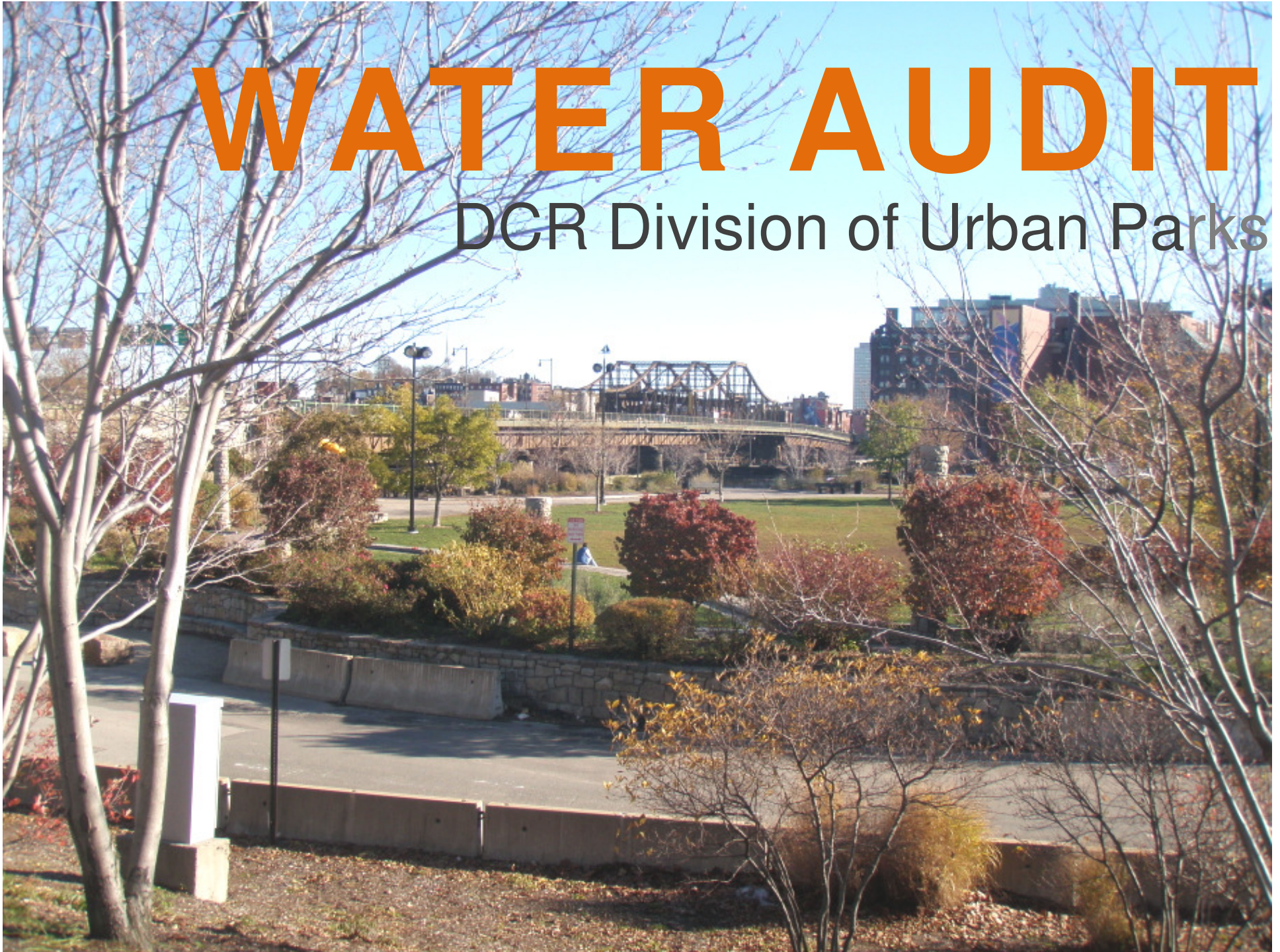


# WATER AUDIT

DCR Division of Urban Parks



# Conducted by

Michelle Moon

Former Intern

Office of Water Resources

Division of Water Supply Protection

Department of Conservation and Recreation

# Acknowledgements

Mark Brady | Peter Church | Michele Drury

Judy Greene | Russ Geer | Nick Gove

Erin Graham | Rob McArthur | Marilyn McCrory

Samantha Overton | Janice Tenzin



# Outline

- Overview
- Urban Parks
  - *recommendations*
- Golf Courses
  - *recommendations*
- Improvements

**OVERVIEW**

# Audit Details

- Conducted in October 2010
- Two Urban Parks Districts
  - Charles River Parks
  - Neponset River Parks
- Two Golf Courses
  - Leo J. Martin
  - Ponkapoag

# OUTSIDE WATER AUDIT | charles river parks

**SITE(S)** Paul Revere, City Square, Nashua St, North Point

**DATE** October 8, 2010

## 1 SITE INSPECTION

### 1.1 Irrigation

Boston Parks

Installation date 1996-2007

Date turned on early spring

Water Source Boston Water & Sewer

Date Turned off Mid/Late October

Cambridge

Installation date 2007

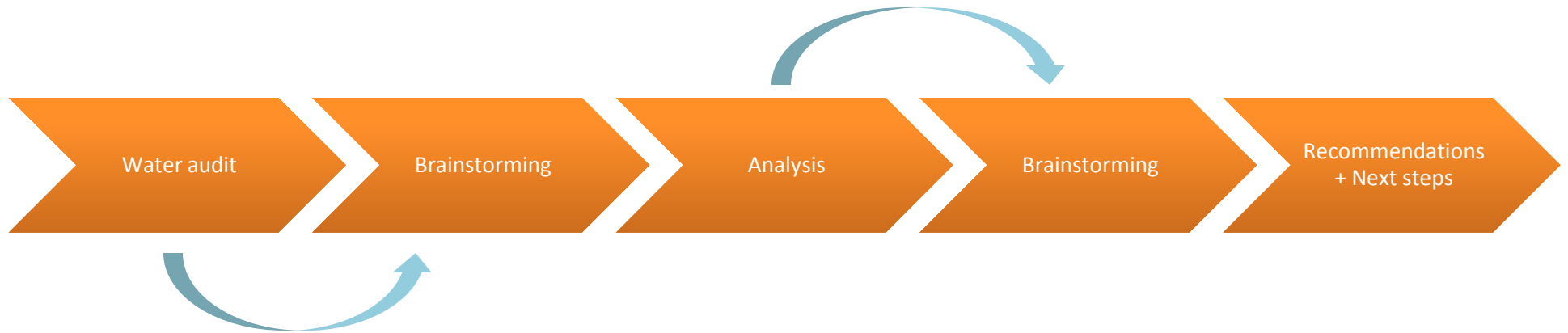
Date turned on early spring

Water Source City of Cambridge

Date Turned off Mid/Late October

NAME	Paul Revere (1)		City Square (2)		Nashua St (3)		North Point (4)		Comments (functioning, number of units)
	Yes?	No?	Yes?	No?	Yes?	No?	Yes?	No?	
Irrigation system	X		X		X		X		
Sunken sprinkler heads	x		X		x		x		
Drip Irrigation	X		X		X		X		
Hand watering		X		X		X		X	
Maintenance schedule	X		X		X		X		Weekly schedule, in addition to spring and fall specific
Conducted monthly/yearly	x		x		x		x		
Meters	X		X		X		X		
Run shut off rain sensor	X		X		X		X		
Adjusted seasonally	X		X		X		X		
Flush drip filters									
Flush pipes at end of season	X		X			X	X		
Known leaks		X	X			X		X	worked on fixing it (2)
Water run-off		X		X		X		X	
Uneven spray patterns									
Rain barrels		x		x		x		x	

# Process

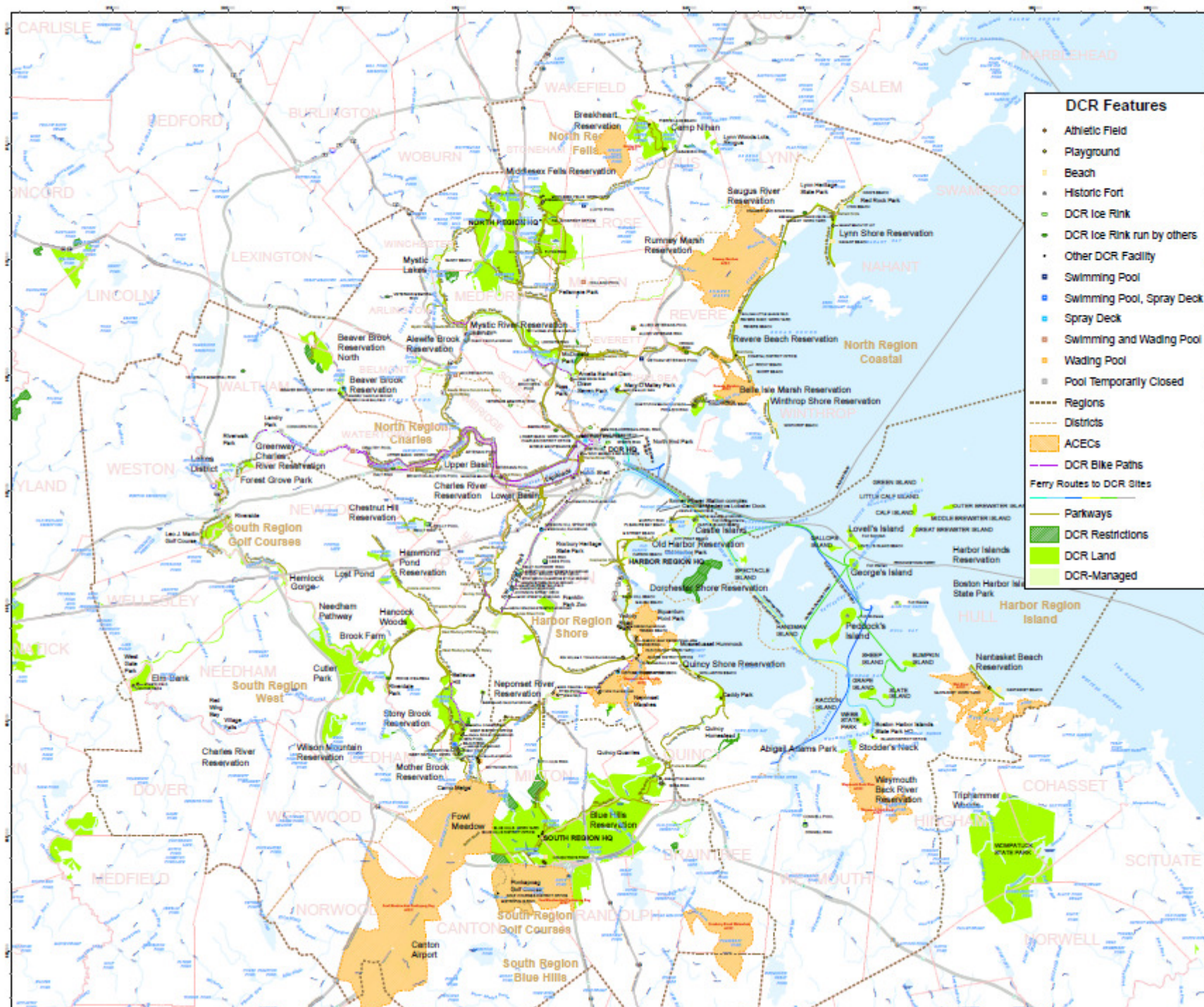


# General Details

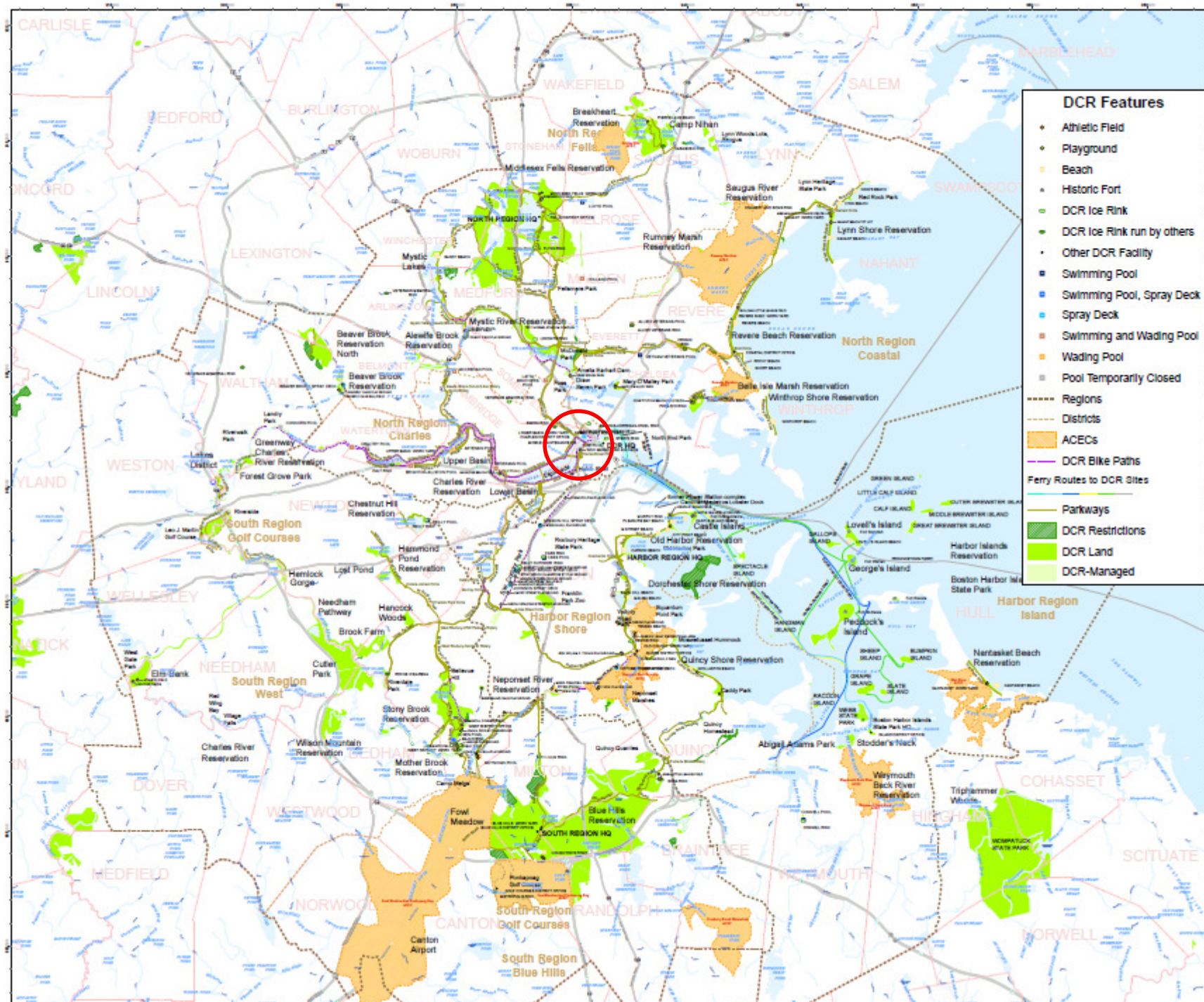
- In compliance with the applicable State Water Conservation Standards.
- Charles River Parks and Golf Courses have the most opportunities to reduce water consumption
- Neponset region does not use much water overall since much of the landscaping does not require much water



**PARKS**







# Charles River Parks

- Paul Revere
- City Square
- Nashua Street
- North Point
- Esplanade



# Paul Revere Park





# City Square Park





# Nashua Street Park



# North Point





# Esplanade



Easy/low cost

semi-difficult

hard/high cost

Check rain sensor  
Start watering season later and end earlier  
Monitor plant health/infiltration

Create irrigation plan

←Fix leaks→

Install faucet aerators

Replace faucets heads

Create educational signs

Have park staff review water bills

Reduce time for fountain

Fix Nashua St Fountain

Adjust watering amount based on age of plants

Add water conservation measures to contracts

# Recommendations | Charles River Parks

## Outdoor

- Reduce the frequency and increase the duration for watering turf.
- Established perennial beds can be watered less frequently and with a shorter duration.
- Rain sensors and irrigation control panels should be checked regularly.
- Irrigation zones for turf and perennial beds should be separated to better target water needs.

## Indoor

- Replace toilets at the Esplanade with low flow toilets and/or waterless urinals.
- Sinks and fixtures should be replaced with water-conserving models.
- Alternatively, look into water reduction retro-fits for the existing toilets and sinks.

# Recommendations | Charles River Parks

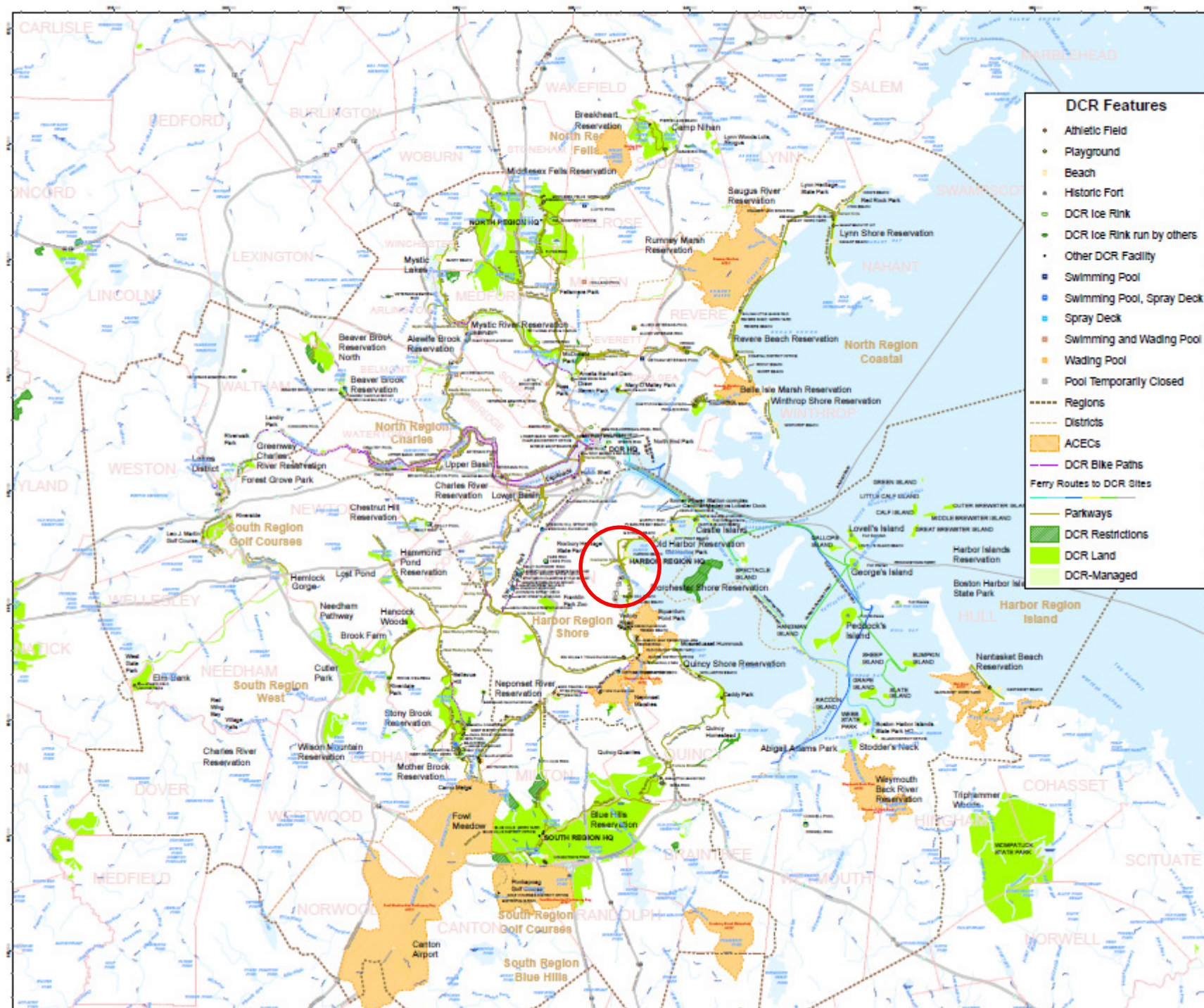
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# Neponset River Parks

- Pope John Paul II Park
- Neponset Spray Deck
- Ryan Park
- Kennedy Garden
- Ventura Ball Field
- Evans Field
- Pleasure Bay



# Pope John Paul II Park



# Ryan Park





# Kennedy Garden





# Pleasure Bay





Easy/low cost

semi-difficult

hard/high cost

Monitor plant health/infiltration

Create irrigation plan

Install spray deck

Start watering season later and end earlier

←Fix leaks→

Create educational signs

Install rain sensors

Purchase custom pool cover

Surveillance equipment

Install rain barrels for community garden

# Recommendations | Neponset River Parks

## Outdoor

- Continue to monitor and evaluate the infiltration rate and plant health.
- Install rain sensors (*where there is irrigation*)
- Consider converting the wading pool at Ryan Park to a spray deck.
- Consider conducting a cost/benefit analysis - install composting toilets in place of the port-a-johns currently in use.

## Indoor

- No public facilities requiring indoor reduction measures.

# Recommendations | Neponset River Parks

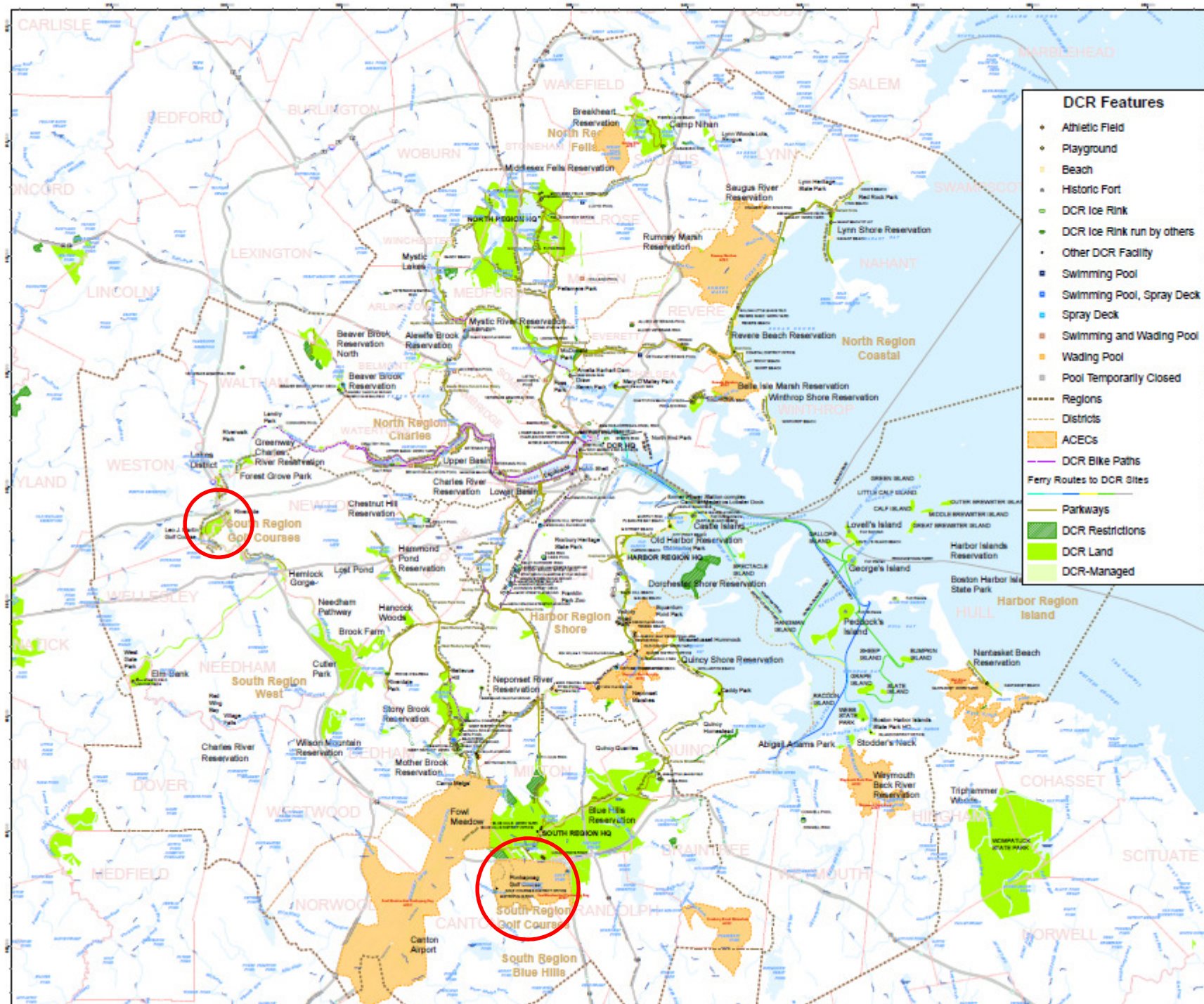
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## Indoor

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**GOLF  
COURSES**





# Golf Courses

Leo J. Martin



Ponkapoag





# Irrigation at Golf Courses



Easy/low cost

semi-difficult

hard/high cost

Monitor plant health/infiltration

replace system

Create irrigation plan

Start watering season later and end earlier

Install rain sensor

← Fix leaks →

Clean system

Fix pumps

Install back-up pump

Install faucet aerators

Replace toilets/faucets

Top dress soil

Educational signs

# Recommendations | Golf Courses

- Replace the irrigation systems with updated efficient systems.
- In the interim, replace pumps with more efficient, water conserving models
- Evaluate whether watering the fairways is necessary (not currently watered).
- Incorporate water conservation measures into new irrigation system.
- Consider installing a subsurface irrigation system,(more efficient).
- Consider weather-based irrigation controllers.
- Create a drought management plans.
- Toilets should be replaced at both golf courses with low flow models and/or waterless urinals.
- Sinks and associated fixtures should be replaced with water-conserving models.
- Alternatively, consider water reduction retro-fits for the existing toilets and sinks.

**IMPROVEMENT**  
**S**

	\$ (\$0- 200)		\$ \$ (\$500- 5000)	\$ \$ \$ (\$1000 - 4 million)
+	<ul style="list-style-type: none"> <li>Look at water bills</li> <li>Create educational signs for public</li> </ul>			<ul style="list-style-type: none"> <li>Fix Nashua Street Fountain</li> </ul>
++	<ul style="list-style-type: none"> <li>Monitor plants</li> <li>Monitor infiltration</li> <li>Evaluate irrigation zones</li> <li>Install rain barrels at the new community garden</li> <li>Top dress soil with a seed mix that has a high variety</li> </ul>			
+++	<ul style="list-style-type: none"> <li>Create irrigation schedule (weekly and monthly)</li> <li>Adjust watering times (early morning, shorter duration, less frequent, and base on age of plants)</li> <li>Start watering later in the season and end earlier</li> <li>Update/revise contracts to include more BMP for irrigation and schedules</li> <li>Hold employee/contractor meetings about ways to conserve water in the parks</li> </ul>	<ul style="list-style-type: none"> <li>Fix leaks</li> <li>Replace broken sprinkler heads, valves and pipes</li> <li>Replace broken faucets and toilets</li> <li>Replace old faucets and toilets</li> </ul>	<ul style="list-style-type: none"> <li>Install well at City Natives (non-potable water reduction)</li> <li>Replace irrigation system with a new water efficient system at the golf courses</li> </ul>	



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	SHORT TERM GOALS	
1	<b>Update contracts + create irrigation plans</b>	COST
	Charles River Parks	\$ 0
	All DCR Parks that have irrigation systems	\$ 0
2	<b>Fix existing problems</b>	
	Ponkapoag Golf and Leo J. Martin Courses (leaks and new pump?)	\$ unknown
3	<b>Replace bathroom fixtures</b>	
	Ponkapoag Golf and Leo J. Martin Courses	
	All new fixtures (11 toilets, 6 urinals, 7 sinks)	\$ 7,467
	Fixture retrofits (11 toilets, 7 sinks)	\$ 2,162
	Leo J. Martin Courses	
	All new fixtures (8 toilets, 2 urinals, 4 sinks)	\$ 5,940
	Fixture retrofits (8 toilets, 4 sinks)	\$ 1,600
	Esplanade – Hatch Shell	
	All new fixtures (9 toilets, 2 urinals, 6 sinks)	\$ 5,166
	Fixture retrofits (9 toilets, 6 sinks)	\$ 1,771
	Esplanade – Dartmouth St Sanitary	
	All new fixtures (16 toilets, 10 urinals, 6 sinks)	\$ 11,116
	Fixture retrofits (16 toilets, 6 sinks)	\$ 3136
	▪ Other possibilities include: Wollaston Bathhouse or the Malibu/Savin Hill	
4	<b>Install rain barrels</b>	
	▪ <i>Investigate where to install rain barrels. Good locations have landscaping that uses potable water for irrigation and nearby roofs with gutters.</i>	\$150 each
5	<b>Educational signs</b>	\$ in house
6	<b>Install rain gages or weather-based irrigation controller</b>	\$50 -950

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## LONG TERM

<b>1</b>	<b>Ponkapoag Golf Course</b>	<b>COST</b>
	Ponkapoag – pop up sprinklers	\$ 4.2 million
	Ponkapoag – subsurface	\$ unknown
	Ponkapoag – Phases	see Appendix A
<b>2</b>	<b>Leo J. Martin Course</b>	
	Leo J. Martin – pop up sprinklers	\$ 1- 4 million
	Leo J. Martin – subsurface	\$ unknown
<b>3</b>	<b>Replace all bathroom fixtures</b>	
	Small bathrooms (2 toilets in total)	
	Medium bathrooms (2 -8 toilets)	
	Large bathrooms (8+ toilets)	
	Neponset River Parks ▪ replace with composting toilets	unknown
<b>4</b>	<b>Wells at City Natives</b>	unknown
<b>5</b>	<b>Cisterns at Neponset River Park</b>	
	New community garden	\$2,000
<b>6</b>	<b>Pool cover or spray deck</b>	unknown



QUESTIONS