

Under Tier 3, the State cannot allow any degradation of the existing water quality necessary to protect and maintain ONRWs. There shall be no new or increased discharge to ONRWs or to tributaries to ONRWs that would result in lower water quality in the ONRW. However, the State may allow some limited activities that result in temporary and short-term changes in the water quality of an ONRW. Such activities must not permanently degrade water quality or result in water quality lower than that necessary to protect the existing uses in the ONRW. During any period of time when, after opportunity for public participation in the decision, the State allows temporary degradation, all practical means of minimizing such degradation shall be implemented.

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER RESOURCES

APPENDIX D

SPECIAL RESOURCE PROTECTION WATERS (SRPWs)

July 2006

WATER QUALITY REGULATIONS APPENDIX D

Special Resource Protection Waters (SRPWs) are high quality surface waters identified by the Director as having significant ecological or recreational uses, which may include but are not limited to: wildlife refuge or management areas; public drinking water supplies; State and Federal parks; State and Federal designated Estuarine Sanctuary Areas; waterbodies containing critical habitats, which may include but are not limited to waterbodies identified by the RIDEM Natural Heritage Program as critical habitat for rare or endangered species; wetland types or specific wetlands listed as rare, threatened, endangered, of special interest or of special concern by the RI Natural Heritage Program; waterbodies identified by the U.S. Department of the Interior on the Final List of Rivers for potential inclusion in the National Wild and Scenic Rivers System.

The following list contains surface waters of the State which have been designated by the Department as SRPWs. Utilizing criteria set forth in the Rhode Island Water Quality Regulations and information garnered from the review and analyses of recommendations and documents by federal and state agencies and private non-profit organizations, RIDEM objectively established a list of SRPWs. This list of designated SRPWs includes the waterbody name, location and water quality classification for each SRPW. Additional information on SRPWs is available from RIDEM, Water Resources and the RIDEM Natural Heritage Program.

Under Tier 2½ of the Antidegradation Provisions, Protection of Water Quality for SRPWs, the State cannot allow any measurable degradation of the existing water quality necessary to protect the characteristic(s) which cause the waterbody to be designated a SRPW. The new or increased discharge or activity will not be allowed unless the applicant can provide adequate scientific and technical documentation and engineering plans which can prove, to the satisfaction of the Director, that specific pollution controls and/or other mitigation measures and BMPs will completely eliminate any measurable impacts to water quality necessary to protect the characteristics which cause the waterbody to be designated a SRPW. If the RIDEM, using Best Professional Judgement and scientific and technical knowledge of proper modern pollution control engineering practices, agrees that the specified pollution controls and/or BMPs will protect the SRPW from all measurable degradation, those agreed-to measures will be conditions required of the applicant in an approval. Any avoidance of such conditions by the applicant will result in automatic revocation of the approval and potential enforcement action. The burden of proof rests on the applicant. Notwithstanding that all public drinking water supplies are SRPWs, public drinking water suppliers may undertake temporary and short term activities within the boundary perimeter of a public drinking water supply impoundment for essential maintenance or to address emergency conditions in order to prevent adverse effects on public health or safety, provided that these activities comply with the requirements set forth in Rule 18.B. (Tier 1 Protection of Existing Uses) and Rule 18.C. (Tier 2 Protection of Water Quality in High Quality Waters).

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories											
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area	
Blackstone River Basin	Abbott Run Brook & Tribs	Abbott Run Brook	RI0001006R-01	Cumberland											X	
Blackstone River Basin	Abbott Run Brook & Tribs	Ash Swamp	RI0001006R-04	Cumberland		X						X	X			
Blackstone River Basin	Abbott Run Brook & Tribs	Ash Swamp Brook	RI0001006R-04	Cumberland		X						X				
Pawcatuck River Basin	Wood River & Tribs	Asheville Pond	RI0008040L-04	Hopkinton	X		X					X				X
Narragansett Basin	Aquidneck Water Supply & Tribs	Bailey Brook	RI0007035R-01	Middletown											X	
Pawtuxet River Basin	Scituate Reservoir & Tribs	Barden Reservoir	RI0006015L-06	Scituate											X	
Narragansett Basin	Barrington & Runnins Rivers	Barrington River Estuary	RI0007021E-01A/B, RI0007021R-01	Barrington, East Providence	X	X						X				X
Thames River Basin	Beach Pond & Tribs	Beach Pond	RI0005010L-01	Exeter	X		X					X				
Narragansett Basin	West Passage Narragansett Basin	Belleville Pond	RI0007027L-02	North Kingstown	X	X						X				
Pawtuxet River Basin	Big River & Tribs	Big River	RI0006012R-02	West Greenwich		X						X				
Pawcatuck River Basin	Wood River & Tribs	Blue Pond	RI0008040L-03	Hopkinton	X		X					X				X
Thames River Basin	Tribes to Five Mile	Bowdish Reservoir	RI0005047L-03	Glocester	X	X	X					X				
Coastal Waters	Southeast Coastal Ponds	Briggs Marsh	RI0010048E-01	Little Compton		X						X	X			X
Coastal Waters	Sakonnet River	Brown Point Marsh	No WB ID	Little Compton		X										
Coastal Waters	Southwest Coastal Ponds	Cards Pond	RI0010043E-01	South Kingstown				X								
Thames River Basin	Tribes to Five Mile	Cedar Swamp Pond	RI0005047L-05	Burrillville		X						X				
Pawcatuck River Basin	Pawcatuck River & Tribs	Chapman Pond/ Crandall Swamp	RI0008039L-01	Westerly		X						X	X			
Coastal Waters	Southeast Coastal Ponds	Cold Brook	RI0010048R-01	Little Compton								X				
Thames River Basin	Tribes to Five Mile	Cold Spring Brook	RI0005047R-05	Burrillville		X						X				
Thames River Basin	Tribes to Five Mile	Croff Farm Brook	RI0005047R-04	Burrillville		X						X				
Blackstone River Basin	Woonsocket Reservoir #3 & all Tribs	Crookfall Brook	RI0001004R-01	North Smithfield, Cumberland											X	
Coastal Waters	Southwest Coastal Ponds	Deep Pond	RI0010043L-08	Charlestown		X						X	X			

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories											
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area	
Blackstone River Basin	Abbott Run Brook & Tribs	Diamond Hill Reservoir	RI0001006L-01	Cumberland											X	
Pawcatuck River Basin	Wood River & Tribs	Diamond Pond/Bog Complex	RI0008040R-06	Richmond		X						X	X			
Coastal Waters	Sakonnet River	Donovan Marsh	No WB ID	Little Compton		X										
Blackstone River Basin	Abbott Run Brook & Tribs	East Sneece Brook	RI0001006R-03	Cumberland								X			X	
Pawcatuck River Basin	Wood River & Tribs	Eli Pond	RI0008040L-05	Hopkinton	X		X					X				X
Coastal Waters	Southwest Coastal Ponds	Factory Pond	RI0010043L-03	South Kingstown		X						X	X			
Pawcatuck River Basin	Pawcatuck River & Tribs	Fisherville Brook, from headwaters north of Henry Brown Rd. in West Greenwich to Route 102 in Exeter.	RI0008039R-07	West Greenwich, Exeter		X						X				X
Coastal Waters	Sakonnet River	Fogland Point Marsh	No WB ID	Tiverton		X						X				
Coastal Waters	Block Island Waters	Fresh Pond	RI0010046L-02	New Shoreham											X	
Coastal Waters	Southwest Coastal Ponds	Fresh Pond	No WB ID	Charlestown		X						X				
Coastal Waters	Southwest Coastal Ponds	Galilee Bird Sanctuary	RI0010043E-06A/E	Narragansett, South Kingstown		X	X									
Narragansett Basin	Aquidneck Water Supply & Tribs	Gardiner Pond	RI0007035L-01	Middletown				X							X	X
Pawcatuck River Basin	Pawcatuck River & Tribs	Gennesee Swamp	RI0008039R-08	South Kingstown		X						X				
Narragansett Basin	Greenwich Bay	Gorton Pond	RI0007025L-01	Warwick	X	X						X	X			X
Pawcatuck River Basin	Wood River & Tribs	Grass Pond	No WB ID	Richmond		X						X	X			X
Coastal Waters	Block Island Waters	Great Salt Pond and Marshes	RI0010046E-01A	New Shoreham								X				
Pawcatuck River Basin	Pawcatuck River & Tribs	Great Swamp	RI0008039L-07	South Kingstown		X	X					X				
Coastal Waters	Southwest Coastal Ponds	Green Hill Pond	RI0010043E-02	South Kingstown								X				
Blackstone River Basin	Abbott Run Brook & Tribs	Happy Hollow Pond	RI0001006L-03	Cumberland											X	
Narragansett Basin	Potowomut River	Hunt River	RI0007028R-03B	North Kingstown		X						X				X
Pawtuxet River Basin	Scituate Reservoir & Tribs	Huntinghouse Brook	RI0006015R-11	Scituate		X						X				

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories												
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area		
Narragansett Basin	Jamestown Water Supply	Jamestown Brook	RI0007036R-01	Jamestown												X	
Narragansett Basin	Warren Reservoir	Kickemuit Reservoir	RI0007034L-01	Warren			X									X	X
Narragansett Basin	Aquidneck Water Supply & Tribs	Lawton Valley Reservoir	RI0007035L-06	Portsmouth												X	
Coastal Waters	Southwest Coastal Ponds	Little Maschaug Pond	No WB ID	Westerly								X					
Pawcatuck River Basin	Tidal Pawcatuck River/Little Narragansett Bay	Little Narragansett Bay	RI0008038E-02A/B	Westerly	X							X					
Blackstone River Basin	Abbott Run Brook & Tribs	Long Brook	RI0001006R-02	Cumberland		X						X					
Pawcatuck River Basin	Wood River & Tribs	Long Pond	RI0008040L-20	Hopkinton	X		X					X					X
Coastal Waters	Southeast Coastal Ponds	Long Pond	RI0010048L-01	Little Compton		X						X	X				
Blackstone River Basin	Blackstone River & Tribs	Lonsdale Marsh Complex (Blackstone River)	RI0001003R-01A	Lincoln, Central Falls, Cumberland		X						X	X				
Narragansett Basin	Aquidneck Water Supply & Tribs	Maidford River	RI0007035R-02A/B	Middletown								X				X	
Coastal Waters	Southwest Coastal Ponds	Maschaug Pond	RI0010043E-03	Westerly								X					
Pawcatuck River Basin	Pawcatuck River & Tribs	Matunuck Hills Complex-Long, White, Spectacle, Hot House and Lily Ponds	RI0010043L-07 (Long), RI0010043L-05 (White), RI0010043L-01 (Hothouse), No WB ID for Spectacle and Lily Ponds	South Kingstown		X						X	X				X
Pawcatuck River Basin	Pawcatuck River & Tribs	McGowan Swamp	RI0008039R-12	Westerly		X						X					
Pawcatuck River Basin	Pawcatuck River & Tribs	Meadowbrook Pond	RI0008039L-05	Richmond		X						X	X				
Pawtuxet River Basin	Pawtuxet River South Branch & Tribs	Mishnock Swamp	RI0006014L-01	Coventry								X					
Pawtuxet River Basin	Scituate Reservoir & Tribs	Moswansicut Pond	RI0006015L-04	Scituate												X	
Narragansett Basin	Aquidneck Water Supply Tribs	Nelson Pond	RI0007035L-02	Middletown												X	X

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories											
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area	
Coastal Waters	Southwest Coastal Ponds	Ninigret Pond	RI0010043E-04A	Charlestown	X	X		X				X	X			X
Narragansett Basin	Aquidneck Water Supply & Tribs	Nonquit Pond	RI0007035L-08	Tiverton		X									X	
Narragansett Basin	Aquidneck Water Supply & Tribs	North Easton Pond	RI0007035L-03	Middletown											X	
Narragansett Basin	Jamestown Water Supply	North Carr Pond	RI0007036L-01	Jamestown											X	
Narragansett Basin	Palmer River	Palmer River	RI0007022E-01A/B	Barrington, Warren		X						X				X
Narragansett Basin	Aquidneck Water Supply & Tribs	Paradise Brook	RI0007035R-03	Middletown											X	
Blackstone River Basin	Abbott Run Brook & Tribs	Pawcatuck Reservoir (Arnold Mills Reservoir)	RI0001006L-02	Cumberland											X	
Pawcatuck River Basin	Pawcatuck River & Tribs	Pawcatuck River	RI0008039R-18A/C/E	Charlestown, Westerly, South Kingstown, Richmond, Hopkinton								X		X		X
Coastal Waters	Tribes to Pettaquamscutt River	Pettaquamscutt River (Narrow River)	RI0010044E-01A	North Kingstown, South Kingstown, Narragansett		X						X	X			X
Pawcatuck River Basin	Wood River & Tribs	Phantom Bog	No WB ID	Hopkinton		X						X	X			
Coastal Waters	Southwest Coastal Ponds	Point Judith Pond	RI0010043E-06A-I	South Kingstown, Narragansett		X	X									X
Pawtuxet River Basin	Scituate Reservoir & Tribs	Ponaganset Reservoir	RI0006015L-02	Glocester											X	
Pawtuxet River Basin	Scituate Reservoir & Tribs	Ponaganset River	RI0006015R-20	Foster/Glocester	X		X								X	
Coastal Waters	Southwest Coastal Ponds	Potters Pond	RI0010043E-05	South Kingstown	X	X						X				
Pawcatuck River Basin	Pawcatuck River & Tribs	Queen River, from William Reynolds Road in Exeter to Dugway Bridge Road in South Kingstown.	RI0008039R-21A/B/C	Exeter, South Kingstown		X						X				X
Coastal Waters	Southeast Coastal Ponds	Quicksand Pond	RI0010048E-02	Little Compton		X						X	X			
Coastal Waters	Southwest Coastal Ponds	Quonochontaug Pond	RI0010043E-07	Charlestown, Westerly	X	X						X				
Pawtuxet River Basin	Scituate Reservoir & Tribs	Regulating Reservoir	RI0006015L-01	Scituate											X	
Blackstone River Basin	Abbott Run Brook & Tribs	Robin Hollow Pond	RI0001006L-04	Cumberland											X	

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories											
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area	
Narragansett Basin	Barrington & Runnins River	Runnins River	RI0007021R-01	Barrington, East Providence								X				
Coastal Waters	Block Island Waters	Sachem Pond	RI0010046L-03	New Shoreham	X							X				
Coastal Waters	Sakonnet River	Sakonnet River - waters in the vicinity of Sachuest Point and Third Beach, Middletown, RI as defined under the Coastal Barrier Resources Act.	RI0010031E-01B		X	X		X				X				
Coastal Waters	Sakonnet River	Sakonnet River - waters in the vicinity of Sakonnet Harbor as defined by the Coastal Barrier Resources Act.	RI0010031E-01D		X	X						X				
Coastal Waters	Sakonnet River	Sakonnet River - waters in the vicinity of Sakonnet Point as defined by the Coastal Barrier Resources Act and the US Fish and Wildlife's designation of Significant Coastal Habitat for the Rhode Island Sound - Buzzards Bay Beach Complex under the Northeast Coastal Areas Study.	RI0010031E-01B		X	X						X				
Coastal Waters	Block Island Waters	Sands Pond	RI0010046L-01	New Shoreham												X
Coastal Waters	Sakonnet River	Sapowet Marsh	No WB ID	Tiverton			X					X				
Coastal Waters	Southwest Coastal Ponds	Schoolhouse Pond	RI0010043L-09	Charlestown		X	X					X	X			
Pawtuxet River Basin	Scituate Reservoir & Tribs	Scituate Reservoir	RI0006015L-07	Scituate												X
Blackstone River Basin	Branch River & Tribs	Screech Hole Bog	No WB ID	Burrillville		X						X	X			
Blackstone River Basin	Branch River & Tribs	Scwindels Swamp Preserve	No WB ID	Glocester		X						X				

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories												
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area		
Pawtuxet River Basin	Scituate Reservoir & Tribs	Shippee Saw Mill Pond	RI0006015L-05	Foster	X											X	
Coastal Waters	Southeast Coastal Ponds	Sisson Pond	RI0007035L-10	Portsmouth												X	
Blackstone River Basin	Branch River & Tribs	Smith & Sayles Reservoir	RI0001002L-07	Glocester	X							X					X
Blackstone River Basin	Sneech Pond & Tribs	Sneech Pond	RI0001005L-01	Cumberland												X	
Narragansett Basin	Aquidneck Water Supply & Tribs	South Easton Pond	RI0007035L-04	Newport												X	
Narragansett Basin	Jamestown Water Supply	South Watson Pond	RI0007036L-02	Jamestown			X									X	X
Narragansett Basin	Aquidneck Water Supply & Tribs	St.Mary's Pond	RI0007035L-05	Portsmouth												X	
Narragansett Basin	Stafford Pond	Stafford Pond	RI0007037L-01	Tiverton	X							X				X	
Coastal Waters	Southwest Coastal Ponds	Succotash Marsh	No WB ID	South Kingstown								X					
Pawcatuck River Basin	Wood River & Tribs	Tippencansett Pond	RI0008040L-17	West Greenwich, Exeter		X						X	X				
Coastal Waters	Southwest Coastal Ponds	Trustom Pond	RI0010043E-08	South Kingstown				X				X					
Coastal Waters	Southeast Coastal Ponds	Tunipus Pond	RI0010048L-04	Little Compton		X											
Coastal Waters	Southwest Coastal Ponds	Twin Pond	No WB ID	Narragansett								X					
Blackstone River Basin	Blackstone River & Tribs	Valley Falls Pond	RI0001003L-02	Cumberland		X						X					
Blackstone River Basin	Wallum Lake & Tribs	Wallum Lake	RI0001001L-01	Burrillville	X		X					X				X	
Pawcatuck River Basin	Pawcatuck River & Tribs	Watchaug Pond	RI0008039L-02	Charlestown	X	X	X					X	X				X
Narragansett Basin	Aquidneck Water Supply & Tribs	Watson Reservoir	RI0007035L-07	Little Compton												X	
Narragansett Basin	West Passage Narragansett Bay	Wesquage Pond	No WB ID	Narragansett								X					X
Pawtuxet River Basin	Scituate Reservoir & Tribs	Westconnaug Reservoir	RI0006015L-03	Scituate, Foster												X	
Pawcatuck River Basin	Wood River & Tribs	Wickaboxet Pond	RI0008040L-18	West Greenwich		X						X	X				
Coastal Waters	Southwest Coastal Ponds	Winnapaug Pond & Salt Marsh	RI0010043E-09	Westerly								X					X
Pawcatuck River Basin	Wood River & Tribs	Wood River	RI0008040R-16A/B/C/D	Richmond, Hopkinton, Westerly	X							X		X	X		
Blackstone River	Woonsocket	Woonsocket	RI0001004L-02	North Smithfield												X	

Basin Name	Subbasin Name	Waterbody Name	Waterbody ID Number	Town	SRPW Categories											
					Recreation	Ecological Habitat	State Park	Federal Park	State Estuarine Area	Federal Estuarine Area	Critical Habitat (Rare and Endangered Species)	Unique Fresh Water Wetland	Wild & Scenic	Drinking Water Supply	Conservation Area	
Basin	Reservoir #3 & all Tribs	Reservoir #1														
Blackstone River Basin	Woonsocket Reservoir #3 & all Tribs	Woonsocket Reservoir #3	RI0001004L-01	North Smithfield											X	
Pawcatuck River Basin	Pawcatuck River & Tribs	Worden Pond	RI0008039L-07	South Kingstown	X	X	X					X	X			X
Pawcatuck River Basin	Wood River & Tribs	Wyoming Pond	RI0008040L-11	Hope Valley	X											
Pawcatuck River Basin	Wood River & Tribs	Yawgoog Pond	RI0008040L-07	Hopkinton	X										X	

**RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER RESOURCES**

APPENDIX E

**RHODE ISLAND SITE SPECIFIC
AQUATIC LIFE WATER QUALITY CRITERIA
DEVELOPMENT POLICY**

July 2006

Rhode Island Site Specific Aquatic Life Water Quality Criteria Development Policy

Introduction

On November 28, 1980 (45 FR 79318), and February 15, 1984 (49 FR 5831), EPA announced through Federal Register notices, the publication of 65 individual ambient water quality criteria documents for pollutants listed as toxic under section 307(a)(1) of the Clean Water Act. On July 29, 1985 (50 FR 30784), EPA published additional water quality criteria documents. Pursuant to new section 303(c)(2)(B) of the Clean Water Act, the Rhode Island Department of Environmental Management (RIDEM), Water Resources, adopted, as guidelines, the aquatic life criteria for those 307(a)(1) toxic pollutants for which there are National criteria recommendations under Section 304(a) of the Act. The purpose of these guidelines is to use optimally, and consistently, all quality data pertaining to the aquatic toxicity of a pollutant in order to determine a concentration of that pollutant which will be protective of aquatic life and support the designated uses. There is valid scientific rationale for the contention that the National criteria derived using the November 28, 1980 National guidelines (45 FR 79341) may be underprotective or overprotective at specific sites. National water quality criteria are based on laboratory toxicity tests in which aquatic organisms were exposed to known concentration of toxicants in laboratory water and, thus, may not adequately represent site water and effluent effects. The underlying intent of adopting water quality criteria into States standards is to establish a set of conditions which, if consistently achieved, will not impair the biological integrity of the aquatic community residing in the waterbody. A prominent aspect of the National criteria is a provision allowing for modification to reflect local environmental conditions. Incorporating site specific water quality criteria into discharge permits will still ensure that the aquatic community is adequately protected from the effects of toxic pollutant discharges, while considering the mitigation of toxicity due to characteristics of a local waterbody and effluent. The need to reevaluate the National criteria and develop site specific criteria can emerge from many factors including:

- 1) High natural ambient concentrations relative to standards or criteria.
- 2) The presence of substances for which water quality based effluent limits are below analytical detectability.
- 3) The possibility of complex or synergistic interactions of chemicals within the effluent and/or site water.
- 4) Observed beneficial or detrimental effects on the receiving water biota.

RIDEM has assembled an extensive data base on background, or natural, ambient concentration of various toxics (eg. copper) in groundwater-fed tributaries. An evaluation of this data base in conjunction with instream observations has revealed that the National criteria may be too stringent for several toxic parameters. In an attempt to connect acceptable instream concentrations for a chemical with the physical/chemical and toxic characteristics of a discharge and site water, RIDEM first developed this site specific criteria procedure using a Mostly Sanitary Secondary Treatment Plant's (MSSTP) effluent and designated site water in 1990. Due to the uncertainties associated with the instream fate of pollutant loading after discharge, RIDEM will not allow for unchecked or maximum attenuation of toxicity by various physical/chemical parameters in every effluent. Using

a MSSTP effluent will afford a consistent, predictable baseline behavior of specific pollutants when attenuated by standard sanitary, secondary effluent components (TSS, alkalinity, pH etc.) This procedure will allow for a moderate amount of attenuation of toxicity by a discharge and site water while addressing the concern of instream fate of pollutant loadings. However, site specific criteria may also be developed using the procedures outlined in the recently finalized EPA document entitled Interim Guidance on Determination and Use of Water-Effect Ratios for Metals (EPA-823-B-94-001 ("EPA WER Guidance")). Since the EPA WER Guidance procedures allow for the evaluation of more site specific characteristics (which may attenuate toxicity) than the RIDEM policy, a more rigorous testing program may be required when following the EPA WER Guidance than that described herein.

The new criteria developed will be applied only to sites where there are existing discharges and will be administered uniformly to disallow any significant fluctuations in toxicity that may occur due to inconsistencies in the influent component or overall treatment. Documentation of the factors that exist at a facility or within a basin, which necessitate site specific criteria development, shall be submitted to RIDEM. This documentation shall include any previous effluent or instream bioassay test results and/or evaluation of the impact of the discharge on the resident aquatic community. It is also necessary to characterize existing water quality conditions at the site or within the basin. The parameters for which site specific criteria are to be developed should be listed with an explanation of why the National criteria for these parameters can not be met. An indication of what levels of the parameters of concern could be attained after institution of an aggressive pretreatment program and exploration of other municipal standard treatment controls, should be discussed within this document.

The municipal effluent and site water data generated from this procedure will be applied to industries as a baseline for permit derivation. Furthermore, the criteria developed from one site may be applied to additional sites if it is demonstrated to the satisfaction of the Director that the hydrologic, ecological and physiographic conditions are consistent between the two sites. New permit limits will be developed in accordance with applicable federal and state regulations and laws, including antibacksliding and antidegradation prohibitions. Necessary modifications to all permits will be based on compliance bioassay monitoring results.

Methodology

As explained above, the RIDEM site specific criteria testing protocol narrowly limits the degree to which mitigation of toxicity may be considered. The main advantage of the RIDEM policy is that the criteria may be applicable to a number of discharges and site waters. However, the RIDEM protocol is also expected to result in more stringent criteria compared to the criteria resulting from following the EPA WER Guidance. The remainder of this document describes RIDEM's protocol and describes testing and data analysis. EPA's WER Guidance should be consulted for further information concerning alternative testing and data analysis procedures.

The site specific criteria shall be developed using a Mostly Sanitary Secondary Treatment Plant's (MSSTP, as designated by RIDEM) effluent with site water. This MSSTP will be a standard secondary facility with little or no industrial input. An efficient Wastewater Treatment facility which handles primarily domestic flow will offer the situation of limited buffering of toxicity due

to chemicals from industrial inputs and/or domestic organic loadings to the WWTF. Thus, this set of tests will represent a best case scenario which can be applied to almost all facilities in the state. Future routine toxicity test results shall be used to monitor continued compliance and may determine if more stringent or lenient permit limits and/or requirements are needed for all facilities.

Since the rationale for site specific criteria development is also based on potential differences in physical and chemical characteristics of the site water, the concept of a "site" must be consistent with this rationale. Therefore, the site should be defined on the basis of expected changes in the relevant parameters' biological availability and/or toxicity due to physical and chemical variability of the site water. These changes in toxicity cannot result from components present in the effluent of an upstream discharge. A site can be limited to an area affected by a single point source discharge or it can be quite large. Due to the complexity of factors, RIDEM will be responsible for delineating sites. It is postulated that a site and site water will be defined on a basin-wide level.

These bioassay tests shall be conducted in accordance with protocol listed in the Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, Fourth Edition (or most recent edition), EPA/600/4-85/013 90/027, September 1991; and the USEPA Water Quality Standards Handbook: Second Edition, EPA-823-B-94-005a, August 1994 (or most recent edition), incorporating any deviations from protocol listed herein, or additional methods if approved by the Director. These tests shall consist of acute toxicity testing of 2 species including a fish (freshwater = fathead minnow, Pimephales promelas; marine = silversides, Menidia spp.) and an invertebrate (freshwater = Ceriodaphnia spp.; marine = shrimp, Mysidopsis bahia). Effluent testing shall be conducted on a pre-chlorinated, 24 hour flow proportioned (samples collected hourly), composite effluent sample of the MSSTP. A 100% effluent sample shall be analyzed to determine the concentration(s) of the parameter(s) of concern.

Acute tests shall be run on the MSSTP effluent diluted with a designated site water (MSSTP mixture) at a ratio of 20 site water:1 effluent. The ratio of 20:1 was chosen because it represents 75% of the dilution factors established for discharges in Rhode Island. However, the Director may approve a testing protocol which is based upon the actual ratio of effluent and site water which will result under the receiving water design flow specified in Section 8.E. of the RI Water Quality Regulations. In this case, the site specific criteria will only be applicable to the particular site evaluated.

An acute screening test shall be conducted on the MSSTP mixture sample, by spiking with one toxicant of concern at concentrations high enough to determine a statistically valid LC₅₀, which is <100%, for that toxicant relevant to each species being tested. Then at least five toxicant concentrations, spaced evenly above and below the previously determined LC₅₀, and a control shall be tested. Two replicates per concentration are required and the number of organisms per replicate will depend on the species being tested (see EPA Methods Manual EPA/600/4-90/027, September 1991). In the case of freshwater testing the hardness of the site water must be monitored at the time the tests are conducted to allow for calculations of the criteria based on hardness. Each complete set of tests shall be conducted on three different occasions (dates). Chemical analyses, including hardness, of the site water and MSSTP effluent combined sample will have to be conducted to confirm the concentration of the spiked chemical on selected dilutions during each testing occasion. Selected dilutions shall include low, medium, and high concentrations on one replicate and one species. Chemical analyses of these dilutions shall be conducted on a portion of the sample taken

immediately prior to the addition of the organisms. Dissolved metal analyses must be conducted if the results of the toxicity testing will be used to establish site specific criteria for dissolved metals.

In addition, similar tests shall be conducted on a control of laboratory water spiked with the toxicant of concern at concentrations not only equivalent to those observed in the effluent, but also which will allow for a statistical comparison with the National criteria. Using the data from both sets of replicates, the LC₅₀, standard deviation, and 95% confidence intervals shall be obtained for each species tested in the laboratory water, relative to each toxicant of concern, for each of the three testing occasions. The laboratory water LC₅₀ test results shall be compared to the National acute LC₅₀ values obtained for each testing occasion to confirm the validity of these site specific tests.

Using the data from both sets of replicates, the LC₅₀, standard deviation, and 95% confidence intervals shall be obtained for each species tested in the MSSTP mixture, relative to each toxicant of concern for each of the valid testing occasions. Species-specific water effect ratio shall be calculated for each of the valid testing occasions by dividing the laboratory water LC₅₀ into the MSSTP mixture LC₅₀. Two species-specific final WER shall be calculated as the geometric mean of the valid WERs (from each species). These two specific WERs shall be compared to see if they are significantly different ($p \leq 0.05$). If these two species-specific WERs are not different, then the final site specific WER is the geometric mean of these two WERs. If the two species-specific water effect ratios are statistically different, then the WER from the most sensitive species shall be the final site specific WER.

If the final site specific WER is not significantly different from a value of one (1.0), then the National Acute Criteria is the Site Specific acute criteria. If the final site specific WER is significantly different from a value of one (1.0), then the Site Specific Criteria shall be calculated by multiplying the final site specific WER times the National freshwater acute criteria formula or the National saltwater acute criteria, as appropriate. The Director may determine not to use all of the valid testing occasions to calculate the final site specific WER if necessary to protect aquatic life.

If a National acute/chronic ratio was used to develop the National chronic criteria for the chemical of interest, the site specific chronic criteria is calculated by multiplying the site specific acute criteria by 2 and then dividing by the National acute/chronic ratio.

If the National acute/chronic ratio for the toxicant of concern does not exist, a site specific chronic criteria can also be obtained by testing species for chronic toxicity. Tests shall be conducted on two species, including a fish (freshwater = fathead minnow, *Pimephales promelas*; marine = silversides, *Menidia spp.*), and an invertebrate (freshwater = *Ceriodaphnia spp.*; marine = shrimp, *Mysidopsis bahia*) using a laboratory water control sample and the MSSTP effluent with site dilution water at a ratio of 1:20. However, the Director may approve a testing protocol which is based upon the actual ratio of effluent and site water which will result under the receiving water design flow specified in Section 8.E. of the RI Water Quality Regulations. In this case the site specific criteria will only be applicable to the particular site evaluated.

The chronic tests shall be conducted in accordance with protocol listed in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine

Organisms, May 1988, EPA/600/4-87/028 (or most recent edition), and Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms Second Edition, March 1989, EPA/600/4-87/001 (or most recent edition), incorporating any deviations from protocol listed below.

A chronic screening test shall be conducted on the MSSTP and site dilution water mixture by spiking with one toxicant of concern at concentrations high enough to determine a statistically valid chronic toxic effect value for that toxicant relevant to each species being tested. Then at least five toxicant concentrations, spaced evenly above and below the previously determined chronic toxic effect value, and a control, shall be tested. The number of replicates per concentration and the number of organisms per replicate will depend on the species being tested in accordance with the EPA protocol. For freshwater tests, the hardness of the site water must be monitored at the time the tests are conducted to allow for calculations of the criteria based on hardness. Each complete set of tests shall be conducted on three different occasions (dates). Chemical analyses, including hardness, of the site water and MSSTP effluent combined sample will have to be conducted to confirm the concentration of the spiked chemical on selected dilutions during each testing occasion.

Selected dilutions shall include low, medium, and high concentrations on one replicate and one species. Chemical analyses of these dilutions shall be conducted on a portion of the sample taken immediately prior to the addition of the organisms.

Using the data from all sets of replicates, the No Observed Effect Concentration (NOEC), Lowest Observed Effect Concentration (LOEC), and Maximum Acceptable Toxicant Concentration (MATC) for each species tested in the lab water tests, relative to each toxicant of concern, for each of the three testing occasions. The results of the laboratory water test obtained for each testing occasion are compared with the National chronic value to determine the validity of these site specific tests.

Using the data from all sets of replicates, the No Observed Effect Concentration (NOEC), Lowest Observed Effect Concentration (LOEC), and Maximum Acceptable Toxicant Concentration (MATC) shall be obtained for each species tested in the MSSTP effluent, relative to each toxicant of concern for each of the valid testing occasions. Species-specific water effect ratios shall be calculated for each of the valid occasions by dividing the chronic value from the laboratory water test into the chronic value from the MSSTP effluent test. Two species-specific final WERs shall be calculated as the geometric mean of the valid WERs (from each species).

If the two species-specific WERs are not significantly different (confidence limits overlap), then the final site specific WER is the geometric mean of these two WERs. If the two species-specific final WERs are significantly different from each other, then the WER from the most sensitive species shall be the final site specific WER.

If the final site specific WER is not significantly different from a value of one (1.0), then the National chronic criteria equals the site specific chronic criteria. If the final site specific WER is significantly different from a value of one (1.0), the site specific Chronic Criteria can be calculated by multiplying the final site specific WER by the National Freshwater Chronic Criteria Formula or the National Saltwater Chronic Criteria, as appropriate. The Director may determine not to use all of the valid testing occasions to calculate the final site specific WER if necessary to protect aquatic life.

Permit Limits and Requirements

The information obtained from the three testing occasions will be reviewed by RIDEM to determine the Final Site Specific criteria for each parameter evaluated. If the results from these test procedures do not change the National criteria, the National criteria would apply to all dischargers on the waterbody and would be used to derive permit limits where necessary. Chemical specific limits will be developed for those pollutants which would cause an excursion above the National criteria and will be incorporated into permits on a case-by-case basis. Dischargers would be required to redesign their facility, if necessary, to ensure compliance with the National criteria and permit limits. Bioassay monitoring requirements and whole effluent toxicity (WET) limits may be developed and incorporate into permits, as necessary, based on previous bioassay test results, continual toxicity during compliance monitoring and new data from dilution studies.

If the results from these test procedures justify changing the National criterion to a site specific criterion, these new ambient criteria would apply to all dischargers on within the designated site and would be used to derive permit limits. For freshwaters, the site specific criteria will be established by multiplying the National criteria, determined at the hardness anticipated during the design receiving water flow, by the final water effect ratio(s). These permits may include chemical specific limits and/or whole effluent toxicity limits. Whole effluent toxicity limits and specifics of bioassay monitoring requirements will be based on previous bioassay test results, continual toxicity during compliance monitoring and new data from dilution studies.

If toxicity testing is incorporated into a permit, facilities with 20:1, or less dilution may be required to conduct chronic toxicity tests. Facilities with a 20.1-100:1 dilution may be required to conduct acute tests. Facilities with greater than 100:1 dilution may also be required to conduct acute toxicity tests. WET limits may be developed based on EPA's acute and/or chronic Toxic Units Method although meeting a minimum LC_{50} may be required if best professional judgement deems it is necessary. Toxicity Identification Evaluations (TIE) and Toxicity Reduction Evaluations (TRE) may be required of any discharger if bioassay compliance monitoring indicates continual toxicity. In addition, bioassessment studies may be required to ensure the integrity of the instream aquatic community.