PRELIMINARY STORMWATER MANAGEMENT SUMMARY

CITY OF DUBLIN UNION COUNTY, OHIO

Prepared for:

PULTE HOMES OF OHIO

Prepared by:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC. COLUMBUS, OHIO

AUTUMN ROSE WOODS CEC PROJECT 150-620

SEPTEMBER 2016



Civil & Environmental Consultants, Inc.

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Civil and Environmental Consultants, Inc. (CEC) has evaluated the current site conditions and the proposed development plan of Autumn Rose Woods (site) and offers the following for stormwater management design considerations to the City of Dublin.

1.0 EXISTING CONDITIONS STORM CALCULATIONS

CEC studied the existing site drainage conditions for the proposed Autumn Rose Woods Development. The proposed disturbed area's existing onsite conditions consist of mostly agricultural crop use with some portions of wooded areas in the eastern part of the site. A horse stable, barns and single family residence exists on the southern part of the development.

The onsite watershed is 37.23 acres and is comprised of row crops with Type C soils. The site drains to the existing storm sewer system in the Park Place Development. A weighted curve number of 75 and time of concentration of 73.9 minutes were calculated for the site.

An additional 21.48 acres of land on the west side of Highland Croy Road is tributary to the site. The offsite area will be routed through the proposed storm sewer system as part of the development.

The existing storm calculation including peak flows for critical storms is included in Appendix A.

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2.0 STORMWATER MANAGEMENT

CEC proposes to construct a single wet basin on the east side of the proposed development, providing water quantity and water quality control in accordance with the City and Ohio EPA regulations. The basin will have an outlet into the existing storm sewer system in Park Place on the south side of the site.

CEC will meet or exceed the requirements of the Stormwater Management Design Manual and will hold the release rate of the critical year post developed storm event to the existing release rate for the 1-year storm event. CEC will design the basins to provide water quality treatment for the onsite and offsite areas tributary to them. The cumulative release from the basin will be less than the allowable release rate.

		Proposed	Dasin			
Storm Event Q _{existing} (year) (cfs)		Q _{pass through} *Q _{allowa} (cfs) (cfs)		Q _{actual} (cfs)	Max W.S.E. A (cfs)	
1	6.64	2.39	9.03	3.51	922.57	
2	10.86	3.87	10.51	5.07	923.10	
5	17.76	6.34	12.98	9.42	923.66	
10	23.99	8.57	15.21	13.33	924.04	
25	33.32	11.91	45.23	20.09	924.68	
50	41.44	14.83	56.27	27.41	925.22	
100	50.25	17.99	68.24	33.51	925.79	

Table 1: Allowable Discharge Summary Proposed Basin

*Allowable Q for 1-10 Year Storm = 1-Year Existing Conditions Q + Qpass through *Allowable Q for 10-100 Year Storm = Existing Conditions Q + Qpass through

APPENDIX A

PRE-DEVELOPED FLOWS



Runoff = 6.64 cfs @ 12.91 hrs, Volume= 1.499 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 1-Year Rainfall=2.20"

	Area ((ac)	CN	Desc	cription		
	7.	810	70	Woo	ds, Good,	HSG C	
	21.	190	74	Past	ure/grassla	and/range,	Good, HSG C
	3.	370	98	Pave	ed parking	, HSG C	
	3.	010	74	Past	ure/grassla	and/range,	Good, HSG C
_	1.8	850	74	>75%	6 Grass co	over, Good	, HSG C
	37.	230	75	Weig	phted Aver	age	
	33.	860		90.9	5% Pervio	us Area	
	3.370 9.05% Impervious Area					ous Area	
	Тс	Length	1 3	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	12.0	100) ()	.0200	0.14		Sheet Flow, Sheet Flow
							Cultivated: Residue>20% n= 0.170 P2= 2.60"
	61.9	1,768	30.	.0028	0.48		Shallow Concentrated Flow, SCF
_							Cultivated Straight Rows Kv= 9.0 fps
			_				

73.9 1,868 Total



Runoff = 10.86 cfs @ 12.89 hrs, Volume= 2.258 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=2.63"

Area ((ac) (CN	Desc	ription				
7.8	810	70	Woo	ds, Good,	HSG C			
21.1	190	74	Past	ure/grassla	and/range,	Good, HSG C		
3.3	370	98	Pave	d parking	, HSG C			
3.010 74			Pasture/grassland/range, Good, HSG C					
1.8	850	74	>75%	6 Grass co	over, Good	, HSG C		
37.2	230	75	Weig	hted Aver	age			
33.8	860		90.9	0.95% Pervious Area				
3.3	370		9.05	% Impervi	ous Area			
Тс	Length	Slo	оре	Velocity	Capacity	Description		
(min)	(feet)	(f	t/ft)	(ft/sec)	(cfs)			
12.0	100	0.02	200	0.14		Sheet Flow, Sheet Flow		
						Cultivated: Residue>20% n= 0.170 P2= 2.60"		
61.9	1,768	0.0	028	0.48		Shallow Concentrated Flow, SCF		
						Cultivated Straight Rows Kv= 9.0 fps		
73.9	1.868	Tot	al					



Runoff = 17.76 cfs @ 12.87 hrs, Volume= 3.478 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 5-Year Rainfall=3.24"

_	Area ((ac) (CN	Desc	ription		
	7.8	810	70	Woo	ds, Good,	HSG C	
	21.	190	74	Pasti	ure/grassla	and/range,	Good, HSG C
	3.3	370	98	Pave	d parking	, HSG C	
	3.0	010	74	Pasti	ure/grassla	and/range,	Good, HSG C
_	1.8	850	74	>75%	6 Grass co	over, Good	, HSG C
	37.2	230	75	Weig	hted Aver	age	
	33.	860		90.95	5% Pervio	us Area	
	3.370 9.05% Impervious Area						
	Тс	Length	S	lope	Velocity	Capacity	Description
_	(min)	(feet)	((ft/ft)	(ft/sec)	(cfs)	
	12.0	100	0.0)200	0.14		Sheet Flow, Sheet Flow
							Cultivated: Residue>20% n= 0.170 P2= 2.60"
	61.9	1,768	0.0	028	0.48		Shallow Concentrated Flow, SCF
							Cultivated Straight Rows Kv= 9.0 fps
	=0.0	1 0 0 0	_				

73.9 1,868 Total



Runoff = 23.99 cfs @ 12.85 hrs, Volume= 4.574 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=3.74"

_	Area ((ac) (CN	Desc	ription		
	7.	810	70	Wood	ds, Good,	HSG C	
	21.	190	74	Pasti	ure/grassla	and/range,	Good, HSG C
	3.	370	98	Pave	d parking,	, HSG C	
	3.	010	74	Pasti	ure/grassla	and/range,	Good, HSG C
_	1.8	850	74	>75%	6 Grass co	over, Good	, HSG C
	37.	230	75	Weig	hted Aver	age	
	33.	860		90.95	5% Pervio	us Area	
	3.370 9.05% Impervious Area						
	Тс	Length	S	lope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	12.0	100	0.0	200	0.14		Sheet Flow, Sheet Flow
							Cultivated: Residue>20% n= 0.170 P2= 2.60"
	61.9	1,768	0.0	028	0.48		Shallow Concentrated Flow, SCF
							Cultivated Straight Rows Kv= 9.0 fps
		1 0 0 0	_				

73.9 1,868 Total



Runoff = 33.32 cfs @ 12.83 hrs, Volume= 6.216 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 25-Year Rainfall=4.44"

_	Area ((ac) (CN	Desc	ription		
	7.8	810	70	Woo	ds, Good,	HSG C	
	21.	190	74	Pasti	ure/grassla	and/range,	Good, HSG C
	3.3	370	98	Pave	d parking	, HSG C	
	3.0	010	74	Pasti	ure/grassla	and/range,	Good, HSG C
_	1.8	850	74	>75%	6 Grass co	over, Good	, HSG C
	37.2	230	75	Weig	hted Aver	age	
	33.	860		90.95	5% Pervio	us Area	
	3.370 9.05% Impervious Area						
	Тс	Length	S	lope	Velocity	Capacity	Description
_	(min)	(feet)	((ft/ft)	(ft/sec)	(cfs)	
	12.0	100	0.0)200	0.14		Sheet Flow, Sheet Flow
							Cultivated: Residue>20% n= 0.170 P2= 2.60"
	61.9	1,768	0.0	028	0.48		Shallow Concentrated Flow, SCF
							Cultivated Straight Rows Kv= 9.0 fps
	=0.0	1 0 0 0	_				

73.9 1,868 Total



Runoff = 41.44 cfs @ 12.82 hrs, Volume= 7.649 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=5.02"

Area ((ac) (CN I	Desci	ription		
7.8	810	70 \	Wood	ds, Good,	HSG C	
21.1	190	74 I	Pastu	ire/grassla	and/range,	Good, HSG C
3.3	370	98 I	Pave	d parking,	HSG C	
3.0	010	74 I	Pastu	ire/grassla	and/range,	Good, HSG C
1.8	850	74 :	>75%	Grass co	over, Good,	, HSG C
37.2	230	75 \	Weigl	hted Aver	age	
33.8	860	ę	90.95	% Pervio	us Area	
3.3	370	ę	9.05%	6 Imperviewski	ous Area	
Тс	Length	Slo	оре	Velocity	Capacity	Description
(min)	(feet)	(f	t/ft)	(ft/sec)	(cfs)	
12.0	100	0.02	200	0.14		Sheet Flow, Sheet Flow
						Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.00)28	0.48		Shallow Concentrated Flow, SCF
						Cultivated Straight Rows Kv= 9.0 fps
73.9	1.868	Tota	al			



Runoff = 50.25 cfs @ 12.81 hrs, Volume= 9.212 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=5.63"

_	Area ((ac) (CN	Desc	cription		
	7.8	810	70	Woo	ds, Good,	HSG C	
	21.	190	74	Past	ure/grassla	and/range,	Good, HSG C
	3.3	370	98	Pave	ed parking	, HSG C	
	3.0	010	74	Past	ure/grassla	and/range,	Good, HSG C
_	1.8	850	74	>75%	6 Grass co	over, Good	, HSG C
	37.2	230	75	Weig	hted Aver	age	
	33.	860		90.9	5% Pervio	us Area	
	3.370 9.05% Impervious Area					ous Area	
	Тс	Length	S	Slope	Velocity	Capacity	Description
_	(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	
	12.0	100	0.	0200	0.14		Sheet Flow, Sheet Flow
							Cultivated: Residue>20% n= 0.170 P2= 2.60"
	61.9	1,768	0.	0028	0.48		Shallow Concentrated Flow, SCF
							Cultivated Straight Rows Kv= 9.0 fps
			_				

73.9 1,868 Total



Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 2.39 cfs @ 13.84 hrs, Volume= 0.865 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 1-Year Rainfall=2.20"

	Area	(ac) C	N Dese	cription				
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C		
	5.	730 7	'0 Woo	ds, Good,	HSG C			
_	2.	100 9	8 Pave	ed parking	, HSG C			
	21.	480 7	'5 Weig	ghted Aver	age			
	19.	380	90.2	2% Pervio	us Area			
	2.	100	9.78	9.78% Impervious Area				
	Тс	Length	Slope	Velocity	Capacity	Description		
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow		
						Woods: Light underbrush n= 0.400 P2= 2.60"		
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF		
						Short Grass Pasture Kv= 7.0 fps		
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow		
						Area= 6.5 sf Perim= 18.0' r= 0.36'		
		4 700	0 0000	0.40		n= 0.240 Sheet flow over Dense Grass		
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,		
_						Cultivated Straight Rows KV= 9.0 fps		
	138.6	3,148	Total					



Subcatchment 1S: Existing Pass-Through

Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 3.87 cfs @ 13.74 hrs, Volume= 1.303 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=2.63"

_	Area	(ac) C	N Des	cription					
	13.	650 7	74 >75°	% Grass co	over, Good	, HSG C			
	5.	730 7	70 Woo	ds, Good,	HSG C				
_	2.	100 9	8 Pave	ed parking	, HSG C				
	21.	480 7	75 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	9.78% Impervious Area					
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
						n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows Kv= 9.0 fps			
	138.6	3 148	Total						



Subcatchment 1S: Existing Pass-Through

Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 6.34 cfs @ 13.72 hrs, Volume= 2.007 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 5-Year Rainfall=3.24"

_	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C			
	5.	730 7	'0 Woo	ds, Good,	HSG C				
_	2.	100 9	8 Pave	ed parking	, HSG C				
_	21.	480 7	75 Weig	ghted Aver	age				
	19.	380	90.2	90.22% Pervious Area					
	2.100			9.78% Impervious Area					
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
						n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows Kv= 9.0 fps			
	120 6	3 1/18	Total						



Subcatchment 1S: Existing Pass-Through

Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 8.57 cfs @ 13.71 hrs, Volume= 2.639 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=3.74"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C			
5.730 70			'0 Woo	Woods, Good, HSG C					
2.100 98 Paved parking, HSG C									
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0 0065	0.25	1 65	Channel Flow, Channel Flow			
			0.0000	0.20					
			0.0000	0.20		Area= 6.5 sf Perim= 18.0' r= 0.36'			
			0.0000	0.20		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass Shallow Concentrated Flow,			
	61.9	1,768	0.0028	0.48		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps			



Subcatchment 1S: Existing Pass-Through

Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 11.91 cfs @ 13.70 hrs, Volume= 3.586 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 25-Year Rainfall=4.44"

_	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C			
5.730 70			'0 Woo	Woods, Good, HSG C					
2.100 98 Paved parking, HSG C									
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
						n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
	61.9	1,768	0.0028	0.48		Cultivated Straight Rows Kv= 9.0 fps			



Subcatchment 1S: Existing Pass-Through

Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 14.83 cfs @ 13.69 hrs, Volume= 4.413 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=5.02"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C			
5.730 70			'0 Woo	Woods, Good, HSG C					
2.100 98 Paved parking, HSG C									
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0 0065	0.25	1 65	Channel Flow, Channel Flow			
			0.0000	0.20					
			0.0000	0.20		Area= 6.5 sf Perim= 18.0' r= 0.36'			
			0.0000	0.20		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass Shallow Concentrated Flow,			
	61.9	1,768	0.0028	0.48		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps			



Subcatchment 1S: Existing Pass-Through

Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 17.99 cfs @ 13.69 hrs, Volume= 5.315 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=5.63"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C			
5.730 70			'0 Woo	Woods, Good, HSG C					
2.100 98 Paved parking, HSG C									
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0 0065	0.25	1 65	Channel Flow, Channel Flow			
			0.0000	0.20					
			0.0000	0.20		Area= 6.5 sf Perim= 18.0' r= 0.36'			
			0.0000	0.20		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass Shallow Concentrated Flow,			
	61.9	1,768	0.0028	0.48		Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps			



Subcatchment 1S: Existing Pass-Through

APPENDIX B

POST-DEVELOPED FLOWS

Runoff = 35.54 cfs @ 12.09 hrs, Volume= 2.405 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 1-Year Rainfall=2.20"

	Area	(ac) C	N Des	scription		
	34.	560	83 1/4	acre lots, 3	88% imp, H	SGC
	21.	427	62.0	00% Pervio	us Area	
	13.133 38.00% Impervious Area			00% Imperv	vious Area	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
						Grass: Short n= 0.150 P2= 2.60"
	2.1	185	0.0050	1.44		Shallow Concentrated Flow, SCF
	4.0	044	0 00 4 0	0 70	2.02	Paved Kv= 20.3 fps
	4.2	944	0.0040	3.73	2.93	12.0" Bound Aroos 0.8 of Dorims 2.1' rs 0.25'
						n = 0.010 PVC smooth interior
_	15.7	1 201	Total			
	10.7	1,201	rotar			



Runoff = 49.79 cfs @ 12.08 hrs, Volume= 3.326 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=2.63"

	Area	(ac) C	N Des	scription		
	34.	560	83 1/4	acre lots, 3	88% imp, H	SGC
	21.	427	62.0	00% Pervio	us Area	
	13.133 38.00% Impervious Area			00% Imperv	vious Area	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
						Grass: Short n= 0.150 P2= 2.60"
	2.1	185	0.0050	1.44		Shallow Concentrated Flow, SCF
	4.0	044	0 00 4 0	0 70	2.02	Paved Kv= 20.3 fps
	4.2	944	0.0040	3.73	2.93	12.0" Bound Aroos 0.8 of Dorims 2.1' rs 0.25'
						n = 0.010 PVC smooth interior
_	15.7	1 201	Total			
	10.7	1,201	rotar			



Runoff = 71.20 cfs @ 12.08 hrs, Volume= 4.729 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 5-Year Rainfall=3.24"

	Area	(ac) C	N Des	scription		
	34.	560	83 1/4	acre lots, 3	88% imp, H	SGC
	21.	427	62.0	00% Pervio	us Area	
	13.133 38.00% Impervious Area			00% Imperv	vious Area	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
						Grass: Short n= 0.150 P2= 2.60"
	2.1	185	0.0050	1.44		Shallow Concentrated Flow, SCF
	4.0	044	0 00 4 0	0 70	2.02	Paved Kv= 20.3 fps
	4.2	944	0.0040	3.73	2.93	12.0" Bound Aroos 0.8 of Dorims 2.1' rs 0.25'
						n = 0.010 PVC smooth interior
_	15.7	1 201	Total			
	10.7	1,201	rotar			



Runoff = 89.41 cfs @ 12.08 hrs, Volume= 5.939 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=3.74"

	Area	(ac) C	N Des	scription		
	34.	560	83 1/4	acre lots, 3	88% imp, H	SGC
	21.	427	62.0	00% Pervio	us Area	
	13.133 38.00% Impervious Area			00% Imperv	vious Area	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
						Grass: Short n= 0.150 P2= 2.60"
	2.1	185	0.0050	1.44		Shallow Concentrated Flow, SCF
	4.0	044	0 00 4 0	0 70	2.02	Paved Kv= 20.3 fps
	4.2	944	0.0040	3.73	2.93	12.0" Bound Aroos 0.8 of Dorims 2.1' rs 0.25'
						n = 0.010 PVC smooth interior
_	15.7	1 201	Total			
	10.7	1,201	rotar			



Runoff = 115.50 cfs @ 12.08 hrs, Volume= 7.696 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 25-Year Rainfall=4.44"

	Area	(ac) C	N Des	scription		
	34.	560	83 1/4	acre lots, 3	88% imp, H	SGC
	21.	427	62.0	00% Pervio	us Area	
	13.133 38.00% Impervious Area			00% Imperv	vious Area	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
						Grass: Short n= 0.150 P2= 2.60"
	2.1	185	0.0050	1.44		Shallow Concentrated Flow, SCF
	4.0	044	0 00 4 0	0 70	2.02	Paved Kv= 20.3 fps
	4.2	944	0.0040	3.73	2.93	12.0" Bound Aroos 0.8 of Dorims 2.1' rs 0.25'
						n = 0.010 PVC smooth interior
_	15.7	1 201	Total			
	10.7	1,201	rotar			



Runoff = 137.42 cfs @ 12.08 hrs, Volume= 9.194 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=5.02"

_	Area	(ac) (CN De	scription		
	34.	560	83 1/4	acre lots, 3	38% imp, H	SGC
	21.	427	62.	00% Pervic	ous Area	
	13.133 38.00% Impervious Area			00% Imper	vious Area	
	Tc (min)	Length (feet)	Slope (ft/ft	e Velocity) (ft/sec)	Capacity (cfs)	Description
	9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
						Grass: Short n= 0.150 P2= 2.60"
	2.1	185	0.0050) 1.44		Shallow Concentrated Flow, SCF
	4.2	944	0.0040) 3.73	2.93	Paved KV= 20.3 fps Pipe Channel, Pipe Flow 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
	15.7	1,201	Total			



Runoff = 160.65 cfs @ 12.08 hrs, Volume= 10.798 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=5.63"

Area	(ac) C	N Des	cription		
34.	560 8	33 1/4 a	acre lots, 3	8% imp, H	SG C
21.	427	62.0	0% Pervio	us Area	
13.	13.133 38.00% Impervious Area			/ious Area	
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		Sheet Flow, Sheet Flow
					Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		Shallow Concentrated Flow, SCF
4.2	944	0.0040	3.73	2.93	Paved KV= 20.3 lps Pipe Channel, Pipe Flow 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			



Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 2.39 cfs @ 13.84 hrs, Volume= 0.865 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 1-Year Rainfall=2.20"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	% Grass co	over, Good	, HSG C			
5.730 70			'0 Woo	Woods, Good, HSG C					
2.100 98 Paved parking, HSG C									
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	9.78% Impervious Area					
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
		4 700	0 0000	0.40		n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows KV= 9.0 fps			
	138.6	3,148	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 3.87 cfs @ 13.74 hrs, Volume= 1.303 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 2-Year Rainfall=2.63"

_	Area	(ac) C	N Dese	cription					
13.650 74 >75% Grass of					over, Good	, HSG C			
5.730 70			70 Woo	Woods, Good, HSG C					
_	2.	100 9	8 Pave	ed parking	, HSG C				
	21.	480 7	75 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
						n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows Kv= 9.0 fps			
	138.6	3 148	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 6.34 cfs @ 13.72 hrs, Volume= 2.007 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 5-Year Rainfall=3.24"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	>75% Grass cover, Good, HSG C					
5.730 70			'0 Woo	Woods, Good, HSG C					
_	2.	100 9	8 Pave	Paved parking, HSG C					
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
		4 700	0 0000	0.40		n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows KV= 9.0 fps			
	138.6	3,148	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 8.57 cfs @ 13.71 hrs, Volume= 2.639 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 10-Year Rainfall=3.74"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	>75% Grass cover, Good, HSG C					
5.730 70			'0 Woo	Woods, Good, HSG C					
_	2.	100 9	8 Pave	Paved parking, HSG C					
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
	04.0	4 700	0 0000	0.40		n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows KV= 9.0 fps			
	138.6	3,148	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 11.91 cfs @ 13.70 hrs, Volume= 3.586 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 25-Year Rainfall=4.44"

_	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	>75% Grass cover, Good, HSG C					
5.730 70			'0 Woo	Woods, Good, HSG C					
_	2.	100 9	8 Pave	Paved parking, HSG C					
_	21.	480 7	75 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
						n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows Kv= 9.0 fps			
	120 6	3 1/18	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 14.83 cfs @ 13.69 hrs, Volume= 4.413 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 50-Year Rainfall=5.02"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	>75% Grass cover, Good, HSG C					
5.730 70			'0 Woo	Woods, Good, HSG C					
_	2.	100 9	8 Pave	Paved parking, HSG C					
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
		4 700	0 0000	0.40		n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
_						Cultivated Straight Rows KV= 9.0 fps			
	138.6	3,148	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Subcatchment 10S: Existing Pass-Through

Runoff = 17.99 cfs @ 13.69 hrs, Volume= 5.315 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Type II 24-hr 100-Year Rainfall=5.63"

	Area	(ac) C	N Dese	cription					
	13.	650 7	′4 >75°	>75% Grass cover, Good, HSG C					
5.730 70			'0 Woo	Woods, Good, HSG C					
	2.	100 9	8 Pave	Paved parking, HSG C					
	21.	480 7	'5 Weig	ghted Aver	age				
	19.	380	90.2	2% Pervio	us Area				
	2.	100	9.78	% Impervi	ous Area				
	_								
	IC	Length	Slope	Velocity	Capacity	Description			
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	30.3	100	0.0110	0.06		Sheet Flow, Sheet Flow			
						Woods: Light underbrush n= 0.400 P2= 2.60"			
	24.5	947	0.0085	0.65		Shallow Concentrated Flow, SCF			
						Short Grass Pasture Kv= 7.0 fps			
	21.9	333	0.0065	0.25	1.65	Channel Flow, Channel Flow			
						Area= 6.5 sf Perim= 18.0' r= 0.36'			
						n= 0.240 Sheet flow over Dense Grass			
	61.9	1,768	0.0028	0.48		Shallow Concentrated Flow,			
						Cultivated Straight Rows Kv= 9.0 fps			
	138.6	3,148	Total						



Subcatchment 10S: Existing Pass-Through

Summary for Pond 8P: Pond B2

Inflow Area	a =	56.040 ac, 2 ⁻	7.18% Impervious	, Inflow Depth =	0.70" fc	or 1-Year event
Inflow	=	35.57 cfs @	12.09 hrs, Volum	e= 3.270	af	
Outflow	=	3.51 cfs @	14.69 hrs, Volum	e= 3.068	af, Atten=	= 90%, Lag= 155.9 min
Primary	=	3.51 cfs @	14.69 hrs, Volum	e= 3.068	af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 922.57' @ 14.69 hrs Surf.Area= 44,149 sf Storage= 62,925 cf

Plug-Flow detention time= 445.7 min calculated for 3.065 af (94% of inflow) Center-of-Mass det. time= 412.3 min (1,309.2 - 896.9)

Volur	ne	Invert	Avail.Stor	rage	Storage I	Description	
#1		921.00'	308,91	I3 cf	Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elov	otion	S 11	urf Aroo	Inc	Store	Cum Stora	
	alion foot)	30		IIIC.	Sluie	(oubic foot)	
((Cubic			
92	21.00		36,080		0	0	
92	2.00		41,185	3	8,633	38,633	
92	23.00		46,391	4	3,788	82,421	
92	24.00		52,403	4	9,397	131,818	
92	25.00		56,766	5	4,585	186,402	
92	26.00		61,230	5	8,998	245,400	
92	27.00		65,795	6	3,513	308,913	
Devic	e Ro	outing	Invert	Outle	et Devices	6	
#	1 Pr	imary	921.00'	48.0'	" Round	Culvert	
		,		L= 10	08.0' CP	P, square edge	headwall, Ke= 0.500
				Inlet	/ Outlet Ir	vert= 921.00 /	920.68' S= 0.0030 '/' Cc= 0.900
				n= 0.	.010 PVC	, smooth interio	or, Flow Area= 12.57 sf
#2	2 De	evice 1	921.00'	5.5"	Vert. Orif	ice/Grate C=	0.600
#3	3 De	evice 1	923.00'	24.0'	" W x 12.0	0" H Vert. Orifi	ce/Grate C= 0.600
#4	1 De	evice 1	922.10'	12.0'	" Horiz. C	orifice/Grate	C= 0.600
				Limit	ed to weir	flow at low hea	ads
#5	5 De	evice 1	924.20'	24.0'	" W x 12.0	0" H Vert. Orifi	ce/Grate C= 0.600
#6	6 De	evice 1	926.00'	24.0'	" x 24.0"	Horiz. Orifice/0	Grate C= 0.600
				Limit	ed to weir	flow at low hea	ads
Prim	ary Οι	ItFlow M	ax=3.51 cfs @	2 14.6	69 hrs HV	V=922.57' (Fre	ee Discharge)
┸_1=	Culve	rt (Passe	es 3.51 cfs of	14.65	cfs poten	itial flow)	
F	-2=Or	ifice/Grat	te (Orifice Co	ntrols	0.92 cfs (@ 5.57 fps)	
	-3=Or	ifice/Grat	te (Controls	0.00 c	fs)		
⊢	-4=Ori	ifice/Grat	te (Orifice Co	ntrols	2.59 cfs (@ 3.30 fps)	
- H	-5=Ori	ifice/Grat	te (Controls	0.00 c	fs)		

6=Orifice/Grate (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area	a =	56.040 ac, 27.18%	Impervious, Inflow De	epth = 0.99"	for 2-Year event
Inflow	=	49.85 cfs @ 12.08	hrs, Volume=	4.629 af	
Outflow	=	5.07 cfs @ 14.65	hrs, Volume=	4.419 af, Atte	n= 90%, Lag= 154.1 min
Primary	=	5.07 cfs @ 14.65	hrs, Volume=	4.419 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 923.10' @ 14.65 hrs Surf.Area= 46,993 sf Storage= 87,094 cf

Plug-Flow detention time= 369.4 min calculated for 4.414 af (95% of inflow) Center-of-Mass det. time= 344.2 min (1,232.7 - 888.5)

Volume	Invert	Avail.Sto	rage Storage	Description					
#1	921.00	308,91	13 cf Custom	Stage Data (Pr	ismatic)Listed below (Recalc)				
Elevatio	n S	urf.Area	Inc.Store	Cum.Store					
(feet	:)	(sq-ft)	(cubic-feet)	(cubic-feet)					
921.0	0	36,080	0	0					
922.0	0	41,185	38,633	38,633					
923.0	0	46,391	43,788	82,421					
924.0	0	52,403	49,397	131,818					
925.0	0	56,766	54,585	186,402					
926.0	0	61,230	58,998	245,400					
927.0	0	65,795	63,513	308,913					
Device	Routing	Invert	Outlet Device	S					
#1	Primary	921.00'	48.0" Round	Culvert					
	2		L= 108.0' CF	P, square edge	headwall, Ke= 0.500				
			Inlet / Outlet I	nvert= 921.00 [°] /	920.68' S= 0.0030 '/' Cc= 0.900				
			n= 0.010 PV0	C, smooth interio	or, Flow Area= 12.57 sf				
#2	Device 1	921.00'	5.5" Vert. Ori	fice/Grate C=	0.600				
#3	Device 1	923.00'	24.0" W x 12.	0" H Vert. Orifi	ce/Grate C= 0.600				
#4	Device 1	922.10'	12.0" Horiz. (Drifice/Grate C	C= 0.600				
			Limited to wei	r flow at low hea	ads				
#5	Device 1	924.20'	24.0" W x 12.	0" H Vert. Orifi	ce/Grate C= 0.600				
#6	Device 1	926.00'	24.0" x 24.0"	Horiz. Orifice/C	Grate C= 0.600				
			Limited to wei	r flow at low hea	ads				
Primary	Primary OutFlow Max=5.07 cfs @ 14.65 hrs HW=923.10' (Free Discharge)								

- **2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 6.59 fps)
- -3=Orifice/Grate (Orifice Controls 0.20 cfs @ 1.02 fps)
- -4=Orifice/Grate (Orifice Controls 3.78 cfs @ 4.82 fps)
- -5=Orifice/Grate (Controls 0.00 cfs)

-6=Orifice/Grate (Controls 0.00 cfs)

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Summary for Pond 8P: Pond B2

Inflow Area	a =	56.040 ac, 2	7.18% Impervio	us, Inflow De	epth = 1.44"	for 5-Year event
Inflow	=	71.39 cfs @	12.08 hrs, Volu	ume=	6.736 af	
Outflow	=	9.42 cfs @	14.10 hrs, Volu	ume=	6.517 af, Atte	en= 87%, Lag= 120.9 min
Primary	=	9.42 cfs @	14.10 hrs, Volu	ume=	6.517 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 923.66' @ 14.10 hrs Surf.Area= 50,368 sf Storage= 114,422 cf

Plug-Flow detention time= 299.3 min calculated for 6.510 af (97% of inflow) Center-of-Mass det. time= 280.9 min (1,160.5 - 879.6)

Volume	Invert	Avail.Stor	age Storage [Description					
#1	921.00'	308,91	3 cf Custom	Stage Data (Pr	ismatic)Listed below (Recalc)				
Flevation	n Si	ırf Area	Inc Store	Cum Store					
(feet)	(sa-ft)	(cubic-feet)	(cubic-feet)					
921.00)	36 080	0	0					
922.00)	41.185	38.633	38.633					
923.00)	46,391	43,788	82,421					
924.00)	52,403	49,397	131,818					
925.00)	56,766	54,585	186,402					
926.00)	61,230	58,998	245,400					
927.00)	65,795	63,513	308,913					
Device	Routing	Invert	Outlet Devices						
#1	Primary	921.00'	48.0" Round	Culvert					
	-		L= 108.0' CPI	P, square edge	headwall, Ke= 0.500				
			Inlet / Outlet In	vert= 921.00' /	920.68' S= 0.0030 '/' Cc= 0.900				
			n= 0.010 PVC	, smooth interic	or, Flow Area= 12.57 sf				
#2	Device 1	921.00'	5.5" Vert. Orif	ice/Grate C=	0.600				
#3	Device 1	923.00'	24.0" W x 12.0)" H Vert. Orifi	ce/Grate C= 0.600				
#4	Device 1	922.10'	12.0" Horiz. O	erifice/Grate C	= 0.600				
<i>щ</i> г	Device 1	004.001	Limited to weir	flow at low hea					
#5 #0	Device 1	924.20	24.0" W X 12.0	H vert. Orifice	Ce/Grate C= 0.600				
#0	Device	926.00	Limited to weir	flow at low hea	ads				
Primary	Primary OutFlow Max=9.42 cfs @ 14.10 hrs HW=923.66' (Free Discharge)								

2=Orifice/Grate (Orifice Controls 1.24 cfs @ 7.51 fps)

-3=Orifice/Grate (Orifice Controls 3.45 cfs @ 2.61 fps)

-4=Orifice/Grate (Orifice Controls 4.73 cfs @ 6.02 fps)

-5=Orifice/Grate (Controls 0.00 cfs)

-6=Orifice/Grate (Controls 0.00 cfs)

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Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area	a =	56.040 ac, 2	7.18% Impervious	, Inflow Depth =	1.84" f	or 10-Year event
Inflow	=	89.81 cfs @	12.08 hrs, Volum	e= 8.578	af	
Outflow	=	13.33 cfs @	13.80 hrs, Volum	e= 8.353	af, Atten	= 85%, Lag= 103.1 min
Primary	=	13.33 cfs @	13.80 hrs, Volum	e= 8.353	af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 924.04' @ 13.80 hrs Surf.Area= 52,569 sf Storage= 133,808 cf

Plug-Flow detention time= 261.1 min calculated for 8.353 af (97% of inflow) Center-of-Mass det. time= 244.9 min (1,118.8 - 873.9)

-5=Orifice/Grate (Controls 0.00 cfs) -6=Orifice/Grate (Controls 0.00 cfs)

Volume	Invert	Avail.Sto	rage	Storage I	Description	
#1	921.00'	308,97	13 cf	Custom	Stage Data (P	rismatic)Listed below (Recalc)
Flevation		urf Area	Inc	Store	Cum Store	
(foot		(sa_ft)	(cubi	c_foot)	(cubic_feet)	
)	26.090	(cubit	0		
921.00)	30,080	~		0	
922.00)	41,185	3	00,000	38,033	
923.00)	46,391	4	13,788	82,421	
924.00)	52,403	4	49,397	131,818	
925.00)	56,766	5	04,585	186,402	
926.00)	61,230	5	08,998	245,400	
927.00)	65,795	6	53,513	308,913	
Device	Routing	Invert	Outle	et Devices	6	
#1	Primary	921.00'	48.0	" Round	Culvert	
			L= 1	08.0' CP	P. square edge	e headwall. Ke= 0.500
			Inlet	/ Outlet In	vert= 921.00' /	(920.68') S= 0.0030 $'/$ Cc= 0.900
			n= 0	010 PVC	smooth interi	or. Flow Area= 12.57 sf
#2	Device 1	921.00'	5.5"	Vert. Orif	ice/Grate C=	0.600
#3	Device 1	923.00'	24.0	" W x 12.0	0" H Vert. Orif	ice/Grate C= 0.600
#4	Device 1	922.10'	12.0	" Horiz. C)rifice/Grate (C = 0.600
		•==•••	Limit	ted to weir	flow at low he	ads
#5	Device 1	924.20'	24.0	" W x 12.0	0" H Vert. Orif	ice/Grate C= 0.600
#6	Device 1	926.00'	24.0	" x 24.0"	Horiz. Orifice/	Grate C= 0.600
			Limit	ted to weir	flow at low he	ads
Primary	OutFlow M	lax=13.34 cfs	@ 13	.80 hrs H	W=924.04' (F	ree Discharge)
1=Cul	vert (Pass	es 13.34 cfs c	of 46.1	4 cfs pote	ential flow)	o ,
1 -2=0	Drifice/Gra	te (Orifice Co	ontrols	1.33 cfs (@ 8.07 fps)	
−3= 0	Drifice/Gra	te (Orifice Co	ontrols	6.74 cfs (a) 3.37 fps)	
-4=C	Drifice/Gra	te (Orifice Co	ontrols	5.26 cfs (0 6.70 fps)	

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area	a =	56.040 ac, 2	27.18% Impervious,	Inflow Depth =	2.42" for	25-Year event
Inflow	=	116.29 cfs @	12.08 hrs, Volume	e= 11.282	af	
Outflow	=	20.09 cfs @	12.61 hrs, Volume	e= 11.048	af, Atten=	83%, Lag= 31.9 min
Primary	=	20.09 cfs @	12.61 hrs, Volume	e= 11.048	af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 924.68' @ 12.61 hrs Surf.Area= 55,379 sf Storage= 168,576 cf

Plug-Flow detention time= 226.4 min calculated for 11.048 af (98% of inflow) Center-of-Mass det. time= 213.3 min (1,080.7 - 867.4)

Volume	Invert	Avail.Sto	rage Storag	ge Description	
#1	921.00'	308,91	3 cf Custo	om Stage Data (Prismatic)Listed below (Recalc)	
- 1	0	- ()			
Elevation	Su	rf.Area	Inc.Store	Cum.Store	
(feet)		(sq-ft)	(cubic-feet)	(cubic-feet)	
921.00		36,080	0	0	
922.00		41,185	38,633	38,633	
923.00		46,391	43,788	82,421	
924.00		52,403	49,397	131,818	
925.00		56,766	54,585	186,402	
926.00		61,230	58,998	245,400	
927.00		65,795	63,513	308,913	
Dovice F	Pouting	Invort	Outlet Devi		
					—
#1 P	rimary	921.00	48.0" ROU	ODD a success a data that a durally 1/2 - 0,500	
			$L = 108.0^{\circ}$		
				el Invert= 921.00 / 920.68 S= 0.0030 / Cc= 0.900	
#0 F		004 001		PVC, Smooth Interior, Flow Area= 12.57 Si	
#2 L #2 F		921.00	5.5 Vert. C		
#3 L		923.00	24.0 VV X 1	12.0 H Vert. Ornice/Grate $C = 0.000$	
#4 L		922.10	IZ.0 HONZ	z. Office/Grate C= 0.000	
#5 F		024 201		12 0" H Vort Orifico/Grate C= 0.600	
#5 L #6 F		924.20	24.0 VV X	$\mathbf{O}'' \mathbf{H}_{\mathbf{O}} \mathbf{O}'' \mathbf{O}''' \mathbf{O}'' \mathbf{O}''' \mathbf{O}'' \mathbf{O}'' \mathbf{O}''' \mathbf{O}''' \mathbf{O}''' \mathbf{O}''' \mathbf{O}''' \mathbf{O}''' \mathbf{O}''' \mathbf{O}'''' \mathbf{O}'''' \mathbf{O}''''''''''''''''''''''''''''''''''''$	
#0 L		920.00	Limited to M	veir flow at low beads	
				well now at low neads	
Primary O	utFlow Ma	ax=20 09 cfs	@ 12 61 hrs	HW=924 68' (Free Discharge)	
1=Culv	ert (Passe	s 20.09 cfs c	of 62.45 cfs p	potential flow)	
1 _2=0	rifice/Grat	e (Orifice Co	ntrols 1.48 ct	fs @ 8.95 fps)	
-3=O	rifice/Grat	e (Orifice Co	ntrols 10.39	cfs @ 5.19 fps)	
<u>4=0</u>	rifice/Grat	e (Orifice Co	ntrols 6.08 ct	fs @ 7.74 fps)	
-5=O	rifice/Grat	e (Orifice Co	ntrols 2.15 cf	fs @ 2.23 fps)	
└ <u></u> 6=0	rifice/Grat	e (Controls	0.00 cfs)		

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Pond 8P: Pond B2

Summary for Pond 8P: Pond B2

Inflow Area	a =	56.040 ac, 27.18% Impervious, Inflow Depth = 2.91" for 50-Year event	
Inflow	=	138.61 cfs @ 12.08 hrs, Volume= 13.607 af	
Outflow	=	27.41 cfs @ 12.53 hrs, Volume= 13.366 af, Atten= 80%, Lag= 26.9 n	nin
Primary	=	27.41 cfs @ 12.53 hrs, Volume= 13.366 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 925.22' @ 12.53 hrs Surf.Area= 57,741 sf Storage= 198,907 cf

Plug-Flow detention time= 204.4 min calculated for 13.352 af (98% of inflow) Center-of-Mass det. time= 194.2 min (1,057.2 - 863.0)

Volume	Invert	Avail.Stor	rage	Storage De	escription	
#1	921.00'	308,91	I3 cf	Custom S	tage Data (F	Prismatic) Listed below (Recalc)
Elevation	Surf.	Area	Inc.	Store	Cum.Store	,
(feet)	()	sq-ft)	(cubic	-feet)	(cubic-feet)	
921.00	36	6,080		0	0	I
922.00	41	l,185	3	8,633	38,633	ı
923.00	46	6,391	4	3,788	82,421	
924.00	52	2,403	4	9,397	131,818	(
925.00	56	6,766	5	4,585	186,402	
926.00	61	,230	5	8,998	245,400	
927.00	65	5,795	6	3,513	308,913	
Device R	outing	Invert	Outle	et Devices		
#1 Pi #2 Di #3 Di #4 Di #5 Di #6 Di	rimary evice 1 evice 1 evice 1 evice 1 evice 1	921.00' 923.00' 922.10' 924.20' 926.00'	48.0' L= 10 Inlet . n= 0. 5.5" 24.0' Limite 24.0' Limite	' Round C)8.0' CPP / Outlet Inv. 010 PVC, Vert. Orific ' W x 12.0" ' Horiz. Ori ed to weir f ' W x 12.0" ' x 24.0" He ed to weir f	sulvert , square edg ert= 921.00' smooth inter ce/Grate C= ' H Vert. Orif ifice/Grate low at low he ' H Vert. Orifice low at low he	e headwall, Ke= 0.500 / 920.68' S= 0.0030 '/' Cc= 0.900 fior, Flow Area= 12.57 sf = 0.600 fice/Grate C= 0.600 C= 0.600 eads fice/Grate C= 0.600 /Grate C= 0.600 eads
Primary Or 1=Culve -2=Or -3=Or -4=Or -5=Or -6=Or	utFlow Max art (Passes ifice/Grate ifice/Grate ifice/Grate ifice/Grate ifice/Grate	=27.41 cfs 27.41 cfs c (Orifice Co (Orifice Co (Orifice Co (Orifice Co (Controls (@ 12. of 75.94 ntrols ntrols ntrols ntrols 0.00 cf	53 hrs HW 4 cfs poten 1.59 cfs @ 12.58 cfs @ 6.68 cfs @ 6.57 cfs @ fs)	/=925.22' (F tial flow) 9.62 fps) 0 6.29 fps) 8.50 fps) 3.29 fps)	⁻ ree Discharge)

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Summary for Pond 8P: Pond B2

Inflow Are	a =	56.040 ac, 2	7.18% Imperv	vious, Inflow	Depth =	3.45"	for 100-	Year event
Inflow	=	162.30 cfs @	12.08 hrs, V	'olume=	16.113	af		
Outflow	=	33.51 cfs @	12.50 hrs, V	'olume=	15.866	af, Attei	n= 79%,	Lag= 25.8 min
Primary	=	33.51 cfs @	12.50 hrs, V	'olume=	15.866	af		

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs Peak Elev= 925.79' @ 12.50 hrs Surf.Area= 60,313 sf Storage= 232,911 cf

Plug-Flow detention time= 189.9 min calculated for 15.866 af (98% of inflow) Center-of-Mass det. time= 179.9 min (1,038.8 - 858.9)

Volume	Invert	Avail.Stor	rage Storage	Description	
#1	921.00'	308,91	3 cf Custom	Stage Data (Prismati	i c) Listed below (Recalc)
	0	~ ^		0 01	
Elevation	Sur	f.Area	Inc.Store	Cum.Store	
(feet)		(sq-ft)	(cubic-feet)	(cubic-feet)	
921.00	3	86,080	0	0	
922.00	4	1,185	38,633	38,633	
923.00	4	6,391	43,788	82,421	
924.00	5	52,403	49,397	131,818	
925.00	5	56,766	54,585	186,402	
926.00	6	61,230	58,998	245,400	
927.00	6	65,795	63,513	308,913	
Davias D	outing	Invert	Outlet Devices		
Device Ri	outing				
#1 Pr	rimary	921.00	48.0" Round	Culvert	
			L= 108.0° CP	P, square edge neadw	/all, Ke= 0.500
				vert= 921.00 / 920.68	S = 0.00307 CC= 0.900
#0 D		004 001	n= 0.010 PVC		w Area= 12.57 st
#2 D	evice 1	921.00	5.5" Vert. Orli		
#3 D0		923.00	24.0" W X 12.0	H Vert. Orifice/Gra	Ite C = 0.600
#4 D0	evice	922.10	12.0" Horiz. C	fine of law based	10
		004 001		IIOW ALIOW NEADS	
#5 D		924.20	24.0 VV X 12.0	H Vert. Orifice/Gra	C = 0.600
#0 D0	evice i	920.00	24.0 X 24.0	Horiz. Ornice/Grate	C = 0.000
			Limited to well	now at low neads	
Primary O	u tFlow Ma	x=33 50 cfs	@ 12 50 hrs H	W=925 79' (Free Dis	charge)
[↑] _1=Culve	ert (Passes	33.50 cfs o	of 88.97 cfs pote	ntial flow)	enalge)
1-2=Or	ifice/Grate	• (Orifice Co	ntrols 1.70 cfs (0 10.29 fps)	
-3=Or	ifice/Grate	(Orifice Co	ntrols 14.56 cfs	@ 7.28 fps)	
-4=Or	ifice/Grate	(Orifice Co	ntrols 7.27 cfs (0.9.25 fps)	
-5=Or	ifice/Grate	(Orifice Co	ntrols 9.98 cfs (2 4.99 fps)	
└6=Or	ifice/Grate	(Controls (0.00 cfs)		

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Pond 8P: Pond B2

