DEROSA AQUATIC CONSULTING

CONSULTING & TRAINING SERVICES FOR AQUATIC PROFESSIONALS

OBSERVATIONS AND RECOMMENDATIONS RESULTING FROM INDEPENDENT REVIEW OF MORSES POND RECREATIONAL AREA (BEACH)

WELLESLEY, MA

Submitted this 29th day of September 2013

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I. EXECUTIVE SUMMARY

DeRosa Aquatic Consulting was contracted to perform an independent review of safety standards and practices governing the operation and management of the recreational swimming beach at Morses Pond in Wellesley, MA. The review included a document review, staff interviews, and multiple site visits, including an unannounced audit. At the time of engagement by counsel in June 2013, town administrators expressed their commitment to keep the beach closed until the most important and immediate factors affecting safety had been adequately addressed.

The Town of Wellesley, through its staff, provided copies of job descriptions and operational manuals for review. An inspection of the beach was performed on Tuesday, June 18, 2013. Recreation Department staff, including the Director of Recreation, the Assistant Director of Recreation and the beach management team were interviewed both on-site and via telephone. These interviews helped provide an understanding of the policies, procedures, safety practices and daily operations of the Morses Pond recreational area. The dedication and commitment of staff to providing a safe recreational experience to all beach users is to be commended. Safety was clearly a priority for both town administrators and direct service staff.

The following observations were made during the independent review and on-site evaluation:

- The swimming area at Morses Pond is well-marked with ropes, buoys (blue/white), and a floating dock system. A shallow-water play area is also clearly defined by a buoyed rope;
- Lifeguards are certified in American Red Cross Lifeguarding/First Aid/CPR/AED;
- Lifeguards receive training at the start of each summer in waterfront rescue skills, including search and rescue procedures;
- Lifeguards possess appropriate rescue equipment, including whistles and rescue tubes. Additional rescue and first aid equipment is also available, including backboards, a rescue board, rescue kayak, AEDs and resuscitation equipment;
- Lifeguards are stationed both in elevated guard stands close to the water's edge and at "ground-level" stations along the floating dock system, including on the platform to the slide;

- The beach gradually slopes into the water to about the position of the center catwalk of the H dock. Within a few feet of this catwalk, the bottom quickly changes slope over a short distance. This steep change in slope, commonly referred to as a drop-off, was located just beyond the center catwalk of the H dock. No water depth markings or warnings regarding the change in slope were provided;
- Two different swim tests are administered to children under twelve years of age: the *slide test* and the *deep water test*; and
- Rules and regulations were clearly posted at the main entrance and in the lobby area of the bath house, but facility safety signage did not focus on the major risks in the aquatic environment: parents not watching their children, the dangers of head-first entries into shallow water and the dangers presented when non-swimmers fail to wear lifejackets.

As a result of this initial review, the following recommendations were discussed on-site with town administrators and prioritized for ***immediate action*** prior to reopening the beach:

- Installation of a new buoyed line, in contrasting color to the existing lines, across the "left" and "right" beaches to more clearly delineate the transition from shallow to deep water;
- Installation of new signage communicating to the public the presence of the "drop off" and explaining the meaning of the new red/white buoyed line;
- Alteration of the swim test from an age-based test to a height-based test;
- Streamlining of the two separate swim tests (deep water and slide tests) to one swim test that then allows access to all deep water;
- Repositioning of the lifeguard stationed at the top of the slide to the base of the slide to allow for better positioning for rescue assistance; and
- Installation of signage advising parents to carefully monitor their children.

Additionally, the following items were identified for ***future action*** as they involve policy and risk management decisions and do not present immediate safety concerns:

- Identification of appropriate signage standards for the beach;
- Coordination of emergency response resources including lifeguards, police and fire services;
- Review of lost bather procedures, including both land and water searches;
- Review of the size of the swimming area, taking into consideration complications of search and rescue caused by both large and deep swimming areas;
- Review of early and late-season beach operations;
- Review of placement of lifeguards for effective surveillance; and
- Review of lifejacket policy.

Following the on-site evaluation, town administrators took swift action to address the issues identified for immediate action, including the addition of a new buoyed rope to mark the drop-off as well as new signs to provide notice to patrons of the drop-off and changes to the swim test. Photographs were provided to the consultant as evidence of completion. Additionally, town staff modified the public announcement script at the beach to encourage parents/guardians/caretakers to carefully monitor children and to immediately report any missing person. Emergency procedures were modified so as to direct patrons away from the beach to the grass area during a search, thereby allowing lifeguards to efficiently implement search procedures while protecting the safety of the remaining beach patrons and avoiding contamination of the search area.

After consultation with town officials on Friday, June 21, 2013, it was determined that the recommendations for immediate action listed above were fully addressed. There being no immediate safety concerns beyond those inherent in the nature of swimming, Morses Pond was then reopened to the public on Friday afternoon.

Within the following week, water levels in the pond had receded dramatically following a controlled release of water from the pond. This release was not anticipated by the Recreation Department. The water loss resulted in the dock system becoming "beached." The water depth at the first buoyed line, delineating the child play area, dropped from 2'3" as measured by the

Consultant on June 18th to approximately 6" in depth as measured by Recreation Department staff the following week. The potential for such dramatic fluctuations in water depth, without notice, raises additional safety concerns that must be managed, in part, through improved communications.

A follow-up audit of Morses Pond was conducted the weekend of August 3-4, 2013. The consultant made an unannounced visit to the pond and observed operations from 1:00 – 6:00 PM on Saturday, August 3rd. The following morning, the Consultant returned to observe lifeguards practicing a lost bather search, interview lifeguard staff concerning daily operations, and observe operations between 10 AM and noon. As a result of these additional site visits, the Consultant was able to verify implementation of those recommendations prioritized in June for immediate action. The Consultant also identified additional operational considerations for the town's review and consideration, including recommendations on lifeguard positioning, zones of surveillance and both early season and late season operations.

In sum, Morses Pond is a well-run waterfront facility. Like many natural water bodies, Morses Pond Beach contains an uneven bottom with changing slopes. By addressing the areas noted for immediate action, the Town of Wellesley enhanced safety at Morses Pond prior to reopening the beach in late June 2013. Like many recreational activities, swimming involves an element of risk that can never be fully eliminated. It is therefore recommended that the discussion of beach safety continue throughout the year. The creation of a beach safety team, comprised of a cross-section of town officials such as Recreation, Police, Fire, Health and DPW, would allow the opportunity for more in-depth discussions of policies, procedures and best practices for managing aquatic risks at Morses Pond. Additional training needs have been identified, and the important role of lifeguard pre-service training has been reinforced. It is recommended that the town consider options for providing a comprehensive pre-service training program using existing resources, including staff, or through the use of an external consultant or training organization. Through the continued involvement of multiple town agencies in lifeguard pre-service training, awareness of waterfront safety should increase and communication and coordination among town agencies should improve.

II. MORSES POND OVERVIEW AND DESIGN

The Morses Pond recreational area is comprised of a swimming beach along with support facilities (bathrooms, changing facilities, showers, first aid room, storage areas and office areas). The beach includes a playground as well as a picnic area with covered shelters, picnic benches and individual grills for cooking purposes. The swimming area is considered a "public bathing beach" as defined in 105 CMR 445.000: Minimum Standards for Bathing Beaches (State Sanitary Code, Chapter VII). Primary access to the beach is from along a paved path leading from the parking area to the bathhouse / beach entrance. An attendant is positioned at the main entry to verify beachgoers possess the requisite tags to gain admission to the beach. The attendant also tracks the number of people entering the beach area each day. A separate ADA entrance allows persons with disabilities to access the beach from the end opposite the bathhouse..

A. **Picnic, Shade Structure and Sand Volleyball Areas.** Staff report that the picnic areas are heavily used, in part because of the benefit of the shade structures. Metal trash cans for hot coals, which help prevent improper disposal of hot coals into the sand, were clearly marked.

It should be noted that while alcohol is not allowed on the beach, and is specifically prohibited in public parks and other public spaces under town bylaw Article 49, Section 19, at the time of this inspection empty beer bottles were observed in the hot coal canisters. While the beach was not open for public use, the presence of beer containers suggests that beachgoers do in fact bring alcohol onto the beach either during or after hours of operation. Staff should continue to be observant for alcohol use while the beach is open, as the risk of injury to patrons increases with alcohol

consumption. The sand volleyball court appeared in good repair although the depth of the sand was not measured as part of this review. The shade structure in the sand offers patrons much-needed protection from the sun.

B. **Playground Area.** The playground area is an excellent addition to the beach. The playground gives children, the predominant users of the beach, something to do other than play in the water. Playground areas have been shown to relieve some of the pressure of overcrowding of the swimming area. Day camp programs, sponsored by the Recreation Department, position themselves in the sand adjacent to the playground in front of the "left shallow" beach. The designation of a "camp" area helps camp staff account for campers by consolidating their use of the beach to specific areas.

C. **Beach Area.** The beach area is approximately 375 linear feet across, as measured using a Kapro measuring wheel. The "left" section of the beach, facing the water, is reserved for day camps from 11:30 a.m. to 3:00 p.m. The "right" section of the beach (closest to the bath house) is partially shaded by trees and was described as being particularly attractive to families with young children. This section of the beach also contains a concrete access ramp into the water intended for persons with mobility impairments. Two distinct colorations of sand were observed on the beach. It was described that the beach sand was replenished following a dredging project in the pond and that the replaced sand was of a different color than the rest of the sand. Three elevated lifeguard stands were positioned across the beach close to water's edge.

D. **Bacteriological Quality.** Bacteriological quality is monitored in conformance with Department of Public Health regulations, specifically 105 CMR 445.031(B). Staff report that the beach is very infrequently closed because of elevated bacteria levels. That said, an on-site inspection revealed that the beach itself slopes steeply to the water's edge. At the time of the inspection, a heavy rainstorm caused significant runoff on the beach flowing runoff into the pond. Stormwater runoff washes bacteria from the beach and surrounding areas into the swimming area. With Canada goose droppings observed within the grassy area, beach upkeep will continue to be an important means of

minimizing bacteriological contamination of the swimming water. Staff should continue the daily effort to remove and properly dispose of goose droppings.

E. **Water Clarity.** Water clarity at the time of each inspection was very good. Two aerators were observed in shallow water. Although clarity was not measured with a Secchi disk, the bottom of the pond was viewable at water depths measured at approximately 3 feet deep. It was reported that during standard operations, water clarity is measured using a Secchi disk at the time the beach opens and then again as needed. While no written materials were reviewed explaining to beach managers when or how to conduct the readings, it was explained that such is passed on verbally to staff from year to year. It is recommended that requirements such as opening and closing procedures, including water clarity testing, be communicated to staff in written form via standard operating procedures.

During the consultant's visit on Saturday, August 3rd there were no Secchi disk readings taken between 1:00 PM and 6:00 PM. It was explained that water clarity on this date measured at over 10' earlier in the morning and as there was no visible change in clarity, no additional test was needed. While documentation of Secchi disk readings was not provided, staff explained that the clarity measurements and basic environmental conditions (e.g. temperature, wind rating, sunny/cloudy) are recorded in the RecTrac software system's weather maintenance module.

While turbidity (cloudy water) does not seem to be a problem at the pond, staff should remain alert for any deterioration in water clarity that might occur over the course of the day. The natural aging of the pond may carry sediment into the swimming area which, when disturbed, may create turbid conditions. Turbidity presents scanning challenges to lifeguards. Because water clarity is specifically mentioned in the DPH regulations governing public bathing areas, it is recommended that lifeguards and beach management staff be given specific guidance describing what remedial actions may be taken should water clarity become compromised during daily operations. At specific issue is language within the applicable public health regulation that states:

> Bathing or swimming shall not be permitted in bathing waters when . . . (2) There are safety hazards including, but not limited to, fast currents, sharp drop-offs or an unstable bottom in the wading area(s) **or lack of water clarity**. (emphasis added).

It is reported that clarity may become an issue with algae growth or following problems with the weed harvester. Although unlikely, because water clarity has been compromised in the past, guidance should be given to staff on how to respond.

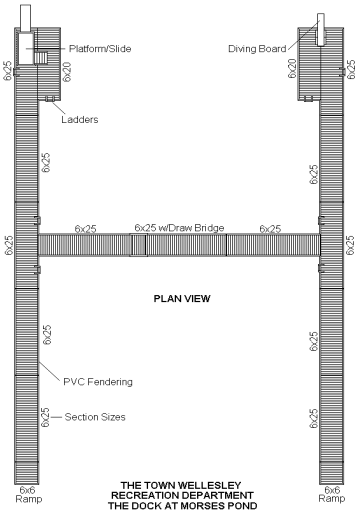
Other agencies operating public beaches within Massachusetts do offer such guidance to staff. For example, the Massachusetts Department of Conservation and Recreation advises staff that when water clarity is compromised, lifeguards should keep patrons out of the water for a period not exceeding 30 minutes, presumably to allow time for suspended solids to sink to the bottom of the beach, thus improving water clarity. (See DCR Waterfront Program Procedural Manual, Section V – Management of Designated Swimming Beaches, April 1, 2007).

Of note, the management practices referenced herein, including those of the Massachusetts DCR as well those of other agencies or communities, help illustrate examples of a "local" standard of care or best practice. These examples help show how other agencies within the Commonwealth, some of which are most certainly in close geographic proximity to the Town of Wellesley, manage their waterfront areas. Although Mass. DCR is a state agency, their management practices are not controlling with respect to the Town of Wellesley. In other words, while the town must comport with the regulations set forth by the Massachusetts Department of Public Health, as enforced through the local Board of Health, the Town of Wellesley does not have to mimic the DCR management practices. The examples provided herein are intended to help town administrators benchmark operations, policies and procedures against other similar swimming areas.

It may be advisable to seek clarification from the Massachusetts Department of Public Health as to what steps may be taken to manage the risk of compromised water clarity

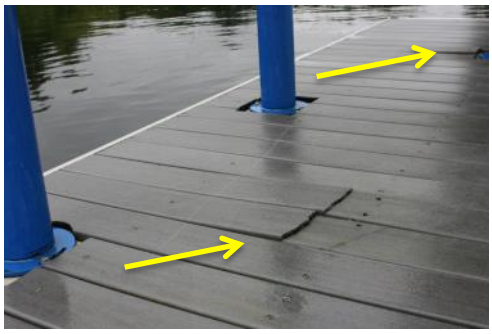
should such occur during daily operations. This will be particularly important if water clarity becomes compromised by the "stirring up" of the bottom sediment, most likely to occur in standing-depth water. If necessary, a variance may be sought from the local Board of Health outlining specific steps staff should take to manage the risk of turbid water, such as by restricting swimmers to waist-deep water. It is reasonably foreseeable that shallow water areas could become cloudy under heavy use. Beach managers should therefore be provided with standard operating procedures to address the safety risk presented by cloudy (turbid) water should such condition arise.

F. Dock Formation. Floating in the water was a large dock system in an "H" formation, representing two vertical extensions from the beach connected by a horizontal catwalk. Each vertical section of the dock is comprised of five separate 6'x25' long segments, in addition to a 6'x6' ramp. This configuration places the end of the dock system approximately 156 feet from shore. The horizontal catwalk is comprised of three 6'x25' sections. At the far corners of the swimming area were two floating rafts. A slide was positioned on the far end of the left side of the dock system. Although the manufacturer's specifications include a diving board on the right-hand dock, the diving board was not purchased or installed.



Mfr's specification diagram for H dock.

The dock system was in good repair, with the only observable damage being to four planks situated beneath the slide. The need for repairs was communicated to staff in June and by the time of the Consultant's follow-up visit in August, repairs had been made.



Planks beneath slide prior to repair.

To help prevent catastrophic head, neck and spine injuries the words "No Diving" were painted onto the dock in shallow water areas. It was recommended that the universal "No Diving" symbol (diver enclosed in a red circle with a diagonal hash mark) also be installed onto the dock, either via stencil or sticker.

"No Diving" stencil on docks.

The use of pictograms over words is preferable. Pictograms found on safety signage typically undergo comprehension testing, thereby providing validated, highly recognizable messages easily understood by patrons, including those who may not read English. The universal "No Diving" symbol was stenciled onto the dock in yellow paint prior to reopening the beach.

"No Diving" symbol added to docks.

G. Slope Gradients. According to the U.S. Army Corps of Engineers, "[t]he slope of the land both above and below the water line is one of the determining factors in the site selection for a good swim area." The Morses Pond beach gradually slopes into the water and continues at a gentle slope to approximately the center catwalk on the H dock. While under ideal conditions the bottom slope of a designated swimming area would range from 2%-5%, a slope of 6%-10% may be acceptable provided the bottom is free of other hazards, such as rocks, holes, sudden drop-offs, etc. While an uneven bottom and changing slope are naturally occurring conditions in lakes and ponds across the country, these risks do present management challenges. Sudden drop-offs, such as with a steep slope change, present hidden dangers that beach users may not expect. The bottom of Morses Pond contains slopes greater than 10% and thus proper management of the area necessitates additional protective measures, such as the presence of lifeguards and clearly defined non-swimmer and wading areas.

Immediately past the center catwalk of the H dock (approximately 70 feet from shore) is a change in slope, commonly referred to as a drop-off. Water depth within the center crib transitioned quickly from 2'9" on the shore side of the catwalk to 3'5" on the far side of the catwalk. This represents roughly an 11% slope, as measured by a depth change of 8" over a run of 6 feet. Depth measurements on the outside right edge of the dock (i.e. left perimeter of "right beach") both before and after the center catwalk show a depth change from 2'5" to 3'7" over a run of 6 feet. This represents a 19% slope, a significant change from the gentle slope leading into the pond. This sudden change in depth over a short distance presents a hidden danger to the unsuspecting beach user. It should be noted that the drop-off is known to exist both by Recreation Department staff and lifeguards. Additionally, it is reported that long-time users of the beach have also referenced a known drop-off in conversations with staff.

A more pronounced slope (approaching 27%) was observed on the far side of the catwalk where water depth dropped one foot over a run of 3'9". A water depth of 3'5" was measured at the far edge of the catwalk and a depth of 4'5" was measured at the center of the ladder adjacent to the catwalk (a distance of 3'9"). The steep slope continues moving away from shore, with a depth of 6'10" measured only 10 feet from the center of the ladder adjacent to the catwalk, or roughly a 24% slope. Water depth at the end of the dock system measured between 13'5" and 14' deep.

While Massachusetts DPH regulations are silent with respect to appropriate beach slopes, other states and agencies have established guidelines for the slope of public bathing areas. The Pennsylvania Department of Health, for example, requires that for water depths under 5 feet, "the bottom shall be uniform and should not exceed 1 foot vertical to 10 feet horizontal (1V:10H)." Within deep-water areas, defined as greater than 5 feet, the bottom slope shall not exceed 1 foot vertical to three feet horizontal. (See Pennsylvania Public Bathing Place Manual, February 2002, Section 5.3 "Bottom Slopes".)

H. Notice of "Drop-Off". Given the foregoing discussion of the dangers presented when encountering a sudden, unexpected change in water depth, it was recommended that the town clearly mark the "drop-off" with marker buoys or, preferably, a buoyed rope in contrasting color to the existing blue/white rope which already defines the swimming and child play areas. A rope with red/white buoys, in concert with appropriate signage, was recommended to help make this hazard stand out from the rest of the swimming area. It was recommended that signs concerning the drop-off follow ANSI standards for safety signage. (See ANSI Z535 Safety Standard). Prior to reopening the beach in June, the Town reported that both the new rope and warning signs were in place. Photographs were provided as evidence of completion. Both the signs and the rope were in use at the time of the Consultant's August audit.

New sandwich board sign providing notice of the drop-off, and explaining the meaning of red buoyed line, and required swim test.

I. Non-Swimmers Area. The addition of the red/white buoyed line prior to the drop-off effectively creates a "non-swimmers" area that, depending upon water depth fluctuations in the pond, should be restricted to no more than 3 - 4 feet deep. A depth of approximately 3 feet is preferable from a safety perspective and would conform to standards set forth by Mass. DCR for the management of its inland swimming areas. Additionally, the existing blue/white rope delineating the zero-depth child play area should serve to help contain very young children. Non-swimmers, even within the wading area, should be advised to stay within chest-deep water. Lifeguards should monitor swimming ability even of non-swimmers and should "call in" those children that venture too deep for their swimming ability. The continued use of a swim test prior to allowing persons into deep water, i.e. beyond the red/white-buoyed line, is also recommended. (More discussion of the swim test may be found herein).

During the August site visit, the water level in the pond was lower than was originally observed in June. The blue and white buoyed rope marking the shallow water child's play

area was positioned in water less than 2 feet deep, making it somewhat of an inconvenience to patrons. The same line was originally measured at about 2'3" in depth in June and then a week later was measured by Recreation Department staff at about 6" of water depth, essentially becoming a trip hazard. Because this line does help prevent young children from wandering too deep, it may be beneficial to keep the line in at least one of the three shallow water areas, preferably the center crib. This may help lessen customer complaints over the rope while also allowing parents with small children the opportunity to play in a clearly defined area.

J. Water Depth. Water depth markings were not observed on the floating dock system. In fact, fixed depth markings are not recommended on the docks given the changing water depth at the pond. Instead, the town could consider implementing a depth marking system using buoys or large poles that are easily viewed from a distance to help provide patrons a better understanding of the water depth at key locations, such as at the red-buoyed rope. An alternative to water depth gauges could be a daily measurement of water depth at the red buoyed rope, with the result posted on a white board at the entrance to the beach. Other options for posting of daily depth measurements might be equally effective.

At the time of the follow-up inspection, a telescoping measuring rod was installed in the water, but it was far too small to be of use to patrons looking to gauge water depths from a distance. The telescoping rod should be removed and if water depth gauges are determined to be beneficial, they should be installed such that depth changes of either 6" or 12" remain viewable from a distance.

The U.S. Army Corps of Engineers utilizes white depth marker poles, marked in feet, to inform swimmers of the approximate depth of the water. As the Army Corps swimming areas are unguarded, the Corps recommends that the depth of the marked swimming area be limited to three (3) feet and

"Homemade" water depth pole.

further states that water depth should not exceed five (5) feet deep. By comparison, water depth at the end of the docks at Morses Pond was observed to be in excess of 13 feet. The water depth is reported to be even deeper at the floating rafts, approaching 18 feet deep.

Telescoping measuring rod placed into Morses Pond.

Also concerned with water depth within swimming areas, Mass. DCR recommends that the "swimmers" area at DCR beaches be marked at a depth not exceeding 8 feet and that a "non-swimmers" area be marked at a depth not exceeding 3 feet. Similar to Mass DCR, the Pennsylvania Department of Health recommends that shallow water wading areas, if provided, be marked by lines and buoys at no more than 2 feet deep. With regard to deep water, Pennsylvania Department of Health states that the "maximum depth at the deepest portion of the designated bathing area should not exceed 6 feet" and, further, that "[i]n no case shall the maximum depth in the designated bathing area, including diving areas, exceed 13 feet." (See Pennsylvania Public Bathing Place Manual, February 2002, Section 5.4 "Maximum Depth".)

Considering these examples, as well as examples provided by the Recreation Department of water depths at other Massachusetts beaches, it is clear that the water depth within the swimming area of Morses Pond is significantly deeper than what we find at many inland beaches. Water depths approaching 18 feet deep are atypical in well-managed inland beaches. Water of this depth presents a risk that should be carefully managed. Indeed, lifeguard certification standards only require lifeguards to surface dive to a minimum depth of 7-10 feet. Thus, the depth at the floating rafts, estimated at 18 feet deep, may be more than double the depth to which many lifeguards may feel comfortable diving. Such water depths complicate a deep-water search and are therefore not recommended. Given the foregoing, it is advisable that town officials consider the risks and benefits of maintaining access to such a deep area of the pond. Further, if such access is to continue, it is imperative that the Recreation Department continues to train lifeguards to surface dive repeatedly to the maximum depth within the swimming area. Regular practice will

be required to develop in the lifeguards the ability to repeatedly dive and swim underwater, as is required during a deep-water search.

K. Size of Deep Water Area. The size of the deep-water swimming area at Morses Pond, defined for purposes of this report as all water beyond the drop-off area at approximately the location of the center catwalk, is substantial. In Morses Pond terminology, this area includes the "Mid" and "Deep" areas denoted in the 2013 Staff Manual.

Although specific measurements from shore to the floating rafts at the far edge of the swimming area were not taken because of a thunderstorm on the day of the site inspection, it is estimated by the Recreation Department, using Google's distance measuring tool, that the rafts are positioned approximately 130 feet from shore. This is different than the distance explained in the 2013 Morses Pond Beach Staff Manual, which states, "the far end of the swim section is at least 100 yards from the beach, a long swim for almost anyone." The far end of the dock system rests about 131 feet from shore, based upon the manufacturer's specifications for the dock system. The floating rafts are further out into the pond than the end of the docks but because of the natural curvature of the beach the rafts are at approximately the same distance from shore. The exact distance from shore to the rafts will fluctuate slightly as water levels in the pond rise and fall over the course of a season.

Even assuming that the distance to the outer perimeter of the swimming area to be approximately 130 feet from shore, this is a significant area for lifeguards to scan and to travel in an emergency. The larger the swimming area, the more time-consuming and resource-intensive a deep-water search becomes. By comparison, DCR recommends that designated swimming areas at DCR facilities not exceed a distance of 100 feet from the shoreline.

It should be noted that DCR swimming facilities do not utilize floating dock systems. The dock system allows lifeguards to be positioned along the dock in close proximity to swimmers furthest from shore. Thus, the presence of lifeguards along the docks may be an effective way to manage swimmers at the surface of the water even though the

swimmers themselves are a distance from shore. However, while lifeguards may be able to effect a timely rescue of a swimmer on the surface from the dock system, there is still a concern for the depth of the water as explained above. Some groups estimate that in roughly 80% of the rescues documented by lifeguards, the lifeguards themselves did not initiate a response. Instead, the presence of a victim was brought to the attention of lifeguards by another patron. In the waterfront environment it is critical to get to patrons in distress before they submerge. Once underwater, the water quickly hides the patron from view. Recovery becomes more time-consuming and difficult. The combination of a large and deep search area makes effecting a search and *rescue* (as opposed to a *recovery*) a challenge.

Despite the large swimming area, beach managers estimate that the majority of swimmers (estimated at 60-70%) stay in chest-deep water. This is consistent with beach use across the country. Given the additional risks presented by the sheer size of the swimming area, town administrators should carefully consider whether the swimming area should be reduced to a more manageable size. Whether to accept the added risks of such a large, deep-water swimming area is a policy decision that must be made in consideration of the resources available to the town in helping supervise the swimming area and in coordinating a deep water search. It may be advisable to scale back the size of the deep-water swimming area particularly in light of staff reports that the majority of patrons remain in shallow water.

If the swimming area is to remain as large as it is today, additional lifeguards may be required to provide adequate patron surveillance during all hours of operation. In other words, rather than the five guard rotation observed, a full seven guard rotation might be needed whenever the full swimming area is available for use. The lifeguards positioned in the elevated guard stands on the beach are not best positioned to provide effective surveillance of the floating rafts much less the entire swimming area contained with the "left" and "right" beaches. If fewer than seven lifeguards are "up", then sections of the beach should be closed to patron use.

L. Lifeguard Stationing and Zones of Coverage. During the Consultant's original review in June, the Consultant identified a need to carefully explore in more detail lifeguard zones of coverage. While many aquatic departments do not provide zone diagrams to lifeguards, to the Recreation Department's credit, zone diagrams were in fact available. The original zone diagrams depicted lifeguard scanning areas from the guard stands 1 and 3 all the way out to the rafts, with additional lifeguards on the docks overlapping the deep water areas. It is the Consultant's opinion that this is too wide an area for the guard in the stand to cover effectively. While it may be true that at certain times of the day the lifeguard in stand numbers one and three can see out to the rafts, having to scan the middle and deep water areas on top of the shallow water zone directly in front on the stand could require an unreasonably long scan time. Moreover, the greater the distance from the lifeguard to the patron, the more challenging scanning becomes, as the target becomes smaller and more easily lost in the field of vision. Additionally, as the sun sets across the pond, there is significant glare off of the water which makes seeing into this zone particularly difficult.

After discussing these concerns with staff, a second set of zone diagrams was provided modifying the original zone diagrams. The modified diagrams were inconsistent with lifeguard stations observed at the time of the unannounced site inspection. Zone diagrams provided depict a seven lifeguard rotation, whereas on two separate occasions only five lifeguards were observed on rotation. In both of these reduced guard scenarios, the entire beach area appeared open for use. It is important that lifeguards be provided zone diagrams or "charts" depicting the zone of coverage for each station. If a "five up" pattern is typical, then zone charts should show how five lifeguards are to provide proper coverage of the swimming area. A separate "seven lifeguard rotation" diagram would then be needed to show the differences in zones when additional staff are available.

Given the size of the swimming area and the position of the docks, rafts and slide, it is this Consultant's opinion that a minimum of seven lifeguards would be needed to provide effective surveillance over all swimming areas. Additional staff would be needed for rotations and periodic breaks in surveillance. During particularly busy periods, or late

afternoon when the sun sets across the pond, an eighth guard might be helpful on a rescue kayak or rescue board patrolling the perimeter of the swimming area. Late in the afternoon, this vantage point would help avoid glare from the setting sun. A seven lifeguard rotations is consistent with the staffing plan provided by the Recreation Department. Minor adjustments to the seven lifeguard rotation depicted on the zone diagram, are recommended.

In practice, seven lifeguards may not be needed "in rotation" at all times. For example, when the beach opens at 10:00 AM, bather numbers are sufficiently low to warrant scaling back on lifeguard coverage. During these low use times, perhaps when 5 or 10 swimmers are in the water, lifeguard stations that are not needed should be closed, and corresponding signage should be placed on the beach or docks making clear that certain areas are closed. One lifeguard could be assigned to help monitor closed areas to ensure persons do not enter the water. Staff should properly monitor the areas where people are swimming and expand coverage by opening new zones as the beach begins to fill.

During the follow-up inspection, four lifeguards were observed guarding from the docks and one from the center guard stand, leaving the end guard stands (zones 1 and 3) empty. This five-guard pattern is not an effective way to cover the entire swimming area. Moreover, as the beach became more crowded, lifeguards did not readjust their positions or radio back to a manager for guidance on how to reposition themselves for effective surveillance. Instead, they continued to guard from assigned positions that did not provide for an optimal scanning location.

The public expects lifeguards to be stationed in the lifeguard stands. As such, it is strongly recommended that the lifeguard stands be staffed whenever the area in front of the stand is open. The stands are positioned properly in the center of each zone, making emergency response more efficient from this central location than from an extreme edge of the zone (e.g. such as on the dock). During low-use times, lifeguards may, if Department procedures allow, guard from the water's edge, in close proximity to patrons. Managers must remain observant of beach usage and lifeguard positioning and must

provide leadership throughout the day to ensure (1) proper stationing of guards with respect to facilty use and (2) effective surveillance.

III. STAFF QUALIFICATIONS, TRAINING AND SUPERVISION

The Morses Pond recreational area is under the direct supervision of the Assistant Director of Recreation, who reports to the Director of Recreation. It should be noted that the Director of Recreation has a long history of involvement in the field of aquatic recreation and possesses the highest level of instructor authorization within the American Red Cross, that of Instructor Trainer. The Director of Recreation was also involved with the 1994 revisions to the American National Red Cross Lifeguarding Program and continues her involvement with the Red Cross as an Instructor Trainer.

The Beach Manager, who reports to the Assistant Director of Recreation, oversees lifeguard and office staff. A beach manager, who, according to the job description must be at least 21 years of age, is scheduled during all operational hours such that there is always a manager on duty to provide direct supervision of lifeguards and office staff. A Swim Lesson Director, who also reports to the Assistant Director, oversees instructional staff. A Park Ranger is available to assist with rule enforcement and to assist in the overall operation of the beach, the Hunnewell Tennis Courts and other recreational areas as may be assigned. The Park Ranger also reports to the Assistant Director of Recreation.

A. **Beach Manager.** Critical to the safe operation of any well-operated aquatic facility is on-site management staff well-versed in aquatic standards, including standards applicable to lifeguards. The Morses Pond beach managers are primarily responsible for managing the day-to-day operations of the beach, including supervising office and lifeguard staff. While knowledge of principles and practices of supervision is required, the position does not require any aquatic-specific knowledge or experience. It is strongly recommended that all those who oversee/manage lifeguards be thoroughly familiar with the standards and best practices applicable to lifeguards. It is highly recommended that the Beach

Manager position require prior lifeguard experience in addition to American Red Cross "Lifeguard Management" certification, or equivalent training.

Under ideal circumstances, Beach Manager positions would be filled from the ranks of Morses Pond lifeguards. However, as this may not always be possible, it is imperative that beach managers, particularly those without lifeguarding experience, understand how it is that lifeguards should perform their duties. It is impossible to provide proper supervision of lifeguards if unfamiliar with the standards lifeguards ought to uphold. While these expectations could be communicated during the onboarding process, the better practice would be to require such experience as a condition of employment or give hiring preference to those with prior lifeguarding experience. Additionally, beach managers should actively participate in lifeguard in-service trainings to better understand the abilities and limitations of lifeguard staff. Beach managers should work closely with any lifeguarding instructors on staff to ensure proper guarding practices. Lastly, if beach managers lack lifeguarding experience, significant amounts of on-site management support from Recreation Department staff experienced in lifeguarding standards, will be needed. For example, beach managers must maintain a physical presence on the beach and must check in with lifeguards throughout the day. This did not happen during the Saturday unannounced audit. This means that more management oversight is needed of the beach managers. If training is enhanced for the beach managers, the need for on-site supervision of managers may diminish.

B. **Lifeguard Captain**. The lifeguard captain, often referred to as a "head lifeguard" is, at minimum, a high school graduate with at least two "years" lifeguarding experience. In a seasonal environment, this is often interpreted as two summers (as opposed to two years or 24 months) of lifeguarding experience. Where possible preference is given to those applicants with two years of college education in addition to lifeguard instructor certification.

The lifeguard captain is responsible for directing lifeguarding and emergency rescue activities and operations, including staffing of lifeguard chairs and positions. Additionally, this position helps develop both pre-service and in-service training

programs for the lifeguard staff. This is a significant amount of responsibility for an employee without much training or experience in these areas, and is complicated if the employee does not have the preferred instructor certification. Because only minimal experience is required for this position, and because so much responsibility is entrusted to the Lifeguard Captain, the training and on-site coaching provided to the Lifeguard Captain throughout the season is critical. As a general rule it is ill-advised to delegate management decisions to employees without clear instructions regarding performance expectations. Substantial supervision and coaching then empowers these employees to learn and apply the applicable standards. While it is preferred that the Lifeguard Captain possess the lifeguarding instructor certification, it should be required that the Lifeguard Captain obtain certification in Lifeguard Management as a condition of employment. Allowing a certain period of time (e.g. two weeks) to obtain this certification would be reasonable, particularly as the certification will soon be available exclusively online.

C. **Lifeguard Minimum Certification Requirements.** Consistent with national standards for lifeguard certification, lifeguards at Morses Pond are required to have current certification in Lifeguarding, First Aid, and CPR/AED for Professional Rescuers and Healthcare Providers. The Town of Wellesley follows the Massachusetts Department of Public Health recommendations for accepted lifeguard-certifying agencies. As such, all Morses Pond lifeguards have been certified in the American Red Cross "Lifeguarding" program. Of note, while the Red Cross lifeguarding program is designed primarily for swimming pool lifeguards, it is nevertheless considered the core course for all lifeguards, including those employed at waterfront areas and waterparks. The Red Cross makes available a separate module known as the "Waterfront Skills Module" which is intended to supplement the core lifeguarding course with the knowledge and skills needed by lifeguards at waterfront areas, such as Morses Pond. (See American Red Cross Lifeguarding Instructor Manual, 2012, Section C "Waterfront Skills", Module Outline, page 151).

By comparison, lifeguards employed by Mass. DCR and assigned to inland or coastal beaches are required by DCR policy to have waterfront certification. DCR lifeguards

assigned to swimming pools are not required to have waterfront certification, although this certification is preferred. As such, it is recommended that Morses Pond lifeguards possess "Waterfront" certification in addition to the skills learned during Pre-Service Training. This would help ensure that lifeguards are familiar with information specific to waterfront areas and skills applicable to the waterfront setting. In making this recommendation it must be noted that waterfront certification is not easily obtained in Massachusetts, as most facilities offering lifeguard courses focus instead on swimming pools. Therefore, the town should strive to staff the beach with a lifeguarding instructor with authorization to teach the waterfront module. It is also recommended that Lifeguarding Instructor certification be a minimum or preferred certification for applicants for Lifeguard Captain and Beach Manager positions. This helps ensure that these employees are familiar with the standards and practices of the lifeguards they oversee.

D. **CPR Certification.** Commonwealth regulations regarding CPR training for lifeguards employed by municipalities require annual recertification in CPR. This conflicts with the two-year certificate validity period now recognized by major CPR training agencies including the American Red Cross and the American Heart Association. As such, while a lifeguard could possess current certification from the perspective of the certifying agency, the Massachusetts first responder regulations require annual certification. Under the DPH pool regulations (105 CMR 135) which admittedly would not apply to Morses Pond, lifeguards need "current" CPR/AED for the Professional Rescuer certification. This is consistent with what the standard of care for lifeguards requires across the country, that being *current* CPR/AED certification. However, under the DPH First Responder regulations (105 CMR 171), "lifeguards employed by the Commonwealth or its political subdivisions" (i.e. towns) must have *annual* certification in CPR/AED for the Professional Rescuer, effectively changing the applicable standard of care for lifeguards at state/town facilities within the Commonwealth. This means that lifeguards working for the town should go through CPR/AED recertification every year. It is recommended that a CPR review course be included with the Pre-Service Training program. This will

help ensure that CPR skills are "fresh" each season and, further, will help ensure that certifications remain current throughout the summer season. Guidance should be obtained from DPH regarding CPR training requirements, as it is philosophically irreconcilable that a lifeguard for a municipal employer would need annual CPR training whereas a lifeguard for a private employer would only need training every two years. That said, studies clearly indicate that CPR skills deteriorate with time. Emphasis on CPR skills should be part of each in-service training exercise, and manikins and CPR training equipment and supplies should be available at the beach so that lifeguards can practice CPR/AED skills.

A review of lifeguarding certifications of Morses Pond lifeguards shows that some certifications were due to expire during the course of the season. This presents a challenge for managers who then have to track certifications and remove from the schedule any staff member whose certifications have expired. It is recommended, where possible, that lifeguards be required to provide proof of certification valid throughout the entire summer season. This helps ensure that lifeguards remain fully certified during the course of their employment.

E. **Lifeguard Experience.** According to the staff manual, lifeguards at Morses Pond should (although are not required) to have a minimum of one year's experience working at another waterfront or at least two year's experience working at a swimming pool. Given the seasonal nature of aquatic recreation in Massachusetts, "one year experience" is generally interpreted as one prior summer season of lifeguarding experience. "Two year's experience" is generally interpreted as two prior summers experience working as a lifeguard. If needed, lifeguards can be hired fresh out of a certification course.

F. **Lifeguard Hiring Process.** Typically the hiring process for lifeguards starts with verification of certifications and then an assessment of knowledge, skills and abilities (KSA's). At Morses Pond, lifeguard applicants must only provide proof of current certification before moving to the interview stage. Following interviews, applicants are then selected for lifeguard positions (even without an assessment of KSA's) and background checks are then conducted. Applicants are hired under the understanding that

they must successfully complete a one-week, facility-specific pre-service training program, demonstrating proficiency in rescue skills. Lifeguards that cannot demonstrate competency are given until the end of the week to remediate skills or their employment is terminated. This post-hire process does help identify those candidates that are not ready to work at the beach, but at a time when finding replacement staff could be a challenge.

While the approach to hiring Morses Pond lifeguards is reasonable, it only works when (1) lifeguards have no surveillance responsibilities until after the week of training has concluded and (2) if lifeguards are in fact terminated if they cannot perform skills correctly. Thus, because there is no other pre-hire skills assessment, the one week of training before lifeguards assume patron surveillance responsibilities (i.e. before the beach opens to the public) is absolutely critical. Lifeguards should not be assigned patron surveillance responsibilities until which time they have completed all of the requisite facility-specific training.

Massachusetts DCR, along with other lifeguard employers, utilizes a detailed process of screening lifeguard applicants, including a timed distance swim, recovery of a 10-pound diving brick from beneath the surface, as well as demonstration of active, passive and submerged victim rescues. Applicants' skills are evaluated and points are assigned based upon skill proficiency. Additionally, a written exam is administered to verify that lifeguards are familiar with the fundamentals of lifeguarding, CPR and first aid principles. Only those applicants that meet the pre-hire standards are offered positions as lifeguards. While a similar screening program may be difficult to implement without the availability of an indoor pool, a written exam and assessment of CPR/AED and first aid skills could be conducted prior to hire, leaving only the water skills for evaluation during the pre-service training program. A written exam and a graded system of evaluating CPR/AED skill performance (and/or first aid) also provides objective measurement criteria useful during the hiring process. Moreover, the skill or knowledge deficiencies identified during the hiring process can form the basis of the pre-service training program, thus helping to strengthen weak knowledge or skill areas. Successful

completion of the pre-service training program should become a condition of employment as opposed to a basis for termination.

This process is common to many employers. Maine State Park lifeguards for years were required to complete a similar "Lifeguard Academy" as a condition of employment. Lifeguards at many National Park Service beaches also require lifeguards to complete a pre-service training program as a condition of employment. Similar training programs exist at all U.S.L.A. beaches. Experience shows that many lifeguards may meet certification requirements but then fail to meet an employer's more stringent hiring requirements. For example, standards require that lifeguards must be able to surface dive to the deepest point within the swimming area, which at Morses Pond is in excess of 16 feet deep. To meet certification requirements, however, lifeguards must only surface dive to a minimum depth of seven feet. If a lifeguard cannot dive to the bottom of the beach, then the lifeguard is of no help during a deep-water line search, and should be precluded from employment. Meeting certification requirements is not enough. Lifeguards must also meet all employer-specific requirements.

It is recommended that lifeguard knowledge and skills be assessed as a routine part of the hiring process rather than after hire. If this is not possible prior to the start of the season, then *conditional* offers of employment should be considered wherein lifeguard positions are not guaranteed until after successful completion of the required pre-service orientation program.

G. **Pre-Service Training.** Once hired, Morses Pond lifeguards undergo a facility-specific training program focusing on the skills needed by waterfront lifeguards. A skills assessment of lifeguard staff is conducted and skill drills are selected to strengthen response and reinforce the facility's Emergency Action Plan for a lost bather. Skills typically covered during this pre-service orientation program include rescues (e.g. active victim rescue, submerged victim rescue), use of the rescue board for distressed and passive swimmers, spinal injury management, shallow and deep water searches, and victim removal from the water. Of note, most of the skills practiced during the pre-service orientation are also contained within the Red Cross waterfront module.

Following the pre-service training program, all newly hired lifeguards participate in what was described by staff to be an informal "shadow" program, wherein lifeguards shadow more experienced staff for three days. During this time, lifeguards become more familiar with beach operations. Although no documentation of the shadow program was provided for review, such programs have been proven to help better prepare lifeguards to meet employer performance expectations.

Although a pre-service training program is offered at the start of each season, no documentation was available outlining the specific skills covered during the program or the content areas discussed. Although it was mentioned that the fire department does participate in the training program, it appears that the pre-service training program focuses more on skill development rather than integrated emergency response among town agencies. It is strongly recommended that a formal pre-service training program outline/agenda be developed and used by staff to prepare lifeguards for the start of each swimming season. The absence of such documentation creates the appearance that the training was either not performed or was informal in nature. Lifeguards should be required to sign in at each pre-service training session. The sign-in sheet (separate from lifeguard time cards) should be kept on file along with the agenda, instructor name, and copies of any supplemental materials distributed.

It is also highly recommended that the pre-service training program include collaborative efforts from other town agencies so lifeguards and beach staff can expand their knowledge of beach management issues (e.g. discussions from police regarding dealing with inebriated patrons, discussions with sanitarians regarding water quality issues). Most importantly, the pre-service program should reinforce the various emergency response procedures for different types of emergencies, requiring a full, simulated response by staff. Competent, experienced personnel should evaluate these drills. If possible a mock rescue and after action debriefing should be coordinated with lifeguards, police, fire, and EMS. It is important for lifeguards and responding agencies to practice and receive feedback on simulated beach emergencies. This allows the opportunity to identify areas for improvement in emergency response, identifies additional training

needs, allows for the sharing of knowledge, and allows a forum to discuss overall beach management issues from a shared perspective. This can be coordinated in-house, or an outside consultant could be hired for this purpose.

H. **Early Season Opening**. Because of the seasonal nature of swimming in the northeast, a Memorial Day opening poses a challenge given both the difficulty in finding enough staff available to work this early in the summer and the need to ensure that lifeguards are properly trained prior to assuming patron surveillance duties. Many college students are not available to work much prior to Memorial Day weekend. With high school students still in school, it becomes very difficult for recreation providers to properly train staff prior to having them go "on stand" in time for the holiday weekend.

While using returning lifeguards to staff an early season opening does offer some risk mitigation benefit, even returning lifeguards will require training. Research on rescue skills, including CPR, clearly shows that skills deteriorate over time, particularly without practice. Returning lifeguards will not have practiced rescue skills and facility-specific emergency procedures over the course of the school year. Thus, it is not sound management practice to put returning lifeguards into a surveillance rotation without first having them demonstrate both rescue skill competency and proficiency in facility-specific emergency action plans. While in theory it may be possible to consolidate training for returning guards to a few days prior to an early season opening, water temperatures in late May are often too cold to allow for significant in-water practice. If an early opening is desired, it may be necessary to explore options to secure indoor pool space for all or a portion of the training.

If a sufficient number of returning lifeguards are available in the early season to provide effective lifeguard services (including reasonably-sized zones, rotations, etc.), it would likely be necessary to hold separate pre-service training opportunities: one for the early season lifeguards and a second in June once the high school students become available. This, of course, requires double the investment of staff time and resources. Moreover, multiple pre-service training sessions detract from the principal benefit of having the team of lifeguards learn to work together. However, the customer service benefit of

opening on a modified schedule early in the season may outweigh the costs and challenges of coordinating multiple training sessions. The bright-line standard that must be met is that all lifeguards must be fully trained to respond to emergencies at Morses Pond using facility-specific emergency action plans before assuming patron surveillance duties. Lifeguards should not be placed on the beach until fully trained.

Another option to consider is whether the early season could be set up as an unguarded swimming area until which time staff can be properly trained. In this case, given the known risk of the drop off, sound risk management practice would require the installation of lines and buoys to restrict swimming to a more reasonable water depth. Depending on water levels in the pond, the ropes delineating the drop-off area may provide sufficient space for bathers. If additional water depth is desired, the outer buoyed line could be installed, however the lines should be brought in to a more reasonable water depth, particularly given the lack of personnel available to assist in an emergency. The dock system and floating rafts should not be installed until which time lifeguards can properly oversee their use. Once the dock system is installed the outer ropes can be moved to their permanent position for the summer.

Well-managed unguarded water areas provide very clear guidance to beach users in how to safely use the beach. Should the town allow for swimming in an unguarded water area, town bylaws may need to be amended to restrict swimming to within the marked swimming area. The Pennsylvania State Park system, much like the Army Corps of Engineer beaches, operate as unguarded water areas and could serve as a source for policy and procedural guidelines. Similarly, Mass. DCR operates many unguarded water areas. They too have policies and procedures that may provide guidance in providing an unguarded water area.

If operating as an unguarded water area, consideration must be given to support facilities. Bathrooms should remain open and staff should provide general facility oversight. It may be advisable to forego daily admission fees in the early season and instead rely upon parking fees during this time to help generate revenue. Of course, a system for charging for parking would have to be implemented. Use of a parking fee may allow the town to

take advantage of the Massachusetts Recreational Use statute, which affords liability protection to landowners who open up their land for recreational use without charging a fee. While a daily admission fee would remove the protections of the recreational use statute, parking fees would not provided that the fee for parking is truly a parking fee. If parking fees were charged on certain days but not on others, this may convert the parking fee to a fee for use, thereby negating liability protections. The day use fee is most appropriate when the beach is fully open to the public.

I. **In-Service Training.** The standard of care applicable to lifeguards requires a program of regular, facility-specific in-service training throughout the course of their employment. It is important to distinguish routine skill practice (e.g. active victim rescue, passive victim rescue, etc.) from scenario-based training that requires lifeguards to practice implementation of the facility's various emergency action plans from start to finish, including victim recognition, lifeguard response, and follow-up care. Moreover, a strong in-service training program presents staff with new skills and/or information to enhance their body of knowledge and enhance emergency response.

As with the pre-service training program, the Morses Pond in-service training program should be more formalized and better documented. Typically, in-service training records include outlines/lesson plans for each in-service session, along with copies of any educational materials or resources used to conduct the training. A simple sign-in sheet listing what skills were practiced on a given morning does not provide enough information to demonstrate a well-thought-out plan for providing lifeguards training specific to their job. Moreover, it doesn't show how the Emergency Action Plan for various types of emergencies was practiced, which is the principal benefit of in-service training. Sample in-service training lesson plans are available to lifeguarding instructors through the American Red Cross.

A training plan should be developed each summer by the Recreation Director or Assistant Director, in cooperation with the beach management team (Beach Manager(s), Lifeguard Captain, Swim Lesson Director). The curriculum should, in part, be based upon knowledge or skill deficiencies noted during the hiring process or during pre-service

training. The plan should also include new skills or information that managers want lifeguards to learn. Flexibility to include issues that may arise at the beach during the summer is also important. A training calendar (or block plan) should be developed showing the general progression of skills to be practiced over the course of the summer along with a breakdown of what new information or skills will be presented. From this training calendar (or block plan), specific lesson plans can then be developed for each in-service. These lesson plans could be saved from year to year, thereby allowing for a binder of in-service training ideas to draw upon each summer.

Lifeguards should sign in to each designated in-service program, and a copy of the detailed agenda or training outline should be attached to the lifeguard sign-in sheet to provide proof of what was covered during that specific in-service training. Physical conditioning exercises (e.g. runs and swims) can be tracked on separate fitness records, based on times or distances completed such that progress can be monitored over the course of a summer.

There should also be a documented plan in place to ensure that all lifeguards receive the equivalent information and training throughout the summer. For example, if lifeguards work on alternating days (e.g. Group A on Mondays, Group B on Tuesdays) the same in-service training outline could be used on consecutive days to ensure that all guards (both Group A and Group B) receive the same information and practice the same skills. Alternatively, a specific in-service training block of time could be reserved for weekly training (e.g. 8-10 Sunday mornings). Staff could then be assigned to one of two in-service training groups. Group A would participate in training on the first Sunday of the month, and then Group B would go through the same training on the second Sunday of the month. Lifeguards could continue to record daily skills practice and track fitness results on a separate log or form, thus preserving the morning workouts.

From a scheduling perspective, in-service training sessions at pools and beaches are typically scheduled at times when the facility is closed to the public. In some cases, in-services may be scheduled during operational hours, such as during a "beach check." At Morses Pond, lifeguards practice skills and lost bather drills in the morning before the

beach opens to the public. As the full complement of lifeguards is not scheduled each day, those guards not on duty would miss that day's specific EAP practice. A system should be in place to ensure that lifeguards not scheduled on a given day complete the same in-service training requirements as those that are scheduled.

It should be noted that the Department recognizes need to improve documentation efforts, including that of in-service training. Because of the nature of peer supervision, wherein beach managers may be very close in age to the staff they supervise, Recreation Department staff will need to provide additional oversight to ensure that paperwork is completed in a timely manner. After raising this issue with staff in June, documentation has already improved, with lifeguards completing more detailed daily training records over the course of the summer. A training calendar has been started and each team of lifeguards now completes the same in-service skills each week.

J. **Performance Audits.** Lifeguards at Morses Pond are advised that "red ball drills" may occasionally be utilized to encourage awareness / attentiveness while guarding. Typically during these internal audits, the beach manager would cause a "target" to be introduced into the swimming area and time the lifeguard's response in finding the target. The "red ball drill" as it is called, may or may not involve a ball or the color red. Some facilities utilize a swimmer with a designated bathing cap instead of a ball. Others facilities may tie a certain color bandana around a swimmer's arm. In all of these cases, the focus is on verifying that lifeguards, while scanning under typical conditions, are able to spot a "target" and blow a whistle within a reasonable timeframe, often cited as 10 seconds. Documentation of red ball drills and specific lifeguard performance during said drills was not provided for review, nor was a red ball drill conducted during the Saturday inspection. However, it is recommended that such spontaneous audits continue and that lifeguards be provided feedback and coaching relative to their performance relative to such audits.

It should be noted that the principal recommendation with respect to training is to better document the training already being conducted and to formalize the pre-service orientation. It is clear from observing the lost bather drill that a focus of the Recreation

Department is to prepare lifeguards to respond to emergencies at Morses Pond. This effort could be bolstered with proper documentation reflecting the many efforts staff already take to ensure lifeguards are properly trained.

IV. BEACH INFRASTRUCTURE, INCLUDING SAFETY EQUIPMENT

The Recreation Department provides Morses Pond lifeguards with necessary safety and rescue equipment, consistent with applicable standards and best practices. Lifeguards are issued a Morses Pond uniform including a whistle. Lifeguards also have access to rescue tubes, rescue boards, a rescue kayak, backboards (with head immobilizers and straps), AEDs, bag valve mask resuscitators (adult and child), first aid supplies, as well as face masks and fins for deep water searches. A public address system allows for communication with patrons on the beach. Hip packs containing personal protective equipment, including gloves are provided to each guard.

A. **Elevated Lifeguard Stations.** Three elevated lifeguard stands are positioned across the beach. Lifeguard Stand #3 (Right Chair/Right Beach) is approximately 80 feet from the edge of the beach. The center guard stand (Lifeguard Stand #2) is positioned approximately 125 feet from the lifeguard stand #3 and is centered on the center crib. The third elevated stand (Stand #1) is positioned approximately 90 feet from the center stand and approximately 80 feet from the far end of the beach. All elevated guard stands are in close proximity to water's edge. Lifeguard stands also possess umbrella rings to allow staff protection from the sun. While the stands may not be exactly centered in their respective areas and are not evenly distributed across the beach, stands are positioned so that lifeguards would be in close proximity to swimmers. This adjustment based upon facility use is one example of the many sound management practices in existence at the beach. The present arrangement of lifeguard stations from the stands allows for adequate surveillance over the shallow water (standing-depth) areas.

   The current spacing of lifeguard stands at Morses Pond is closely aligned with Mass. DCR standards for inland beaches. DCR requires that lifeguards at inland beaches be

"stationed no more than 75 linear feet from the side boundaries of the designated swimming area and then at intervals not exceeding 150 linear feet between each stand/station." (See Waterfront Program Procedural Manual, Section V – Management of Designated Swimming Beaches, April 1, 2007.). Given the position of the floating dock system, lifeguard stand numbers two and three appear reasonably positioned with respect to each swimming area created by the dock system and marker buoy lines, despite the slight deviation from DCR standards for lifeguard stand placement at inland beaches.

B. **Ground-Level Lifeguard Stations.** Additional lifeguards are stationed on the floating dock system at various positions. These positions allow for better surveillance of deep water areas than could occur from the elevated guard stands, while also allowing for a more rapid response time to emergency situations. The "ground-level" lifeguard stations on the docks are most appropriate for guarding the "middle" and "deep" areas of the beach, not the shallow water areas. The shallow water areas would likely be best guarded from the beach.

1. **Slide Station.** Lifeguards positioned at the top of the slide have a good vantage point over the deep water swim area, but are not positioned to quickly render assistance to swimmers in the water should the need for such assistance arise. Given this, it is strongly recommended that the lifeguard positioned at the top of the slide, be repositioned to the base of the slide to observe swimmers enter and safely exit the water, while also controlling the line to the slide. Swimmers should only be allowed up the stairs to the slide when the preceding user has moved clear from the splashdown area. These recommendations were communicated to staff in June and were implemented prior to the unannounced audit.

   At the time of a second follow-up visit, lifeguards had resumed guarding from atop the slide, as they felt they had better control over patrons from that position and could see more of the deep water area. Nevertheless, the risk at the slide is that a patron (including non-swimming adults) could go down the slide and struggle (or sink) upon entry. If a lifeguard were to remain at the

base of the slide, the lifeguard could provide immediate assistance. This is not possible from the top of the slide, where line of sight to the splashdown areas is compromised, and where the lifeguard would have to quickly descend the stairs and then negotiate a 90 degree turn toward the end of a dock, while carrying a rescue tube with a long strap. This increases the risk of injury to the lifeguard and also delays rescue assistance. For these reasons, it is recommended that lifeguards position themselves at the end of the dock whenever the slide is in use.

To help control patrons such that they remain in a single, orderly queue, a line could be painted onto the dock just prior to the slide giving patrons a visual cue as to where to "line up" while waiting to use the slide. We have used this method with much success at Penn State where we will have lines of 30 or 40 day campers lined up to jump from our diving tower. Much like a slide, we only allow one person on the tower at a time. Thus, I am confident that with training and consistent enforcement patrons will become accustomed to new rules for safe use of the slide.

When the slide is not being used, the elevated platform could be an appropriate staffing position, as the elevated station allows for a better vantage point over deep water areas. However, the elevated position should be reserved for those times when the slide is not being used by patrons.

2. **Center Catwalk Stations.** The lifeguards on the center catwalk are primarily responsible for supervising the deep-water areas of left and right beaches, including both "middle" and "deep" areas.

3. **Right Dock Station.** The lifeguard at the end of the right dock has been described as standing with his/her back to the right deep area so as to observe the center deep area from the end of the docks out to the ropes. This position has also been described as being responsible for the right beach from the catwalk out to the floating raft. The surveillance responsibilities of this

position must be consistently described to staff, both in written zone charts as well as during pre-service training. Each guard at this position should understand his/her area of responsibility. It should be noted that during the site visits, lifeguards at this position were very attentive and scanning large areas of water, so as to include right deep, center deep and some of the center middle crib. Because only a handful of patrons were within these zones at any given time, the lifeguards indicated they felt comfortable tracking each patron.

C. **Zones of Surveillance.** After having reviewed zone diagrams depicting the area each lifeguard is responsible for watching, and after having multiple conversations with staff regarding the exact area of responsibility for each guard stand, the exact areas that each lifeguard is supposed to monitor remains unclear. It seems that there is a discrepancy between what the zone diagrams depict and what staff report are standard staffing patterns. For example, the Lifeguard Coverage Zones depict an eight-guard rotation (seven "up" with one "down for rotations); whereas discussions with staff indicate a six-guard rotation is typical (five guards "up" with one "down" for rotations).

Drawing all reasonable inferences from staff interviews, it appears that the lifeguard in Station 3 (right beach) is responsible, at times, for the total area of right beach, from water's edge to the far boundary. This is an extremely large area to survey. By comparison, the lifeguard at Station 2 (center beach) is only responsible for a portion of the shallow-water crib, and the lifeguard in Station 1 (left beach) is responsible for watching the left shallow beach, a significant portion of left deep, and overlapping into center crib. This too is a very large area to watch.

Lifeguards are also stationed along the floating dock system, each with a separate area of responsibility. While zone charts indicate a lifeguard stationed at the end of the right dock, there were conflicting descriptions among managers, staff and documents regarding the zone of responsibility for this guard. Some indicate this guard is responsible for watching the middle crib and the "middle deep" area from the docks to the rope, while zone diagrams indicate this guard is responsible for the right deep beach out to the floating dock.

It is strongly recommended that the Recreation Department re-examine lifeguard stationing and zones of coverage and take steps to ensure that all staff understand the boundaries of each zone. There is some concern that deep-water areas may need additional lifeguards for proper surveillance depending upon bather load and swimmer location in the water. A seven or eight lifeguard rotation may be required given the size and shape of the swimming area. It is strongly recommended that the placement of lifeguard stations and the size of each zone be re-evaluated by the Recreation Department with knowledge of typical facility use patterns, ideally on a busy day. Zones should be established that allow lifeguards to reach the furthest point in their zone within a reasonable time frame. Documented timed tests were recommended to validate the appropriateness of the size of each lifeguard's zone of responsibility, and by the time of the follow-up inspection, the Department had begun conducting timed swim tests as recommended. New zone diagrams should be created to more clearly explain to staff the boundaries of each zone. Lifeguards should not be required to scan beyond 180° during each scan, in other words guards may look left to right but should not be responsible for areas behind their view. During peak times lifeguards should continue to be positioned on a rescue board or kayak and/or on each floating dock.

The consultant discussed with staff options for zones of surveillance and provided guidance as to the standards for reasonably sized zones. Sample zone diagrams are included in the appendices to this report. Because lifeguard stations may change during the course of the day, based upon location on patrons, it will be imperative for the lifeguard manager and lifeguard captain to understand factors that affect surveillance and that they position guards in such a way as to maximize effectiveness.

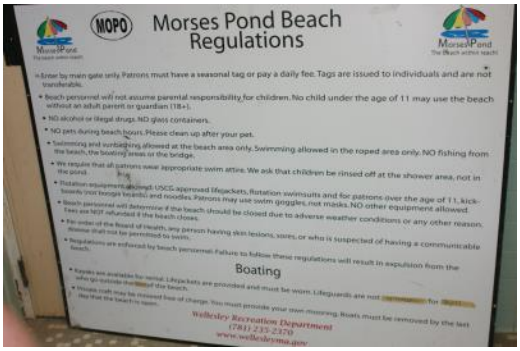
D. **Bathhouse.** The bathhouse at Morses Pond contains bathroom and changing facilities for each gender. Bathroom stalls were recently replaced and are in excellent condition. Vending machines are available for patrons. Rules and regulations are posted at the entrance area to the bathrooms. Showers for general rinsing purposes are available on the outside of the bathhouse.

E. Entry to Beach. The main entry to the beach, adjacent to the office window, is unremarkable and represents a lost opportunity to create a "grand entrance" and reinforce safety messaging.

Main Entrance to Morses Pond Beach

For little expense, the main entry could be landscaped and a check-in table with umbrella for sun protection could be positioned for staff use. A more attractive entrance could be used to provide additional safety messages. While it was described that someone would sit at a table at the entrance, this was not observed during any site visits. Instead, staff remained in the office at the window.

F. Signage. Safety signage on the beach was very limited at the time of initial inspection. While the risk of drowning is generally considered an open and obvious danger requiring no specific warnings, it is recommended that beach signage be expanded to include the major areas of risk at open water swimming areas, to wit, "Parents Please Watch Your Children" "No Headfirst Entries in Shallow Water" and "Non-Swimmers Wear Lifejackets." Beach regulations are posted at the entrance to the beach as well as in the "lobby" area of the bathhouse through which patrons must pass if entering the bathrooms. The long list of rules and regulations fails to address key risks at swimming areas, particularly the risk of parents not watching their children and the risk of spinal injuries from headfirst entries into shallow water. Moreover, studies have shown that patrons simply do not read long lists of rules. Safety educational signs should stand out from the noise of all other signs in the area.



Morses Pond Beach Rules and Regulations

Staff report that some of the signs depicted below are intended for the "off" season, when lifeguards are not stationed at the beach. However, lifeguards were in fact stationed at the beach prior to the site inspection when the photos were taken. Thus, signs that should

have been taken down and/or replaced prior to opening the beach were not in fact removed or replaced. Better coordination with town agencies responsible for placement of signs is needed to ensure that the appropriate signs are posted at the appropriate times.

1. A brown metal sign posted along the main path to beach from the parking lot instructs patrons that the park is closed from sunset to sunrise. (See photo in number 3 below). A similar sign is posted on the fence adjacent to the vehicular path at the main entry. Vines have overgrown the sign and are now blocking it from view. Vines should be cut back or the sign should be repositioned so it can be seen. At the time of the unannounced audit in August, this sign remained in place.

Sign hidden by vines

2. Another sign along the path from the parking lot to the beach states "WARNING No Lifeguard On Duty Swim At Your Own Risk." It is unclear whether the "Swim At Your Own Risk" sign is intended for the water body to the right of the path or whether this sign is intended for the main beach, where lifeguards were in fact present during operational hours. In either case, it is recommended that this particular sign be replaced. "Swim At Your Own Risk" signs may be interpreted to encourage swimming in areas where swimming is not allowed. Instead, "Unguarded Water Area" signs or "No Lifeguard On Duty" signs (with the appropriate pictogram) may be used to inform patrons of the absence of lifeguards. More importantly, a color scheme should be selected that allows warning signs to stand out from other signs, such as the sign referencing hours of operation. Warning signs should not be brown. Instead, they should stand out from their surroundings,

Signs on path to beach.

including other brown informational signs. By the time of the unannounced audit, the No Lifeguard on Duty sign depicted above had been removed.

3. A second "No Lifeguard On Duty Swim At Your Own Risk" sign was also posted on the fence adjacent to the beach entrance. It did not appear that this sign was removed or covered during the day when lifeguards were in fact present. When facility signage conflicts with actual conditions, the overall efficacy of the signage program is called into question. Patrons, in these situations, are conditioned to ignore the conflicting visual messages; why pay attention to any sign at all when posted signs do not represent actual conditions? People tend to discount warnings they feel are common sense or which do not represent actual conditions.

No lifeguard on duty sign at beach entrance driveway.

4. There were no safety signs posted on the beach or on/at lifeguard stands at the time of the initial inspection. Highly visible safety signs were also not posted at the main entrance, such as on the building wall adjacent to the first aid room. This is a lost opportunity.

Signs could be mounted on the back lifeguard stands.

It is recommended that the town consider using signage consistent with ANSI safety signage standards. Clarion's Swimming Pool Safety signage system comes highly recommended. Although the name suggests these signs are intended for swimming pools, the important safety messages are equally beneficial at waterfront areas. (See http://www.clarionsafety.com/Swimming-

Pool-Safety-Signs).

It is recommended that the town take advantage of access routes to the beach by installing safety signs along the path from the parking lot. Most appropriate for this path would be the yellow, diamond-shaped "Watch Your Children" and "Non-Swimmers Wear Lifejackets" signs. These signs could also be mounted on the back of lifeguard stands. The more detailed "Danger" signs would be appropriate in the bathrooms and at the entrance to the beach where patrons are more likely to pause to read the information on the sign. "No Diving" signs are recommended at beaches that prohibit diving. Whereas water depths off the end of the docks and at the rafts would be safe for diving, the "No Diving" sign may not be appropriate. Lifeguards should, however, warn patrons against running into the water and diving head-first as this could result in catastrophic injury.

Lastly, even though signs do add a layer of liability protection and risk reduction, lifeguards and beach managers should continue their efforts to politely and uniformly enforce facility safety rules. An interaction with staff is more likely to change patron behavior than merely reading a posted sign. The combination of signs plus rule enforcement is most desirable.

Examples of signs from Clarion Safety Signage System.

G. Water Safety Education. In addition to safety signs, the town could consider providing water safety information on the Morses Pond Beach website. This might be particularly important if the town implements changes in the policies, procedures or setup of the beach. By educating the public as to the rationale of the changes, there may be increased community support for the updated aquatic program. The U.S. Army Corps of Engineers maintains a water safety educational section of their website in an effort to help reduce risks by better educating beach visitors. (See http://watersafety.usace.army.mil/).

V. POLICIES AND PROCEDURES

Morses Pond is a well-run aquatic facility. Risk management strategies such as swim tests, that are not common to all open-water areas, have long been implemented at Morses Pond. Moreover, the town's commitment to facility-specific training of lifeguard staff at the start of each season, as well as the requirement of ongoing in-service training, is a clear indication that much attention is given to safety and managing risks at the day use area. As with many long-standing recreational amenities, it is suggested that policies and procedures be re-evaluated periodically to remain current with industry standards and best practices. While "tradition" plays an important role in how this beach has been managed, it is recommended that the many things that staff report are standard operating procedures be placed in written form for consistency and so that they can be referenced during training programs or during daily operations.

As water-based recreational use evolves over time, we tend to see new trends emerge, such as an increase in popularity of shallow water swimming areas and the requirement of lifejackets for all non-swimming minors. "Christian's Law" highlights one example of a shift in aquatic standards. This new law requires recreational programs and camps within Massachusetts to swim test children and make available lifejackets to non-swimmers and at-risk swimmers. While safety experts have recommended that lifejackets be made available to patrons for many years, this recommendation never had the force of law in Massachusetts until now. Given changes in areas such as facility usage patterns, attendance, public expectations and patron behaviors, periodic

policy review is necessary to help ensure management practices are consistent with industry standards. Such review may result in changes to the size and shape of the swimming area as well as the rules and regulations for the safe use and enjoyment of Morses Pond.

A. **Swim Test.** While swimmers at many open water beaches are not given a swim test prior to being allowed into deep water, the Wellesley Recreation Department has long required a swim test for children under the age of twelve years. Those children who wanted to use the slide were given a "relaxed" swim test, whereas a more challenging test was administered to those wanting to use the rafts.

Four Foot Note & Float sign.

The use of two different swim tests is not recommended. Because the slide is in deep water (13.5 feet), the same swimming test should be administered to anyone wishing to enter deep water. The goal of a swim test is to assess basic swimming ability and comfort in the water. As such, the more challenging test would be preferred.

"You must be this tall" sign installed at slide prior to beach reopening.

The use of age-based requirements is not recommended for a variety of reasons, most important of which is that age does not correlate to swimming ability. A non-swimming adult should be restricted from deep-water areas just as a non-swimming child should be restricted from such areas. It was therefore recommended that the town use height as the basis for administering a swim test rather than age. Patrons are already familiar with height requirements such as those commonly encountered at amusement and waterparks. Moreover, because many incidents occur in water approximately four feet deep, and because four feet of depth is considered "deep" to anyone under five feet tall, it was recommended that the swim test be

administered to any person (adult or child) less than four feet tall. To assist with implementing this change, it was recommended that town create a sign that indicates a height of four feet from the ground. Each of these recommendations was implemented prior to reopening of the beach in June.

Another observation relative to the swim test policy is that department policies state "Only experienced Lifeguards or WSI certified staff may administer the deep water test." (See Morses Pond Staff Manual, 2013). Recent guidance from Mass. DPH suggests that only Water Safety Instructors, not lifeguards, should administer the swim test. While I agree in concept with the Recreation Department's approach to having experienced lifeguards or instructors administer the swim test, this appears at odds with the current guidance from Mass. DPH. As such, and until DPH modifies its recommendations for implementing Christian's Law, I must advise following the DPH guidance. It is my understanding that current practice is to only use WSI's to administer the swim test.

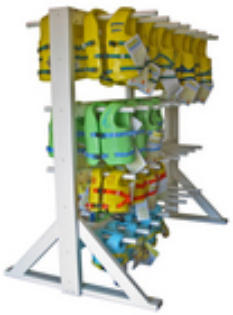
As the DPH guidance is not obligatory at this time, the Board of Health could allow properly trained lifeguards to administer a swim test, provided the lifeguards are given very specific instructions on evaluating swimming proficiency. As finding certified Water Safety Instructors can be difficult, the requirement to use only a WSI for swim testing is cumbersome. Allowing for lifeguards to administer the swim test with guidance in evaluating skills seems to be a reasonable approach to safety and would be consistent with what is normally required of lifeguards; that is evaluating swimming proficiency from a safety perspective rather than from the perspective of technical accuracy in stroke technique.

Moreover, with respect to Christian's Law, clarification should be requested as to what constitutes a "recreational program." While it is clear that Christian's Law applies to the Recreation Department's day camp program, it is unclear whether "open swim" times would be considered a "recreational program." Irrespective of Christian's law requirements, it is also recommended that the town consider a lifejacket policy as described below.

B. **Lifejacket Policy.** Prevention of drowning should be a priority at all aquatic venues. Minimizing the risk of a drowning incident starts by selecting an appropriate swimming area, such as one that gently slopes to shore and that has clear boundary markers. Swimming where lifeguards are present is another layer of protection against drowning. In recent years, the swimming public has become accustomed to using lifejackets as yet another layer of protection. Lifejackets are engineered for safety. By design, a lifejacket is intended to keep a non-swimmer at the surface of the water. Whereas seatbelts were once only an "option" available to drivers and passengers of motor vehicles, the use of seatbelts is now commonplace and is in fact required by law in many jurisdictions.

Many public swimming areas, including pools and beaches, now require non-swimmers to wear lifejackets. Some states, such as California, require that lifejackets be made available for non-swimmers at certain venues, e.g. waterparks. Given the challenges parents face in keeping track of young children at swimming areas, it is recommended that lifejackets be required for anyone unable to pass a swim test. This would go a long way to preventing accidental drowning. If lifejackets are to be required, ample public outreach is needed to explain the rationale for the new requirement. It is recommended that such a change occur at the start of the swimming season and only after public notice.

Another option leading up to a lifejacket requirement is to begin providing lifejackets as a free "loaner" program. Patrons who do not successfully pass a swim test would be offered the free use of a U.S. Coast Guard-approved lifejacket. Storage racks are available through major aquatic suppliers and would be a very visible and colorful addition to the swimming area. A variety of lifejacket sizes would be required. Multiple organizations, including the Association of Aquatic Professionals, offer grant funding for agencies to purchase lifejackets for recreational use.



Lifejacket rack.

A Type-III lifejacket such as those found in waterparks is recommended. While these are more costly than the orange Type-II PFDs available at retail outlets, many recreation

providers find that children are very comfortable wearing these jackets and are more inclined to continue wearing them throughout the day. Grant programs are available to communities wishing to implement a lifejacket program.

The City of Lake Elsinore (California) implemented, in 2005, a lifejacket loaner program at a "wading only" beach where lifeguards were not even present. Lifejackets are left outside on a display rack for use by the public. Signage was created to encourage lifejacket use. Patrons wanting a lifejacket simply borrow the jacket and return it after use. While some lifejackets were damaged or stolen, the city reports that actual number was well below that which was expected. Information relative to the Lake Elsinore shoreline safety initiative may be found online at http://www.lake-elsinore.org/index.aspx?page=177.

City of Lake Elsinore Loaner Lifejackets.

If desired, the ability to track loaner lifejackets using the existing RecTrac software is also possible. By adding a barcode sticker to each lifejacket, a jacket could be scanned out each time it is issued to a patron. The lifejacket would then attach to the patron's RecTrac account profile allowing for the town to charge the patron if the lifejacket is damaged or not returned. This, of course, requires the additional module that allows for equipment rentals as well as barcode scanning equipment.

C. **Note and Float Program.** The National Note & Float program is a free, customizable program that encourages the use of lifejackets by non-swimmers. Originally introduced at Pennsylvania State University, the Note & Float program has been well received by children, adults and college-age non-swimmers alike. Materials may be produced locally or ordered through Water Safety Products, Inc. The essence of the Note & Float Program is first identifying all non-swimmers with a designated wristband and then "floating" non-swimmers with an appropriately sized lifejacket.

The Town of Wellesley already has a swim test designed to identify non-swimmers. Under this program, swimmers are issued wristbands that allow for entry into deep water. The 2013 Morses Pond Staff Manual describes two separate wristband colors that are issued based upon which swim test was completed. Now that only one swim test will be administered, one color could be used to designate permission to access deep water, while the other could be used to identify people who should remain in shallow (standing-depth) water.

Note & Float 4 ft sign and lifejacket rack.

Under the Note & Float program, wristbands are issued to non-swimmers to not only identify the non-swimmers but to also build buy-in from patrons while reinforcing key safety messages. As the town is already conducting swim tests and issuing wristbands, the only additional step needed would be to offer non-swimmers a lifejacket for use. An added benefit to the program is that issuing a wristband and lifejacket is an opportunity to also provide information relative to swimming lessons. Children who want to swim without a lifejacket are then encouraged and motivated to take swimming lessons so as to be able to pass the swim test. Additional information on the free Note and Float Program may be found online at www.aquaticsafetygroup.com/NoteAndFloat.html.

Note & Float wristband.

D. **Emergency Procedures.** Lifeguards are trained by Recreation Department staff to search areas of the pond whenever a swimmer is reported missing. Specific procedures are detailed in the Morses Pond staff manual. Many beach managers, however, differentiate between a lost swimmer (i.e. last seen in the water) and a missing child last seen on land. If staffing levels permit, a limited land search can be implemented concurrently with a water search. While emergency instructions require calling emergency services at the time of the initial report, dispatching police, fire and EMS right away may not be an

efficient use of town resources. For example, it may not be necessary to dispatch fire services every time a child wanders out of his/her parent's line of site. Instead, it may be prudent to dispatch police services and, after a quick search of the restrooms, playground and parking lot, request fire services if the missing child is not located quickly. It is also unclear from discussions with staff and in the Emergency Action Plan who assumes control of the water search once police and fire services are on scene. It is strongly recommended that the section of the staff manual pertaining to lost bather searches be re-written for better organization and clarity.

In an effort to address emergency response in a coordinated manner, it is recommended that town officials work together via a safety committee or task force to develop an integrated approach to managing reports of lost swimmers and missing children. Each responding agency may have specific concerns that may need to be addressed. For example, police services may want to capture information from a parent/guardian to determine whether a crime has been committed, such as abduction by a non-custodial parent. Police services may also be needed for crowd control and to ensure access to the beach by other emergency responders. Emergency Medical Services will likely want to dispatch an ambulance to the beach and may, in the event of a possible submersion, dispatch an Advanced Cardiac Life Support unit. Fire services may have access to boats or other search and rescue devices.

At the same time, if there is no official dive team on the fire department, the State Police dive team may need to be called for assistance at the time a water search is initiated. Professional search assistance may be required as lifeguards lack the training to determine how best to expand a water search after an initial search of the area yields no results. This is an incident command decision that should be made by a competent incident commander. Further, given the size and depth of the swimming area and the likelihood that sediment will be stirred up during the search, a second search of the water area may be required as lifeguards may miss a body underwater during an initial search. This level of emergency management requires advance coordination and a clear understanding among all agencies as to the roles, responsibilities and limitations of each

group. Standard incident command guidelines should be put in place to help manage such incidents. It was recommended that the Beach Manager participate in Incident Command training (either through local resources or online through FEMA) as the Beach Manager may have occasion to oversee an emergency at the beach pending arrival of police and fire services. It was reported in August that both managers have successfully completed Incident Command training, including ICS 100 and ICS 200.

The town has already begun to review the above recommendations. Discussions regarding emergency procedures are already in progress. During discussions with town administrators, a structured response protocol to any report of a missing person at the beach was recommended over a "full" response for each call. While a full response would put assets on the beach in a timely manner, the reality is that such a response might not be necessary. Deploying fire and EMS assets to the beach for a child who may have wandered out of sight ties up those resources such that they cannot respond to other emergencies, thus requiring mutual aid from neighboring communities. Instead of a full response, it was proposed that police dispatchers dispatch officers to the beach at the first report of any lost child. While police are en route, the dispatcher could then follow a pre-determined script to ascertain whether a land or water search is needed. Any time it is determined that a water search is to be initiated, the dispatchers would then dispatch a full response including fire and EMS personnel. Similarly, because police officers can be at the beach within minutes, the responding officer(s) could establish incident command upon arrival and request additional resources as needed.

E. **Lost Bather Search.** Lifeguards demonstrated a well-rehearsed and executed lost bather search. However, a number of issues arose that suggest the need for additional discussion relative to conducting lost bather searches. First and foremost is the need to establish the point in the water where the bather was last seen. This point should be marked in the sand. Typically the search begins from this point and expands outward from there. Lifeguards must use information gathered from the reporting individual to help guide the decision of where to start the search. This did not occur during the practiced search. Lifeguards were presented with a scenario wherein a 60-year-old man was last seen

swimming laps. Rather than identifying where in the water the man was last seen, lifeguards began a shallow-water line search parallel to shore and progressing deeper and deeper out to the floating raft. The majority of this search was of water areas where an adult man would not have likely been swimming laps, including shallow water areas. Lifeguards terminated the search after approximately 15 minutes, and only after searching right beach. Had they used information regarding the activity the swimmer was reportedly engaged in (swimming laps from raft to raft) they could have quickly altered their search pattern to begin in deep water, sweeping across the zone, working their way from deep water to shallow. Lifeguards also failed to utilize all staff during the search. One lifeguard remained on the dock holding a backboard for 15 minutes. Her role was to be ready to help remove the victim from the water. In reality, she could have been more effective in the water searching rather than standing on the dock. Moreover, the missing person report form was not readily available to lifeguard staff, as it is kept in the office. It was recommended that the form be kept on a clipboard in the office so that when a lifeguard radios back with the details of a missing person, the receiving party can quickly take notes on the form, helping guide the lifeguard, if necessary, in capturing all relevant data.

Given the need for fact-specific analysis of each situation to determine a point last seen and establish an immediate search objective, standard incident command protocols should be used to guide the emergency response. The incident commander, likely the beach manager or lifeguard captain, would decide upon the appropriate starting point of the search, the search pattern (e.g. left to right parallel to shore, deep to shallow perpendicular to shore) and instruct lifeguards in how to begin the search. This, of course, requires the beach manager to also be familiar with search procedures, which would be possible if the manager were required to have prior lifeguarding experience. Critical information to guide the decision of how to search the beach would include:

- Age and height of the missing person;
- Activity last engaged in (lap swimming, playing in standing-depth water, etc.);
- Point last seen; and

- Available resources, including whether to utilize patrons to assist.

In considering emergency response protocols for missing bathers, some consideration should be given to whether patrons should be utilized to assist in a search. While patrons can be utilized to search shallow waters (up to waist deep), this takes some time and staffing power to organize and is not a reliable approach for all times the beach is open. Lifeguards would have to be assigned to assist with organizing patrons and helping ensure their safety during their participation in the search, thereby taking lifeguards away from a deep water search. Untrained patrons could stir up the bottom of the pond creating turbid conditions thereby hampering search efforts. More importantly, given the very clear water observed at the beach and the very gradual slope to deep water that occurs prior to the drop-off, the shallow water area may be quickly scanned in seconds thus allowing lifeguards to almost immediately start a deep water search in which patrons could not participate.

Given the foregoing, it is **not recommended** that patrons be used to search shallow water areas. Instead, patrons should be directed away from the water and asked to account for their own children. If a canine unit will be used to help in a search, it also may not be advisable to have patrons initiate a land search beyond the immediate sand area. Too many people moving about could contaminate the scene and/or disrupt evidence. The involvement of beachgoers in such a detailed, coordinated search is best coordinated by police and fire services rather than by Recreation Department lifeguards.

It is recommended that lifeguards receive additional training and practice in searching the swimming area in a manner consistent with the facts obtained from the reporting party. While this training could be developed in-house using existing resources, the Town might also consider engaging professionals experienced with search procedures to assist with this training need. This workshop should be conducted during lifeguard pre-service training and ultimately would culminate in a full mock-rescue involving lifeguards, police, fire and EMS.

F. **Admissions / Carrying Capacity.** While an examination of the carrying capacity of Morses Pond Beach is outside of the scope of this report, it is recommended that the town undergo an analysis of the carrying capacity of the beach and water areas. Determining the carrying capacity of an open-water beach is a complex process involving many factors beyond a simple mathematical computation of the surface area of beach and water areas. Ecological impact, traffic congestion, access to parking, ease of access to the beach, desired turnover, desired experience, and other factors may also figure into a carrying capacity range.

The U.S. Army Corps of Engineers recommends a minimum of 50 ft^2 of sand/turf and 30 ft^2 of swimming area be provided per person. The size of the parking area is generally used to help control overcrowding on the beach. For example, with a swimming area of approximately 36,500 ft^2, the Morses Pond Beach could accommodate roughly 1500 swimmers under the Army Corps guidelines. Using the Corp's assumption that 60% of the bathers at any time would be using the beach (900), 30% the water (450) and 10% elsewhere (150) we arrive at an understanding of how many people the beach could hold absent the other carrying capacity concerns. In reality, a selected carrying capacity value should be below this number, as ecological impact and other concerns would serve to limit the capacity. Moreover, if the size of the swimming area were reduced, this too would affect capacity.

While gross attendance numbers have risen over the years, the numbers themselves do not raise immediate safety concerns. More important than a gross patron count would be bather demographics such as age, swimming proficiency and the ability to understand English, as each of these factors could affect policy decisions regarding the management of the beach. Moreover, the town currently helps regulate beach crowding via the size of the parking area. This is consistent with management practices at many beach areas. The larger the parking area, the more crowded a given beach can become. Should it be determined that the beach is "too crowded" one way to help minimize overcrowding would be to reduce the size of the parking lot. That said, the current policy of setting higher admission rates for non-resident patrons also serves to limit attendance. If a desire

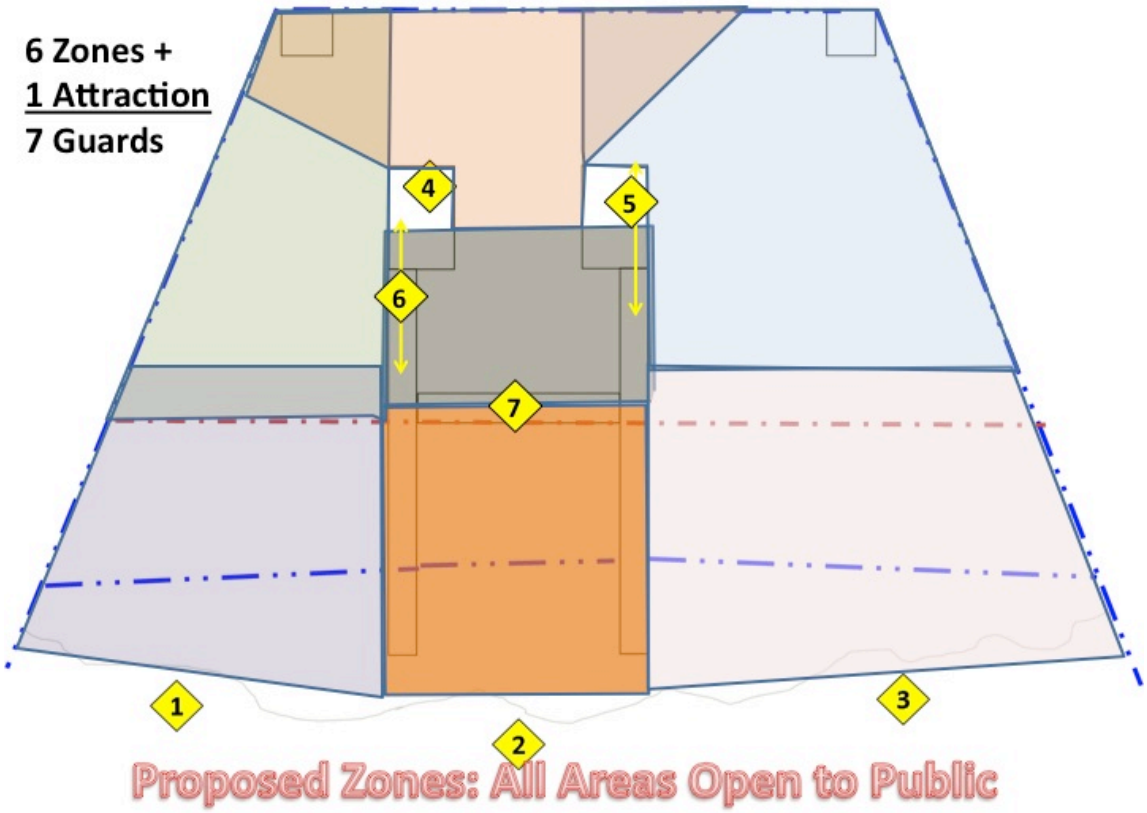
to further restrict attendance exists, raising non-resident fees even higher may provide some additional relief on the beach.

It is reported that the Recreation Department has started tracking attendance in various areas of the facility, including the "beach" and water areas. The data collected will be helpful to better understand facility usage patterns, including areas where people/swimmers congregate as well as times of peak attendance. Such data is often more helpful than gross attendance numbers alone. For example, this data can help demonstrate how a seemingly high daily attendance number can be comprised of patrons spread over the course of the day, or concentrated at specific times. This information may allow management to enhance staff coverage during times of peak usage. Similarly, the data can show that while the attendance number appears high, more people may be on the beach than in the water, reflecting a lower risk than the seemingly high patron count might otherwise suggest. The data may also suggest that certain water areas have a higher density of swimmers, thus requiring staffing patterns to be adjusted to allow for maximum coverage over more crowded areas. This information will be critical as staffing patterns are analyzed for future seasons and can be used to substantiate the need for increased staff to address the various risks discussed within this report.

APPENDICES

Appendix A

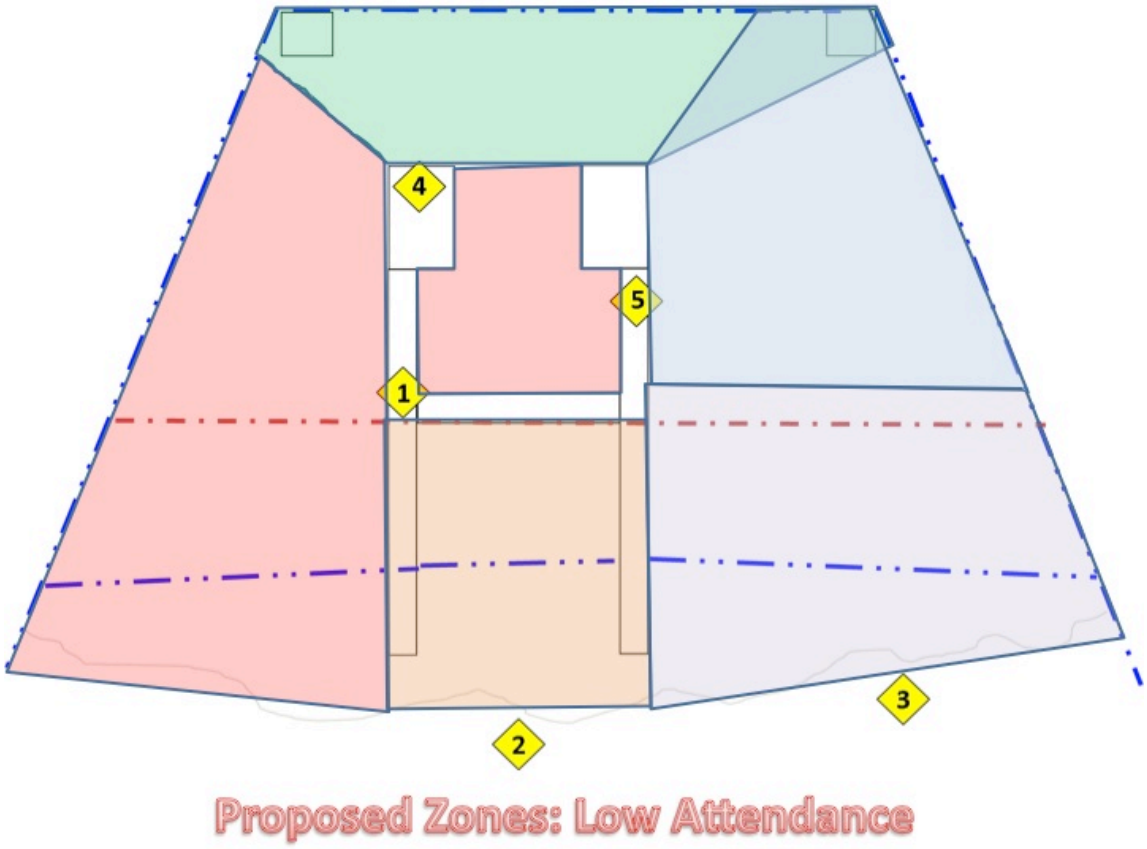
Example of Seven Lifeguard Zone Diagram



Guard 1:	Left shallow
Guard 2:	Center shallow crib
Guard 3:	Right shallow
Guard 4:	Positioned on dock at base of slide; controls slide and monitors deep areas from left raft to just beyond the midpoint of the swim area.
Guard 5:	Walking position on right dock; monitors right mid and right deep to raft
Guard 6:	Walking position on left dock; monitors left mid and left deep to raft
Guard 7:	Positioned on center catwalk; monitors deep crib
Guard 8:	(Optional) On kayak or rescue board along boundary of swim area
Guard 9:	Available for rotations and relief breaks from the sun

Appendix B

Example of Five Lifeguard Zone Diagram



Guard 1: Maintains closed left shallow, left middle and center middle crib

Guard 2: Center shallow crib

Guard 3: Right shallow

Guard 4: Positioned on slide platform; responsible for deep area between rafts

Guard 5: Right mid and right deep

Guard 6: Available for rotations and relief breaks from the sun