



March 16, 2012

US Environmental Protection Agency – New England  
NCCW GP Processing  
Municipal Assistance Unit (CMU)  
One Congress Street, Suite 1100  
Boston, Massachusetts 02114-2023

rec'd  
3/27/12  
OEP 44

Re: Norwood Theater Geothermal Heating and Cooling System (Bleed Water Discharge)  
109 Central Street, Norwood, Massachusetts  
Noncontact Cooling Water Discharge General Permit Application  
Under Massachusetts General Permit No. MAG250000

To Whom It May Concern:

**1. Introduction**

This National Pollutant Discharge Elimination System (NPDES) Noncontact Cooling Water General Permit (NCCWP) application was prepared by SAK Environmental, LLC (SAK) for Tribeca Builders Inc. who is managing the full renovation of the Norwood Theater (Theater) (See **Figure 1- Site Location Map**). The Theater is a 14,000 square foot facility in downtown Norwood, MA. The renovation includes the installation of a geothermal heating and cooling system having four (4), 1,500 deep standing column wells as the ground couple.

WellSpring Geothermal completed a preliminary design of the system which includes a design circulation flow rate of about 300 gallons per minute (gpm) for the geothermal system which will provide heating and cooling to the Theater. A periodic bleed (ie. discharge) of circulated water at approximately 30 gpm is anticipated during times when the system is operating at peak demand (mid-winter and mid-summer). It is estimated that the bleed (ie. discharge) would occur for approximately 8 hours/day on approximately 30 days per year.

This application is to permit the discharge of the bleed water to a surface water body via the municipal storm drainage system. Discharge on-site is not possible due to space limitations and where the Theater already manages excessive groundwater via a sump pump. Discharge via the municipal storm drain was identified as a viable option. Through consultation with the Town of Norwood's Engineering office it was determined that the municipal storm drain system discharges to Meadow Brook, and ultimately the Neponset River. Project information listed below:

Permit Applicant: Tribeca Builders Inc.  
21 Drydock Avenue  
Boston, MA  
E.J. Lanni, 617-531-1689

Permit Preparer: SAK Environmental LLC  
231 Sutton Street, Suite 2G  
North Andover, MA  
Mark Grady, 978-688-7804

Project Owner: Story Board LLC  
109 Central Street  
Norwood, MA  
Susan Lewis, 781-255-6980

## **2. Notice of Intent (NOI) Form for Noncontact Cooling Water General Permit**

Completed form is attached in **Appendix A**.

## **3. Submittal Time Frames**

New discharges are required to submit the NOI to EPA and the respective State (Massachusetts) at least 60-days prior (postmark date) to the commencement of discharge.

## **4. Special Requirements for Groundwater Sources**

Since groundwater is used in the geothermal wells, and will be discharged as described previously it is required that a representative sample of the NCCW effluent be taken. The effluent sample was taken on February 1, 2012 during the pumping of the wells. The sample was taken prior to the commingling of the effluent water with other sources. The sample was sent to a State Certified Laboratory, Contest Labs of East Longmeadow, MA, and analyzed for Antimony, Arsenic, Chromium (Total), Chromium (VI), Copper, Chloride, Iron, Mercury, Nickel, Silver, and Zinc. A surface water sample was taken from Meadow Brook upstream of the discharge location to be analyzed for Hardness.

### **4.1. Laboratory Results**

Groundwater from the geothermal wells was sampled and analyzed in accordance with Section 5.4 of the General Permit. See **Table 1** for a summary of Laboratory Results. Laboratory Data is available in **Appendix B**. All metals compounds analyzed were not detected except for Iron at 0.12 mg/L. The pH of the groundwater was 7.2 standard units and the Chloride result was 610 mg/L. Additionally, hardness of the receiving water was also analyzed and reported to be 47 mg/L.

### **4.2. Temperature Change Calculation**

Temperature adjustment for receiving water was calculated by setting the heat load discharge from the "plant" (geothermal well system) equal to the heat load accepted by the river.

$$Q_{\text{plant}} = C_p m_p \Delta T_p$$

$$Q_{\text{river}} = C_p m_r \Delta T_r$$

$$C_p m_p \Delta T_p = C_p m_r \Delta T_r$$

$$\Delta T_r = m_p / m_r \times \Delta T_p$$

$Q_{\text{plant/river}}$  = heat load discharge from plant/river (btu)

$\Delta T_r$  = change in river temperature, °F

$\Delta T_p$  = change in temperature, effluent - influent, °F

$C_p$  = heat capacity of water = 1.0 °F x btu/lb

$m_p$  = mass of effluent, lbs (gal. or cubic feet per second if volume is used)

$m_r$  = mass of river, lbs (gal. or cubic feet per second if volume is used)

$$\Delta T_r = \frac{m_p}{m_r} \times \Delta T_p$$

Where:  $m_p = 0.06684 \text{ cfs}$  (30 gpm)  
 $m_r = 4.5 \text{ cfs}$   
 $\Delta T_p = \pm 30 \text{ °F}$

$$\Delta T_r = \frac{0.06684 \text{ cfs}}{4.5 \text{ cfs}} \times 30 \text{ °F} = \pm 0.446$$

Solving for the change in river temperature yields a temperature change of  $\pm 0.446^\circ\text{F}$ . This was achieved by converting the 30 gpm bleed system discharge (mass of effluent) to 0.06684 cubic feet per second (cfs). Additionally, the change in temperature (effluent – influent) will not exceed a  $30^\circ\text{F}$  difference, thus making the change in temperature negligible. The mass of the river was obtained from the USGS Stream Stats data collector, and found to be 4.5 cfs (7 Day 10 year Low Flow). This information allowed for the determination of a temperature change of  $\pm 0.446^\circ\text{F}$ , approximately an order of magnitude less than the  $3.0^\circ\text{F}$  differential allowed for Class B cold waters. Calculations and stream flow data are enclosed.

#### 4.3. Dilution Factor Calculation

A Dilution Factor (DF) was calculated (Attachment B) in order to identify the limits for total metals. The DF calculation was performed in accordance with the procedure contained in Attachment B, "Calculation of Dilution Factor for Massachusetts." The purpose of the DF calculation is to establish the Total Recoverable Limits for metals, taking into consideration the anticipated dilution of the detected analytes upon discharge of effluent to the discharge waters.

$$\text{Dilution Factor} = \frac{Q_R + (Q_P * 1.55)}{Q_P * 1.55}$$

$Q_p$  = Plants maximum design flow, in million gallons per day (mgd)  
 $Q_R$  = Estimated 7Q10 low flow for receiving water at the plants outfall  
(cfs)  
1.55 = Factor to convert mgd to cfs

Where:  $Q_p$  = 0.0432 mgd  
 $Q_R$  = 4.5 cfs

$$\text{Dilution Factor} = \frac{4.5 + ((0.0432) * 1.55)}{(0.0432) * 1.55} = 68.20$$

Notes:

cfs = cubic feet per second

mgd = million gallons per day

## **5. Areas of Critical Environmental Concern**

SAK reviewed the Massachusetts Department of Environmental Protection (MADEP) Priority Resource Map to locate any areas of critical environmental concern close in proximity to the Theatre (See **Figure 2 – Priority Resource Map**). Protected open space areas are located approximately ½ mile to the East, West, and South of the Theatre. The area surrounding portions of Meadow Brook are in a floodplain, however, the bleed water discharge is expected to occur only seasonally when stormwater, snowmelt and flooding are of minimal concern (Jan/Feb, July/Aug). The discharge associated with this permit is not expected to affect any areas of critical concern.

## **6. Endangered Species Eligibility Act**

SAK has consulted with the US Fish and Wildlife Service (USFWS) website and determined that the planned Theater discharge does not contain federally listed endangered and threatened species. According to the USFWS, no endangered or threatened species are present in Norfolk County. See **Appendix C** for a list of all federally listed endangered and threatened species in Massachusetts and letter from the USFWS.

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) website was consulted. Rare species have been identified in the Town of Norwood (see **Appendix C**), but discharge does not occur in an area identified as an NHESP estimated rare wetland habitat area, certified vernal pool, or ACEC on the Priority Resource map (see **Figure 2**).

## **7. National Historic Preservation Act**

SAK has reviewed all the listed, or eligible to be listed, historic properties or places listed on the National Register of Historic Places for Norfolk County, Massachusetts. The search focused on

all listed properties in Norwood, Massachusetts. The nearest listed historic site to the Theater is Norwood Memorial Municipal Building at 566 Washington Street in Norwood, Massachusetts. The permit complies with Scenario #2 listed in Appendix 3 of the NPDES NCCW General Permit "(2) If historic properties are identified but it is determined that they will not be affected by the discharges, the applicant has met the NHPA eligibility criteria for coverage under this permit". The discharge allowed under this permit would not adversely affect the property. The National Register did not list Historic Districts, Vacant, or not-in-use properties or places in Norwood, Massachusetts. A copy of all listed Historical properties in Norwood, Massachusetts is attached in **Appendix D**.

## **8. Reporting**

Discharge of the NCCW is designed to be done during peak thermal demand times (mid-summer and mid-winter). For this reason discharge will be intermittent. Annual discharge reports are required to maintain coverage under this permit and reports will be submitted by the 15<sup>th</sup> of January. When discharge does commence, the owner (permittee) will submit written notification of discharge to the EPA within five (5) days of the start of discharge. During times the discharge of the NCCW is occurring, on a quarterly basis, monitoring results obtained during the previous three months will be summarized for each month and reported on separate Discharge Monitoring Report forms (DMRs). The DMRs will be postmarked by the 15<sup>th</sup> of January, April, July, and October. The first report may include less than three months of data. Signed and dated original DMRs, and accompanying reports must be submitted to EPA at:

U.S. Environmental Protection Agency  
Water Technical Unit (SEW)  
P.O. Box 8127  
Boston, Massachusetts 02114

Copies of the initial permit filing (and applicable fee) and monitoring reports will be submitted to:

Massachusetts Department of Environmental Protection  
Division of Watershed Management  
627 Main Street, Second Floor  
Worcester, Massachusetts 01608

An example DMR is included in **Appendix E**.

## **9. Administration**

### **9.1. Notice of Termination**

A Notice of Termination (NOT) of Discharge will be submitted to the aforementioned agencies. The NOT will include the required information outlined in Appendix 4, Section II of the NPDES NCCW General Permit. The NOT will be submitted within 30 days of the cessation of discharge. All records will be kept for a minimum of three (3) years as required in the General Permit.

**9.2. Continuation of General Permit after its Expiration**

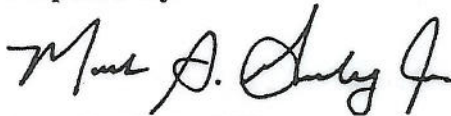
If EPA issues a new General Permit in the future, the owner will submit a new NOI at least 60 days prior to the expiration date of the expiring General Permit.

Do not hesitate to contact Mark Grady at 978-688-7804 x114.

Sincerely,

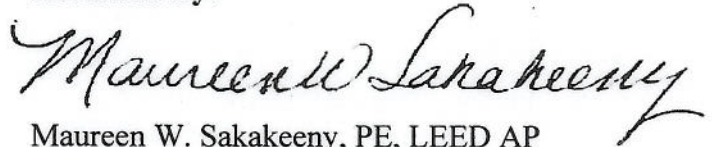
**SAK Environmental LLC**

**Prepared By:**



Mark P. Grady, EIT  
Environmental Engineer

**Reviewed By:**



Maureen W. Sakakeeny, PE, LEED AP  
Principal

Cc: MA DEP, Division of Watershed Management (Worcester, MA)  
E.J. Lanni, Rich Daly (Tribeca Builders)  
Timothy Roos (WellSpring Geothermal)

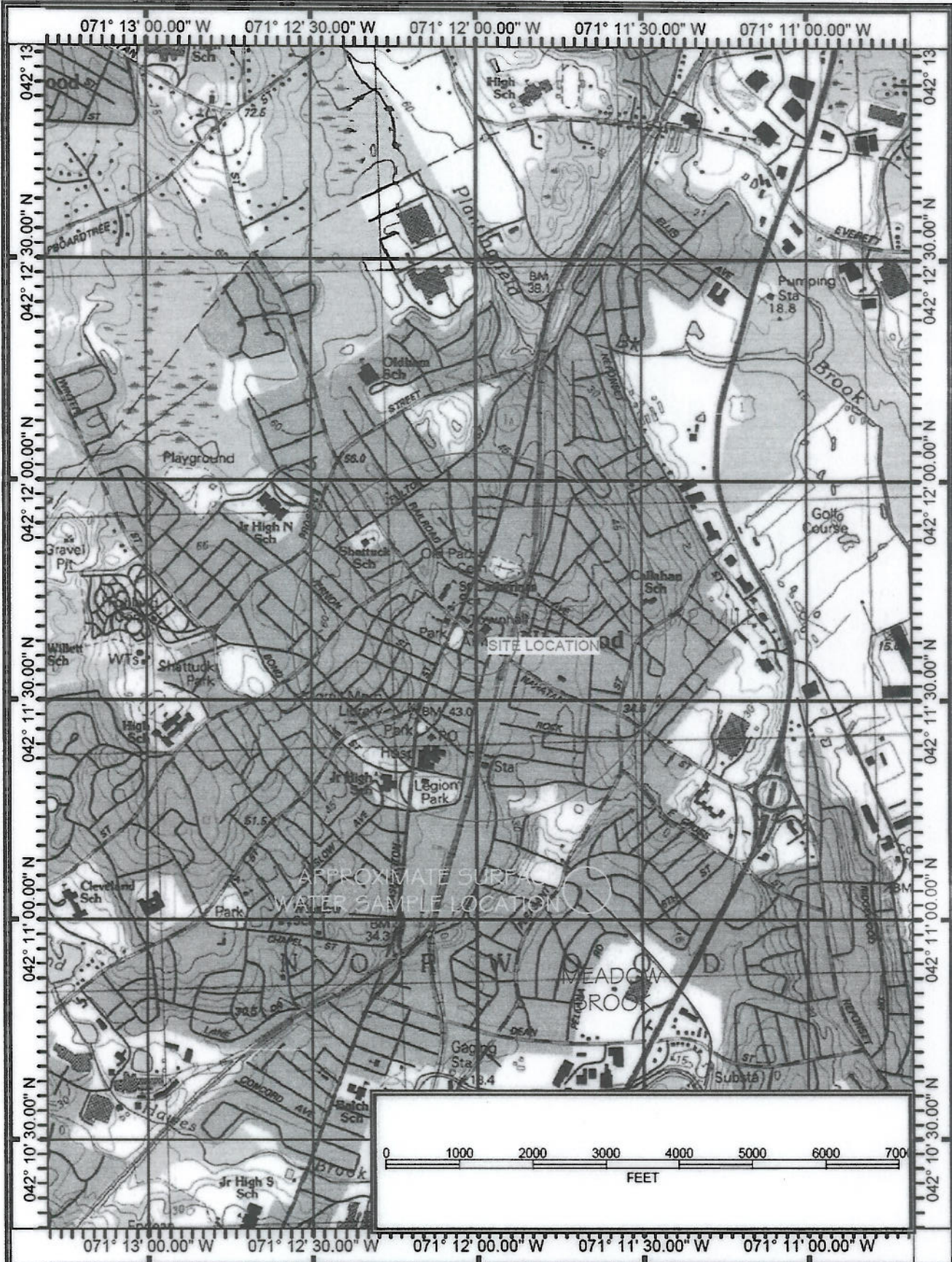
Enclosures:

Figure 1 – Site Location Map  
Figure 2 – Priority Resource Map  
Figure 3 – Aerial Map

Table 1 – Laboratory Data

Calculations

Appendix A – Notice of Intent  
Appendix B – Laboratory Data  
Appendix C – Endangered Species  
Appendix D – Historical Data  
Appendix E – Example Discharge Monitoring Report



**SAK Environmental**

231 SUTTON STREET SUITE 2G  
NORTH ANDOVER, MA 01845  
TELEPHONE: (978) 688 - 7804  
FAX: (978) 688 - 7801  
www.SAKEnvironmental.com

FIGURE 1 - SITE LOCATION MAP

NORWOOD THEATRE  
109 CENTRAL STREET  
NORWOOD, MA 02062

PROJECT NO. 11.20.00

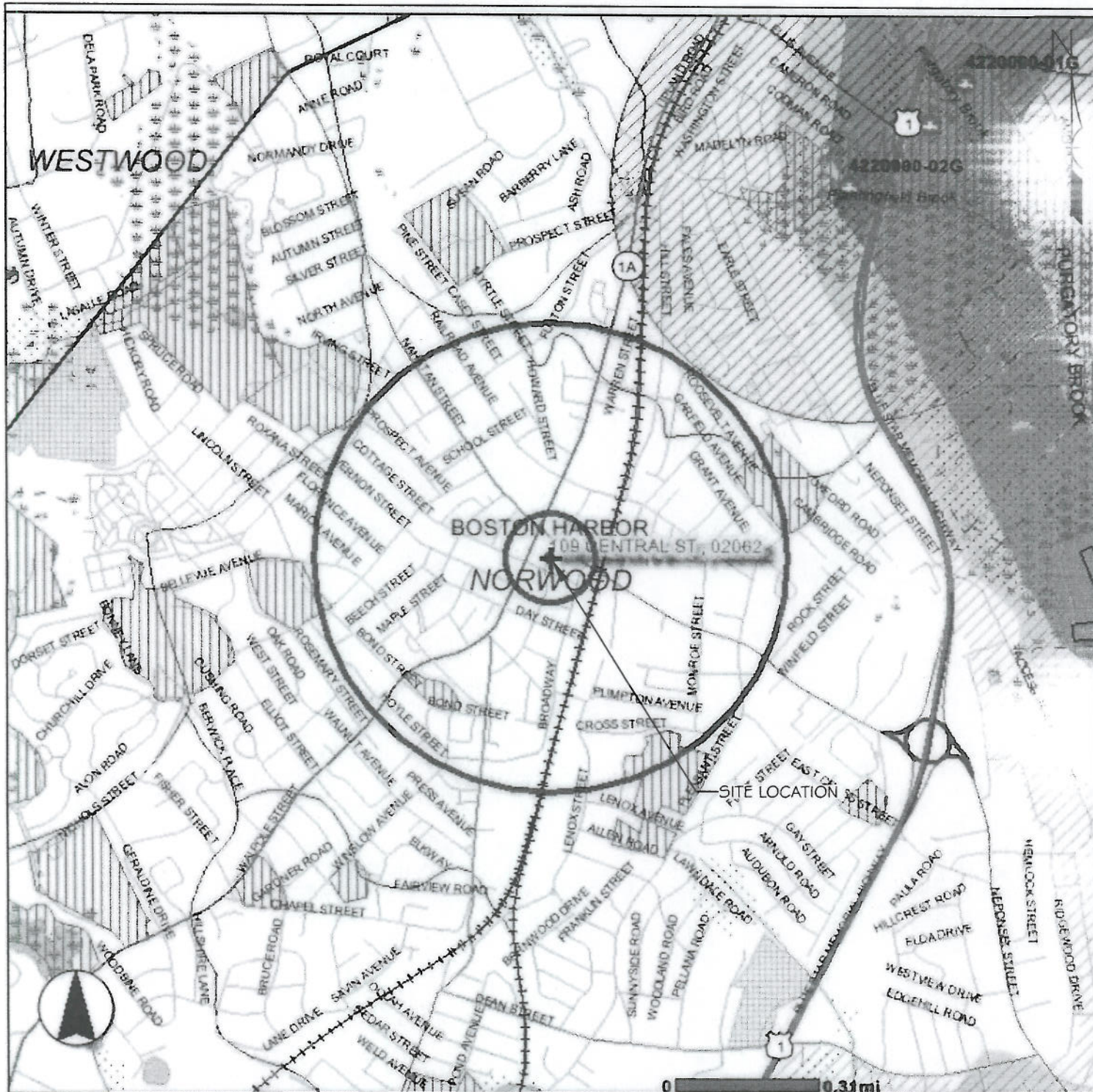
CLIENT:  
NORWOOD THEATRE

SCALE:  
SEE MAP

DATE: OCTOBER 4, 2011

DRAWN BY:  
SJD

CHECKED BY:  
SAS



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, Sub, Streams, Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source.....

Non Potential Drinking Water Source Area: Medium, High (Yield)...

PWS Protection Areas: Zone II, MPA, Zone A .....

Hydrography Open Water, PWS Reservoir, Tidal Flat .....

Wetlands: Freshwater, Saltwater, Cranberry Bog .....

FEMA 100yr Floodplain, Protected Open Space, ACEC .....

NHESP Est Rare Wetland Habitat, Certified Vernal Pool ...

DEP Permitted Solid Waste Landfill.....

**s|a|k** Environmental

231 SUTTON STREET, SUITE 2G  
NORTH ANDOVER, MA 01845  
TELEPHONE: (978) 688 - 7804  
FAX: (978) 688 - 7801  
www.SAKEnvironmental.com

FIGURE 2 - PRIORTY RESOURCE MAP

NORWOOD THEATRE REONVATION  
NORWOOD, MASSACHUSETTS

PROJECT NO. 11.20.00

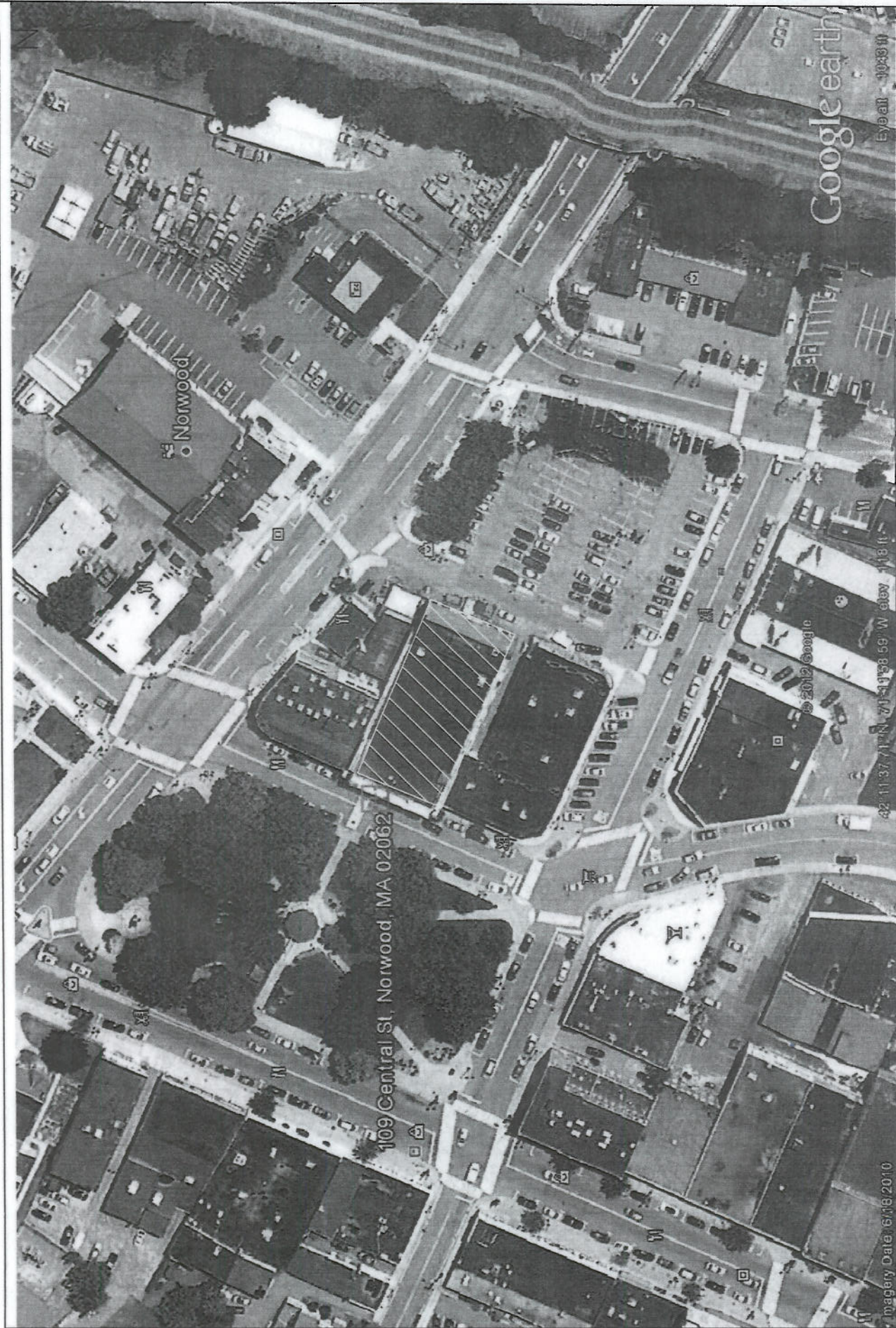
CLIENT:  
NORWOOD THEATRE

SCALE:  
SHOWN ON DRAWING

DATE: OCTOBER 14, 2011

DRAWN BY:  
SJD

CHECKED BY:  
SAS



|                                                                                                                                                                                                                            |                                                            |  |                            |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--|----------------------------|-----------------------|
| <b>Slack Environmental</b><br>231 SUTTON STREET, SUITE 2G<br>NORTH ANDOVER, MA 01845<br>TELEPHONE: (978) 688 - 7804<br>FAX: (978) 688 - 7801<br><a href="http://www.SlackEnvironmental.com">www.SlackEnvironmental.com</a> | FIGURE 3 - AERIAL MAP                                      |  | PROJECT NO. 11.20.00       | DATE: OCTOBER 4, 2011 |
|                                                                                                                                                                                                                            | NORWOOD THEATRE<br>109 CENTRAL STREET<br>NORWOOD, MA 02062 |  | CLIENT:<br>NORWOOD THEATRE | DRAWN BY:<br>SJD      |
|                                                                                                                                                                                                                            |                                                            |  | SCALE:<br>SEE MAP          | CHECKED BY:<br>SAC    |

## CALCULATIONS

## Calculations

### Dilution Factor Calculations for Massachusetts

$$\text{Dilution Factor} = \frac{Q_R + (Q_p * 1.55)}{Q_p * 1.55}$$

$Q_p$  = Plants maximum design flow, in million gallons per day (mgd)

$Q_R$  = Estimated 7Q10 low flow for receiving water at the plants outfall (cfs)

1.55 = Factor to convert mgd to cfs

Where:  $Q_p$  = 0.0432 mgd

$Q_R$  = 4.5 cfs

$$\text{Dilution Factor} = \frac{4.5 + ((0.0432) * 1.55)}{(0.0432) * 1.55} = 68.20$$

Note:

cfs = cubic feet per second

mgd = million gallons per day

Prepared by: MPG

Reviewed by: SAS

## Calculations

### Receiving Water Temperature Calculation (Engineering calculation for Massachusetts facilities)

$$Q_{\text{plant}} = C_p m_p \Delta T_p$$

$$Q_{\text{river}} = C_p m_r \Delta T_r$$

$$C_p m_p \Delta T_p = C_p m_r \Delta T_r$$

$$\Delta T_r = m_p / m_r \times \Delta T_p$$

$Q_{\text{plant}}$  = heat load discharge from plant (btu)

$\Delta T_r$  = change in river temperature, °F

$\Delta T_p$  = change in temperature, effluent - influent, °F

$C_p$  = heat capacity of water = 1.0 °F x btu/lb

$m_p$  = mass of effluent, lbs (gal. or cubic feet per second if volume is used)

$m_r$  = mass of river, lbs (gal. or cubic feet per second if volume is used)

$$\Delta T_r = \frac{m_p}{m_r} \times \Delta T_p$$

Where:  $m_p = 0.06684$  cfs (30 gpm)

$m_r = 4.5$  cfs

$\Delta T_p = \pm 30$  °F

$$\Delta T_r = \frac{0.06684 \text{ cfs}}{4.5 \text{ cfs}} \times 30 \text{ °F} = \pm 0.446$$

Prepared by: MGP

Reviewed by: SAS



## StreamStats Data-Collection Station Report

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**USGS Station Number** 01105000  
**Station Name** NEPONSET RIVER AT NORWOOD, MA

[Click here to link to available data on NWIS-Web for this site.](#)

### Descriptive Information

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|                           |                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------|
| Station Type              | Gaging Station, continuous record                                                                 |
| Regulated?                | False                                                                                             |
| Period of Record          | 1939-present                                                                                      |
| Remarks                   | Flow affected by mills and reservoirs and by several diversions for municipal and industrial use. |
| Latitude (degrees NAD83)  | 42.1775986                                                                                        |
| Longitude (degrees NAD83) | -71.20088639                                                                                      |
| Hydrologic unit code      | 01090001                                                                                          |
| Local Basin               | 19-Boston Harbor                                                                                  |
| County                    | 021-Norfolk                                                                                       |
| MCD                       | 50250-Norwood town                                                                                |
| Directions to station     | 200 feet upstream from Pleasant Street                                                            |

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### Physical Characteristics

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| Characteristic Name        | Value  | Units        | Citation Number |
|----------------------------|--------|--------------|-----------------|
| Area_of_Lakes_and_Ponds    | 3.38   | square miles | <u>30</u>       |
| Contributing_Drainage_Area | 35.200 | square miles | <u>47</u>       |
| Drainage_Area              | 34.7   | square miles | <u>30</u>       |
| Main_Channel_Length        | 11.000 | miles        | <u>47</u>       |
| Mean_Basin_Elevation       | 210    | feet         | <u>30</u>       |
| Mean_Basin_Slope_ft_per_mi | 23.8   | feet per mi  | <u>30</u>       |
| Percent_Forest             | 72.000 | percent      | <u>47</u>       |
| Percent_Lakes_and_Ponds    | 3.3800 | percent      | <u>47</u>       |

|                               |        |             |           |
|-------------------------------|--------|-------------|-----------|
| Percent_Storage               | 3.4900 | percent     | <u>47</u> |
| Soil_Infiltration             | 4.3000 | inches      | <u>47</u> |
| Stream_Slope_10_and_85_Method | 23.800 | feet per mi | <u>47</u> |
| Total_Stream_Length           | 11     | miles       | <u>30</u> |

## Streamflow Statistics

| Statistic Name                      | Value      | Units                 | Citation Number |
|-------------------------------------|------------|-----------------------|-----------------|
| <b>Peak-Flow Statistics</b>         |            |                       |                 |
| 10_Year_Peak_Flood                  | 600        | cubic feet per second | <u>47</u>       |
| 100_Year_Peak_Flood                 | 1200       | cubic feet per second | <u>47</u>       |
| 2_Year_Peak_Flood                   | 317        | cubic feet per second | <u>47</u>       |
| 200_Year_Peak_Flood                 | 1450.00    | cubic feet per second | <u>47</u>       |
| 25_Year_Peak_Flood                  | 803        | cubic feet per second | <u>47</u>       |
| 5_Year_Peak_Flood                   | 470        | cubic feet per second | <u>47</u>       |
| 50_Year_Peak_Flood                  | 986        | cubic feet per second | <u>47</u>       |
| Log_Mean_of_Annual_Peaks            | 2.5220     | Log base 10           | <u>47</u>       |
| Log_Skew_of_Annual_Peaks            | 0.6980     | Log base 10           | <u>47</u>       |
| Log_STD_of_Annual_Peaks             | 0.1760     | Log base 10           | <u>47</u>       |
| Mean_Annual_Flood                   | 234.000    | cubic feet per second | <u>47</u>       |
| Peak_years_with_historic_adjustment | 90.000     | years                 | <u>47</u>       |
| Systematic_peak_years               | 36         | years                 | <u>47</u>       |
| WRC_Mean                            | 2.5290     | Log base 10           | <u>47</u>       |
| WRC_Skew                            | 0.8920     | Log base 10           | <u>47</u>       |
| WRC_STD                             | 0.1860     | Log base 10           | <u>47</u>       |
| <b>Flood-Volume Statistics</b>      |            |                       |                 |
| 7_Day_10_Year_Maximum               | 345.000    | cubic feet per second | <u>47</u>       |
| 7_Day_2_Year_Maximum                | 179.000    | cubic feet per second | <u>47</u>       |
| 7_Day_50_Year_Maximum               | 559.000    | cubic feet per second | <u>47</u>       |
| <b>Low-Flow Statistics</b>          |            |                       |                 |
| <del>7_Day_10_Year_Low_Flow</del>   | <u>4.5</u> | cubic feet per second | <u>19</u>       |
| 7_Day_2_Year_Low_Flow               | 7.4        | cubic feet per second | <u>19</u>       |
| <b>Flow-Duration Statistics</b>     |            |                       |                 |
| 1_Percent_Duration                  | 278        | cubic feet per second | <u>41</u>       |
| 10_Percent_Duration                 | 126        | cubic feet per second | <u>41</u>       |
| 20_Percent_Duration                 | 87         | cubic feet per second | <u>41</u>       |
| 25_Percent_Duration                 | 75         | cubic feet per second | <u>41</u>       |
| 30_Percent_Duration                 | 65         | cubic feet per second | <u>41</u>       |
| 40_Percent_Duration                 | 50         | cubic feet per second | <u>41</u>       |

|                                 |        |                       |           |
|---------------------------------|--------|-----------------------|-----------|
| 5_Percent_Duration              | 166    | cubic feet per second | <u>41</u> |
| 50_Percent_Duration             | 37     | cubic feet per second | <u>41</u> |
| 60_Percent_Duration             | 27     | cubic feet per second | <u>41</u> |
| 70_Percent_Duration             | 19     | cubic feet per second | <u>41</u> |
| 75_Percent_Duration             | 16     | cubic feet per second | <u>41</u> |
| 80_Percent_Duration             | 13     | cubic feet per second | <u>41</u> |
| 90_Percent_Duration             | 8.7    | cubic feet per second | <u>41</u> |
| 95_Percent_Duration             | 6.5    | cubic feet per second | <u>41</u> |
| 99_Percent_Duration             | 3.9    | cubic feet per second | <u>41</u> |
| <b>General Flow Statistics</b>  |        |                       |           |
| Average_daily_streamflow        | 55.992 | cubic feet per second | <u>41</u> |
| Maximum_daily_flow              | 1260   | cubic feet per second | <u>41</u> |
| Minimum_daily_flow              | 0.58   | cubic feet per second | <u>41</u> |
| Std_Dev_of_daily_flows          | 61.154 | cubic feet per second | <u>41</u> |
| <b>Base Flow Statistics</b>     |        |                       |           |
| Average_BFI_value               | 0.578  | dimensionless         | <u>42</u> |
| Number_of_years_to_compute_BFI  | 64     | years                 | <u>42</u> |
| Std_dev_of_annual_BFI_values    | 0.065  | dimensionless         | <u>42</u> |
| <b>Precipitation Statistics</b> |        |                       |           |
| 24_Hour_2_Year_Precipitation    | 3.3000 | inches                | <u>47</u> |
| Mean_Annual_Precipitation       | 43.500 | inches                | <u>47</u> |
| <b>Climate Characteristics</b>  |        |                       |           |
| Mean_Annual_Snowfall            | 46.000 | inches                | <u>47</u> |
| <b>Temperature Statistics</b>   |        |                       |           |
| Mean_Min_January_Temperature    | 19.000 | degrees F             | <u>47</u> |

## Citations

| Citation Number | Citation Name and URL                                                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19              | <u>Wandle, S.W., Jr., 1984, Gazetteer of Hydrologic Characteristics of Streams in Massachusetts--Coastal River Basins of the North Shore and Massachusetts Bay: U.S. Geological Survey Water-Resources Investigations Report 84-4281</u> |
| 30              | <u>Imported from NWIS file</u>                                                                                                                                                                                                           |
| 41              | <u>Wolock, D.M., 2003, Flow characteristics at U.S. Geological Survey streamgages in the conterminous United States: U.S. Geological Survey Open-File Report 03-146 digital data set</u>                                                 |
| 42              | <u>Wolock, D.M., 2003, Base-flow index grid for the conterminous United States: U.S. Geological Survey Open-File Report 03-263, digital data set</u>                                                                                     |
| 47              | <u>Wandle, S.W., Jr., 2003, Estimating peak discharges of small, rural streams in Massachusetts: U.S. Geological Survey Water-Supply Paper 2215, 26 p.</u>                                                                               |

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Appendix A

Notice of Intent (NOI) Form for Nonpoint Source Pollution

## Appendix A

### Notice of Intent (NOI) Form for Noncontact Cooling Water General Permit

## APPENDIX 5

### Suggested Form for Notice of Intent (NOI) for the Noncontact Cooling Water General Permit

1. General facility information. Please provide the following information about the facility.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                        |                                                                                                                                                              |                                        |                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------|
| <p>a) Name of facility: Norwood Theater</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"> <p>Facility Location Address :</p> <p>109 Central Street, Norwood, MA</p> <p>longitude: <u>-71.19974</u></p> <p>latitude: <u>42.19386</u></p> </td> <td style="width: 40%;"> <p>Facility SIC codes:</p> <p>7922</p> </td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        | <p>Facility Location Address :</p> <p>109 Central Street, Norwood, MA</p> <p>longitude: <u>-71.19974</u></p> <p>latitude: <u>42.19386</u></p>                | <p>Facility SIC codes:</p> <p>7922</p> | <p>Type of Business: Theater</p> <p>Facility Mailing Address (if not location address)</p> |
| <p>Facility Location Address :</p> <p>109 Central Street, Norwood, MA</p> <p>longitude: <u>-71.19974</u></p> <p>latitude: <u>42.19386</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>Facility SIC codes:</p> <p>7922</p> |                                                                                                                                                              |                                        |                                                                                            |
| <p>b) Name of facility owner: Story Board LLC</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        | <p>Email address of owner:</p>                                                                                                                               |                                        |                                                                                            |
| <p>Owner's Tel #: <u>(781) 255-6980</u></p> <p>Owner's Fax # _____</p> <p>Address of owner (if different from facility address)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        | <p>Owner is (check one): 1. Federal _____ 2. State _____ 3. Tribal _____</p> <p>4. Private <input checked="" type="checkbox"/> 5. Other _____ (Describe)</p> |                                        |                                                                                            |
| <p>Legal name of Operator, if not owner: <u>Story Board LLC</u></p> <p>Operator Contact Name: <u>Susan Lewis</u></p> <p>Operator Tel Number: <u>(781) 255-6980</u> Fax Number: _____</p> <p>Operator's email: <u>N/A at this time</u></p> <p>Operator Address (if different from owner)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                                                                                                                                                              |                                        |                                                                                            |
| <p>d) Attach topographic map indicating the locations of the facility and the receiving water; all NCCW discharge points; upstream and downstream monitoring points. Map attached? <input checked="" type="checkbox"/></p> <p>e) Check Yes or No for the following:</p> <p>1. Has a prior NPDES permit been granted for the discharge? Yes _____ No <input checked="" type="checkbox"/> If Yes, Permit Number: _____</p> <p>2. Is the discharge a "new discharge" as defined by 40 CFR Section 122.22? Yes <input checked="" type="checkbox"/> No _____</p> <p>3. Is the facility covered by an individual NPDES permit? Yes _____ No <input checked="" type="checkbox"/> If Yes, Permit Number _____</p> <p>4. Is there a pending application on file with EPA for this discharge? Yes _____ No <input checked="" type="checkbox"/> If Yes, date of submittal: _____</p> |                                        |                                                                                                                                                              |                                        |                                                                                            |

2. Discharge information. Please provide information about the discharge, (attaching additional sheets as needed)

a) Name of receiving water into which discharge will occur: Meadow Brook (near Neponset River)  
State Water Quality Classification: B Freshwater: Yes Marine Water: \_\_\_\_\_

b) Describe the discharge activities for which the owner/applicant is seeking coverage: Discharge of groundwater from a geothermal well system's bleed

c) FOR MASSACHUSETTS FACILITIES ONLY: Engineering Calculations: Submit the completed engineering calculation of the surface water temperature rise as shown in Attachment A of the General Permit. Check if attached: ✓

d) Number of outfalls 1

For each outfall:

e) What is the maximum daily and average monthly flow of the discharge? Note that EPA will use the flow reported here as the facility's permitted effluent flow limit. Max Daily Flow 43,200 GPD Average Flow 14,400 GPD

f) What is the maximum daily and average monthly temperature of the discharge (in degrees F)? Max Temp. 90 Average Temp. 65

g) What is the maximum and minimum monthly pH of the discharge (in s.u.)? Max pH 8 Min pH 6

h) FOR MASSACHUSETTS FACILITIES ONLY: Is the source water of the NCCW potable water? Yes \_\_\_\_\_ No ✓ If Yes, EPA will calculate the Total Residual Chlorine limit for facilities located in Massachusetts.

i) Is the discharge continuous? Yes \_\_\_\_\_ No ✓ If no, is the discharge periodic (P) (occurs regularly, i.e., monthly or seasonally, but is not continuous all year) or intermittent (I) (occurs sometimes but not regularly) or both (B) P  
If (P), number of days or months per year of the discharge 30 d and the specific months of discharge July-August/January-February;  
If (I), number of days/year there is a discharge \_\_\_\_\_

j) Latitude and longitude of each discharge within 100 feet: outfall 1: long. 42 11' 06" lat. 71 11' 41"; outfall 2: long. \_\_\_\_\_ lat. \_\_\_\_\_;  
outfall 3: long. \_\_\_\_\_ lat. \_\_\_\_\_ (See [http://www.epa.gov/tri/report/siting\\_tool](http://www.epa.gov/tri/report/siting_tool))

k) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water 4.5 cfs  
Please attach any calculation sheets used to support stream flow and dilution calculations. See General Permit Attachment B for equations and additional information.

MASSACHUSETTS FACILITIES: See Part 3.4 and Appendix 1 of the General Permit for more information on ACEC.  
Areas of Critical Environmental Concern (ACEC): Does the discharge occur in an ACEC? Yes \_\_\_\_\_ No ✓  
If yes, provide the name of the ACEC: \_\_\_\_\_

3. NCCW Source Water Information. Please provide information about the NCCW source water, using separate sheets as necessary:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>a) Indicate source of the NCCW (i.e., municipal water supply, private well, surface water withdrawal, groundwater):<br/> Source: <u>Geothermal well water (1500 feet deep GW)</u><br/> Name of Source Water: _____<br/> Groundwater _____<br/> Is the source registered/permitted under MA Water Management Act or NHDES Water User Registration Rule (Env Wq 2202)?<br/> Yes _____ No <u>✓</u><br/> If yes, registration number: _____</p> | <p>b) If source water is surface water:<br/> i) Is it a freshwater river or stream Yes _____ No <u>✓</u><br/> ii) Is it a lake? _____ reservoir? _____<br/> iii) Is it tidal river? _____ estuary? _____ ocean? _____<br/> c) Is the source water groundwater? Yes _____ No _____ If yes, see Appendix 8 and submit effluent and surface water test results, as required in Part 5.4 of the General Permit.<br/> d) Does the facility use both a primary and backup source of noncontact cooling water?<br/> Yes _____ No <u>✓</u><br/> If yes, attach information that identifies and explains the primary and backup sources of noncontact cooling water for and how often the backup supply was used in last three years.</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

4. Best Technology Available for CWIS

Are you subject to BTA requirements at Part 4.2 of the General Permit? (Facility's discharge is covered by this General Permit and the facility withdraws noncontact cooling water from surface source water). Yes \_\_\_\_\_ No ✓ If No, explain:

If YES, attach the facility-specific BTA description as required in Part 4.3 of the General Permit. For additional information and guidance, see Questions 13-23 of the NCCW Fact Sheet, posted at <http://www.epa.gov/region1/npdcs/nccwgp.html>. Provide a map showing the location of each CWIS intake structure; NCCW outfall(s) and any CWIS feature referred to in the BTA description.

Include in your description:

- \_\_\_\_\_ Measures to meet the General Permit Part 4.3.a general BTA requirements, including documentation that describes the facility's monitoring program for impinged fish and/or invertebrate; or the required alternative monitoring plan frequency and/or protocol
- \_\_\_\_\_ A characterization of the source water body's aquatic life habitat in the vicinity of each CWIS during the seasons when the CWIS may be in use
- \_\_\_\_\_ The attributes of the current CWIS
- \_\_\_\_\_ Design measures of the CWIS
- \_\_\_\_\_ Operation measures of the CWIS
- \_\_\_\_\_ Historical occurrence of impinged fish for the past five years
- \_\_\_\_\_ If applicable, a demonstration that the facility's intake rate is commensurate with a closed-cycle recirculation system
- \_\_\_\_\_ Other components to reduce impingement and/or entrainment of aquatic life

**4. BTA FOR CWIS CONTINUED:**

Provide the following information for each CWIS to support your attached facility-specific BTA description.

Design capacity of the of the CWIS \_\_\_\_\_MGD  
Maximum monthly average intake of the CWIS during the previous five years \_\_\_\_\_MGD    Month in which this flow occurred \_\_\_\_\_  
Maximum through-screen design intake velocity \_\_\_\_\_feet/second (fps)

For facilities where the CWIS is located on a freshwater river or stream, provide the following information:

The source water's annual mean flow \_\_\_\_\_cubic feet/second (cfs) as available from USGS or other appropriate source  
The design intake flow as a % of the source water's annual mean flow \_\_\_\_\_ Attach calculations if equal to or less than 5% of annual mean flow.  
The source water's 7Q10 \_\_\_\_\_cfs. See Attachment B of the General Permit for more information on 7Q10 determinations.  
The design intake flow as a percent of the source water's 7Q10 \_\_\_\_\_

**5. Contaminant Information**

If applicable, attach a listing of all non-toxic pH neutralization and/or dechlorination chemicals used, including chemical name and manufacturer; maximum and average daily quantity used as well as the maximum and average daily expected concentrations (mg/l) in the NCCW discharge, and the vendor's reported aquatic toxicity (NOAEL and/or LC<sub>50</sub> in percent for aquatic organism(s)).

**6. Determination of Endangered Species Act Eligibility:** Provide documentation of ESA eligibility as required at Part 3.4 and Appendix 2, Part C, Step 4, of the General Permit. In addition, respond to the following questions.

- a) Are any listed threatened or endangered species, or designated critical habitat, in proximity to the discharge? Yes \_\_\_\_\_ No ☒   
b) Has any consultation with the federal services been completed? Yes ☒ No \_\_\_\_\_   
c) Is consultation underway? Yes \_\_\_\_\_ No ☒   
d) What were the results of the consultation with the U.S. Fish and Wildlife Service and/or NOAA Fisheries Service (check one):  
a "no jeopardy" opinion \_\_\_\_\_ or written concurrence \_\_\_\_\_ on a finding that the discharges are not likely to adversely affect any endangered species or  
e) Which of the five eligibility criteria listed in Appendix 2, Section B (A,B,C,D or E) have you met? A \_\_\_\_\_   
f) Attach a copy of the most current federal listing of endangered and threatened species from the USF&W web site listed in Appendices 2, 2.1 and 4

**7. Documentation of National Historic Preservation Act requirements:** Please respond to the following questions:

- a) Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility site or in proximity to the discharge? Yes \_\_\_\_\_ No ☒   
b) Have any State or Tribal historic preservation officers been consulted in this determination? Yes \_\_\_\_\_ or No ☒ If yes, attach the results of the consultation(s).   
c) Which of the three National Historic Preservation Act requirements listed in Appendix 3, Section C (1,2 o3) have you met? 1 \_\_\_\_\_

8. Supplemental Information: Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit

9. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22 (see below) including the following certification:

I certify under penalty of law that (1) no biocides or other chemical additives except for those used for pH adjustment and/or dechlorination are used in the noncontact cooling water (NCCW) system; (2) the discharge consists solely of NCCW (to reduce temperature) and authorized pH adjustment and/or dechlorination chemicals; (3) the discharge does not come in contact with any raw materials, intermediate product, water product (other than heat) or finished product; (4) if the discharge of noncontact cooling water subsequently mixes with other wastewater (i.e. stormwater) prior to discharging to the receiving water, any monitoring provided under this permit will be only for noncontact cooling water; (5) where applicable, the facility has complied with the requirements of this permit specific to the Endangered Species Act and National Historic Preservation Act; and (6) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility Name: Norwood Theatre

Operator signature: Susan Q. Davis

Title: Stonybrook LLC

Date: 2/18/12

Federal regulations require this application to be signed as follows:

1. For a corporation, by a principal executive officer of at least the level of vice president;
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively, or,
3. For a municipality, State, Federal or other public facility, by either a principal executive officer or ranking elected official.

## Appendix B

### Laboratory Data

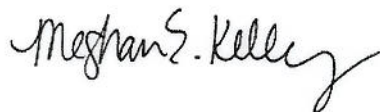
February 13, 2012

Mark Grady  
SAK Environmental, LLC  
231 Sutton Street  
North Andover, MA 01845

Project Location: Norwood  
Client Job Number:  
Project Number: 11.20.00  
Laboratory Work Order Number: 12B0043

Enclosed are results of analyses for samples received by the laboratory on February 1, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley  
Project Manager

SAK Environmental, LLC  
231 Sutton Street  
North Andover, MA 01845  
ATTN: Mark Grady

REPORT DATE: 2/13/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 11.20.00

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 12B0043

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Norwood

| FIELD SAMPLE # | LAB ID:    | MATRIX        | SAMPLE DESCRIPTION | TEST                                                                                  | SUB LAB |
|----------------|------------|---------------|--------------------|---------------------------------------------------------------------------------------|---------|
| NCCW Sample    | 12B0043-01 | Ground Water  |                    | SM18-20 4500 CL B<br>SM18-20 4500 H B<br>SW-846 6010C<br>SW-846 7196A<br>SW-846 7470A |         |
| NCCW SW Sample | 12B0043-02 | Surface Water |                    | SM18-20 2340B                                                                         |         |

**CASE NARRATIVE SUMMARY**

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

**SM18-20 4500 H B****Qualifications:**

Holding time was exceeded. pH analysis should be performed immediately at time of sampling. Nominal 1 hour holding time was exceeded.

**Analyte & Samples(s) Qualified:****pH**

12B0043-01[NCCW Sample], B045484-DUP1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson  
Laboratory Director

Project Location: Norwood

Sample Description:

Work Order: 12B0043

Date Received: 2/1/2012

Field Sample #: NCCW Sample

Sample ID: 12B0043-01

Start Date/Time: 2/1/2012 9:15:00AM

Sample Matrix: Ground Water

Stop Date/Time: 2/1/2012 9:20:00AM

## Metals Analyses (Total)

| Analyte  | Results | RL      | Units | Dilution | Flag | Method       | Date Prepared | Date/Time Analyzed | Analyst |
|----------|---------|---------|-------|----------|------|--------------|---------------|--------------------|---------|
| Cadmium  | ND      | 0.0040  | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Chromium | ND      | 0.010   | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Copper   | ND      | 0.010   | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Iron     | 0.12    | 0.050   | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Lead     | ND      | 0.010   | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Mercury  | ND      | 0.00010 | mg/L  | 1        |      | SW-846 7470A | 2/7/12        | 2/8/12 9:59        | AMR     |
| Nickel   | ND      | 0.010   | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Silver   | ND      | 0.0050  | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |
| Zinc     | ND      | 0.020   | mg/L  | 1        |      | SW-846 6010C | 2/7/12        | 2/8/12 18:41       | OP      |

Project Location: Norwood

Sample Description:

Work Order: 12B0043

Date Received: 2/1/2012

Field Sample #: NCCW Sample

Sample ID: 12B0043-01

Start Date/Time: 2/1/2012 9:15:00AM

Sample Matrix: Ground Water

Stop Date/Time: 2/1/2012 9:20:00AM

## Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

| Analyte             | Results | RL     | Units    | Dilution | Flag | Method            | Date Prepared | Date/Time Analyzed | Analyst |
|---------------------|---------|--------|----------|----------|------|-------------------|---------------|--------------------|---------|
| Chloride            | 610     | 10     | mg/L     | 10       |      | SM18-20 4500 CL B | 2/13/12       | 2/13/12 10:00      | VAK     |
| Hexavalent Chromium | ND      | 0.0040 | mg/L     | 1        |      | SW-846 7196A      | 2/2/12        | 2/2/12 9:00        | SBP     |
| pH @17.2°C          | 7.2     |        | pH Units | 1        | H-05 | SM18-20 4500 H B  | 2/2/12        | 2/2/12 8:15        | LL      |

Project Location: Norwood

Sample Description:

Work Order: 12B0043

Date Received: 2/1/2012

Field Sample #: NCCW SW Sample

Sample ID: 12B0043-02

Start Date/Time: 2/1/2012 7:30:00AM

Sample Matrix: Surface Water

Stop Date/Time: 2/1/2012 7:35:00AM

**Metals Analyses (Total)**

| Analyte  | Results | RL  | Units | Dilution | Flag | Method        | Date Prepared | Date/Time Analyzed | Analyst |
|----------|---------|-----|-------|----------|------|---------------|---------------|--------------------|---------|
| Hardness | 47      | 3.0 | mg/L  | 1        |      | SM18-20 2340B | 2/7/12        | 2/9/12 13:02       | OP      |

**Sample Extraction Data**

Prep Method: SW-846 3005A-SM18-20 2340B

| Lab Number [Field ID]       | Batch   | Initial [mL] | Final [mL] | Date     |
|-----------------------------|---------|--------------|------------|----------|
| 12B0043-02 [NCCW SW Sample] | B045763 | 50.0         | 50.0       | 02/07/12 |

SM18-20 4500 CL B

| Lab Number [Field ID]    | Batch   | Initial [mL] | Final [mL] | Date     |
|--------------------------|---------|--------------|------------|----------|
| 12B0043-01 [NCCW Sample] | B046083 | 100          | 100        | 02/13/12 |

SM18-20 4500 H B

| Lab Number [Field ID]    | Batch   | Initial [mL] | Final [mL] | Date     |
|--------------------------|---------|--------------|------------|----------|
| 12B0043-01 [NCCW Sample] | B045484 | 50.0         |            | 02/02/12 |

Prep Method: SW-846 3005A-SW-846 6010C

| Lab Number [Field ID]    | Batch   | Initial [mL] | Final [mL] | Date     |
|--------------------------|---------|--------------|------------|----------|
| 12B0043-01 [NCCW Sample] | B045762 | 50.0         | 50.0       | 02/07/12 |

SW-846 7196A

| Lab Number [Field ID]    | Batch   | Initial [mL] | Final [mL] | Date     |
|--------------------------|---------|--------------|------------|----------|
| 12B0043-01 [NCCW Sample] | B045771 | 50.0         | 50.0       | 02/02/12 |

Prep Method: SW-846 7470A Prep-SW-846 7470A

| Lab Number [Field ID]    | Batch   | Initial [mL] | Final [mL] | Date     |
|--------------------------|---------|--------------|------------|----------|
| 12B0043-01 [NCCW Sample] | B045717 | 6.00         | 6.00       | 02/07/12 |

# QUALITY CONTROL

## Metals Analyses (Total) - Quality Control

| Analyte                                  | Result  | Reporting Limit | Units | Spike Level                                              | Source Result | %REC | %REC Limits | RPD   | RPD Limit | Notes |
|------------------------------------------|---------|-----------------|-------|----------------------------------------------------------|---------------|------|-------------|-------|-----------|-------|
| <b>Batch B045717 - SW-846 7470A Prep</b> |         |                 |       |                                                          |               |      |             |       |           |       |
| <b>Blank (B045717-BLK1)</b>              |         |                 |       | Prepared: 02/07/12 Analyzed: 02/08/12                    |               |      |             |       |           |       |
| Mercury                                  | ND      | 0.00010         | mg/L  |                                                          |               |      |             |       |           |       |
| <b>LCS (B045717-BS1)</b>                 |         |                 |       | Prepared: 02/07/12 Analyzed: 02/08/12                    |               |      |             |       |           |       |
| Mercury                                  | 0.00190 | 0.00010         | mg/L  | 0.00200                                                  |               | 95.2 | 80-120      |       |           |       |
| <b>LCS Dup (B045717-BSD1)</b>            |         |                 |       | Prepared: 02/07/12 Analyzed: 02/08/12                    |               |      |             |       |           |       |
| Mercury                                  | 0.00189 | 0.00010         | mg/L  | 0.00200                                                  |               | 94.3 | 80-120      | 0.993 | 20        |       |
| <b>Duplicate (B045717-DUP1)</b>          |         |                 |       | Source: 12B0043-01 Prepared: 02/07/12 Analyzed: 02/08/12 |               |      |             |       |           |       |
| Mercury                                  | ND      | 0.00010         | mg/L  |                                                          | ND            |      |             | NC    | 20        |       |
| <b>Matrix Spike (B045717-MS1)</b>        |         |                 |       | Source: 12B0043-01 Prepared: 02/07/12 Analyzed: 02/08/12 |               |      |             |       |           |       |
| Mercury                                  | 0.00186 | 0.00010         | mg/L  | 0.00200                                                  | ND            | 93.1 | 75-125      |       |           |       |
| <b>Batch B045762 - SW-846 3005A</b>      |         |                 |       |                                                          |               |      |             |       |           |       |
| <b>Blank (B045762-BLK1)</b>              |         |                 |       | Prepared: 02/07/12 Analyzed: 02/08/12                    |               |      |             |       |           |       |
| Cadmium                                  | ND      | 0.0040          | mg/L  |                                                          |               |      |             |       |           |       |
| Chromium                                 | ND      | 0.010           | mg/L  |                                                          |               |      |             |       |           |       |
| Copper                                   | ND      | 0.010           | mg/L  |                                                          |               |      |             |       |           |       |
| Iron                                     | ND      | 0.050           | mg/L  |                                                          |               |      |             |       |           |       |
| Lead                                     | ND      | 0.010           | mg/L  |                                                          |               |      |             |       |           |       |
| Nickel                                   | ND      | 0.010           | mg/L  |                                                          |               |      |             |       |           |       |
| Silver                                   | ND      | 0.0050          | mg/L  |                                                          |               |      |             |       |           |       |
| Zinc                                     | ND      | 0.020           | mg/L  |                                                          |               |      |             |       |           |       |
| <b>LCS (B045762-BS1)</b>                 |         |                 |       | Prepared: 02/07/12 Analyzed: 02/08/12                    |               |      |             |       |           |       |
| Cadmium                                  | 0.527   | 0.0040          | mg/L  | 0.500                                                    |               | 105  | 80-120      |       |           |       |
| Chromium                                 | 0.500   | 0.010           | mg/L  | 0.500                                                    |               | 99.9 | 80-120      |       |           |       |
| Copper                                   | 0.504   | 0.010           | mg/L  | 0.500                                                    |               | 101  | 80-120      |       |           |       |
| Iron                                     | 0.505   | 0.050           | mg/L  | 0.500                                                    |               | 101  | 80-120      |       |           |       |
| Lead                                     | 0.467   | 0.010           | mg/L  | 0.500                                                    |               | 93.4 | 80-120      |       |           |       |
| Nickel                                   | 0.485   | 0.010           | mg/L  | 0.500                                                    |               | 96.9 | 80-120      |       |           |       |
| Silver                                   | 0.502   | 0.0050          | mg/L  | 0.500                                                    |               | 100  | 80-120      |       |           |       |
| Zinc                                     | 0.504   | 0.020           | mg/L  | 0.500                                                    |               | 101  | 80-120      |       |           |       |
| <b>LCS Dup (B045762-BSD1)</b>            |         |                 |       | Prepared: 02/07/12 Analyzed: 02/08/12                    |               |      |             |       |           |       |
| Cadmium                                  | 0.507   | 0.0040          | mg/L  | 0.500                                                    |               | 101  | 80-120      | 3.88  | 20        |       |
| Chromium                                 | 0.483   | 0.010           | mg/L  | 0.500                                                    |               | 96.6 | 80-120      | 3.37  | 20        |       |
| Copper                                   | 0.486   | 0.010           | mg/L  | 0.500                                                    |               | 97.3 | 80-120      | 3.56  | 20        |       |
| Iron                                     | 0.512   | 0.050           | mg/L  | 0.500                                                    |               | 102  | 80-120      | 1.39  | 20        |       |
| Lead                                     | 0.458   | 0.010           | mg/L  | 0.500                                                    |               | 91.5 | 80-120      | 2.02  | 20        |       |
| Nickel                                   | 0.467   | 0.010           | mg/L  | 0.500                                                    |               | 93.4 | 80-120      | 3.71  | 20        |       |
| Silver                                   | 0.479   | 0.0050          | mg/L  | 0.500                                                    |               | 95.9 | 80-120      | 4.69  | 20        |       |
| Zinc                                     | 0.486   | 0.020           | mg/L  | 0.500                                                    |               | 97.3 | 80-120      | 3.59  | 20        |       |

### QUALITY CONTROL

#### Metals Analyses (Total) - Quality Control

| Analyte                               | Result | Reporting<br>Limit | Units | Spike<br>Level | Source<br>Result | %REC | %REC<br>Limits | RPD | RPD<br>Limit | Notes |
|---------------------------------------|--------|--------------------|-------|----------------|------------------|------|----------------|-----|--------------|-------|
| Batch B045763 - SW-846 3005A          |        |                    |       |                |                  |      |                |     |              |       |
| Blank (B045763-BLK1)                  |        |                    |       |                |                  |      |                |     |              |       |
| Prepared: 02/07/12 Analyzed: 02/09/12 |        |                    |       |                |                  |      |                |     |              |       |
| Hardness                              | ND     | 3.0                | mg/L  |                |                  |      |                |     |              |       |

### QUALITY CONTROL

#### Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

| Analyte                                  | Result | Reporting Limit | Units    | Spike Level                   | Source Result | %REC                          | %REC Limits | RPD   | RPD Limit | Notes |
|------------------------------------------|--------|-----------------|----------|-------------------------------|---------------|-------------------------------|-------------|-------|-----------|-------|
| <b>Batch B045484 - SM18-20 4500 H B</b>  |        |                 |          |                               |               |                               |             |       |           |       |
| <b>LCS (B045484-BS1)</b>                 |        |                 |          | Prepared & Analyzed: 02/02/12 |               |                               |             |       |           |       |
| pH                                       | 7.01   |                 | pH Units | 7.00                          |               | 100                           | 0-200       |       |           |       |
| <b>Duplicate (B045484-DUP1)</b>          |        |                 |          | <b>Source: 12B0043-01</b>     |               | Prepared & Analyzed: 02/02/12 |             |       |           |       |
| pH                                       | 7.2    |                 | pH Units |                               | 7.2           |                               |             | 0.415 | 2.93      | H-05  |
| <b>Batch B045771 - SW-846 7196A</b>      |        |                 |          |                               |               |                               |             |       |           |       |
| <b>Blank (B045771-BLK1)</b>              |        |                 |          | Prepared & Analyzed: 02/02/12 |               |                               |             |       |           |       |
| Hexavalent Chromium                      | ND     | 0.0040          | mg/L     |                               |               |                               |             |       |           |       |
| <b>LCS (B045771-BS1)</b>                 |        |                 |          | Prepared & Analyzed: 02/02/12 |               |                               |             |       |           |       |
| Hexavalent Chromium                      | 0.096  | 0.0040          | mg/L     | 0.100                         |               | 96.3                          | 80-120      |       |           |       |
| <b>LCS Dup (B045771-BSD1)</b>            |        |                 |          | Prepared & Analyzed: 02/02/12 |               |                               |             |       |           |       |
| Hexavalent Chromium                      | 0.095  | 0.0040          | mg/L     | 0.100                         |               | 94.7                          | 80-120      | 1.66  | 20        |       |
| <b>Matrix Spike (B045771-MS1)</b>        |        |                 |          | <b>Source: 12B0043-01</b>     |               | Prepared & Analyzed: 02/02/12 |             |       |           |       |
| Hexavalent Chromium                      | 0.098  | 0.0040          | mg/L     | 0.100                         | ND            | 97.9                          | 75-125      |       |           |       |
| <b>Matrix Spike Dup (B045771-MSD1)</b>   |        |                 |          | <b>Source: 12B0043-01</b>     |               | Prepared & Analyzed: 02/02/12 |             |       |           |       |
| Hexavalent Chromium                      | 0.098  | 0.0040          | mg/L     | 0.100                         | ND            | 97.9                          | 75-125      | 0.00  | 20        |       |
| <b>Batch B046083 - SM18-20 4500 CL B</b> |        |                 |          |                               |               |                               |             |       |           |       |
| <b>Blank (B046083-BLK1)</b>              |        |                 |          | Prepared & Analyzed: 02/13/12 |               |                               |             |       |           |       |
| Chloride                                 | ND     | 1.0             | mg/L     |                               |               |                               |             |       |           |       |
| <b>LCS (B046083-BS1)</b>                 |        |                 |          | Prepared & Analyzed: 02/13/12 |               |                               |             |       |           |       |
| Chloride                                 | 19     |                 | mg/L     | 20.3                          |               | 95.0                          | 80.8-118    |       |           |       |
| <b>LCS Dup (B046083-BSD1)</b>            |        |                 |          | Prepared & Analyzed: 02/13/12 |               |                               |             |       |           |       |
| Chloride                                 | 20     |                 | mg/L     | 20.3                          |               | 96.2                          | 80.8-118    | 1.24  | 12.7      |       |

# FLAG/QUALIFIER SUMMARY

- \* QC result is outside of established limits.
- † Wide recovery limits established for difficult compound.
- ‡ Wide RPD limits established for difficult compound.
- # Data exceeded client recommended or regulatory level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

H-05 Holding time was exceeded. pH analysis should be performed immediately at time of sampling. Nominal 1 hour holding time was exceeded.

# CERTIFICATIONS

## Certified Analyses included in this Report

| Analyte                           | Certifications       |
|-----------------------------------|----------------------|
| <b>SM18-20 2340B in Water</b>     |                      |
| Hardness                          | CT,MA,NH,NY,RI       |
| <b>SM18-20 4500 CL B in Water</b> |                      |
| Chloride                          | NH,CT,MA,NY,RI,NC,ME |
| <b>SM18-20 4500 H B in Water</b>  |                      |
| pH                                | CT,MA,NH,NY,RI,ME    |
| <b>SW-846 6010C in Water</b>      |                      |
| Cadmium                           | CT,NH,NY,RI,ME,NC    |
| Chromium                          | CT,NH,NY,RI,ME,NC    |
| Copper                            | CT,NH,NY,RI,ME,NC    |
| Iron                              | CT,NH,NY,RI,ME,NC    |
| Lead                              | CT,NH,NY,RI,NC,ME    |
| Nickel                            | CT,NH,NY,RI,ME,NC    |
| Silver                            | CT,NH,NY,RI,ME,NC    |
| Zinc                              | CT,NH,NY,RI,ME,NC    |
| <b>SW-846 7196A in Water</b>      |                      |
| Hexavalent Chromium               | CT,NH,NY,RI,NC,ME    |
| <b>SW-846 7470A in Water</b>      |                      |
| Mercury                           | CT,NH,NY,RI,NC,ME    |

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

| Code | Description                                  | Number        | Expires    |
|------|----------------------------------------------|---------------|------------|
| AIHA | AIHA-LAP, LLC                                | 100033        | 02/1/2014  |
| MA   | Massachusetts DEP                            | M-MA100       | 06/30/2012 |
| CT   | Connecticut Department of Public Health      | PH-0567       | 09/30/2013 |
| NY   | New York State Department of Health          | 10899 NELAP   | 04/1/2012  |
| NH   | New Hampshire Environmental Lab              | 2516 NELAP    | 02/5/2013  |
| RI   | Rhode Island Department of Health            | LAO00112      | 12/30/2012 |
| NC   | North Carolina Div. of Water Quality         | 652           | 12/31/2012 |
| NJ   | New Jersey DEP                               | MA007 NELAP   | 06/30/2012 |
| FL   | Florida Department of Health                 | E871027 NELAP | 06/30/2012 |
| VT   | Vermont Department of Health Lead Laboratory | LL015036      | 07/30/2012 |
| WA   | State of Washington Department of Ecology    | C2065         | 02/23/2012 |
| ME   | State of Maine                               | 2011028       | 06/9/2013  |
| VA   | Commonwealth of Virginia                     | 1381          | 12/14/2012 |



39 Spruce St.  
East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
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## Sample Receipt Checklist

CLIENT NAME: SAK RECEIVED BY: C.C-S. DATE: 2/1/12

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples?

If not, explain:

3) Are all the samples in good condition?

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 3.0°C

5) Are there Dissolved samples for the lab to filter?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No

(Walk-in clients only) if not already approved

Client Signature: \_\_\_\_\_

## Containers received at Con-Test

|                                | # of containers |                       | # of containers |
|--------------------------------|-----------------|-----------------------|-----------------|
| 1 Liter Amber                  |                 | 8 oz amber/clear jar  |                 |
| 500 mL Amber                   |                 | 4 oz amber/clear jar  |                 |
| 250 mL Amber (8oz amber)       |                 | 2 oz amber/clear jar  |                 |
| 1 Liter Plastic                |                 | Air Cassette          |                 |
| 500 mL Plastic                 | <u>1</u>        | Hg/Hopcalite Tube     |                 |
| 250 mL plastic                 | <u>3</u>        | Plastic Bag / Ziploc  |                 |
| 40 mL Vial - type listed below |                 | PM 2.5 / PM 10        |                 |
| Colisure / bacteria bottle     |                 | PUF Cartridge         |                 |
| Dissolved Oxygen bottle        |                 | SOC Kit               |                 |
| Encore                         |                 | TO-17 Tubes           |                 |
| Flashpoint bottle              |                 | Non-ConTest Container |                 |
| Perchlorate Kit                |                 | Other glass jar       |                 |
| Other                          |                 | Other                 |                 |

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_  
# Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_  
# Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen:

Do all samples have the proper Acid pH: Yes No N/A

Do all samples have the proper Base pH: Yes No N/A

Doc# 277

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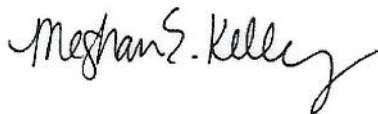
February 17, 2012

Mark Grady  
SAK Environmental, LLC  
231 Sutton Street  
North Andover, MA 01845

Project Location: Norwood  
Client Job Number:  
Project Number: 11.20.00  
Laboratory Work Order Number: 12B0535

Enclosed are results of analyses for samples received by the laboratory on February 16, 2012. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley  
Project Manager

SAK Environmental, LLC  
231 Sutton Street  
North Andover, MA 01845  
ATTN: Mark Grady

REPORT DATE: 2/17/2012

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 11.20.00

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 12B0535

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Norwood

| FIELD SAMPLE # | LAB ID:    | MATRIX       | SAMPLE DESCRIPTION | TEST         | SUB LAB |
|----------------|------------|--------------|--------------------|--------------|---------|
| NCCW Sample    | 12B0535-01 | Ground Water |                    | SW-846 6020A |         |

**CASE NARRATIVE SUMMARY**

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson  
Laboratory Director

Project Location: Norwood

Sample Description:

Work Order: 12B0535

Date Received: 2/16/2012

Field Sample #: NCCW Sample

Sample ID: 12B0535-01

Start Date/Time: 2/1/2012 9:15:00AM

Sample Matrix: Ground Water

Stop Date/Time: 2/1/2012 9:20:00AM

## Metals Analyses (Total)

| Analyte  | Results | RL  | Units | Dilution | Flag | Method       | Date Prepared | Date/Time Analyzed | Analyst |
|----------|---------|-----|-------|----------|------|--------------|---------------|--------------------|---------|
| Antimony | ND      | 5.0 | µg/L  | 5        |      | SW-846 6020A | 2/16/12       | 2/17/12 13:41      | KSH     |
| Arsenic  | ND      | 2.0 | µg/L  | 5        |      | SW-846 6020A | 2/16/12       | 2/17/12 13:41      | KSH     |

**Sample Extraction Data**

Prep Method: SW-846 3005A-SW-846 6020A

| Lab Number [Field ID]    | Batch   | Initial [mL] | Final [mL] | Date     |
|--------------------------|---------|--------------|------------|----------|
| 12B0535-01 [NCCW Sample] | B046320 | 50.0         | 50.0       | 02/16/12 |

**QUALITY CONTROL**
**Metals Analyses (Total) - Quality Control**

| Analyte                             | Result | Reporting<br>Limit | Units | Spike<br>Level                        | Source<br>Result | %REC | %REC<br>Limits | RPD   | RPD<br>Limit | Notes |
|-------------------------------------|--------|--------------------|-------|---------------------------------------|------------------|------|----------------|-------|--------------|-------|
| <b>Batch B046320 - SW-846 3005A</b> |        |                    |       |                                       |                  |      |                |       |              |       |
| <b>Blank (B046320-BLK1)</b>         |        |                    |       | Prepared: 02/16/12 Analyzed: 02/17/12 |                  |      |                |       |              |       |
| Antimony                            | ND     | 5.0                | µg/L  |                                       |                  |      |                |       |              |       |
| Arsenic                             | ND     | 2.0                | µg/L  |                                       |                  |      |                |       |              |       |
| <b>LCS (B046320-BS1)</b>            |        |                    |       | Prepared: 02/16/12 Analyzed: 02/17/12 |                  |      |                |       |              |       |
| Antimony                            | 258    | 5.0                | µg/L  | 250                                   |                  | 103  | 80-120         |       |              |       |
| Arsenic                             | 259    | 2.0                | µg/L  | 250                                   |                  | 104  | 80-120         |       |              |       |
| <b>LCS Dup (B046320-BSD1)</b>       |        |                    |       | Prepared: 02/16/12 Analyzed: 02/17/12 |                  |      |                |       |              |       |
| Antimony                            | 260    | 5.0                | µg/L  | 250                                   |                  | 104  | 80-120         | 0.665 | 20           |       |
| Arsenic                             | 254    | 2.0                | µg/L  | 250                                   |                  | 101  | 80-120         | 2.18  | 20           |       |

**FLAG/QUALIFIER SUMMARY**

- \* QC result is outside of established limits.
- † Wide recovery limits established for difficult compound.
- ‡ Wide RPD limits established for difficult compound.
- # Data exceeded client recommended or regulatory level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

| Sample | Concentration | Recovery | RPD |
|--------|---------------|----------|-----|
| 10101  | 10.00         | 100.0    | 0.0 |
| 10102  | 10.00         | 100.0    | 0.0 |
| 10103  | 10.00         | 100.0    | 0.0 |
| 10104  | 10.00         | 100.0    | 0.0 |
| 10105  | 10.00         | 100.0    | 0.0 |
| 10106  | 10.00         | 100.0    | 0.0 |
| 10107  | 10.00         | 100.0    | 0.0 |
| 10108  | 10.00         | 100.0    | 0.0 |
| 10109  | 10.00         | 100.0    | 0.0 |
| 10110  | 10.00         | 100.0    | 0.0 |
| 10111  | 10.00         | 100.0    | 0.0 |
| 10112  | 10.00         | 100.0    | 0.0 |
| 10113  | 10.00         | 100.0    | 0.0 |
| 10114  | 10.00         | 100.0    | 0.0 |
| 10115  | 10.00         | 100.0    | 0.0 |
| 10116  | 10.00         | 100.0    | 0.0 |
| 10117  | 10.00         | 100.0    | 0.0 |
| 10118  | 10.00         | 100.0    | 0.0 |
| 10119  | 10.00         | 100.0    | 0.0 |
| 10120  | 10.00         | 100.0    | 0.0 |
| 10121  | 10.00         | 100.0    | 0.0 |
| 10122  | 10.00         | 100.0    | 0.0 |
| 10123  | 10.00         | 100.0    | 0.0 |
| 10124  | 10.00         | 100.0    | 0.0 |
| 10125  | 10.00         | 100.0    | 0.0 |
| 10126  | 10.00         | 100.0    | 0.0 |
| 10127  | 10.00         | 100.0    | 0.0 |
| 10128  | 10.00         | 100.0    | 0.0 |
| 10129  | 10.00         | 100.0    | 0.0 |
| 10130  | 10.00         | 100.0    | 0.0 |
| 10131  | 10.00         | 100.0    | 0.0 |
| 10132  | 10.00         | 100.0    | 0.0 |
| 10133  | 10.00         | 100.0    | 0.0 |
| 10134  | 10.00         | 100.0    | 0.0 |
| 10135  | 10.00         | 100.0    | 0.0 |
| 10136  | 10.00         | 100.0    | 0.0 |
| 10137  | 10.00         | 100.0    | 0.0 |
| 10138  | 10.00         | 100.0    | 0.0 |
| 10139  | 10.00         | 100.0    | 0.0 |
| 10140  | 10.00         | 100.0    | 0.0 |
| 10141  | 10.00         | 100.0    | 0.0 |
| 10142  | 10.00         | 100.0    | 0.0 |
| 10143  | 10.00         | 100.0    | 0.0 |
| 10144  | 10.00         | 100.0    | 0.0 |
| 10145  | 10.00         | 100.0    | 0.0 |
| 10146  | 10.00         | 100.0    | 0.0 |
| 10147  | 10.00         | 100.0    | 0.0 |
| 10148  | 10.00         | 100.0    | 0.0 |
| 10149  | 10.00         | 100.0    | 0.0 |
| 10150  | 10.00         | 100.0    | 0.0 |
| 10151  | 10.00         | 100.0    | 0.0 |
| 10152  | 10.00         | 100.0    | 0.0 |
| 10153  | 10.00         | 100.0    | 0.0 |
| 10154  | 10.00         | 100.0    | 0.0 |
| 10155  | 10.00         | 100.0    | 0.0 |
| 10156  | 10.00         | 100.0    | 0.0 |
| 10157  | 10.00         | 100.0    | 0.0 |
| 10158  | 10.00         | 100.0    | 0.0 |
| 10159  | 10.00         | 100.0    | 0.0 |
| 10160  | 10.00         | 100.0    | 0.0 |
| 10161  | 10.00         | 100.0    | 0.0 |
| 10162  | 10.00         | 100.0    | 0.0 |
| 10163  | 10.00         | 100.0    | 0.0 |
| 10164  | 10.00         | 100.0    | 0.0 |
| 10165  | 10.00         | 100.0    | 0.0 |
| 10166  | 10.00         | 100.0    | 0.0 |
| 10167  | 10.00         | 100.0    | 0.0 |
| 10168  | 10.00         | 100.0    | 0.0 |
| 10169  | 10.00         | 100.0    | 0.0 |
| 10170  | 10.00         | 100.0    | 0.0 |
| 10171  | 10.00         | 100.0    | 0.0 |
| 10172  | 10.00         | 100.0    | 0.0 |
| 10173  | 10.00         | 100.0    | 0.0 |
| 10174  | 10.00         | 100.0    | 0.0 |
| 10175  | 10.00         | 100.0    | 0.0 |
| 10176  | 10.00         | 100.0    | 0.0 |
| 10177  | 10.00         | 100.0    | 0.0 |
| 10178  | 10.00         | 100.0    | 0.0 |
| 10179  | 10.00         | 100.0    | 0.0 |
| 10180  | 10.00         | 100.0    | 0.0 |
| 10181  | 10.00         | 100.0    | 0.0 |
| 10182  | 10.00         | 100.0    | 0.0 |
| 10183  | 10.00         | 100.0    | 0.0 |
| 10184  | 10.00         | 100.0    | 0.0 |
| 10185  | 10.00         | 100.0    | 0.0 |
| 10186  | 10.00         | 100.0    | 0.0 |
| 10187  | 10.00         | 100.0    | 0.0 |
| 10188  | 10.00         | 100.0    | 0.0 |
| 10189  | 10.00         | 100.0    | 0.0 |
| 10190  | 10.00         | 100.0    | 0.0 |
| 10191  | 10.00         | 100.0    | 0.0 |
| 10192  | 10.00         | 100.0    | 0.0 |
| 10193  | 10.00         | 100.0    | 0.0 |
| 10194  | 10.00         | 100.0    | 0.0 |
| 10195  | 10.00         | 100.0    | 0.0 |
| 10196  | 10.00         | 100.0    | 0.0 |
| 10197  | 10.00         | 100.0    | 0.0 |
| 10198  | 10.00         | 100.0    | 0.0 |
| 10199  | 10.00         | 100.0    | 0.0 |
| 10200  | 10.00         | 100.0    | 0.0 |

# CERTIFICATIONS

## Certified Analyses included in this Report

| Analyte | Certifications |
|---------|----------------|
|---------|----------------|

### SW-846 6020A in Water

|          |                   |
|----------|-------------------|
| Antimony | CT,NH,NY,RI,NC,ME |
|----------|-------------------|

|         |                   |
|---------|-------------------|
| Arsenic | CT,NH,NY,RI,NC,ME |
|---------|-------------------|

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

| Code | Description                                  | Number        | Expires    |
|------|----------------------------------------------|---------------|------------|
| AIHA | AIHA-LAP, LLC                                | 100033        | 02/1/2014  |
| MA   | Massachusetts DEP                            | M-MA100       | 06/30/2012 |
| CT   | Connecticut Department of Public Health      | PH-0567       | 09/30/2013 |
| NY   | New York State Department of Health          | 10899 NELAP   | 04/1/2012  |
| NH   | New Hampshire Environmental Lab              | 2516 NELAP    | 02/5/2013  |
| RI   | Rhode Island Department of Health            | LAO00112      | 12/30/2012 |
| NC   | North Carolina Div. of Water Quality         | 652           | 12/31/2012 |
| NJ   | New Jersey DEP                               | MA007 NELAP   | 06/30/2012 |
| FL   | Florida Department of Health                 | E871027 NELAP | 06/30/2012 |
| VT   | Vermont Department of Health Lead Laboratory | LL015036      | 07/30/2012 |
| WA   | State of Washington Department of Ecology    | C2065         | 02/23/2012 |
| ME   | State of Maine                               | 2011028       | 06/9/2013  |
| VA   | Commonwealth of Virginia                     | 1381          | 12/14/2012 |



Email: [info@contestlabs.com](mailto:info@contestlabs.com)  
[www.contestlabs.com](http://www.contestlabs.com)

Project # 11,20.00

DATA DELIVERY (check all that apply)

Email: [mqcrach@spvsnvllc.com](mailto:mqcrach@spvsnvllc.com)

Format: ☒ PDF ☒ EXCEL ☐ OGIS

|        |  |  |
|--------|--|--|
| Engine |  |  |
| Motor  |  |  |

1

1

1

11

**Front**

Other

148-Hr

b appar

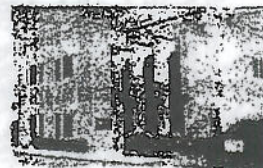
UNIT

Page 1 of 1

Page 9 of 10

[illegible]

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East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
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### Sample Receipt Checklist

CLIENT NAME: SAK RECEIVED BY: C.C-S. DATE: 2/1/12

- 1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included  
2) Does the chain agree with the samples? Yes No  
If not, explain:  
3) Are all the samples in good condition? Yes No  
If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 3.0°C

5) Are there Dissolved samples for the lab to filter?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples?

Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No  
(Walk-in clients only) if not already approved  
Client Signature: \_\_\_\_\_

### Containers received at Con-Test

|                                | # of containers |                       | # of containers |
|--------------------------------|-----------------|-----------------------|-----------------|
| 1 Liter Amber                  |                 | 8 oz amber/clear jar  |                 |
| 500 mL Amber                   |                 | 4 oz amber/clear jar  |                 |
| 250 mL Amber (8oz amber)       |                 | 2 oz amber/clear jar  |                 |
| 1 Liter Plastic                |                 | Air Cassette          |                 |
| 500 mL Plastic                 | <u>1</u>        | Hg/Hopcalite Tube     |                 |
| 250 mL plastic                 | <u>3</u>        | Plastic Bag / Ziploc  |                 |
| 40 mL Vial - type listed below |                 | PM 2.5 / PM 10        |                 |
| Colisure / bacteria bottle     |                 | PUF Cartridge         |                 |
| Dissolved Oxygen bottle        |                 | SOC Kit               |                 |
| Encore                         |                 | TO-17 Tubes           |                 |
| Flashpoint bottle              |                 | Non-ConTest Container |                 |
| Perchlorate Kit                |                 | Other glass jar       |                 |
| Other                          |                 | Other                 |                 |

Laboratory Comments:

40 mL vials: # HCl \_\_\_\_\_ # Methanol \_\_\_\_\_  
# Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_  
# Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen:

Do all samples have the proper Acid pH: Yes No N/A

Doc# 277

Do all samples have the proper Base pH: Yes No N/A

Rev. 1 May 2011

## Appendix C

## Endangered Species Eligibility Act

## FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

| COUNTY     | SPECIES                         | FEDERAL STATUS | GENERAL LOCATION/HABITAT                                                        | TOWNS                                                                             |
|------------|---------------------------------|----------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Barnstable | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | All Towns                                                                         |
|            | Roseate Tern                    | Endangered     | Coastal beaches and the Atlantic Ocean                                          | All Towns                                                                         |
|            | Northeastern beach tiger beetle | Threatened     | Coastal Beaches                                                                 | Chatham                                                                           |
|            | Sandplain gerardia              | Endangered     | Open areas with sandy soils.                                                    | Sandwich and Falmouth.                                                            |
|            | Northern Red-bellied Cooter     | Endangered     | Inland Ponds and Rivers                                                         | Bourne (north of the Cape Cod Canal)                                              |
| Berkshire  | Bog Turtle                      | Threatened     | Wetlands                                                                        | Egremont and Sheffield                                                            |
| Bristol    | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | Fairhaven, Dartmouth, Westport                                                    |
|            | Roseate Tern                    | Endangered     | Coastal beaches and the Atlantic Ocean                                          | Fairhaven, New Bedford, Dartmouth, Westport                                       |
|            | Northern Red-bellied Cooter     | Endangered     | Inland Ponds and Rivers                                                         | Taunton                                                                           |
| Dukes      | Roseate Tern                    | Endangered     | Coastal beaches and the Atlantic Ocean                                          | All Towns                                                                         |
|            | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | All Towns                                                                         |
|            | Northeastern beach tiger beetle | Threatened     | Coastal Beaches                                                                 | Aquinnah and Chilmark                                                             |
|            | Sandplain gerardia              | Endangered     | Open areas with sandy soils.                                                    | West Tisbury                                                                      |
| Essex      | Small whorled Pogonia           | Threatened     | Forests with somewhat poorly drained soils and/or a seasonally high water table | Gloucester, Essex and Manchester                                                  |
|            | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury    |
| Franklin   | Northeastern bulrush            | Endangered     | Wetlands                                                                        | Montague, Warwick                                                                 |
|            | Dwarf wedgemussel               | Endangered     | Mill River                                                                      | Whately                                                                           |
| Hampshire  | Small whorled Pogonia           | Threatened     | Forests with somewhat poorly drained soils and/or a seasonally high water table | Hadley                                                                            |
|            | Puritan tiger beetle            | Threatened     | Sandy beaches along the Connecticut River                                       | Northampton and Hadley                                                            |
|            | Dwarf wedgemussel               | Endangered     | Rivers and Streams.                                                             | Hatfield, Amherst and Northampton                                                 |
| Hampden    | Small whorled Pogonia           | Threatened     | Forests with somewhat poorly drained soils and/or a seasonally high water table | Southwick                                                                         |
| Middlesex  | Small whorled Pogonia           | Threatened     | Forests with somewhat poorly drained soils and/or a seasonally high water table | Groton                                                                            |
| Nantucket  | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | Nantucket                                                                         |
|            | Roseate Tern                    | Endangered     | Coastal beaches and the Atlantic Ocean                                          | Nantucket                                                                         |
|            | American burying beetle         | Endangered     | Upland grassy meadows                                                           | Nantucket                                                                         |
| Plymouth   | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett                 |
|            | Northern Red-bellied Cooter     | Endangered     | Inland Ponds and Rivers                                                         | Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke |
|            | Roseate Tern                    | Endangered     | Coastal beaches and the Atlantic Ocean                                          | Plymouth, Marion, Wareham, and Mattapoisett.                                      |
| Suffolk    | Piping Plover                   | Threatened     | Coastal Beaches                                                                 | Winthrop                                                                          |
| Worcester  | Small whorled Pogonia           | Threatened     | Forests with somewhat poorly drained soils and/or a seasonally high water table | Leominster                                                                        |

- Eastern cougar and gray wolf are considered extirpated in Massachusetts.
- Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
- Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

New England Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5087  
<http://www.fws.gov/newengland>

January 17, 2012

To Whom It May Concern:

This project was reviewed for the presence of federally listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

(<http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm>)

Based on information currently available to us, no federally listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required. No further Endangered Species Act coordination is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Mr. Anthony Tur of this office at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman  
Supervisor  
New England Field Office

|         |                |                                 |                   |   |          |
|---------|----------------|---------------------------------|-------------------|---|----------|
| NORWELL | Vascular Plant | Platanthera flava var. herbiola | Pale Green Orchis | T | 1981     |
| NORWELL | Vascular Plant | Rumex verticillatus             | Swamp Dock        | T | 2008     |
| NORWELL | Vascular Plant | Senna hebecarpa                 | Wild Senna        | E | Historic |

| Town    | Taxonomic Group | Scientific Name                  | Common Name         | MESA Status | Federal Status | Most Recent Observation |
|---------|-----------------|----------------------------------|---------------------|-------------|----------------|-------------------------|
| NORWOOD | Beetle          | Cicindela purpurea               | Purple Tiger Beetle | SC          |                | 1913                    |
| NORWOOD | Bird            | Ammodramus henslowii             | Henslow's Sparrow   | E           |                | Historic                |
| NORWOOD | Bird            | Ixobrychus exilis                | Least Bittern       | E           |                | 1985                    |
| NORWOOD | Reptile         | Terrapene carolina               | Eastern Box Turtle  | SC          |                | 1989                    |
| NORWOOD | Vascular Plant  | Aristida purpurascens            | Purple Needlegrass  | T           |                | 1894                    |
| NORWOOD | Vascular Plant  | Houstonia longifolia             | Long-leaved Bluet   | E           |                | 1910                    |
| NORWOOD | Vascular Plant  | Nabalus serpentarius             | Lion's Foot         | E           |                | 1901                    |
| NORWOOD | Vascular Plant  | Petasites frigidus var. palmatus | Sweet Coltsfoot     | E           |                | 1897                    |
| NORWOOD | Vascular Plant  | Platanthera flava var. herbiola  | Pale Green Orchis   | T           |                | 1909                    |
| NORWOOD | Vascular Plant  | Scirpus longii                   | Long's Bulrush      | T           |                | 2002                    |
| NORWOOD | Vascular Plant  | Sphenopholis pennsylvanica       | Swamp Oats          | T           |                | Historic                |

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Updated: October 27, 2009

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Massachusetts Division of Fisheries and Wildlife, 1 Rabbit Hill Rd, Westborough, MA 01581

Tel: (508) 389-6300; Fax: (508) 389-7890

Natural Heritage & Endangered Species Program Tel: (508) 389-6360; Fax: (508) 389-7891

## Appendix D

### National Historic Preservation Act

## **State Listings – Norfolk County**

### **Day, Fred Holland, House \*\* (added 1977 - - #77000191)**

93 Day St. , Norwood \_\_\_\_\_

Historic Significance: Person, Architecture/Engineering

Architect, builder, or engineer: Beal, J. Williams

Architectural Style: Tudor Revival

Historic Person: Day, Fred Holland

Significant Year: 1890, 1859

Area of Significance: Literature, Art, Architecture

Period of Significance: 1875-1899, 1850-1874

Owner: Private

Historic Function: Domestic

Historic Sub-function: Single Dwelling

Current Function: Domestic, Recreation And Culture

Current Sub-function: Museum, Single Dwelling

### **Norwood Memorial Municipal Building (added 1996 - - #96001086)**

Also known as **Norwood Town Hall**

566 Washington St. , Norwood \_\_\_\_\_

Historic Significance: Architecture/Engineering, Event

Architect, builder, or engineer: Miner, Edward, et al., Upham, William G.

Architectural Style: Late Gothic Revival

Area of Significance: Architecture, Politics/Government, Art, Community Planning And Development

Period of Significance: 1925-1949

Owner: Local

Historic Function: Government, Recreation And Culture, Social

Historic Sub-function: City Hall, Meeting Hall, Monument/Marker

Current Function: Government, Recreation And Culture, Social

Current Sub-function: City Hall, Meeting Hall, Monument/Marker

## **Historic Districts**

No Results

## **Vacant/Not In-use**

No Results

**Information obtained from:**

**<http://www.nationalregisterofhistoricplaces.com/MA/Norfolk/state2.html>**



ADDRESS

|               |  |
|---------------|--|
| PERMIT NUMBER |  |
|               |  |

|                  |  |
|------------------|--|
| DISCHARGE NUMBER |  |
|                  |  |

FACILITY LOCATION

FROM

|                   |    |     |    |
|-------------------|----|-----|----|
| MONITORING PERIOD |    |     |    |
| YEAR              | MO | DAY | TO |
|                   |    |     |    |

☐ Check here if No Discharge

NOTE: Read Instructions before completing this form

| PARAMETER | X                  | QUANTITY OR LOADING |       |       | QUALITY OR CONCENTRATION |       |       | NO. EX | FREQUENCY OF ANALYSIS | SAMPLE TYPE |
|-----------|--------------------|---------------------|-------|-------|--------------------------|-------|-------|--------|-----------------------|-------------|
|           |                    | VALUE               | VALUE | UNITS | VALUE                    | VALUE | UNITS |        |                       |             |
|           | SAMPLE MEASUREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | PERMIT REQUIREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | SAMPLE MEASUREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | PERMIT REQUIREMENT |                     |       |       |                          |       |       |        |                       |             |
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|           | SAMPLE MEASUREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | PERMIT REQUIREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | SAMPLE MEASUREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | PERMIT REQUIREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | SAMPLE MEASUREMENT |                     |       |       |                          |       |       |        |                       |             |
|           | PERMIT REQUIREMENT |                     |       |       |                          |       |       |        |                       |             |

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER

TYPED OR PRINTED

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

DATE

TELEPHONE

AREA CODE

NUMBER

YEAR

MO

DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.



Enter your transmittal number

X250813

Transmittal Number

Your unique Transmittal Number can be accessed online: <http://mass.gov/dep/service/online/trasmfrm.shtml>**Massachusetts Department of Environmental Protection****Transmittal Form for Permit Application and Payment**

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: DEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. Copy 2 must accompany your fee payment. Copy 3 should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP  
P.O. Box 4062  
Boston, MA  
02211

\* Note:  
For BWSC Permits,  
enter the LSP.

**A. Permit Information**

1. Permit Code: 7 or 8 character code from permit instructions  
Non Contact Cooling Water General Permit

2. Name of Permit Category  
BRP WM 11

3. Type of Project or Activity

**B. Applicant Information – Firm or Individual**

Story Board LLC

1. Name of Firm - Or, if party needing this approval is an individual enter name below:  
Lewis Susan

2. Last Name of Individual  
109 Central Street

3. First Name of Individual  
4. MI

5. Street Address  
Norwood MA 02062 781-255-6980

6. City/Town  
7. State 8. Zip Code 9. Telephone # 10. Ext. #

11. Contact Person  
Susan Lewis

12. e-mail address (optional)

**C. Facility, Site or Individual Requiring Approval**

Norwood Theater

1. Name of Facility, Site Or Individual  
109 Central Street

2. Street Address  
Norwood MA 02062 781-255-6980

3. City/Town  
4. State 5. Zip Code 6. Telephone # 7. Ext. #

8. DEP Facility Number (if Known)  
9. Federal I.D. Number (if Known) 10. BWSC Tracking # (if Known)

**D. Application Prepared by (if different from Section B)\***

SAK Environmental LLC

1. Name of Firm Or Individual  
231 Sutton Street, Suite 2G

2. Address  
North Andover MA 01845 978-688-7804 114

3. City/Town  
4. State 5. Zip Code 6. Telephone # 7. Ext. #

8. Contact Person  
Mark Grady

9. LSP Number (BWSC Permits only)

**E. Permit - Project Coordination**

1. Is this project subject to MEPA review? ☐ yes ☒ no  
If yes, enter the project's EOE file number - assigned when an Environmental Notification Form is submitted to the MEPA unit:

EOEA File Number

**F. Amount Due****Special Provisions:**

1. ☒ Fee Exempt (city, town or municipal housing authority)(state agency if fee is \$100 or less).  
There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ Hardship Request - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ Alternative Schedule Project (according to 310 CMR 4.05 and 4.10).
4. ☐ Homeowner (according to 310 CMR 4.02).

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

2361

Check Number

385.00

Dollar Amount

3/16/2012

Date