

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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April 23, 2019

Mr. Michael Liberati Corteva Agriscience Agriculture Division of DowDuPont Chestnut Run Plaza 715-236 Wilmington, DE 19805

VIA ELECTRONIC MAIL

Re: Summer 2018 City Shops Bank Management Area Maintenance Inspection Area of Concern 4, Former DuPont Waynesboro Plant Waynesboro, Virginia EPA ID# VAD003114832

Dear Mr. Liberati:

This letter acknowledges the receipt and review of the Summer 2018 City Shops Bank Management Area Maintenance Inspection dated December 3, 2018, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by AECOM on behalf of the E.I du Pont de Nemours and Company (DuPont).

The Department has no comments on the memorandum.

If you have any questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Last work

Kurt W. Kochan Corrective Action Project Manager Office of Remediation Programs

cc: DuPont Waynesboro Correspondence File Ceil Mancini, Josh Collins, AECOM



tel

fax

Memorandum

То	Michael Liberati, DuPont CRG Ralph Stahl, DuPont CRG Page 1 of 2	
СС	Nancy Grosso, DuPont CRG Ceil Mancini, AECOM	
Subject	Summer 2018 City Shops BMA Maintenance Inspection Former DuPont Waynesboro Site, Area of Concern 4	
From	Andrew Miano, AECOM Joshua Collins, AECOM	
Date	December 3, 2018	

This memorandum summarizes the Summer 2018 Maintenance Inspection (inspection) of the City Shops Bank Management Area (BMA) conducted June 21st 2018. It was the first post-construction inspection following completion of construction in February 2018, and followed the scope described in the Maintenance Plan included as Appendix M of the Basis of Design Report, Phase 1A BMAs, South River AOC 4 (Anchor QEA et al., 2016). The purpose of the post-construction inspection is to set identify potential BMA maintenance needs, focusing on vegetative growth, bank stability, and the integrity of the installed bank remediation features. Additional attachments to this memorandum include:

- Table 1 Maintenance inspection log
- Appendix A Photographic log

Findings

The results of the inspection will serve to establish the post-construction baseline condition for future maintenance inspections, and also document any significant changes from the asbuilt condition. A brief summary of findings is provided below; complete details of the maintenance inspection are included in Table 1.

Vegetation

- The upper portions of the bank exhibited healthy growth of rye grasses, planted saplings and native vegetation throughout the BMA.
- Planted rye grass has been effective in preventing the colonization of invasive plants, such as Japanese knotweed (*Fallopia japonica*).
- Larger trees left in place during remediation along the BMA are healthy and show no sign of stress.
- Japanese knotweed was documented in areas of the BMA that were not remediated; these areas will be monitored and treated (if necessary) to prevent their spread into the restored portions of the BMA.

Stability

• River banks generally maintained a consistent bank angle throughout the BMA as constructed with no sign of surface erosion, scour, or undercutting at the toe of slope.



- There was no evidence of recent erosion or "at-risk" trees (e.g. trees that may no longer be stable due to erosion) within the remediated areas.
- An area of erosion upstream (outside of the remedial footprint) of Primary BMA B was documented and will continue to be closely monitored during the fall (leaf-off) inspection to evaluate the need for potential corrective action.
- Multiple "at-risk" trees were documented with localized scour and erosion, between the two remediated sections of the BMA.

Installed Features

- The installed rock toe was intact and are starting to show evidence of desired sediment deposition in some locations.
- The furthest downstream piece of installed large woody debris (LWD; location 00+850') has shifted due to spring/summer high flows and is now projecting into the stream channel at an angle; all other LWD features were stable and anchor chains were intact.
- Geocell and erosion control fabric were intact and showed no sign of wear.
- No scour was documented at the toe of slope within the remediated portions of the BMA.

The Summer 2018 maintenance inspection conducted at the City Shops BMA documented the integrity of the BMA. The establishment of native planted grasses, saplings/live stakes, and mature trees left in place during the remediation have minimized the spread of invasive plant species into the areas cleared for the remediation.

PATH FORWARD

The following conditions documented during this inspection will be closely monitored during the winter, leaf-off inspection to identify the need for corrective action:

- Erosion at the upstream transition of the Primary BMA B area.
- Stability of the LWD at location 00+850' (most downstream LWD) that was shifted during late spring/summer high flow events.

REFERENCES

Anchor QEA, AECOM, and E.I. du Pont de Nemours and Company. 2016. Basis of Design Report, Phase 1A Bank Management Areas, South River Area of Concern 4. September 2016.

Table 1 Summer 2018 City Shops BMAMaintenance Inspection Former DuPont Waynesboro Site, Area of Concern 4

		Unde	rcutting			Exposed Roots			At Risk Trees			Ins	stalled Stabilization Feature	sIntact			Local Scour		
Station (ft) ¹	Approximate Bank Angle (Degrees)	Consistent Grade (Y/N) ²	Notes	Photo# (Appendix A)	Exposed Roots (L/M/H) ³	Notes	Photo# (Appendix A)	At Risk Trees Present (Y/N + #) ⁴	Notes	Photo# (Appendix A)	Rock Toe/LWD (Y/N) ⁵	Geocell (Y/N) ⁶	Erosion Control Fabric (Y/N) ⁶	Notes	Photo# (Appendix A)	Scour Present (Y/N) ⁷	Notes	Photo# (Appendix A)	Overall Change Since Previous Inspection (Y/N)
00 - 25	85	Y		1,3	Н	High quantity of exposed rootson the bank. 95%vegetated	1,3	Y	At risk treespresent	1,2,3	NA	NA	NA		1,2,3	Y	Scour present along lower bank	1,3	NA
00+00	70	N (see not es)	Lower bank; ~60 degrees Upper bank; ~80 degrees	4	Ν	No woody plants adjacent to edge of water; minimal vegetation present on lower bank	4	Ν	No woody plant sadjacent to edge of water	4	Y	Y	Y		4	Y	Some scour present at start of rock toe	4	NA
00+50	45	Y		5	N	Rye grasses and planted saplings growing along top of rock toe	5,6,7	N	No woody plantsadjacent to edge of water	5,6,7	Y (LWD and Pock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. LWD intact	5	Ν	No scour present along rock toe	5,6,7	NA
00+100	45	Y		8	Ν	Rye grasses and planted saplings growing along top of rock toe	8	Ν	No woody plantsadjacent to edge of water	8	Y (LWD and Rock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. LWD intact	8	N	No scour present along rock toe	8	NA
00+150	45	Y		9,10	NA	Rye grasses and planted saplings growing along top of rock toe	9,10	Ν	No woody plant sadjacent to edge of water	9,10	Y (LWD and Pock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. LWD intact	9,10	N	No scour present along rock toe	9,10	NA
00+200	45	Y		11,12	NA	Rye grasses and planted saplings growing along top of rock toe	11,12	Ν	No woody plantsadjacent to edge of water	11,12	Y	Y	Y	No Geocell or Erosion Control Fabric exposed. Pock stairs and gate present on upper half of bank	11	N	No scour present along rock toe; outfall pipe present within rock toe	11,12	NA
00+250	45	Υ		13	NA	Rye grasses and planted saplings growing along top of rock toe	13	Ν	No woody plant sadjacent to edge of water	13	Y (LWD and Rock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. LWD intact	13	N	No scour present along rock toe	13	NA
00+300	46	Y		14	NA	Rye grasses and planted saplings growing along top of rock toe	14	Ν	No woody plant sadjacent to edge of water	14	Y (LWD and Rock toe)	Y	Y	Some Erosion Control Fabric exposed around tree base. LWD intact	14	N	No scour present along rock toe	14	NA
00+350	45	Y		15	NA	Rye grasses and planted saplings growing along top of rock toe. Some large trees present	15	Ν	No woody plantsadjacent to edge of water	15	Y (LWD and Rock toe)	Y	Y	Some Erosion Control Fabric exposed around tree base. LWD intact	15	N	No scour present along rock toe	15	NA
00+400	45	Y		16, 17, 18	NA	Rye grasses and planted saplings growing along top of rock toe. Some large trees present	16,17,18	Ν	No woody plantsadjacent to edge of water	16,17,18	Y (LWD and Rock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. LWD intact	16,17,18	Y	Minimal scour present near rock toe; two outfall pipespresent within rock toe	16,17,18	NA
00+450	45	Y		19	NA	Pye grasses and planted saplings growing along top of rock toe. Some large trees present	19	Ν	No woody plantsadjacent to edge of water	19	Y	Y	Y	No Geocell or Erosion Control Fabric exposed.	19	N	No scour present along rock toe	19	NA
00+500	45	Y		20,21,22	NA	Pye grasses, hydrangeas, and planted saplingsgrowing along top of rock toe. Some large treespresent	20, 21	Ν	Some woody plants adjacent to edge of water below the transect	22	Y	Y	Y	No Geocell or Erosion Control Fabric exposed.	20,21	N	No scour present along rock toe	20	NA
00+550	70	Y		23	н	Lower bank consists mostly of exposed roots	23	Y	Several large trees with exposed root shanging over the river	23	NA	NA	NA	Section was not remediated	23	Y	Entire lower bank showslarge amountsof scour	23	NA
00+600	75	Y		24,25,26	н	Lower bank consists mostly of exposed roots	24,25,26	Y	Sycamore hasmany exposed rootsalong the lower bank	24	NA	NA	NA	Section wasnot remediated	24,25,26	Y	Entire lower bank showslarge amountsof scour	24,25,26	NA
00+650	80	Y		27	н	Large amountsof erosion have exposed many rootson the upper bank	27	Y	At risk treespresent along the upper bank.	27	NA	NA	NA	Section wasnot remediated	27	Y	Entire bank shows large amount sof scour	27	NA
00+700	90	Y		28	н	Large amount sof erosion have exposed many root son the upper bank	28	Y	At risk treespresent along the upper bank.	28	NA	NA	NA	Section wasnot remediated	28	Y	Entire bank shows large amount sof scour	28	NA
00+750	90	N (see notes)	Beginning of second remediated area. '90 upstream and '45 downstream	29,30,31	м	Erosion has exposed roots on the upper bank on the upstream portion of this location	29, 31	Y	At risk treespresent upstream of rock toe	29, 30, 31	Y	Y	Y	Beginning of second remediated section	29,30	Y	Large amountsof scour above rock toe	29,31	NA
00+800	40	Y		32,33	NA	Vegetation consistsof rye grasses and live stakes/planted saplings	32, 33	Ν	No woody plantsadjacent to edge of water	32,33	Y (LWD and Rock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. LWD intact	32,33	N	No scour present along rock toe	32	NA
00+850	25	N (see notes)	Lower bank; ~25 degrees Upper bank; ~30 degrees	34,35,36	NA	Vegetation consists of rye grasses and live stakes/planted saplings	34,35,36	Ν	No woody plant sadjacent to edge of water	34,35,36	N (LWD) and Y (Rock toe)	Y	Y	No Geocell or Erosion Control Fabric exposed. ; LWD moved from itsinst alled position. The root ball side of the inst alled LWD has pivoted downst ream from its original position and isnow angled into the river.	34,35,36	N	No scour present along rock toe	34,35,36	NA
00+880	20	Y		37,38	NA	Vegetation consists of rye grasses, trees and live stakes/planted saplings	37,38	Ν	No woody plant sadjacent to edge of water	37,38	Y (Rock toe)	Y	Y	Some Erosion Control Fabric exposed at top of slope.	37,38	N	No scour present along rock toe and lower bank	37,38	NA

Notes: 1. Inspection station is described as the distance (feet) upstream (-) or downstream (-) from the start of the BMA(00); example, Station 00 + 50' is 50 feet downstream from the start of the BMA 2. Asignificant deviation from continuous bank stope or break in grade may be used as an indicator of undercutting; consistent bank grade is evaluated as Y(yes) or N (no) 3. The extent to which roots are exposed may provide a relative measure of the magnitude of apparent erosin; extent of exposed roots is evaluated as I (ow), M (moderate), H (high), or NA(not applicable- no exposed roots) 4. At-risk trees it, i.e., trees that lean towards the river) typically have a greater potential to fall into the river disdoge the bank solin and erosion-control productismmediately around and above the tree; presence of at-risk trees is evaluated as Y(yes) or N (no) 5. Installed rock to e and large woody debris (LWD) features are monitored to ensure that they are anchored and determine whether material hassoughed, or been eroded, or moved downstream; these installed features are evaluated as Y(yes, intact), N (no, not intact), or NA(not applicable- no installed features to monitor) 6. Installed geocel and erosion control fabric are monitored to ensure that they are intact and determine whether material isexposed or visible; these installed features are evaluated as Y(yes, intact), N (no, not intact), or NA(not applicable- no installed features to monitor) 7. The presence of local scour isexessed at the toe and center of the bank, per inspection station, as well as approximately 25 feet upstream and downstream of the start and end of the BMA the presence of scour isevaluated as Y(yes) or N (no)

APPENDIX A PHOTOGRAPHIC LOG

Client Name:		Site Location:	Project No.	
DuPont		STM-07 (City Shops)	60559681	
Photo No. Date: 1 6/21/2018				
Direction Photo Taken:				
Northwest				
Description:			A AND	
Station 00 – 25'	Carl Carlos			
~85 degree bank angle; at risk trees present; scour present; 95% vegetated.				

Photo No.Date:
6/21/2018Direction Photo
Taken:

Northeast

Description:

Station 00 - 25'

Looking upstream from location 00-25'; high quantity of exposed roots on the bank; at risk trees present; scour present; 95% vegetated.





APPENDIX A PHOTOGRAPHIC LOG

Client Name:	Site Loca	tion:	Project No.
DuPont		STM-07 (City Shops)	60559681
Photo No. Date: 3 6/21/2018			
Direction Photo Taken: West			
Description: Station 00 – 25'			
View looking downstream from location 00-25'; high quantity of exposed roots on the bank and scour present until beginning of rock toe.			

Photo No. Date: 6/21/2018 Direction Photo Taken: Image: Northwest Northwest Image: Northwest Description: Image: Notify the second second



APPENDIX A PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DuPont	STM-07 (City Shops)	60559681
Photo No. Date: 5 6/21/2018		
Direction Photo Taken: Northwest		
Description: Station 00 + 50'		
~45 degree bank angle; no scour present; installed rock toe intact; vegetation consists of planted rye grasses and native container plants; LWD intact.		

Photo No.
6Date:
6/21/2018Direction Photo
Taken:

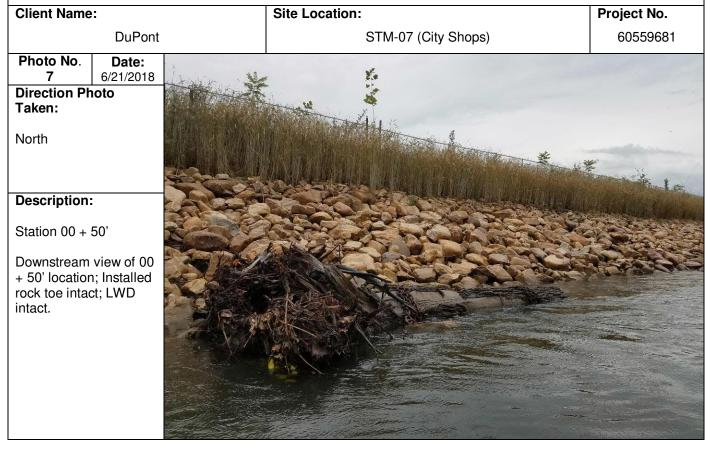
West

Description:

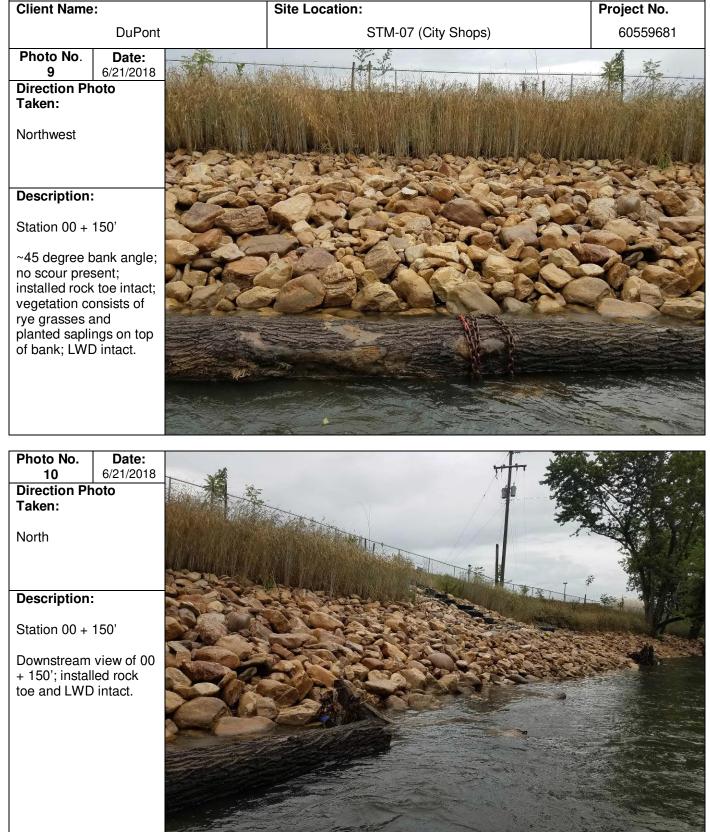
Station 00 + 50'

Upstream view of 00 + 50' location; no scour present; installed rock toe intact.









APPENDIX A PHOTOGRAPHIC LOG

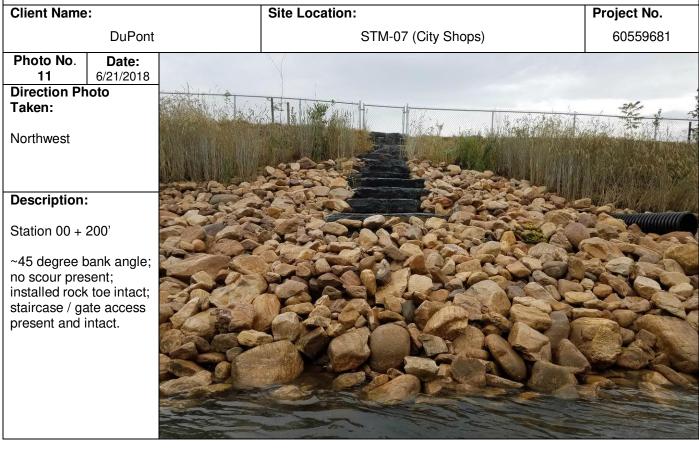


Photo No.
12Date:
6/21/2018Direction Photo
Taken:

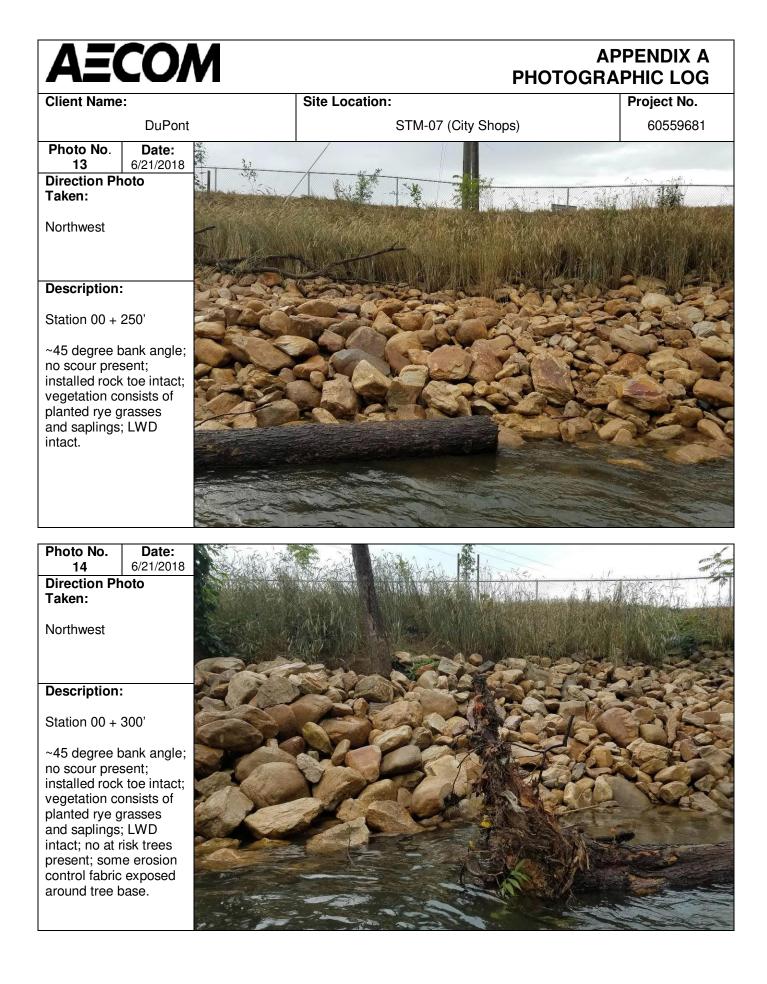
North

Description:

Station 00 + 200'

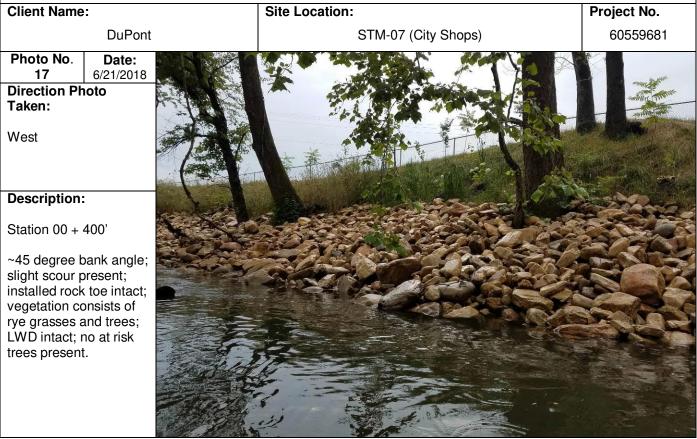
Downstream view of 00 + 200'; vegetation consists of planted rye grasses and saplings; outfall pipe present within rock toe. Note presence wrack line with large branches deposited at top of rock toe during high flow events.





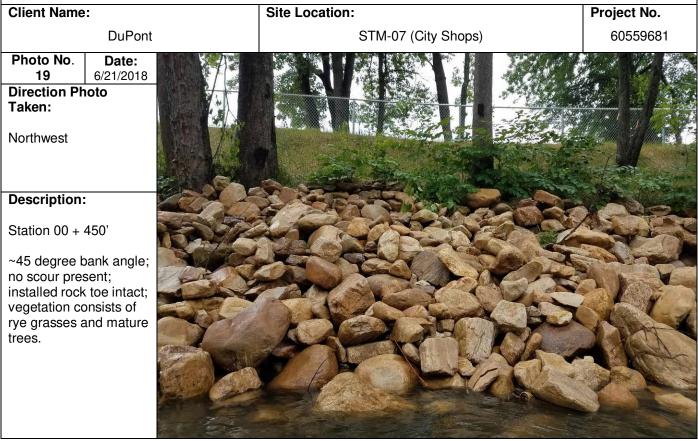
AECOM **APPENDIX A PHOTOGRAPHIC LOG Client Name:** Site Location: Project No. DuPont STM-07 (City Shops) 60559681 Photo No. Date: 6/21/2018 15 **Direction Photo** Taken: Northwest **Description:** Station 00 + 350' ~45 degree bank angle; no scour present; installed rock toe intact; vegetation consists of rye grasses, planted saplings and mature sycamore trees; LWD intact; some erosion control fabric exposed around tree base; no at risk trees present.

Photo No. Date: 6/21/2018 16 **Direction Photo** Taken: Northwest **Description:** Station 00 + 400' ~45 degree bank angle; slight scour present; installed rock toe intact; vegetation consists of rye grasses and mature trees; LWD intact; no at risk trees present.











ΑΞϹΟΜ

Client Name:		Site Location:	Project No.
DuPo	ont	STM-07 (City Shops)	60559681
Photo No. Date: 21 6/21/20			
Direction Photo Taken:			
Southwest			
Description:			
Station 00 + 500'			
Upstream view of 00+500' ~no scour present; installed rock toe intact; vegetation consists of rye grasse and mature trees; no risk trees present.	s		
Photo No.Date: 6/21/20Direction Photo Taken:Northwest			
Description: Station 00 + 500' Downstream view of 0			
+ 500' immediately before the end of the rock toe; no scour present; installed rock toe intact.			

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APPENDIX A PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DuPont	STM-07 (City Shops)	60559681
Photo No. Date: 23 6/21/2018		
Direction Photo Taken:	ALL AND ALL AND	
Northwest		
Description:		
Station 00 + 550' (non- remediated transect)		
~70 degree bank angle; high quantity of exposed roots; at risk trees present; scour present; LWD present.		
		2
Photo No. Date:		

24 6/21/2018 Direction Photo Taken: Northwest

Description:

Station 00 + 600' (nonremediated transect)

~75 degree bank angle; high quantity of exposed roots; at risk trees present; scour present.



AECOM **APPENDIX A PHOTOGRAPHIC LOG Client Name:** Site Location: Project No. DuPont STM-07 (City Shops) 60559681 Photo No. Date: 25 6/21/2018 **Direction Photo** Taken: Southwest **Description:** Station 00 + 600' (nonremediated transect) Upstream view of 00 + 600'; high quantity of exposed roots; at risk trees present.

Photo No.
26Date:
6/21/2018Direction Photo
Taken:

North Northwest

Description:

Station 00 + 600' (nonremediated transect)

Downstream view of 00 + 600'; high quantity of exposed roots; at risk trees present; scour present.



AECOM **APPENDIX A PHOTOGRAPHIC LOG Client Name:** Site Location: Project No. DuPont STM-07 (City Shops) 60559681 Photo No. Date: 27 6/21/2018 **Direction Photo** Taken: Northwest **Description:** Station 00 + 650' (nonremediated transect) ~80 degree bank angle; high quantity of exposed roots; at risk trees present; scour present.

Photo No. Date: 28 6/21/2018 Direction Photo Taken:

Northwest

Description:

Station 00 + 700' (nonremediated transect)

~90 degree bank angle; high quantity of exposed roots; at risk trees present; scour present.



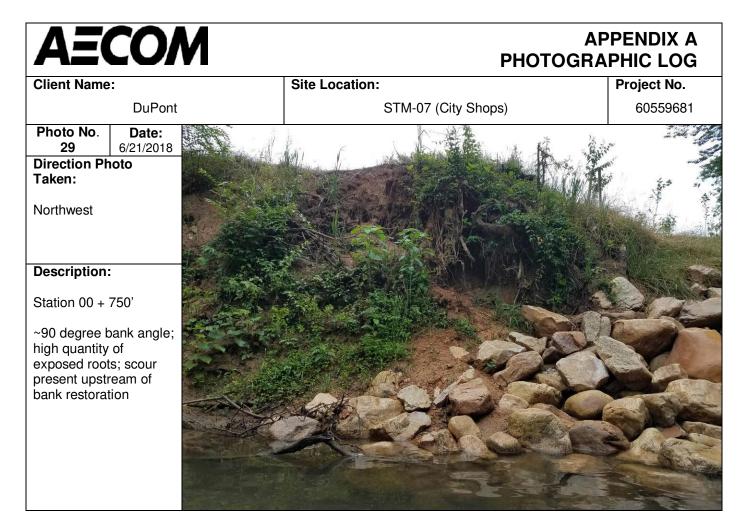


Photo No.
30Date:
6/21/2018Direction Photo
Taken:

North

Description:

Station 00 + 750'

Upstream view of 00 + 750'; high quantity of exposed roots; scour present; at risk trees present upstream and outside of remedial footprint.



APPENDIX A PHOTOGRAPHIC LOG

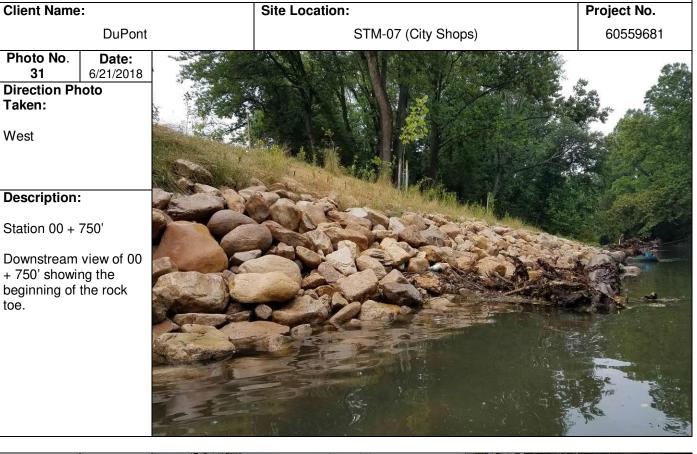


Photo No. 32 Date: 6/21/2018 Direction Photo Taken:

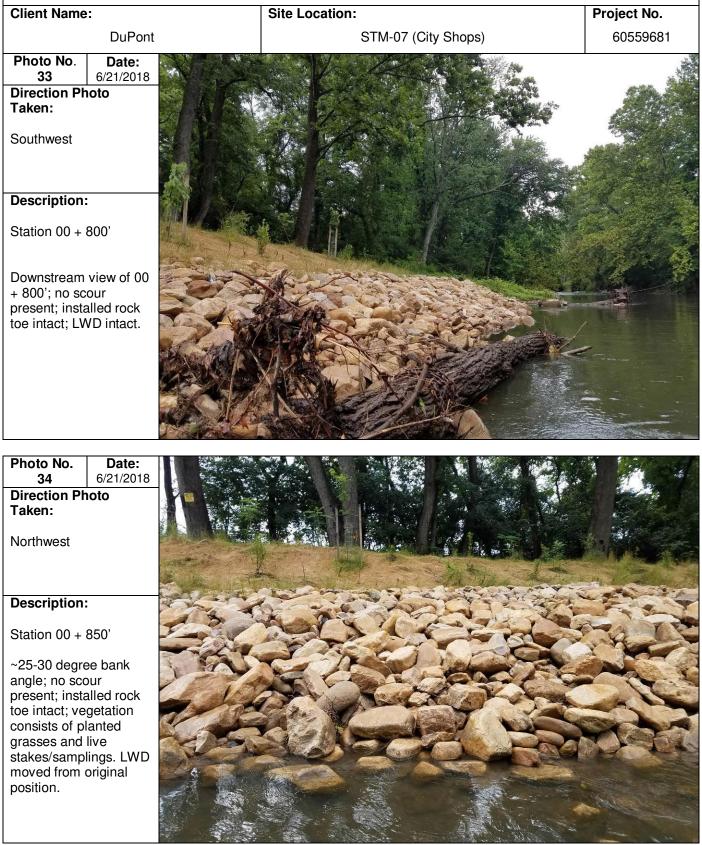
Northwest

Description:

Station 00 + 800'

~40 degree bank angle; no scour present; installed rock toe intact; vegetation consists of planted rye grasses and live stakes/saplings.







APPENDIX A PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DuPont	STM-07 (City Shops)	60559681
Photo No. Date: 35 6/21/2018	See start and a los	22
Direction Photo Taken:		
Southwest		
Description:		the state when
Station 00 + 850'		
Upstream view of 00 + 850'; no scour present along installed rock toe; planted vegetation present and healthy.		

Photo No.
36Date:
6/21/2018Direction Photo
Taken:

Northeast

Description:

Station 00 + 850'

Downstream view of 00 + 850'; LWD moved from its installed position. The root ball side of the installed LWD has pivoted downstream from its original position and is now angled into the river.



ΑΞϹΟΜ

APPENDIX A PHOTOGRAPHIC LOG

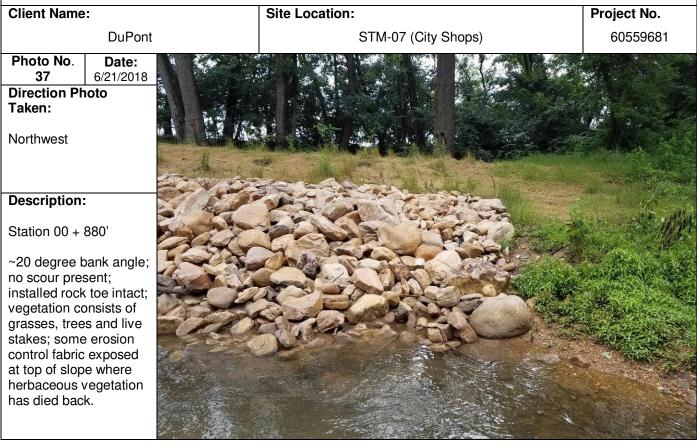


Photo No. Date: 38 6/21/2018 Direction Photo Taken:

Northeast

Description:

Station 00 + 880'

Downstream view of 00 + 880' at the end of the remedial footprint.

