APPENDIX B: ADDITIONAL PRIMARY SOURCES REVIEWED

This page is intentionally blank.
May 25, 2007

Mr. Carter Terenzini
Town Administrator
157 Main Street
Spencer, Massachusetts 01562

Re: Water Treatment Facility Review and Evaluation Services

Dear Mr. Terenzini:

This letter summarizes our evaluation and recommendations in accordance with our agreement with the Town of Spencer dated May 1, 2007, to review and evaluate the water treatment system particularly in connection with its chemical feed system. A report specifically dedicated to the instrumentation of the sodium hydroxide chemical feed system is submitted to you in a separate letter.

**Scope of Work**

Per our agreement with the Town of Spencer, the scope of work is to provide professional services to assist the Town of Spencer by providing a risk and best management practices review and evaluation for the town’s water treatment system particularly in connection with its chemical feed systems. The following describes the scope of work.

1. Meet with the Town to discuss the scope of services and schedule for the project.

2. Provide the services of experienced water treatment professionals to visit the water treatment facilities to review and evaluate their adequacy for public water supply. In particular, this review and evaluation shall focus on the chemical feed facilities and related failsafe capabilities.

3. Prepare and submit to the Town a letter report summarizing the review and evaluation, and presenting findings regarding the water treatment facilities and recommendations for improvement needs as appropriate.

4. Prepare for and meet with the Town’s Blue Ribbon Committee to present the findings and recommendations.

5. Prepare for and meet with the Town in a public meeting to present the findings and recommendations.
Multimedia Materials Reviewed by the Blue Ribbon Committee

Audio Cassette Tape – labeled “Water Emerg Misc Calls” provided by SPD

Worcester Telegram & Gazette Articles
April 26, 2007 – Lye Fouls Water // Town Struggles to Cope with Accident (C. Semon)
April 26, 2007 – More than 85 People Sickened // Some Victims Suffer Burns (M. Valencia)
April 26, 2007 - Dangerous Waters // Dozens Hurt By Lye; Firm Ban Still in Effect (B. Miner, K. Ring)
April 26, 2007 – Sodium Hydroxide Can Be a Boon or a Bane (Editorial)
April 28, 2007 - Water Questions Remain (J. Russell)
April 30, 2007 – Lye-Laced Water Deters Customers // Spencer Businesses Experience Drop in Traffic; May Seek Relief (J. Russell)
May 1, 2007 – Lye Victim Tells of Her Injuries // Woman’s Esophagus Damaged by Drinking Contaminated Water (B. Miner)
May 1, 2007 – DEP Investigation into Lye Accident Continues (B. Miner)
May 2, 2007 – Water Chief is Supported by Officials // Lack of License Dismissed (J. Russell)
May 3, 2007 – Human Error Put Lye In Water // Town Reassigns Two Employees (B. Miner)
May 3, 2007 – Review of Water Crisis Sought // Outside Agency to do the Study (K. Ring)
May 8, 2007 – Selectmen Suspend Licenses of Two Taverns (C. Semon)

Spencer Cable Re-Broadcast of Press Conferences
April 25, 2007 – 11:30 AM
April 25, 2007 – 3:00 PM
April 25, 2007 – 8:00 PM

Audio Cassette Tape – containing 8:21 AM call on April 25, 2007 from SPD to ODIS
Introduction

On April 25, 2007, an overdose of sodium hydroxide was mistakenly introduced into the water distribution system. Once the emergency response was complete, questions were raised regarding why earlier notification via the alarm system and shut down of the finished water pump did not occur. Additional questions also were raised relating to the reliability and safety of the sodium hydroxide chemical feed system. The sodium hydroxide chemical feed system was immediately taken out of service by the Town.

Weston & Sampson was requested to evaluate the water treatment plant’s chemical feed system described above utilizing best industry practices. Additionally, Weston & Sampson was requested to take operational responsibility of the treatment plant on May 2, 2007. Weston & Sampson’s Jack Mitchell conducted this evaluation, and the findings and recommendations are presented below. It should be noted that additional conditions or situations that were unknown or not observed during the time of this evaluation may exist and may require attention through a more comprehensive inspection and evaluation of the entire water treatment plant and pump station.

Attached are schematic diagrams illustrating the water treatment plant and the sodium hydroxide chemical feed system.

Sodium Hydroxide Chemical Feed System

Sodium hydroxide is commonly used throughout the waterworks industry to adjust the pH of drinking water. In so doing, the water becomes less corrosive to piping and fixture materials that contain metals such as lead and copper. As in many other communities, Spencer has been successful in meeting the stringent maximum contaminant levels for lead and copper in drinking water as set forth by the United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MADEP).

The current sodium hydroxide (caustic) feed system comprises a 2,000-gallon steel bulk storage tank. The bulk storage tank fill line travels from the top of the tank through an exterior wall to the loading dock area adjacent to the hydroxide storage room.

Chemical is supplied directly to two BFI hydraulic diaphragm, positive displacement pumps through a ¾-inch CPVC pipe with an isolation valve. Individual isolation valves are provided for both pumps on the suction and discharge. Each pump is piped directly to the finished water pumping main via individual ¾-inch schedule 80 CPVC pipes. The chemical discharge piping travels through an interior wall separating the chemical storage room from the high lift (finished water) pump room. Pulsa-Feeder surge tanks are located on the top of the chemical feed pump discharge lines. The pump discharge lines are cross-connected in the High Lift Pump Station. The cross connection is mounted on a horizontal run of pipe approximately seven feet high. Vertical
runs of pipe drop directly over the finished water pumping main and have isolation valves and ball check valves. The ¾-inch CPVC lines are connected to ¾-inch removable chemical injector tubes. The chemical tubes enter the finished water pumping main through 1-inch corporation stops that are directly tapped into the main. The corporation stops utilize pack joint (compression) fittings to hold the injection tube in place.

Pump controls are mounted next to each pump. The controls are Hand-Off-Automatic (H-O-A) selector switches. Both pumps have stroke adjustment dials. By adjusting the dial, one can change the pump output capacity between 0 and 100%. These pumps do not have speed control. In normal operation the pump control selector is placed in the automatic (A) mode. When the finished water pump begins to operate and a flow is established, as indicated by the finished water meter mounted on the finished water piping, the chemical pump is allowed to run. In the manual mode, the pump runs regardless of flow or no flow.

**Review of the Chemical Feed System**

We have identified the following list of deficiencies based on inspection of the system. A discussion follows the list.

1. The sodium hydroxide tank fill line is not identified at the fill connection.
2. The chemical lines are not labeled for contents or flow direction. The lines are also incorrectly color-coded.
3. The sodium hydroxide bulk storage tank does not have an overflow within the containment area for the tank.
4. The sodium hydroxide bulk storage tank does not have a dependable level indicator.
5. The tank discharge/pump supply line is not outfitted with a drain fixture.
6. The chemical pump delivery system requires upgrading.
7. The H-O-A switches are located so that the operator must enter the containment area.
8. The H-O-A selector switches do not have a spring return on the Hand operation side.
9. A 110-volt electrical outlet is placed between the two pumps. It is not a ground fault type and is contained in a metal box and conduit.
10. A three hundred gallon diesel fuel tank is stored in the chemical containment area.
11. The chemical containment area does not appear to have any type of chemical resistant liner such as an epoxy coating.
12. The chemical containment area does not have a flood alarm.
13. The emergency shower is not plumbed to code and does not appear to have an alarm connected to it.

**1. The sodium hydroxide tank fill line is not identified at the fill connection.**

The sodium hydroxide fill line is accessible from the driveway side of the pump building, near the loading dock. It simply protrudes through the wall and terminates with a quick connect fitting that
will accept a hose from the chemical delivery truck. The quick connect fitting is normally covered with a cap designed to cover it. Several feet away is another connection to deliver water for contractors’ use. Both fittings should be clearly identified to prevent accidental connections or possible personal exposure to sodium hydroxide by somebody opening the wrong cap. Weston & Sampson recommends that placards be installed identifying each connection.

2. **The chemical lines are not labeled for contents or flow direction. The lines are also incorrectly color-coded.**

All chemical feed systems are required to have labeling and/or color-coding. Proper identification of the tanks and piping, combined with the information supplied under the “Workers Right To Know” law, provide emergency responders with immediate knowledge of the materials they are working with or around. Proper labeling of chemical lines minimizes inadvertent and dangerous mistakes by people. It is recommended that the Water Department review the chemical feed systems identification system and “Workers Right To Know” program and update both.

3. **The sodium hydroxide bulk storage tank does not have an overflow within the containment area for the tank.**

The sodium hydroxide bulk storage tank appears to be in good condition based on exterior visual observation. As with any other chemical, it is advisable to vent the tank to the building exterior. Sodium hydroxide gives off very acrid fumes that, when combined with moisture, become very corrosive. This room does not have any mechanical ventilation and by venting to the atmosphere the effects of the fumes are minimized.

Of concern is that the bulk storage tank vent also serves as the tank overflow. The vent terminates near the fill line near the loading dock and is pointed down. In the event that the tank is over filled the overflow could possibly spill onto an individual or splash them. It is recommended that an overflow be installed in the sodium hydroxide bulk tank containment area.

4. **The sodium hydroxide bulk storage tank does not have a dependable level indicator.**

The sodium hydroxide bulk storage tank is outfitted with a pressure level indicator. This type of device is typically used to measure levels of oil storage tanks. The unit in use indicates that it is designed for this chemical. The readings are accurate when the tank is full but the accuracy diminishes as the level drops. It is recommended that this unit be replaced with a newer and more accurate device.

5. **The tank discharge/pump supply line is not outfitted with a drain fixture.**

The sodium hydroxide bulk storage tank discharge/pump supply line does not have a drain fixture on it. In the event that the tank must be drained, or the supply lines to the chemical feed pumps
must be drained, this fixture would provide a safer and more controlled method to do so. It is recommended that a drain valve be placed on the tank discharge line.

6. **The chemical pump delivery system requires upgrading.**

The chemical feed pumps that are in use are old and their replacement parts are increasingly costly to obtain. The manufacturer, BIF, is no longer in business. The company that absorbed BIF (Leeds and Northrop) is still providing maintenance parts for the pumps.

CPVC was the material of choice by the designer of this system. The pump discharge lines are subjected to pressures exceeding 200 psi. It is unclear what the pipe operating pressure is rated for. This pipe has glued fittings and they have a history of leaks according to the plant operators. Given the high operating pressure of this system, it is advisable to consider converting the existing CPVC piping to 316 stainless steel piping (if the sodium hydroxide application point remains at its current location instead of being relocated prior to the clearwell – see further recommendations below).

Chemical conveyed from the chemical feed pumps is injected through two chemical injector tubes into the finished water pump discharge pipe. The injector tubes enter the pumping main through 1-inch corporation stops with pack joint fittings to hold the injector tubes. The corporation stops are directly tapped into the water main pipe. Attached to the corporation stop are several stainless steel straps to be used as secondary tube holders. In the event the tube loosened from the pack joint fitting the strap will hold the tube in place and prevent it from blowing out of the corporation stop.

It is recommended that the corporation stops be removed from the pumping main and tapping saddles be installed. The corporation stops can then be reinstalled into the saddles. This action will improve the amount of support of the threaded area of the corporation stop, making it more secure. It is also recommended that the safety straps be mounted onto the tube end of the injector tube as an added safety factor (if the sodium hydroxide application point remains at its current location instead of being relocated prior to the clearwell – see further recommendations below).

7. **The H-O-A switches are located so that the operator must enter the containment area**

Chemical pump controls are located in the containment area near the pumps. The controls are H-O-A selector switches. In the A (Automatic) mode the pumps are started and stopped based on flow through the finished water meter. In the O (Off) mode the chemical pump will not operate. In the H (Hand) mode, the pump will operate continuously.

The location of these switches presents a safety risk. The switches are subjected to chemical leaks and spills. Sodium hydroxide is a very corrosive chemical and as it dries it leaves a crystalline salt that will conduct electricity. Every time the operator enters the containment area he/she is subjected to the possibility of coming into contact with the chemical, in both the wet and dry state. It is
recommended that the switches be removed from this area and relocated to an area outside the chemical containment area.

8. The H-O-A selector switches do not have a spring return on the Hand operation side.

As described earlier, the currently installed H-O-A switches remain in Hand mode when placed in this position. It is recommended that the selector switches be replaced with spring loaded Hand mode switches to minimize the possibility that the pump could be left operating in Hand mode by mistake.

9. A 110-volt electrical outlet is placed between the two pumps. It is not a ground fault type and is contained in a metal box and conduit

There is an electrical outlet plug located in the sodium hydroxide containment area. The outlet is not a ground fault protected device and is mounted in a metal box. Industry standards require that electrical outlets be a ground fault circuit contained in a chemical resistant enclosure that is sealed (explosion proof) with spring-loaded covers over the outlets. It is recommended that a new electrical outlet that satisfies the above standards be mounted away from the pumps on the outside of the containment area but accessible from within the area. It is recommended that the existing electrical outlet be de-energized and removed.

10. A 300-gallon diesel fuel tank is stored in the chemical containment area.

A chemical containment area is typically designed to contain 110% of the maximum volume of chemical stored within the confines of the area. Although the majority of these designed areas are for a single dedicated chemical, it is possible to have multiple chemicals stored in the area as long as they are compatible (will not react adversely when mixed) and the systems are clearly defined and separated. Storage of any other substance must be approved by the regulatory authority (DEP). Because this is a drinking water treatment facility, another criterion is that the substance be a food grade material. Currently there is a 300-gallon steel fuel oil storage tank within the sodium hydroxide containment area. It is recommended that the fuel tank be removed from the containment area. It is our understanding that the Water Department is in the process of relocating the fuel tank elsewhere.

11. The chemical containment area does not appear to have any type of chemical resistant liner such as an epoxy coating

The concept of containment is to provide a secure area to hold the chemical as a result of a spill. To insure the chemical does not leak through pores or seams, the containment interior should be lined or coated with a sealant to provide a protective barrier. This containment area does not have such a protective barrier. It is recommended that a proper sealant be applied within the containment area.
12. The chemical containment area does not have a flood alarm.

In the event that a spill did occur in the sodium hydroxide containment area, notification is important to mitigate the volume of the spill or to take other action. A float alarm can provide this notification and prompt the required response to the situation. Therefore, it is recommended that an alarm be added to the containment area.

13. The emergency shower is not plumbed to code and does not appear to have an alarm connected to it.

A safety shower is installed in the walkway adjacent to the sodium hydroxide containment area. The proper installation of this device requires that it is supplied by the first tap on the water service line and no other taps are made on this line. This installation does not meet this condition. It is recommended to change the water service line to address this deficiency. It is also recommended that a tempering tank be installed upstream of this device to warm the water. Applying cold water to an individual that has just been exposed to chemicals may place them in shock. A flow sensor should be placed in the water supply line and connected to an alarm. The alarm should be connected to the alarm system to notify others of a potential incident and to have them respond to provide assistance.

Currently there is a hand-held emergency eye wash bottle mounted close to the emergency shower. It does not appear that the water has been changed for a significant period of time. Emergency eye wash stations are available and can be incorporated into the emergency shower station. Such a device provides an improved level of treatment for this type of situation. It is recommended to provide an emergency eye wash station that is part of the emergency shower, including an alarm.

Other concerns relating to the sodium hydroxide chemical feed system.

1. It is recommended that a reed type flow switch be placed in the water line prior to the chemical application point. This device should be used as the interlock that prevents the chemical pump(s) from operating until a flow has been established. Currently the raw and finished water flow meters utilize a differential pressure cell. A small air bubble could cause the meters to read a differential pressure and provide a false signal indicating a flow is established, when in fact there is not a flow. A reed switch works with the velocity of the water flowing through the pipe moving the switch, providing a positive flow signal.

2. The chemical feed discharge piping does not contain an anti-siphon device. This device would stop the siphoning of chemical in the event a vacuum or negative pressure is exerted on the water main. It is recommended that an anti-siphon device be installed (if the sodium hydroxide application point remains at its current location instead of being relocated prior to the clearwell – see further recommendations below).
3. The sodium hydroxide system does not contain a chemical day tank. Day tanks typically hold enough chemical to meet 125% of a maximum day’s requirements. The use of a day tank minimizes the volume that could be spilled or siphoned. A day tank also allows the operator to measure accurate volumes of chemicals used to determine dosage. It is recommended that a day tank with appropriate appurtenances be installed.

4. Many of the concerns previously discussed result from the application of this chemical on the finished water pump discharge. Consideration should be given to changing the application point of the chemical. The most obvious point would be at the filter discharge or clearwell inlet. This area is low pressure and will allow the use of CPVC piping, less expensive chemical feed pumps and the installation of all of the proper chemical feed system appurtenances. It is also important to note that by feeding the chemical in the clearwell, the operator has some buffering time to handle unusual situations as a result of the volume of the clearwell. For these reasons, it is recommended that the sodium hydroxide application point be relocated to the filter discharge header pipe immediately prior to the clearwell. If this is done, then several of the above recommendations, as noted, would not be applicable.

**Analyzers and Alarms**

As part of this evaluation Weston & Sampson was requested to attempt to ascertain why alarms did not notify the operator of the problem much earlier. To better explain the problem a brief overview of the system is necessary. The following information is based on the review of records and plans of the two facilities (treatment plant and finished water pump station).

The original pump station was constructed in the early 1990s and a completed alarm system was installed that included the following major alarms:

- Station intrusion
- Turbine pump failure
- Hi/lo chlorine
- Hi/lo pH
- Building temperature

The alarm system was connected to an auto dialer contained in the control cabinet in the station.

In the mid 1990s the filtration plant was built. The existing alarms from the pump station were routed into the new treatment facility. The existing alarm panel was left in place and remained functional except the dialer was removed. According to the loop drawings, the alarms that were sent over to the new facility were to be connected to the new alarm panel. It is unclear if it was intended to connect all the alarms to the new dialer. The existing analyzers also remained in place at the pump station.
Analyzers

The chlorine analyzer was turned off and under repair. Repairs to this unit have been completed and the unit is operating. The unit is very unstable and the Water Department has elected to replace this unit. As of this writing, a new unit has been ordered and will be installed in the very near future. This alarm system does function and rings out at both control panels.

The pH analyzer initially appeared to be working, and the alarms were able to be activated using two buffer solutions. The alarms rang through both panels. The meter was recalibrated using a pH 4 buffer and a pH 7 buffer. This action resulted in a failure of the pH probe. As of this writing a new probe has been ordered and will be installed when it arrives. Weston & Sampson was able to identify the pH alarm settings as 5.5 (low) and 9.78 (high). Both alarms rang out to both panels.

Recent investigations have revealed that there is a possibility that the chlorine analyzer alarms are tied to the pH meter alarms. It appears that if one analyzer goes into alarm, the alarm will be displayed on both alarm panels (in the pump house and in the treatment plant). However, if both the chlorine alarm and the pH alarm go into high level alarm at the same time, a turbine (pump) failure alarm will be displayed in the pump house and a chlorine high, pH high and chlorine gas alarm will be displayed in the treatment plant. The alarms will trigger a shut down of the finished water pump and will activate the alarm dialer to notify staff. It is recommended that the chlorine and pH analyzer alarms should be segregated. It is also recommended that the alarm conditions be expanded such that either alarm condition would initially provide notification through the alarm system panel and auto dialer; and second, higher alarm setpoints would automatically shut down the finished water pump and provide notification through the alarm system panel and auto dialer.

Alarms

Weston & Sampson provided a Senior Instrumentation Technician to evaluate the chemical system controls and alarms on May 1, 2007. His written report is provided to the Town as a separate document. One of the technician’s findings is that although the alarms do function within the facilities, they are not connected to the auto dialer.

Further investigation revealed that the dialer was not plugged into the phone jack. It is unknown how long the dialer had been unplugged but the telephone numbers entered into the dialer included a former superintendent that left the Water Department in the late 1990s. Also, the phone jack was tied into the Water Department’s phone system. In order to dial an outside line, the telephone number must be preceded by a 9. None of the numbers were preceded by a 9. The telephone dialer was displaying “disabled.” This function required someone to depress the disable button on the dialer.

Following the instrumentation system inspection, the Water Department installed a lock box around the telephone jack to prevent an accidental unplugging of the dialer. Additionally the Water
Mr. Carter Terenzini  
May 25, 2007  
Page 10

Department has had a new dedicated telephone line installed for the dialer and the dialer is in working order.

Weston & Sampson assumed operational responsibility of the Spencer Water Treatment Facility on May 2, 2007. Several of the alarms were tested during this period, and several alarms were found to not display as would be expected. For example, the clearwell low level alarm displays correctly, however the low/low level alarm displays as the clearwell level high and the clearwell level low and chlorine gas leak alarms. The display in the pump station is turbine failure. This test was performed by backwashing the filters while the clearwell level was low. The high lift pump was also operating. The low level alarms did not lock out (stop) either pump. The high lift pump was manually shut off to allow the clearwell to recover. When the pump was restarted it displayed an emergency pump stop alarm.

Weston & Sampson recommends that the entire alarm system receive a comprehensive review by a trained technician and design engineer. Alarms that are no longer needed should be removed. Existing alarms should be tested for functionality and, if required, additional alarms added. Without delay, however, the pH, chlorine, water storage tank level and clearwell level alarms should be tied into the auto dialer and tested. Those responders whose telephone numbers would be called by the auto dialer under alarm conditions should be notified in advance and prepared for proper response.

Summary of Recommendations

The following is a list of the recommendations described in this letter report. The recommended improvements shown with an asterisk (*) are those that could be completed by Town staff. It is recommended that the other recommended improvements will require engineering evaluation and design efforts.

1. Signage placards at the sodium hydroxide fill connection*  
2. Proper identification of tanks and piping; “Workers Right to Know” program update*  
3. Sodium hydroxide containment area overflow*  
4. New sodium hydroxide bulk storage tank level indicator  
5. Drain valve for sodium hydroxide bulk storage tank  
6. Tapping saddles for finished water piping chemical application points*  
7. Remove and relocate H-O-A switches away from containment area  
8. Replace H-O-A switches with spring-load in H mode  
9. Remove and replace electrical outlet to outside of containment area  
10. Remove fuel storage tank from containment area*  
11. Apply sealant to containment area  
12. Liquid level (flood) alarm in containment area  
13. Revise water service line piping for emergency shower in pump station and add emergency eye wash station as part of shower installation with flow switch alarm and tempering tank  
14. Other concerns:
Mr. Carter Terenzini  
May 25, 2007  
Page 11

a. Reed type flow switch prior to chemical application point  
b. Anti-siphon device on chemical discharge piping  
c. Day tank and appurtenances  
d. Relocate sodium hydroxide application point to filtered water discharge header prior to the clearwell

15. Alarm System (also refer to separate instrumentation letter report)  
a. Comprehensive review of entire alarm system  
b. Tie pH, chlorine, water storage tank level and clearwell level alarms into auto dialer  
c. Notify and prepare responders to be called by auto dialer*

**Conceptual Opinion of Probable Costs**

Based on the above evaluation, Weston & Sampson’s conceptual opinion of probable cost for the above recommended improvements is approximately $39,000 not including engineering design or additional alarm system improvements that may be needed. A more comprehensive review of the entire alarm system is needed to identify improvement needs and corresponding costs. Further review is also needed to identify engineering costs associated with the recommended improvements that cannot be completed directly by Town staff.

We appreciate this opportunity to be of service to the Town of Spencer. Please do not hesitate to contact myself or Jack Mitchell if you have any questions regarding this evaluation report.

Very truly yours,

WESTON & SAMPSON ENGINEERS, INC.  

[Signature]  
Patrick J. Connelly, P.E.  
Senior Vice President

WESTON & SAMPSON SERVICES, INC.  

[Signature]  
John W. Mitchell  
General Manager
May 25, 2007

Mr. Carter Terenzini
Town Administrator
157 Main Street
Spencer, Massachusetts 01562

Re: Inspection of the Water Treatment Plant’s Chemical Feed System Instrumentation

Dear Mr. Terenzini:

This letter summarizes our evaluation and recommendations in accordance with our agreement with the Town of Spencer dated May 1, 2007, to evaluate the water treatment facility’s chemical feed system instrumentation.

Scope of Work

Per our agreement with the Town of Spencer, the scope of work is to provide the services of an experienced instrumentation professional specifically to evaluate the water treatment facility’s chemical feed system instrumentation, and to prepare and submit to the Town a letter summarizing the instrumentation system evaluation and presenting findings and recommendations as appropriate. The evaluation is in response to the chemical feed system instrumentation’s failure to notify operations staff of the high pH occurrence on April 25, 2007.

Evaluation of Chemical Feed System Instrumentation

Weston & Sampson’s Mr. Sal Ferrara was on site at the Spencer, Massachusetts Water Treatment Plant on May 2, 2007, to evaluate the chemical system instrumentation operation and alarms. Mr. Ferrara’s findings are as presented below and are solely based on his observations while at the treatment plant during the day of inspection. It should be noted that additional conditions or situations that were unknown or not observed during the time of this evaluation may exist and may require attention through a more comprehensive inspection and evaluation of the entire water treatment plant and pump station.

1. The first inspection was the Verbatim Auto Dialer. The disarmed light was displayed on the auto dialer. It was also found that the telephone line was not connected. After connecting the phone line and testing the dialer, the dialer was found to be in working order.

2. The pH analyzer was then inspected. The high and low pH alarms were then simulated and it was found that the alarm signals were working in the distribution pump room and also in the LCS control panel in the laboratory. The pH alarms were found to be not connected to the auto
dialer. This was confirmed by review of the control wiring diagrams available on site. It appears that the pH alarms are not shown to tie into the auto dialer on the 1995 design drawings. It was also found that the alarm contacts are generated from an analog current trip. Analog current trips are outdated, not user friendly, and require technical expertise to adjust. They should be replaced by digital current trips. There are two sets of digital contacts on the pH analyzer that are not currently being used, but could be used to shut down the finished water pump under high pH condition. Using these digital contacts would allow the operator to set alarm setpoints on the touch screen pad.

3. The auto circuit for the sodium hydroxide (NaOH) Chemical Feed Pumps was then inspected. When the switch is in the Auto position, the chemical feed pumps are intended to turn on automatically when the finished water pump comes on. There is also a flow signal interlock built in so if there is not enough finished water flow in the pipeline the chemical feed pumps will not turn on. The purpose of this is to enable the chemical feed pumps to operate only if the finished water pump is on and the flow signal is established. The chemical feed pumps’ Manual (Hand) switch position overrides the finished water pump and flow cut-off and allows the pumps to operate continuously in the manual mode.

**Recommendations**

Based on the above observations and evaluations, Weston & Sampson’s recommendations are as follows:

1. The phone line connection to the Auto Dialer should be mounted in a secure lockable box so it cannot accidentally be unplugged from the telephone line. This work was completed shortly after this inspection.

2. A loop indicator should be installed in the LCS Control Cabinet with relay outputs so the pH alarms can be tied into the Auto Dialer. The indicator should have programmable alarm set points.

3. The spare digital relay outputs in the pH analyzer should be tied into the distribution pump run circuit. The circuit should be wired to shut the finished water pump down in the event of a high or low pH condition to avoid pumping high or low pH water into the distribution system.

4. The manual Hand-Off-Auto switch for the NaOH chemical feed pumps should be moved to a more accessible location. Also, the manual Hand-Off-Auto switches should be changed so that the hand operation is a spring return style switch. This will avoid the possibility of accidentally leaving the pump on in the Hand position.
5. A spill alarm float should be installed in the NaOH chemical containment area. This should activate a horn and light, and an alarm should be tied into the Auto Dialer in order to provide notification of a chemical spill from the NaOH bulk storage tank.

A conceptual opinion of probable costs related to these instrumentation improvement needs is presented in the separate letter report for the water treatment plant chemical feed system evaluation.

We appreciate the opportunity to be of service to the Town of Spencer. Please contact us if you have any questions regarding this inspection report.

Very truly yours,

WESTON & SAMPSON SERVICES, INC.

Mark L. McIntire
Vice President

V. Salvatore Ferrara
Senior Instrumentation Technician
Following the April 25th – April 27th Town of Spencer Water Emergency, a survey was distributed to all of the customers of the Spencer Water System. The survey was distributed to a total of 1,439 residents and included 14 questions regarding various aspects of the incident. The survey allowed for specific yes/no response sets as well as the opportunity to provide suggestions for better overall communication efforts in future emergency situations. Of the total surveys sent out, 439 were returned (31%). The surveys were then reviewed and assessed based on the most valuable and relevant questions, which will be available below in graph form.

**QUESTION # 1 & #2**

Questions #1 and #2 of the survey were in regards to what time the resident **first** heard of the incident, as well as the source they received the information from. The chart below shows that the majority of the residents who responded were informed between 8:00am and 12:00pm (83%). The highest percentage of residents (26%) were informed of the incident between 10:00am and 11:00am.

<table>
<thead>
<tr>
<th>Time</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7AM</td>
<td>20</td>
<td>5%</td>
</tr>
<tr>
<td>8AM</td>
<td>48</td>
<td>11%</td>
</tr>
<tr>
<td>9AM</td>
<td>86</td>
<td>20%</td>
</tr>
<tr>
<td>10AM</td>
<td>114</td>
<td>26%</td>
</tr>
<tr>
<td>11AM</td>
<td>55</td>
<td>13%</td>
</tr>
<tr>
<td>12PM</td>
<td>55</td>
<td>13%</td>
</tr>
<tr>
<td>1PM</td>
<td>18</td>
<td>4%</td>
</tr>
<tr>
<td>2PM</td>
<td>10</td>
<td>2%</td>
</tr>
<tr>
<td>3PM</td>
<td>7</td>
<td>2%</td>
</tr>
<tr>
<td>4PM</td>
<td>9</td>
<td>2%</td>
</tr>
<tr>
<td>5PM</td>
<td>6</td>
<td>1%</td>
</tr>
<tr>
<td>6PM+</td>
<td>3</td>
<td>1%</td>
</tr>
</tbody>
</table>

The following graph is a representation of the source from which residents indicated they **first** heard of the crisis. The majority of respondents (50%), claimed they received a telephone call from a neighbor/friend or relative. There were (10%) of respondents who stated they heard from the television, (4%) who heard from a radio broadcast and (3%) who received first word from the distributed town flyers. The remaining (33%) indicated they received word from other sources (i.e. Email, work, school, poor water pressure, scanner, flashing signs, ambulances, businesses in town etc.)

![](How Residents Were First Informed of the Incident)
**QUESTION # 3**

Question #3 of the survey was in regard to whether or not residents felt they were notified in a timely and efficient manner. The response to this question came back with a total of (60%) answering yes, (36%) answering no and (4%) that did not respond at all and were N/A.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>N/A</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>263</td>
<td>18</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>60%</td>
<td>4%</td>
<td>36%</td>
</tr>
</tbody>
</table>

**QUESTION # 5**

Following this question in importance was Question #5, which related to whether or not residents felt they were kept up to date on changing events throughout the incident. The results proved to be very positive, whereas (88%) of the respondents stated that they did in fact feel they were kept up to date, while only (9%) responded with a no, and (3%) with N/A.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>N/A</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>384</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>88%</td>
<td>3%</td>
<td>9%</td>
</tr>
</tbody>
</table>
**QUESTION # 8 & #9**

Question #8 was an important question due to the fact it was regarding whether or not the resident was treated at the decontamination site or transported to another medical facility during the time of the crisis. Again, the results remained positive, with only 5 (1%) out of the 439 respondents indicating they had been treated. Of those who did respond yes, the ratings given of their treatment from 1-5 were (4,4,3,2 and N/A). Accompanying the ratings was the option of providing comments/suggestions regarding the decontamination site. The responses provided are listed below followed by the rating that corresponds with each comment.

- Provide “examinations” at decontamination site vs. hospital; inconvenient (3)
- Be mindful of clothing and personal items at site (4)
- Keep residents more informed at site (4)
- Experience was humiliating although necessary; Be clear about treatment (2)

**Question #8**

Were you treated at the decontamination site and/or transported to a Medical facility?

- **YES**
  - 5 – 1%
- **NO**
  - 434 – 99%

**QUESTION # 11**

Question #11 was another very important question due to the fact it regarded the confidence in Town workers and their response to the incident. The responses once again showed that overall the majority of the respondents (81%) felt that they did in fact feel the workers responded appropriately to the situation, which was one of the major concerns of the survey. There was an (11%) response rate which claimed workers were not able to respond appropriately, and (8%) of residents did not respond and therefore were N/A.

**Question #11**

Do you believe the Town’s emergency responders were able to respond appropriately to the situation?

- **YES**
  - 357
  - 81%
- **N/A**
  - 36
  - 8%
- **NO**
  - 46
  - 11%
**QUESTION # 1 3**

The last yes/no response question was #13, which related to the results of the investigation from the incident and whether residents felt they had been informed of them. Once again, this was another positive response overall, with (83%) of the responses being yes, the town has acted responsively in the sharing of results. Only (11%) responded with a no, and the remaining (8%) with responses that were N/A.

**Question # 13**
Although all the results are not yet in, do you believe the town has acted responsively with the investigation of the incident and the sharing of those results?

- **YES**
  - 365
  - 83%

- **N/A**
  - 29
  - 7%

- **NO**
  - 45
  - 10%

**QUESTION # 4 , #6 & #10**

Lastly, the residents were asked to share suggestions as to what better ways of mass communication there might have been to alert the town of the incident earlier and more efficiently. Due to the large and varied responses, the suggestions that showed up most are as listed below. Asterisks note the suggestions that appeared most frequently.

- Town siren / Loudspeaker **
- Notify Business Sector first **
- Priority Calling (Business/Restaurant/Nursing Home) **
- Reverse 911 / Mass E-mail / Text message
- Scanner announcements
- Emergency Signals **
- Live coverage on Access channel **
- Shut off water immediately
- Utilize WRTA – bus system
- More man power/volunteers
- Phone alarm system
- Color code on/in water
- Running scroll on bottom of TV
- Use of Major local radio stations **
- Town Administrators / Selectmen going door-door

Submitted By: Whitney T. Fritze
Utilities & Facilities Staff
Approximately 130 surveys were distributed to Town employees & officers in the following departments: Town Hall, Sugden Library, Utilities & Facilities, Sewer, Fire, and Police. A total of 58 (45%) surveys were returned to the Fire Department. Of those 58, 6 were not included in the compilation of results. 5 of these 6 had respondents indicating that they did not directly participate in the response for the incident. As the forward to the survey states that the questions should be answered “relating to what YOU were involved in”, these responses were excluded from the compiled results. The sixth survey was not included in the results due to it not being received until 7/25/07, after the results were tabulated.

The following pages contain the results of the survey.
Question 1
What time of day did you first learn of the incident?

All 52 respondents answered question #1. The breakdown is as follows:

8 (15%)  Unspecified Time/AM
4 (8%)  0630
6 (12%)  0600
2 (4%)  0730
3 (6%)  0800
2 (4%)  0830
8 (15%)  0900
5 (10%)  0930
5 (10%)  1000
0  1030
3 (6%)  1100
0  1130
0  1200
1 (2%)  1230
1 (2%)  1300
4 (8%)  Unspecified Time/PM

Within the first three (3) hours if the incident, 38 (73%) of the respondents had been notified of the emergency.

Question 2
How did you first learn of the incident?

All 52 respondents answered question #2. The breakdown is as follows:

2 (4%)  E-mail
13 (25%)  Phone Call
16 (31%)  Fellow Staff
0  Customer
21 (40%)  Other
Question 2, continued

The “Other” methods of notification are as follows:
Friend (2 respondents)
SRS pager
Police Department
Former employee (3 respondents)
TV/News (2 respondents)
Court personnel
Fire pager (6 respondents)
Scanner (3 respondents)
Boss at work
SEMA member calling to see why they had not responded

Within the first three (3) hours of the incident, the breakdown of means of notification for the 38 respondents during this time is as follows:

2 (5%) E-mail
8 (21%) Phone Call
13 (25%) Fellow Staff
0 Customer
15 (39%) Other
Question 3
*Was this a good notification method?*

51 respondents answered question #3. The breakdown is as follows:

- 35 (69%) Yes
- 16 (31%) No

Of those who responded “No”, the notification methods are as follows:
- Friend (2 respondents)
- SEMA member calling to see why they had not responded
- Fellow Staff (3 respondents)
- Fire pager (2 respondents)
- Scanner
- TV/News (2 respondents)
- Court personnel
- Former employee (3 respondents)
- SRS pager

Out of the 16 (31%) of respondents who were not satisfied with their means of notification, 13 (81%) of them were notified by methods classified as “Other”.

Question 4
*Did you feel like you knew what was happening as the event first unfolded?*

50 respondents answered question #1. The breakdown is as follows:

- 26 (52%) Yes
- 24 (48%) No

Question 5
*Please make any suggestions on how to improve the notification methods.*

The following is a synopsis of the ideas that were suggested:
- Use of a mass e-mail/page/cell text to employees
- Updated and fast phone tree
- Calls directly to each department
- Alerts over commuter-friendly radio stations
- Reverse 911
- Earlier updates on TV/radio stations
Question 6
What were you doing as a work function prior to learning of the incident?

Please note that based on the answers given, it is not possible to tell with accuracy which departments/positions respondents were working at during the onset of the incident. Also note that many of the respondents were engaged in activities other than working for the town at the time of notification. This includes people at an alternate job. Any reply indicating this was put into a general “non-work related activity” category. All 52 respondents answered this question. The following is a synopsis of the answers given.

34 (65%) Normal work related duties
18 (35%) Non-work related activity

The following is an overview of the duties that were being performed by those respondents who replied that they were performing normal work related duties:
Lab work
Patrol
Normal office duties
Normal work duties
Taking a break
In court

Question 7
Did that change once you were notified of the incident?

48 respondents answered this question.

35 (73%) Yes
13 (27%) No

Again, note that since there is no accurate way to determine what position/department a person was working for at the time of notification, it is not able to be determined which positions/departments were more likely to be called upon to change their daily activities.
**Question 8**

*If yes, to what did your work function change?*

33 respondents replied to this question. The following is an overview of the replies:

People who stated that they were engaged in normal work/office duties prior to notification of the incident stated they were now engaged in: answering residents phone calls & questions, assisting Police Department command, answering service calls, handing out water, processing insurance claims, & handing out flyers.

People who stated that they were engaged in non-work related activities prior to notification of the incident stated they were now engaged in: responding to decon site, responding to rehab sites, responding for fire station coverage, and left work and returned to town to stand by.
The following chart shows responses to questions 9-12

**Question 9**
*What tasks were you assigned for the incident?*

**Question 10**
*Did you have the tools and/or information to perform the tasks assigned to you?*

**Question 11**
*Do you feel that the tasks to which you were assigned were adequate for your expertise?*

**Question 12**
*Do you feel you could have been better assigned to another task to be better utilized?*

<table>
<thead>
<tr>
<th>Duties Assigned</th>
<th>Question 9</th>
<th>Question 10</th>
<th>Question 11</th>
<th>Question 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD station coverage</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>FD station coverage/ambulance escorts/distribute flyers</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Rehab site coverage</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Handled claims</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Admin support for SRS</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Rehab support/water delivery</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Business notifications/answered phones</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Decon support</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Incident command</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Rehab support/flyer distribution</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Triage</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Logistics officer</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Traffic details</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Rehab support/water distribution</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Website updating</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Assist police staff</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>General police work</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Traffic/water distribution site security</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Answered &amp; logged calls/water distribution</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Water distribution</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Various</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Monitored water plant</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Answered phones/gave out info</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Dispatching</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Decon/logistics</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Admin duties &quot;as needed&quot;</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Support at fire department</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Monitor sewer department</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Handed out flyers</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Prepared by: Stephanie Wachewski
July 26, 2007
Totals/Percentages for questions 10-12:

**Question 10**
46 (94%) Yes  
3 (6%) No

**Question 11**
44 (94%) Yes  
3 (6%) No

**Question 12**
9 (20%) Yes  
37 (80%) No

**Question 13**
*Throughout the incident, were you kept appraised of the situation and do you feel you were adequately appraised of what was happening?*

46 respondents answered this question.

41 (89%) Yes  
5 (11%) No
Question 14

*Who was you supervisor during the crisis?*

All 52 respondents answered this question. As the answers varied significantly, all replies are listed below. A number in ( ) next to the name indicates more than one person gave the answer.

- Mark Robidoux (2)
- Jean Mulhall & Carter Terenzini
- None
- Sandy Fritz (10)
- Karen Cullen
- Cpt. Collette (4)
- Incident Commander (2)
- Myself (2)
- Cpt. ??
- “Logistics Man”
- Deputy Chief Locke (2)
- Chief Parsons (4)
- Chief Parsons & Chief Wilson
- Don’t know
- Sgt. Befford & Edwards
- Sgt Agnew (2)
- Carter Terenzini (3)
- Margaret Bacon & Carter Terenzini
- Chief Darrin (4)
- Sgt. Agnew & Sgt. Befford
- Sgt. Befford
- Sgt. Agnew
- Chief Darrin & Sgt. Agnew
- Deputy Chief Locke & Worcester Chief
- Carter Terenzini (officially) Karen Cullen (unofficially)
- Fire Chief & Police Chief

Question 15

*Describe in detail what you did from the time you were notified until you were relieved of your post during the incident.*

The majority of the respondents either did not answer this question, gave the exact same answer as for question 9, or answered “see question 9”. For these reasons, any reply here was incorporated into question 9.
Question 16

*What lessons did you learn from the incident?*

The following is an overview of the replies:

- ICS works
- There are resources out there for just about anything that happens
- Departments work well together under crisis
- The ambulance task forces work well
- Don’t drink the water
- It’s not a good practice to keep revising initial information given
- Accidents happen
- Constant monitoring of water and sewer plants is necessary
- There should be proper staffing at all plants
- Road work should be done by separate crews
- Waste of time
- Town needs to find a better notification method
- Too many chiefs, not enough indians
- MEMA needs to stay at the command post
- Central communications are vital
- Can never be too prepared
- Delegation/multi-tasking skills are essential
- People aren’t always used to their full capabilities
- It’s not necessary to know everything that’s going on if it doesn’t relate to you
- Town departments need to better understand NIMS
- Keep asking questions
- Databases of businesses/shut-ins need to be better
- Too many non-essential/civilian people hanging around the station
- Town needs a plan for chain of information

Question 17

*Do you feel that the NIMS training and other training you received adequately prepared you to understand how Incident Response works?*

44 respondents answered this question. The replies are as follows:

- 38 (86%) Yes
- 4 (9%) No
- 2 (5%) Somewhat
Question 18
Please add any additional comments.

- Department heads worked together smoothly and all workers did a great job
- Everything seemed to run fine- didn’t see any real problems
- Press should have been kept somewhere else besides the PD/FD/SRS area
- Positive action minimized damages
- Should not be called away from duty station because of age and no longer willing or fit to respond to this type of emergency
- More supervision of people helping out needed
- Volunteers worked well but town employees, especially on OT, felt job was beneath them
- Dispatchers need to be briefed before press conferences due to influx of calls during the conferences
- Impressive cooperation between agencies
- Overall went well but seemed to be a lapse in who to notify
- Great communication between departments
- Made best of a nasty situation
- Identification vests should have been worn by all positions
- Better notification systems are needed
- Impressed with the way other towns came in and how they worked together
- More info needed to be given to workforce
- E911 would have made a dramatic difference
- BoH wasn’t alerted to emergency
- Management of town employees could have been better utilized with better communications
- Response by all departments/agencies was excellent
- Improved call down lists are needed
- Radio announcement on stations commuters use would be helpful
- Town Hall department heads could have helped more to relieve overworked departments
- Less busy departments could have been split up to help busy departments
- Felt underutilized given capabilities/skills/etc… may have been different if another emergency happened during the incident
- Would have been helpful to have a TV/radio at Town Hall
- Took too long to get this survey
COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the matter of:

Town of Spencer

File No.: ACOP- CE-07-5D006  56e

ADMINISTRATIVE CONSENT ORDER WITH PENALTY
AND
NOTICE OF NONCOMPLIANCE

I. THE PARTIES

1. The Department of Environmental Protection ("Department" or "MassDEP") is a duly constituted agency of the Commonwealth of Massachusetts established pursuant to M.G.L. c. 21A, § 7. MassDEP maintains its principal office at One Winter Street, Boston, Massachusetts 02108, and its Central Regional Office at 627 Main Street, Worcester, Massachusetts 01608.

2. The Town of Spencer ("Respondent" or "Town") is a municipal corporation duly organized under the laws of the Commonwealth of Massachusetts. The Town, through its Office of Utilities and Facilities and Board of Water Commissioners, operates a community public water supply system currently serving 7,037 customers in the Town (the "PWS"). Respondent’s mailing address for purposes of this Consent Order is 157 Main Street, Spencer, Massachusetts 01562.

II. STATEMENT OF FACTS AND LAW

3. MassDEP is responsible for the implementation and enforcement of M.G.L. c. 111, § 159 et seq., 42 U.S.C. §§300f – 300j (the Federal Safe Drinking Water Act) and the Drinking Water Regulations at 310 CMR 22.00. MassDEP has authority under M.G.L. c. 21A, § 16 and the Administrative Penalty Regulations at 310 CMR 5.00 to assess civil administrative penalties to persons in noncompliance with the laws and regulations set forth above.

4. The following facts and allegations have led MassDEP to issue this Consent Order:

   A. The Town operates the PWS in accordance with a number of approvals issued by the Department. On April 12, 1990, the Department approved addition of a
water treatment chemical to address leaching of lead and copper from pipes in the distribution system caused by acidic (low pH) water. The treatment chemical used by the Town is sodium hydroxide, and the approval states that “alarms will be sent to a location monitored 24 hours a day.”

B. In the morning of April 25, 2007, the Town’s police and fire departments received numerous customer complaints of burning sensations from using the water. Upon investigating the complaints, the Town notified the Department that excessive amounts of sodium hydroxide had entered the water distribution system for an unknown duration at the Meadow Road Water Treatment Plant.

C. The Department issued a verbal Do Not Use Order to the Town, and directed the Town immediately to provide public notification of the Do Not Use Order to potentially affected customers throughout town via radio, television, and by hand delivery. Even with the public notification, over 100 people were treated at area hospitals because of contact with the contaminated water during the course of the day.

D. Later in the day on April 25, 2007, the Department issued a written Do Not Use Order to the Town. On April 25th and April 26th, the Town flushed the entire distribution system to remove the sodium hydroxide.

E. On April 26, 2007, the Department terminated the Do Not Use Order, but issued a boil order. Because the volume of water used in flushing the system and the loss of pressure may have disturbed bacterial contaminants typically found within the distribution system itself, the Department directed the Town to sample points within the distribution system for bacterial contaminants, and to advise customers to flush the water lines in their homes, and then to boil water before using it.

F. On April 27, 2007, the Department terminated the boil order and continued its investigation of the cause of the chemical overfeed.

G. As a result of its investigation, the Department has determined that operator error was the cause of the chemical overfeed, but that several additional problems relating to alarms prevented the operator error from being discovered in time to prevent the overfeed to the distribution system, in violation of 310 CMR 22.03(1) and 22.04(7). In addition, M.G.L. c. 111, §170 provides that anyone who defiles or corrupts any source of water shall be subject to a civil penalty for each day that such violation occurs or continues.

H. The Town will request appropriations, grants and other actions from Town Meeting and other bodies sufficient to fund and undertake the corrective actions set forth in this Order in accordance the schedule herein.
III. DISPOSITION AND ORDER

For the reasons set forth above, MassDEP hereby issues, and Respondent hereby consents to, this Order:

5. The parties have agreed to enter into this Consent Order because they agree that it is in their own interests, and in the public interest, to proceed promptly with the actions called for herein rather than to expend additional time and resources litigating the matters set forth above. Respondent enters into this Consent Order without admitting or denying the facts or allegations set forth herein. However, Respondent agrees not to contest such facts and allegations for purposes of the issuance or enforcement of this Consent Order.

6. MassDEP’s authority to issue this Consent Order is conferred by the statutes and regulations cited in Part II of this Consent Order.

7. Respondent shall perform the following actions within 30 days of the effective date of this Consent Order:

   A. Investigate and comment, to MassDEP, the fluctuations in pH (pH increasing at approximately 3 hour intervals) at Meadow Road Water Treatment Plant (WTP) shown on the pH recording charts earlier this year (e.g., April 8th, April 9th, April 10th).

   B. Have a qualified instrumentation specialist evaluate and commence the repair of the existing failsafe and alarm systems. At a minimum, the respondent shall meet the requirements outlined for alarms and failsafes in Attachment A, which is incorporated herein by reference. The Respondent shall provide MassDEP with copies of documentation of the work performed, drawings of all connections and all test reports certifying the functionality of all of the alarms. All alarm work must be completed before the addition of sodium hydroxide may resume.

   C. The Respondent shall submit to MassDEP for review and approval plans and specifications to install a temporary sodium hydroxide system at Meadow Road WTP. The plans shall include safe storage of chemicals during the time period this temporary system is used. Upon written approval of the plans and specifications by MassDEP, the Respondent shall proceed on the installation of the temporary system.

8. Within 60 days of the effective date of this Consent Order, Respondent shall have completed construction of the temporary sodium hydroxide treatment system at Meadow Road WTP. The Respondent shall notify MassDEP in writing, for an inspection upon completion of the installation. Included with the written notification, the Respondent shall provide a copy of the engineer’s certification letter/report that the temporary sodium hydroxide treatment system was installed in accordance with the approved plans and specifications and that all items in Attachment A have been addressed. The Respondent
shall not activate the temporary sodium hydroxide treatment until written approval by MassDEP has been provided.

9. **Within 90 days** of the effective date of this Consent Order, Respondent shall have its engineer submit plans and specifications (with BRP WS 29-Chemical Addition and transmittal form) to add sodium hydroxide at the filter discharge or in the clearwell as both parties are agreed that chemical addition to the high pressure finished water side is not best practice. The plans for this permanent sodium hydroxide treatment system at Meadow Road WTP shall include, at a minimum, the requirements outlined for alarms and failsafes in Attachment B, which is incorporated herein by reference, and the following:

   A. A visual display of the volume contained in the bulk tank
   B. Remove the existing plastic pipe from the chemical pump discharge
   C. Remove sodium hydroxide injector tubes and corporation stops. Install tapping saddles with plugs over areas that corporation stops were previously installed
   D. Install a day tank with visual scale for the chemical feed system
   E. Label the sodium hydroxide tank fill line at the fill connection
   F. Label all chemical piping for content and flow direction
   G. Properly color-code the chemical piping.
   H. Repair or replace the in-line chlorine residual analyzer. The chlorine residual of the finished water shall be continuously monitored and recorded.
   I. Repair or replace the in-line pH analyzer. The pH of the finished water shall be continuously monitored and recorded.
   J. Ensure that the autodialer phone line and wall jack is labeled and secured by installation of a lockable box.
   K. Update the water operator contact list to be used for dispatch and programmed into the autodialer.
   L. All alarms shall be tested with satisfactory results
   M. Operators shall be trained on operation and testing of the alarm system functions.
   N. For safety reasons, Respondent shall make provisions in staffing such that an operator does not work alone when performing repairs to a chemical feed system.

10. **Within 10 months** of the effective date of this Consent Order, Respondent shall complete construction of the Meadow Road WTP permanent modifications as approved by MassDEP. The Respondent shall notify MassDEP in writing, for an inspection upon completion of the installation. Included with the written notification, the Respondent shall provide MassDEP with documentation that all of the items in paragraph 9 above have been addressed and shall submit the following:

   A. An updated list of alarms (include stamped plan of alarm configuration/as-builts plans)
In the Matter of: Town of Spencer
ACOP-CE-07-5D006
Page 5 of 19

B. An updated Operation & Maintenance manual as a result of modifications made to the facility systems
C. Certification that the Preventative Maintenance Program and Standard Operating Procedures as a result of modifications made to the facility systems have been updated.
D. Certification that all items in Attachment B have been addressed.

Respondent shall not activate the permanent sodium hydroxide treatment until written approval by MassDEP is provided. **Within 14 days** of written approval from MassDEP to activate the Meadow Road WTP, Respondent shall commence full operation of the treatment facility.

11. **Within 12 months** of the effective date of this Consent Order, Respondent shall complete construction of corrosion control treatment as permitted (BRP WS 29 Transmittal #71439) as approved on March 1, 2006 by MassDEP at Cranberry Brook Well, including failsafes and alarms consistent with the requirements set forth in Attachment B for the Meadow Road Water Treatment Facility. The Respondent shall notify MassDEP, in writing, for an inspection upon completion of the installation. Included with the written notification, the Respondent shall provide the engineer’s certification letter/report that the sodium hydroxide treatment system was installed in accordance with the approved plans and specifications and that all items in Attachment B have been addressed. Respondent shall not activate the sodium hydroxide treatment system at Cranberry Brook well until written approval by MassDEP is provided. **Within 14 days** of written approval from MassDEP to activate the Cranberry Brook WTP, Respondent shall commence full operation of the treatment facility.

12. **Within 18 months** of the effective date of this Consent Order, Respondent shall:

A. Submit a transmittal form, permit application BRP WS 25 (Treatment Facility Modification), and a schedule for implementation to MassDEP for review and approval to upgrade the monitoring system for System Control and Data Acquisition (SCADA) for all water department facilities. The implementation schedule shall include a training component for water system staff. At a minimum, the permit application must include the failsafe and alarm systems and chemical feed system modifications described in Attachment B and paragraph 3 of Attachment A.

B. Submit a transmittal form, permit application BRP WS 32 (Distribution System Modification), and a schedule for implementation to MassDEP for review and approval to address the high pressures within the distribution system.

C. Submit a Master Plan and Capital Improvement Plan for the Water Distribution System.
13. Except as otherwise provided, all notices, submittals and other communications required by this Consent Order shall be directed to:

Marielle Stone, Drinking Water Section Chief
Department of Environmental Protection
627 Main Street
Worcester, Massachusetts 01608

Such notices, submittals and other communications shall be considered delivered by Respondent upon receipt by MassDEP.

14. Actions required by this Consent Order shall be taken in accordance with all applicable federal, state, and local laws, regulations and approvals. This Consent Order shall not be construed as, nor operate as, relieving Respondent or any other person of the necessity of complying with all applicable federal, state, and local laws, regulations and approvals.

15. For purposes of M.G.L. c 21A, § 16 and 310 CMR 5.00, this Consent Order shall also serve as a Notice of Noncompliance for Respondent’s noncompliance with the requirements cited in Part II above. MassDEP hereby determines, and Respondent hereby agrees, that the deadlines set forth above constitute reasonable periods of time for Respondent to take the actions described.

16. Force Majeure

A. MassDEP agrees to extend the time for performance of any requirement of this Consent Order if MassDEP determines that such failure to perform is caused by a Force Majeure event. The failure to perform a requirement of this Consent Order shall be considered to have been caused by a Force Majeure event if the following criteria are met: (1) an event delays performance of a requirement of this Consent Order beyond the deadline established herein; (2) such event is beyond the control and without the fault of Respondent and Respondent’s employees, agents, consultants, and contractors; and (3) such delay could not have been prevented, avoided or minimized by the exercise of due care by Respondent or Respondent’s employees, agents, consultants, and contractors.

B. Financial inability and unanticipated or increased costs and expenses associated with the performance of any requirement of this Consent Order shall not be considered a Force Majeure Event.

C. If any event occurs that delays or may delay the performance of any requirement of this Consent Order, Respondent shall immediately, but in no event later than 5 days after obtaining knowledge of such event, notify MassDEP in writing of such event. The notice shall describe in detail: (i) the reason for and the anticipated length of the delay or potential delay; (ii) the measures taken and to be taken to prevent, avoid, or minimize the delay or potential delay; and (iii) the timetable for taking such measures. If Respondent intends to
In the Matter of: Town of Spencer
ACOP-CE-07-5D006
Page 7 of 19

attribute such delay or potential delay to a Force Majeure event, such notice shall also include the rationale for attributing such delay or potential delay to a Force Majeure event and shall include all available documentation supporting a claim of Force Majeure for the event. Failure to comply with the notice requirements set forth herein shall constitute a waiver of Respondent’s right to request an extension based on the event.

D If MassDEP determines that Respondent’s failure to perform a requirement of this Consent Order is caused by a Force Majeure event, and Respondent otherwise complies with the notice provisions set forth in paragraph C above, MassDEP agrees to extend in writing the time for performance of such requirement. The duration of this extension shall be equal to the period of time the failure to perform is caused by the Force Majeure event. No extension shall be provided for any period of time that Respondent’s failure to perform could have been prevented, avoided or minimized by the exercise of due care. No penalties shall become due for Respondent’s failure to perform a requirement of this Consent Order during the extension of the time for performance resulting from a Force Majeure event.

E A delay in the performance of a requirement of this Consent Order caused by a Force Majeure event shall not, of itself, extend the time for performance of any other requirement of this Consent Order.

17. Respondent shall pay to the Commonwealth a civil administrative penalty in the amount of thirty four thousand two hundred and fifty dollars ($34,250.00) for the violations identified in Part II above, as follows:

A. Within thirty (30) days of the effective date of this Consent Order, Respondent shall pay to the Commonwealth two thousand dollars ($2000.00); and

B. MassDEP hereby agrees to suspend payment of the sum of twelve thousand one hundred twenty-five dollars ($12,125.00); provided, however, that if Respondent violates any provision of this Consent Order, or further violates any of the regulations cited in Part II above within one year of the effective date of this Consent Order, Respondent shall pay to the Commonwealth the remaining amount of twelve thousand one hundred twenty-five dollars ($12,125.00) within thirty (30) days of the date MassDEP issues Respondent a written demand for payment. This paragraph shall not be construed or operate to bar, diminish, adjudicate, or in any way affect, any legal or equitable right of MassDEP to assess Respondent additional civil administrative penalties, or to seek any other relief, with respect to any future violation of any provision of this Consent Order or any law or regulation.

18. Supplemental Environmental Project

A. MassDEP has determined that it is appropriate to include a Supplemental Environmental Project (“SEP”) in the resolution of this matter. Such SEP is included for the
purpose of mitigating the administrative penalty and not in lieu thereof. The terms of the SEP are set forth in Attachment C, which is attached hereto and incorporated herein.

B. Respondent hereby certifies that, as of the effective date of this Consent Order, Respondent is not required to perform the actions of the SEP by: (1) any contractual or other legal obligation; (2) any federal, state or local law or regulation; or (3) any agreement, grant or as injunctive relief.

C. Within thirty (30) days of completing the SEP, Respondent shall submit to MassDEP a SEP Completion Report, which shall document completion of the SEP by including: (1) a description of the actions taken to complete the SEP; (2) verification and documentation that the required expenditures were made and the dates of such expenditures; and (3) the following certification:

I, [Name], [Title], hereby attest under the pains and penalty of perjury that (i) I have personally examined and am familiar with the information contained herein; (ii) the information contained herein is true, accurate and complete to the best of my knowledge and belief; (iii) Respondent implemented the SEP in accordance with the requirements of this Consent Order; and (iv) I am fully authorized to make this attestation on behalf of Respondent. I am aware that there are significant penalties, including without limitation possible fines and imprisonment, for willfully submitting false, incomplete or inaccurate information.

D. Respondent shall pay a stipulated civil administrative penalty to the Commonwealth in the amount of $8,000.00 if Respondent fails to perform and complete the SEP in accordance with this Consent Order.

E. In the event the cost of performing and completing the SEP in accordance with the provisions of this paragraph is less than $8,000.00, Respondent shall pay to the Commonwealth as a civil administrative penalty the difference between $8,000.00 and the actual amount expended. Such penalty shall be paid on or before the due date for the SEP Completion Report as set forth above and payment shall be made in the manner set forth in this Consent Order for payment of civil administrative penalties.

F. Respondent shall state in a prominent manner whenever it publicizes the SEP, or the results thereof, that the SEP was undertaken, or is being undertaken, as part of the resolution of an environmental enforcement action by MassDEP.

19 Environmental Management System

A. MassDEP has determined that it is appropriate for Respondent to implement an Environmental Management System ("EMS") in the resolution of this matter. Such EMS is included for the purpose of mitigating the administrative penalty and not in lieu thereof.
B. If Respondent fails to implement an EMS as described in MassDEP's *Guidance on Incorporating Environmental Management Systems into Enforcement Negotiations and Settlements (January 2001)*, then Respondent shall pay a suspended penalty of $12,125.00 within ten (10) days of receipt of the Department’s written demand for payment.

C. The EMS should be implemented to ensure that the Office of Utilities and Facilities and the Water Department achieve and maintain compliance with environmental requirements including, at a minimum, the development and implementation of:

1. Environmental compliance policies, procedures and guidance documents for all of the organization’s operations and activities;
2. Clearly specified organizational responsibilities and accountability of organization’s staff and management, on-site service providers, and contractors for regulatory compliance, required reporting to regulatory agencies, and corrective actions implemented in their area(s) of responsibility;
3. A system for tracking compliance activities;
4. Schedules and a system for conducting regular inspections of operations and facilities and annual self audits of operations and facilities for the purposes of preventing and controlling releases, ensuring environmental protection, and maintaining compliance with statutory and regulatory requirements;
5. A system for ensuring that routine requirements for sampling, monitoring, and reporting data required by law, regulation and permit are accomplished;
6. Standard procedures and requirements for incident and noncompliance reporting to regulatory agencies, including requirements to report releases of oil and/or hazardous materials and implementation of measures to minimize risks from such releases;
7. A system for establishing return to compliance plans for noncompliance identified during inspections and audits;
8. A system for the development of continuous improvement goals and results reporting that may include: recycling and the purchase of recycled products; pollution prevention; source reduction; resource conservation; energy consumption; waste minimization, renewable energy and renewable technologies;
9. Annual compliance training for management and personnel, and initiation training for new management and personnel;
10. A process for an objective annual review and evaluation of the EMS and its components, including: implementation of modifications as necessary to ensure timely compliance and a commitment to continual improvement, and senior management review to ensure that goals are being achieved;
11. A program for ongoing community outreach in the environmental aspects of regulated entity’s operations and general environmental awareness.

D. Respondent hereby certifies that it is not required to perform or to develop the EMS by any federal, state or local law or regulation; nor is Respondent required to perform or to develop the EMS by agreement, grant or as injunctive relief in this or any other case or in compliance with state or local requirements. Respondent further certifies
In the Matter of: Town of Spencer
ACOP-CE-07-5D006
Page 10 of 19

that it has not received, and is not presently negotiating to receive, credit in any other enforcement action for the EMS

E. Respondent shall maintain documentation at the Facility of full EMS implementation, and shall make such information available to the Department upon request. The Department shall have sole discretion to evaluate the adequacy of EMS implementation, and a determination by the Department that an EMS has not been fully implemented in compliance with this Order shall not be subject to an adjudicatory hearing.

F. Within ninety (90) days of the effective date of this Consent Order, Respondent shall submit a written report to DEP describing the final EMS and a schedule for implementing it. Respondent shall submit quarterly reports describing implementation efforts between submission of the final EMS and the submission required in subparagraph F below.

G. Within eighteen (18) months of the effective date of this Consent Order, Respondent shall provide a written report to MassDEP verifying that the final EMS is implemented in one of the following forms:

(1) Report of an independent qualified EMS auditor, or

(2) Self-certification by an officer or manager of Respondent with the authority to spend money and assign staff, accompanied by a statement that the signatory has personally determined that each element is in place and understands that false statements may be subject to penalties.

20. Respondent understands, and hereby waives, its right to an adjudicatory hearing before MassDEP on, and judicial review of, the issuance and terms of this Consent Order and to notice of any such rights of review. This waiver does not extend to any other order issued by the MassDEP.

21. This Consent Order may be modified only by written agreement of the parties hereto.

22. The provisions of this Consent Order are severable, and if any provision of this Consent Order or the application thereof is held invalid, such invalidity shall not affect the validity of other provisions of this Consent Order, or the application of such other provisions, which can be given effect without the invalid provision or application, provided however, that MassDEP shall have the discretion to void this Consent Order in the event of any such invalidity.

23. Nothing in this Consent Order shall be construed or operate as barring, diminishing, adjudicating or in any way affecting (i) any legal or equitable right of
MassDEP to issue any additional order or to seek any other relief with respect to the subject matter covered by this Consent Order, or (ii) any legal or equitable right of MassDEP to pursue any other claim, action, suit, cause of action, or demand which MassDEP may have with respect to the subject matter covered by this Consent Order, including, without limitation, any action to enforce this Consent Order in an administrative or judicial proceeding.

24. This Consent Order shall not be construed or operate as barring, diminishing, adjudicating, or in any way affecting, any legal or equitable right of MassDEP or Respondent with respect to any subject matter not covered by this Consent Order.

25. This Consent Order shall be binding upon Respondent and upon Respondent’s heirs, successors and assigns. Respondent shall not violate this Consent Order and shall not allow or suffer Respondent’s employees, agents, contractors or consultants to violate this Consent Order. Until Respondent has fully complied with this Consent Order, Respondent shall provide a copy of this Consent Order to each successor or assignee at such time that any succession or assignment occurs.

26. In addition to the penalty set forth in this Consent Order (including any suspended penalty), if Respondent violates any provision of the Consent Order, Respondent shall pay stipulated civil administrative penalties to the Commonwealth in the amount of $250.00 per day for each day, or portion thereof, each such violation continues.

Stipulated civil administrative penalties shall begin to accrue on the day a violation occurs and shall continue to accrue until the day Respondent corrects the violation or completes performance, whichever is applicable. Stipulated civil administrative penalties shall accrue regardless of whether MassDEP has notified Respondent of a violation or act of noncompliance. All stipulated civil administrative penalties accruing under this Consent Order shall be paid within thirty (30) days of the date MassDEP issues Respondent a written demand for payment. If a court judgment is necessary to execute a claim for stipulated penalties under this Consent Order, Respondent agrees to assent to the entry of such judgment. If simultaneous violations occur, separate penalties shall accrue for separate violations of this Consent Order. The payment of stipulated civil administrative penalties shall not alter in any way Respondent’s obligation to complete performance as required by this Consent Order. MassDEP reserves its right to elect to pursue alternative remedies and alternative civil and criminal penalties which may be available by reason of Respondent’s failure to comply with the requirements of this Consent Order. In the event MassDEP collects alternative civil administrative penalties, Respondent shall not be required to pay stipulated civil administrative penalties pursuant to this Consent Order for the same violations.

Respondent reserves whatever rights it may have to contest MassDEP’s determination that Respondent failed to comply with the Consent Order and/or to contest the accuracy of MassDEP’s calculation of the amount of the stipulated civil administrative penalty.
In the Matter of: Town of Spencer  
ACOP-CE-07-5D006  
Page 12 of 19

27. Respondent shall pay all civil administrative penalties due under this Consent Order, including suspended and stipulated penalties, by certified check, cashier’s check, or money order made payable to the Commonwealth of Massachusetts. Respondent shall clearly print on the face of its payment Respondent’s full name, the file number appearing on the first page of this Consent Order, and the Respondent’s Federal Employer Identification Number, and shall mail it to:

Commonwealth of Massachusetts  
Department of Environmental Protection  
Commonwealth Master Lockbox  
P.O. Box 3982  
Boston, Massachusetts 02241-3982

Respondent shall simultaneously mail a copy of the payment to:

Robert A. Bostwick, Sanitary Survey/Enforcement Coordinator  
Department of Environmental Protection  
627 Main Street  
Worcester, Massachusetts 01608.

In the event Respondent fails to pay in full any civil administrative penalty as required by this Consent Order, then pursuant to M.G.L. c. 21A, § 16, Respondent shall be liable to the Commonwealth for up to three (3) times the amount of the civil administrative penalty, together with costs, plus interest on the balance due from the time such penalty became due and attorneys’ fees, including all costs and attorneys’ fees incurred in the collection thereof. The rate of interest shall be the rate set forth in M.G.L. c. 231, § 6C.

28. Failure on the part of MassDEP to complain of any action or inaction on the part of Respondent shall not constitute a waiver by MassDEP of any of its rights under this Consent Order. Further, no waiver by MassDEP of any provision of this Consent Order shall be construed as a waiver of any other provision of this Consent Order.

29. To the extent authorized by the current owner, Respondent agrees to provide MassDEP, and MassDEP’s employees, representatives and contractors, access at all reasonable times to Town of Spencer’s Water Department facilities for purposes of conducting any activity related to its oversight of this Consent Order. Notwithstanding any provision of this Consent Order, MassDEP retains all of its access authorities and rights under applicable state and federal law.

30. This Consent Order may be executed in one or more counterpart originals, all of which when executed shall constitute a single Consent Order.

31. The undersigned certify that they are fully authorized to enter into the terms and conditions of this Consent Order and to legally bind the party on whose behalf they are signing this Consent Order.
32. This Consent Order shall become effective on the date that it is executed by MassDEP.

Consented To:

TOWN OF SPENCER

By: [Signature]

Carter Terenzini
Town Administrator
157 Main Street
Spencer, Massachusetts 01562
Telephone: (508) 885-7500

Federal Employer Identification No.: 046-001-308

Date: 8/22/2007

Issued By:

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: [Signature]

Martin Stueberg, Regional Director
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608
Telephone: (508) 792-7650

Date: 9/4/2007
Attachment A

1. The following failsafe and alarm systems must be included in the temporary sodium hydroxide system at Meadow Road WTP as required by paragraph 7B above.
   a. A paddle type flow switch shall be installed on the common filter discharge pipe. The flow switch shall be the interlock (failsafe) to all chemical feed systems to insure positive flow. Chemical feed systems shall not operate in the automatic mode without positive flow confirmation via the flow switch.
   b. Delivery of water to the distribution system via the high lift (finished water) pump must terminate upon activation of a major alarm, such as, but not limited to:
      i. high/low pH, Notification via autodialer
      ii. high-high pH, Plant shutdown, Notification via autodialer
      iii. high/low chlorine residual, Notification via autodialer
      iv. high-high/low-low chlorine residual, Plant shutdown, Notification via autodialer
      v. high-high/low-low level clear well, Plant shutdown, Notification via autodialer
   c. The sodium hydroxide chemical feed pump must shut down or remain off when:
      i. the high-high pH alarm is triggered
      ii. there is no positive flow signal
   b. The sodium hypochlorite chemical feed pump must shut down and remain off when:
      i. there is no positive flow signal (via the flow switch)
      ii. low-low or high-high chlorine residual alarm is triggered

NOTE: If high-high or low-low alarms are generated from either the in-line pH or chlorine monitor, the raw and finished water pumps are to shut down and not restart until the operator clears and resets the alarms. The operator must determine cause of the alarms, clear and reset the alarms at the treatment facility and not from a remote location.
If a high-high alarm occurs after the finished water pump shuts down, it cannot restart until the cause has been determined and the alarm is cleared and reset.

2. At a minimum the following alarms shall cause notification to a location manned 24 hours a day/7 days a week so that a water system operator can respond (i.e., established alarm set points that are tied into the autodialer system):
   a. high/low pH (set points not greater than 8.0 and not less than 6.8, respectively). A high-high set point not to exceed 9.0 shall shut down the operation of the WTP and notify the operator via the autodialer.
   b. high/low chlorine residual (set points 1 and 0.3 mg/l, respectively). A high-high set point not to exceed 1.5 mg/l and a low-low set point not to
be less than 0.2 mg/l shall shut down the operation of the WIP and notify the operator via the autodialer
c. high/low clear well level shall function as the start/stop control of the well pump. A high-high and low-low control/alarm system shall shut down both the well and high service pump in alarm condition. There shall also be notification of the operator via the autodialer.
d. high/low finished water tank level (Moose Hill Reservoir)
e. low building temperature
f. flood (both buildings and containment area)
g. emergency eye wash/shower(s)
h. pump failure/disagreement (high service pump)

MassDEP acknowledges that the set points noted above may require adjustment and as such MassDEP shall be notified when adjustments are made.

NOTE: All buildings have intrusion alarms that cause notification to a security monitoring company. The company notifies the local police department of an alarm condition. The police department has a list of contacts for the water department and when deemed safe for inspection a water operator will respond to evaluate if the facility has been vandalized or tampered with.

3 Automated startup of the plant is prohibited after shutdown due to a major alarm. An operator must respond, diagnose and correct the situation that triggered the alarm condition before restarting the plant.

NOTE: All alarms that result in a shutdown of the WIP shall be called out as a common critical alarm. The Standard Operating Procedures shall state that when the operator receives the critical alarm the WIP is shut down and immediate action must be taken. Critical alarms must be corrected prior to restart of the facility.

4. The control (HOA or Hand-Off-Auto) switch for all chemical feed pumps shall be replaced with the spring return type for “manual or hand” operation so that the chemical feed pumps cannot be left running inadvertently.

5. As part of a Preventative Maintenance Program, develop and implement Standard Operating Procedures for:
   a. Recording maintenance activities
   b. Recording adjustments to settings on chemical feed pump(s)
   c. Conducting and recording chemical feed pump calibrations
   d. Recording alarms triggered - note how alarm was received (e.g., on panel, autodialer activated), who was notified, and actions taken by whom to correct alarm condition.
e. Conducting and recording weekly checks of all alarm set points and monthly testing of all alarm conditions at a minimum or immediately following any modifications to the system
f. Periodically update autodialet call-out list and phone numbers to be certain the proper individuals are notified of an emergency condition
g. Calibrate and maintain all continuous monitoring equipment and in-line analyzers in accordance with manufacturers’ recommendations (e.g., replacement schedule for probes) and keep a record of such calibrations
h. Calibration standards and buffers must remain current (i.e., not allowed to be used past expiration date)
i. Verify daily the accuracy of in-line analyzers using field grab samples and bench top probe (keep a record of such activities)
j. Calibrate bench top probe(s) daily, when samples are being analyzed
k. Test emergency shower/eyewash monthly (keep a record of such activities)
l. Record water quality complaints when received
m. Record standby power testing of diesel generator (weekly run test and monthly load test)
n. Staff training on the operation and testing of the alarm system.
Attachment B

1. The following failsafe and alarm systems must be included as part of the permanent sodium hydroxide treatment systems at Meadow Road WTP and Cranberry Brook WTP and in the BRP WS25-Treatment Facility Modification permit application required by paragraphs 9, 11 & 12A above:
   a. Install a flow switch for the common filter discharge pipe to serve as positive flow confirmation. All chemical feed systems (sodium hydroxide, potassium permanganate, sodium hypochlorite) shall all be allowed to operate only through flow confirmation of the flow switch.
   b. At a minimum the following additional alarms shall cause notification to a location manned 24 hours a day/7 days a week so that a water system operator can respond (i.e., established set points that are tied into the autodialer):
      i. high/low pH (set points not greater than 8.0 and not less than 6.8, respectively) A high-high set point not to exceed 9.0 shall shut down the operation of the WTP and notify the operator via the autodialer.
      ii. high/low chlorine residual (set points 1 and 0.3 mg/l, respectively) A high-high set point not to exceed 1.5 mg/l and a low-low set point not to be less than 0.2 shall shut down operation of the WTP and notify the operator via the autodialer.
      iii. high/low clear well level shall function as the start/stop control of the well pump. A high-high and low-low control/alarm system shall shut down both the well and high service pump in alarm condition. There shall be notification of the operator via the autodialer.
      iv. high/low finished water tank level (Moose Hill Reservoir)
      v. low building temperature
      vi. flood (both buildings and containment area)
      vii. activation of emergency shower/eyewash(s)
      viii. pump failure/disagreement (high service pump)

MassDEP acknowledges that the set points noted above may require adjustment and as such MassDEP shall be notified when adjustments are made.

NOTE: All buildings have intrusion alarms that cause notification to a security monitoring company. The company notifies the local police department of an alarm condition. The police department has a list of contacts for the water department and when deemed safe for inspection a water operator will respond to evaluate if the facility has been vandalized or tampered with.

2. The following modifications to the chemical feed systems shall be made:
   a. Emergency shower/eyewash must be supplied by the finished water line
b. Remove any equipment that no longer pertains to the current operations (e.g. chlorine gas feed equipment and associated alarm enunciator, SCBA, etc.)
c. Relocate light switches to the outside of the chemical feed rooms for operator safety
d. Close openings in the electrical control panel in the front building
e. Relocate control switches for chemical feed pumps to location outside the chemical containment area (e.g., hydroxide)
f. Relocate and replace in accordance with current standards any outlet boxes to location outside the chemical containment area (e.g., hydroxide)
g. Make necessary modifications to provide antisiphon protection on the discharge line for all chemical feed pumps
h. Make modifications such that the containment area for hydroxide is separate from that of the diesel fuel for the standby power generator
i. Make modifications so that the hydroxide bulk tank has a separate vent (to exterior) and overflow (to containment area)
j. Mark and identify all chemical storage tanks, piping and fill ports.
Within **12 months** of the effective date of this Consent Order, the Town shall complete a Supplemental Environmental and Safety project consisting of a “Lessons Learned” Report based on findings by the Blue Ribbon Committee for distribution to other municipalities. A seminar in Spencer will be conducted to which all other municipalities within the Central MA region will be invited. The experience and response by the town of Spencer could obviously benefit many other municipalities in the Commonwealth in preparing for many different types of events in the Post 911 environment. An estimated budget for this project is as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blue Ribbon Committee Support</strong></td>
<td>60 $/hr</td>
<td>$12.90</td>
<td>$774.00</td>
</tr>
<tr>
<td>(clerk for meetings and general</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>administration)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response Surveys</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing and mailing of surveys</td>
<td>1700</td>
<td>$0.59</td>
<td>$1,003.00</td>
</tr>
<tr>
<td>Survey review/reporting</td>
<td>30 $/hr</td>
<td>$10.00</td>
<td>$300.00</td>
</tr>
<tr>
<td>**Preparation of Presentation</td>
<td>40 $/hr</td>
<td>$125.00</td>
<td>$5,000.00</td>
</tr>
<tr>
<td>Materials**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Informational Mailer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter</td>
<td>350</td>
<td>$0.15</td>
<td>$52.50</td>
</tr>
<tr>
<td>Brochure</td>
<td>350</td>
<td>$1.10</td>
<td>$385.00</td>
</tr>
<tr>
<td>Envelope</td>
<td>350</td>
<td>$0.05</td>
<td>$17.50</td>
</tr>
<tr>
<td>Postage</td>
<td>350</td>
<td>$0.39</td>
<td>$136.50</td>
</tr>
<tr>
<td><strong>Confirmation Mailer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmation letter</td>
<td>10</td>
<td>$0.15</td>
<td>$1.50</td>
</tr>
<tr>
<td>Posters (waiting for Excel to confirm a price)</td>
<td>50</td>
<td>$5.00</td>
<td>$250.00</td>
</tr>
<tr>
<td>Envelopes</td>
<td>10</td>
<td>$0.20</td>
<td>$2.00</td>
</tr>
<tr>
<td>Postage</td>
<td>10</td>
<td>$0.97</td>
<td>$9.70</td>
</tr>
<tr>
<td><strong>Presentation Booklet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(75 pages, 2 sided, glossy, spiral bound)</td>
<td>200</td>
<td>$12.50</td>
<td>$2,500.00</td>
</tr>
<tr>
<td><strong>Accompanying CD-ROM</strong></td>
<td></td>
<td>$1.75</td>
<td>$350.00</td>
</tr>
<tr>
<td><strong>Presenter Stipend</strong></td>
<td></td>
<td>$100.00</td>
<td>$8,000.00</td>
</tr>
<tr>
<td>(includes time presenting, meal, travel, &amp; set-up/breakdown)</td>
<td>80 $/hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td>$18,781.70</td>
</tr>
</tbody>
</table>
