Water Quality Monitoring Plan for Bridge Demolition Activities for the

New NY Bridge Project

Revision 09 August 3, 2017

Prepared by **Tappan Zee Constructors, LLC** 555 White Plains Rd., Suite 400 Tarrytown, NY 10591



Document History									
Issue Date	Description	By	Revision						
3/06/2013	Submitted for NYSTA review	SZ/VW	0						
4/11/2013	Revised per NYSTA comments	SZ/WV	1						
5/02/2013	Revised per NYSDEC comments	VW	2						
8/21/2013	Revised per NYSDEC Permit Modification	VW	3						
7/15/2014	Revised per NYSDEC Permit Modification	CC	4						
7/25/2014	Revised per NYSTA comments	CC	5						
8/1/2014	Revised per NYSDEC comments	CC	6						
6/3/2016	Revised to include Drilled Shaft Monitoring	CC	7						
12/12/2016	Revised to included Modified Sampling Procedures& Drilled Shaft Monitoring Requirements	CC/JLC	8						
8/03/2017	Revised to include Demolition Activities and per NYSDEC comments	JLC	9						



Table of Contents

1.0	Intro	luction	.1							
2.0	Monitoring Objectives1									
3.0	Methe	ods	.3							
	3.1	Visual Observations	.3							
	3.2	Vessel Based Whole Water Samples	.4							
	3.3	Reduced Water Quality Monitoring	.5							
4.0	Repo	rting	.5							
	4.1	Analytical Results	.5							
	4.2	Water Quality Standard Exceedances	.6							
	4.3	Reporting	.6							

Attachments

Attachment A. Visual Observation Forms



1.0 Introduction

The New York State Department of Environmental Conservation Permit DEC ID 3-9903-00043/00012 (NYSDEC Permit) and subsequent modifications through and including July 3, 2014 letter from NYSDEC for the Tappan Zee Hudson River Crossing Project (Project) sets forth the requirements for water quality monitoring during demolition. This Water Quality Monitoring Plan (Plan) reflects these requirements and meets the Environmental Performance Commitments (EPCs) identified in the Final Environmental Impact Statement (FEIS). The Plan for construction activities is described in Revision 8 of this Plan. The Plan for demolition activities is described in the sections below.

2.0 Monitoring Objectives

The overall objective of this program is to monitor demolition activities for total suspended solids (TSS) and contaminants via the collection and analysis of whole water samples and for turbidity through visual inspection as described in Table 1. If a specific demolition activity is occurring at multiple locations on a given day, water quality samples will be collected from a single representative location where the activity is occurring. If one of the locations is within Area 1 or 6, the single representative sample would be collected from these areas to the maximum extent practicable.

Table 1. Water Quality Monitoring Required by Demolition Activities Associated with the Tappan Zee Hudson River Crossing Project

Demolition Activity	Water Quality Monitoring
	Ice Breaker and Fender Removal
Timber Pile Clusters (Ice breakers/ dolphins)	Daily visual monitoring for turbidity extending beyond 500ft mixing zone or full depth turbidity curtain if in Area 1. Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone or turbidity curtain if in Area 1. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing
	zone; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.
Timber/Steel Fender Frame	 Daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.



Demolition Activity	Water Quality Monitoring
Triangular Concrete Ice Breakers	Daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.
Main Span Fender:	Daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.
	Foundation Removal
Timber pile foundation removal	Daily visual monitoring for turbidity extending beyond 500-ft mixing zone or outside of full depth turbidity curtain if in Area 1; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone or outside of full depth turbidity curtain if in Area 1. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone or outside the turbidity curtain if in Area 1; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.
Circular Caissons	Daily visual monitoring for turbidity extending beyond 500-ft mixing zone or outside of full depth turbidity curtain if in Area 6; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60,61, and 64 at the edge of a 500-foot mixing zone. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone or outside the turbidity curtain if in Area 6; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.



Demolition Activity	Water Quality Monitoring
Rectangular Caissons	Daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.
Debris Recovery from River Bottom (If conducted as a stand alone activity separate from a demolition activity)	Daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS and contaminants for compliance with WQ Standard Permit Condition 59, 60, 61, and 64 at the edge of a 500-foot mixing zone. Per NYSDEC approval: Reduced to daily visual monitoring for turbidity extending beyond 500-ft mixing zone; Collection of whole water samples for TSS twice per week or twice per every seven days the activity occurs following the first five monitoring events of whole water sample collection.

3.0 Methods

Water quality monitoring methods will vary based on in-water demolition activity (i.e. visual observation or vessel based whole water sample collection). Based on the width of the Hudson River and hydrodynamics in the area, multiple activities can be monitored or sampled each day with one survey crew. If all activities can not be monitored or sampled by a single crew, additional crews or vessels will be used as necessary.

The sections below describe the methods for the water quality monitoring plan.

3.1 Visual Observations

Visual observations of activities will be conducted by a barge-based or vessel-based observer during the activities identified in Table 1.

An observation of turbidity that extends beyond the 500-ft mixing zone or in the vicinity of the demolition activity, as specified in Table 1, will be reported immediately to the Environmental Compliance Manager (ECM) or designee who will then inform NYSTA, OECM, and NYSDEC. The ECM or designee will immediately coordinate with Tappan Zee Constructors, LLC (TZC) operations to implement corrective actions as to comply with water quality standards.

Visual observations will be documented on one or more field forms (Attachment A). Observations forms include but are not limited to:



- Environmental Checklists (ENV CL)
- Field Compliance Reports (FCR)
- Visual Inspection Forms (VIF)

If an exceedance is reported during reduced monitoring for an activity listed in Table 1, then additional monitoring will be implemented as specified in Section 3.3.

3.2 Vessel Based Whole Water Samples

Vessel-based water quality monitoring will be conducted for activities as specified in Table 1. TSS and contaminant whole water samples will be collected during either the flood or ebb tide stage during daylight hours. Water quality monitoring via whole water sample collection will be conducted daily for each activity.

Daily visual observations as described in Section 3.1 will continue through the duration of activities described in Permit Condition 59. If there is an exceedance of 100 mg/l above ambient TSS value or the observation of turbidity extending beyond 500-ft mixing zone, then corrective actions will be taken and the NYSDEC will be consulted to determine if additional monitoring is required. NYSTA and the OECM will notify NYSDEC to any corrective actions implemented. Vessel-based monitoring may be temporarily suspended due to weather or other safety concerns. If monitoring is temporarily suspended NYSTA and the OECM will be notified who will inform the NYSDEC. Conditions resulting in suspension of monitoring due to weather or other safety concerns will be documented in the reports described in Section 4.1 and 4.3.

3.2.1 In-Plume (Downcurrent)

In-plume surveys will be collected at the edge of the 500-ft mixing zone, or at the nearest practicable proximity to a silt curtain, if one is used. An Acoustic Doppler Current Profiler (ADCP) will be used to identify the plume. An Optical Backscatter Sensor (OBS) configured to record turbidity (NTU), depth (meters), temperature (°C) and salinity (ppt) will be mounted to a submersible pump and used to collect vertical profiles at water sample station locations. Simultaneously, the pump will be used to collect discrete whole water samples at separate depths for laboratory analysis of TSS and contaminants. When water depth is less than 10 feet, only mid-depth samples will be collected. When water depth is greater than 20 feet, samples will be taken from near-surface and near-bottom. When water depth is greater samples will be taken from near-surface, mid-depth, and near-bottom. Near-surface samples will be collected from approximately three feet below the surface, mid-depth will be collected approximately half-way between the bottom and surface and bottom samples from approximately three feet above the bottom. The water samples will be preserved at 4° C and sent to the laboratory for analysis under full Chain-of-Custody protocols.

3.2.2 Background (Upcurrent)

In addition to in-plume surveys, ambient surveys will be conducted using the same methods and procedures described above. Ambient surveys will be conducted along a transect a minimum of 500-ft up current of the source to provide data for comparison with the in-plume surveys. This transect will be conducted at a location up current of the source where the water quality effects of the project are no longer discernible. Samples will be collected in the same manner as the in-plume surveys.

3.2.3 Contaminant Analyses

To obtain measurements of water quality within the water column, whole water samples will be collected per Section 2.0 during each survey at the upcurrent and downcurrent transect. These samples will be collected using the pump sampler at the required depths, and will be analyzed for the parameters listed in Permit Condition 61.

The samples to be analyzed for dissolved nickel, copper, lead and zinc will be filtered in the field. All samples will be prepared, preserved as required, maintained at 4°C and shipped to a New York State Department of Health Environmental Laboratory Approval Program certified lab under full Chain-of-Custody protocols.

If an exceedance is reported during reduced monitoring for an activity listed in Table 1 then additional monitoring will be implemented as specified in Section 3.3.

3.2.4 Modified Whole Water Sample Collection due to Limited Access, Safety, or Other Operational Concerns

In the event that the site configuration would prevent the collection of whole water samples as outlined in Section 3.2.1 or Section 3.2.2 as described above, due to limited access, monitoring crew safety, or other operational concern, TZC will request to modify the collection of whole water samples for a specific operation to allow for representative samples to be collected while ensuring the safety of staff and equipment.

TZC will collect water quality samples using a battery powered pump sampler or a Niskin water sampler for the downcurrent and upcurrent samples. A field inspector will position themselves in a location that is safely accessible and collect a representative water quality sample. The water depth will be measured prior to collecting a sample and sample depths will be collected as specified in Section 3.2.1. To fill the requisite sample volumes, multiple niskin samples may be required to be collected from a given depth. An ADCP and OBS unit will not be used during collection of samples. The water samples will be preserved at 4° C and sent to the laboratory for analysis under full Chain-of-Custody protocols. The collected samples will be analyzed for and reported upon according to Section 3.2.3.

3.3 Reduced Water Quality Monitoring

Following the receipt of five consecutive water quality monitoring events with no water quality standard exceedances for an activity listed in Table 1, TZC will provide the results to NYSTA, OECM, and NYSDEC and request to follow a reduced monitoring schedule per Permit Condition 64. Following approval by NYSDEC, documented in the form of a letter or e-mail, TZC will follow the reduced monitoring schedule for that activity as stated in Table 1.

If, during the reduced sampling for any activity, visible turbidity is observed immediately outside of a silt curtain or at the edge of the 500-foot mixing zone (per Table 1) or if there is an exceedance of 100 mg/L above the ambient TSS value, corrective action shall be taken and TSS monitoring frequency shall return to daily (every day that the activity occurs) for that activity until such time as TSS concentrations are less than 100 mg/L above ambient values on two consecutive measurements and visible turbidity is not observed immediately outside of a silt curtain or at the edge of the 500-ft mixing zone (per Table 1). NYSDEC may specify additional monitoring until compliance is demonstrated. Samples shall be collected until NYSDEC approves resumption of reduced monitoring.

4.0 Reporting

4.1 Analytical Results

All analytical results (i.e. TSS and contaminants) of water samples collected in Section 3.1. will be provided to NYSTA and the OECM. The OECM will transmit the analytical results to the NYSDEC by fax or email within 48 hours of receipt of the data results from TZC. Any exceedances will be highlighted by TZC. Exceedances will be based on differences in TSS and contaminant concentrations from analytical results of the water samples between the upcurrent and downcurrent stations, when the background concentration exceeds the water quality standards or detection limits in Permit Condition 61. Otherwise, exceedances will be based on the water quality standards or detection limits in Permit Condition 61.

Following receipt of five samples for an activity monitoring TZC will provide the results and request for reduced monitoring to NYSTA and OECM who will forward it to NYSDEC. TZC will follow the reduced sampling schedules provided in Table 1 once approved by NYSDEC.

4.2 Water Quality Standard Exceedances

In the event of an exceedance of a water quality standard for TSS and contaminants based on the analytical results of the water samples or field form documented visual inspections of turbidity as described in Permit Condition 64.c, NYSTA, OECM, and NYSDEC will be notified. Corrective actions will be taken and TSS monitoring will return to daily for that activity until TSS concentrations are less than 100 mg/l above ambient values on two consecutive measurements and turbidity is not observed extending beyond the 500-ft mixing zone. With NYSDEC approval, activity monitoring would return to the reduced schedule stated in Table 1. Based on the Plan, in consultation with the OECM and NYSDEC, the inwater activities will be re-evaluated in consultation with NYSDEC to determine the need for procedural changes.

4.3 Reporting

Three (3) copies of the annual water quality monitoring report, summarizing the results of the water quality monitoring program and analyses will be submitted to NYSDEC for review within 30 days following the New Year.

ATTACHMENT A Visual Observation Forms

TAPPAN ZEE CONSTRUCTORS, LLC

DEMOLITION ENVIRONMENTAL CHECKLIST

Ν

NA

Y

Ν

Time Notified:

INSTRUCTIONS: Complete Section A for all work. Complete Sections below as work progresses for those activites. **CHECK POINTS (CP) must be initialed by responsible person before work progresses.** Return completed form at end of shift.

Pier/Bent # .:		Date:	Sup	erintendent:					
SECTION A. GENERAL REQUIREMENTS									
A1. Spill Prevention (circle NA if no	ot applicable)								
(CP) Spill Kit and SPCC Plan readily available (confirm spill kit content list is stocked, circle and initial)									
Sheen or spill of ANY size observed									
If Yes, immediately notify ECT a	and take co	prrective action		Persons Notified:		Time Noti	fied (hh mm	ı):	
A2. Peregrine Falcon Protectio	n (circle NA if	activity or equipmer	nt is desig	gnated unlikely landing site for falcons)					
Checkerboard flag installed at t	op of cran	es (circle one)				Y	N	NA	
B3. Sturgeon See below for examples	. Complete at	end of shift or wher	n fish/ bir	rds observed.					
Sturgeon observed (circle): Y N If Yes immediately notify ECT and fill out sections below									
Observer Name: Time(s) obs									
ECT Member(s) Notified: Time Notified (hh m								n):	
2-mm Wedgewire screen used for intakes from Hudson River Y								NA	
		SECTION B.	SUP	ER/SUBSTRUCTURE DEMOL	ITON		•	•	
Activity Information (circle one):		A. Saw Cutting	g В. (Core Drilling C. Other					
1. (CP) Debris net/shielding inst	talled prio	r to superstruct	ure wo	ork:	initial here	Y	N	NA	
2. Dust suppression implimented if potential for fugitive dust Y								NA	
If No , immediately notify ECT a	nd take co	rrective action		Persons Notified:		Time Noti	fied:	•	
If corrective action taken, state	action tak	en:							
SECTION C. INWATER/FOUNDATION DEMOLITION									
Activity Information (circle one):	A. Cuttir	ng/Hoe Rammi	ng	B. Sediment Displacement	C. Debris Re	moval from	Bottom		
	D. Tim	ber Pile Remov	/al (Ice	breaker or foundation)	E. Other				
1. a.Does activity disturb river b	oottom sec	liments?					Y	N	
b. If Yes? (CP)ECT notified within 6 hours to coordinate Water Quality Monitoring ?								N	
2. a. (CP) Full Depth Turbidity curtain installed (Areas 1 and 6 only)									
b. (CP) 5' Turbidity curtain installed and anchored to the river bottom (Areas 2,3,4 and 5) initial here								N	

 If Yes, immediately notify ECT and take corrective action
 Persons Notified:

 3. Dust suppression implemented if work is above water or fugitive dust observed?

Turbidity observed outside of turbidity curtain if used or beyond 500 ft mixing zone if not (circle):

Environmental Compliance Team Contacts

(contact in order showing	antii someone is reached)
1. Elena Barnett	914-514-5324
Jefferey Kapus	646-823-4685
3. Joseph Cassone	845-367-2099
4. Zach Osei	917-559-6611

Examples of a Sturgeon

APPENDIX G Identification Key for Sturgeon Found in Northeast U.S. Waters



(print)

WATER QUALITY MONITORING PLAN: VISUAL INSPECTION FORM New NY Bridge Project



Inspector:

Date:

Т

Location	iii watei	rime in	Time Out	Turbidity	Time of	Time of	Containment	Sturgeon Observed
Location	Activity	(24-Hr)	(24-Hr)	Observed?	Observation	Notification	Boom in Place?	(Yes / No)
Nater Activities	: Dredging/Armori	ng/Cofferdam Con	struction/Cofferda	m De-watering/Imp	bact Pile Driving/Vib	oratory Pile Driving	g/Pile Extraction/Pile	De-watering/Other
mments:		(Include file nur	nber of any phot	ographs)				
			/ I					



E	Observer:			Location:			
T	Date:		Day:		Time:	Weather:	
Ē	Work Obse	rved:					

Compliance Plan:			Work Performed in Compliance with Plan: Yes/No				Comments:						
		•									<i>v</i>		
Marine Co	mplia	nce P	lan Che	ck List:	-	Place y	es or no ir	box. If activ	ity is not	occurring sel	ect NA		
Operatio	n	Insp	ected	Pier	Turbidity Observed	Boom in Place	Sheen Observe	Spill Kits d Stocked	SPCC Plan Site	n Sturgeon Observed	Flag o Crane	Stickers on Operating Equipment	Comments
Pile Driving	5												
Armoring													
Pile Dewater	ring								ЪЛ				
Cofferdam Dewatering										/			
Concreting													
Pile Driving	g Acti	vity C	heck Lis	st:									
Pier	PD S Tim	Start e	Pile Nu	mbers	NAS Operatin During PD	g B P	oom in Frace V	ing psi Vithin Specs	Cables Taut	No. of Shroud Sections	Barge Monitor	On Barge Form in Progress	Comments
General No	otes:												
Environme	ntal /	Action	s Taker	n:									

Figure 1 –	Figure 2 –
Figure 3 –	Figure 4 –