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Memorandum

Refer to File No. LYF-0381B

TO: Town of Lynnfield Planning Board

FROM: Hayes Engineering, Inc.
Anthony M. Capachietti, PE

DATE: March 11, 2022

SUBJECT: Groundwater Mounding Calculations
109 Lowell Street – Vallis Way
Lynnfield, MA

Cc: Linden Engineering



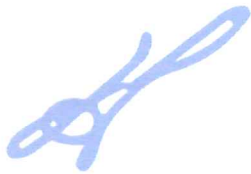
In accordance with Volume 3, Chapter 1 of the Massachusetts DEP Stormwater Standards a mounding analysis was conducted for the proposed subsurface infiltration system (PSIS) at the above referenced project. Mounding analysis is required for exfiltration systems that have less than four (4) feet separation to seasonal high groundwater *and* proposed to attenuate the peak discharge from a 10-year of higher 24-hour storm event. The mounding analysis must demonstrate:

1. the *Required Recharge Volume* is fully dewatered within 72-hours; and
2. the groundwater mound that forms under the recharge system will not break out above the land within the 72-hour period.

The proposed infiltration basin for the Vallis Way Subdivision provides for greater than 7-feet of separation from the bottom of the infiltration basin to the estimated seasonal high-water table in the vicinity of the basin, nevertheless a mounding calculation was performed for the extreme event specified by Linden Engineering. This extreme event consists of the 25-year NOAA Atlas 14, 24-hour event immediately followed by the 100-year NOAA Atlas 14, 24-hour event.

Groundwater mounding analysis was performed using the Hantush Method and modelled with the HANTUSH software package developed by GeoHydroCycle, Inc. The following model parameters were used in the analysis:

- Application Rate – The application rate is equivalent to the total extreme event infiltration volume (21,294cf + 46,802 cf = 68,096 cf.) divided by the surface area of the infiltration system (2,906 sf) over the duration of the design storms (2 days) or 11.7 feet per day;



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- Duration of Application – The duration of application is 48-hours (2 days), equivalent to the duration of the back-to-back design storm events;
- Total Simulation Time – The total simulation time is 72-hours (3 days), the period of analysis for draw down;
- Fillable Porosity – The fillable porosity is the specific yield of an aquifer. The attached graph from Walton's *Analytical Groundwater Modeling* indicates an average porosity in sands and gravel of 0.28;

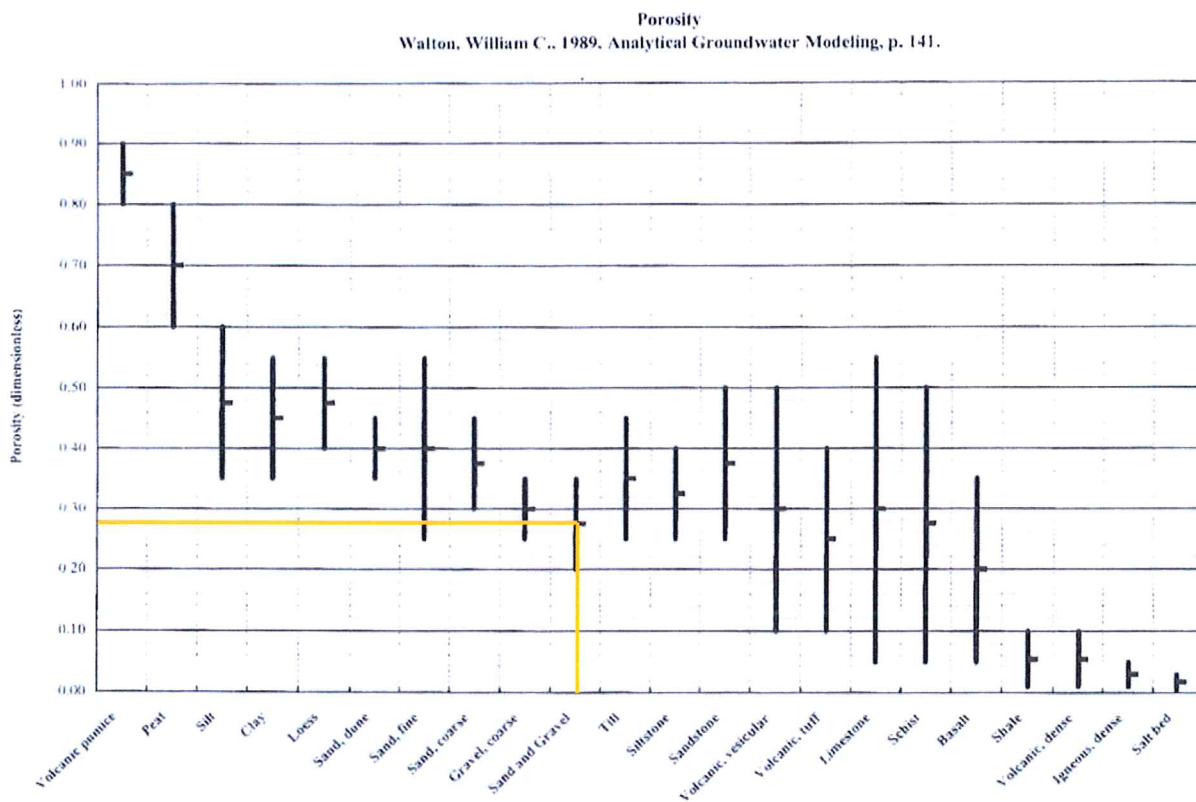
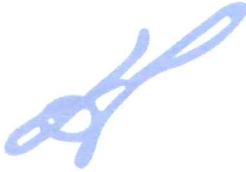


Figure 1 – Porosity in Various Soils

- Hydraulic Conductivity – The hydraulic conductivity of fine sand was estimated to be 300 feet per day using the estimated range of rates for clean sand and gravel on the accompanying Anderson & Woessner graph indicating Ranges of Hydraulic Conductivity for Unconsolidated Materials;



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Ranges of Hydraulic Conductivity - Unconsolidated Materials
Anderson & Woessner, 1992 p. 40

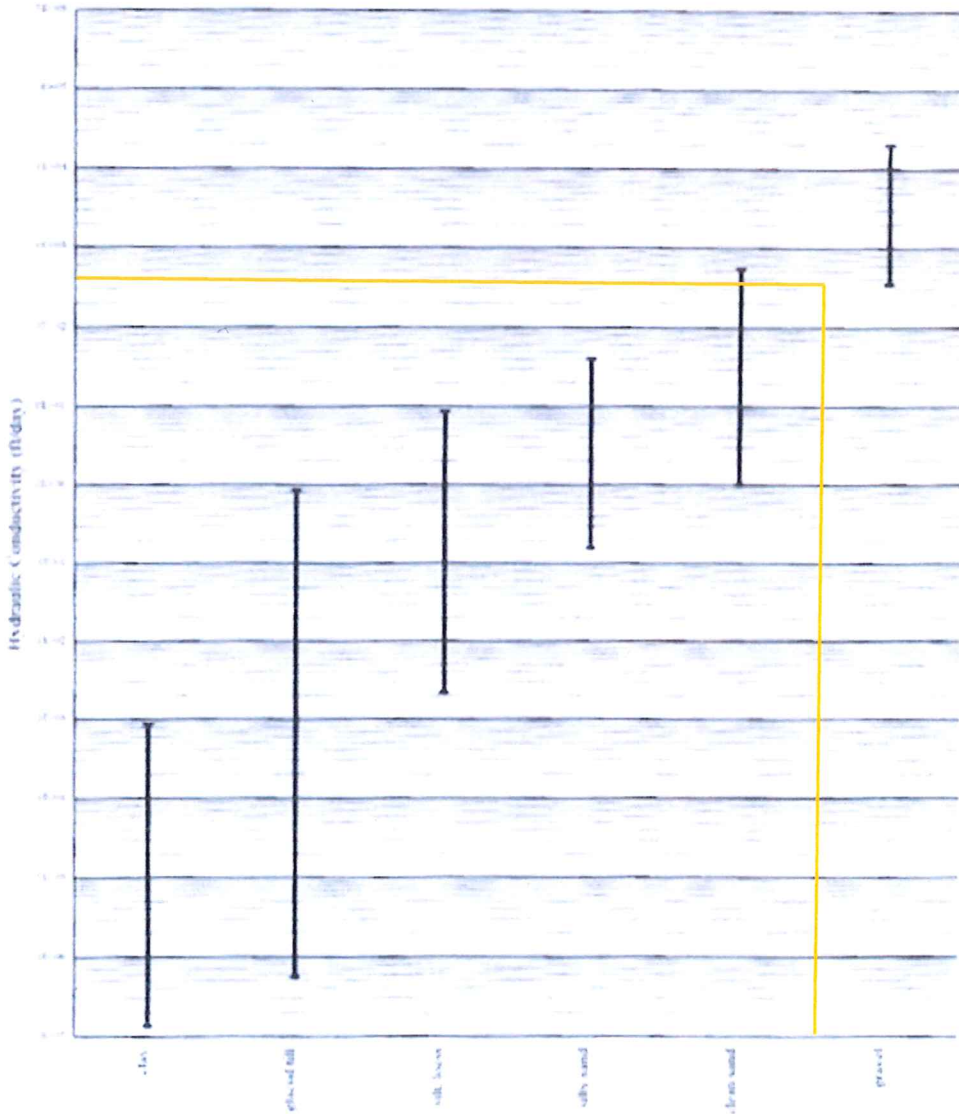
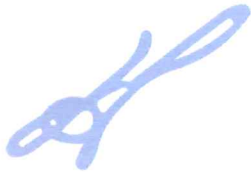


Figure 2 – Hydraulic Conductivity in Various Soils

- Initial Saturated Thickness – The initial saturated thickness of the aquifer is the difference between the seasonal-high water table elevation and bedrock. Various wells were found in the area using the MassDEP Well Database. Depth to bedrock varied between 5-feet to 71-feet in the project vicinity. Based on the soil test pits and this well



MEMORANDUM

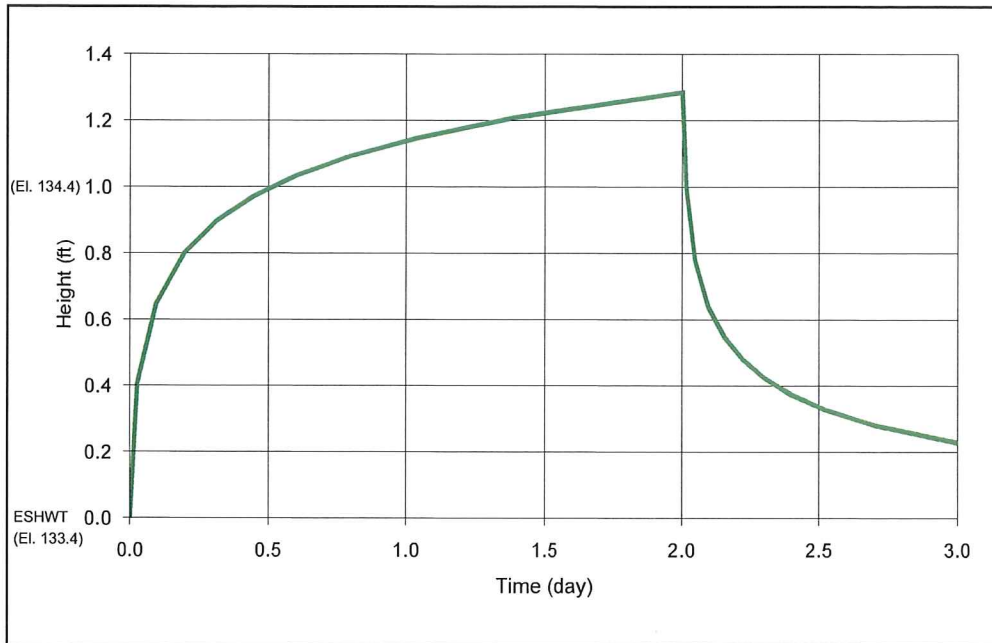
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data the depth to bedrock was estimated at 50-feet, resulting in an initial saturated thickness of 43-feet.

- Length and width of application area are equivalent to the length and width of the proposed subsurface infiltration system (87.76' x 33.11');
- Constant Head Boundary – The constant head boundary represents a waterbody or other interface that limits hydraulic conductivity and is not warranted for this analysis.

The resultant groundwater mound peaked at 1.3 feet above the average, estimated seasonal-high water table elevation in the system (ESHWT=133.4) to an elevation of 134.7 feet. The bottom of the infiltration basin is proposed at elevation 140.5 and the top of the berm at the basin is proposed at elevation 146.50. The groundwater elevation does not break out above the land in accordance with the requirements stated in Volume 3, Chapter 1 of the Stormwater Standards, nor will it break out from the basin berm as the groundwater mound remains wholly below the system. Additionally, the ground water recedes to an elevation of 0.23 feet above the ESHWT elevation, or elevation 133.6, indicating the proposed infiltration basin is fully dewatered within 72-hours (i.e. below the bottom of the basin elevation = 140.5). The system, as designed, conforms with the requirements for stormwater infiltration.

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Hayes Engineering, Inc.

PROJECT: LYF-0381B Vallis Way

ANALYST: AMC

DATE: 3/11/2022 TIME: 12:26:47 PM

INPUT PARAMETERS

Application rate: 11.7 c.ft/day/sq. ft

Duration of application: 2 day

Total simulation time: 3 day

Fillable porosity: 0.28

Hydraulic conductivity: 300 ft/day

Initial saturated thickness: 43 ft

Length of application area: 87.76 ft

Width of application area: 33.11 ft

No constant head boundary used

Groundwater mounding @

X coordinate: 0 ft

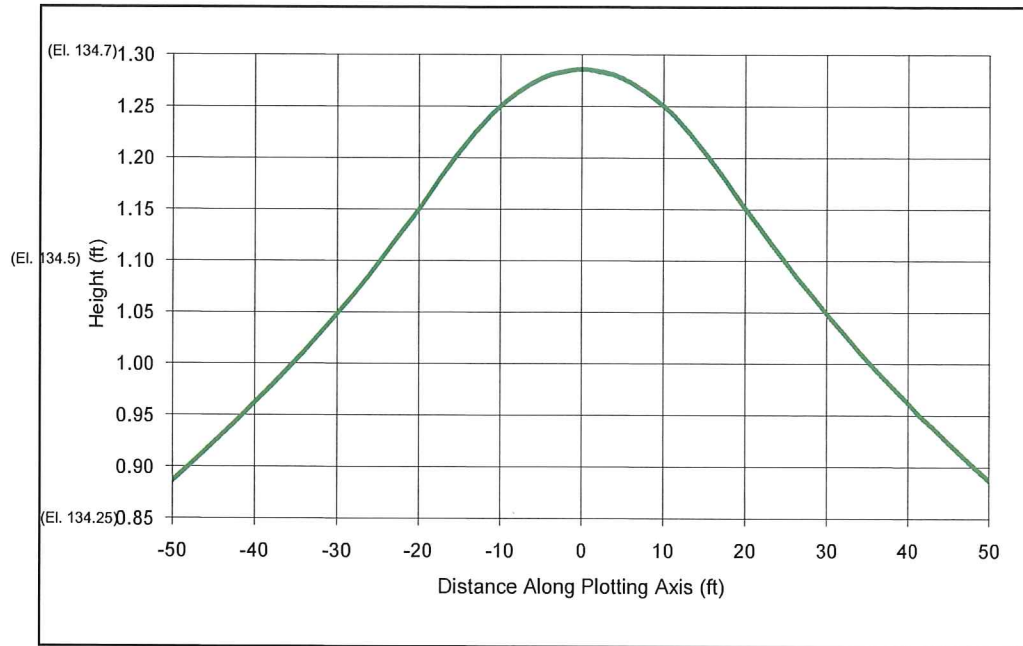
Y coordinate: 0 ft

Total volume applied: 67994.16 cft

MODEL RESULTS

Time (day)	Mound Height (ft) <small>(Above ESHWT Elev. = 133.4)</small>
0	0
0	0.41
0.1	0.65
0.2	0.8
0.3	0.9
0.4	0.97
0.6	1.03
0.8	1.09
1	1.15
1.4	1.21
2	1.29
2	1
2	0.78
2.1	0.64
2.2	0.55
2.2	0.48
2.3	0.42
2.4	0.37
2.5	0.33
2.7	0.28
3	0.23

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Hayes Engineering, Inc.

PROJECT: LYF-0381B Vallis Way

ANALYST: AMC

DATE: 3/11/2022 TIME: 12:31:51 PM

INPUT PARAMETERS

Application rate: 11.7 c.ft/day/sq. ft

Duration of application: 2 days

Fillable porosity: 0.28

Hydraulic conductivity: 300 ft/day

Initial saturated thickness: 43 ft

Length of application area: 87.76 ft

Width of application area: 33.11 ft

No constant head boundary used

Plotting axis from Y-Axis: 90 degrees

Edge of recharge area:

positive X: 16.6 ft

positive Y: 0 ft

Total volume applied: 67994.16 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft) <small>(Above ESHWT Elev. = 133.4)</small>
-50	0	-50	0.89
-42	0	-42	0.95
-34.1	0	-34	1.01
-26.1	0	-26	1.09
-19.9	0	-20	1.15
-15	0	-15	1.21
-11.1	0	-11	1.24
-7.7	0	-8	1.26
-4.8	0	-5	1.28
-2.9	0	-3	1.28
-1.6	0	-2	1.28
0	0	0	1.29
1.6	0	2	1.28
2.9	0	3	1.28
4.8	0	5	1.28
7.7	0	8	1.26
11.1	0	11	1.24
15	0	15	1.21
19.9	0	20	1.15
26.1	0	26	1.09
34.1	0	34	1.01
42	0	42	0.95
50	0	50	0.89

Summary for Pond 2P: Infiltration Pond

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=45)

Inflow Area = 404,672 sf, 12.52% Impervious, Inflow Depth = 0.63" for 25 Year event
 Inflow = 4.15 cfs @ 12.20 hrs, Volume= 21,286 cf
 Outflow = 0.74 cfs @ 14.00 hrs, Volume= 21,294 cf, Atten= 82%, Lag= 107.7 min
 Discarded = 0.74 cfs @ 14.00 hrs, Volume= 21,294 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 142.14' @ 14.00 hrs Surf.Area= 4,625 sf Storage= 6,221 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 88.5 min (976.1 - 887.6)

Volume	Invert	Avail.Storage	Storage Description
#1	140.50'	39,382 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.50	2,906	0	0
141.00	3,593	1,625	1,625
142.00	4,337	3,965	5,590
143.00	6,379	5,358	10,948
144.00	7,336	6,858	17,805
145.00	8,350	7,843	25,648
146.00	9,420	8,885	34,533
146.50	9,976	4,849	39,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.50'	6.930 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.74 cfs @ 14.00 hrs HW=142.14' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.74 cfs)

Summary for Pond 2P: Infiltration Pond

Inflow Area = 404,672 sf, 12.52% Impervious, Inflow Depth = 1.39" for 100 Year event
 Inflow = 8.53 cfs @ 12.38 hrs, Volume= 46,783 cf
 Outflow = 1.23 cfs @ 14.61 hrs, Volume= 46,802 cf, Atten= 86%, Lag= 134.2 min
 Discarded = 1.23 cfs @ 14.61 hrs, Volume= 46,802 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 144.32' @ 14.61 hrs Surf.Area= 7,660 sf Storage= 20,200 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 195.5 min (1,056.4 - 860.9)

Volume	Invert	Avail.Storage	Storage Description
#1	140.50'	39,382 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.50	2,906	0	0
141.00	3,593	1,625	1,625
142.00	4,337	3,965	5,590
143.00	6,379	5,358	10,948
144.00	7,336	6,858	17,805
145.00	8,350	7,843	25,648
146.00	9,420	8,885	34,533
146.50	9,976	4,849	39,382

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.50'	6.930 in/hr Exfiltration over Surface area

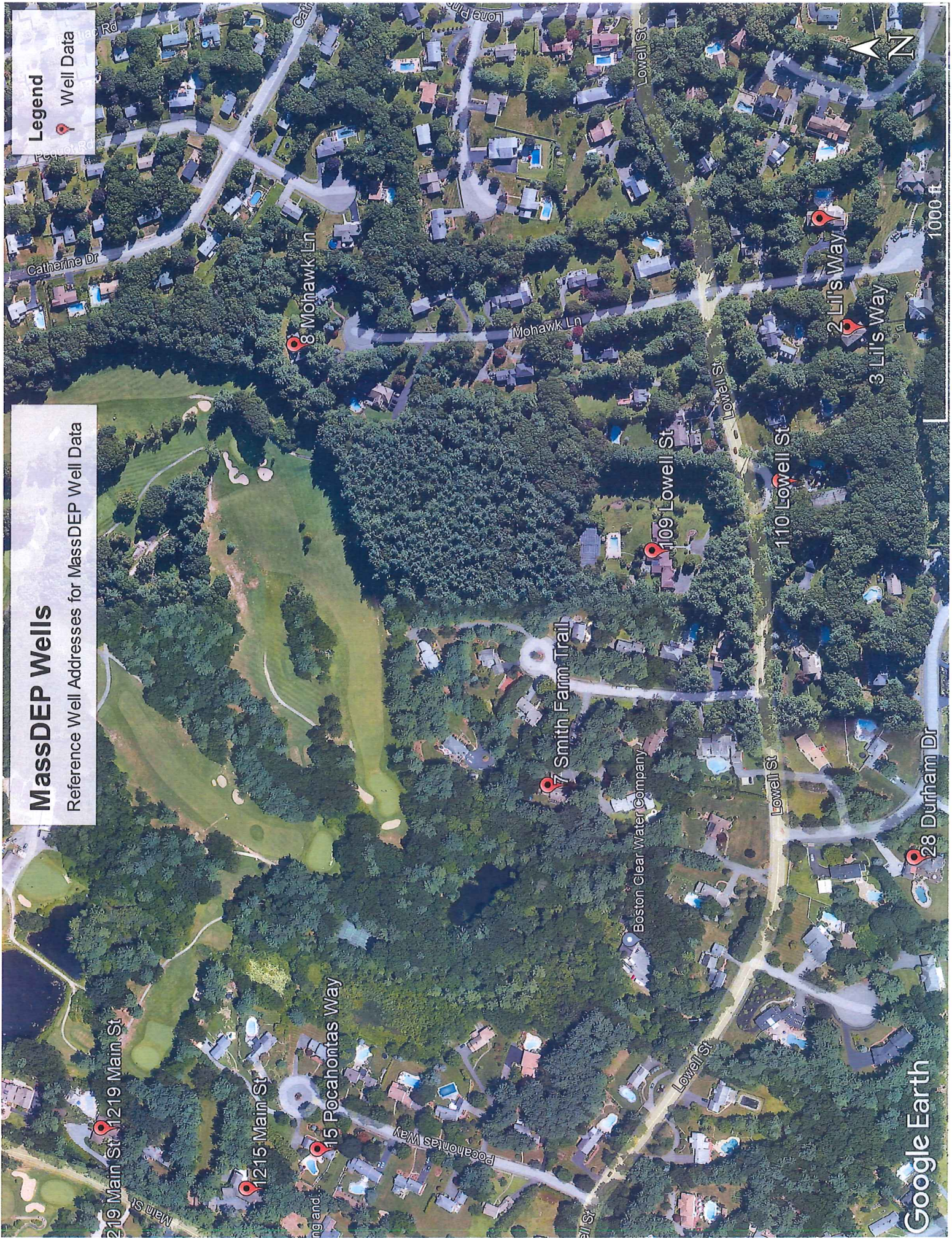
Discarded OutFlow Max=1.23 cfs @ 14.61 hrs HW=144.32' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.23 cfs)

MassDEP Wells

Reference Well Addresses for MassDEP Well Data

Legend

Well Data



MassDEP

Well Completion Report

WELL LOCATION

GPS North: 42.557150 GPS West: -71.040933 Assessors Map:
 Address: 1219 MAIN STREET Assessors Lot:
 Sub Division: Permit Number:
 City/Town: LYNNFIELD Date Issued:
 Board Of Health Permit Obtained: NR

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Domestic	Air Hammer	Air Hammer

ADDITIONAL WELL INFORMATION

Developed: Yes
 Disinfected: Yes
 Total Well Depth: 320.00
 Fracture Enhancement: No
 Well Seal Type: None
 Depth to Bedrock: 62.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:
 Type:
 Nominal Pump Capacity:
 Intake Depth:
 Horsepower:
 Comments:

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
2.00 (Above Ground)	78.00	Steel	17#	6

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter
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WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose
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STATIC WATER LEVEL (ALL WELLS)

Date Measured	Depth Below Ground Surface
04/30/2010	18.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
04/29/2010	Air Blow with Drill Stem	10.00	000:15	320	024:00	18

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	62.00	Gravel			No			

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
62	162	Granite		No						
162	262	Granite		Yes					Addition	
262	320	Granite	10 GPM	Yes					Addition	

62'

MassDEP

Well Completion Report

WELL LOCATION

GPS North:	GPS West:	Assessors Map:
Address: 1215 Main Street		Assessors Lot:
Sub Division:		Permit Number:
City/Town: LYNNFIELD		Date Issued:
Board Of Health Permit Obtained: NR		

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Domestic	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:

Disinfected:

Total Well Depth: 630.00

Fracture Enhancement:

Well Seal Type:

Depth to Bedrock: 50.50

PERMANENT PUMP (IF AVAILABLE)

Pump Description:

Type:

Nominal Pump Capacity:

Intake Depth:

Horsepower:

Comments: Geographic Description-----Well is located 200ft E of Main Street, 0.3 mi N of intersection with Lowell Street
Water-bearing rock/unconsolidated material Description: soft green/soft orange rock

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	74.00	Steel		
1.00 (Above Ground)	0.00			

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL(ALL WELLS)

Date Measured	Depth Below Ground Surface
09/07/1990	24.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
09/07/1990	Air Blow with Drill Stem	75.00	03:30	630	00:13	24

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	20.00			sand				
20.00	21.00			sand				
21.00	41.00	Gravel						
41.00	43.00	Gravel						
43.00	50.50			hardpan				

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
50.5	150.5		bedrock							
150.5	250.5		bedrock							
250.5	350.5		bedrock							
350.5	450.5		bedrock							
450.5	550.5		bedrock							
550.5	630		bedrock							

50.5'

MassDEP Well Completion Report

WELL LOCATION

GPS North: **GPS West:** **Assessors Map:**
Address: 110 Lowell Street **Assessors Lot:**
Sub Division: **Permit Number:**
City/Town: LYNNFIELD **Date Issued:**
Board Of Health Permit Obtained:

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Irrigation	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:
Disinfected:
Total Well Depth: 545.00
Fracture Enhancement:
Well Seal Type:
Depth to Bedrock: 12.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:
Type:
Nominal Pump Capacity:
Intake Depth:
Horsepower:
Comments: Geographic Description-----Well is located 80ft S of Lowell St, 0.2 mi E of intersection with Durham Drive Water-bearing rock/unconsolidated material Description: green rock

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	21.00	Steel		

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL (ALL WELLS)

Date Measured	Depth Below Ground Surface
09/16/1992	200.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
09/16/1992	Air Lift	2.00	00:30	545	00:01	450

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	12.00	Organics		loam				

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
12	112		bedrock							
112	212		bedrock							
212	312		bedrock							
312	412		bedrock							
412	512		bedrock							
512	545		bedrock							

12'

MassDEP

Well Completion Report

WELL LOCATION

GPS North:	GPS West:	Assessors Map:
Address: 28 Durham Drive		Assessors Lot:
Sub Division:		Permit Number:
City/Town: LYNNFIELD		Date Issued:
Board Of Health Permit Obtained: NR		

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Irrigation	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:

Disinfected:

Total Well Depth: 1,175.00

Fracture Enhancement:

Well Seal Type:

Depth to Bedrock: 15.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:

Type:

Nominal Pump Capacity:

Intake Depth:

Horsepower:

Comments: Geographic Description-----Well is located 50ft S of Durham Drive, 0.1 mi S of intersection with Lowell St. Water-bearing rock/unconsolidated material Description: med black rock Well recovery data missing.

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	40.00	Steel	17#	

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL(ALL WELLS)

Date Measured	Depth Below Ground Surface
09/19/1989	25.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
09/06/1989	Air Lift	3.00	01:00	1175		

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	15.00	Gravel						

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
15	115		med black rock							
115	215		med black rock							
215	315		med black rock							
315	415		med black rock							
415	515		med black rock							
515	615		med black rock							
615	715		med black rock							
715	815		med black rock							
815	915		med black rock							
915	1015		med black rock							
1015	1115		med black rock							
1115	1175		med black rock							

MassDEP

Well Completion Report

WELL LOCATION

GPS North:	GPS West:	Assessors Map:
Address: 15 Pocahontas Way		Assessors Lot:
Sub Division:		Permit Number:
City/Town: LYNNFIELD		Date Issued:
Board Of Health Permit Obtained:		

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Domestic	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:

Disinfected:

Total Well Depth:

Fracture Enhancement:

Well Seal Type:

Depth to Bedrock: 67.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:

Type:

Nominal Pump Capacity:

Intake Depth:

Horsepower:

Comments: Geographic Description-----Well is located 40ft W of Pocahontas Way, 0.1 mi N of intersection with Lowell St.Gravel Pack Well: YDiameter: Total well depth undocumented.Unclear if depth to bedrock is 65 ft; bedrock geology extends to 67 ft BGS? Unconsolidated well: medium gravel.

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	60.00	Steel		

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter
60.00	65.00		0.03	

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL(ALL WELLS)

Date Measured	Depth Below Ground Surface
05/06/1989	16.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
05/04/1989		34.00	02:00	18		

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	1.00	Organics		loam				
1.00	20.00			sand				
20.00	40.00	Gravel						
40.00	60.00	Gravel						
60.00	65.00	Gravel						
65.00	67.00			rock/broken				

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft

67'

MassDEP

Well Completion Report

WELL LOCATION

GPS North:	GPS West:	Assessors Map:
Address: 8 Mohawk Lane		Assessors Lot:
Sub Division:		Permit Number:
City/Town: LYNNFIELD		Date Issued:
Board Of Health Permit Obtained: NR		

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Irrigation	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:

Disinfected:

Total Well Depth: 800.00

Fracture Enhancement:

Well Seal Type:

Depth to Bedrock: 5.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:

Type:

Nominal Pump Capacity:

Intake Depth:

Horsepower:

Comments: Geographic Description-----Well is located 100ft N of Mohawk Lane, 0.25 mi N of intersection with Lowell street Water-bearing rock/unconsolidated material Description: med-soft gray rock

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	20.00	Steel	17#	

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL(ALL WELLS)

Date Measured	Depth Below Ground Surface
05/28/1994	20.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
05/28/1994	Air Lift	7.00	01:00	800	03:15	20

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	5.00	Artificial Fill						

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
5	105		med gray rock							
105	205		med gray rock							
205	305		med gray rock							
305	405		med gray rock							
405	505		med gray rock							
505	600		med gray rock							
600	700		soft gray rock							
700	800		soft gray rock							

MassDEP

Well Completion Report

WELL LOCATION

GPS North:	GPS West:	Assessors Map:
Address: 7 Smith Farm Trail		Assessors Lot:
Sub Division:		Permit Number:
City/Town: LYNNFIELD		Date Issued:
Board Of Health Permit Obtained:		

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
New Well	Domestic	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:

Disinfected:

Total Well Depth: 705.00

Fracture Enhancement:

Well Seal Type:

Depth to Bedrock: 71.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:

Type:

Nominal Pump Capacity:

Intake Depth:

Horsepower:

Comments: Water-bearing rock/unconsolidated material Description: graniteGravel Pack Well: NDiameter: Water quality tests made: Chemical, BiologicalDrawdown and well recovery data missing.Water-bearing rocks: unidentified.

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	97.00	Steel		

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL(ALL WELLS)

Date Measured	Depth Below Ground Surface
04/01/1989	36.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
04/01/1989		0.33				

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	20.00	Gravel						
20.00	40.00	Gravel						
40.00	60.00	Gravel						
60.00	71.00	Gravel						

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
71	171		bedrock							
171	271		bedrock							
271	371		bedrock							
371	471		bedrock							
471	571		bedrock							
571	671		bedrock							
671	705		bedrock							

71'

MassDEP Well Completion Report

WELL LOCATION

GPS North:	GPS West:	Assessors Map:
Address: 3 Lil's Way		Assessors Lot:
Sub Division:		Permit Number:
City/Town: LYNNFIELD		Date Issued:
Board Of Health Permit Obtained: Y		

Work Performed	Well Type	Drilling Method Overburden	Drilling Method Bedrock
Hydrofracture	Irrigation	Air Rotary	Air Rotary

ADDITIONAL WELL INFORMATION

Developed:

Disinfected:

Total Well Depth: 500.00

Fracture Enhancement:

Well Seal Type:

Depth to Bedrock: 8.00

PERMANENT PUMP (IF AVAILABLE)

Pump Description:

Type:

Nominal Pump Capacity:

Intake Depth:

Horsepower:

Comments: Geographic Description-----Well is located 300ft E of Lil's Way, 0.1 mi S of intersection with Lowell street
Water-bearing rock/unconsolidated material Description: dark blue rock
Well is hydrofractured to yield 5 gpm.

CASING

From(ft)	To(ft)	Type	Thickness	Diameter
0.00	20.00	Steel		

SCREEN

From(ft)	To(ft)	Type	slotsize	Diameter

WELL SEAL / FILTER PACK / ABANDONMENT MATERIAL

From(ft)	To(ft)	Material Description	Purpose

STATIC WATER LEVEL(ALL WELLS)

Date Measured	Depth Below Ground Surface
08/19/1996	22.00

WELL TEST DATA (ALL SECTIONS MANDATORY FOR PRODUCTION WELLS)

Date	Method	Yield(GPM)	Time Pumped (hrs & min)	Pumping Level (Ft. BGS)	Time To Recover (Hrs & min)	Recovery
08/19/1996	Air Lift	5.00	01:30	500	00:30	30

OVER BURDEN

From(ft)	To(ft)	Lithology	Color	Comment	Water Zone	Loss / Add of Fluid	Drill Stem Drop	Drill Rate
0.00	2.00	Organics						
2.00	8.00	Gravel						

BEDROCK

From(ft)	To(ft)	Lithology	Comment	Water Zone	Drill Stem Drop	Extra Large	Drill Rate	Rust Stain	Loss / Add Of Fluid	# of Fract Per Ft
8	108		bedrock							
108	208		bedrock							
208	308		bedrock							
308	408		bedrock							
408	500		bedrock							

8'

