

Summary of CSO Beaches Estimated Storage Volumes (REV 3)

King County CSO plan and RWSP Transfer Documents references from documents provided to Carollo Engineers subsequent to NTP issued to Carollo, January 2, 2007.
 KCDNRP WTD analyses results 2007, based on curves provided by WTD in March of 2007 as provided to Carollo Engineers.
 KCDNRP WTD analyses results 2009 based on memorandum as referenced, provided to Carollo Engineers.

Storage Volumes in million gallons (MG)

Basin	1997 CSO Plan ¹	RWSP TX Document ²	K. Schock, 2007 ⁶	Carollo TM202.1 2007 ¹⁰	K. Schock, 2009 ¹³ (at the 90th percentile probability of ≤ 5 O.F. events in 5 years)			K. Schock, 2009 ¹⁷	K. Schock, 2009 ²² (at the 95th confidence interval)		
					Lower 95th CI Volume	Upper 95th CI Volume	Model Estimated Volume		Storage Volume	Lower 95th CI Volume	Upper 95th CI Volume
Barton	0.500	0.000 ³	0.810 - 0.350 ⁷	0.5 ¹¹	0.12 - 0.00 ¹⁴	0.71 - 0.19 ¹⁴	0.350 - 0.050 ¹⁴	0.32 - 0.11 ¹⁸	0.06	0.16	0.11
Murray	1.000	0.800 ⁴	1.770 - 0.770 ⁸	1.3 ¹²	0.90 - 0.61 ¹⁵	1.75 - 1.56 ¹⁵	1.220 - 1.010 ¹⁵	0.86 - 1.0 ¹⁹	0.83	1.13	1.0
S.Magnolia	1.300	1.300	2.620	2.6	NA	NA	NA	1.8 ²⁰	1.42	2.31	1.78
N.Beach	0.140	0.140 ⁵	3.470 ⁹	3.5	NA ¹⁶	NA ¹⁶	NA ¹⁶	3.9 - 2.2 ²¹	1.71	2.98	2.15

1. King County CSO 5-Year Update, Task 4.0 Development of Alternatives, 1997, Brown & Caldwell, et.al.
2. CPTR Transfer Document to MCIP... KC DNRP WTD, May 16, 2006.
3. The basis of the described project is addition of a 7.5 mgd pump station and force main without storage. Text leaves open the option of storage after hydraulic analysis. Sizing dependent on further study.
4. Storage size dependent on final choice at Barton; facilities are interdependent. Sizing dependent on further study.
5. Size based on 1997 CSO plan update with reference to unknown size from 1993 EWR. Sizing dependent on further study.
6. KCDNRP WTD, analysis of storage volumes, K. Schock, March 2007 (Used a 1.3 multiplication factor to Barton PS flows and a 1.4 multiplication factor to Murray PS flows. Includes uncertainty of meeting regulatory requirements).
7. Volume range at 90th percentile with Barton PS capacity from 22 mgd to 32 mgd (omits uncertainty of measured flow and model calibration errors).
8. Volume range 90th percentile, Barton PS capacity 24 mgd to 32 mgd, Murray PS capacity 31.5 mgd (omits uncertainty of measured flow and model calibration errors).
9. 90th percentile, NB PS capacity 3.4 mgd.
10. Carollo Engineers, Technical Memorandum 202.1, CSO Control Approach and Planning Boundaries, Final Draft, December 2007, Table ES.2.
11. Based on Barton PS capacity of 28 mgd.
12. Assumes storage added in Barton basin per line above.
13. KCDNRP WTD, "Revised CSO Storage Requirements...", K. Schock, January 12, 2009 (Omitted multiplication factor to Barton PS and Murray PS flows, pump tests revealed Barton did not require 1.3 multiplication factor and pumps tests showed the new Murray PS magnetic meters did not require corrections; the new magnetic meters were operating since late 2007 and the Murray basin was calibrated to this data. Volumes include uncertainty of meeting regulatory, uncertainty of measured flows, and uncertainty of modeled flows).
14. analysis with Barton PS capacity 22 mgd to 33 mgd.
15. analysis with Barton PS capacity 22 mgd to 33 mgd, Murray PS capacity 31.5 mgd.
16. Analysis for North Basin in review subsequent to pump testing showing NB PS capacity of 2.4 mgd.
17. "CSO Storage Requirements for the Barton, Murray, South Magnolia, and North Beach CSO Facility Project, K. Schock, 2/25/2009.
18. One year recurrence interval, Barton PS capacities 22 to 33 mgd.
19. One year recurrence interval, Barton PS capacities 22 to 33 mgd, Murray PS capacity 31.5 mgd.
20. One year recurrence interval, Magnolia Trunk capacity of 4.3 mgd.
21. One year recurrence interval, North Beach PS capacities of 2.2 and 3.9 mgd.
22. "CSO Storage Volumes for the County's and Carollo's Calibration", K. Schock, 10/20/2009, email to A. de Steiguer, et.al.

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