI

CLIENT:	STARK AND PELTONEN	DATE:	03-27-90
LOCATION:	RAYMOND, NEW HAMPSHIRE	WELL NO.:	OW4SR
COUNTY:	ROCKINGHAM	WELL DEPTH:	11.98 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	3.130 ft
AQUIFER:	F/C SAND	THICKNESS:	8.85 ft
INTAKE RADIUS:	0.310 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	6.680 ft	SCREEN BASE:	11.98 ft
INITIAL HEAD:	2.710 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 3.50020square cm/sec

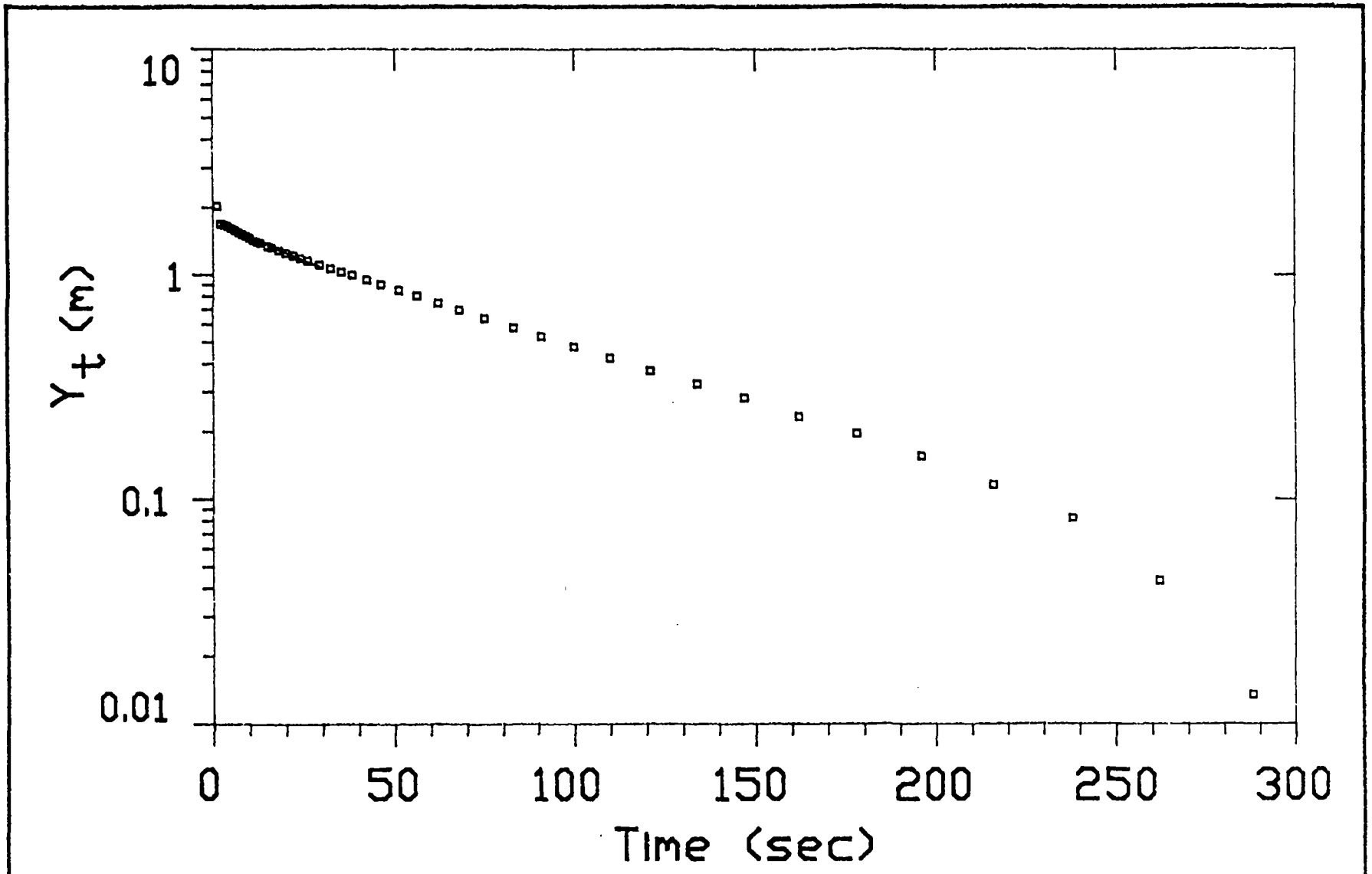
CONDUCTIVITY: 0.01298 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (cm) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	2.03		
2	2.00	1.68	1.67	0.827
3	3.00	1.67	1.64	1.59
4	4.00	1.64	1.62	1.68
5	5.00	1.61	1.59	1.21
6	6.00	1.57	1.56	0.511
7	7.00	1.54	1.54	0.133
8	8.00	1.51	1.52	-0.285
9	9.00	1.48	1.49	-0.546
10	10.00	1.45	1.47	-0.981
11	11.00	1.42	1.44	-1.81
12	12.00	1.40	1.42	-1.48
13	13.00	1.38	1.40	-1.23
14	15.00	1.34	1.35	-1.24
15	16.00	1.32	1.33	-1.16
16	18.00	1.28	1.29	-0.832
17	20.00	1.24	1.25	-0.455
18	22.00	1.21	1.21	0.0845
19	24.00	1.18	1.17	0.557
20	26.00	1.15	1.13	1.21
21	29.00	1.10	1.08	2.07
22	32.00	1.06		
23	35.00	1.02		

No.	TIME (secs)	Head, H (cm) DATA	SYNTHETIC	DIFFERENCE (percent)
24	38.00	0.996		
25	42.00	0.946		
26	46.00	0.902		
27	51.00	0.848		
28	56.00	0.800		
29	62.00	0.743		
30	68.00	0.691		
31	75.00	0.636		
32	83.00	0.579		
33	91.00	0.528		
34	100.0	0.475		
35	110.0	0.423		
36	121.0	0.371		
37	134.0	0.324		
38	147.0	0.281		
39	162.0	0.233		
40	178.0	0.196		
41	196.0	0.155		
42	216.0	0.115		
43	238.0	0.0822		
44	262.0	0.0431		
45	288.0	0.0134		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE

CONDUCTIVITY: .01297 cm/sec

TRANSMISSIVITY: 3.500 sq. cm/sec

INITIAL HEAD: 2.710 ft

Data Set: OW4SRSI | Date: 03-27-90

for: STARK AND PELTONEN

by: BALSAM ENVIRONMENTAL CONSULTANTS

WELL DATA: Units: ft

AQUIFER: F/C SAND

THICKNESS: 8.850

SCREEN: top: 6.680 base: 11.98

DIAMETER: casing: .1660 intake: .6200

DEPTH: Water Table: 3.130 TD: 11.98

Slug In Test

Well: OW4SR

MOTTOLO RI/FS
RAYMOND, NH

DATA SET: OW4SRSO

CLIENT:	STARK AND PELTONEN	DATE:	06-22-89
LOCATION:	RAYMOND, NEW HAMPSHIRE	WELL NO.:	OW-4SR
COUNTY:	ROCKINGHAM	WELL DEPTH:	11.98 ft
PROJECT:	MOTTOLO RI/FS	WATER TABLE:	3.130 ft
AQUIFER:	F/C SAND	THICKNESS:	8.85 ft
INTAKE RADIUS:	0.310 ft	CASING RADIUS:	0.083 ft
SCREEN TOP:	6.680 ft	SCREEN BASE:	11.98 ft
INITIAL HEAD:	2.727 ft	TRANS. RATIO:	1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: 2.91294square cm/sec

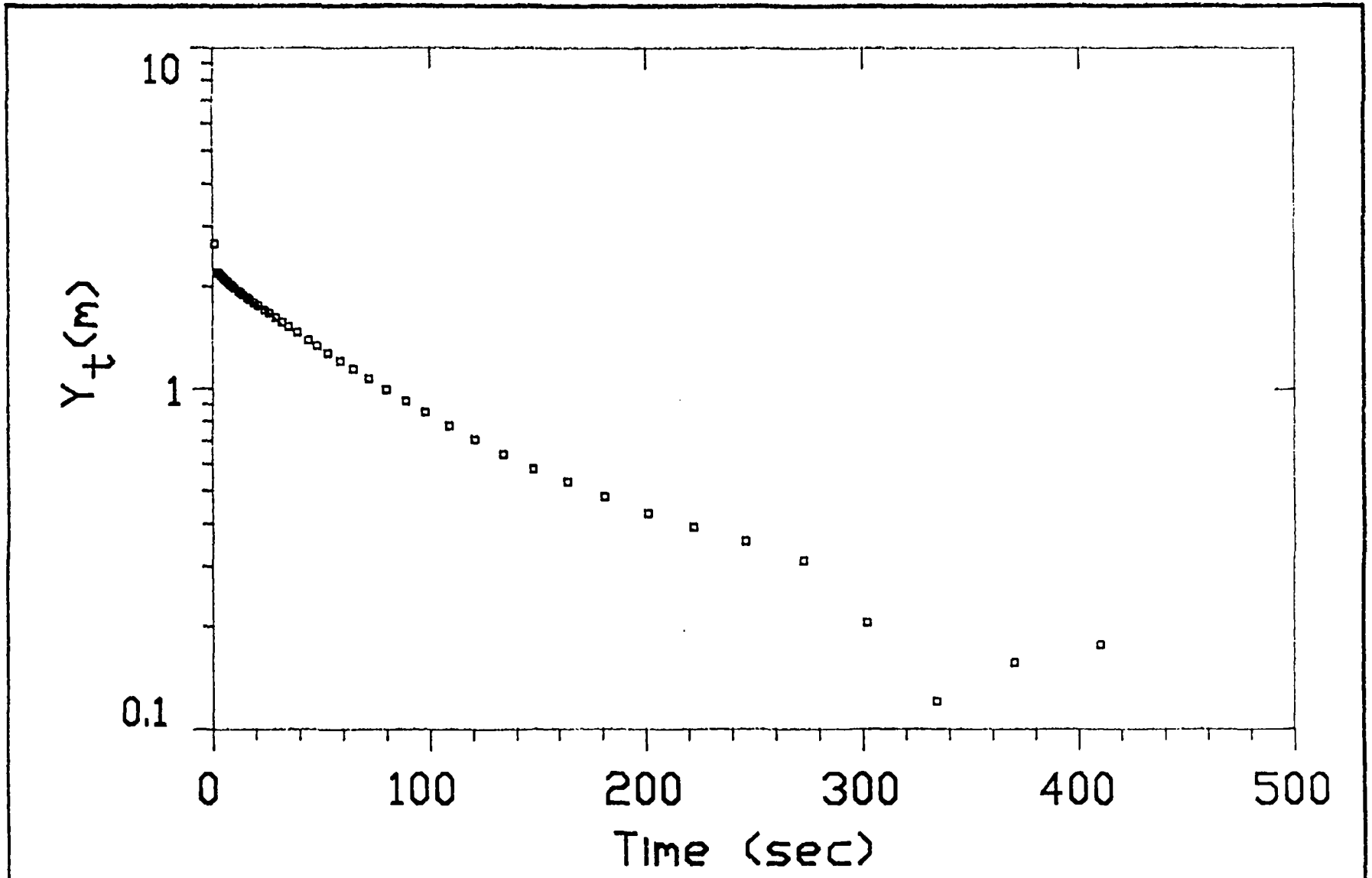
CONDUCTIVITY: 0.01080 cm/sec

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

No.	TIME (secs)	Head, H (cm) DATA	SYNTHETIC	DIFFERENCE (percent)
1	1.00	2.67		
2	2.00	2.19		
3	3.00	2.18	2.15	1.45
4	4.00	2.14	2.12	0.919
5	5.00	2.11	2.10	0.542
6	6.00	2.08	2.08	0.175
7	7.00	2.05	2.05	0.0126
8	8.00	2.03	2.03	-0.240
9	9.00	2.00	2.01	-0.398
10	10.00	1.97	1.99	-0.573
11	12.00	1.93	1.94	-0.652
12	13.00	1.91	1.92	-0.586
13	14.00	1.89	1.90	-0.696
14	16.00	1.84	1.86	-0.631
15	17.00	1.82	1.84	-0.657
16	19.00	1.79	1.79	-0.487
17	21.00	1.75	1.75	-0.183
18	24.00	1.70	1.70	0.103
19	26.00	1.66	1.66	0.304
20	29.00	1.61	1.60	0.618
21	32.00	1.57	1.55	0.943
22	35.00	1.52		
23	39.00	1.46		

No.	TIME (secs)	Head, H (cm) DATA	SYNTHETIC	DIFFERENCE (percent)
24	44.00	1.39		
25	48.00	1.33		
26	53.00	1.27		
27	59.00	1.20		
28	65.00	1.13		
29	72.00	1.06		
30	80.00	0.992		
31	89.00	0.916		
32	98.00	0.849		
33	109.0	0.775		
34	121.0	0.706		
35	134.0	0.639		
36	148.0	0.578		
37	164.0	0.529		
38	181.0	0.478		
39	201.0	0.427		
40	222.0	0.390		
41	246.0	0.355		
42	273.0	0.310		
43	302.0	0.204		
44	334.0	0.120		
45	370.0	0.156		
46	410.0	0.175		

CURRENT RESOLUTION MATRIIX NOT AVAILABLE



MODEL TYPE: BOUWER and RICE	for: STARK AND PELTONEN	Slug Out Test
CONDUCTIVITY: .01079 cm/sec	by: BALSAM ENVIRONMENTAL CONSULTANTS	
TRANSMISSIVITY: 2.913 sq. cm/sec	WELL DATA: Units: ft	Well: OW-4SR
INITIAL HEAD: 2.727 ft	AQUIFER: F/C SAND	
Data Set: OW4SRSD / Date: 06-22-89	THICKNESS: 8.850	MOTTOLO RI/FS
	SCREEN: top: 6.680 base: 11.98	RAYMOND, NH
	DIAMETER: casing: .1660 intake: .6200	
	DEPTH: Water Table: 3.130 TD: 11.98	

APPENDIX B-6

GROUND WATER AND SURFACE WATER ELEVATION MEASUREMENTS

APPENDIX B-6

GROUND WATER ELEVATIONS

MOTTOLO SITE RI/FS
RAYMOND, NH

WELL ID	CASING* ELEVATION	GROUND ELEVATION	GW DEPTH** 04-18-89	GW ELEV. 04-18-89	GW DEPTH** 09-27-89	GW ELEV. 09-27-89	GW DEPTH* 12-12-89	GW ELEV. 12-12-89
DW-1	226.2	NM	4.7	221.5	NM	-	5.5	220.7
JB-5	191.6	189.1	NM	-	NM	-	NM	-
JB-7	189.7	187.4	NM	-	NM	-	NM	-
JB-8	190.9	188.4	2.5	188.4	NM	-	NM	-
MO-1	232.8	231.1	8.0	224.8	10.5	222.3	10.8	222.0
MO-2S	188.7	187.2	1.9	186.8	2.3	186.4	2.2	186.4
MO-2D	188.4	187.0	1.8	186.6	2.3	186.1	2.3	186.1
MO-2DR	190.1	188.4	2.7	187.5	3.4	186.8	4.1	186.0
MO-3S	189.3	187.0	2.4	186.9	2.6	186.7	FROZEN	-
MO-3SR	189.3	187.5	1.1	188.2	1.5	187.8	1.4	187.9
MO-3D	190.4	188.2	2.3	188.1	2.9	187.5	2.7	187.6
MO-3DR	191.0	188.1	FLOWING	+191.0	0.2	190.8	FROZEN	-
MO-4S	189.4	187.5	1.6	187.8	1.8	187.6	1.9	187.5
MO-4D	189.8	187.6	1.4	188.4	1.7	188.1	1.9	187.9
MO-5S	183.9	181.7	2.5	181.4	2.6	181.2	3.1	180.8
MO-5D	183.2	182.0	1.6	181.5	1.8	181.3	2.2	181.0
MO-5DR	184.2	181.9	2.7	181.5	2.9	181.3	2.9	181.2
MO-6	170.1	168.3	FLOWING	+170.1	FLOWING	+170.1	FLOWING	+170.1
MW-7S	229.8	228.6	3.9	225.9	7.0	222.8	DRY	-
MW-7D	229.9	228.7	6.3	223.6	9.4	220.5	7.7	222.2
MW-8S	231.5	230.3	6.4	225.1	9.5	222.0	9.5	222.0
MW-8D	232.1	230.6	29.3	202.8	31.4	200.8	30.4	201.8
MW-9S	221.3	218.6	5.9	215.5	DRY	-	DRY	-
MW-9D	221.5	219.0	6.0	215.5	11.5	210.0	7.8	213.7
MW-10D	258.1	257.0	15.0	243.1	15.8	242.3	15.3	242.7
MW-11D	221.7	220.2	7.1	214.6	10.1	211.7	11.2	210.5
MW-12S	191.2	188.7	5.8	185.5	6.0	185.2	6.5	184.8
MW-12D	189.6	186.9	FLOWING	+189.6	FLOWING	+189.6	FLOWING	+189.6
MW-13S	184.0	182.3	2.3	181.7	3.4	180.6	3.0	181.0
MW-13D	182.9	181.5	FLOWING	+183.0	0.6	182.3	FROZEN	-
MW-14S	184.1	182.8	1.3	182.8	4.2	179.9	2.0	182.1
MW-14D	182.1	181.5	0.2	181.8	2.3	179.8	1.3	180.7
MW-15S	182.5	180.7	5.0	177.5	DRY	-	10.5	172.0
MW-15D	183.9	182.0	13.2	170.7	14.5	169.4	14.1	169.8
MW-16D	199.2	197.5	10.7	188.5	15.5	183.6	14.6	184.5
MW-17D	195.6	193.2	2.9	192.7	6.6	189.0	6.1	189.5
MW-18S	165.8	164.2	5.4	160.4	6.1	159.7	6.5	159.3
MW-18D	165.8	164.5	3.3	162.5	4.6	161.2	3.6	162.2
MW-19D	204.0	202.3	7.5	196.5	11.8	192.2	10.6	193.4
MW-20S	226.6	223.7	NI	-	NI	-	5.0	221.5
MW-20D	225.3	223.6	NI	-	NI	-	4.7	220.6
MW-21S	231.5	228.8	NI	-	NI	-	8.9	222.6
MW-21D	231.7	228.7	NI	-	NI	-	10.7	221.0
OW-2SR	210.5	209.0	2.5	208.0	4.4	206.1	5.3	205.2
OW-2DR	211.6	209.3	4.9	206.7	6.9	204.7	6.5	205.1
OW-3	222.3	221.2	3.3	219.0	NM	-	NM	-
OW-3R	224.0	221.5	7.0	216.9	9.5	214.5	8.8	215.2
OW-4S	219.0	217.5	3.4	215.7	NM	-	NM	-
OW-4SR	219.3	218.0	3.3	216.0	6.0	213.3	5.6	213.8
OW-4D	218.9	217.5	NM	-	NM	-	NM	-
OW-4DR	219.4	217.6	13.4	205.9	7.5	211.9	14.7	204.6

LEGEND:

* "CASING ELEVATION" REFERS TO INNERMOST CASING ELEVATION.
** GROUND WATER DEPTHS WERE MEASURED FROM THE TOP OF INNERMOST CASING BY BALSAM PERSONNEL ON THE DATES SHOWN ABOVE.
NI NOT INSTALLED
NM NOT MEASURED

NOTE: ELEVATIONS ARE IN FEET, REFERENCED TO MEAN SEA LEVEL.

APPENDIX B-6

SURFACE WATER ELEVATIONS

MOTTOLO SITE RI/FS
RAYMOND, NH

LOCATION	REFERENCE ELEVATION	DEPTH * TO SW 04-18-89	SW ELEVATION 04-18-89	DEPTH * TO SW 09-27-89	SW ELEVATION 09-27-89	DEPTH * TO SW 12-12-89	SW ELEVATION 12-12-89
SE-1	219.2	1.7	217.5	DRY	-	FROZEN	-
SE-2	215.0	1.7	213.3	DRY	-	FROZEN	-
SE-3	212.1	1.9	210.3	DRY	-	FROZEN	-
SE-4	197.6	2.9	194.7	DRY	-	FROZEN	-
SE-5	189.7	1.1	188.6	1.6	188.1	FROZEN	-
SE-6	188.2	2.1	186.1	2.4	185.8	FROZEN	-
SE-7	188.0	2.5	185.5	2.5	185.5	FROZEN	-
SE-8	184.1	1.3	182.8	1.1	183.0	FROZEN	-
SE-9	182.1	0.7	181.4	0.9	181.2	FROZEN	-

NOTES:

1. SURFACE WATER ELEVATIONS WERE MEASURED AS DEPTHS BELOW A SURVEYED REFERENCE POINT AT EACH LOCATION.
2. ELEVATIONS ARE IN FEET, REFERENCED TO MEAN SEA LEVEL.

APPENDIX B-7

STREAM GAUGING DATA AND BASEFLOW ESTIMATES

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

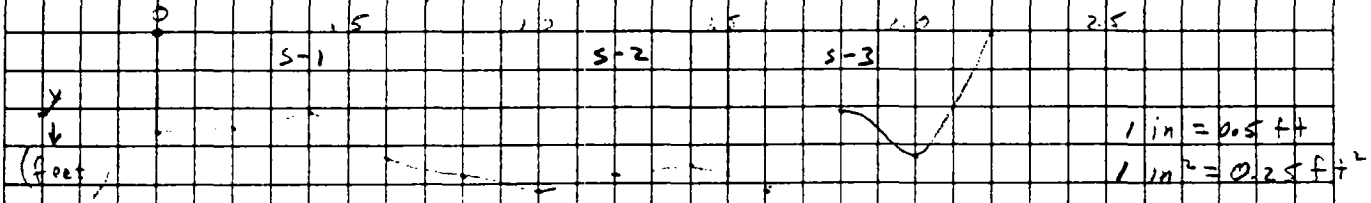
Project 6185 Page 1 of 5

Client April, 1989 Data Date 5/3/89 By BTQ

Subject Mottolo QI/FJ - Stream Gauging SF1 Checked 5/4/89 By ESW

Discharge using planimetered areas: Q = AV Approved 6/8/89 By TSS

Width - x (ft)	Depth - y (inches / ft)		Velocity (rev/min) = ft/min ft/sec = rev/sec
0	2.25	0.27	
0.2	3.0	0.25	
0.4	2.5	0.21	
0.6	4.0	0.33	31
0.8	4.5	0.38	
1.0	5.0	0.42	
1.2	4.5	0.38	32
1.4	4.25	0.35	
1.6	5.0	0.42	
1.8	2.5	0.21	76
2.0	4.0	0.33	
2.2	0.25	0.02	



1 in = 0.5 ft

1 in² = 0.25 ft²

Section S-1 W = 0.9 feet

Planimeter Readings = 2880, 2950 A = 2950 - 2880 = 70 × 0.1 = 7 cm²

$7\ cm^2 \times \frac{1\ in^2}{6.45\ cm^2} \times \frac{.25\ ft^2}{in^2} = 0.28\ ft^2$ $Q = .28\ ft^2 \times 31 \frac{rev}{min} \times \frac{1\ min}{60\ sec} \times \frac{1\ sec}{1\ rev} \times \frac{0.9\ ft}{1\ sec}$

$= 0.14 \frac{ft^2}{sec}$

Section S-2 W = 0.6 ft.

Planimeter Readings: 0534, 0595 A = 0595 - 0534 = 61 × .1 = 6.1 cm²

$6.1\ cm^2 \times \frac{1\ in^2}{6.45\ cm^2} \times \frac{.25\ ft^2}{in^2} = 0.24\ ft^2$ $Q = .24 \times 32 \times \frac{1}{60} = 0.13\ ft^3/sec$

Section S-3 W = 0.7

Planimeter Readings = 0729, 0821 A = 0821 - 0729 = 92 × .1 = 9.2 cm²

$9.2\ cm^2 \times \frac{1}{6.45} \times .25 = 0.24\ ft^2$ $Q = .24 \times 76 \times \frac{1}{60} = 0.27\ ft^3/sec$

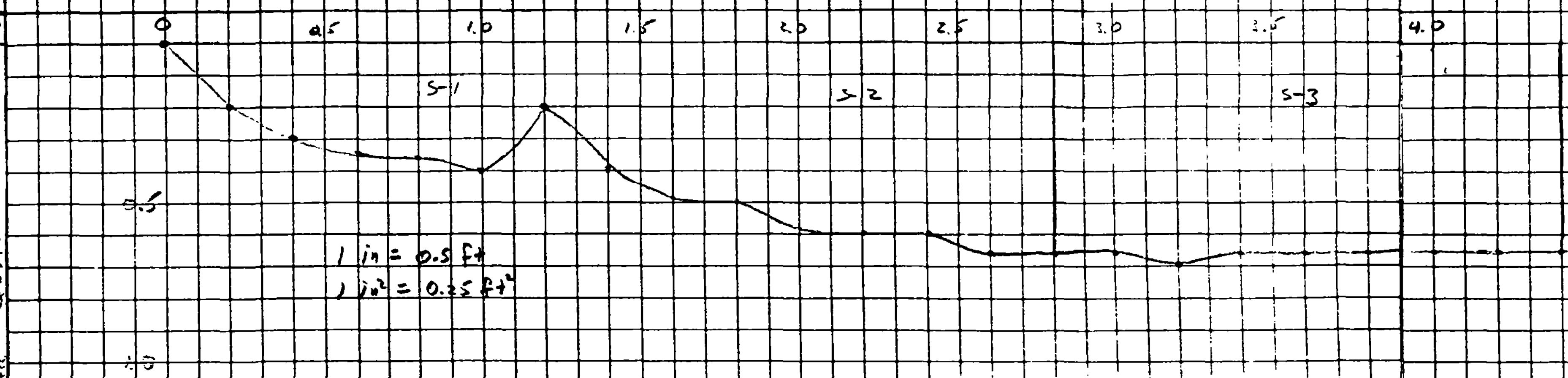
Total Q = [illegible] = 0.54 ft³/sec

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

Project 6185 Page 2 of 5
Date 5/3/89 By BTQ
Checked 5/4/89 By ESU
Approved 6/8/90 By TSS

Client April, 1989 Data
Subject Mot tols Q.I.Fs Stream Gauging SF3
Discharge Using Planimeter Area

$Q = AV$



1 in = 0.5 ft
1 in² = 0.25 ft²

Width x (ft)	Depth y (ft)	Velocity (Rev/min)
0.2	0.2	
0.4	0.3	
0.6	0.34	
0.8	0.35	
1.0	0.4	85
1.2	0.2	
1.4	0.4	
1.6	0.48	
1.8	0.5	
2.0	0.58	
2.2	0.6	26
2.4	0.6	
2.6	0.65	
2.8	0.65	
3.0	0.65	
3.2	0.7	18
3.4	0.65	
3.6	0.65	
3.8	0.65	
4.0	0.65	
4.2	0.65	
4.4	0.65	

Section S-1 W = 1.6 ft Planimeter Readings 993, 1121 A = 1121 − 993 = 128 × .1 = 12.8 cm²

$12.8\,cm^2 \times \frac{1\,in^2}{6.452\,cm^2} \times \frac{.25\,ft^2}{1\,in^2} = 0.49\,ft^2$

$Q = 0.49\,ft^2 \times 85\,\frac{rev}{min} \times \frac{1\,min}{60\,sec} \times \frac{1\,ft/sec}{1\,rev} \times \frac{ft}{1\,sec}$
$= 0.69\,ft^3/sec$

Section S-2 W = 1.2 ft Planimeter Readings – 1504, 1691, 1879
187, 188 A = 187.5 × .1 = 18.75 cm²

$18.75\,cm^2 \times \frac{1}{6.452} \times .25 = 0.73\,ft^2$

$Q = 0.73 \times 26 \times \frac{1}{60} = 0.32\,ft^3/sec$

Section S-3 W = 1.6 ft Planimeter Readings 3372, 3650, 3932
278, 276 A = 277 × .1 = 27.7 cm²

$27.7\,cm^2 \times \frac{1}{6.452} \times .25 = 1.1\,ft^2$

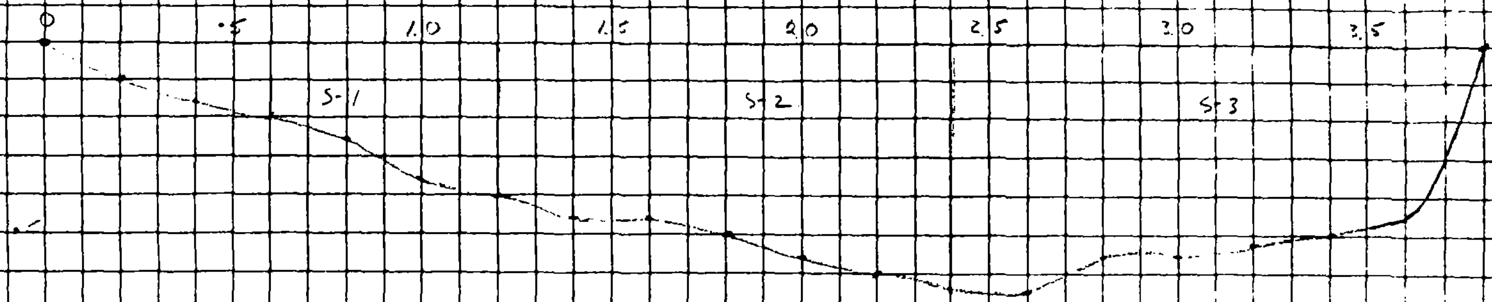
$Q = 1.1 \times 18 \times \frac{1}{60} = 0.33\,ft^3/sec$

Total $Q = 0.69 + 0.32 + 0.33 = 1.34\,ft^3/sec$

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

Client: April, 1989 Data
Subject: [illegible]
Project: [illegible] | Page 3 of 5
Date: [illegible] /89 | By RTQ
Checked 5/4/89 | By EJV
Approved 6/8/90 | By [illegible]

Discharge using planimetered area Q = AV



1 in = 0.5 ft
$1 in^2 = 0.25 ft^2$

Width x (ft)	Depth y (ft)	Velocity (rev/min)
0.2	0.1	
0.4	0.15	
0.6	0.20	10
0.8	0.25	
1.0	0.35	
[illegible]	0.40	
[illegible]	0.45	
[illegible]	0.45	
1.8	0.50	39
2.0	0.55	
2.2	0.60	
2.4	0.64	
2.6	0.64	
2.8	0.55	
3.0	0.55	
3.2	0.56	20
3.4	0.50	
3.6	0.45	
3.8	0	

Section S-1 Width = 1.2 ft.

Planimeter Readings - 3140, 3208, 3276
68 68

$A = 68 \times .1 = 6.8\ cm^2$

$6.8\ cm^2 \times \frac{1\ in^2}{6.452\ cm^2} \times \frac{.25\ ft^2}{1\ in^2} = 0.26\ ft^2$

$Q = 0.26\ ft^2 \times 10 \frac{rev}{min} \times \frac{1\ min}{60\ sec} \times \frac{15\ sec}{1\ rev} \times \frac{1\ ft}{15\ sec}$

$= 0.04\ ft^3/sec$

Section S-2 Width = 1.2 ft.

Planimeter Readings - 4110, 4271, 4432
161 161

$A = 16.1\ cm^2$

$A = 16.1 \times \frac{1}{6.452} \times .25 = 0.62\ ft^2$

$Q = 0.62 \times 39 \times \frac{1}{60} = 0.40\ ft^3/sec$

Section S-3 Width = 1.4 ft.

Planimeter Readings - 4834, 5022, 5213 (191), 18

$A = 18.95\ cm^2 \times \frac{1}{6.452} \times .25 = 0.73\ ft^2$

$Q = 0.73 \times 20 \times \frac{1}{60} = 0.24\ ft^3/sec$

Total Q = 0.68 ft³/sec

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

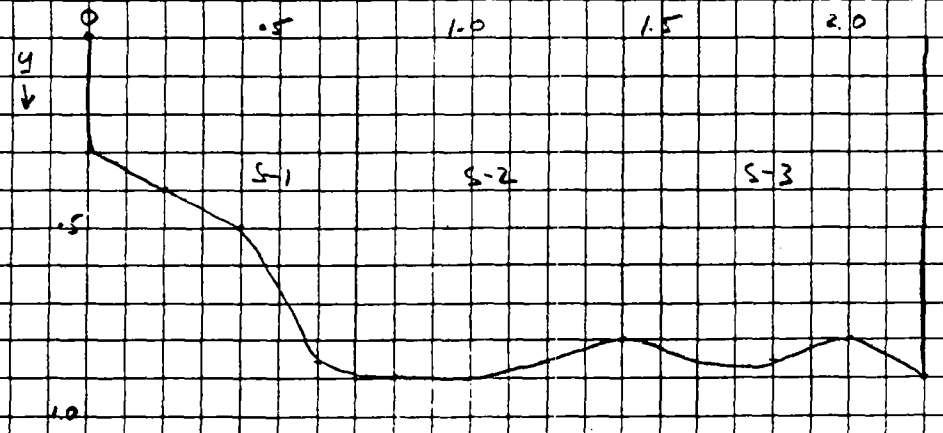
Project 6185 Page 41 of 5

Client April, 1989 Data Date 5/4/89 By RTQ

Subject 11 2Ho/2 RI/FS Stream Gauging SF-6 (5:35 PM) Checked 5/4/89 By ESW

Discharge using Planimeter and area: Q = AV Approved 6/18/90 By TH

Width x (feet)	Depth y (feet)	Velocity (rev/min)
0	0.2	
0.2	0.4	
0.4	0.5	14
0.6	0.85	
0.7	0.9	
1.0	0.9	32
1.2	0.85	
1.4	0.8	55
1.6	0.85	
1.8	0.85	
2.0	0.7	
2.2	0.9	



Section S-1 width = 0.7 ft.

Planimeter Readings - 5914, 6016, 6116
102 100

$A = 10.1\,cm^2 \times \frac{1}{6.452} \times .25 = 0.39\,ft^2$

$Q = 0.39 \times 14 \times \frac{1}{60} = 0.09\,ft^3/sec$ ✓

Section S-2 width = 0.7 ft

Planimeter Readings - 6656, 6818, 6979
162 161

$A = 16.15\,cm^2 \times \frac{1}{6.452} \times 0.25 = 0.63\,ft^2$ ✓

Section S-3 width 0.8 ft

Planimeter Readings - 7263, 7439, 7616
176 177

$A = 17.65\,cm^2 \times \frac{1}{6.452} \times .25 = 0.68\,ft^2$

$Q = 0.68 \times 55 \times \frac{1}{60} = 0.62\,ft^3/sec$ ✓

Total Q = 0.09 + 0.34 + 0.62 = 1.05 ft³/s

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

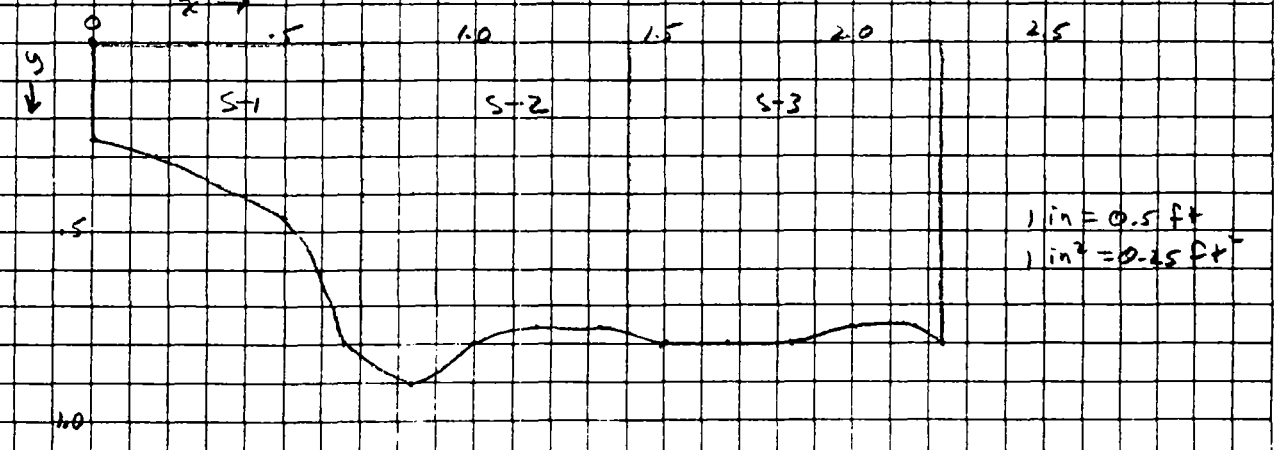
Project 6185 Page 5 of 5

Client April, 1989 Data Date 5/4/89 By BTQ

Subject Mott 010 RI/FS - Stream Gaging SF-6 (7.35 PM) Checked 5/4/89 By ESW

Discharge using planimetered areas Q = AV Approved 6/8/90 By TSS

x (in)	x (ft)	y (ft)	Velocity (rev/min)
0	0	.25	
2	.17	.3	
4	.33	.38	.17
6	.5	.45	
8	.67	.8	
10	.83	.9	
12	1.0	.8	.16
14	1.17	.75	
16	1.33	.75	
18	1.5	.8	
20	1.67	.8	
22	1.83	.8	.36
24	2.0	.75	
26	2.17	.75	
27	2.25	.8	



1 in = 0.5 ft

1 in² = 0.25 ft²

Section S-1 Width = 0.7 ft.

Planimeter Readings - 8234, 8814, 8894 (80, 80)

$A = 8\ cm^2 \times \frac{1}{6.45^2} \times .25 = 0.31\ ft^2$

$Q = 0.31 \times .17 \times \frac{1}{60} = 0.09\ ft^3/sec$

Section S-2 Width = 0.7 ft

Planimeter Readings - 2429, 2629, 2779 (150, 150)

$A = 15\ cm^2 \times \frac{1}{6.45^2} \times .25 = .58\ ft^2$

$Q = .58 \times 16 \times \frac{1}{60} = 0.15\ ft^3/sec$

Section S-3 Width = 0.825 ft

Planimeter Readings - 7928, 8098, 8268 (170, 168)

$A = 16.9\ cm^2 \times \frac{1}{6.45^2} \times .25 = 0.65\ ft^2$

$Q = 0.65 \times 36 \times \frac{1}{60} = 0.39\ ft^3/sec$

Total Q = 0.09 + 0.15 + 0.39 = 0.63 ft³/sec

BALSAM ENVIRONMENTAL CONSULTANTS, INC.

Project 6185 Page 1 of 1

Client April, 1989 Data Date 5/4/89 By ESW

Subject Mottolo RI/FS - Stream Gauging Checked 5/5/89 By ESW

Approved [illegible] 6/8/90 By [illegible]

SF-5 - Time to fill 600 ml beaker

Test	Time
1	1.6 sec
2	1.6 sec
3	1.5 sec
4	1.8 sec

$\frac{600\ ml}{1.63\ sec}$ (Average) = 0.01 cfs

SF-2 - Time to fill 600 ml beaker

Test	Time
1	1.5 sec
2	1.4 sec
3	1.5 sec
4	1.4 sec

$\frac{600\ ml}{1.45\ sec}$ (Average) = 0.02 cfs

TO: Tim Stone
FROM: Keith Taylor
DATE: 1/12/90
RE: Baseflow Analysis
BALSAM JOB #6185

Results of Ground Water Recharge Analysis For Mottolo Site

I have measured the areas of the drainage basins for stream gaging stations SF-1, SF-3, SF-4, and two estimations of the basin encompassing the Mottolo site. Using average annual precipitation of 44 inches from Pease Air Force Base data and a range of theoretical infiltration values, the average annual ground water flux (base flow) from each of the basins has been calculated.

Infiltration Values

The sources for the infiltration values are a study conducted in the Quinebaug River Basin in Connecticut (Randall and others, 1966) and one conducted along the Little Androscoggin River in Maine (Morrissey, 1983). From stream gage data and ground water levels, the percent of total annual precipitation infiltrating as base flow was determined for basins covered with glacial till. Basins characterized by till were found to have 20% and 19% of total annual precipitation reaching the water table, respectively, for the two studies. R.G. Gerber in Maine has reportedly calculated recharge rates for till in Maine using water table fluctuations with a result of 15% of total precipitation infiltrating (pers. communication with P. Garrett, 1989).

It is my understanding that the Mottolo site and surrounding area are covered with a sandy till. I therefore have used infiltration values of 15% and 25% to approximate the range for this material.

Ground Water Flux

Base flow calculations for 15% and 25% infiltration are summarized below:

	SF-4:	SF-3:	SF-1:	Mottolo Site Area A	Mottolo Site Area B
(15%)	0.09 cfs	0.085 cfs	0.074 cfs	0.0031 cfs	0.0018 cfs
(25%)	0.15 cfs	0.14 cfs	0.12 cfs	0.0051 cfs	0.0030 cfs

As expected, the volume of baseflow increases with an increase in basin size. Although the area between SF-1 and SF-4 contributes 20% of the total base flow at SF-4, the actual increase in volume

is only about 0.02 cfs. This increase would be difficult to detect with stream gage data considering the small and irregular streambed.

Comparison with Stream Gage Data

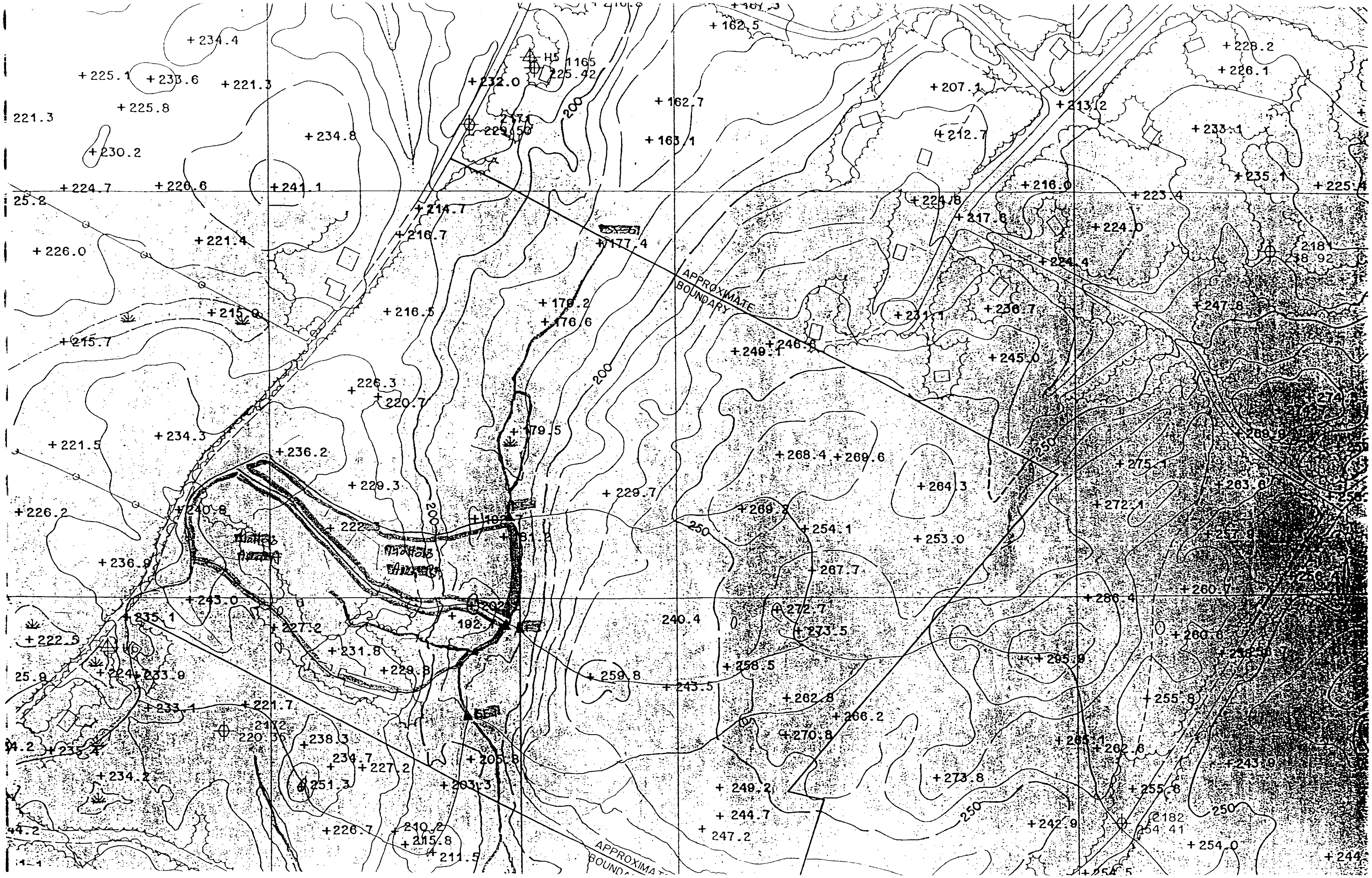
The stream gage data collected for SF-1, SF-3, and SF-4 resulted in discharge volumes higher than the calculated average base flow as shown below. This situation would be expected for data which should reflect high water table conditions and the probable addition of spring runoff.

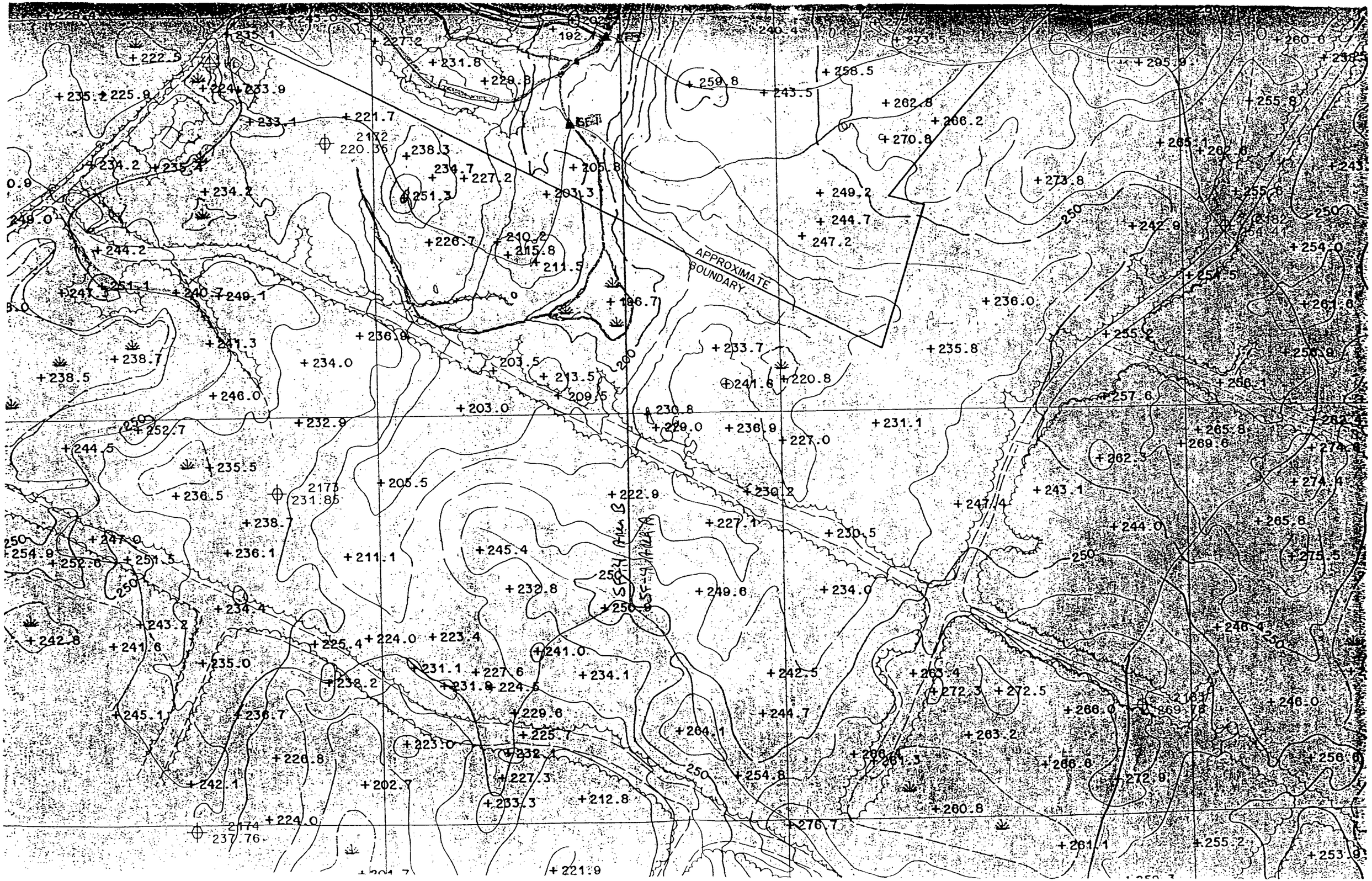
An interesting feature of the stream gage data is the decrease in discharge from SF-3 to SF-4 and SF-6, opposite of what should happen as the drainage area increases. One possible explanation for these anomalies is the change in channel morphology from SF-3 to SF-4 to SF-6. Geologic cross-sections and surface topography show that the stream channel at SF-3 is narrow. It also appears that the knob just west of SF-3 (elevation 202.2) may be bedrock cored, further reducing the amount of overburden available for water storage. As SF-4 is approached, the stream channel widens and the overburden thickness increases, and a swamp is shown between SF-4 and SF-6. As a result, the stream may be changing from one gaining ground water to one temporarily losing water to the overburden deposits and swamps. The overall discharge continues to increase downstream, but much of it is moving as ground water underflow adjacent to and below the stream.

Location	Stream Gage Data(cfs)	15% Infiltration	25% Infiltration
SF-1	0.50	0.074	0.12
SF-3	1.36	0.085	0.14
SF-4	0.67	0.09	0.15
SF-6	1.02		

Randall, A.D., Thomas, M.P., Thomas, C.E., and Baker, J.A., 1966, Water Resource Inventory of Connecticut, Part 1. Quinebaug River Basin: Connecticut Water Resources Commission, Bulletin 8, 102p.

Morrissey, D., 1983, Hydrology of the Little Androscoggin River Valley Aquifer, Oxford County, Maine: U.S. Geological Survey Water Resource Investigations 83-4018, 79p., 8 plates.


APPROXIMATE BOUNDARY
APPROXIMATE BOUNDARY
200
200
200
250
250
250
250
+ 234.4
+ 225.1
+ 233.6
+ 221.3
221.3
+ 225.8
+ 234.8
+ 230.2
+ 224.7
+ 226.6
+ 241.1
+ 226.0
+ 221.4
+ 215.0
+ 215.7
+ 232.0
H5 1165
225.42
+ 162.5
+ 162.7
+ 163.1
+ 207.1
+ 212.7
+ 213.2
+ 228.2
+ 226.1
+ 233.1
+ 235.1
+ 225.4
+ 216.0
+ 223.4
+ 217.6
+ 224.0
+ 224.4
+ 214.7
+ 216.7
+ 177.4
+ 216.5
+ 176.6
+ 245.0
+ 247.8
+ 226.3
+ 220.7
+ 179.5
+ 234.3
+ 221.5
+ 236.2
+ 229.3
+ 229.7
+ 268.4
+ 269.6
+ 264.3
+ 275.1
+ 263.6
+ 272.1
+ 226.2
+ 240.6
+ 222.3
+ 254.1
+ 253.0
+ 236.9
+ 267.7
+ 243.0
+ 280.4
+ 260.7
+ 235.1
+ 227.2
+ 192.7
240.4
+ 272.7
+ 273.5
+ 222.5
+ 231.8
+ 229.8
+ 259.8
+ 243.5
+ 258.5
+ 295.9
+ 233.9
+ 233.1
+ 221.7
+ 262.8
+ 266.2
+ 255.8
220.35
+ 238.3
234.7
+ 227.2
+ 205.8
+ 270.8
+ 235.4
+ 234.2
+ 251.3
+ 203.3
+ 249.2
+ 273.8
+ 262.6
+ 255.6
+ 244.7
+ 247.2
+ 242.9
254.41
+ 254.0
+ 226.7
+ 210.2
+ 215.8
+ 211.5


APPROXIMATE BOUNDARY
SCALE: 1 INCH = 4 MILES