CITY OF PHILOMATH
Storm Drainage System Master Plan

Computations for Existing Conditions

APPENDIX E

CITY OF PHILOMATH
Storm Drainage System Master Plan

Computations for Future Conditions

APPENDIX D

APPENDIX D - FUTURE LAND USE BREAKDOWN										Future Land Use, Percent																				
Philomath Storm Drainage Master Plan										Philomath - City Zoning Districts															Benton County Zoning Districts								
										Commercial				Residential						Industrial				Commercial		Residential			Industrial				
Map			Quadrant	Location	Basin ID					C1	C2	C3	C4	R1	R2	R3	P	O	O/R	LI	HI	SPD	C	C2	UR-5			IP	LI	HI	Runoff	Unzoned
				Description					Acres																LDR	MDR	HDR				Coeff.	
										0.90	0.80	0.85	0.70	0.40	0.55	0.75	0.20	0.75	0.65	0.70	0.80	0.70	0.75	0.90	0.40	0.55	0.75	0.75	0.70	0.80	Cw	0.10
1	of	4	Southwest	Adelaide	6	-	10	12.39						65	30										5						0.445	
1	of	4	Southwest		6	-	20	11.78						65	30										5						0.445	
1	of	4	Southwest		6	-	30	2.55								50									50						0.575	
1	of	4	Southwest		6	-	40	109.62																	80						0.340	20
1	of	4	Southwest	9th Street	9	-	10	12.71						55	40										5						0.460	
1	of	4	Southwest		9	-	20	2.37							100																0.550	
1	of	4	Southwest		9	-	30	10.88								100															0.750	
1	of	4	Southwest		9	-	40	10.94														100									0.700	
1	of	4	Southwest		9	-	50	28.88			20									80											0.720	
1	of	4	Southwest		9	-	60	26.28									50				25				25						0.400	
1	of	4	Southwest	11th Street	11	-	10	32.97									50								50						0.300	
3	of	4	Northwest	13th Street	13	-	1	19.80						35											65						0.400	
1	of	4	Southwest		13	-	2	33.17							60										15		25				0.578	
3	of	4	Northwest		13	-	3	33.21																		100					0.550	
3	of	4	Northwest		13	-	4	21.11																			100				0.750	
1	of	4	Southwest		13	-	5	6.47						10													90				0.715	
3	of	4	Northwest		13	-	6	12.25																			100				0.750	
3	of	4	Northwest		13	-	7	13.37																		10	75		15		0.723	
1	of	4	Southwest		13	-	8	20.78						20		10					10						35		25		0.673	
1	of	4	Southwest		13	-	10	2.80							100																0.550	
1	of	4	Southwest		13	-	20	3.34								20			80												0.670	
1	of	4	Southwest		13	-	30	6.85								30			70												0.680	
1	of	4	Southwest		13	-	40	17.75						40	30		5		25												0.498	
1	of	4	Southwest		13	-	50	16.91							85					15											0.573	
1	of	4	Southwest		13	-	60	30.08																	100						0.400	
1	of	4	Southwest	15th Street	15	-	10	10.45		10	30								60												0.720	
1	of	4	Southwest		15	-	20	9.82							100																0.550	
1	of	4	Southwest		15	-	30	7.12									100														0.200	
1	of	4	Southwest		15	-	40	38.34						10	50		15								25						0.445	
1	of	4	Southwest	17th Street	17	-	10	1.96							100																0.550	
1	of	4	Southwest	18th Street	18	-	10	2.20							100																0.550	
1	of	4	Southwest	19th Street	19	-	10	22.79							30										70						0.445	

APPENDIX D - FUTURE LAND USE BREAKDOWN										Future Land Use, Percent																			
Philomath Storm Drainage Master Plan										Philomath - City Zoning Districts															Benton County Zoning Districts								
										Commercial				Residential							Industrial			Commercial		Residential			Industrial				Unzoned
Map			Quadrant	Location	Basin ID					C1	C2	C3	C4	R1	R2	R3	P	O	O/R	LI	HI	SPD	C	C2	UR-5			IP	LI	HI	Runoff	UZ
				Description					Acres																LDR	MDR	HDR				Coeff.	
										0.90	0.80	0.85	0.70	0.40	0.55	0.75	0.20	0.75	0.65	0.70	0.80	0.70	0.75	0.90	0.40	0.55	0.75	0.75	0.70	0.80	Cw	0.10
3	of	4	NW/USGS	Newton	NC	-	1	458.31																	15						0.145	85
3	of	4	Northwest	Creek	NC	-	2	48.05																	40	60					0.490	
3	of	4	Northwest		NC	-	3	21.37												25									75		0.700	
3	of	4	Northwest		NC	-	4	15.50													35									65	0.800	
1	of	4	Southwest		NC	-	10	14.58				25	35		40																0.678	
1	of	4	Southwest		NC	-	12	14.34			35								65												0.703	
1	of	4	Southwest		NC	-	14	27.14			50								50												0.725	
1	of	4	Southwest		NC	-	16	8.92				20	30						50												0.705	
2	of	4	Southeast		NC	-	18	17.01						90		10															0.435	
2	of	4	Southeast		NC	-	20	107.73							5		45								50						0.318	
2	of	4	Southeast		NC	-	22	21.80				10		60	30																0.490	
2/4	of	4	SE/NE		NC	-	24	203.18									70											30			0.365	
2	of	4	Southeast		NC	-	26	66.42																				90	10		0.745	
1	of	4	Southwest		NC	-	28	12.80					50											20				30			0.725	
4	of	4	Northeast		NC	-	30	132.01																				100			0.750	
4	of	4	Northeast		NC	-	32	135.61																				100			0.750	
4	of	4	NE/USGS		NC	-	34	255.51																	25						0.175	75
4	of	4	NE/USGS		NC	-	36	706.01																	25						0.175	75
3	of	4	NW/USGS	West	WNC	-	1	155.85																	30						0.190	70
3	of	4	NW/USGS	Fork	WNC	-	2	33.69																	100						0.400	
3	of	4	NW/USGS	Newton	WNC	-	3	121.48																	20	60			20		0.550	
1	of	4	Southwest	Creek	WNC	-	4	56.71													15								60	25	0.740	
1	of	4	Southwest		WNC	-	5	20.25													15									85	0.800	
1	of	4	Southwest		WNC	-	6	26.34													80								15	5	0.785	
1	of	4	Southwest		WNC	-	7	5.09																	100						0.400	
1	of	4	Southwest		WNC	-	8	8.57							10										90						0.415	
1	of	4	Southwest		WNC	-	9	5.11																	100						0.400	
1	of	4	Southwest		WNC	-	10	2.41																	100						0.400	
2	of	4	Southeast	Bell-	BF	-	90	17.12						100																	0.400	
2	of	4	Southeast	Fountain	BF	-	80	4.32						100																	0.400	
2	of	4	Southeast		BF	-	70	3.63						100																	0.400	
2	of	4	Southeast		BF	-	60	2.31						100																	0.400	
2	of	4	Southeast		BF	-	50	13.79						100																	0.400	
2	of	4	Southeast		BF	-	40	1.66						100																	0.400	
2	of	4	Southeast		BF	-	10	20.75																	100						0.400	

APPENDIX D - FUTURE LAND USE BREAKDOWN									Future Land Use, Percent																				
Philomath Storm Drainage Master Plan									Philomath - City Zoning Districts															Benton County Zoning Districts								
									Commercial				Residential						Industrial			Commercial		Residential			Industrial				
Map			Quadrant	Location	Basin ID				C1	C2	C3	C4	R1	R2	R3	P	O	O/R	LI	HI	SPD	C	C2	UR-5			IP	LI	HI	Runoff	Unzoned
				Description				Acres																LDR	MDR	HDR				Coeff.	
									0.90	0.80	0.85	0.70	0.40	0.55	0.75	0.20	0.75	0.65	0.70	0.80	0.70	0.75	0.90	0.40	0.55	0.75	0.75	0.70	0.80	Cw	0.10
2	of	4	Southeast	Southwood	SW	-	30	26.93																100						0.400	
2	of	4	Southeast	Area	SW	-	20	7.57					100																		0.400	
2	of	4	Southeast		SW	-	10	6.66					100																		0.400	
1	of	4	Southwest	Chapel	CH	-	10	30.09								90								10						0.220	
2	of	4	Southeast	Drive	CH	-	20	17.63																100						0.400	
2/4	of	4	SE/NE/USGS	East Fork	ENC	-	10	193.11																			40			0.360	60
2	of	4	Southeast	Newton	ENC	-	20	103.40			5		65											30						0.423	
2	of	4	Southeast	Creek	ENC	-	30	89.15																100						0.400	
								3831.84																							

APPENDIX D - PEAK STORM FLOW COMPUTATIONS, FUTURE LAND USE CONDITIONS
PHILOMATH STORM DRAINAGE MASTER PLAN

Basin ID	Area	C FUTURE	Area x C	Length	Velocity	Time of Concentration	Travel Time	Tc+Tt calc	Tc+Tt use	Intensity, in/hr (ODOT Zone 8) 5	10	25	50	100	Basin ID	Storm Peak Flow, cfs (ODOT Zone 8) 5	10	25	50	100
	acres	unitless	acres	Feet		min	min	min	min											
610	12.4	0.45	5.5	1,500	3	8.3		8.3	10.0	1.60	1.78	2.07	2.33	2.58	610	9	10	11	13	14
620	11.8	0.45	5.2	1,400	3		7.8	7.8	10.0	1.60	1.78	2.07	2.33	2.58	620	8	9	11	12	14
610+620	*24.2*	*0.45*	*10.8*					*16.1*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*610+620*	*14*	*16*	*18*	*21*	*24*
640	109.6	0.34	37.3	3,000	3		16.7	16.7	20.0	1.13	1.30	1.50	1.69	1.90	640	42	48	56	63	71
610,620,640	*133.8*	*0.36*	*48.0*					*32.8*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*610,620,640*	*39*	*44*	*53*	*58*	*66*
630	2.6	0.58	1.5	700	3		3.9	3.9	10.0	1.60	1.78	2.07	2.33	2.58	630	2	3	3	3	4
610,620,640,630	*136.3*	*0.36*	*49.5*					*32.8*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*610,620,640,630*	*41*	*46*	*54*	*60*	*68*
910	12.7	0.46	5.8	1,400	3	7.8		7.8	10.0	1.60	1.78	2.07	2.33	2.58	910	9	10	12	14	15
930	10.9	0.75	8.2	800	3		4.4	4.4	10.0	1.60	1.78	2.07	2.33	2.58	930	13	15	17	19	21
910+930	*23.6*	*0.59*	*14.0*					*12.2*	*12.0*	*1.48*	*1.65*	*1.90*	*2.18*	*2.40*	*910+930*	*21*	*23*	*27*	*31*	*34*
920	2.4	0.55	1.3	500	3	2.8		2.8	10.0	1.60	1.78	2.07	2.33	2.58	920	2	2	3	3	3
940	10.9	0.70	7.7	700	3		3.9	3.9	10.0	1.60	1.78	2.07	2.33	2.58	940	12	14	16	18	20
920+940	*13.3*	*0.67*	*9.0*					*6.7*	*10.0*	*1.60*	*1.78*	*2.07*	*2.33*	*2.58*	*920+940*	*14*	*16*	*19*	*21*	*23*
910,930,920,940	*26.6*	*0.67*	*17.9*					*18.9*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*910,930,920,940*	*20*	*23*	*27*	*30*	*34*
950	28.9	0.72	20.8	900	3		5.0	5.0	10.0	1.60	1.78	2.07	2.33	2.58	950	33	37	43	48	54
910-950	*55.5*	*0.70*	*38.7*					*23.9*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*910-950*	*39*	*44*	*52*	*58*	*65*
960	26.3	0.40	10.5	1,350	3		7.5	7.5	10.0	1.60	1.78	2.07	2.33	2.58	960	17	19	22	24	27
910-960	*81.8*	*0.60*	*49.2*					*31.4*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*910-960*	*45*	*50*	*60*	*67*	*74*
1110	33.0	0.30	9.9	2,100	3	11.7		0.0	12.0	1.48	1.65	1.90	2.18	2.40	1110	15	16	19	22	24
1303	33.2	0.55	18.3	1,500	3	8.3		8.3	10.0	1.60	1.78	2.07	2.33	2.58	1303	29	33	38	43	47
1304	21.1	0.75	15.8	1,550	3		8.6	8.6	10.0	1.60	1.78	2.07	2.33	2.58	1304	25	28	33	37	41
1303+1304	*54.3*	*0.63*	*34.1*					*16.9*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*1303+1304*	*39*	*44*	*51*	*58*	*65*
1305	6.5	0.72	4.6	1,000	3		5.6	5.6	10.0	1.60	1.78	2.07	2.33	2.58	1305	7	8	10	11	12
1303+1304+1305	*60.8*	*0.64*	*38.7*					*22.5*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1303+1304+1305*	*39*	*44*	*52*	*58*	*65*
1301	19.8	0.40	7.9	1,250	3	6.9		6.9	10.0	1.60	1.78	2.07	2.33	2.58	1301	13	14	16	18	20
1302	33.2	0.58	19.2	1,600	3		8.9	8.9	10.0	1.60	1.78	2.07	2.33	2.58	1302	31	34	40	45	49
1301+1302	*53.0*	*0.51*	*27.1*					*15.8*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*1301+1302*	*36*	*41*	*47*	*53*	*59*
1306	12.3	0.75	9.2	1,200	3	6.7		6.7	10.0	1.60	1.78	2.07	2.33	2.58	1306	15	16	19	21	24
1307	13.4	0.72	9.7	1,000	3		5.6	5.6	10.0	1.60	1.78	2.07	2.33	2.58	1307	15	17	20	23	25
1306+1307	*25.6*	*0.74*	*18.9*					*12.2*	*12.0*	*1.48*	*1.65*	*1.90*	*2.18*	*2.40*	*1306+1307*	*28*	*31*	*36*	*41*	*45*
1308	20.8	0.67	14.0	1,350	3		7.5	7.5	10.0	1.60	1.78	2.07	2.33	2.58	1308	22	25	29	33	36
1306+1307+1308	*46.4*	*0.71*	*32.8*					*19.7*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*1306+1307+1308*	*37*	*43*	*49*	*55*	*62*
1301-1308	*160.2*	*0.62*	*98.7*						*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1301-1308*	*99*	*112*	*133*	*148*	*167*
1310	2.8	0.55	1.5	900	3	5.0		5.0	10.0	1.60	1.78	2.07	2.33	2.58	1310	2	3	3	4	4
1301-1310	*163.0*	*0.61*	*100.2*						*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1301-1310*	*100*	*114*	*135*	*150*	*169*
1320	3.3	0.67	2.2	300	3		1.7	1.7	10.0	1.60	1.78	2.07	2.33	2.58	1320	4	4	5	5	6
1301-1320	*166.3*	*0.62*	*102.4*					*26.7*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1301-1320*	*102*	*117*	*138*	*154*	*173*
1330	6.9	0.68	4.7	200	3		1.1	1.1	10.0	1.60	1.78	2.07	2.33	2.58	1330	7	8	10	11	12
1301-1330	*173.2*	*0.62*	*107.1*					*27.8*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*1301-1330*	*97*	*109*	*130*	*146*	*162*
1340	17.8	0.50	8.8	650	3		3.6	3.6	10.0	1.60	1.78	2.07	2.33	2.58	1340	14	16	18	21	23
1301-1340	*190.9*	*0.61*	*115.9*					*31.4*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*1301-1340*	*105*	*118*	*140*	*158*	*175*
1350	16.9	0.57	9.7	800	3		4.4	4.4	10.0	1.60	1.78	2.07	2.33	2.58	1350	16	17	20	23	25
1301-1350	*207.8*	*0.60*	*125.6*					*35.8*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*1301-1350*	*103*	*116*	*138*	*152*	*173*
1360	30.1	0.40	12.0	1,900	3		10.6	10.6	11.0	1.60	1.78	2.07	2.33	2.58	1360	19	21	25	28	31
1301-1360	*237.9*	*0.58*	*137.7*					*46.4*	*45.0*	*0.69*	*0.78*	*0.92*	*1.02*	*1.15*	*1301-1360*	*95*	*107*	*127*	*140*	*158*

APPENDIX D - PEAK STORM FLOW COMPUTATIONS, FUTURE LAND USE CONDITIONS
PHILOMATH STORM DRAINAGE MASTER PLAN

Basin ID	Area	C FUTURE	Area x C	Length	Velocity	Time of Concentration	Travel Time	Tc+Tt		Intensity, in/hr (ODOT Zone 8)					Basin ID	Storm Peak Flow, cfs (ODOT Zone 8)				
								calc	use	5	10	25	50	100		5	10	25	50	100
	acres	unitless	acres	Feet		min	min	min	min											
1510	10.5	0.72	7.5	900	3	5.0		5.0	10.0	1.60	1.78	2.07	2.33	2.58	1510	12	13	16	18	19
1530	7.1	0.20	1.4	1,350	3		7.5	7.5	10.0	1.60	1.78	2.07	2.33	2.58	1530	2	3	3	3	4
1510+1530	*17.6*	*0.51*	*8.9*					*12.5*	*13.0*	*1.41*	*1.60*	*1.85*	*2.10*	*2.31*	*1510+1530*	*13*	*14*	*17*	*19*	*21*
1520	9.8	0.55	5.4	900	3	5.0		5.0	10.0	1.60	1.78	2.07	2.33	2.58	1520	9	10	11	13	14
1510, 1530, 1520	*27.4*	*0.52*	*14.3*					*12.5*	*13.0*	*1.41*	*1.60*	*1.85*	*2.10*	*2.31*	*1510, 1530, 1520*	*20*	*23*	*27*	*30*	*33*
1710	2.0	0.55	1.1	450	3	2.5		2.5	10.0	1.60	1.78	2.07	2.33	2.58	1710	2	2	2	3	3
1510-1710	*29.4*	*0.53*	*15.4*					*12.5*	*13.0*	*1.41*	*1.60*	*1.85*	*2.10*	*2.31*	*1510-1710*	*22*	*25*	*29*	*32*	*36*
1540	38.3	0.45	17.1	1,800	3		10.0	10.0	10.0	1.60	1.78	2.07	2.33	2.58	1540	27	30	35	40	44
1510-1540	*67.7*	*0.48*	*32.5*					*22.5*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1510-1540*	*32*	*37*	*44*	*49*	*55*
1810	2.2	0.55	1.21	350	3	1.9		1.9	10.0	1.60	1.78	2.07	2.33	2.58	1810	2	2	3	3	3
1910	22.8	0.45	10.1	2,000	3	11.1		11.1	11.0	1.51	1.70	1.98	2.25	2.48	1910	15	17	20	23	25
NC1	458.3	0.15	66.5	5,500	5	18.3		18.3	20.0	1.13	1.30	1.50	1.69	1.90	NC1	75	86	100	112	126
NC2	48.1	0.49	23.5	1,875	4		7.8	7.8	10.0	1.60	1.78	2.07	2.33	2.58	NC2	38	42	49	55	61
NC1+NC2	*506.4*	*0.18*	*90.0*					*26.1*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*NC1+NC2*	*90*	*103*	*121*	*135*	*152*
NC3	21.4	0.70	15.0	1,000	4		4.2	4.2	10.0	1.60	1.78	2.07	2.33	2.58	NC3	24	27	31	35	39
NC1+NC2+NC3	*527.7*	*0.20*	*105.0*					*30.3*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*NC1+NC2+NC3*	*96*	*107*	*127*	*143*	*158*
NC4	15.5	0.80	12.4	1,250	4		5.2	5.2	10.0	1.60	1.78	2.07	2.33	2.58	NC4	20	22	26	29	32
NC1-NC4	*543.2*	*0.22*	*117.4*					*35.5*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*NC1-NC4*	*96*	*108*	*129*	*142*	*162*
WNC1	155.9	0.19	29.6	2,500	5	8.3		8.3	10.0	1.60	1.78	2.07	2.33	2.58	WNC1	47	53	61	69	76
WNC2	33.7	0.40	13.5	2,000	5	6.7		6.7	10.0	1.60	1.78	2.07	2.33	2.58	WNC2	22	24	28	31	35
WNC3	121.5	0.55	66.8	3,000	4		12.5	12.5	13.0	1.41	1.60	1.85	2.10	2.31	WNC3	94	107	124	140	154
WNC1-WNC3	*311.0*	*0.35*	*109.9*					*20.8*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*WNC1-WNC3*	*124*	*143*	*165*	*186*	*209*
WNC6	26.3	0.79	20.7	1,750	4		7.3	7.3	10.0	1.60	1.78	2.07	2.33	2.58	WNC6	33	37	43	48	53
WNC1,2,3, WNC6	*337.4*	*0.39*	*130.6*					*28.1*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*WNC1,2,3, WNC6*	*119*	*133*	*159*	*178*	*197*
WNC1-6, NC1-4	*880.6*	*0.28*	*247.9*					*35.5*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*WNC1-6, NC1-4*	*203*	*228*	*273*	*300*	*342*
WNC10	2.4	0.40	1.0	100	3	0.6	0.6	0.6	10.0	1.60	1.78	2.07	2.33	2.58	WNC10	2	2	2	2	2
WNC1-6, NC1-4, WNC10	*883.0*	*0.28*	*248.9*					*36.1*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*WNC1-6, NC1-4, WNC10*	*204*	*229*	*274*	*301*	*343*
WNC5	20.3	0.80	16.2	2,000	4	8.3		8.3	10.0	1.60	1.78	2.07	2.33	2.58	WNC5	26	29	34	38	42
WNC7	5.1	0.40	2.0	625	3		3.5	3.5	10.0	1.60	1.78	2.07	2.33	2.58	WNC7	3	4	4	5	5
WNC5+WNC7	*25.3*	*0.72*	*18.2*					*11.8*	*12.0*	*1.48*	*1.65*	*1.90*	*2.18*	*2.40*	*WNC5+WNC7*	*27*	*30*	*35*	*40*	*44*
WNC4	56.7	0.74	42.0	2,250	4	9.4		9.4	10.0	1.60	1.78	2.07	2.33	2.58	WNC4	67	75	87	98	108
WNC8	8.6	0.42	3.6	875	3		4.9	4.9	10.0	1.60	1.78	2.07	2.33	2.58	WNC8	6	6	7	8	9
WNC4+WNC8	*65.3*	*0.70*	*45.5*					*14.2*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*WNC4+WNC8*	*60*	*68*	*78*	*89*	*100*
WNC4, 5, 7, 8	*90.6*	*0.70*	*63.8*					*14.2*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*WNC4, 5, 7, 8*	*84*	*96*	*110*	*124*	*140*
NC14	27.1	0.73	19.7	1,800	3	10.0		10.0	10.0	1.60	1.78	2.07	2.33	2.58	NC14	31	35	41	46	51
WNC4578-NC14	*117.8*	*0.71*	*83.4*					*14.2*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*WNC4578-NC14*	*110*	*125*	*144*	*163*	*183*
NC28	12.8	0.73	9.3	900	3		5.0	5.0	10.0	1.60	1.78	2.07	2.33	2.58	NC28	15	17	19	22	24
WNC4578,NC14,NC28	*130.6*	*0.71*	*92.7*					*19.2*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*WNC4578,NC14,NC28*	*105*	*121*	*139*	*157*	*176*
WNC9	5.1	0.40	2.0	250	3	1.4		1.4	10.0	1.60	1.78	2.07	2.33	2.58	WNC9	3	4	4	5	5
WNC4578,NC14,28,WNC9	*135.7*	*0.70*	*94.8*					*19.2*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*WNC4578,NC14,28,WNC9*	*107*	*123*	*142*	*160*	*180*
NC36	706.0	0.18	123.6	8,000	5	26.7		26.7	25.0	1.00	1.14	1.35	1.50	1.69	NC36	124	141	167	185	209
NC30	132.0	0.75	99.0	3,500	4		14.6	14.6	15.0	1.32	1.50	1.72	1.95	2.19	NC30	131	149	170	193	217
NC36+NC30	*838.0*	*0.27*	*222.6*					*41.3*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*NC36+NC30*	*167*	*187*	*218*	*247*	*276*
NC26	66.4	0.75	49.5	2,625	4		10.9	10.9	11.0	1.51	1.70	1.98	2.25	2.48	NC26	75	84	98	111	123
NC36, 30, 26	*904.4*	*0.30*	*272.0*					*52.2*	*50.0*	*0.64*	*0.73*	*0.85*	*0.95*	*1.08*	*NC36, 30, 26*	*174*	*199*	*231*	*258*	*294*

APPENDIX D - PEAK STORM FLOW COMPUTATIONS, FUTURE LAND USE CONDITIONS
PHILOMATH STORM DRAINAGE MASTER PLAN

Basin ID	Area	C FUTURE	Area x C	Length	Velocity	Time of Concentration	Travel Time	Tc+Tt calc	Tc+Tt use	Intensity, in/hr (ODOT Zone 8) 5	10	25	50	100	Basin ID	Storm Peak Flow, cfs (ODOT Zone 8) 5	10	25	50	100
	acres	unitless	acres	Feet		min	min	min	min											
WNC4578,NC14,28,WNC9+															WNC4578,NC14,28,WNC9+					
+NC36, 30, 26	1040.1	0.35	366.8					52.2	50.0	0.64	0.73	0.85	0.95	1.08	+NC36, 30, 26	235	268	312	348	396
NC16	8.9	0.71	6.3	1,200	3	6.7		6.7	10.0	1.60	1.78	2.07	2.33	2.58	NC16	10	11	13	15	16
SUM ALL TO NC16	1049.0	0.36	373.1					52.2	50.0	0.64	0.73	0.85	0.95	1.08	SUM ALL TO NC16	239	272	317	354	403
NC12	14.3	0.70	10.1	1,600	3	8.9		8.9	10.0	1.60	1.78	2.07	2.33	2.58	NC12	16	18	21	23	26
NC10	14.6	0.68	9.9	1,200	3		6.7	6.7	10.0	1.60	1.78	2.07	2.33	2.58	NC10	16	18	20	23	26
NC12+NC10	28.9	0.69	20.0					15.6	15.0	1.32	1.50	1.72	1.95	2.19	NC12+NC10	26	30	34	39	44
NC18	17.0	0.44	7.4	1,600	3		8.9	8.9	10.0	1.60	1.78	2.07	2.33	2.58	NC18	12	13	15	17	19
NC10, 12, 18	45.9	0.60	27.4					24.4	25.0	1.00	1.14	1.35	1.50	1.69	NC10, 12, 18	27	31	37	41	46
NC34	255.5	0.18	44.7	3,500	5	11.7		11.7	12.0	1.48	1.65	1.90	2.18	2.40	NC34	66	74	85	97	107
NC32	135.6	0.75	101.7	2,200	4		9.2	9.2	10.0	1.60	1.78	2.07	2.33	2.58	NC32	163	181	211	237	262
NC34+NC32	391.1	0.37	146.4					20.8	20.0	1.13	1.30	1.50	1.69	1.90	NC34+NC32	165	190	220	247	278
NC24	203.2	0.37	74.2	3,000	4		12.5	12.5	13.0	1.41	1.60	1.85	2.10	2.31	NC24	105	119	137	156	171
NC34, 32, 24	594.3	0.37	220.6					33.3	35.0	0.82	0.92	1.10	1.21	1.38	NC34, 32, 24	181	203	243	267	304
NC22	21.8	0.49	10.7	1,200	3		6.7	6.7	10.0	1.60	1.78	2.07	2.33	2.58	NC22	17	19	22	25	28
NC34, 32, 24, 22	616.1	0.38	231.3					40.0	40.0	0.75	0.84	0.98	1.11	1.24	NC34, 32, 24, 22	173	194	227	257	287
SUM ALL TO N16 +															SUM ALL TO N16 +					
NC 10, 12, 18+															NC 10, 12, 18+					
NC34, 32, 24, 22	1711.1	0.37	631.7					52.2	50.0	0.64	0.73	0.85	0.95	1.08	NC34, 32, 24, 22	404	461	537	600	682
NC20	107.7	0.32	34.3	2,500	4		10.4	10.4	10.0	1.60	1.78	2.07	2.33	2.58	NC20	55	61	71	80	88
SUM ALL TO NC20	1818.8	0.37	666.0					62.6	60.0	0.57	0.64	0.75	0.84	0.94	SUM ALL TO NC20	380	426	499	559	626
ENC21	25.6	0.42	10.8	1,200	3	6.7		6.7	10.0	1.60	1.78	2.07	2.33	2.58	ENC21	17	19	22	25	28
ENC20	77.8	0.42	32.9	1,700	3		9.4	9.4	10.0	1.60	1.78	2.07	2.33	2.58	ENC20	53	59	68	77	85
ENC21+ENC20	103.4	0.42	43.7					16.1	15.0	1.32	1.50	1.72	1.95	2.19	ENC21+ENC20	58	66	75	85	96
ENC10	193.1	0.36	69.5	5,000	4	20.8		20.8	20.0	1.13	1.30	1.50	1.69	1.90	ENC10	79	90	104	117	132
ENC21, 20, 10	296.5	0.38	113.3					30.3	30.0	0.91	1.02	1.21	1.36	1.51	ENC21, 20, 10	103	116	137	154	171
ENC30	89.2	0.40	35.7	2,750	3		15.3	15.3	15.0	1.32	1.50	1.72	1.95	2.19	ENC30	47	53	61	70	78
ENC10,20,21,30	385.7	0.39	148.9					45.6	45.0	0.69	0.78	0.92	1.02	1.15	ENC10,20,21,30	103	116	137	152	171
SW10	6.7	0.40	2.7	800	3	4.4		4.4	10.0	1.60	1.78	2.07	2.33	2.58	SW10	4	5	6	6	7
SW20	7.6	0.40	3.0	650	3		3.6	3.6	10.0	1.60	1.78	2.07	2.33	2.58	SW20	5	5	6	7	8
SW10+SW20	14.2	0.40	5.7					8.1	10.0	1.60	1.78	2.07	2.33	2.58	SW10+SW20	9	10	12	13	15
SW30	26.9	0.40	10.8	1,100	3		6.1	6.1	10.0	1.60	1.78	2.07	2.33	2.58	SW30	17	19	22	25	28
SW10, 20, 30	41.2	0.40	16.5					14.2	15.0	1.32	1.50	1.72	1.95	2.19	SW10, 20, 30	22	25	28	32	36
BF90	17.1	0.40	6.8	1,000	3	5.6		5.6	10.0	1.60	1.78	2.07	2.33	2.58	BF90	11	12	14	16	18
BF80	4.3	0.40	1.7	400	3		2.2	2.2	10.0	1.60	1.78	2.07	2.33	2.58	BF80	3	3	4	4	4
BF90+BF80	21.4	0.40	8.6					7.8	10.0	1.60	1.78	2.07	2.33	2.58	BF90+BF80	14	15	18	20	22
BF60	2.3	0.40	0.9	400	3		2.2	2.2	10.0	1.60	1.78	2.07	2.33	2.58	BF60	1	2	2	2	2
BF90, 80, 60	23.8	0.40	9.5					10.0	10.0	1.60	1.78	2.07	2.33	2.58	BF90, 80, 60	15	17	20	22	25
BF70	3.6	0.40	1.5	500	3	2.8		2.8	10.0	1.60	1.78	2.07	2.33	2.58	BF70	2	3	3	3	4
BF90, 80, 60, 70	27.4	0.40	11.0					10.0	10.0	1.60	1.78	2.07	2.33	2.58	BF90, 80, 60, 70	18	19	23	26	28
BF50	13.8	0.40	5.5	1,600	3	8.9		8.9	10.0	1.60	1.78	2.07	2.33	2.58	BF50	9	10	11	13	14
BF90, 80, 60, 70, 50	41.2	0.40	16.5					10.0	10.0	1.60	1.78	2.07	2.33	2.58	BF90, 80, 60, 70, 50	26	29	34	38	42
BF10	20.8	0.40	8.3	1,100	3		6.1	6.1	10.0	1.60	1.78	2.07	2.33	2.58	BF10	13	15	17	19	21
BF90-50, BF10	61.9	0.40	24.8					16.1	15.0	1.32	1.50	1.72	1.95	2.19	BF90-50, BF10	33	37	43	48	54

BASIN ID	NODE						ARGED FLOW CONDITIONS (outlet control)							EXCESS
(Outfall	FROM	TO	LINE	LOCATION			-	HEAD-	LOSS	VEL-	Q - CAPACITY		STORM	CAP-
Name)			NO.	ALONG	FROM	TO	ER	WATER		OCITY			FLOW	ACITY
							(ft)	ELEV. (ft)	(ft)	(ft/sec)	(cfs)		(cfs)	(cfs)
													25-YR	
6	A	B	1	ADELAIDE	NORTH OF PIONEER								11.0	67.3
6	B	C	2	ADELAIDE	NORTH OF PIONEER								22.0	75.4
6	C	D	3	ADELAIDE	AT PIONEER								22.0	-9.7
6	D	E	4	BACKLOT	PIONEER TO DAMPIER								22.0	51.0
6	E	F	5	DAMPIER	DAMPIER								22.0	143.1
6	F	G	6	BACKLOT	SOUTH OF DAMPIER								22.0	63.1
6	H	I	8	SPRR	CROSSING				3.0	5.8	18.3		33.0	-14.7
6	J	K	10	HWY 20	ALONG HWY 20								36.0	-7.8
6	K	L	11	HWY 20	ALONG HWY 20								36.0	-24.1
6	L	M	12	HWY 20	ALONG HWY 20								36.0	3.2
6	M	N	13	HWY 20	CROSSING								54.0	-20.8
													25-YR	
9	A	B	1	9/10 ALLEY	MAIN TO ALLEY								27.0	-15.0
9	C	D	3	9/10 ALLEY	ALLEY TO APPLEGATE								30.0	12.2
9	D	E	4	APPLEGATE	9/10 ALLEY TO 9TH								37.0	-6.3
9	E	F	5	9TH	SOUTH OF APPLEGATE								47.0	-15.1
9	F	G	6	9TH	SOUTH OF APPLEGATE								52.0	-13.7
													25-YR	
13	A	B	1	12/13 ALLEY	PIONEER TO N OF MAIN								135.0	-82.3
13	B	C	2	12/13 ALLEY	N OF MAIN TO S OF MAIN								135.0	-101.1
13	C	D	3	12/13 ALLEY	NORTH OF APPLEGATE								135.0	-79.7
13	D	E	4	13TH	APPLEGATE	CEDAR							135.0	-115.8
													50-YR	
NC	A	B	1	NC	HIGHWAY 20				3.0	5.8	18.3		267.0	-248.7
				TRIB										
ENC	A	B	1	ENC	HIGHWAY 20				4.0	7.9	39.2		50-YR	
ENC	A	B	1						4.0	6.8	21.6			
ENC	A	B	1						4.0	6.8	21.6	82.5	117.0	-34.5
ENC	C	D	2	ENC	JAMES				3.5	6.9	41.1			
ENC	C	D	2		STREET				3.5	6.9	41.1	82.3	135.0	-52.7
ENC	E	F	3	ENC	MIDWAY BETW				3.5	6.9	41.1			
ENC	E	F	3		JMS/APPGATE				3.5	6.9	41.1	82.3	145.0	-62.7
ENC	G	H	4	ENC	APPLEGATE				4.0	7.0	50.0			
ENC	G	H	4		STREET				4.0	7.0	50.0	100.0	154.0	-54.0

APPENDIX E - EXISTING LAND USE BREAKDOWN									Existing Land Use, Percent																				
Philomath Storm Drainage Master Plan									Philomath - City Zoning Districts														Benton County Zoning Districts							
									Commercial				Residential						Industrial				Commercial		Residential			Industrial				Unzoned
Map			Quadrant	Location	Basin ID				C1	C2	C3	C4	R1	R2	R3	P	O	O/R	LI	HI	SPD		C	C2	UR-5			IP	LI	HI	Runoff	UZ
				Description				Acres																	LDR	MDR	HDR				Coeff.	
									0.90	0.80	0.85	0.70	0.40	0.55	0.75	0.20	0.75	0.65	0.70	0.80	0.70		0.75	0.90	0.40	0.55	0.75	0.75	0.70	0.80	Cw	0.10
1	of	4	Southwest	Adelaide	6	-	10	12.39					65.0	30.0											5.0						0.445	
1	of	4	Southwest		6	-	20	11.78					65.0	30.0											5.0						0.445	
1	of	4	Southwest		6	-	30	2.55							37.5										37.5						0.456	
1	of	4	Southwest		6	-	40	109.62																	16.0						0.148	20
1	of	4	Southwest	9th Street	9	-	10	12.71					55.0	40.0											5.0						0.460	
1	of	4	Southwest		9	-	20	2.37						100.0																	0.550	
1	of	4	Southwest		9	-	30	10.88							100.0																0.750	
1	of	4	Southwest		9	-	40	10.94													100.0										0.700	
1	of	4	Southwest		9	-	50	28.88		20.0									80.0												0.720	
1	of	4	Southwest		9	-	60	26.28								10.0				5.0					5.0						0.160	
1	of	4	Southwest	11th Street	11	-	10	32.97								10.0									10.0						0.140	
3	of	4	Northwest	13th Street	13	-	1	19.80					7.0												13.0						0.160	
1	of	4	Southwest		13	-	2	33.17						30.0											7.5		12.5				0.339	
3	of	4	Northwest		13	-	3	33.21																		10.0					0.145	
3	of	4	Northwest		13	-	4	21.11																			50.0				0.425	
1	of	4	Southwest		13	-	5	6.47					4.0														36.0				0.346	
3	of	4	Northwest		13	-	6	12.25																			10.0				0.165	
3	of	4	Northwest		13	-	7	13.37																		2.0	15.0		3.0		0.225	
1	of	4	Southwest		13	-	8	20.78					8.0		4.0					4.0							14.0		10.0		0.329	
1	of	4	Southwest		13	-	10	2.80						100.0																	0.550	
1	of	4	Southwest		13	-	20	3.34							20.0			80.0													0.670	
1	of	4	Southwest		13	-	30	6.85							24.0			56.0													0.564	
1	of	4	Southwest		13	-	40	17.75					40.0	30.0		5.0		25.0													0.498	
1	of	4	Southwest		13	-	50	16.91						42.5					7.5												0.336	
1	of	4	Southwest		13	-	60	30.08																	25.0						0.175	
1	of	4	Southwest	15th Street	15	-	10	10.45	10.0	30.0								60.0													0.720	
1	of	4	Southwest		15	-	20	9.82						100.0																	0.550	
1	of	4	Southwest		15	-	30	7.12								50.0															0.150	
1	of	4	Southwest		15	-	40	38.34					7.5	37.5		11.3									18.8						0.359	
1	of	4	Southwest	17th Street	17	-	10	1.96						100.0																	0.550	
1	of	4	Southwest	18th Street	18	-	10	2.20						100.0																	0.550	
1	of	4	Southwest	19th Street	19	-	10	22.79						30.0											70.0						0.445	

APPENDIX E - EXISTING LAND USE BREAKDOWN										Existing Land Use, Percent																				
Philomath Storm Drainage Master Plan										Philomath - City Zoning Districts														Benton County Zoning Districts								
										Commercial				Residential							Industrial			Commercial		Residential			Industrial				Unzoned
Map			Quadrant	Location	Basin ID					C1	C2	C3	C4	R1	R2	R3	P	O	O/R	LI	HI	SPD	C	C2	UR-5			IP	LI	HI	Runoff	UZ
				Description					Acres																LDR	MDR	HDR				Coeff.	
										0.90	0.80	0.85	0.70	0.40	0.55	0.75	0.20	0.75	0.65	0.70	0.80	0.70	0.75	0.90	0.40	0.55	0.75	0.75	0.70	0.80	Cw	0.10
3	of	4	NW/USGS	Newton	NC	-	1	458.31																	0.0						0.100	85
3	of	4	Northwest	Creek	NC	-	2	48.05																	0.0	0.0					0.100	
3	of	4	Northwest		NC	-	3	21.37												5.0									15.0		0.220	
3	of	4	Northwest		NC	-	4	15.50													28.0									52.0	0.660	
1	of	4	Southwest		NC	-	10	14.58				25.0	35.0		40.0															0.678	
1	of	4	Southwest		NC	-	12	14.34		35.0									65.0												0.703	
1	of	4	Southwest		NC	-	14	27.14		50.0									50.0												0.725	
1	of	4	Southwest		NC	-	16	8.92				12.0	18.0						30.0												0.463	
2	of	4	Southeast		NC	-	18	17.01						54.0		6.0															0.301	
2	of	4	Southeast		NC	-	20	107.73							1.0		9.0								10.0						0.144	
2	of	4	Southeast		NC	-	22	21.80				10.0		60.0	30.0																0.490	
2/4	of	4	SE/NE		NC	-	24	203.18									35.0											15.0			0.233	
2	of	4	Southeast		NC	-	26	66.42																				54.0	6.0		0.487	
1	of	4	Southwest		NC	-	28	12.80					12.5										5.0					7.5			0.256	
4	of	4	Northeast		NC	-	30	132.01																				5.0			0.133	
4	of	4	Northeast		NC	-	32	135.61																				5.0			0.133	
4	of	4	NE/USGS		NC	-	34	255.51																	1.3						0.104	75
4	of	4	NE/USGS		NC	-	36	706.01																	1.3						0.104	75
3	of	4	NW/USGS	West	WNC	-	1	155.85																	0.0						0.100	70
3	of	4	NW/USGS	Fork	WNC	-	2	33.69																	0.0						0.100	
3	of	4	NW/USGS	Newton	WNC	-	3	121.48																	2.0	6.0			2.0		0.145	
1	of	4	Southwest	Creek	WNC	-	4	56.71													9.0								36.0	15.0	0.484	
1	of	4	Southwest		WNC	-	5	20.25													4.5									25.5	0.310	
1	of	4	Southwest		WNC	-	6	26.34													32.0								6.0	2.0	0.374	
1	of	4	Southwest		WNC	-	7	5.09																	0.0						0.100	
1	of	4	Southwest		WNC	-	8	8.57							1.0										9.0						0.132	
1	of	4	Southwest		WNC	-	9	5.11																	0.0						0.100	
1	of	4	Southwest		WNC	-	10	2.41																	0.0						0.100	
2	of	4	Southeast	Bell-	BF	-	90	17.12						80.0																	0.340	
2	of	4	Southeast	Fountain	BF	-	80	4.32						100.0																	0.400	
2	of	4	Southeast		BF	-	70	3.63						100.0																	0.400	
2	of	4	Southeast		BF	-	60	2.31						100.0																	0.400	
2	of	4	Southeast		BF	-	50	13.79						100.0																	0.400	
2	of	4	Southeast		BF	-	40	1.66						100.0																	0.400	
2	of	4	Southeast		BF	-	10	20.75																	0.0						0.100	

APPENDIX E - EXISTING LAND USE BREAKDOWN									Existing Land Use, Percent																					
Philomath Storm Drainage Master Plan									Philomath - City Zoning Districts														Benton County Zoning Districts								
									Commercial				Residential						Industrial				Commercial		Residential			Industrial				
Map			Quadrant	Location	Basin ID				C1	C2	C3	C4	R1	R2	R3	P	O	O/R	LI	HI	SPD		C	C2	UR-5			IP	LI	HI	Runoff	Unzoned
				Description				Acres																	LDR	MDR	HDR				Coeff.	
									0.90	0.80	0.85	0.70	0.40	0.55	0.75	0.20	0.75	0.65	0.70	0.80	0.70		0.75	0.90	0.40	0.55	0.75	0.75	0.70	0.80	Cw	0.10
2	of	4	Southeast	Southwood	SW	-	30	26.93																	5.0						0.115	
2	of	4	Southeast	Area	SW	-	20	7.57					100.0																		0.400	
2	of	4	Southeast		SW	-	10	6.66					100.0																		0.400	
1	of	4	Southwest	Chapel	CH	-	10	30.09								22.5									2.5						0.130	
2	of	4	Southeast	Drive	CH	-	20	17.63																	0.0						0.100	
2/4	of	4	SE/NE/USGS	East Fork	ENC	-	10	193.11																				8.0			0.152	60
2	of	4	Southeast	Newton	ENC	-	20	103.40			4.0		52.0												24.0						0.358	
2	of	4	Southeast	Creek	ENC	-	30	89.15																	10.0						0.130	
								3831.84																								

APPENDIX E - PEAK STORM FLOW COMPUTATIONS, EXISTING LAND USE CONDITIONS (CHANGE IN RUNOFF C and VELOCITY/TIME)

PHILOMATH STORM DRAINAGE MASTER PLAN

Basin ID	Area	C EXIST	Area x C	Length	Velocity	Time of Concentration	Travel Time	Tc+Tt calc	Tc+Tt use	Intensity, in/hr (ODOT Zone 8) 5	10	25	50	100	Basin ID	Storm Peak Flow, cfs (ODOT Zone 8) 5	10	25	50	100
	acres	unitless	acres	Feet		min	min	min	min											
610	12.4	0.45	5.5	1,500	3	8.3		8.3	10.0	1.60	1.78	2.07	2.33	2.58	610	9	10	11	13	14
620	11.8	0.45	5.2	1,400	3		7.8	7.8	10.0	1.60	1.78	2.07	2.33	2.58	620	8	9	11	12	14
610+620	*24.2*	*0.45*	*10.8*					*16.1*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*610+620*	*14*	*16*	*18*	*21*	*24*
640	109.6	0.15	16.2	3,000	2		25.0	25.0	25.0	1.00	1.14	1.35	1.50	1.69	640	16	18	22	24	27
610,620,640	*133.8*	*0.20*	*27.0*					*41.1*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*610,620,640*	*20*	*23*	*26*	*30*	*33*
630	2.6	0.46	1.2	700	2		5.8	5.8	10.0	1.60	1.78	2.07	2.33	2.58	630	2	2	2	3	3
610,620,640,630	*136.3*	*0.21*	*28.1*					*41.1*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*610,620,640,630*	*21*	*24*	*28*	*31*	*35*
910	12.7	0.46	5.8	1,400	3	7.8		7.8	10.0	1.60	1.78	2.07	2.33	2.58	910	9	10	12	14	15
930	10.9	0.75	8.2	800	3		4.4	4.4	10.0	1.60	1.78	2.07	2.33	2.58	930	13	15	17	19	21
910+930	*23.6*	*0.59*	*14.0*					*12.2*	*12.0*	*1.48*	*1.65*	*1.90*	*2.18*	*2.40*	*910+930*	*21*	*23*	*27*	*31*	*34*
920	2.4	0.55	1.3	500	3	2.8		2.8	10.0	1.60	1.78	2.07	2.33	2.58	920	2	2	3	3	3
940	10.9	0.70	7.7	700	3		3.9	3.9	10.0	1.60	1.78	2.07	2.33	2.58	940	12	14	16	18	20
920+940	*13.3*	*0.67*	*9.0*					*6.7*	*10.0*	*1.60*	*1.78*	*2.07*	*2.33*	*2.58*	*920+940*	*14*	*16*	*19*	*21*	*23*
910,930,920,940	*26.6*	*0.67*	*17.9*					*18.9*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*910,930,920,940*	*20*	*23*	*27*	*30*	*34*
950	28.9	0.72	20.8	900	3		5.0	5.0	10.0	1.60	1.78	2.07	2.33	2.58	950	33	37	43	48	54
910-950	*55.5*	*0.70*	*38.7*					*23.9*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*910-950*	*39*	*44*	*52*	*58*	*65*
960	26.3	0.16	4.2	1,350	2		11.3	11.3	11.0	1.51	1.70	1.98	2.25	2.48	960	6	7	8	9	10
910-960	*81.8*	*0.52*	*42.9*					*35.1*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*910-960*	*35*	*39*	*47*	*52*	*59*
1110	33.0	0.14	4.6	2,100	2	17.5		17.5	20.0	1.13	1.30	1.50	1.69	1.90	1110	5	6	7	8	9
1303	33.2	0.15	4.8	1,500	2	12.5		12.5	13.0	1.41	1.60	1.85	2.10	2.31	1303	7	8	9	10	11
1304	21.1	0.43	9.0	1,550	2		12.9	12.9	13.0	1.41	1.60	1.85	2.10	2.31	1304	13	14	17	19	21
1303+1304	*54.3*	*0.25*	*13.8*					*25.4*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1303+1304*	*14*	*16*	*19*	*21*	*23*
1305	6.5	0.35	2.2	1,000	2		8.3	8.3	10.0	1.60	1.78	2.07	2.33	2.58	1305	4	4	5	5	6
1303+1304+1305	*60.8*	*0.26*	*16.0*					*33.8*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*1303+1304+1305*	*13*	*15*	*18*	*19*	*22*
1301	19.8	0.16	3.2	1,250	2	10.4		10.4	10.0	1.60	1.78	2.07	2.33	2.58	1301	5	6	7	7	8
1302	33.2	0.34	11.2	1,600	2		13.3	13.3	13.0	1.41	1.60	1.85	2.10	2.31	1302	16	18	21	24	26
1301+1302	*53.0*	*0.27*	*14.4*					*23.8*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*1301+1302*	*14*	*16*	*19*	*22*	*24*
1306	12.3	0.17	2.0	1,200	2	10.0		10.0	10.0	1.60	1.78	2.07	2.33	2.58	1306	3	4	4	5	5
1307	13.4	0.23	3.0	1,000	2		8.3	8.3	10.0	1.60	1.78	2.07	2.33	2.58	1307	5	5	6	7	8
1306+1307	*25.6*	*0.20*	*5.0*					*18.3*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*1306+1307*	*6*	*7*	*8*	*8*	*10*
1308	20.8	0.33	6.8	1,350	2		11.3	11.3	11.0	1.51	1.70	1.98	2.25	2.48	1308	10	12	14	15	17
1306+1307+1308	*46.4*	*0.26*	*11.9*					*29.6*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*1306+1307+1308*	*11*	*12*	*14*	*16*	*18*
1301-1308	*160.2*	*0.26*	*42.3*						*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*1301-1308*	*35*	*39*	*47*	*51*	*58*
1310	2.8	0.55	1.5	900	3	5.0		5.0	10.0	1.60	1.78	2.07	2.33	2.58	1310	2	3	3	4	4
1301-1310	*163.0*	*0.27*	*43.8*						*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*1301-1310*	*36*	*40*	*48*	*53*	*61*
1320	3.3	0.67	2.2	300	3		1.7	1.7	10.0	1.60	1.78	2.07	2.33	2.58	1320	4	4	5	5	6
1301-1320	*166.3*	*0.28*	*46.1*					*36.7*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*1301-1320*	*38*	*42*	*51*	*56*	*64*
1330	6.9	0.56	3.9	200	2		1.7	1.7	10.0	1.60	1.78	2.07	2.33	2.58	1330	6	7	8	9	10
1301-1330	*173.2*	*0.29*	*49.9*					*38.3*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*1301-1330*	*37*	*42*	*49*	*55*	*62*
1340	17.8	0.50	8.8	650	3		3.6	3.6	10.0	1.60	1.78	2.07	2.33	2.58	1340	14	16	18	21	23
1301-1340	*190.9*	*0.31*	*58.8*					*41.9*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*1301-1340*	*44*	*49*	*58*	*65*	*73*
1350	16.9	0.34	5.7	800	2		6.7	6.7	10.0	1.60	1.78	2.07	2.33	2.58	1350	9	10	12	13	15
1301-1350	*207.8*	*0.31*	*64.5*					*48.6*	*50.0*	*0.64*	*0.73*	*0.85*	*0.95*	*1.08*	*1301-1350*	*41*	*47*	*55*	*61*	*70*
1360	30.1	0.18	5.3	1,900	2		15.8	15.8	15.0	1.60	1.78	2.07	2.33	2.58	1360	8	9	11	12	14
1301-1360	*237.9*	*0.29*	*69.7*					*64.4*	*60.0*	*0.57*	*0.64*	*0.75*	*0.84*	*0.94*	*1301-1360*	*40*	*45*	*52*	*59*	*66*

APPENDIX E - PEAK STORM FLOW COMPUTATIONS, EXISTING LAND USE CONDITIONS (CHANGE IN RUNOFF C and VELOCITY/TIME)

PHILOMATH STORM DRAINAGE MASTER PLAN

Basin ID	Area	C EXIST	Area x C	Length	Velocity	Time of Concentration	Travel Time	Tc+Tt calc	Tc+Tt use	Intensity, in/hr (ODOT Zone 8) 5	10	25	50	100	Basin ID	Storm Peak Flow, cfs (ODOT Zone 8) 5	10	25	50	100
	acres	unitless	acres	Feet		min	min	min	min											
1510	10.5	0.72	7.5	900	3	5.0		5.0	10.0	1.60	1.78	2.07	2.33	2.58	1510	12	13	16	18	19
1530	7.1	0.15	1.1	1,350	2		11.3	11.3	11.0	1.51	1.70	1.98	2.25	2.48	1530	2	2	2	2	3
1510+1530	*17.6*	*0.49*	*8.6*					*16.3*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*1510+1530*	*11*	*13*	*15*	*17*	*19*
1520	9.8	0.55	5.4	900	3	5.0		5.0	10.0	1.60	1.78	2.07	2.33	2.58	1520	9	10	11	13	14
1510, 1530, 1520	*27.4*	*0.51*	*14.0*					*16.3*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*1510, 1530, 1520*	*18*	*21*	*24*	*27*	*31*
1710	2.0	0.55	1.1	450	3	2.5		2.5	10.0	1.60	1.78	2.07	2.33	2.58	1710	2	2	2	3	3
1510-1710	*29.4*	*0.51*	*15.1*					*16.3*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*1510-1710*	*20*	*23*	*26*	*29*	*33*
1540	38.3	0.36	13.8	1,800	2		15.0	15.0	15.0	1.60	1.78	2.07	2.33	2.58	1540	22	25	28	32	36
1510-1540	*67.7*	*0.43*	*28.8*					*31.3*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*1510-1540*	*26*	*29*	*35*	*39*	*44*
1810	2.2	0.55	1.21	350	3	1.9		1.9	10.0	1.60	1.78	2.07	2.33	2.58	1810	2	2	3	3	3
1910	22.8	0.45	10.1	2,000	3	11.1		11.1	11.0	1.51	1.70	1.98	2.25	2.48	1910	15	17	20	23	25
NC1	458.3	0.10	45.8	5,500	4	22.9		22.9	25.0	1.00	1.14	1.35	1.60	1.69	NC1	46	52	62	73	77
NC2	48.1	0.10	4.8	1,875	3		10.4	10.4	10.0	1.60	1.78	2.07	2.33	2.58	NC2	8	9	10	11	12
NC1+NC2	*506.4*	*0.10*	*50.6*					*33.3*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*NC1+NC2*	*42*	*47*	*56*	*61*	*70*
NC3	21.4	0.22	4.7	1,000	3		5.6	5.6	10.0	1.60	1.78	2.07	2.33	2.58	NC3	8	8	10	11	12
NC1+NC2+NC3	*527.7*	*0.10*	*55.3*					*38.9*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*NC1+NC2+NC3*	*42*	*46*	*54*	*61*	*69*
NC4	15.5	0.66	10.2	1,250	3		6.9	6.9	10.0	1.60	1.78	2.07	2.33	2.58	NC4	16	18	21	24	26
NC1-NC4	*543.2*	*0.12*	*65.6*					*45.8*	*45.0*	*0.69*	*0.78*	*0.92*	*1.02*	*1.15*	*NC1-NC4*	*45*	*51*	*60*	*67*	*75*
WNC1	155.9	0.10	15.6	2,500	4	10.4		10.4	10.0	1.60	1.78	2.07	2.33	2.58	WNC1	25	28	32	36	40
WNC2	33.7	0.10	3.4	2,000	4	8.3		8.3	10.0	1.60	1.78	2.07	2.33	2.58	WNC2	5	6	7	8	9
WNC3	121.5	0.15	17.6	3,000	3		16.7	16.7	15.0	1.32	1.50	1.72	1.95	2.19	WNC3	23	26	30	34	39
WNC1-WNC3	*311.0*	*0.12*	*36.6*					*27.1*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*WNC1-WNC3*	*37*	*42*	*49*	*55*	*62*
WNC6	26.3	0.37	9	1,750	3		9.7	9.7	10.0	1.60	1.78	2.07	2.33	2.58	WNC6	16	18	20	23	25
WNC1,2,3, WNC6	*337.4*	*0.14*	*46.4*					*36.8*	*35.0*	*0.82*	*0.92*	*1.10*	*1.21*	*1.38*	*WNC1,2,3, WNC6*	*38*	*43*	*51*	*56*	*64*
WNC1-6, NC1-4	*880.6*	*0.13*	*112.0*					*45.8*	*45.0*	*0.69*	*0.78*	*0.92*	*1.02*	*1.15*	*WNC1-6, NC1-4*	*77*	*87*	*103*	*114*	*129*
WNC10	2.4	0.10	0.2	100	2	0.8	0.8	0.8	10.0	1.60	1.78	2.07	2.33	2.58	WNC10	0	0	0	1	1
WNC1-6, NC1-4, WNC10	*883.0*	*0.13*	*112.2*					*46.7*	*45.0*	*0.69*	*0.78*	*0.92*	*1.02*	*1.15*	*WNC1-6, NC1-4, WNC10*	*77*	*88*	*103*	*114*	*129*
WNC5	20.3	0.31	6.3	2,000	3	11.1		11.1	11.0	1.51	1.70	1.98	2.25	2.48	WNC5	9	11	12	14	16
WNC7	5.1	0.10	0.5	625	2		5.2	5.2	10.0	1.60	1.78	2.07	2.33	2.58	WNC7	1	1	1	1	1
WNC5+WNC7	*25.3*	*0.27*	*6.8*					*16.3*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*WNC5+WNC7*	*9*	*10*	*12*	*13*	*15*
WNC4	56.7	0.48	27.4	2,250	3	12.5		12.5	13.0	1.41	1.60	1.85	2.10	2.31	WNC4	39	44	51	58	63
WNC8	8.6	0.13	1.1	875	2		7.3	7.3	10.0	1.60	1.78	2.07	2.33	2.58	WNC8	2	2	2	3	3
WNC4+WNC8	*65.3*	*0.44*	*28.6*					*19.8*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*WNC4+WNC8*	*32*	*37*	*43*	*48*	*54*
WNC4, 5, 7, 8	*90.6*	*0.39*	*35.4*					*19.8*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*WNC4, 5, 7, 8*	*40*	*46*	*53*	*60*	*67*
NC14	27.1	0.73	19.7	1,800	3	10.0		10.0	10.0	1.60	1.78	2.07	2.33	2.58	NC14	31	35	41	46	51
WNC4578-NC14	*117.8*	*0.47*	*55.0*					*19.8*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*WNC4578-NC14*	*62*	*72*	*83*	*93*	*105*
NC28	12.8	0.26	3.3	900	2		7.5	7.5	10.0	1.60	1.78	2.07	2.33	2.58	NC28	5	6	7	8	8
WNC4578,NC14,NC28	*130.6*	*0.45*	*58.3*					*27.3*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*WNC4578,NC14,NC28*	*58*	*66*	*79*	*87*	*99*
WNC9	5.1	0.10	0.5	250	2	2.1		2.1	10.0	1.60	1.78	2.07	2.33	2.58	WNC9	1	1	1	1	1
WNC4578,NC14,28,WNC9	*135.7*	*0.43*	*58.8*					*27.3*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*WNC4578,NC14,28,WNC9*	*59*	*67*	*79*	*88*	*99*
NC36	706.0	0.10	73.4	8,000	4	33.3		33.3	35.0	0.82	0.92	1.10	1.21	1.38	NC36	60	68	81	89	101
NC30	132.0	0.13	17.6	3,500	3		19.4	19.4	20.0	1.13	1.30	1.50	1.69	1.90	NC30	20	23	26	30	33
NC36+NC30	*838.0*	*0.11*	*91.0*					*52.8*	*55.0*	*0.60*	*0.68*	*0.80*	*0.89*	*1.00*	*NC36+NC30*	*55*	*62*	*73*	*81*	*91*
NC26	66.4	0.49	32.3	2,625	3		14.6	14.6	15.0	1.32	1.50	1.72	1.95	2.19	NC26	43	49	56	63	71
NC36, 30, 26	*904.4*	*0.14*	*123.3*					*67.4*	*70.0*	*0.53*	*0.59*	*0.68*	*0.76*	*0.85*	*NC36, 30, 26*	*65*	*73*	*84*	*94*	*105*

APPENDIX E - PEAK STORM FLOW COMPUTATIONS, EXISTING LAND USE CONDITIONS (CHANGE IN RUNOFF C and VELOCITY/TIME)
PHILOMATH STORM DRAINAGE MASTER PLAN

Basin ID	Area	C	Area x C	Length	Velocity	Time of	Travel	Tc+Tt		Intensity, in/hr (ODOT Zone 8)					Basin ID	Storm Peak Flow, cfs (ODOT Zone 8)				
		EXIST				Concentration	Time	calc	use	5	10	25	50	100		5	10	25	50	100
	acres	unitless	acres	Feet		min	min	min	min											
WNC4578,NC14,28,WNC9+															*WNC4578,NC14,28,WNC9+*					
+NC36, 30, 26	*1040.1*	*0.18*	*182.2*					*67.4*	*70.0*	*0.53*	*0.59*	*0.68*	*0.76*	*0.85*	*+NC36, 30, 26*	*97*	*107*	*124*	*138*	*155*
NC16	**8.9**	**0.46**	**4.1**	**1,200**	**2**	**10.0**		**10.0**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**NC16**	**7**	**7**	**9**	**10**	**11**
SUM ALL TO NC16	*1049.0*	*0.18*	*186.3*					*67.4*	*70.0*	*0.53*	*0.59*	*0.68*	*0.76*	*0.85*	*SUM ALL TO NC16*	*99*	*110*	*127*	*142*	*158*
NC12	**14.3**	**0.70**	**10.1**	**1,600**	**3**	**8.9**		**8.9**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**NC12**	**16**	**18**	**21**	**23**	**26**
NC10	**14.6**	**0.68**	**9.9**	**1,200**	**3**		**6.7**	**6.7**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**NC10**	**16**	**18**	**20**	**23**	**26**
NC12+NC10	*28.9*	*0.69*	*20.0*					*15.6*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*NC12+NC10*	*26*	*30*	*34*	*39*	*44*
NC18	**17.0**	**0.30**	**5.1**	**1,600**	**2**		**13.3**	**13.3**	**13.0**	**1.41**	**1.60**	**1.85**	**2.10**	**2.31**	**NC18**	**7**	**8**	**9**	**11**	**12**
NC10, 12, 18	*45.9*	*0.55*	*25.1*					*28.9*	*30.0*	*0.91*	*1.02*	*1.21*	*1.36*	*1.51*	*NC10, 12, 18*	*23*	*26*	*30*	*34*	*38*
NC34	**255.5**	**0.10**	**26.6**	**3,500**	**4**	**14.6**		**14.6**	**15.0**	**1.32**	**1.50**	**1.72**	**1.95**	**2.19**	**NC34**	**35**	**40**	**46**	**52**	**58**
NC32	**135.6**	**0.13**	**18.0**	**2,200**	**3**		**12.2**	**12.2**	**12.0**	**1.48**	**1.65**	**1.90**	**2.18**	**2.40**	**NC32**	**27**	**30**	**34**	**39**	**43**
NC34+NC32	*391.1*	*0.11*	*44.6*					*26.8*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*NC34+NC32*	*45*	*51*	*60*	*67*	*75*
NC24	**203.2**	**0.23**	**47.3**	**3,000**	**3**		**16.7**	**16.7**	**15.0**	**1.32**	**1.50**	**1.72**	**1.95**	**2.19**	**NC24**	**62**	**71**	**81**	**92**	**104**
NC34, 32, 24	*594.3*	*0.15*	*92.0*					*43.5*	*45.0*	*0.69*	*0.78*	*0.92*	*1.02*	*1.15*	*NC34, 32, 24*	*63*	*72*	*85*	*94*	*106*
NC22	**21.8**	**0.49**	**10.7**	**1,200**	**3**		**6.7**	**6.7**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**NC22**	**17**	**19**	**22**	**25**	**28**
NC34, 32, 24, 22	*616.1*	*0.17*	*102.6*					*50.1*	*50.0*	*0.64*	*0.73*	*0.85*	*0.95*	*1.08*	*NC34, 32, 24, 22*	*66*	*75*	*87*	*98*	*111*
SUM ALL TO N16 +															*SUM ALL TO N16 +*					
NC 10, 12, 18+															*NC 10, 12, 18+*					
NC34, 32, 24, 22	*1711.1*	*0.18*	*314.0*					*67.4*	*70.0*	*0.53*	*0.59*	*0.68*	*0.76*	*0.85*	*NC34, 32, 24, 22*	*166*	*185*	*214*	*239*	*267*
NC20	**107.7**	**0.14**	**15.5**	**2,500**	**3**		**13.9**	**13.9**	**14.0**	**1.38**	**1.55**	**1.79**	**2.01**	**2.24**	**NC20**	**21**	**24**	**28**	**31**	**35**
SUM ALL TO NC20	*1818.8*	*0.18*	*329.5*					*81.3*	*80.0*	*0.49*	*0.54*	*0.63*	*0.70*	*0.78*	*SUM ALL TO NC20*	*161*	*178*	*208*	*231*	*257*
ENC21	**25.6**	**0.36**	**9.2**	**1,200**	**2**	**10.0**		**10.0**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**ENC21**	**15**	**16**	**19**	**21**	**24**
ENC20	**77.8**	**0.36**	**27.9**	**1,700**	**2**		**14.2**	**14.2**	**14.0**	**1.38**	**1.55**	**1.79**	**2.01**	**2.24**	**ENC20**	**38**	**43**	**50**	**56**	**62**
ENC21+ENC20	*103.4*	*0.36*	*37.0*					*24.2*	*25.0*	*1.00*	*1.14*	*1.35*	*1.50*	*1.69*	*ENC21+ENC20*	*37*	*42*	*50*	*56*	*63*
ENC10	**193.1**	**0.15**	**29.4**	**5,000**	**3**	**27.8**		**27.8**	**30.0**	**1.13**	**1.30**	**1.50**	**1.69**	**1.90**	**ENC10**	**33**	**38**	**44**	**50**	**56**
ENC21, 20, 10	*296.5*	*0.22*	*66.4*					*41.9*	*40.0*	*0.75*	*0.84*	*0.98*	*1.11*	*1.24*	*ENC21, 20, 10*	*50*	*56*	*65*	*74*	*82*
ENC30	**89.2**	**0.13**	**11.6**	**2,750**	**2**		**22.9**	**22.9**	**25.0**	**1.00**	**1.14**	**1.35**	**1.50**	**1.69**	**ENC30**	**12**	**13**	**16**	**17**	**20**
ENC10,20,21,30	*385.7*	*0.20*	*78.0*					*64.9*	*60.0*	*0.57*	*0.64*	*0.75*	*0.84*	*0.94*	*ENC10,20,21,30*	*44*	*50*	*58*	*65*	*73*
SW10	**6.7**	**0.40**	**2.7**	**800**	**3**	**4.4**		**4.4**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**SW10**	**4**	**5**	**6**	**6**	**7**
SW20	**7.6**	**0.40**	**3.0**	**650**	**3**		**3.6**	**3.6**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**SW20**	**5**	**5**	**6**	**7**	**8**
SW10+SW20	*14.2*	*0.40*	*5.7*					*8.1*	*10.0*	*1.60*	*1.78*	*2.07*	*2.33*	*2.58*	*SW10+SW20*	*9*	*10*	*12*	*13*	*15*
SW30	**26.9**	**0.12**	**3.1**	**1,100**	**2**		**9.2**	**9.2**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**SW30**	**5**	**6**	**6**	**7**	**8**
SW10, 20, 30	*41.2*	*0.21*	*8.8*					*17.2*	*15.0*	*1.32*	*1.50*	*1.72*	*1.95*	*2.19*	*SW10, 20, 30*	*12*	*13*	*15*	*17*	*19*
BF90	**17.1**	**0.34**	**5.8**	**1,000**	**2**	**8.3**		**8.3**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**BF90**	**9**	**10**	**12**	**14**	**15**
BF80	**4.3**	**0.40**	**1.7**	**400**	**3**		**2.2**	**2.2**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**BF80**	**3**	**3**	**4**	**4**	**4**
BF90+BF80	*21.4*	*0.35*	*7.5*					*10.6*	*11.0*	*1.51*	*1.70*	*1.98*	*2.25*	*2.48*	*BF90+BF80*	*11*	*13*	*15*	*17*	*19*
BF60	**2.3**	**0.40**	**0.9**	**400**	**3**		**2.2**	**2.2**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**BF60**	**1**	**2**	**2**	**2**	**2**
BF90, 80, 60	*23.8*	*0.36*	*8.5*					*12.8*	*13.0*	*1.41*	*1.60*	*1.85*	*2.10*	*2.31*	*BF90, 80, 60*	*12*	*14*	*16*	*18*	*20*
BF70	**3.6**	**0.40**	**1.5**	**500**	**3**	**2.8**		**2.8**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**BF70**	**2**	**3**	**3**	**3**	**4**
BF90, 80, 60, 70	*27.4*	*0.36*	*9.9*					*12.8*	*13.0*	*1.41*	*1.60*	*1.85*	*2.10*	*2.31*	*BF90, 80, 60, 70*	*14*	*16*	*18*	*21*	*23*
BF50	**13.8**	**0.40**	**5.5**	**1,600**	**3**	**8.9**		**8.9**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**BF50**	**9**	**10**	**11**	**13**	**14**
BF90, 80, 60, 70, 50	*41.2*	*0.38*	*15.4*					*12.8*	*13.0*	*1.41*	*1.60*	*1.85*	*2.10*	*2.31*	*BF90, 80, 60, 70, 50*	*22*	*25*	*29*	*32*	*36*
BF10	**20.8**	**0.10**	**2.1**	**1,100**	**2**		**9.2**	**9.2**	**10.0**	**1.60**	**1.78**	**2.07**	**2.33**	**2.58**	**BF10**	**3**	**4**	**4**	**5**	**5**
BF90-50, BF10	*61.9*	*0.28*	*17.5*					*21.9*	*20.0*	*1.13*	*1.30*	*1.50*	*1.69*	*1.90*	*BF90-50, BF10*	*20*	*23*	*26*	*30*	*33*