

603 Salem Street  
Wakefield, MA 01880  
Tel: (781) 246-2800  
Fax: (781) 246-7596

Nantucket, MA 02554  
Tel: (508) 228-7909

Refer to File No. LYF-0934A

April 8, 2021

Conservation Commission  
55 Summer Street  
Lynnfield, MA 01940

RE: Response to Stormwater Technical Peer Review  
160 Moulton Drive, Lynnfield

Dear Commission Members,

The following response is provided to the letter sent to Nina Pickering-Cook of Anderson & Kreiger, LLP, 50 Milk Street, Boston, MA 02109 regarding a Stormwater Technical Peer Review provided for 160 Moulton Drive in Lynnfield, MA by Gregory Rogowski, Civil Designer of ESS Group, Inc.

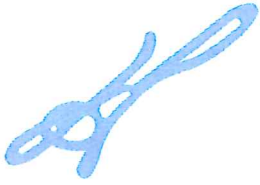
The above-captioned memo was provided the Lynnfield Conservation Commission on March 16, 2021, indicating that it raised serious questions on the Stormwater Permit Application submitted by 160 Moulton Drive LLC. We do not agree and provide the following in reply. The bold headings in this response are correspondent to the bold headings contained in that review.

**Site Plan – Drawing No. C1, revised on March 4, 2021.**

As it relates to the response of item 26, the double-grate design was to pass the 100-year storm. It was only mentioned that flow down the walk would be provided as an emergency spillway. As to the fact that it would be a slipping hazard for pedestrians during winter weather conditions, it is not anticipated that that walkway would be used in such conditions and was designed only for access from the proposed dedicated Little League spaces during the baseball season, which does not generally occur with winter weather conditions. In any event, I do not believe this is a concern for the Stormwater Permit.

**Erosion & Sedimentation Plan – Drawing No. C5, revised on March 4, 2021.**

Very minor grading was shown in the western and northwestern portion of Suntaug Avenue, with a small area outside the proposed silt fence as we did not want to install a silt fence and block access to the gate along the southerly line of Newhall Park. This area is not steep and is unlikely to cause anything significant as far as erosion is concerned. If thought to be necessary,



To: Lynnfield Conservation Commission  
RE: 160 Moulton Drive, Lynnfield, MA  
Date: April 8, 2021

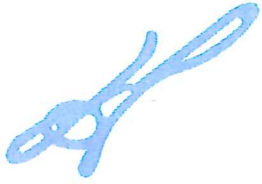
jute mat could be utilized if that small disturbance occurs. The area of proposed jute mat, if required, has been shown on the plan. We have also extended the silt fence on the westerly bound adjoining Oak Street. All erosion control is subject to review, during construction, by the Conservation Administrator.

### **MADEP Stormwater Standards**

- 1) The applicant provided sufficient information to determine that there would be a reduction in peak flow rate (and volume) toward Newhall Park (Standard 2). The 2-year flow reduction is 1.99 cfs, or 64%, and the 2-year volume reduction is 6,035 cfs, or 61%, all presented in the original submission.
- 2) The applicant provided information that, in this redevelopment project, there was a large reduction in impervious area and that the runoff volume had been reduced by over 50% in all storms, indicating that there is no loss of annual recharge to the groundwater, but actually an increase in recharge. We believe that is sufficient to meet Standard 3. Note that all decrease in runoff volume is recharged. (See attached calculations.)
- 3) The review is inconclusive as to what data was requested under the Special Permits and not provided, so we cannot respond. The applicant did submit a Stormwater Report and Stormwater Report Checklist and Certification with the Application for the Stormwater Permit. Note that reference is made to a Notice of Intent which this project does not require as it is outside Conservation jurisdiction, under MGL Chapter 131, Section 40.

### **Watershed Maps – Drawing No. WSE dated July 6, 2018, Drawing No. WSP, revised on September 6, 2018.**

- 1) The watershed maps you refer to are not the final watershed maps utilized for the proposed flow. They were watershed maps utilized for runoff comparison from the site itself. It is perfectly applicable to utilize an arbitrary boundary for that purpose, being a property line, limit of activity line or other convenient boundary. The total runoff was finally calculated by adding the small watersheds you mention in a revised watershed boundary plan submitted with the February 12, 2021 submission.
- 2) Time of concentration flow paths were not indicated as, due to the small size of the watersheds, less than half an acre, a minimum concentration time of 6 minutes was used for all the watersheds. No other professional engineer reviewing this project was concerned with that approach.



To: Lynnfield Conservation Commission  
RE: 160 Moulton Drive, Lynnfield, MA  
Date: April 8, 2021

We have calculated the actual concentration times, as follows:

|    |   |
|----|---|
| E1 | 1.7 minutes                             |
| E2 | 2.0 minutes                             |
| P1 | the building                            |
| P2 | 4.7 minutes                             |
| P3 | 6.2 minutes (6 minutes is conservative) |
| P4 | 1.7 minutes                             |

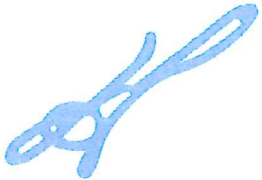
Six (6) minutes is the normal minimum concentration time used for these calculations. See attached watershed maps with flow paths.

**HydroCAD Stormwater Calculations – Existing Conditions printed July 6, 2018, Proposed Conditions printed February 16, 2021.**

- 1) This comment does not indicate wherein the consultant believes the HydroCAD analysis did not reflect the proposed closed drainage system.
- 2) The reason for the direct entry of the 6 minute concentration times was previously explained.
- 3) The infiltration rates used was 8.27 inches per hour and, while the letter indicates that the soil evaluator test holes indicated a 3.7 inch per hour infiltration rate, that was an incorrect number. The soil evaluator holes indicated that the 8.27 rate for a sand was acceptable; the soil being a coarse sand. (See Soil Suitability Assessment sheets attached.)
- 4) The undersigned is well aware of the so-called “Cornell Study” and while it has been adopted by some towns, it has not been adopted by the Town of Lynnfield, nor has it been adopted by the Department of Environmental Protection. In any event, no matter what rainfall data is utilized, the benefits of this redevelopment project will still be demonstrated.

**Infiltration Chambers**

- 1) Whereas the subsurface disposal system is infiltrating only roof runoff, and in fact roof runoff which has gone through a gas trap and deep sump manhole, pollutant removal issues should not be of concern. As such, roof runoff is presumed clean. Volume 1, Chapter 1 of the Stormwater Regulations states: “Runoff from non-metal roofs may be discharged to a dry well without any pretreatment”. No treatment in the soil would be required.



To: Lynnfield Conservation Commission  
RE: 160 Moulton Drive, Lynnfield, MA  
Date: April 8, 2021

- 2) Estimated seasonal high groundwater table elevation and test hole information has been provided by a Massachusetts licensed soil evaluator and was shown on the revised plans submitted on March 8, 2021. (See attached Soil Suitability Assessment sheets.)
- 3) The site plan shows an adequate separation distance of the septic system to the infiltration chamber, and the Linden Engineering Special Condition was only to require a view of the final septic system design to ensure that separation distance is met. A 25-foot separation distance is shown.

We look forward to the opportunity of discussing this report with ESS at your next meeting and getting their response.

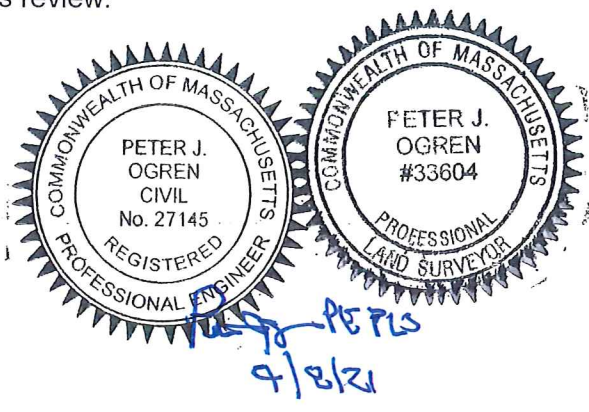
In addition to the soil forms, we are also providing the amended Operation and Maintenance Plan for the deep sump manhole, and a revised "Erosion and Sedimentation Plan" to reflect the requested changes, as a result of this review.

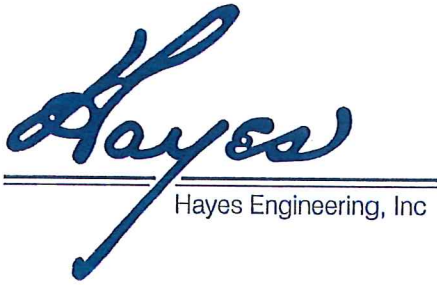
Very truly yours,

Peter J. Ogren, P.E., P.L.S.  
President

PJO/dab  
Enclosures

- cc: Charlie Richter – Town Engineer
- Dave Palumbo – 160 Moulton Drive, LLC
- Attorney Ted Regnante
- Nina Pickering-Cook – Anderson & Kreiger, LLP
- Gregory Rogowski – ESS Group





603 Salem Street  
 Wakefield, MA 01880  
 Tel: (781) 246-2800  
 Fax: (781) 246-7596

# Recharge Worksheet

Nantucket, MA 02554  
 Tel: (508) 228-7909

Refer to File No. LYF-0934A

## Required Recharge Volume:

The *Required Recharge Volume* equals a depth of runoff corresponding to the soil type times the impervious areas covering that soil type at the post-development site.

$$R_v = F \times A_{\text{impervious}}$$

Where:

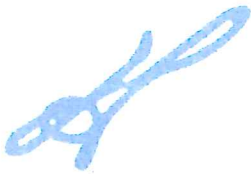
$R_v$  is the Required Recharge Volume  
 F is the Target Depth Factor associated with each Hydrologic Soil Group  
 $A_{\text{impervious}}$  is the proposed pavement and rooftop area at the site

| NRCS HYDROLOGIC SOIL TYPE | APPROX. SOIL TEXTURE | TARGET DEPTH FACTOR (F) |
|---------------------------|----------------------|-------------------------|
| A                         | sand                 | 0.6-inch                |
| B                         | loam                 | 0.35-inch               |
| C                         | silty loam           | 0.25-inch               |
| D                         | clay                 | 0.1-inch                |

*Recharge Target Depth by Hydrologic Soil Group*

## Required Recharge Volume Calculation

| NRCS Hydrologic Soil Group            | Target Depth Factor (F) (inches) | Proposed Impervious Area (A) (square feet) | Required Recharge Volume (Rv) (cubic feet) |
|---------------------------------------|----------------------------------|--|--|
| A (sand)                              | 0.60                             | 43,474                                     | 2,174                                      |
| B (loam)                              | 0.35                             | 0  | 0  |
| C (silty loam)                        | 0.25                             | 0  | 0  |
| D (clay)                              | 0.10                             | 0  | 0  |
| <b>Total Recharge Volume Required</b> |                                  |  | <b>2,174</b>                               |



**Draw Down Analysis:**

*Static Method:*

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where:

Rv is the Storage Volume Provided  
 K is the Saturated Hydraulic Conductivity (for "Static" Method, use Rawls Rate)  
 Bottom Area is the Bottom Area of Recharge Structure

**1982 Rawls Rates**

| Texture Class   | NRCS Hydrologic Soil Group (HSG) | Infiltration Rate Inches/Hour |
|-----------------|----------------------------------|-------------------------------|
| Sand            | A                                | 8.27                          |
| Loamy Sand      | A                                | 2.41                          |
| Sandy Loam      | B                                | 1.02                          |
| Loam            | B                                | 0.52                          |
| Silt Loam       | C                                | 0.27                          |
| Sandy Clay Loam | C                                | 0.17                          |
| Clay Loam       | D                                | 0.09                          |
| Silty Clay Loam | D                                | 0.06                          |
| Sandy Clay      | D                                | 0.05                          |
| Silty Clay      | D                                | 0.04                          |
| Clay            | D                                | 0.02                          |

**INFILTRATION AREA 1P:**  $Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$

$$= \frac{2,174\ cf}{(8.27/hr)(1'/12)(1,854sf)} = 1.7\ hours$$

LYF-0934A

www.hayeseng.com

Commonwealth of Massachusetts  
City/Town of LYNNFIELD  
Form 11 - Soil Suitability Assessment

A. Facility Information

Owner Name  
TOP TIER PROPERTIES

Street Address  
93 MAPLE ST

City  
MALDEN

State  
MA

Map/Lot #  
02148

Zip Code

B. Site Information

1. (Check one)  New Construction  Upgrade  Repair

2. Soil Survey Available?  Yes  No

URBAN LAND

Soil Name

If yes: NRCS  
Source

602  
Soil Map Unit

Soil Limitations

Geologic/Parent Material

3. Surficial Geological Report Available?  Yes  No

4. Flood Rate Insurance Map

Above the 500-year flood boundary?  Yes  No  
If Yes, continue to #5.

5. Within a velocity zone?  Yes  No

6. Within a Mapped Wetland Area?  Yes  No

7. Current Water Resource Conditions (USGS):

Month/Year

8. Other references reviewed:

Landform

If yes:

Year Published/Source

Publication Scale

Map Unit

Within the 100-year flood boundary?  Yes  No

MassGIS Wetland Data Layer:

Wetland Type

Range:  Above Normal  Normal  Below Normal



Commonwealth of Massachusetts  
 City/Town of **LYNNFIELD**  
 Form 11 - Soil Suitability Assessment

F.

G. Soil Evaluator Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

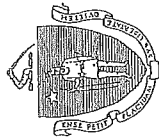
  
 Signature of Soil Evaluator SE2074

Gordon Rogerson SE2074  
 Typed or Printed Name of Soil Evaluator / License #

Feb. 23, 2021

Date  
 June 30, 2022  
 Expiration Date of License





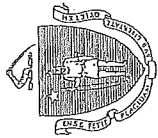
Commonwealth of Massachusetts  
 City/Town of LYNNFIELD  
 Form 11 - Soil Suitability Assessment

C. On-Site Review (continued)

Deep Observation Hole Number: SWM 1 Date: 2-23-21 Time: \_\_\_\_\_  
 Weather: PTLY CLDY 38°

- Location 160 MOULTON DRIVE  
 Ground Elevation at Surface of Hole: \_\_\_\_\_ feet  
 Latitude/Longitude: \_\_\_\_\_
- Land Use PARKING LOT  
 (e.g., woodland, agricultural field, vacant lot, etc.)  
 Vegetation NONE Surface Stones (e.g., cobbles, stones, boulders, etc.) NONE Slope (%) \_\_\_\_\_  
 Position on Landscape (SU, SH, BS, FS, Wetlands 7100 feet
- Distances from: \_\_\_\_\_  
 Open Water Body \_\_\_\_\_ Landform \_\_\_\_\_ Drainage Way \_\_\_\_\_ feet  
 Property Line \_\_\_\_\_ Drinking Water Well \_\_\_\_\_ feet  
 Other \_\_\_\_\_ feet
- Parent Material: Outwash  
 Unsuitable Materials Present:  Yes  No

- If Yes:  Disturbed Soil  Fill Material  Impervious Layer(s)  Weathered/Fractured Rock  Bedrock  
 Groundwater Observed:  Yes  No If Yes: \_\_\_\_\_  
 Estimated Depth to High Groundwater: 7120 inches elevation  
 Depth Weeping from Pit: NO Depth Standing Water in Hole: \_\_\_\_\_



Commonwealth of Massachusetts  
 City/Town of **LYNNFIELD**  
 Form 11 - Soil Suitability Assessment

C. On-Site Review (continued)

Deep Observation Hole Number: SWM 1

| Depth (in.) | Soil Horizon/<br>Layer | Soil Matrix: Color-<br>Moist (Munsell) | Redoximorphic Features |       | Soil Texture<br>(USDA) | Coarse Fragments<br>% by Volume |        | Soil Structure | Soil<br>Consistence<br>(Moist) | Other |
|-------------|------------------------|--|------------------------|-------|------------------------|---------------------------------|--------|----------------|--------------------------------|-------|
|             |                        |  | Depth                  | Color |                        | Percent                         | Gravel |                |                                |       |
| 0-2         | PAVEMENT               |  |                        |       | GR                     | 20                              | 0/0    | gr             | m                              |       |
| 2-36        | H7M                    |  |                        |       | Fs1                    | 0                               | 0/0    | gr             | mfr                            |       |
| 36-44       | Apb                    | 10YR 3/3                               |                        |       | S1                     | 0                               | 0/0    | m              | mfr                            |       |
| 44-65       | Bwb                    | 10YR 5/4                               |                        |       | 1fs                    | 0                               | 0/0    | m              | mfr                            |       |
| 65-87       | C1                     | 10YR 5/8                               |                        |       | CS                     | 30                              | 0/0    | sg             | mfr                            |       |
| 87-120      | C2                     | 10YR 4/4                               | 7120                   |       |                        |                                 |        |                |                                |       |

Additional Notes:



Commonwealth of Massachusetts  
 City/Town of LYNNFIELD  
 Form 11 - Soil Suitability Assessment

C. On-Site Review (continued)

Deep Observation Hole Number: SWM.2 Date: 2/23/21 Time: \_\_\_\_\_ Weather: Partly cloudy 38°

1. Location 160 MOULTON DRIVE Ground Elevation at Surface of Hole: \_\_\_\_\_ feet Latitude/Longitude: \_\_\_\_\_

2. Land Use PARKING LOT Surface Stones (e.g., cobbles, stones, boulders, etc.) NONE Slope (%) \_\_\_\_\_  
 (e.g., woodland, agricultural field, vacant lot, etc.)  
NONE

3. Distances from: Vegetation \_\_\_\_\_ Landform \_\_\_\_\_ Position on Landscape (SU, SH, BS, FS, Wetlands) 7/00 feet  
 Open Water Body 420 feet Drainage Way \_\_\_\_\_  
 Property Line \_\_\_\_\_ Drinking Water Well \_\_\_\_\_ Other \_\_\_\_\_  
45 feet

4. Parent Material: OUTWASH Unsuitable Materials Present:  Yes  No

If Yes:  Disturbed Soil  Fill Material  Impervious Layer(s)  Weathered/Fractured Rock  Bedrock

5. Groundwater Observed:  Yes  No If Yes: \_\_\_\_\_ Depth Weeping from Pit NO Depth Standing Water in Hole \_\_\_\_\_

Estimated Depth to High Groundwater: 7 inches 120 elevation



Commonwealth of Massachusetts  
 City/Town of LYNNFIELD  
 Form 11 - Soil Suitability Assessment

C. On-Site Review (continued)

Deep Observation Hole Number: SWA 2

| Depth (in.) | Soil Horizon/<br>Layer | Soil Matrix Color-<br>Moist (Munsell) | Redoximorphic Features |       |         | Soil Texture<br>(USDA) | Coarse Fragments<br>% by Volume |                     |    | Soil<br>Consistence<br>(Moist) | Other |
|-------------|------------------------|---------------------------------------|------------------------|-------|---------|------------------------|---------------------------------|---------------------|----|--------------------------------|-------|
|             |                        |                                       | Depth                  | Color | Percent |                        | Gravel                          | Cobbles<br>& Stones |    |                                |       |
| 0-96        | HTM                    | (FILL)                                |                        |       |         |                        |                                 |                     |    |                                |       |
| 96-120      | C                      | 10YR 4/4                              | 7-120"                 |       |         | CS                     | 20                              | 90                  | 59 | mvf                            |       |
|             |                        |                                       |                        |       |         |                        |                                 |                     |    |                                |       |
|             |                        |                                       |                        |       |         |                        |                                 |                     |    |                                |       |
|             |                        |                                       |                        |       |         |                        |                                 |                     |    |                                |       |
|             |                        |                                       |                        |       |         |                        |                                 |                     |    |                                |       |
|             |                        |                                       |                        |       |         |                        |                                 |                     |    |                                |       |

Additional Notes:

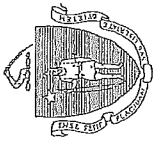
---



---



---



Commonwealth of Massachusetts  
 City/Town of LYNNFIELD  
 Form 11 - Soil Suitability Assessment

**D. Determination of High Groundwater Elevation**

1. Method Used:
- Depth observed standing water in observation hole
  - Depth weeping from side of observation hole.
  - Depth to soil redoximorphic features (mottles)
  - Depth to adjusted seasonal high groundwater ( $S_h$ ) (USGS methodology)

Index Well Number \_\_\_\_\_ Reading Date \_\_\_\_\_

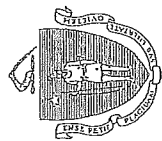
$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$

Obs. Hole # \_\_\_\_\_  $S_c$  \_\_\_\_\_  $S_r$  \_\_\_\_\_  $OW_c$  \_\_\_\_\_  $OW_{max}$  \_\_\_\_\_  $OW_r$  \_\_\_\_\_  $S_h$  \_\_\_\_\_

Obs. Hole # \_\_\_\_\_  $S_c$  \_\_\_\_\_  $S_r$  \_\_\_\_\_  $OW_c$  \_\_\_\_\_  $OW_{max}$  \_\_\_\_\_  $OW_r$  \_\_\_\_\_  $S_h$  \_\_\_\_\_

**E. Depth of Pervious Material**

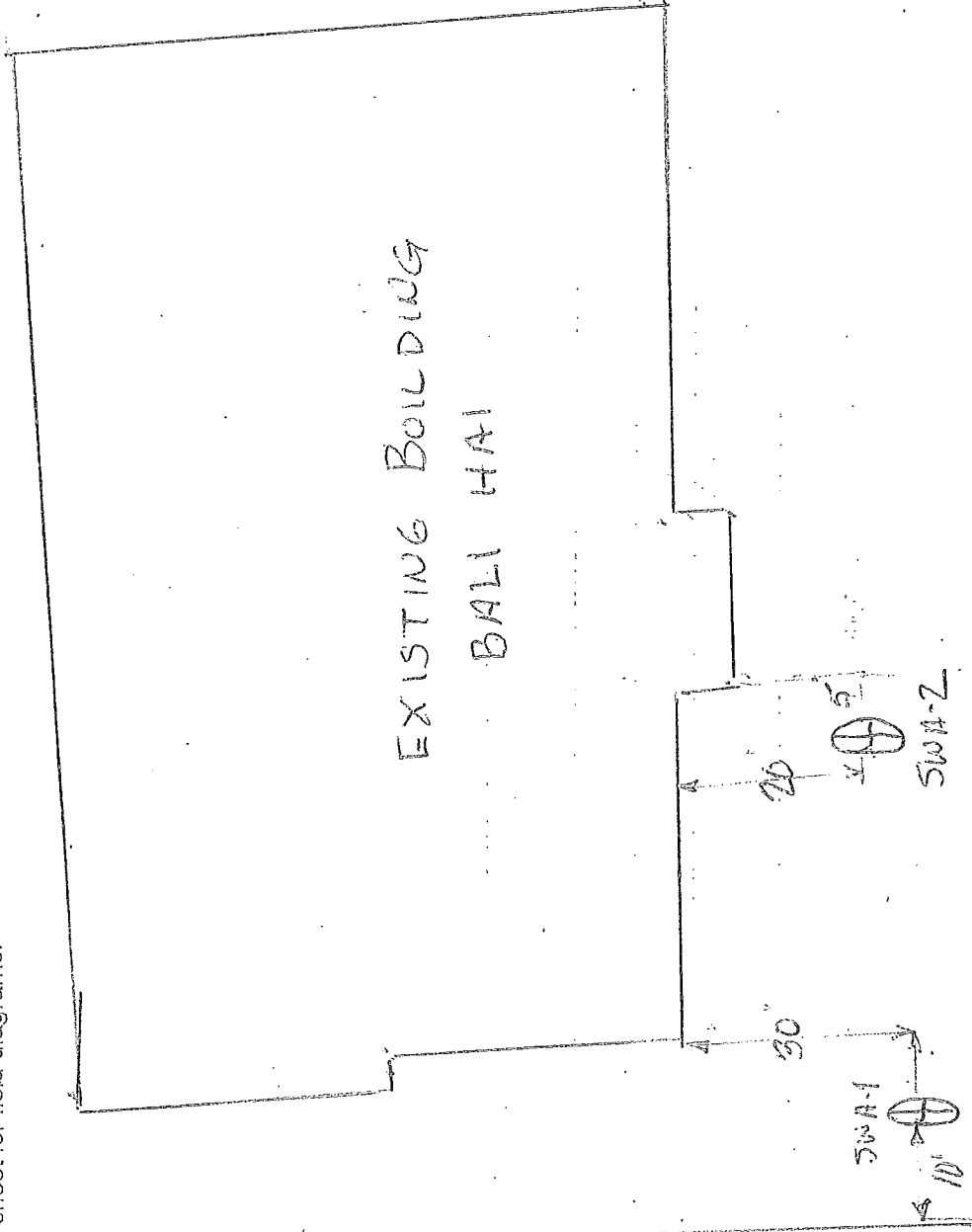
1. Depth of Naturally Occurring Pervious Material
- a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area
- Yes  No
- b. If yes, at what depth was it observed? Upper boundary: \_\_\_\_\_ inches Lower boundary: \_\_\_\_\_ inches
- c. If no, at what depth was impervious material observed? Upper boundary: \_\_\_\_\_ inches Lower boundary: \_\_\_\_\_ inches



Commonwealth of Massachusetts  
 City/Town of **LYNNFIELD**  
 Form 11 - Soil Suitability Assessment

Field Diagrams

Use this sheet for field diagrams:



**OPERATION AND MAINTENANCE PLAN AND  
LONG-TERM POLLUTION PREVENTION PLAN**

**160 MOULTON DRIVE  
LYNNFIELD, MASSACHUSETTS**

**Date: July 6, 2018**  
**Revised March 3, 2021**  
**Revised April 8, 2021**



Hayes Engineering, Inc.  
603 Salem Street  
Wakefield, MA 01880  
Tel: (781) 246-2800

**OPERATION AND MAINTENANCE PLAN AND  
LONG-TERM POLLUTION PREVENTION PLAN  
160 MOULTON DRIVE  
LYNNFIELD, MASSACHUSETTS**

July 6, 2018  
Revised March 3, 2021  
Revised April 8, 2021

**GENERAL**

The management plan incorporates the following structural Best Management Practices to infiltrate stormwater runoff from the proposed residential development.

1. Deep Sump Catch Basins with Gas Trap/ **Manhole Structure**
2. Stormwater Infiltration Chambers (StormTech DC-780)
3. Hydrodynamic Particle Separator (Contech CDS-4 Unit)
4. Street & Parking Lot Sweeping

These stormwater management facilities have unique characteristics, uses, planning considerations and maintenance requirements. The maintenance requirements, as suggested by the DEP in "Volume 2 Chapter 2: Structural BMP Specifications for the Massachusetts Stormwater Handbook", and the suggested schedules, are summarized in the following sections. It is suggested that the following guidelines be adhered to for a one-year cycle following completion of the project, then adjusted, as necessary, based on the results of the required inspections, unless otherwise stated. Locations of the catch basin, particle separator, and subsurface chamber treatment BMPs installed at this residential development are shown on the accompanying Hayes Engineering, Inc. plan titled "Stormwater Maintenance Plan, #160 Moulton Drive, Lynnfield, Mass." dated March 4, 2021.

**Deep Sump Catch Basin and Manhole Structure**

- Inspect catch basins **and manhole structures** at least 4 times yearly to identify presence of component damage, clogs, and trash and sediment accumulations.
- Inlets should be cleaned with a vacuum truck to remove sediment, trash, and petroleum at least four (4) times per year, including in April and November, after heavy rain and petroleum or chemical spills, and when sediment level is at least ½ depth from the invert of the lowest pipe in the basin to the bottom of the basin.
- Damaged grates, basin, and hood components **and any damage to manhole covers and structures** noted during inspections shall be promptly repaired or replaced to ensure full function of these pre-treatment devices.
- All sediments and hydrocarbons should be properly handled and disposed, in accordance with local, state and federal guidelines and regulations.



### **Stormwater Management Area (StormTech DC-780 Subsurface Chambers)**

Chamber manufacturer StormTech recommends that inspection be conducted every six (6) months for the first year and at least annually thereafter, and if significant sediment accumulation is found, cleaning with a JetVac machine should be performed, as outlined in their "O & M Isolator® Row Manual". The Manual is attached hereon and further found at: ([https://www.stormtech.com/download\\_files/pdf/11011\\_StormTechIsolatorOMManual.pdf](https://www.stormtech.com/download_files/pdf/11011_StormTechIsolatorOMManual.pdf)).

Subsurface chamber systems are prone to failure due to clogging. Regulating the sediment and petroleum product input to the proposed system is the priority maintenance activity. Sediments and any oil spillage should be trapped and removed before they reach the chambers. Catch basin and proprietary particle separator pre-treatment devices which flow into the infiltration system shall be regularly cleaned according to the maintenance schedules provided herein to prevent fine sediments and debris from entering and clogging the subsurface system. Hayes Engineering, Inc. recommends the following inspection schedule in addition to that provided in the above-referenced StormTech O & M Manual to ensure that the chambers function well into the future.

- The Contractor shall verify that the required crushed stone and geotechnical fabric materials are clean and free of sediments and petroleum residue prior to, during and after the chamber system installation.
- Inspections of the chamber system shall be made by a registered profession engineer after every major storm for the first few months after construction to verify that proper function has been achieved. During these initial inspections, water levels in the chambers should be measured and recorded in a permanent log over several days to check the drainage duration and verify that sediments are not accumulating. If ponded water is present after 24 hours or an accumulation of sediment or debris is noted within the chambers, the Homeowners Association (or designated property manager) and engineer shall determine the cause for this condition and devise an action plan to improve system functionality. Any required maintenance or major repair will be documented in the permanent logbook and be completed within seven business days, with a report of such to the Lynnfield Town Engineer and Conservation Commission.
- Once the chamber system has been verified to perform as designed, interior chamber conditions shall be inspected at least annually. Post construction inspections (to be conducted through inspection ports) shall consist of documenting interior chamber and bed conditions, measured water depth, and presence of sediment. If inspection indicates that the system is clogged (ponding water present after 24 hours or sediment accumulations present), replacement or major repair actions may be required as determined by a professional engineer. In this case, the Homeowners Association (or designated property manager) and engineer shall determine the cause for this condition and devise an action plan. Any required maintenance or major repair will be documented in the permanent log book and be completed within seven business days, with a report of such to the Lynnfield Town Engineer and Conservation Commission.
- The inspection and maintenance responsibility for the subsurface system shall belong to the Property Owner, Homeowner's Association, and designated property manager.

### **Contech CDS Hydrodynamic Separator**

Regulating the input to the proposed water quality system is the priority maintenance activity. Sediments and any oil spillage should be trapped and removed before they reach the chambers.

- CDS units should be inspected least twice a year (i.e. spring and fall) and cleaned at least once a year, adjusting frequency based on evaluations of sediment and pollutant accumulation as recommended by the manufacturer (further described in the attached Contech “CDS® Inspection and Maintenance Guide” obtained from the Contech website (<https://www.conteches.com/technical-guides/search?filter=08DV04355M>) and as summarized below).
- CDS unit cleaning shall occur when the isolated sump is filled with sediment, trash, and other pollutants to 75% capacity and at least on an annual basis but is likely to vary widely based on site conditions. Typical maintenance cleaning is done with a commercial vacuum truck. Inspection for the CDS unit will include both visual inspection of components and quantification of the sediment load and oil and grease volumes. Access is gained through designated manhole covers and sediment measurement is easily made from the surface with a tube dipstick with ball valve, tape measure, or other measuring device inserted through the open manhole. Sample log sheets for recording observation and maintenance is provided in the Maintenance Guide and attached hereon. All sediment and oil waste materials shall be disposed of in accordance with all Federal, State, and Local regulations.
- The inspection and maintenance responsibility for the CDS hydrodynamic separator unit shall belong to the Property Owner, Homeowner’s Association, and designated property manager.

### **Sweeping**

Parking areas and driveways shall be cleaned with a mechanical sweeper at least annually to control pollutant loading within the stormwater treatment devices. Sweeping frequency may need to be increased based upon evaluation of sediment accumulations within the treatment devices.

### **Removal of Siltation Controls**

All siltation controls, including, but not limited to catch basin silt sacks, compost socks, bales, and silt fence shall be removed, with the approval of the Town Engineer, as soon as practical after paving, re-vegetation and total stabilization of the site. Unvegetated areas remaining in the area of the siltation controls shall be loamed and seeded with the appropriate groundcover to ensure re-vegetation as rapidly as possible after the removal of the siltation controls.

O&M / LPPP  
160 Moulton Drive  
Lynnfield, MA 01940  
July 6, 2018, Revised March 3, 2021, Revised April 8, 2021

**Owner and Maintenance Responsibilities**

In the case of all proposed stormwater management facilities, during construction of the proposed stormwater management system the developer shall be the owner and party responsible for maintenance. Once the development is complete, the Property Owner or Homeowner's Association (if any) will assume the responsibility of on-going maintenance, as well as the long-term pollution prevention plan, unless other legally-binding agreements are established with another entity.

**INSPECTION AND MAINTENANCE REPORT FORM  
 160 MOULTON DRIVE  
 LYNNFIELD, MASSACHUSETTS**

TO BE COMPLETED FOR REQUIRED INSPECTIONS AND MAINTENANCE  
 AT THE FREQUENCY SPECIFIED IN THE OPERATION AND MAINTENANCE PLAN

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Inspector's Title: \_\_\_\_\_

Days Since Last Rainfall: \_\_\_\_\_

Amount of Last Rainfall: \_\_\_\_\_

|   | Treatment BMP                        | BMP Installed at Grade?<br>(circle one) |    | BMP Maintenance Required or performed?<br>(circle one) |    | Corrective Action Needed And Notes |
|---|--------------------------------------|---|----|--|----|------------------------------------|
|   |                                      | Yes                                     | No | Yes  | No |                                    |
| 1 | StormTech DC-780 Subsurface Chambers |   |    |  |    |                                    |
| 2 | Catch Basins-                        |   |    |  |    |                                    |
| 3 | Contech CDS-4 Unit                   |   |    |  |    |                                    |
| 4 |                                      |   |    |  |    |                                    |
| 5 |                                      |   |    |  |    |                                    |
| 6 |                                      |   |    |  |    |                                    |
| 7 |                                      |   |    |  |    |                                    |

Additional Comments:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**LONG TERM POLLUTION PREVENTION PLAN  
160 MOULTON DRIVE  
LYNNFIELD, MASSACHUSETTS**

- Good housekeeping practices: Prevent or reduce pollutant runoff from the project development through the use of street sweeping, erosion control and catch basin cleaning.
- Provisions for storing materials and waste products inside or under cover: All materials stored on site should be stored in a neat and orderly fashion in their appropriate containers and, if possible, under a roof or other secure enclosure. Waste products should be placed in secure receptacles until they are emptied by a licensed solid waste management company in Massachusetts.
- Vehicle washing controls: The project is comprised of an apartment building; therefore, it is not anticipated that vehicles will be washed on site.
- Requirements for routine inspections and maintenance of stormwater BMPs: Follow the guidelines outlined above.
- Spill prevention and response plans:

Prevention: All materials stored on site should be stored in a neat and orderly fashion in their appropriate containers and, if possible, under a roof or other secure enclosure. Products should be kept in their original containers with the original manufacturer's label. Products should not be mixed with one another unless recommended by the manufacturer. If possible, all of the product should be used up before disposing of the container. The Manufacturer's recommendations for proper use and disposal should be followed.

Response: Manufacturer's recommended methods for cleanup should be followed. Spills should be cleaned up immediately after discovery. The spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent injury from contact with a hazardous substance. Spills of toxic or hazardous material shall be reported to the appropriate State and/or local authority in accordance with local and/or State regulations.

- Provisions for maintenance of lawns, gardens, and other landscaped areas: The project is comprised of single family house lots, therefore, these activities should be left up the individual homeowners to schedule and perform.
- Requirements for storage and use of fertilizers, herbicides, and pesticides (Should any questions arise about these materials the Order of Conditions for this project should be consulted if applicable):

Fertilizers: Fertilizers shall be applied in the minimum amounts recommended by the manufacturer. Once applied, fertilizers shall be worked into the soil to limit exposure to stormwater. Storage shall be stored under a roof or other secure enclosure. The contents of any partially used bags of fertilizers shall be transferred to a sealable plastic bag or bin to avoid spills.

Herbicides and Pesticides: Store herbicides and pesticides in original containers that are closed and labeled, in a secure area out of reach of children and pets. Avoid storing in damp areas where containers may become moist or rusty. Herbicides and Pesticides should not be stored near food. Follow the label instructions strictly about where and how much to apply. Do not put herbicides and pesticides in the trash or down the drain. Use rubber gloves when handling and use an appropriate cartridge mask if using products extensively.

- Pet waste management provisions: The project is comprised of an apartment building, the property manager will require individual tenants who own pets to perform the clean up and disposal of their pet waste.
- Provisions for operation and management of septic systems: The project is comprised of an apartment building; therefore, the septic system is privately owned and the responsibility for these activities lies with property manager to schedule and perform.
- Provisions for solid waste management: Waste products should be placed in secure receptacles until they are emptied by a licensed solid waste management company in Massachusetts.
- Snow disposal and plowing plans relative to Wetland Resource Areas: Snow disposal should be in accordance with the Bureau of Resource Protection Snow Disposal Guidelines, Guideline No. BRPG01-01 effective December 21, 2015.
- Winter Road Salt and/or Sand Use and Storage restrictions:

Road Salt: Use and storage should be in accordance with the Bureau of Resource Protection Drinking Water Program Guidelines on Deicing Chemical (Road Salt) Storage, Guideline No. DWSG97-1 effective December 19, 1997, a copy of which is attached.

Sand: Whenever possible, use of environmentally friendly alternatives, i.e. calcium chloride and sand instead of salt for melting ice should be considered.

- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan: The responsibility lies with the property manager.

O&M / LPPP  
160 Moulton Drive  
Lynnfield, MA 01940  
July 6, 2018, Revised March 3, 2021, Revised April 8, 2021

Effective Date: March 8, 2001

Guideline No. BRPG01-01

Applicability: Applies to all federal, state, regional and local agencies, as well as to private businesses.

Supersedes: BRP Snow Disposal Guideline BRPG97-1 issued 12/19/97, and all previous snow disposal guidance

Approved by: Glenn Haas, Assistant Commissioner for Resource Protection

PURPOSE: To provide guidelines to all government agencies and private businesses regarding snow disposal site selection, site preparation and maintenance, and emergency snow disposal options that are acceptable to the Department of Environmental Protection, Bureau of Resource Protection.

APPLICABILITY: These Guidelines are issued by the Bureau of Resource Protection on behalf of all Bureau Programs (including Drinking Water Supply, Wetlands and Waterways, Wastewater Management, and Watershed Planning and Permitting). They apply to public agencies and private businesses disposing of snow in the Commonwealth of Massachusetts.

## INTRODUCTION

Finding a place to dispose of collected snow poses a challenge to municipalities and businesses as they clear roads, parking lots, bridges, and sidewalks. While we are all aware of the threats to public safety caused by snow, collected snow that is contaminated with road salt, sand, litter, and automotive pollutants such as oil also threatens public health and the environment.

As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and are toxic to aquatic life at certain levels. Sand washed into waterbodies can create sand bars or fill in wetlands and ponds, impacting aquatic life, causing flooding, and affecting our use of these resources.

There are several steps that communities can take to minimize the impacts of snow disposal on public health and the environment. These steps will help communities avoid the costs of a contaminated water supply, degraded waterbodies, and flooding. Everything we do on the land has the potential to impact our water resources. Given the authority of local government over the use of the land, municipal officials and staff have a critically important role to play in protecting our water resources.

The purpose of these guidelines is to help municipalities and businesses select, prepare, and maintain appropriate snow disposal sites before the snow begins to accumulate through the winter.

## RECOMMENDED GUIDELINES

These snow disposal guidelines address: (1) site selection; (2) site preparation and maintenance; and (3) emergency snow disposal.

### 1. SITE SELECTION

The key to selecting effective snow disposal sites is to locate them adjacent to or on pervious surfaces in upland areas away from water resources and wells. At these locations, the snow meltwater can filter in to the soil, leaving behind sand and debris which can be removed in the springtime. The following areas should be avoided:

- Avoid dumping of snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.
- Do not dump snow within a Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply well or within 75 feet of a private well, where road salt may contaminate water supplies.
- Avoid dumping snow on MassDEP-designated high and medium-yield aquifers where it may contaminate groundwater (see the next page for information on ordering maps from MassGIS showing the locations of aquifers, Zone II's, and IWPAs in your community).
- Avoid dumping snow in sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.
- Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

#### Site Selection Procedures

1. It is important that the municipal Department of Public Works or Highway Department, Conservation Commission, and Board of Health work together to select appropriate snow disposal sites. The following steps should be taken:
2. Estimate how much snow disposal capacity is needed for the season so that an adequate number of disposal sites can be selected and prepared.



3. Identify sites that could potentially be used for snow disposal such as municipal open space (e.g., parking lots or parks).
4. Sites located in upland locations that are not likely to impact sensitive environmental resources should be selected first.
5. If more storage space is still needed, prioritize the sites with the least environmental impact (using the site selection criteria, and local or MassGIS maps as a guide).

#### MassGIS Maps of Open Space and Water Resources

If local maps do not show the information you need to select appropriate snow disposal sites, you may order maps from MassGIS (Massachusetts Geographic Information System) which show publicly owned open spaces and approximate locations of sensitive environmental resources (locations should be field-verified where possible). Different coverages or map themes depicting sensitive environmental resources are available from MassGIS on the map you order. At a minimum, you should order the Priority Resources Map. The Priority Resources Map includes aquifers, public water supplies, MassDEP-approved Zone II's, Interim Wellhead Protection Areas, Wetlands, Open Space, Areas of Critical Environmental Concern, NHESP Wetlands Habitats, MassDEP Permitted Solid Waste facilities, Surface Water Protection areas (Zone A's) and base map features. The cost of this map is \$25.00. Other coverages or map themes you may consider, depending on the location of your city or town, include Outstanding Resource Waters and MassDEP Eelgrass Resources. These are available at \$25.00 each, with each map theme being depicted on a separate map. Maps should be ordered from [MassGIS](#). Maps may also be ordered by fax at 617-626-1249 (order form available from the MassGIS web site) or mail. For further information, contact MassGIS at 617-626-1189.

## 2. SITE PREPARATION AND MAINTENANCE

In addition to carefully selecting disposal sites before the winter begins, it is important to prepare and maintain these sites to maximize their effectiveness. The following maintenance measures should be undertaken for all snow disposal sites:

- A silt fence or equivalent barrier should be placed securely on the downgradient side of the snow disposal site.
- To filter pollutants out of the meltwater, a 50-foot vegetative buffer strip should be maintained during the growth season between the disposal site and adjacent waterbodies.
- Debris should be cleared from the site prior to using the site for snow disposal.
- Debris should be cleared from the site and properly disposed of at the end of the snow season and no later than May 15.

### 3. EMERGENCY SNOW DISPOSAL

As mentioned earlier, it is important to estimate the amount of snow disposal capacity you will need so that an adequate number of upland disposal sites can be selected and prepared.

If despite your planning, upland disposal sites have been exhausted, snow may be disposed of near waterbodies. A vegetated buffer of at least 50 feet should still be maintained between the site and the waterbody in these situations. Furthermore, it is essential that the other guidelines for preparing and maintaining snow disposal sites be followed to minimize the threat to adjacent waterbodies.

Under extraordinary conditions, when all land-based snow disposal options are exhausted, disposal of snow that is not obviously contaminated with road salt, sand, and other pollutants may be allowed in certain waterbodies under certain conditions. In these dire situations, notify your Conservation Commission and the appropriate MassDEP Regional Service Center before disposing of snow in a waterbody.

Use the following guidelines in these emergency situations:

- Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
- Do not dispose of snow in saltmarshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPA's of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
- Do not dispose of snow where trucks may cause shoreline damage or erosion.
- Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local ordinances and bylaws.

#### FOR MORE INFORMATION

If you need more information, contact one of MassDEP's Regional Service Centers:

Northeast Regional Office, Wilmington, 978-694-3200

Southeast Regional Office, Lakeville, 508-946-2714

Central Regional Office, Worcester, 508-792-7683

Western Regional Office, Springfield, 413-755-2214

or

Call Thomas Maguire of DEP's Bureau of Resource Protection in Boston at 617-292-5602.

O&M / LPPP  
160 Moulton Drive  
Lynnfield, MA 01940  
July 6, 2018, Revised March 3, 2021, Revised April 8, 2021

Effective Date: December 19, 1997

Guideline No. DWSG97-1

Applicability: Applies to all parties storing road salt or other chemical deicing agents.

Supersedes: Fact Sheet: DEICING CHEMICAL (ROAD SALT) STORAGE (January 1996)

Approved by: Arleen O'Donnell, Asst. Commissioner for Resource Protection

**PURPOSE:** To summarize salt storage prohibition standards around drinking water supplies and current salt storage practices.

**APPLICABILITY:** These guidelines are issued on behalf of the Bureau of Resource Protection's Drinking Water Program. They apply to all parties storing road salt or other chemical deicing agents.

#### **I. The Road Salt Problem:**

Historically, there have been incidents in Massachusetts where improperly stored road salt has polluted public and private drinking water supplies. Recognizing the problem, state and local governments have taken steps in recent years to remediate impacted water supplies and to protect water supplies from future contamination. As a result of properly designing storage sheds, new incidents are uncommon. These guidelines summarize salt storage prohibition standards around drinking water supplies and current salt storage practices.

#### **II. Salt Pile Restrictions in Water Supply Protection Areas:**

Uncovered storage of salt is forbidden by Massachusetts General Law Chapter 85, section 7A in areas that would threaten water supplies. The Drinking Water Regulations, 310 CMR 22.21(2)(b), also restrict deicing chemical storage within wellhead protection areas (Zone I and Zone II) for public water supply wells, as follows: "storage of sodium chloride, chemically treated abrasives or other chemicals used for the removal of ice and snow on roads [are prohibited], unless such storage is within a structure designed to prevent the generation and escape of contaminated runoff or leachate." For drinking water reservoirs, 310 CMR 22.20C prohibits, through local bylaw, uncovered or uncontained storage of road or parking lot de-icing and sanding materials within Zone A at new reservoirs and at those reservoirs increasing their withdrawals under MGL Chapter 21G, the Water Management Act.

For people on a low-sodium diet, 20 mg/L of sodium in drinking water is consistent with the bottled water regulations' meaning of "sodium free." At 20 mg/L, sodium contributes 10% or less to the sodium level in people on a sodium-restricted diet. For more information contact: Catherine Sarafinas at 617-556-1070 or [catherine.sarafinas@state.ma.us](mailto:catherine.sarafinas@state.ma.us), or Suzanne Robert at 617-292-5620 or [suzanne.robert@state.ma.us](mailto:suzanne.robert@state.ma.us).

### **III. Salt Storage Best Management Practices (BMP):**

Components of an "environment-friendly" roadway deicing salt storage facility include:

- the right site = a flat site;
- adequate space for salt piles;
- storage on a pad (impervious/paved area);
- storage under a roof; and
- runoff collection/containment.

For more information, see The Salt Storage Handbook, 6th ed. Virginia: Salt Institute, 2006 (phone 703-549-4648 or <http://www.saltinstitute.org/publication/safe-and-sustainable-snowfighting/>).

### **IV. Salt Storage Practices of the Massachusetts Highway Department:**

The Massachusetts Highway Department (MHD) has 216 permanent salt storage sheds at 109 locations in the state. On leased land and state land under arteries and ramps, where the MHD cannot build sheds, salt piles are stored under impermeable material. This accounts for an additional 15 sites. The MHD also administers a program to assist municipalities with the construction of salt storage sheds. Of 351 communities, 201 municipalities have used state funds for salt storage facilities.

For more information about MHD's salt storage facilities, contact Paul Brown at the Massachusetts Highway Department, 10 Park Plaza, Boston, MA 02116 (phone 617-973-7792).