Project Management and Objectives Elements

1.1 Quality Assurance Project Plan Approval Sheet

Program Title: Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey and Pennsylvania (MACWA RAM Umbrella QAPP 1.0)

Project Title: Rapid Assessment of Tidal Wetlands in Representative Watersheds of the Delaware Estuary. EPA # 83458901-0. (MACWA RAM Project QAPP 1.1)

Organization name:	Partnership for the Delaware Estuary & Barnegat Bay Partnership
Effective date:	June 1, 2010[1]
Approval:	
Project Start Date:	May 1, 2010
Project End Date:	April 30, 2012

Project Manager &: QA Officer

Danielle Kreeger Date: 5/3/10

Danielle Kreeger, PhD, Science Director
Partnership for the Delaware Estuary

EPA Project Officer :

Date: 6/17/10

Gregg Serenbetz
EPA Office of Wetlands, Oceans and Watersheds

EPA QA Officer:

Date: 6-17-10

Chuck Spooner
EPA

[1] Effective date may be changed to reflect the date of signature of agreement between EPA HQ, EPA Region 2, and the Partnership

Addendum to Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey & Pennsylvania (MACWA RAM Umbrella QAPP 1.0)

Rapid Assessment of Tidal Wetlands in Representative Watersheds of the Delaware Estuary: MACWA RAM Project QAPP 1.1 for EPA Grant #83458901-0.

Quality Assurance Project Plan
MACWA RAM Project QAPP v1.1

Partnership for the Delaware Estuary

Note: The Mid-Atlantic Coastal Wetland Assessment (MACWA) consists of two components: rapid assessment methods (RAM) and site-specific intensive monitoring (SSIM). A general QAPP is available that describes methods and data quality objectives for each of the two components, referred to as the MACWA RAM Umbrella QAPP and the MACWA SSIM Umbrella QAPP. Project-specific statements of work with details such as location information, sampling density and timelines are omitted from the two umbrella QAPPs. These details are included in supplemental, project-specific QAPP's that are considered as addenda to the umbrella QAPPs. This document is Project QAPP 1.1, which is the first addendum to the MACWA RAM Umbrella QAPP v1.0. Any future revision of the umbrella QAPP will be denoted as a new version number (whole number to the left of the decimal; e.g. from 1.0 to 2.0) and be applied to all addenda (e.g., from 1.1 to 2.1 for this QAPP.)

Date: June 1, 2010

Prepared by: Danielle Kreeger, PhD, Science Director and Angela Padeletti Science Specialist, Partnership for the Delaware Estuary

Prepared for: United States Environmental Protection Agency, Head Quarters

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Partnership for the Delaware Estuary

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Gregg Serenbetz
EPA Office of Wetlands, Oceans and Watersheds

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[1] Effective date may be changed to reflect the date of signature of agreement between EPA HQ, EPA Region 2, and the Partnership

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1.3 Project/Task Organization

The relationships of the main partners are summarized in Figure 1 and identified below. The principal investigator responsible for scientific guidance and analysis is D. Kreeger.

Project Managers

Danielle Kreeger, PhD, Science Director of the Partnership for the Delaware Estuary (PDE) will be responsible for the overall organization and implementation of the Rapid Assessment of Tidal Wetlands in Representative Watersheds of the Delaware Estuary Project, EPA Grant # 83458901-0. This organization will coordinate various subawardees to PDE as well as maintain the official approved QA Project Plan for PDE and this addendum. In our small National Estuary Program we cannot afford to provide a separate Project Manager and QA manager. Therefore Dr. Kreeger will serve as both the QA officer as well as the Project Manager for this project.

Collaborators – Subawardee and Associates

David Velinsky, PhD, Vice President and Director of the Patrick Center for Environmental Research, Academy of Natural Sciences of Philadelphia will be a subawardee for this project and will help with the collecting of rapid assessment data as well as provide a boat to access some sites.

Amy Jacobs, Delaware Department of Natural Resources and Environmental Control (DNREC) will provide a seasonal employee to assist in the implementation of the rapid assessments in the state of Delaware. Ms. Jacob's group will also transfer their vast knowledge about the Mid Atlantic Tidal Rapid Assessment Method to PDE staff and their partners.

State Partners

Bartholomew Wilson, Delaware Department of Natural Resources and Environmental Control (DNREC) will coordinate Delaware State efforts in collaboration with their ongoing rapid assessment efforts.

Thomas Belton, PhD, New Jersey Department of Environmental Protection (NJDEP), and Dorina Frizzera, New Jersey Coastal Zone Program (NJCZP) will work with PDE to facilitate coordination and data sharing with other monitoring in New Jersey and help with any state-specific needs of the project.

Kevin Hess, Pennsylvania Department of Environmental Protection (PADEP) will assist in meeting any state-specific needs as well as coordinate with monitoring occurring in Pennsylvania.

Federal Partners

US EPA Quality Assurance Officer: Chuck Spooner will perform the responsibilities of a Quality Assurance Officer for the US Environmental Protection Agency.

US EPA Project Officer: Greg Serenbetz, Office of Wetlands, Oceans and Watersheds, will perform responsibilities as Project Officer for this project.

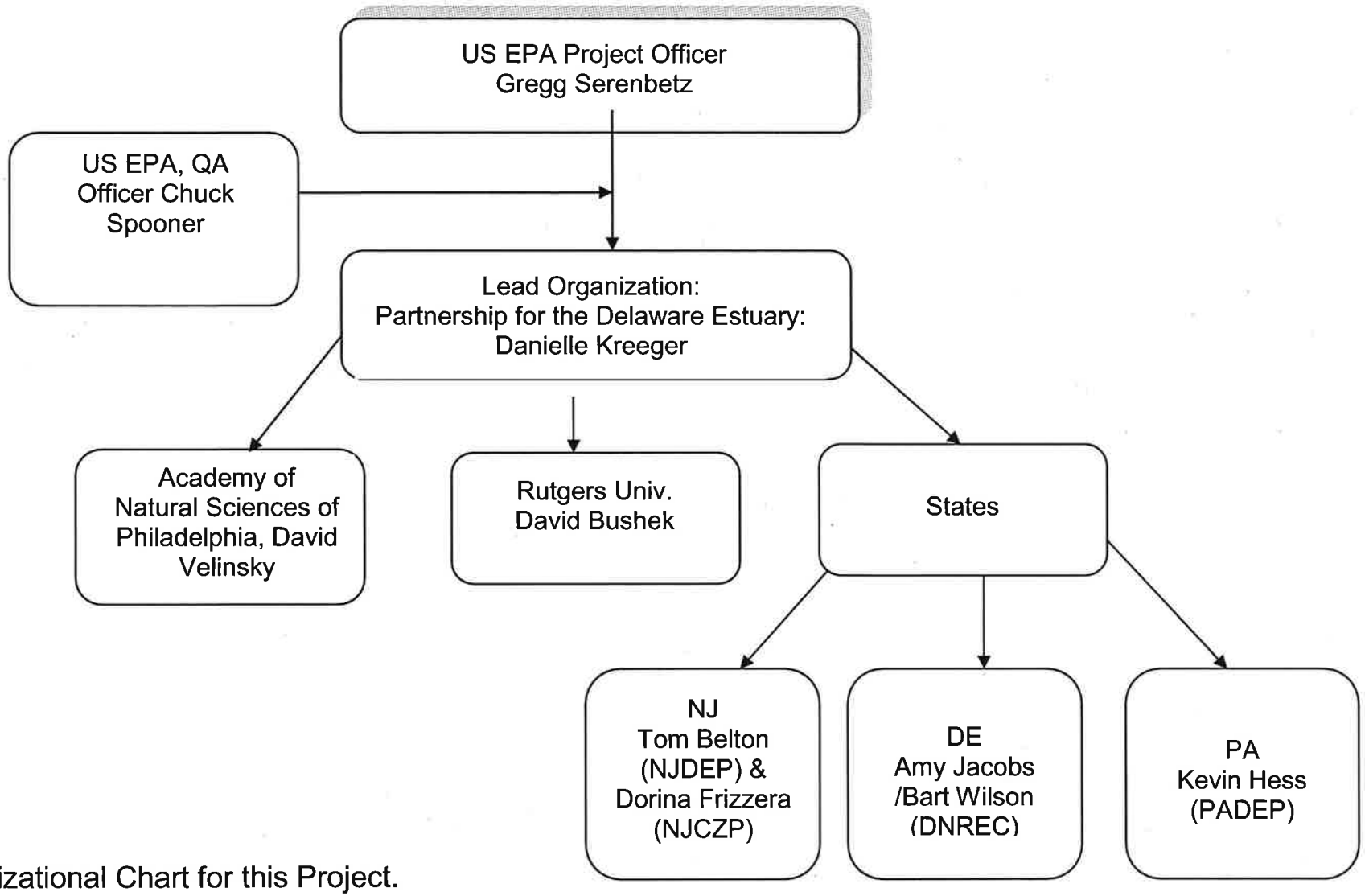

Figure 1: Organizational Chart for this Project.

1.4 Problem Definition/Background

1.4.1 Problem Definition

See page 14, Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey & Pennsylvania, Version 1.0

1.4.2 Background

See page 14, Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey & Pennsylvania, Version 1.0. This specific project (EPA # 83458901-0) is a Wetland Program Development Grant awarded to the Partnership for the Delaware Estuary to permit the first series of rapid assessments for tidal wetlands within four tributary watersheds to the Delaware Estuary during 2010-2011.

1.5 Project/Task Description

Sites Since a full probabilistic survey of all tidal wetlands of the Delaware Estuary would entail sampling at thousands of sites to cover this sample frame and subpopulations, the initial approach of the Mid-Atlantic Coastal Wetland Assessment (MACWA) will be to focus on distinct watersheds that represent this sample frame and which, together, contain representative subpopulations and varying stressor conditions. The four representative watersheds selected to be surveyed here will augment efforts by the State of Delaware to assess tidal wetlands in two watersheds in the central portion of the state (St. Jones and Murderkill). Specifically we will assess 120 sampling points, 30 in each of four representative watersheds (Table 1). Figure 2 shows spatially the locations of the four tributary watersheds that will be sampled in this project. Completion of additional sample points will be contingent on additional grants and addressed with separate project-specific QA plans (addenda to MACWA RAM Umbrella QAPP 1.0) if funded by EPA.

Per watershed, 30 sample points will be studied within HUC12 delineations. These points will be randomly selected with the help of US EPA's Western Ecology Division with their environmental statisticians. We will provide EPA with the USFW National Wetlands Inventory GIS layer that has the tidal wetlands delineated within the HUC12 watershed unit, and we will request a 2x – 3x overdraft of random points within each watershed. The additional points will be sequentially selected if additional funding is acquired to boost sample point density as well as to allow for the rejection of sample points from the initial set of thirty in the instance that a site is inaccessible or for any other reasons that are stated in the Mid-Atlantic Tidal Wetlands Rapid Assessment Method (Appendix C of the MACWA RAM Umbrella QAPP 1.0) in the section "Establishing the Assessment Area".

Tidal wetlands in the Delaware Estuary are impacted by diverse stressors. Salt marshes appear impacted by seaward erosion and interior decay from various anthropogenic and natural disturbances, whereas brackish marshes are disturbed by invasive *Phragmites*, hydroplogic alterations, development, etc. Freshwater tidal marshes appear most degraded by contaminants, nutrients, hydrologic alteration, and development. All appear constrained in their landward migration by development in their buffers. By surveying 30 points in each watershed, we will characterize the condition of the principal diversity of stressors and marsh types across the estuary. For data comparison, fixed monitoring stations are separately being established in at least 3 of these watersheds and stations are planned for the fourth watershed, contingent on funding from other sources (see MACWA SSIM Umbrella QAPP 1.0.)

All equipment needed to perform this study can be found in Appendix C of the MACWA RAM Umbrella QAPP 1.0. There are no special personnel required for this project, only training that is described in section 1.7.

Table 1: Survey design for rapid assessment of 120 tidal wetland sample points within four representative tributary watersheds of the Delaware Estuary.

State	Watershed	Estuary Region	Dominant Marsh Type	Points	Year
DE	Broadkill	Polyhaline	Salt marsh	30	1 (2010)
DE	Christina	Oligo- to Mesohaline	FW tidal marsh	30	2 (2011)
NJ	Maurice	Polyhaline	Salt marsh	30	2 (2011)
PA	Lower Del.	Oligohaline	FW tidal marsh	30	2 (2011)

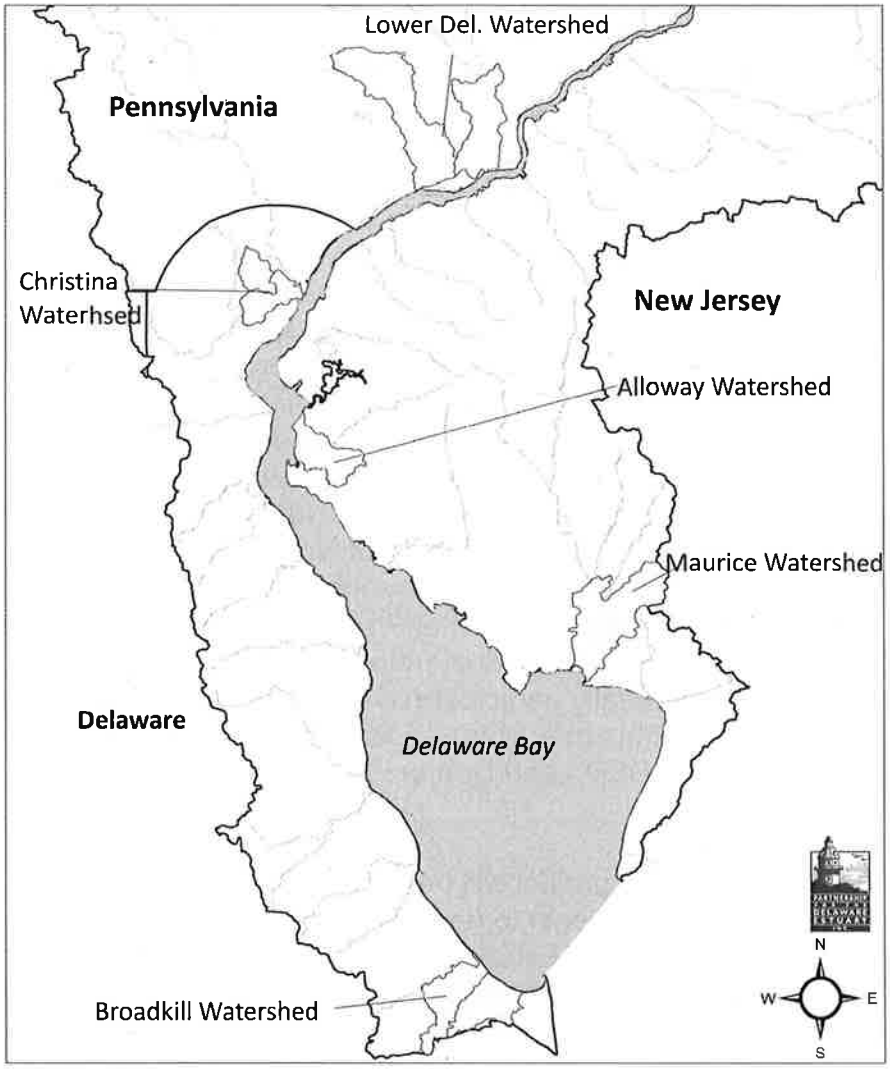

Figure 2: Watersheds where rapid assessments will be performed in the Delaware Estuary. Alloway watershed is an alternate to the four watersheds targeted.

Probabilistic Sampling at Random Sites (RAM, Tier 2):

Timeline: This project will span two years. Two watersheds will be assessed in late summer, 2010, and the other two watersheds will be assessed in 2011 (Table 1). ***Phase 1*** of the project will be performed in winter-spring 2010 and will consist of planning and purchasing supplies, finalizing the probabilistic design, securing landowner permission and arranging collecting permits. ***Phase 2*** will consist of summer 2010 field work, which will be assessing up to 30 sites in each

of two of the four watersheds. ***Phase 3*** will consist of Year 1 data entry, analysis, and dissemination during the period between fall 2010 and spring 2011. ***Phase 4*** will consist of summer 2011 field work, which will include assessing 30 sites in each of two watersheds (Table 1). ***Phase 5*** will consist of 2011 data entry and analysis, 2010 to 2011 data interpretation, and study of interrelationships with watershed stressors and data from nearest fixed monitoring stations. ***Phase 6*** will consist of final report preparation and dissemination of results to regional managers and at national meetings.

Roles of Partners: PDE will coordinate all tasks associated with this grant. PDE will be responsible for communicating among various collaborators and the Mid-Atlantic Coastal Wetland Assessment Group (MACWAG) including staff from three state agencies; EPA Regions 2 and 3; and national and Mid-Atlantic workgroups. PDE will establish subcontracts and manage budgets, oversee and directly participate in all field work, manage data according to our QA Program, interpret results for diverse audiences, and prepare interim and final reports. The MACWAG will provide technical guidance and in-kind support. Member organizations with local knowledge of targeted watersheds will be engaged as subawardees. Examples include the Academy of Natural Sciences (ANSP), Barnegat Bay Partnership (BBP), DE Division of Natural Resources and Environmental Control (DNREC), NJ Department of Environmental Protection (NJDEP), PA Department of Environmental Protection (PADEP), Rutgers University, and Villanova University. Most notably, staff from each of the three state agencies plan to materially participate in both technical advising and field assessments that occur within their states. Examples include Amy Jacobs (DNREC,) Kevin Hess (PADEP,) and Dorina Frizzera and Dr. Thomas Belton (NJDEP.)

Primary data collected in this project will be synthesized with secondary data obtained from our partners to begin to develop a network of wetland condition information across the Delaware Estuary and the adjacent coastal habitats. Associated datasets and reports will be interpreted in the context of stressor gradients (nutrients, contaminants, development) and climate change (sea level rise, species range shifts). Condition data will also be contrasted with information being collected in intensive studies at fixed stations to begin to deduce relationships between tidal wetland condition and function, with management implications regarding ecosystem services, restoration planning, and climate adaptation.

1.6 Quality Objectives and Criteria for Measurement Data

See Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey & Pennsylvania, Version 1.0 (page 14).

1.7 Special Training Needs/Certification

See Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey & Pennsylvania, Version 1.0 (page 14)

1.8 Reporting, Documents, Records & Reports to Managment

PDE will work with our Science and Technical Advisory Committee (STAC) and the Mid-Atlantic Coastal Wetland Assessment Group (MACWAG) to review data and reports and make any adjustments deemed necessary. All final data will be kept at the Wilmington, DE offices of the PDE. Electronic versions of all data will be backed up electronically on the PDE's server as well as copied onto a CD monthly. Paper field notes will be copied and stored at the PDE offices as well as provided to the project partners.

A final report for this project will be prepared 90 days after the project period ends (4/30/2012)in a legible font and font size, and this will detail methods and results, summarize field data, summarize lab data, report about the field audit, and all field log and data sheets. Data obtained from this project may also be used to produce a manuscript for submission to a peer reviewed journal. Electronic formats of data will include excel files, word documents, MS access files, csv files, jpgs.

Intern reports will be submitted 30 days after each six month anniversary of the award (5/1/2010). Sub awardees are required to provide intern reports as to their specific contracts as well as a final report to the Project managers.

All data (hard copy and electronic) will be stored at PDE for a period of 10 years after the conclusion of the project.

Monitoring and Assessment data will be in the following documentation:

- Field data sheets
- Field log books
- Field validation sheets
- Site maps
- Sample preparation notes
- Laboratory analysis reports
- QC checks of laboratory results
- Calibration of instrument results
- Instrument printouts
- QAPP reports
- Computer database of field data

- Computer files of background papers and reports
- Yearly Reports
- Final Report

For sections 2.0 through 3.5, please refer to:

PDE and BBP 2010. Rapid Assessment Monitoring Program for Tidal Wetlands of Delaware, New Jersey & Pennsylvania: Quality Assurance Project Plan Version 1.0 (MACWA RAM Umbrella QAPP 1.0). Prepared by the Partnership for the Delaware Estuary and Barnegat Bay Partnership for EPA, June 2010. 40 p.