APPENDIX E:
SWM AND STORM DRAIN OUTFALL ASSESSMENT

APPENDIX E.1: STORMWATER MANAGEMENT ASSESSMENT

STRU_NO	SWM	Sub Area	Structure Name	BMP Type	Drainage Area (ac)	Imp. Area (ac)	Percent Imp (%)	Ex/Pr Footprint (ac)	Field Notes	Action
Subarea 1										
811	-	1	RIDGELEY'S CHOICE SECT 1	DP	35.32	6.64	19%	0.36	large marshy wetland area with lots of trees	**Retrofit** - possible shallow wetland/marsh facility with small forebay areas, replace riser
517	-	1	FULLERTON FARMS	DP	9.82	0.66	7%	0.06	overgrown facility, appears to have a pilot channel, not much water outside of the channel	**Retrofit -** possible bioretention or shallow wetland/marsh facility, major vegetation removal necessary
616		1	JOPPA CORNER SQUARE	ED	0.63			0.00	*underground - not inspected*	-
963		1	WEIS MARKET	UGS	8.80			0.00	*underground - not inspected*	-
2129		1	MARMARAS PROPERTY AKA DOUBLE T DINER	ED	1.71			0.00	*underground - not inspected*	-
		1	Bel Air at Silver Spring - Shopping Plaza		11.02			0.00	*underground - not inspected*	-
Subarea 2										
755	-	2	PERRY WOODS	DP	**10.38**	2.60	25%	0.06	embankment failure, no retention, moderate sediment accumulation, difficult access	**New/Retrofit** - remove sediment, reconstruct embankment, provide riser
	889	2			7.12	0.90	13%	0.27	lots of phrag, inflow pt close to outflow pt - little treatment, good access	**Retrofit** - remove excess vegetation, provide berm/baffle boards to increase flow path between inflow and riser
1838	B332244	2	TURNBROOK (FKA TURNBULL PROP)	DRY ED	3.43	0.99	29%	0.23	good condition, some standing water, sediment and debris accumulation	**Maintenance** - remove debris and sediment, clean gravel over horizontal low flow pipe
888	82490	2	SPRING HILL POND 3	DP	18.54	6.58	36%	0.39	appears maintained, woody veg on embankment cut, lots of phrag	**Maintenance** - remove debris and sediment in facility and inflow points, clean low flow orifice in riser
Subarea 3										
		3			**9.09**	1.18	13%	0.47	upstream of 1635, wetland area, no defined outfall or structure	**New/Retrofit -** construct berm, install riser to provide storage within the existing wetland area with minimal impacts
1634		3	HINES ESTATES POND 1	ED	**14.54**	2.48	17%	0.57	no mh on riser, weirs are clogged - maintenance, d/s beaver dam? Fair condition	**Maintenance** - **provide mh cover for riser**, clean riser weir and remove excess vegetation around riser
1635		3	HINES ESTATES POND 2	ED	4.60	1.88	41%	0.16	good condition - some sediment accumulation	**Maintenance** - remove sediment accumulation
Subarea 4										
525	B026869	4	GLEN MILL ESTATES POND 2	DP	**3.33**	0.30	9%	0.09	holding lots of water, stand pipe clogged, no mh on riser structure	**Maintenance** - **provide mh cover for riser**, replace stand pipe and dewater pond, **causing upstream storm drain problems**
890	82490	4	SPRING HILL POND 2	DP	3.44	1.28	37%	0.16	outfall filled with debris and sediment, facility bottom overgrown, banks well maintained, standing water, close proximity to stream channel	**Maintenance** - clean low flow grate, remove excess vegetation in facility
524	B026869	4	GLEN MILL ESTATES POND 1	DP	**6.29**	1.21	19%	0.22	good condition, holding a little water	**No Action**
Subarea 5										
1233	B146590	5	HINES MEADOW (CLEAR MEADOW)**BUILT**	ED	**6.42**	0.93	14%	0.24	fair condition, a lot of vegetation headcut forming d/s of riprap outfall	**Maintenance** - remove excess vegetation, stabilized outfall channel
1025	B095701	5	PERRY HALL COURTS SECT 1 CONDO	UGS	2.14			0.00	*underground - not inspected*	-
Subarea 6										
1473	B024239	6	NORTHWIND FARMS II POND 2	DP	**23.98**	3.09	13%	0.50	minimal management provided, online system, no retention - appears work was recently done	**Retrofit** - possible offline shallow wetland/marsh facility, need to provide bypass for larger storms
Subarea 7										
729	B024239	7	NORTHWIND FARMS II POND 1	DP	11.28	1.84	16%	0.33	inflow channel is slightly incised, standing water, embankments are stable, phrag and veg present	**Maintenance/Possible Retrofit** - remove excess vegetation, stabilize inflow channel, reduce low flow orifice size to provide additional retention (retrofit)
Subarea 8										
215	B065539	8	FERGUSON MEADOWS	DP	**4.34**	0.76	17%	0.13	inflow silted, trash at outflow, shape has been altered since originally constructed (per property owner), low flow pipe & gravel act as a berm	**Retrofit** - remove debris and sediment, provide berm along property to the north to increase capacity, replace low flow pipe and riser structure

757	A	8	PINEDALE WOODS FAC 4 NO ASB	DP	-			-	pond filled in - does not exist, investigated as an outfall site	**Retrofit** - investigate why pond was originally filled in
1786		8	SEVEN OAKS ELEMENTARY**BUILT**	ED	**8.62**	1.02	12%	0.34	fair condition, access road splits pond, no defined forebay/treatment areas, major d/s headcut, end section of outfall pipe has completely rusted out	**Retrofit -** remove berm in facility, regrade into shallow wetland/marsh facility with forebays at inflow points, replace riser and outfall pipe (possibly line pipe), stabilize outfall channel
1003		8	QUAIL RUN SECTION I	ED	**5.32**	0.65	12%	0.23	good condition, inflow pipe contains sediment,	**Maintenance** - remove excess vegetation, remove sediment from inflow pipes and clean horizontal low flow pipe gravel
2209		8	BREWER PROPERTY SEVEN CTS RD	ED	**11.83**	2.84	24%	0.49	good condition, could use some cleaning of sediment and debris, evidence of burroughs on embankments	**Maintenance** - remove debris and sediment at inflow points, horizontal low flow pipe gravel and riser structure
2180		8	QUAIL RUN SEC. II ASSISTED LIVING FACILITY	EDSD	**5.48**	1.37	25%	0.40	good condition, pond is dry and inflow pts are stable	**No Action**
Subarea 10										
1744		10	PERRY HALL COURTS SEC 2	EDSD	**14.84**	2.84	19%	0.51	sediment accum in forebay, some ponding near gabion weir, riser is in good condition	**Maintenance** - remove sediment in forebay, repair wooden fence
Subarea 11										
		11			**5.73**	0.84	15%	0.88	Pond across channel appears to be an old wetland?? No riser, looks like embankment failed	**New/Retrofit -** construct berm, install riser to provide storage within the existing wetland area with minimal impacts
393	B143382	11	CEDARSIDE FARM POND 1	ED	**13.99**	4.38	31%	0.38	sediment accum but pond is dry, low flow pipe and gravel clogged but functioning	**Maintenance -** remove debris and sediment, clean gravel over horizontal low flow pipe
631		11	KENTUCKY FRIED CHICKEN (AKA MINTE HOMES) *	DP	**4.06**	0.85	21%	0.34	ponding water, appears maintained - trees cut along embankment	**Maintenance -** clean low flow pipe and excess vegetation
Subarea 13										
439	97166	13	DAWNVALE WEST**BUILT**	DP	4.97	0.84	17%	0.16	standing water, access is difficult, outfalls into storm drain system, overflow into grass ditch	**Maintenance** - remove debris, sediment and excess vegetation
Subareas 15 & 16										
1842		15	VILLAGE OF WHITE OAK, SECT 2	DP	**16.47**	1.27	8%	0.12	wet and extremely silty-swampy, has u/s flow splitter	**Retrofit** - possible shall wetland/marsh facility, major sediment excavation and riser replacement
955		15	VILLAGE OF WHITE OAK, SECTION 3, POND 3	DP	**8.90**	2.20	25%	0.12	major accumulation of silt and sediment (1-2'), pilot channel has formed, access ok	**Retrofit** - possible shall wetland/marsh facility, major sediment excavation and riser replacement
1210	B057784	15	GUNTER PROPERTY	EDSD	**16.18**	2.13	13%	0.51	very large, steep slopes, sediment and debris accumulation	**Maintenance -** remove debris, sediment and excess vegetation
757	C	15+16			**41.13**	7.38	18%	0.92	overgrown, standing water, sediment accum at inflow pt, **CMP riser is laying on it's side**	**Maintenance/Possible Retrofit** - provide riser, remove sediment and excess vegetation
Subareas 17										
734	B121648	17	OAKHURST POND 2	DP	**78.82**	14.58	19%	0.59	lots of phrag, no WQ, large scale project based on size	**Retrofit** - possible shallow wetland/marsh facility with small forebay areas, evaluate low flow weir trash rack
Subarea 18										
		18			**10.91**	0.00	0%	0.19	across from 806B, no existing swm, woody flat area	**New/Retrofit** - evaluate possible shallow wetland/marsh facility, could combine treatment with 806B
806	B	18	RED FOX FARMS POND & BASIN 2	IF	1.85	0.95	51%	0.01	lots of sediment, inlet is buried, some woody growth, no infiltration	**Retrofit** - possible bioretention facility, excavate sediment and remove woody vegetation
Subarea 19										
806	A	19	RED FOX FARMS POND & BASIN 1	DP	**4.66**	0.91	19%	0.05	no infiltration-holding water, very overgrown but appears stable	**Retrofit** - possible shallow wetland/marsh facility with small forebay areas, provide riser
954		19	VILLAGE OF WHITE OAK, SECTION 3, POND 2	DP	**13.92**	3.27	23%	0.13	good condition, stable outfall and embankments, sediment accumulation on low flow grate	**Retrofit -** provide berm/baffle boards to increase flow path between inflow and riser to increase treatment
Subarea 20										
806	C	18	RED FOX FARMS POND & BASIN 3	IF	1.65	0.48	29%	0.06	fair condition, partial inflow pipe disconnection, difficult access, close proximity to stream channel	**Maintenance** - pipe joint repair, remove excess vegetation

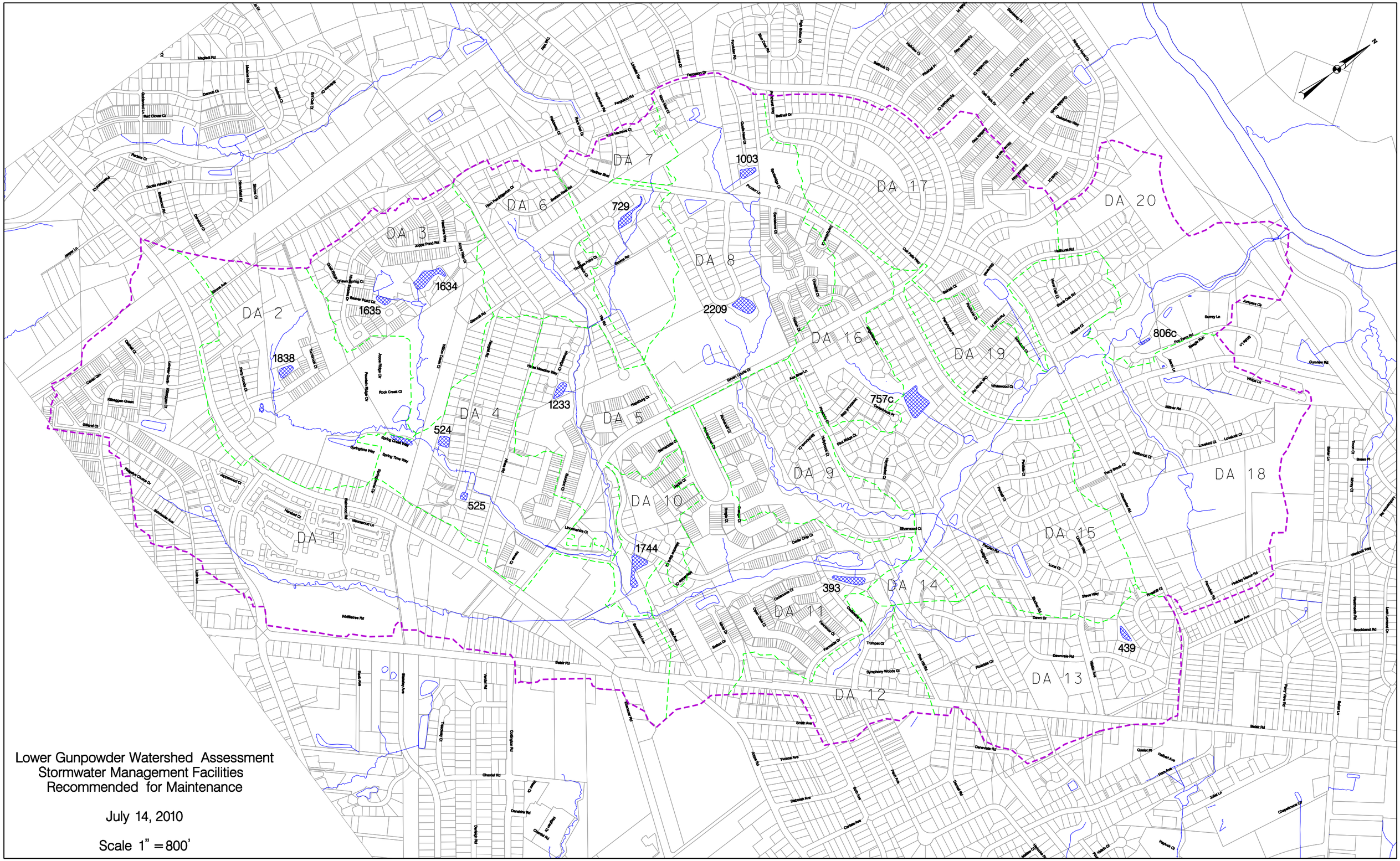
APPENDIX E.2:
STORM DRAIN
OUTFALL ASSESSMENT

Outfall No.	Sub Area	Drainage Area (ac)	Impervious Area (ac)	Percent Imp.	Pr Footprint (ac)	Outfall Channel Length (lf)	Field Notes	Action
Subarea 1 *(12 outfalls investigated)*								
10	1	7.79	2.21	28%	0.33	36	submerged outfall, no defined outfall channel until headcut at stream bank, surrounding area is wet	
11	1	11.02	11.02	100%	0.05	51	no defined outfall - dissipates into the floodplain - outfall of underground swm facility at Belair and Silver Spring shopping plaza	
12	1	6.07	2.19	36%	0.08	85	banks slightly eroded, channel bottom looks stable and flat, stabilize banks to reduce sediment loading	
Subarea 2 *(1 outfall investigated)*								
Subarea 3 *(0 outfalls investigated)*								
Subarea 4 *(1 outfall investigated)*								
13	4	1.07	0.82	77%	0.39	110	submerged outfall, no outfall channel for approx 20-30' d/s - eroded channel into stream, surrounding area is wet - some standing water	
Subarea 5 *(3 outfalls investigated)*								
Subarea 6 *(6 outfalls investigated)*								
Subarea 7 *(2 outfalls investigated)*								
16	7	7.98	0.74	9%	0.52	125	ex grass swale outfall channel - forebay present with sediment and gravel, possibility for widening channel and planting, good access	
Subarea 8 *(4 outfalls investigated)*								
18	8	2.56	1.21	47%	0.31	162	site of bmp 757a (has been filled in), good access and plenty of room - try to find out why old bmp was filled in	
19	8	1.75	0.73	41%	0.04	188	sheet flow from dead end street into riprap channel, u/s of wetland area	
Subarea 9 *(5 outfalls investigated)*								
17	9	1.71	0.91	53%	0.02	80	major drop to stream channel, no headcutting, disconnection of pipe sections and end section, poor access	
Subarea 10 *(0 outfalls investigated)*								
Subarea 11 *(2 outfalls investigated)*								
14	11	1.04	0.80	77%	0.22	506	outfall clogged - standing water, easy access off court, not defined outfall channel - dissipates into the woods	
15	11	9.75	2.81	29%	0.18	440	eroded channel, possibly combine with 14 to create bmp	
Subarea 12 *(4 outfalls investigated)*								
1	12	23.94	6.08	25%	0.73	0	ex. wetland type area, easy access, possibly combine outfalls into a wetland/pond area - install riser structure	
2	12					24		
3	12					0		
4	12					0		
Subarea 13 *(4 outfalls investigated)*								
5	13	0.99	0.60	61%	0.02	10	major pipe disconnection, gabion basket washed away, d/s channel lined with broken up conc - appears stable	
6	13	42.49	6.21	15%	0.15	0	convergence of two channels - possible treatment in triangle area	
7	13	3.23	1.02	32%	0.09	65	wet area adj to stream channel, easy access, collects runoff from one inlet	
Subarea 14 *(0 outfalls investigated)*								
Subarea 15 *(5 outfalls investigated)*								
8	15	7.62	1.40	18%	0.06	205	severe erosion, needs stabilization to reduce sediment loading - flows into bmp 757c	

20	15	2.54	0.88	35%	0.09	124	wide riprap outfall channel, disconnection of pipe sections and end section	
Subarea 16 *(4 outfalls investigated)*								
9	16	5.00	0.73	15%	0.02	70	bare matting, severe headcutting with eroded banks - flows into bmp 757C	
Subarea 17 *(1 outfall investigated)*								
Subarea 18 *(2 outfalls investigated)*								
21	18	3.05	1.28	42%	0.31	0	grass channel with eroded bottom, heavy vegetation on banks, connects to farm pond	
Subarea 19 *(2 outfalls investigated)*								
22	19	5.23	1.65	31%	0.26	185	submerged outfall, lots of sediment accumulation, large DA and good access	
Subarea 20 *(0 outfalls investigated)*								

APPENDIX E.3:
STORMWATER MANAGEMENT FACILITIES RECOMMENDED FOR MAINTENANCE

FID	STRU_NO	SWM	Subarea	Structure Name	BMP Type	Drainage Area (ac)	Ownership	Field Notes	Action
	Subarea 1								
	Subarea 2								
2	1838	B332244	2	TURNBROOK (FKA TURNBULL PROP)	DRY ED	3.43	PUBLIC	good condition, some standing water, sediment and debris accumulation	**Maintenance** - remove debris and sediment, clean gravel over horizontal low flow pipe
	Subarea 3								
1422	1634		3	HINES ESTATES POND 1	ED	**20.69**	PUBLIC	no mh on riser, weirs are clogged - maintenance, d/s beaver dam? Fair condition	**Maintenance** - **provide mh cover for riser**, clean riser weir and remove excess vegetation around riser
1423	1635		3	HINES ESTATES POND 2	ED	4.60	PUBLIC	good condition - some sediment accumulation	**Maintenance** - remove sediment accumulation
	Subarea 4								
488	525	B026869	4	GLEN MILL ESTATES POND 2	DP	**3.33**	PUBLIC	holding lots of water, stand pipe clogged, no mh on riser structure	**Maintenance** - **provide mh cover for riser**, replace stand pipe and dewater pond, **causing upstream storm drain problems**
487	524	B026869	4	GLEN MILL ESTATES POND 1	DP	**6.29**	PUBLIC	good condition, holding a little water	**No Action**
	Subarea 5								
1137	1233	B146590	5	HINES MEADOW (CLEAR MEADOW)**BUILT**	ED	**6.42**	PUBLIC	fair condition, a lot of vegetation headcut forming d/s of riprap outfall	**Maintenance** - remove excess vegetation, stabilized outfall channel
	Subarea 6								
	Subarea 7								
686	729	B024239	7	NORTHWIND FARMS II POND 1	DP	11.28	PUBLIC	inflow channel is slightly incised, standing water, embankments are stable, phrag and veg present	**Maintenance/Possible Retrofit** - remove excess vegetation, stabilize inflow channel, reduce low flow orifice size to provide additional retention (retrofit)
	Subarea 8								
943	1003		8	QUAIL RUN SECTION I	ED	**5.32**	PUBLIC	good condition, inflow pipe contains sediment,	**Maintenance** - remove excess vegetation, remove sediment from inflow pipes and clean horizontal low flow pipe gravel
1899	2209		8	BREWER PROPERTY SEVEN CTS RD	ED	**11.83**	PUBLIC	good condition, could use some cleaning of sediment and debris, evidence of burroughs on embankments	**Maintenance** - remove debris and sediment at inflow points, horizontal low flow pipe gravel and riser structure
Subarea 9 - No Existing SWM Facilities									
	Subarea 10								
1517	1744		10	PERRY HALL COURTS SEC 2	EDSD	**14.84**	PUBLIC	sediment accum in forebay, some ponding near gabion weir, riser is in good condition	**Maintenance** - remove sediment in forebay, repair wooden fence
	Subarea 11								
364	393	B143382	11	CEDARSIDE FARM POND 1	ED	**13.99**	PUBLIC	sediment accum but pond is dry, low flow pipe and gravel clogged but functioning	**Maintenance -** remove debris and sediment, clean gravel over horizontal low flow pipe
Subarea 12 - No Existing SWM Facilities									
	Subarea 13								
405	439	97166	13	DAWNVALE WEST**BUILT**	DP	4.97	PUBLIC	standing water, access is difficult, outfalls into storm drain system, overflow into grass ditch	**Maintenance** - remove debris, sediment and excess vegetation
Subarea 14 - No Existing SWM Facilities									
	Subareas 15 & 16								
712	757	C	15+16			**41.13**	?	overgrown, standing water, sediment accum at inflow pt, CMP **riser is laying on it's side**	**Maintenance/Possible Retrofit** - provide riser, remove sediment and excess vegetation
	Subareas 17								
	Subarea 18								
	Subarea 19								
	Subarea 20								
759	806	C	18	RED FOX FARMS POND & BASIN 3	IF	1.65	?	fair condition, partial inflow pipe disconnection, difficult access, close proximity to stream channel	**Maintenance** - pipe joint repair, remove excess vegetation



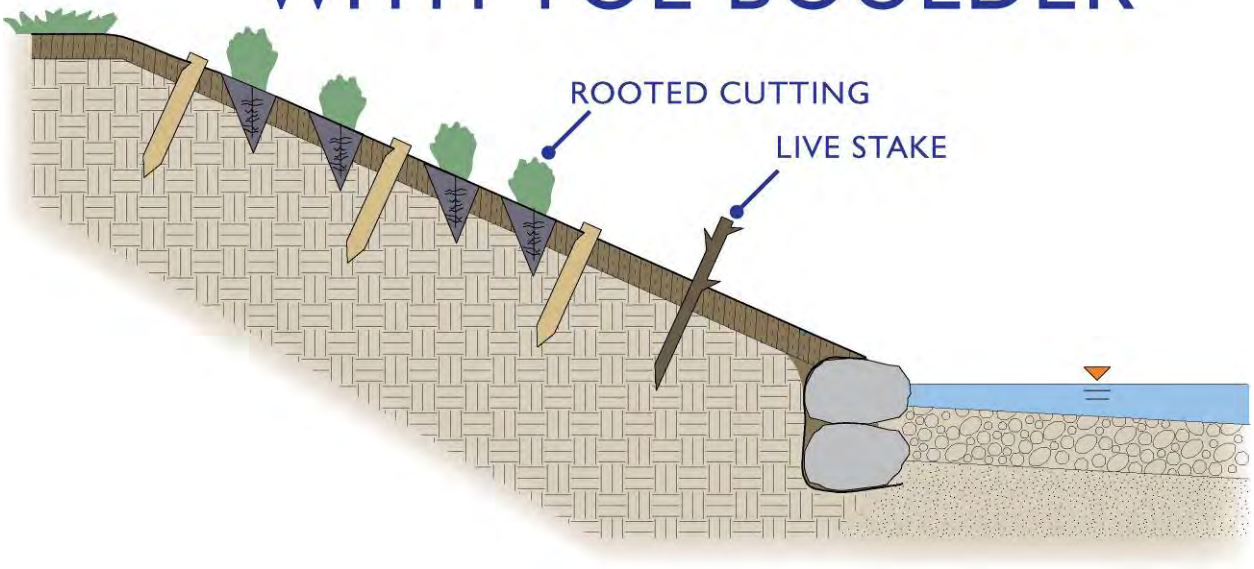
Lower Gunpowder Watershed Assessment
Stormwater Management Facilities
Recommended for Maintenance

July 14, 2010

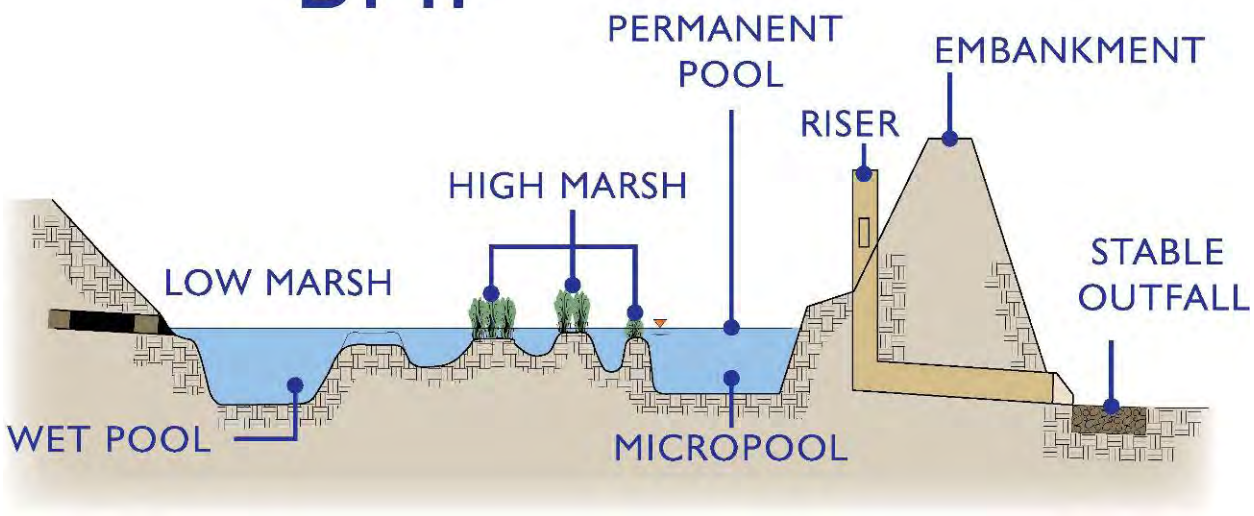
Scale 1" = 800'

APPENDIX F:
POTENTIAL TREATMENT TYPES

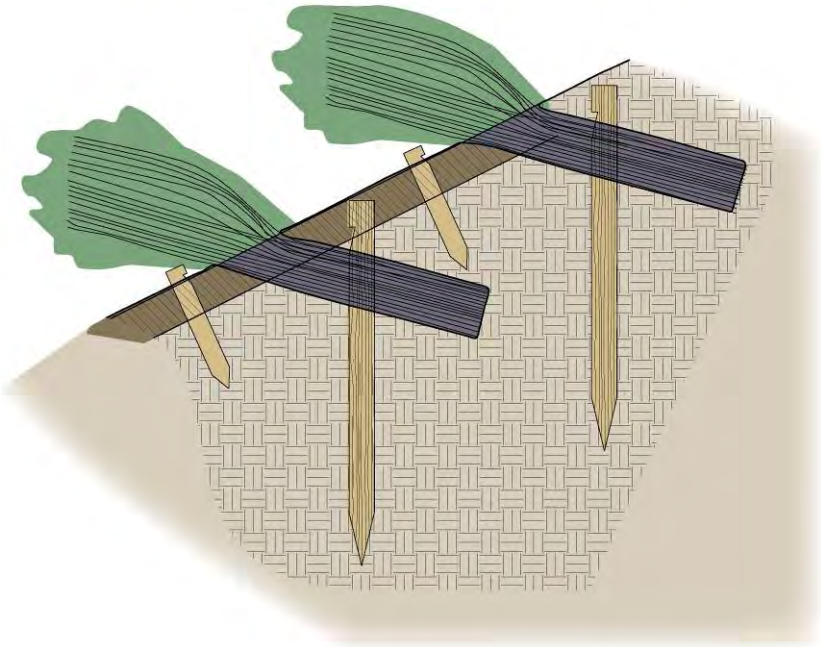
BIOENGINEERING WITH TOE BOULDER



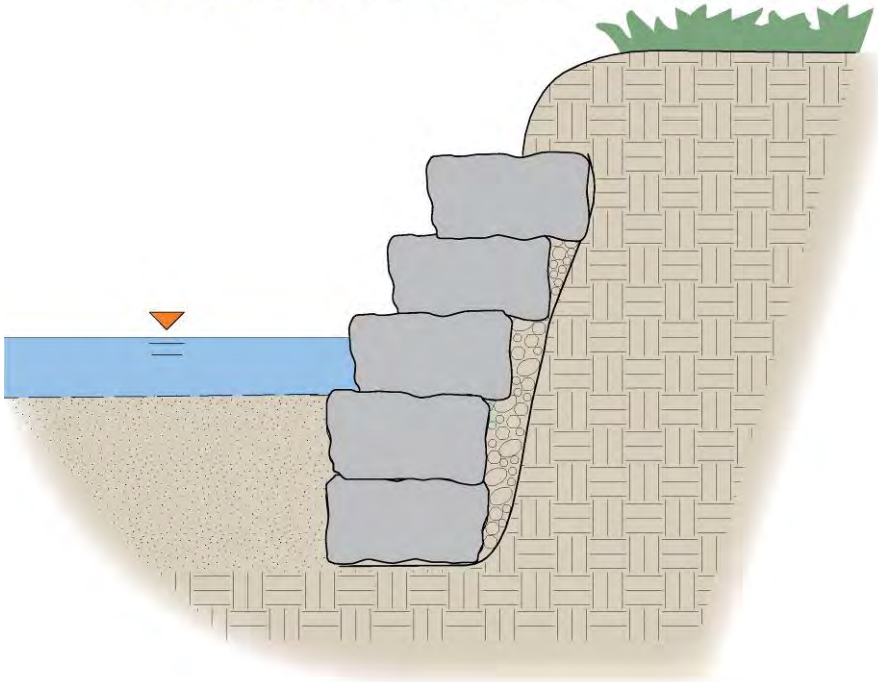
BMP



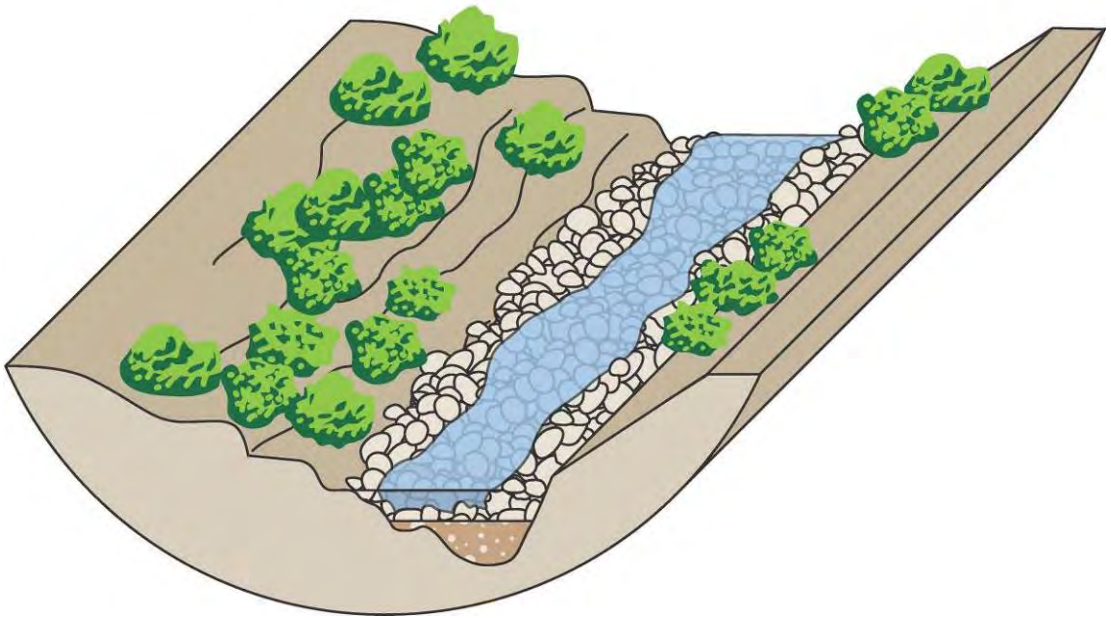
BRUSH LAYERING



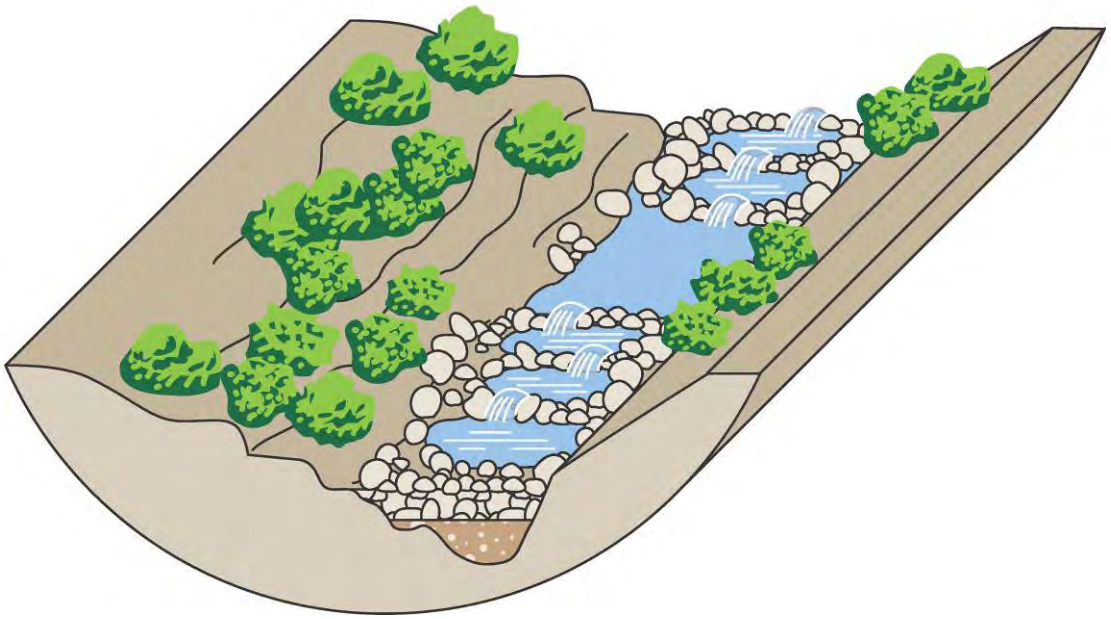
IMBRICATED WALL



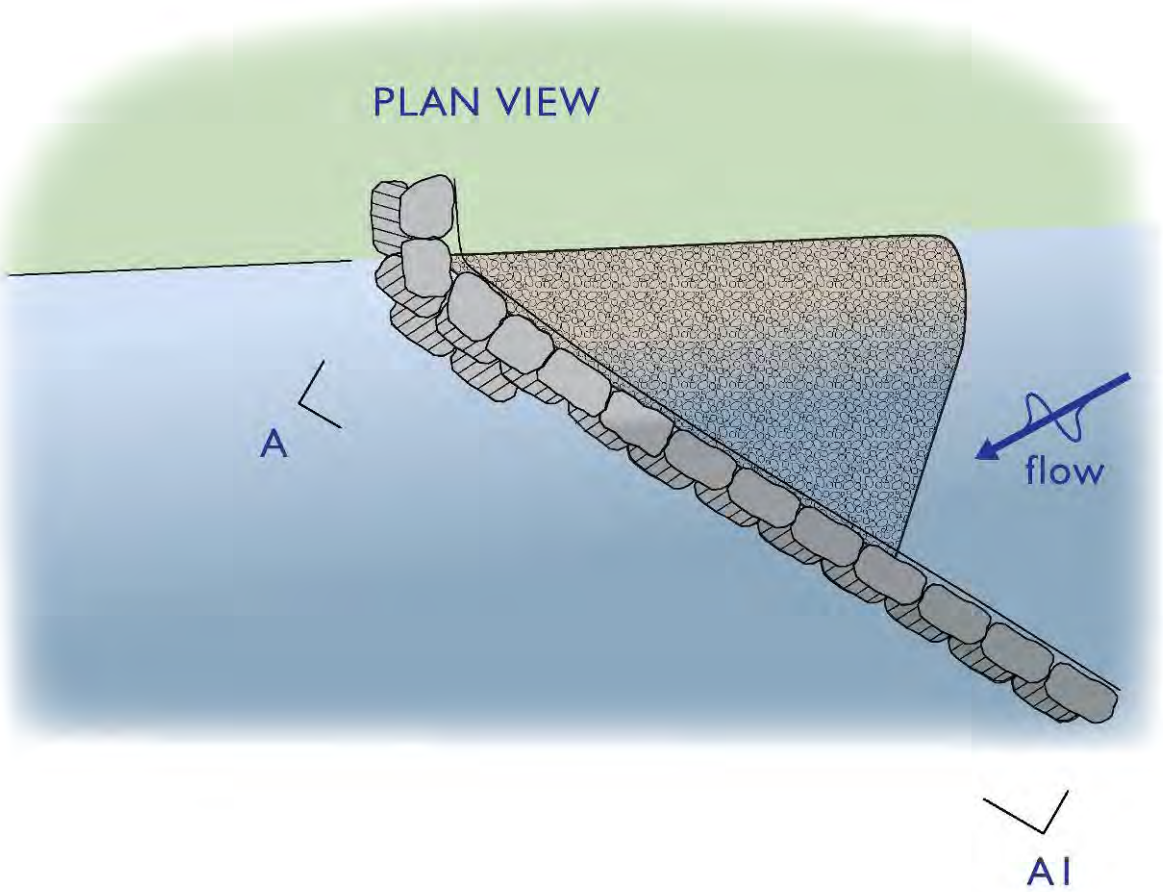
RIFFLE GRADE CONTROL

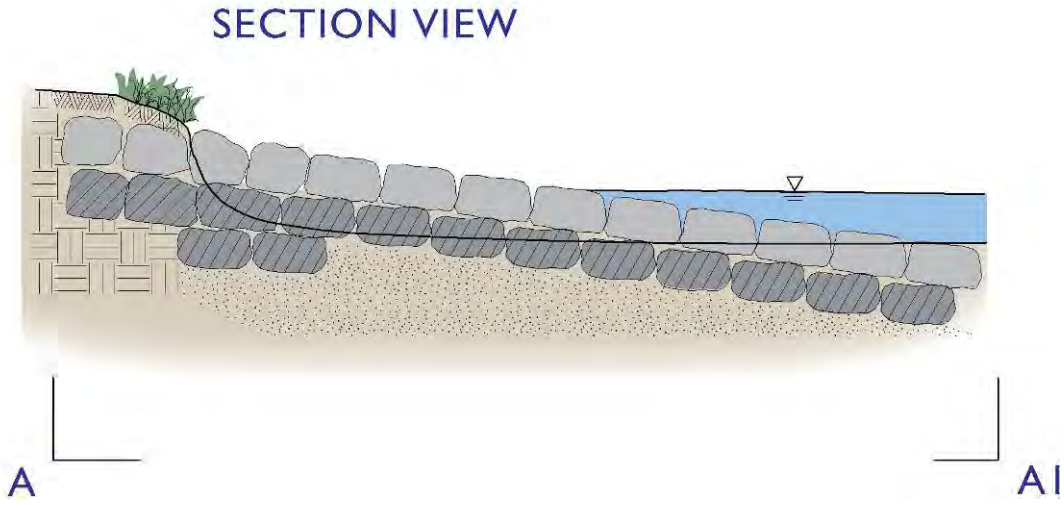


STEP POOLS

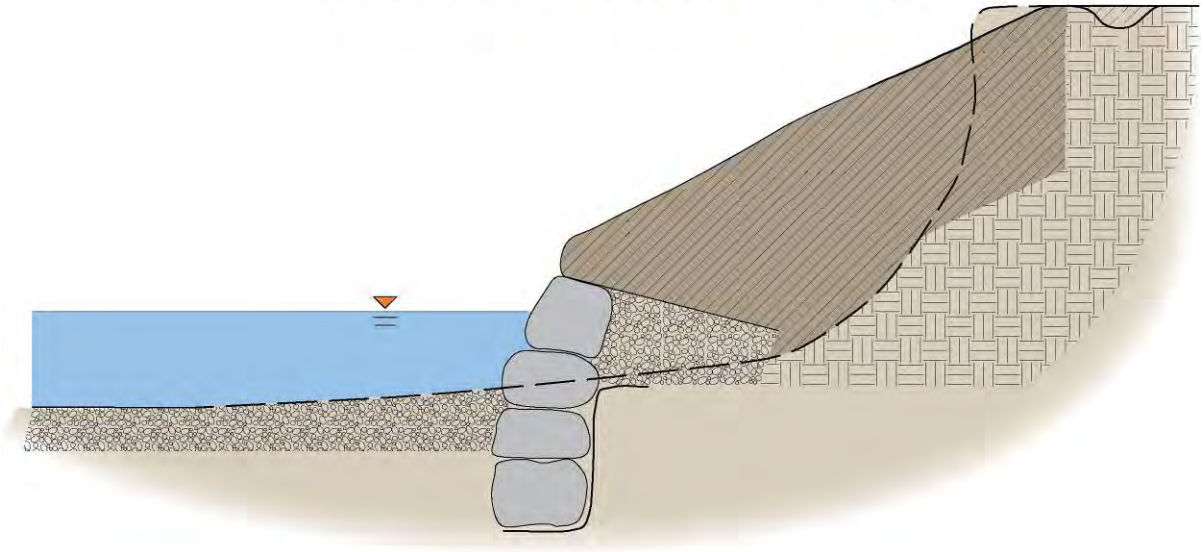
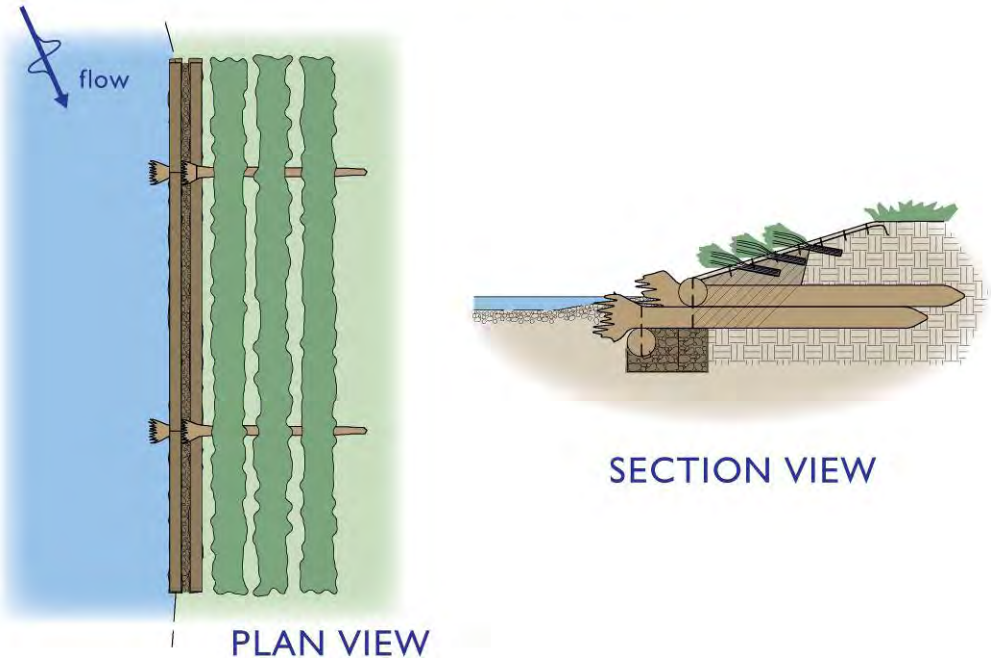


ROCK VANE





DOUBLE TOE BOULDER



TOE LOG