

# **Attachment 7**

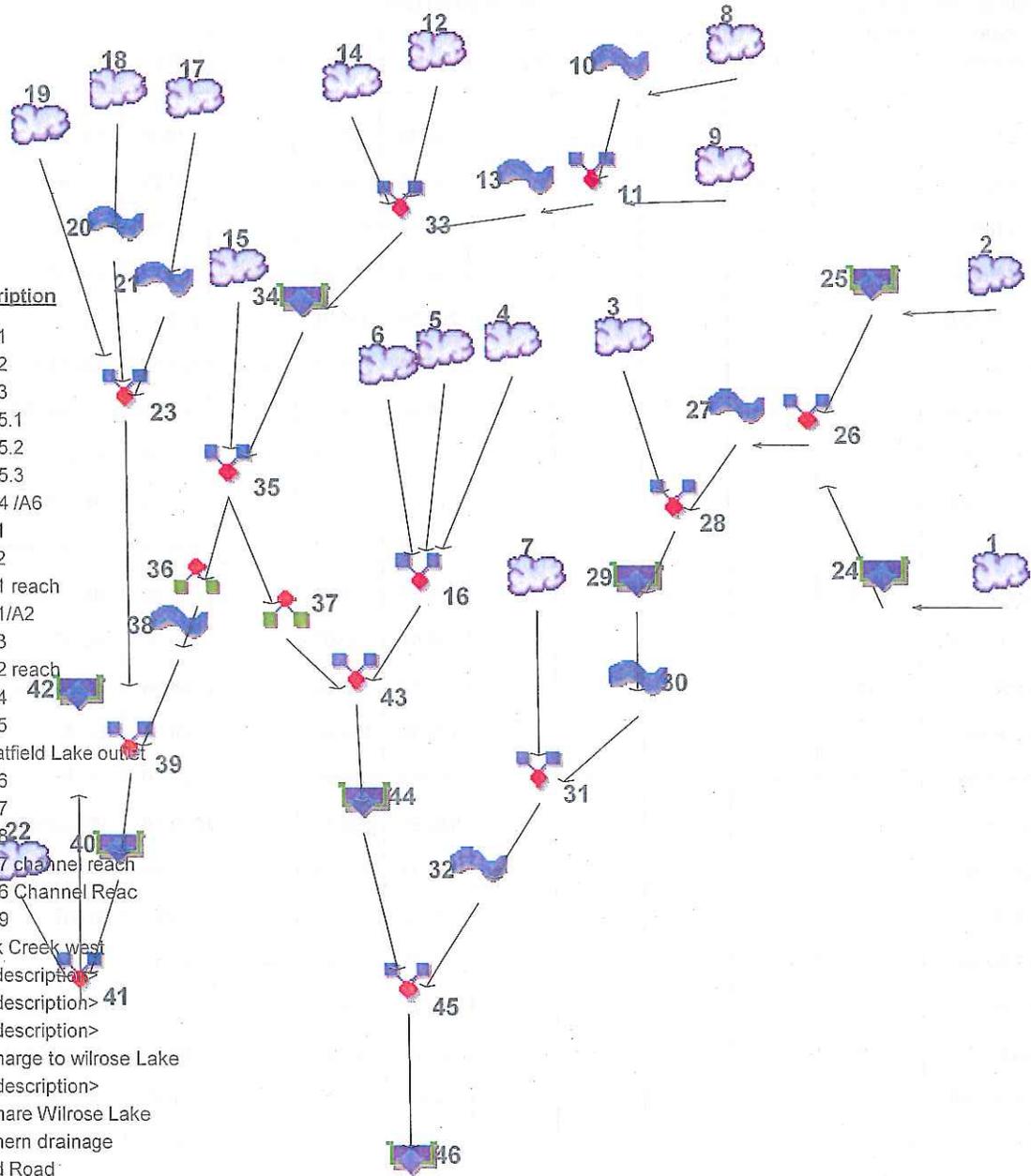
## **Watershed Model Schematic**

# Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

## Legend

Hvd.	Origin	Description
1	SCS Runoff	SD-A1
2	SCS Runoff	SD-A2
3	SCS Runoff	SD-A3
4	SCS Runoff	SD-A5.1
5	SCS Runoff	SD-A5.2
6	SCS Runoff	SD-A5.3
7	SCS Runoff	SD-A4 /A6
8	SCS Runoff	BL-A1
9	SCS Runoff	BL-A2
10	Reach	BL-A1 reach
11	Combine	BL-A1/A2
12	SCS Runoff	BL-A3
13	Reach	BL-A2 reach
14	SCS Runoff	BL-A4
15	SCS Runoff	BL-A5
16	Combine	Wheatfield Lake outlet
17	SCS Runoff	BL-A6
18	SCS Runoff	BL-A7
19	SCS Runoff	BL-A8
20	Reach	BL-A7 channel reach
21	Reach	BL-A6 Channel Reac
22	SCS Runoff	BL-A9
23	Combine	Black Creek west
24	Reservoir	<no description>
25	Reservoir	<no description>
26	Combine	<no description>
27	Reach	Discharge to wilrose Lake
28	Combine	<no description>
29	Reservoir	Dischare Wilrose Lake
30	Reach	southern drainage
31	Combine	Ward Road
32	Reach	Southern Drainage Extension
33	Combine	Lakeside storm ponds
34	Reservoir	routed Lakeside ponds
35	Combine	Black Creek East
36	Diversion1	Black Creek diversion
37	Diversion2	Southern Drainage
38	Reach	Black Creek East
39	Combine	<no description>
40	Reservoir	Liberty drive
41	Combine	<no description>
42	Reservoir	<no description>
43	Combine	Diverted Wheatfield Lakes
44	Reservoir	Whaetfield Lakes
45	Combine	<no description>
46	Reservoir	<no description>



# Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	-----	-----	-----	-----	12.38	18.15	-----	30.91	SD-A1
2	SCS Runoff	-----	-----	-----	-----	-----	17.39	24.99	-----	41.24	SD-A2
3	SCS Runoff	-----	-----	-----	-----	-----	98.51	141.45	-----	233.60	SD-A3
4	SCS Runoff	-----	-----	-----	-----	-----	24.13	34.95	-----	58.47	SD-A5.1
5	SCS Runoff	-----	-----	-----	-----	-----	293.34	357.95	-----	485.67	SD-A5.2
6	SCS Runoff	-----	-----	-----	-----	-----	274.09	377.81	-----	593.62	SD-A5.3
7	SCS Runoff	-----	-----	-----	-----	-----	40.48	58.46	-----	97.59	SD-A4 /A6
8	SCS Runoff	-----	-----	-----	-----	-----	16.83	25.07	-----	42.97	BL-A1
9	SCS Runoff	-----	-----	-----	-----	-----	15.34	22.43	-----	37.97	BL-A2
10	Reach	8	-----	-----	-----	-----	12.76	19.64	-----	35.12	BL-A1 reach
11	Combine	9, 10	-----	-----	-----	-----	23.50	34.48	-----	58.80	BL-A1/A2
12	SCS Runoff	-----	-----	-----	-----	-----	39.01	56.03	-----	92.52	BL-A3
13	Reach	11	-----	-----	-----	-----	23.12	33.94	-----	58.04	BL-A2 reach
14	SCS Runoff	-----	-----	-----	-----	-----	139.36	194.63	-----	309.84	BL-A4
15	SCS Runoff	-----	-----	-----	-----	-----	12.93	19.05	-----	32.60	BL-A5
16	Combine	4, 5, 6,	-----	-----	-----	-----	529.91	690.77	-----	1020.70	Wheatfield Lake outlet
17	SCS Runoff	-----	-----	-----	-----	-----	72.59	101.79	-----	162.94	BL-A6
18	SCS Runoff	-----	-----	-----	-----	-----	68.88	92.52	-----	140.61	BL-A7
19	SCS Runoff	-----	-----	-----	-----	-----	44.09	64.77	-----	110.51	BL-A8
20	Reach	18	-----	-----	-----	-----	52.95	73.26	-----	115.72	BL-A7 channel reach
21	Reach	17	-----	-----	-----	-----	63.79	90.97	-----	148.73	BL-A6 Channel Reac
22	SCS Runoff	-----	-----	-----	-----	-----	24.08	35.67	-----	61.31	BL-A9
23	Combine	19, 20, 21,	-----	-----	-----	-----	119.52	169.39	-----	275.71	Black Creek west
24	Reservoir	1	-----	-----	-----	-----	12.38	18.15	-----	30.89	<no description>
25	Reservoir	2	-----	-----	-----	-----	17.42	24.99	-----	41.24	<no description>
26	Combine	24, 25	-----	-----	-----	-----	21.81	31.36	-----	53.36	<no description>
27	Reach	26	-----	-----	-----	-----	20.86	30.37	-----	51.52	Discharge to wilrose Lake
28	Combine	3, 27	-----	-----	-----	-----	117.00	168.77	-----	281.30	<no description>
29	Reservoir	28	-----	-----	-----	-----	10.16	11.62	-----	13.67	Dischare Wilrose Lake
30	Reach	29	-----	-----	-----	-----	10.08	11.56	-----	13.63	southern drainage
31	Combine	7, 30	-----	-----	-----	-----	44.23	63.37	-----	104.51	Ward Road
32	Reach	31	-----	-----	-----	-----	44.11	63.02	-----	103.45	Southern Drainage Extension
33	Combine	12, 13, 14,	-----	-----	-----	-----	150.75	213.41	-----	347.50	Lakeside storm ponds

# Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
34	Reservoir	33	-----	-----	-----	-----	69.75	128.55	-----	289.33	routed Lakeside ponds
35	Combine	15, 34	-----	-----	-----	-----	82.05	134.03	-----	296.85	Black Creek East
36	Diversion1	35	-----	-----	-----	-----	16.41	26.81	-----	59.37	Black Creek diversion
37	Diversion2	35	-----	-----	-----	-----	65.64	107.22	-----	237.48	Southern Drainage
38	Reach	36	-----	-----	-----	-----	14.62	21.65	-----	38.16	Black Creek East
39	Combine	23, 38	-----	-----	-----	-----	123.92	178.52	-----	303.39	<no description>
40	Reservoir	39	-----	-----	-----	-----	87.18	169.05	-----	298.88	Liberty drive
41	Combine	22, 40	-----	-----	-----	-----	110.96	190.66	-----	333.00	<no description>
42	Reservoir	41	-----	-----	-----	-----	108.49	144.08	-----	182.10	<no description>
43	Combine	16, 37,	-----	-----	-----	-----	534.44	699.19	-----	1056.01	Diverted Wheatfield Lakes
44	Reservoir	43	-----	-----	-----	-----	22.63	34.79	-----	63.43	Whaetfield Lakes
45	Combine	32, 44	-----	-----	-----	-----	61.18	89.53	-----	153.66	<no description>
46	Reservoir	45	-----	-----	-----	-----	61.17	89.51	-----	153.37	<no description>

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	12.38	2	1096	486,703	----	----	----	SD-A1	
2	SCS Runoff	17.39	2	852	320,828	----	----	----	SD-A2	
3	SCS Runoff	98.51	2	882	2,085,006	----	----	----	SD-A3	
4	SCS Runoff	24.13	2	920	595,977	----	----	----	SD-A5.1	
5	SCS Runoff	293.34	2	728	1,182,746	----	----	----	SD-A5.2	
6	SCS Runoff	274.09	2	738	1,342,011	----	----	----	SD-A5.3	
7	SCS Runoff	40.48	2	982	1,223,199	----	----	----	SD-A4 /A6	
8	SCS Runoff	16.83	2	790	201,541	----	----	----	BL-A1	
9	SCS Runoff	15.34	2	948	419,397	----	----	----	BL-A2	
10	Reach	12.76	2	846	201,509	8	----	----	BL-A1 reach	
11	Combine	23.50	2	898	620,906	9, 10	----	----	BL-A1/A2	
12	SCS Runoff	39.01	2	872	795,118	----	----	----	BL-A3	
13	Reach	23.12	2	930	620,891	11	----	----	BL-A2 reach	
14	SCS Runoff	139.36	2	750	915,799	----	----	----	BL-A4	
15	SCS Runoff	12.93	2	992	401,724	----	----	----	BL-A5	
16	Combine	529.91	2	730	3,120,732	4, 5, 6,	----	----	Wheatfield Lake outlet	
17	SCS Runoff	72.59	2	788	806,303	----	----	----	BL-A6	
18	SCS Runoff	68.88	2	756	498,307	----	----	----	BL-A7	
19	SCS Runoff	44.09	2	1054	1,591,442	----	----	----	BL-A8	
20	Reach	52.95	2	782	498,291	18	----	----	BL-A7 channel reach	
21	Reach	63.79	2	818	806,287	17	----	----	BL-A6 Channel Reac	
22	SCS Runoff	24.08	2	906	570,881	----	----	----	BL-A9	
23	Combine	119.52	2	802	2,896,024	19, 20, 21,	----	----	Black Creek west	
24	Reservoir	12.38	2	1098	486,701	1	575.12	7,579	<no description>	
25	Reservoir	17.42	2	852	320,823	2	576.52	3,409	<no description>	
26	Combine	21.81	2	910	807,524	24, 25	----	----	<no description>	
27	Reach	20.86	2	962	807,495	26	----	----	Discharge to wilrose Lake	
28	Combine	117.00	2	892	2,892,498	3, 27	----	----	<no description>	
29	Reservoir	10.16	2	1654	2,171,759	28	573.86	7,440,924	Dischare Wilrose Lake	
30	Reach	10.08	2	1838	2,137,778	29	----	----	southern drainage	
31	Combine	44.23	2	1008	3,360,978	7, 30	----	----	Ward Road	
32	Reach	44.11	2	1054	3,360,489	31	----	----	Southern Drainage Extension	
33	Combine	150.75	2	750	2,331,810	12, 13, 14,	----	----	Lakeside storm ponds	
Southern Drainage black Creek modified.gov							Return Period: 10 Year		Thursday, 01 / 28 / 2016	

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
34	Reservoir	69.75	2	944	2,331,294	33	574.00	505,052	routed Lakeside ponds
35	Combine	82.05	2	962	2,733,019	15, 34	-----	-----	Black Creek East
36	Diversion1	16.41	2	962	546,605	35	-----	-----	Black Creek diversion
37	Diversion2	65.64	2	962	2,186,418	35	-----	-----	Southern Drainage
38	Reach	14.62	2	1070	546,121	36	-----	-----	Black Creek East
39	Combine	123.92	2	804	3,442,141	23, 38	-----	-----	<no description>
40	Reservoir	87.18	2	884	3,442,134	39	573.26	323,076	Liberty drive
41	Combine	110.96	2	894	4,013,014	22, 40	-----	-----	<no description>
42	Reservoir	108.49	2	928	4,013,014	41	569.41	145,998	<no description>
43	Combine	534.44	2	732	5,307,147	16, 37,	-----	-----	Diverted Wheatfield Lakes
44	Reservoir	22.63	2	1468	3,737,269	43	571.83	4,236,831	Whaetfield Lakes
45	Combine	61.18	2	1106	7,097,764	32, 44	-----	-----	<no description>
46	Reservoir	61.17	2	1110	7,057,219	45	569.65	49,621	<no description>

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	18.15	2	1086	698,775	----	----	----	SD-A1	
2	SCS Runoff	24.99	2	850	449,319	----	----	----	SD-A2	
3	SCS Runoff	141.45	2	878	2,920,046	----	----	----	SD-A3	
4	SCS Runoff	34.95	2	914	841,429	----	----	----	SD-A5.1	
5	SCS Runoff	357.95	2	728	1,456,218	----	----	----	SD-A5.2	
6	SCS Runoff	377.81	2	738	1,836,361	----	----	----	SD-A5.3	
7	SCS Runoff	58.46	2	976	1,726,974	----	----	----	SD-A4 /A6	
8	SCS Runoff	25.07	2	790	289,358	----	----	----	BL-A1	
9	SCS Runoff	22.43	2	942	597,046	----	----	----	BL-A2	
10	Reach	19.64	2	840	289,331	8	----	----	BL-A1 reach	
11	Combine	34.48	2	882	886,378	9, 10	----	----	BL-A1/A2	
12	SCS Runoff	56.03	2	870	1,113,560	----	----	----	BL-A3	
13	Reach	33.94	2	910	886,364	11	----	----	BL-A2 reach	
14	SCS Runoff	194.63	2	750	1,262,690	----	----	----	BL-A4	
15	SCS Runoff	19.05	2	984	576,767	----	----	----	BL-A5	
16	Combine	690.77	2	732	4,134,009	4, 5, 6,	----	----	Wheatfield Lake outlet	
17	SCS Runoff	101.79	2	786	1,111,719	----	----	----	BL-A6	
18	SCS Runoff	92.52	2	756	666,996	----	----	----	BL-A7	
19	SCS Runoff	64.77	2	1044	2,284,882	----	----	----	BL-A8	
20	Reach	73.26	2	780	666,981	18	----	----	BL-A7 channel reach	
21	Reach	90.97	2	814	1,111,705	17	----	----	BL-A6 Channel Reac	
22	SCS Runoff	35.67	2	902	819,632	----	----	----	BL-A9	
23	Combine	169.39	2	800	4,063,566	19, 20, 21,	----	----	Black Creek west	
24	Reservoir	18.15	2	1090	698,772	1	575.30	8,637	<no description>	
25	Reservoir	24.99	2	850	449,314	2	576.55	3,483	<no description>	
26	Combine	31.36	2	880	1,148,088	24, 25	----	----	<no description>	
27	Reach	30.37	2	960	1,148,060	26	----	----	Discharge to wilrose Lake	
28	Combine	168.77	2	886	4,068,108	3, 27	----	----	<no description>	
29	Reservoir	11.62	2	1672	2,838,127	28	574.55	8,507,575	Dischare Wilrose Lake	
30	Reach	11.56	2	1830	2,787,695	29	----	----	southern drainage	
31	Combine	63.37	2	994	4,514,672	7, 30	----	----	Ward Road	
32	Reach	63.02	2	1038	4,481,947	31	----	----	Southern Drainage Extension	
33	Combine	213.41	2	750	3,262,618	12, 13, 14,	----	----	Lakeside storm ponds	
Southern Drainage black Creek modified.gov							Return Period: 25 Year		Thursday, 01 / 28 / 2016	

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
34	Reservoir	128.55	2	794	3,262,084	33	574.63	576,169	routed Lakeside ponds
35	Combine	134.03	2	794	3,838,849	15, 34	-----	-----	Black Creek East
36	Diversion1	26.81	2	794	767,769	35	-----	-----	Black Creek diversion
37	Diversion2	107.22	2	794	3,071,077	35	-----	-----	Southern Drainage
38	Reach	21.65	2	992	767,293	36	-----	-----	Black Creek East
39	Combine	178.52	2	802	4,830,868	23, 38	-----	-----	<no description>
40	Reservoir	169.05	2	822	4,830,860	39	573.72	381,075	Liberty drive
41	Combine	190.66	2	824	5,650,494	22, 40	-----	-----	<no description>
42	Reservoir	144.08	2	912	5,650,490	41	570.26	312,208	<no description>
43	Combine	699.19	2	732	7,205,090	16, 37,	-----	-----	Diverted Wheatfield Lakes
44	Reservoir	34.79	2	1458	5,365,207	43	572.10	5,662,060	Whaetfield Lakes
45	Combine	89.53	2	1082	9,847,170	32, 44	-----	-----	<no description>
46	Reservoir	89.51	2	1088	9,806,290	45	570.26	59,060	<no description>

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	30.91	2	1074	1,161,539	----	----	----	SD-A1	
2	SCS Runoff	41.24	2	850	724,487	----	----	----	SD-A2	
3	SCS Runoff	233.60	2	876	4,708,312	----	----	----	SD-A3	
4	SCS Runoff	58.47	2	910	1,370,291	----	----	----	SD-A5.1	
5	SCS Runoff	485.67	2	728	1,999,604	----	----	----	SD-A5.2	
6	SCS Runoff	593.62	2	736	2,876,875	----	----	----	SD-A5.3	
7	SCS Runoff	97.59	2	968	2,812,419	----	----	----	SD-A4 /A6	
8	SCS Runoff	42.97	2	788	480,985	----	----	----	BL-A1	
9	SCS Runoff	37.97	2	936	982,213	----	----	----	BL-A2	
10	Reach	35.12	2	830	480,962	8	----	----	BL-A1 reach	
11	Combine	58.80	2	864	1,463,176	9, 10	----	----	BL-A1/A2	
12	SCS Runoff	92.52	2	868	1,795,516	----	----	----	BL-A3	
13	Reach	58.04	2	888	1,463,163	11	----	----	BL-A2 reach	
14	SCS Runoff	309.84	2	750	1,996,937	----	----	----	BL-A4	
15	SCS Runoff	32.60	2	976	958,732	----	----	----	BL-A5	
16	Combine	1020.70	2	732	6,246,767	4, 5, 6,	----	----	Wheatfield Lake outlet	
17	SCS Runoff	162.94	2	786	1,758,174	----	----	----	BL-A6	
18	SCS Runoff	140.61	2	754	1,016,487	----	----	----	BL-A7	
19	SCS Runoff	110.51	2	1034	3,798,046	----	----	----	BL-A8	
20	Reach	115.72	2	776	1,016,475	18	----	----	BL-A7 channel reach	
21	Reach	148.73	2	808	1,758,162	17	----	----	BL-A6 Channel Reac	
22	SCS Runoff	61.31	2	896	1,362,432	----	----	----	BL-A9	
23	Combine	275.71	2	796	6,572,684	19, 20, 21,	----	----	Black Creek west	
24	Reservoir	30.89	2	1084	1,161,534	1	575.97	12,818	<no description>	
25	Reservoir	41.24	2	850	724,481	2	576.60	3,577	<no description>	
26	Combine	53.36	2	876	1,886,016	24, 25	----	----	<no description>	
27	Reach	51.52	2	934	1,885,991	26	----	----	Discharge to wilrose Lake	
28	Combine	281.30	2	880	6,594,301	3, 27	----	----	<no description>	
29	Reservoir	13.67	2	1700	3,701,488	28	575.68	10,872,630	Dischare Wilrose Lake	
30	Reach	13.63	2	1858	3,622,579	29	----	----	southern drainage	
31	Combine	104.51	2	980	6,435,000	7, 30	----	----	Ward Road	
32	Reach	103.45	2	1016	6,377,400	31	----	----	Southern Drainage Extension	
33	Combine	347.50	2	750	5,255,617	12, 13, 14,	----	----	Lakeside storm ponds	
Southern Drainage black Creek modified.g							Return Period: 100 Year		Thursday, 01 / 28 / 2016	

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total surge used (cuft)	Hydrograph Description
34	Reservoir	289.33	2	772	5,255,063	33	575.56	685,514	routed Lakeside ponds
35	Combine	296.85	2	772	6,213,794	15, 34	-----	-----	Black Creek East
36	Diversion1	59.37	2	772	1,242,757	35	-----	-----	Black Creek diversion
37	Diversion2	237.48	2	772	4,971,027	35	-----	-----	Southern Drainage
38	Reach	38.16	2	948	1,242,287	36	-----	-----	Black Creek East
39	Combine	303.39	2	798	7,814,969	23, 38	-----	-----	<no description>
40	Reservoir	298.88	2	808	7,814,975	39	574.02	430,049	Liberty drive
41	Combine	333.00	2	812	9,177,396	22, 40	-----	-----	<no description>
42	Reservoir	182.10	2	1124	9,177,383	41	571.91	1,631,533	<no description>
43	Combine	1056.01	2	732	11,217,780	16, 37,	-----	-----	Diverted Wheatfield Lakes
44	Reservoir	63.43	2	1418	8,944,317	43	572.65	8,523,949	Wheatfield Lakes
45	Combine	153.66	2	1056	15,321,750	32, 44	-----	-----	<no description>
46	Reservoir	153.37	2	1074	15,280,280	45	572.69	104,873	<no description>

# Hydraflow Table of Contents

<b>Watershed Model Schematic.....</b>	<b>1</b>
<b>Hydrograph Return Period Recap.....</b>	<b>2</b>
<b>10 - Year</b>	
<b>Summary Report.....</b>	<b>4</b>
<b>25 - Year</b>	
<b>Summary Report.....</b>	<b>6</b>
<b>100 - Year</b>	
<b>Summary Report.....</b>	<b>8</b>