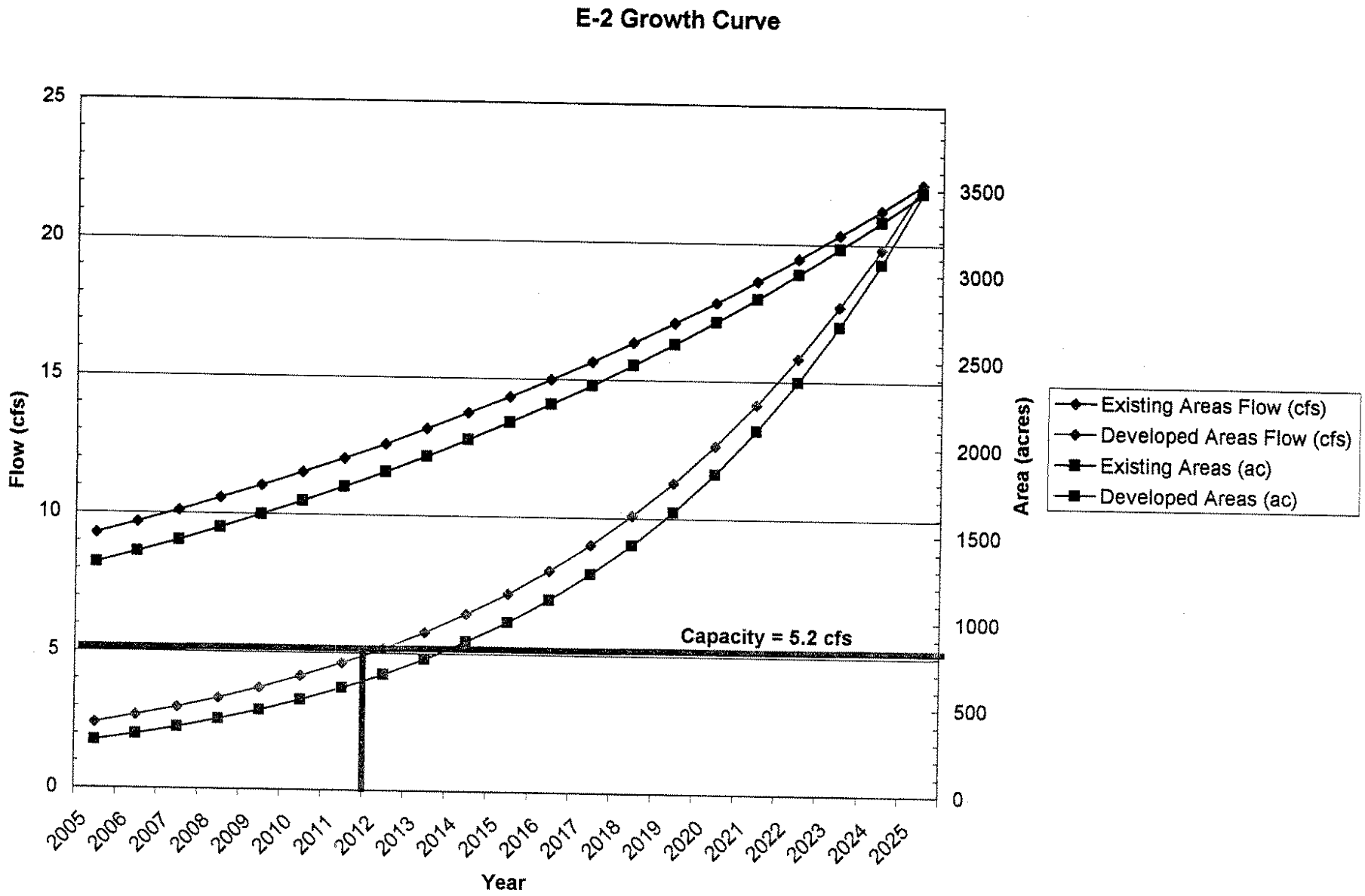
APPENDIX F

HDR
Lincoln, Nebraska
Lincoln Wastewater System
Oak Creek Trunk Sewers
Sewer Hydraulic Model

City PN: 502940
HDR PN: 20843
File 6.11
December 5, 2005

Segment R-2	Existing Areas Flow (cfs)	Existing Areas (ac)	Developed Areas Flow (cfs)	Developed Areas (ac)
Year	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac
2005	9.28	1305	2.38	277
2006	9.69	1371	2.66	315
2007	10.12	1439	2.97	357
2008	10.57	1512	3.32	405
2009	11.04	1588	3.71	460
2010	11.53	1668	4.14	522
2011	12.04	1751	4.63	592
2012	12.58	1839	5.17	672
2013	13.14	1932	5.78	763
2014	13.72	2029	6.46	865
2015	14.33	2131	7.22	982
2016	14.97	2238	8.07	1115
2017	15.64	2351	9.03	1265
2018	16.34	2469	10.10	1435
2019	17.07	2593	11.29	1629
2020	17.83	2723	12.63	1849
2021	18.63	2860	14.14	2098
2022	19.46	3004	15.82	2381
2023	20.33	3155	17.71	2702
2024	21.25	3313	19.82	3066
2025	22.20	3480	22.20	3480
Growth Rate		5.0%		13.5%

Capacity 5.2 cfs


E-2 Growth Curve
Flow (cfs)
Area (acres)
Year
Capacity = 5.2 cfs
Existing Areas Flow (cfs)
Developed Areas Flow (cfs)
Existing Areas (ac)
Developed Areas (ac)
0
5
10
15
20
25
0
500
1000
1500
2000
2500
3000
3500
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

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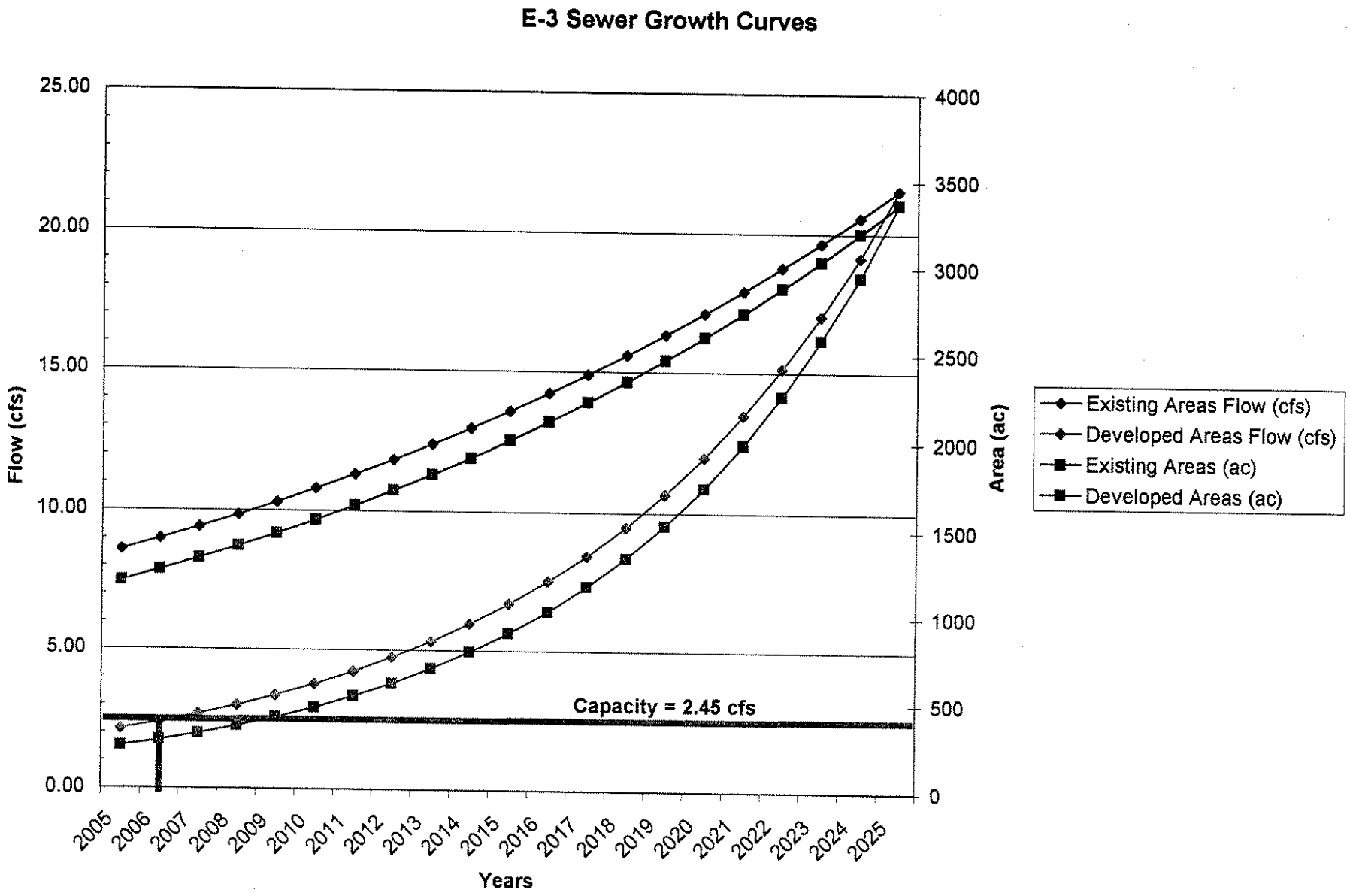
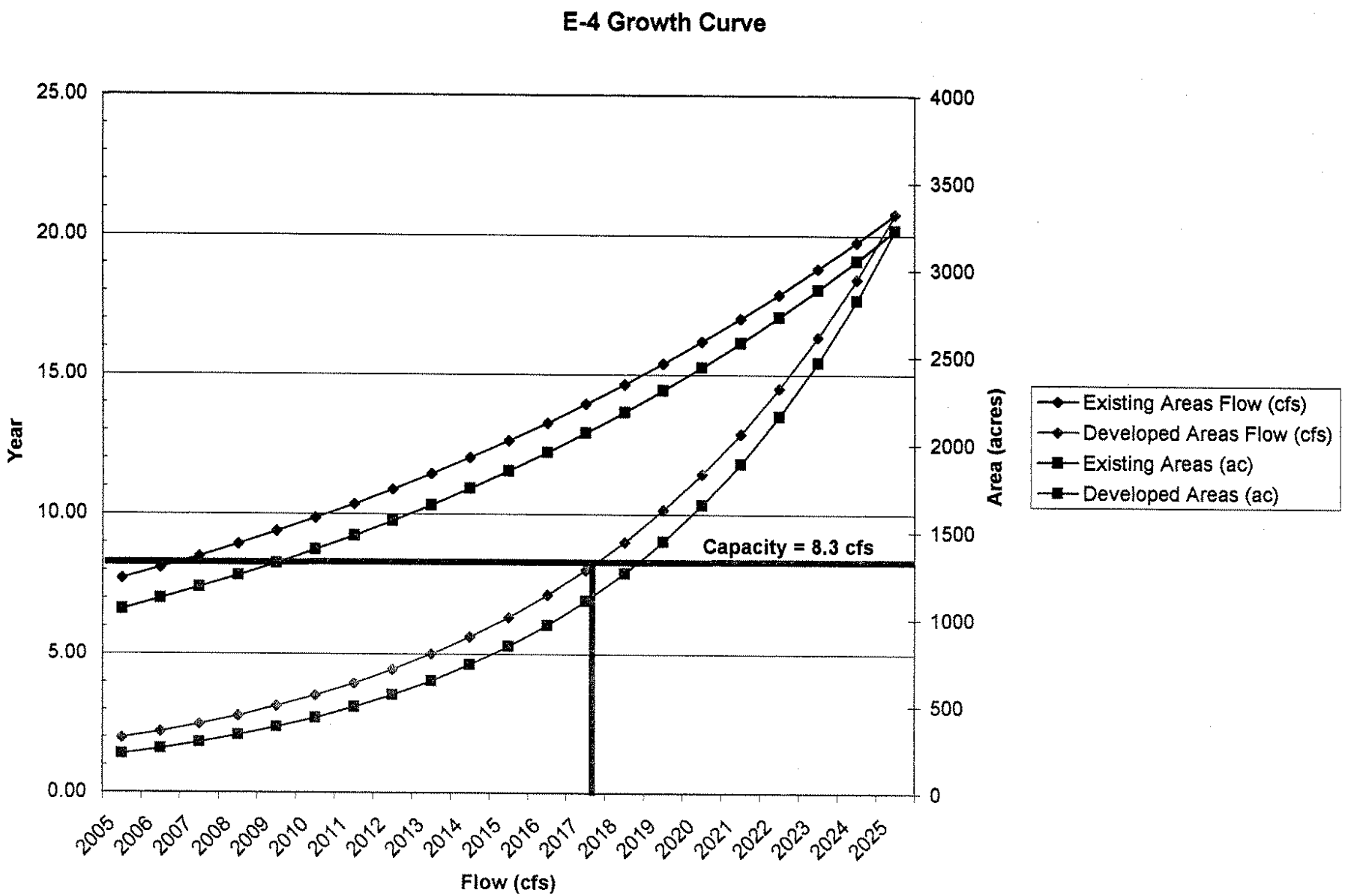
Segment E-3	Existing Areas Flow (cfs)	Existing Areas (ac)	Developed Areas Flow (cfs)	Developed Areas (ac)
Year	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac
2005	8.56	1124	2.12	242
2006	8.98	1258	2.37	276
2007	9.40	1325	2.66	314
2008	9.84	1395	2.98	359
2009	10.31	1469	3.35	409
2010	10.79	1547	3.76	467
2011	11.30	1630	4.22	532
2012	11.83	1717	4.73	607
2013	12.39	1808	5.31	693
2014	12.97	1904	5.96	790
2015	13.58	2006	6.69	901
2016	14.22	2112	7.52	1028
2017	14.89	2225	8.45	1173
2018	15.60	2343	9.49	1338
2019	16.34	2468	10.66	1526
2020	17.11	2599	11.98	1741
2021	17.92	2738	13.47	1986
2022	18.77	2884	15.14	2266
2023	19.66	3037	17.02	2585
2024	20.59	3199	19.14	2948
2025	21.56	3369	21.56	3369
Growth Rate		5.3%		14.1%

Capacity = 2.45 cfs


E-3 Sewer Growth Curves
Flow (cfs)
Area (ac)
Years
Capacity = 2.45 cfs
Existing Areas Flow (cfs)
Developed Areas Flow (cfs)
Existing Areas (ac)
Developed Areas (ac)
25.00
20.00
15.00
10.00
5.00
0.00
4000
3500
3000
2500
2000
1500
1000
500
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

Segment E-4	Existing Areas Flow (cfs)	Existing Areas (ac)	Developed Areas Flow (cfs)	Developed Areas (ac)
Year	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac
2005	7.70	1056	1.96	221
2006	8.09	1117	2.20	253
2007	8.50	1181	2.47	289
2008	8.93	1249	2.78	330
2009	9.38	1321	3.12	378
2010	9.85	1397	3.51	432
2011	10.35	1477	3.95	494
2012	10.88	1562	4.44	565
2013	11.43	1652	4.99	646
2014	12.01	1747	5.62	739
2015	12.62	1847	6.32	845
2016	13.27	1953	7.12	966
2017	13.94	2066	8.01	1105
2018	14.65	2184	9.02	1263
2019	15.40	2310	10.15	1445
2020	16.19	2443	11.44	1652
2021	17.01	2583	12.88	1889
2022	17.88	2732	14.51	2161
2023	18.80	2889	16.35	2471
2024	19.76	3055	18.43	2825
2025	20.77	3231	20.77	3231
Growth Rate		5.8%		14.4%
Capacity = 8.3 cfs				


E-4 Growth Curve
25.00
20.00
15.00
10.00
5.00
0.00
Year
4000
3500
3000
2500
2000
1500
1000
500
0
Area (acres)
Capacity = 8.3 cfs
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Flow (cfs)
Existing Areas Flow (cfs)
Developed Areas Flow (cfs)
Existing Areas (ac)
Developed Areas (ac)

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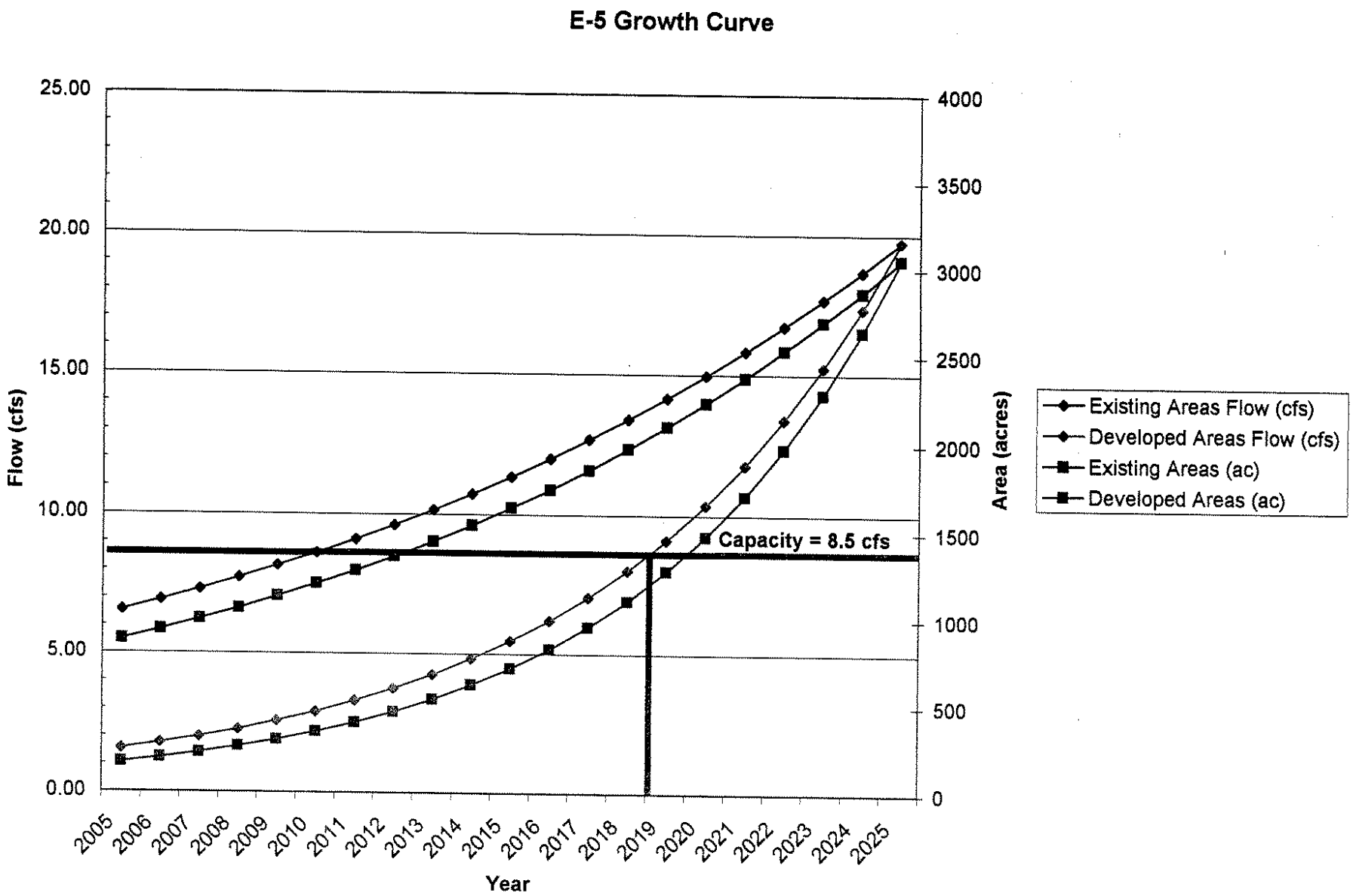
Segment E-5	Existing Areas Flow (cfs)	Existing Areas (ac)	Developed Areas Flow (cfs)	Developed Areas (ac)
Year	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac	Existing + Tier I + 1500 ac
2005	6.55	879	1.55	168
2006	6.92	935	1.75	194
2007	7.31	996	1.99	225
2008	7.72	1060	2.25	260
2009	8.16	1128	2.56	300
2010	8.62	1200	2.90	347
2011	9.10	1277	3.29	401
2012	9.62	1359	3.74	464
2013	10.16	1447	4.24	536
2014	10.74	1540	4.82	620
2015	11.35	1638	5.47	717
2016	12.00	1744	6.21	828
2017	12.68	1856	7.06	958
2018	13.40	1975	8.02	1107
2019	14.16	2102	9.12	1280
2020	14.97	2237	10.37	1479
2021	15.82	2381	11.79	1710
2022	16.72	2534	13.41	1977
2023	17.68	2696	15.25	2285
2024	18.69	2870	17.36	2642
2025	19.75	3054	19.75	3054
Growth Rate		6.4%		15.6%
Capacity=8.5 cfs				


E-5 Growth Curve
25.00
20.00
15.00
10.00
5.00
0.00
Flow (cfs)
4000
3500
3000
2500
2000
1500
1000
500
0
Area (acres)
Capacity = 8.5 cfs
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year
Existing Areas Flow (cfs)
Developed Areas Flow (cfs)
Existing Areas (ac)
Developed Areas (ac)

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Segment E-6D	Existing Areas Flow (cfs)	Existing Areas (ac)	Developed Areas Flow (cfs)	Developed Areas (ac)
Year	Existing + Tier I	Existing + Tier I	Existing + Tier I	Existing + Tier I
2005	0.00	0	0.00	0
2006	0.00	0	0.00	0
2007	0.00	0	0.00	0
2008	0.00	0	0.00	0
2009	0.00	0	0.00	0
2010	0.00	0	0.00	0
2011	0.00	0	0.00	0
2012	0.00	0	0.00	0
2013	0.00	0	0.00	0
2014	0.00	0	0.00	0
2015	0.00	0	0.00	0
2016	0.00	0	0.00	0
2017	0.00	0	0.00	0
2018	0.00	0	0.00	0
2019	0.00	0	0.00	0
2020	0.00	0	0.00	0
2021	0.00	0	0.00	0
2022	0.00	0	0.00	0
2023	0.00	0	0.00	0
2024	0.00	0	0.00	0
2025	5.19	675	5.19	675
Growth Rate		NA		NA

3.30 cfs 402 acres