Appendix G:
HYDROLOGY AND WATER QUALITY

County of Los Angeles
Department of Parks
and Recreation
433 South Vermont Avenue
Los Angeles, California 90020

Earvin Magic Johnson Park

Existing Conditions Hydrology Evaluation Report

DRAFT

July 30, 2014

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Existing Conditions Hydrology Evaluation Report

DRAFT

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1. Project Background

The Earvin "Magic" Johnson Park is located in the City of Los Angeles and is owned and operated by the County of Los Angeles Department of Parks and Recreation (DPR). The 104-acre recreation area, named after basketball Hall of Famer, Earvin "Magic" Johnson, is used for outdoor activities such as family or corporate gatherings, festivals, and large sports activities. The focal points of the park are the beautiful fishing lakes, picnic areas with barbecue grills, open green space, a children's play area, and a popular walking path.

The park and a housing complex known as Ujima Village were built over the Athens Tank Farm area, previously owned by ExxonMobile. When the old Athens Tank Farm was removed in the 1960s, contaminants were left in the soil and were a source of concern for many years. Local, state and federal agencies have been gathering and analyzing data to determine whether the contamination posed a health risk. Soil, soil gas, groundwater, and air samples ordered by the Los Angeles Regional Water Quality Control Board have all indicated that the present levels of chemicals in the soil are not dangerous to human health. In addition, several homes east of the park have been tested for soil vapor samples, outdoor air samples and air samples taken from crawl spaces beneath for methane, benzene and other volatile organic compounds and were found to not pose a risk to health (Ridley-Thomas, 2013).

A cleanup has begun at the former Ujima Village site and Magic Johnson Park. The cleanup will use soil vapor extraction to remove volatile organic compounds from the ground, as well as the excavation of small areas of the property (Ridley-Thomas, 2013). Plans to re-imagine strategic uses for the existing 104 acre park, as well as the 16 acres that previously comprised Ujima Village are underway.

As part of the re-imagining, plans for alternative must be evaluated for environmental impacts, including impacts to drainage and water quality. This study provides information on the existing hydrologic conditions within the park area and Ujima Village.

2. Hydrology

The area surrounding Earvin "Magic" Johnson Park is highly urbanized within the City of Los Angeles. The park is located on the coastal plain within Dominguez Channel Watershed, which drains to the ocean near the Port of Los Angeles. The region has a mean annual rainfall of 12.11 inches. The general topography around the park slopes from northwest to southeast. Water all around the park is captured in storm drains owned and operated by the City of Los Angeles and the County of Los Angeles. **Figure 2-1** shows the adjacent facilities and subareas of the project area. The yellow lines represent subarea boundaries, and the orange lines indicate parcel boundaries. The yellow circle and blue lines represent catch basins and storm drains near the project site.

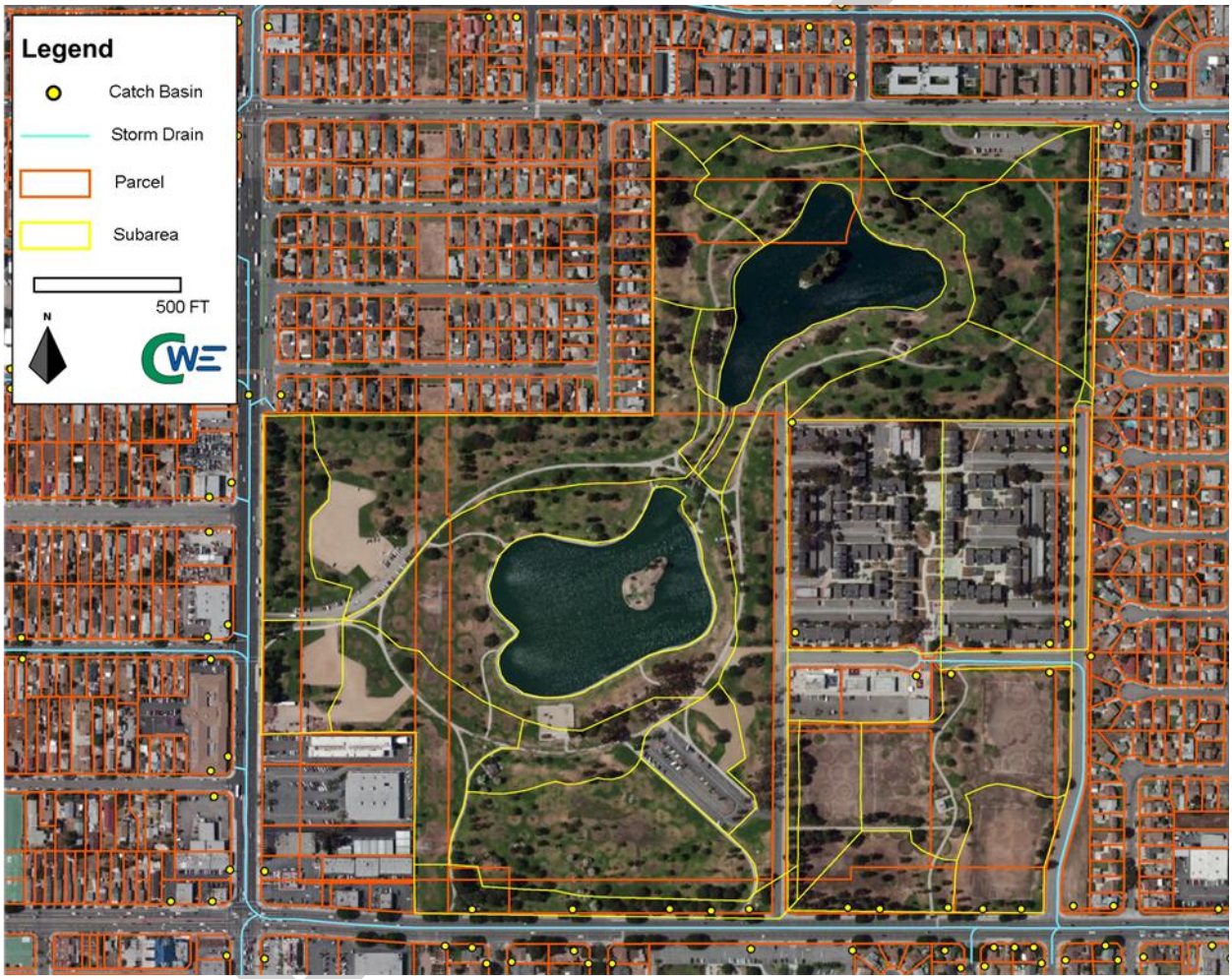

Figure 2-1 Map of Earvin Magic Johnson Park Project Area and Subareas

2.1 Rainfall Event Data

Hydrologic studies within both the City of Los Angeles and the County of Los Angeles are required to use the modified rational method (MODRAT) developed by the Los Angeles County Flood Control District. In urban areas, the design rainfall is the 25-year rainfall event, except where there is a sump which is required to meet higher drainage requirements. Drains that remove water from sumps must carry runoff from the 50-year rainfall event. All other drains must carry at least the 10-year, with streets carrying the remainder of flow. If flow depths exceed the property line or street capacity, the drain size must be

increased until the requirements are met. For water quality considerations, either the 0.75-inch or 85th percentile rainfall depth must be treated. In order to provide the data required to analyze all possible situations, the rainfall events and depths in **Table 2-1** were used for hydrologic calculations. All volume calculations use the 24-hour unit hyetograph with the design rainfall depth to generate runoff hydrographs.

Table 2-1 Rainfall in Project Watershed

Recurrence Interval	24-hr Rainfall (inches)
0.75-inch	0.75
85th Percentile	0.91
10-yr	4.18
25-yr	5.14
50-yr	5.86
100-yr	6.57

2.2 Watershed Subareas Hydrologic Characteristics and Times of Concentration

The characteristics of watershed subareas influence time of concentration (Tc) and flow rates. The most important factors include the subarea size, land use as a percentage of impervious area, the type of soil, and the flow path length and slope. The subareas in the existing condition are mainly open space, therefore the percentage imperviousness is low in most subareas. Areas of Ujima Village, the parking lots, and roads and sidewalks increase imperviousness in some of the subareas. There are two major soil types found within the park based on the County of Los Angeles soil classifications for hydrology studies. **Figure 2-2** provides a map of the park showing the watershed subareas, the land uses, and soil types for the park subwatersheds.

(a)

(b)

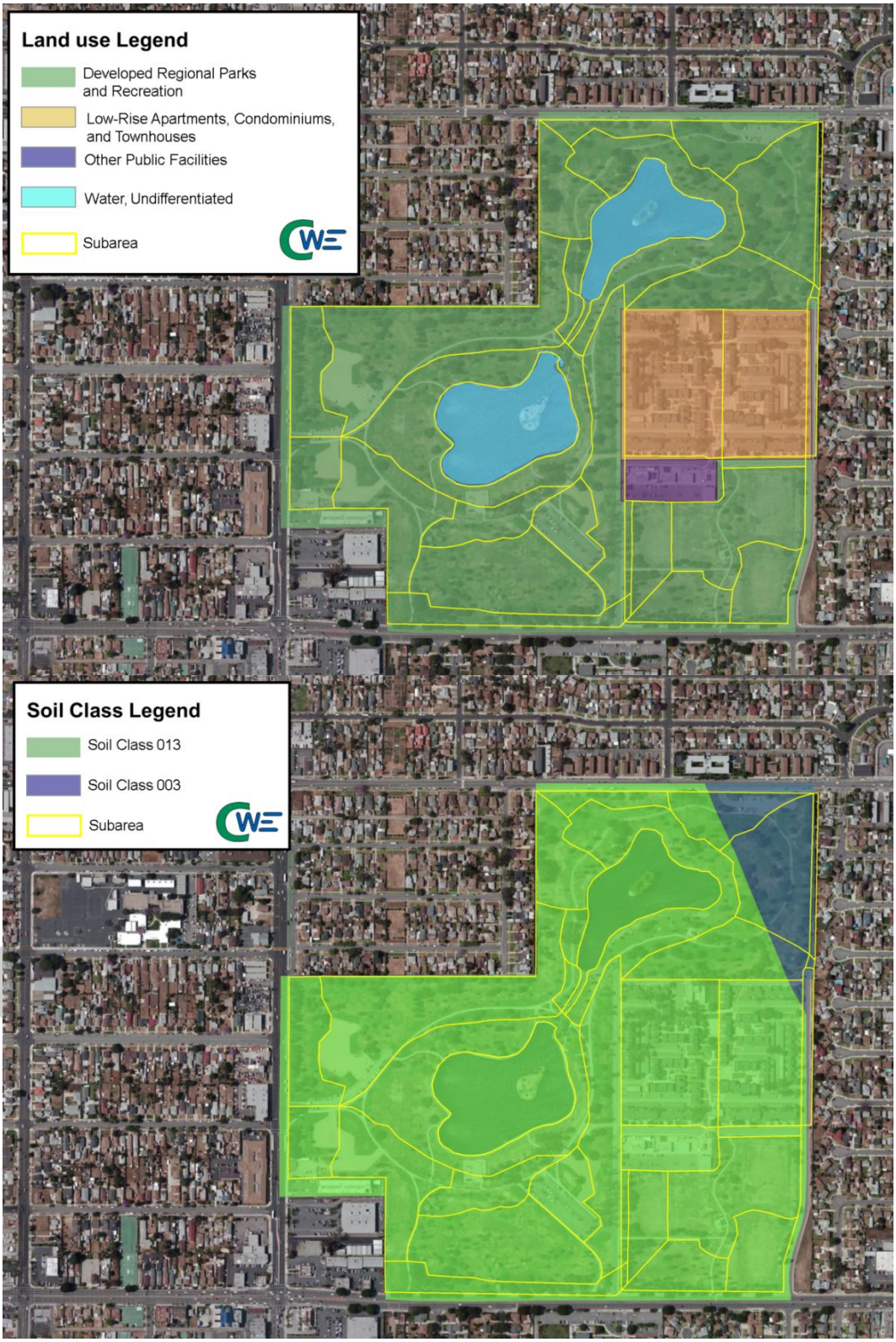

Figure 2-2 Map of Land Use and Soil Class Types

The longest flow path for each subarea was determined and the length and slope were developed based on the LAR-IAC topographic data in the Watershed Modeling System (WMS). **Figure 2-3** shows the subareas and the Tc flow path. **Table 2-2** summarizes the hydrologic characteristics of the subareas used for the hydrologic study, along with the Tc. Intensity is not shown in the table since it varies with the rainfall event recurrence interval.

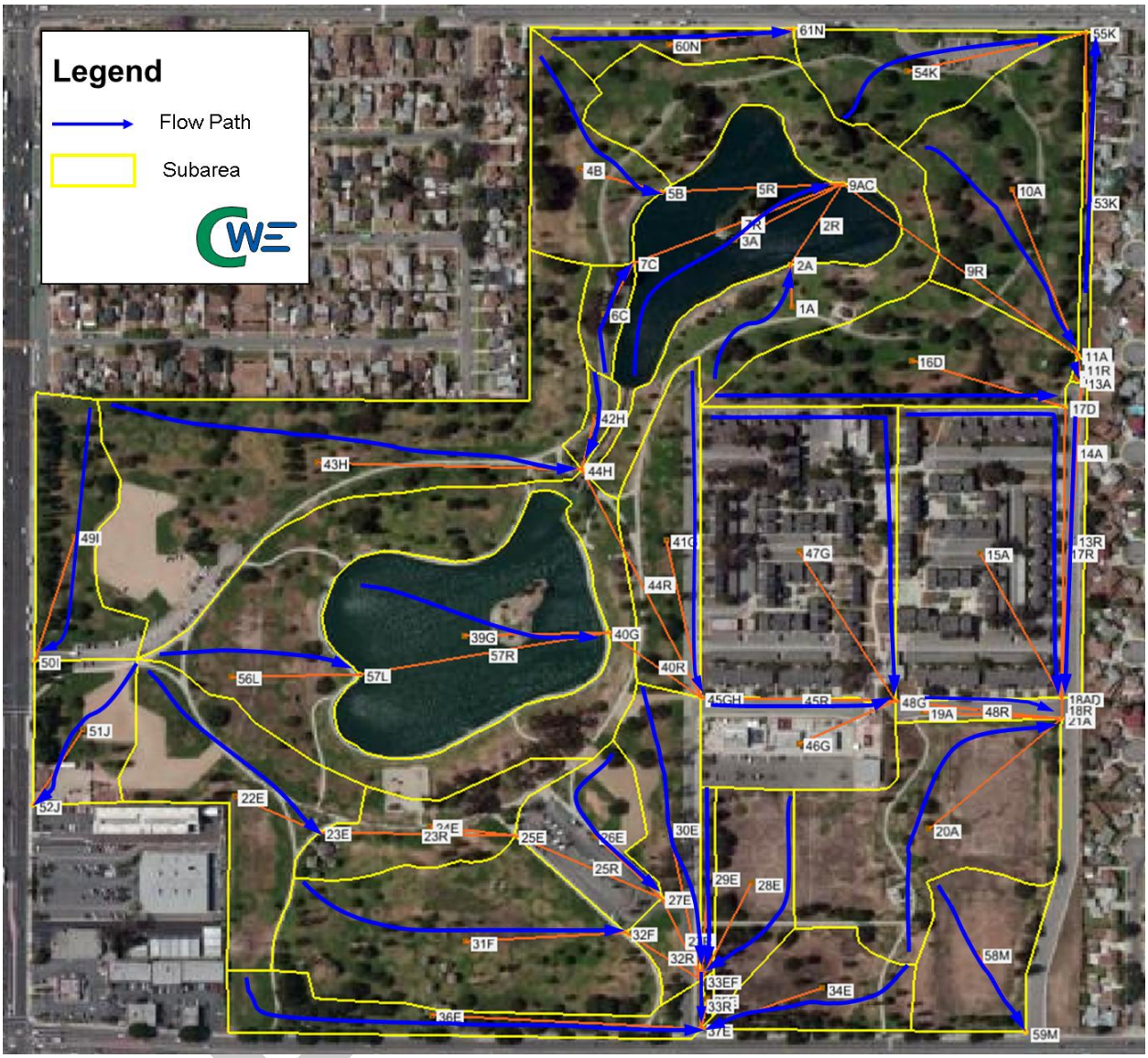

Figure 2-3 Map of Subareas and Tc Flow Paths

Table 2-2 Hydrologic Characteristics of Watershed Subareas							
Subarea	Area (ac)	Land Use % Imp.	Soil #	Flow Path Length (ft)	Flow Path Slope (ft/ft)	Cu/Cd	Tc (min)
1 A	7.28	3	013	401	0.0001	0.82	17
3 A	5.47	96	013	1,007	0.0040	0.90	13
4 B	2.96	3	013	549	0.0082	0.90	8
6 C	0.67	2	013	282	0.0073	0.90	5
10 A	5.79	2	003	705	0.0111	0.33	17
12 A	0.05	2	003	65	0.0130	0.51	5
14 A	1.01	40	013	790	0.0025	0.88	12
15 A	7.45	86	013	1,087	0.0047	0.89	13
16 D	4.49	2	013	898	0.0089	0.88	11
19 A	0.55	2	013	409	0.0049	0.90	7
20 A	6.64	2	013	942	0.0081	0.88	11
22 E	4.85	2	013	594	0.0099	0.90	8
24 E	2.52	2	013	589	0.0116	0.90	8
26 E	2.31	2	013	437	0.0195	0.87	6
28 E	2.23	2	013	589	0.0052	0.90	9
29 E	0.37	2	013	472	0.0000	0.78	20
30 E	2.88	2	013	589	0.0158	0.90	7
31 F	7.3	2	013	852	0.0119	0.89	10
34 E	2.32	2	013	537	0.0025	0.90	9
35 E	0.08	2	013	132	0.0025	0.90	5
36 E	2.49	2	013	1,249	0.0106	0.86	13
39 G	7.49	95	013	663	0.0000	0.89	28
41 G	3.22	14	013	812	0.0055	0.88	11
42 H	0.38	2	013	253	0.0088	0.90	5
43 H	10.85	2	013	1216	0.0085	0.85	13
46 G	2.68	86	013	458	0.0066	0.90	7
47 G	8.79	86	013	1,174	0.0068	0.89	13
49 I	3.04	2	013	637	0.0000	0.72	27
51 J	2.15	2	013	412	0.0073	0.90	7
53 K	0.53	2	003	842	0.0011	0.25	30
54 K	2.76	2	003	673	0.0178	0.35	15
56 L	9.35	2	013	493	0.0198	0.90	6
58 M	2.7	2	013	428	0.0080	0.90	7
60 N	1.21	2	013	612	0.0090	0.90	8

2.3 Subarea Flow Rates for Design Rainfall Events

Subarea flows are dependent on the rainfall event and the subarea characteristics. **Table 2-3** shows the runoff peak flow rates for each subwatershed within the park for the various design flow rates. Each flow rate is provided in cubic feet per second (cfs).

Table 2-3 Subarea Flow Rates for Rainfall Events (cfs)

Subarea	0.75-inch	85th Percentile	10-year	25-year	50-year	100-year
1 A	0.17	0.21	3.98	8.17	11.69	14.82
3 A	0.92	1.12	7.06	9.29	10.98	12.81
4 B	0.07	0.09	3.90	6.04	7.53	8.99
6 C	0.02	0.02	1.25	1.77	2.20	2.46
10 A	0.13	0.16	1.01	2.26	3.72	5.52
12 A	0.00	0.00	0.10	0.14	0.18	0.21
14 A	0.08	0.10	1.06	1.59	2.04	2.44
15 A	1.12	1.36	8.99	11.97	14.74	17.28
16 D	0.10	0.12	4.37	7.56	9.51	11.43
19 A	0.01	0.02	0.84	1.31	1.61	1.95
20 A	0.15	0.18	6.12	10.57	14.04	16.85
22 E	0.11	0.13	6.26	9.69	12.08	14.41
24 E	0.06	0.07	3.26	5.43	6.29	7.51
26 E	0.05	0.06	3.81	5.83	6.65	8.13
28 E	0.05	0.06	2.55	4.17	5.26	6.23
29 E	0.01	0.01	0.22	0.41	0.57	0.73
30 E	0.06	0.08	4.08	6.32	7.78	8.73
31 F	0.16	0.20	7.99	13.01	16.45	19.54
34 E	0.05	0.06	2.53	4.11	5.50	6.17
35 E	0.00	0.00	0.22	0.28	0.32	0.35
36 E	0.06	0.07	1.99	3.59	4.77	6.09
39 G	1.24	1.51	7.10	8.78	10.38	12.11
41 G	0.13	0.16	3.25	5.45	6.81	8.15
42 H	0.01	0.01	0.79	1.10	1.25	1.41
43 H	0.24	0.30	8.20	15.53	20.67	25.27
46 G	0.41	0.51	4.54	5.97	7.24	8.13
47 G	1.34	1.62	10.69	14.73	17.52	20.55
49 I	0.07	0.08	1.62	2.44	3.41	4.60
51 J	0.05	0.06	3.33	5.16	5.89	7.12
53 K	0.01	0.01	0.09	0.14	0.19	0.25
54 K	0.06	0.08	0.49	1.26	2.01	3.02
56 L	0.21	0.26	15.48	22.04	27.08	30.39
58 M	0.06	0.07	4.10	6.35	7.24	8.76
60 N	0.03	0.03	1.46	2.42	3.01	3.38

The design of stormwater BMPs and capture facilities requires understanding both peak and volumes of flows resulting from rainfall events. **Table 2-4** provides a summary of the runoff volume generated in each subarea.

Table 2-4 Subarea Runoff Volumes for Rainfall Events (ac-ft)

Subarea	0.75-inch	85th Percentile	10-year	25-year	50-year	100-year
1 A	0.055	0.067	0.414	0.582	0.712	0.848
3 A	0.348	0.422	2.054	2.601	3.014	3.434
4 B	0.023	0.028	0.182	0.245	0.295	0.347
6 C	0.005	0.006	0.041	0.055	0.066	0.078
10 A	0.417	0.506	2.514	3.213	3.748	4.294
12 A	0.418	0.507	2.519	3.218	3.755	4.302
14 A	0.444	0.538	2.674	3.414	3.982	4.561
15 A	0.801	0.972	4.696	5.909	6.832	7.767
16 D	0.032	0.039	0.257	0.352	0.427	0.506
19 A	0.837	1.016	4.988	6.308	7.316	8.341
20 A	0.884	1.073	5.366	6.827	7.947	9.088
22 E	0.034	0.041	0.28	0.378	0.457	0.538
24 E	0.052	0.063	0.426	0.576	0.695	0.818
26 E	0.068	0.083	0.562	0.758	0.913	1.076
28 E	0.084	0.102	0.69	0.931	1.124	1.324
29 E	0.087	0.105	0.712	0.962	1.161	1.369
30 E	0.107	0.13	0.883	1.192	1.438	1.696
31 F	0.052	0.063	0.423	0.575	0.696	0.823
34 E	0.176	0.213	1.439	1.948	2.354	2.779
35 E	0.176	0.214	1.445	1.956	2.363	2.79
36 E	0.194	0.236	1.586	2.151	2.601	3.073
39 G	0.395	0.48	2.211	2.72	3.104	3.488
41 G	0.437	0.53	2.493	3.09	3.541	3.996
42 H	0.003	0.003	0.024	0.031	0.038	0.044
43 H	0.08	0.097	0.631	0.876	1.067	1.268
46 G	0.648	0.786	3.866	4.88	5.653	6.439
47 G	1.073	1.302	6.271	7.849	9.043	10.253
49 I	0.021	0.026	0.162	0.223	0.277	0.333
51 J	0.016	0.019	0.129	0.174	0.209	0.246
53 K	0.004	0.004	0.02	0.026	0.031	0.036
54 K	0.023	0.028	0.134	0.178	0.212	0.248
56 L	0.067	0.081	0.553	0.742	0.89	1.05
58 M	0.019	0.023	0.159	0.214	0.257	0.303
60 N	0.009	0.01	0.07	0.094	0.114	0.134

Flow rates from each subarea combine and are routed through the internal storm drains to collection points as shown in **Figure 2-3**. The peak flows are slightly reduced based on channel storage and hydrograph superposition. **Table 2-5** provides flow data at each of the outlets.

Table 2-5 Outlet Flow Rates for Rainfall Events (cfs)

Subarea	0.75-inch	85th Percentile	10-year	25-year	50-year	100-year
2A	0.17	0.21	3.98	8.17	11.69	14.82
5B	0.07	0.09	3.9	6.04	7.53	8.99
7C	0.02	0.02	1.25	1.77	2.2	2.46
8AB	1.17	1.42	14.85	23.37	30.08	36.52
9AC	1.18	1.43	16.05	25.09	32.22	38.92
11A	1.31	1.59	17.04	27.29	35.9	44.41
13A	1.31	1.59	17.12	27.42	36.07	44.61
17D	0.1	0.12	4.37	7.56	9.51	11.43
18AD	2.62	3.18	31.54	48.52	62.34	75.77
21A	2.78	3.37	38.49	60.37	77.99	94.55
23E	0.11	0.13	6.26	9.69	12.08	14.41
25E	0.16	0.2	9.52	15.12	18.37	21.92
27E	0.21	0.26	13.32	20.9	24.95	30.05
32F	0.16	0.2	7.99	13.01	16.45	19.54
33EF	0.5	0.61	28.11	44.8	54.97	65.09
37E	0.61	0.74	32.79	52.75	65.54	77.62
40G	1.24	1.51	7.1	8.78	10.38	12.11
44H	0.25	0.31	8.89	16.54	21.86	26.64
45GH	1.63	1.97	19.17	30.67	38.88	46.7
48G	3.37	4.11	34.33	51.26	63.59	75.37
50I	0.07	0.08	1.62	2.44	3.41	4.6
52J	0.05	0.06	3.33	5.16	5.89	7.12
55K	0.07	0.09	0.58	1.4	2.19	3.26
57L	0.21	0.26	15.48	22.04	27.08	30.39
59M	0.06	0.07	4.1	6.35	7.24	8.76
61N	0.03	0.03	1.46	2.42	3.01	3.38

The values found in this report provide information on the volumes and peak flow rates generated within Earvin Magic Johnson Park and Ujima Village. These values can be used for comparison to design alternatives to be proposed for improving these areas.

3. References

Hydrology Manual. Alhambra, CA: Los Angeles County Department of Public Works, Water Resources Division, 2006. Print.

"LAR-IAC." *Project Website*. County of Los Angeles, n.d. Web. 29 Apr. 2014. <http://planning.lacounty.gov/LARIAC/>.

"Ujima Village – Supervisor Mark Ridley Thomas – Environment." *Supervisor Mark Ridley Thomas Environment*. N.p., 06 Aug. 2013. Web. 28 Apr. 2014. <http://ridleythomas.lacounty.gov/Environment/index.php/category/ujima/>

Appendix A
Field Investigation Photos

Figure 1 Aerial Imagery of Earvin Magic Johnson Park and Investigation Sites

Figure 2 Site #1 – Looking East from Site #1. Catch basin in park to collect surface runoff.

Figure 3 Site #2 – Looking north at a drainage ditch that collects flow and directs flow to the road.

Figure 4 Site #3 – Looking northwest towards park wall and catch basin to collect surface flows.

Figure 5 Site #4 – Looking north towards park wall and catch basin to collect surface flows.

Figure 6 Site #5 – Looking east at a grate to collect surface flows from sidewalk and grass.

Figure 7 Site #6 – Looking west towards power lines and at a grate to collect surface flows.

Figure 8 Site #7 – Looking east at parking lot drainage system.

Figure 9 Site #8 – Looking south at a closed restroom facility near Ujima Village.

Figure 10 Site #9 – Looking south towards an abandoned day care center at Ujima Village.

Figure 11 Site #10 – Looking south at a catch basin near Ujima Village Remediation Site.

Figure 12 Site #11 – Looking south towards catch basin on Wadsworth Ave.

Figure 13 Site #12 – Looking south on Clovis Avenue towards El Segundo Boulevard.

Appendix B

MODRAT Analysis
Existing Conditions
0.75-Inch 24-Hour Rainfall

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Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 1

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	0.17	7.3	0.17	0.055	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.03
1 2A	0.0	0.00	7.3	0.17	0.055	0	357	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 3A	5.5	0.92	12.8	1.09	0.348	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.96
1 4B	3.0	0.07	3.0	0.07	0.023	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.03
1 5B	0.0	0.00	3.0	0.07	0.023	0	492	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 6C	0.7	0.02	0.7	0.02	0.005	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 7C	0.0	0.00	0.7	0.02	0.005	0	576	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 8AB	3.0	0.00	15.8	1.17	0.371	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 9AC	0.7	0.00	16.5	1.18	0.376	0	766	0.00942	0.00	0.00	0	13	0	0.75	0.00
1 10A	5.8	0.13	22.3	1.31	0.417	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 11A	0.0	0.00	22.3	1.31	0.417	0	71	0.01085	0.00	0.00	0	3	0	0.75	0.00
1 12A	0.1	0.00	22.4	1.31	0.418	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 13A	0.0	0.00	22.4	1.31	0.418	0	820	0.00245	0.00	0.00	0	3	0	0.75	0.00
1 14A	1.0	0.08	23.4	1.40	0.444	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.40
1 15A	7.4	1.12	30.8	2.52	0.801	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.86
1 16D	4.5	0.10	4.5	0.10	0.032	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 17D	0.0	0.00	4.5	0.10	0.032	0	776	0.00244	0.00	0.00	0	13	0	0.75	0.00
1 18AD	4.5	0.00	35.3	2.62	0.833	0	65	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 19A	0.6	0.01	35.9	2.63	0.837	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 20A	6.6	0.15	42.5	2.78	0.884	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 21AG	0.0	0.00	42.5	2.78	0.884	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 22E	4.8	0.11	4.8	0.11	0.034	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 23E	0.0	0.00	4.8	0.11	0.034	0	505	0.01072	0.00	0.00	0	13	0	0.75	0.00
1 24E	2.5	0.06	7.3	0.16	0.052	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 25E	0.0	0.00	7.3	0.16	0.052	0	417	0.01457	0.00	0.00	0	13	0	0.75	0.00
1 26E	2.3	0.05	9.6	0.21	0.068	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 27E	0.0	0.00	9.6	0.21	0.068	0	236	0.00289	0.00	0.00	0	13	0	0.75	0.00
1 28E	2.2	0.05	11.8	0.26	0.084	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 29E	0.4	0.01	12.2	0.27	0.087	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 30E	2.9	0.06	15.1	0.34	0.107	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 31F	7.3	0.16	7.3	0.16	0.052	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 32F	0.0	0.00	7.3	0.16	0.052	0	307	0.01047	0.00	0.00	0	13	0	0.75	0.00
1 33EF	7.3	0.00	22.4	0.50	0.159	0	128	0.00243	0.00	0.00	0	13	0	0.75	0.00
1 34E	2.3	0.05	24.7	0.55	0.176	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 35E	0.1	0.00	24.8	0.55	0.176	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 36E	2.5	0.06	27.3	0.61	0.194	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 37E	0.0	0.00	27.3	0.61	0.194	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 39G	7.5	1.24	7.5	1.24	0.395	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.95
1 40G	0.0	0.00	7.5	1.24	0.395	0	398	0.02289	0.00	0.00	0	13	0	0.75	0.00
1 41G	3.2	0.13	10.7	1.37	0.437	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.14
1 42H	0.4	0.01	0.4	0.01	0.003	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 43H	10.9	0.24	11.3	0.25	0.080	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 44H	0.0	0.00	11.3	0.25	0.080	0	668	0.01280	0.00	0.00	0	13	0	0.75	0.00
1 45GH	11.3	0.00	22.0	1.63	0.517	0	519	0.00761	0.00	0.00	0	13	0	0.75	0.00
1 46G	2.7	0.41	24.7	2.04	0.648	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.86
1 47G	8.8	1.34	33.5	3.37	1.073	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.86
1 48G	0.0	0.00	33.5	3.37	1.073	0	446	0.00448	0.00	0.00	0	13	0	0.75	0.00
1 49I	3.0	0.07	3.0	0.07	0.021	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 50I	0.0	0.00	3.0	0.07	0.021	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 51J	2.2	0.05	2.2	0.05	0.016	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 52J	0.0	0.00	2.2	0.05	0.016	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 53K	0.5	0.01	0.5	0.01	0.004	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 54K	2.8	0.06	3.3	0.07	0.023	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 55K	0.0	0.00	3.3	0.07	0.023	0	0	0.00000	0.00	0.00	0	3	0	0.75	0.00
1 56L	9.4	0.21	9.4	0.21	0.067	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 57L	0.0	0.00	9.4	0.21	0.067	0	680	0.00153	0.00	0.00	0	13	0	0.75	0.00
1 58M	2.7	0.06	2.7	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 59M	0.0	0.00	2.7	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 60N	1.2	0.03	1.2	0.03	0.009	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 61N	0.0	0.00	1.2	0.03	0.009	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00

Normal End of MODRAT

Appendix C

MODRAT Analysis
Existing Conditions
85th Percentile 24-Hour Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 15:06:39 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 1

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	7.3	0.21	7.3	0.21	0.067	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.03
1	2A	0.0	0.00	7.3	0.21	0.067	0	357	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	3A	5.5	1.12	12.8	1.33	0.422	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.96
1	4B	3.0	0.09	3.0	0.09	0.028	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.03
1	5B	0.0	0.00	3.0	0.09	0.028	0	492	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	6C	0.7	0.02	0.7	0.02	0.006	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	7C	0.0	0.00	0.7	0.02	0.006	0	576	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	8AB	3.0	0.00	15.8	1.42	0.450	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	9AC	0.7	0.00	16.5	1.43	0.456	0	766	0.00942	0.00	0.00	0	13	0	0.91	0.00
1	10A	5.8	0.16	22.3	1.59	0.506	0	0	0.00000	0.00	0.00	0	3	30	0.91	0.02
1	11A	0.0	0.00	22.3	1.59	0.506	0	71	0.01085	0.00	0.00	0	3	0	0.91	0.00
1	12A	0.1	0.00	22.4	1.59	0.507	0	0	0.00000	0.00	0.00	0	3	26	0.91	0.02
1	13A	0.0	0.00	22.4	1.59	0.507	0	820	0.00245	0.00	0.00	0	3	0	0.91	0.00
1	14A	1.0	0.10	23.4	1.69	0.538	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.40
1	15A	7.4	1.36	30.8	3.06	0.972	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.86
1	16D	4.5	0.12	4.5	0.12	0.039	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	17D	0.0	0.00	4.5	0.12	0.039	0	776	0.00244	0.00	0.00	0	13	0	0.91	0.00
1	18AD	4.5	0.00	35.3	3.18	1.011	0	65	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	19A	0.6	0.02	35.9	3.20	1.016	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	20A	6.6	0.18	42.5	3.37	1.073	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	21AG	0.0	0.00	42.5	3.37	1.073	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	22E	4.8	0.13	4.8	0.13	0.041	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	23E	0.0	0.00	4.8	0.13	0.041	0	505	0.01072	0.00	0.00	0	13	0	0.91	0.00
1	24E	2.5	0.07	7.3	0.20	0.063	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	25E	0.0	0.00	7.3	0.20	0.063	0	417	0.01457	0.00	0.00	0	13	0	0.91	0.00
1	26E	2.3	0.06	9.6	0.26	0.083	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	27E	0.0	0.00	9.6	0.26	0.083	0	236	0.00289	0.00	0.00	0	13	0	0.91	0.00
1	28E	2.2	0.06	11.8	0.32	0.102	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	29E	0.4	0.01	12.2	0.33	0.105	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	30E	2.9	0.08	15.1	0.41	0.130	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	31F	7.3	0.20	7.3	0.20	0.063	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	32F	0.0	0.00	7.3	0.20	0.063	0	307	0.01047	0.00	0.00	0	13	0	0.91	0.00
1	33EF	7.3	0.00	22.4	0.61	0.193	0	128	0.00243	0.00	0.00	0	13	0	0.91	0.00
1	34E	2.3	0.06	24.7	0.67	0.213	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	35E	0.1	0.00	24.8	0.67	0.214	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	36E	2.5	0.07	27.3	0.74	0.236	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	37E	0.0	0.00	27.3	0.74	0.236	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	39G	7.5	1.51	7.5	1.51	0.480	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.95
1	40G	0.0	0.00	7.5	1.51	0.480	0	398	0.02289	0.00	0.00	0	13	0	0.91	0.00
1	41G	3.2	0.16	10.7	1.67	0.530	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.14
1	42H	0.4	0.01	0.4	0.01	0.003	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	43H	10.9	0.30	11.3	0.31	0.097	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	44H	0.0	0.00	11.3	0.31	0.097	0	668	0.01280	0.00	0.00	0	13	0	0.91	0.00
1	45GH	11.3	0.00	22.0	1.97	0.628	0	519	0.00761	0.00	0.00	0	13	0	0.91	0.00
1	46G	2.7	0.51	24.7	2.49	0.786	0	0	0.00000	0.00	0.00	0	13	28	0.91	0.86
1	47G	8.8	1.62	33.5	4.11	1.302	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.86
1	48G	0.0	0.00	33.5	4.11	1.302	0	446	0.00448	0.00	0.00	0	13	0	0.91	0.00
1	49I	3.0	0.08	3.0	0.08	0.026	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	50I	0.0	0.00	3.0	0.08	0.026	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	51J	2.2	0.06	2.2	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	52J	0.0	0.00	2.2	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	53K	0.5	0.01	0.5	0.01	0.004	0	0	0.00000	0.00	0.00	0	3	30	0.91	0.02
1	54K	2.8	0.08	3.3	0.09	0.028	0	0	0.00000	0.00	0.00	0	3	30	0.91	0.02
1	55K	0.0	0.00	3.3	0.09	0.028	0	0	0.00000	0.00	0.00	0	3	0	0.91	0.00
1	56L	9.4	0.26	9.4	0.26	0.081	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	57L	0.0	0.00	9.4	0.26	0.081	0	680	0.00153	0.00	0.00	0	13	0	0.91	0.00
1	58M	2.7	0.07	2.7	0.07	0.023	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	59M	0.0	0.00	2.7	0.07	0.023	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	60N	1.2	0.03	1.2	0.03	0.010	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	61N	0.0	0.00	1.2	0.03	0.010	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00

Normal End of MODRAT

Appendix D

MODRAT Analysis Existing Conditions 10-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 15:04:47 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 10

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	3.98	7.3	3.98	0.414	0	0	0.00000	0.00	0.00	0	13	30	4.17	0.03
1 2A	0.0	0.00	7.3	3.98	0.414	0	357	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 3A	5.5	7.06	12.8	11.00	2.054	0	0	0.00000	0.00	0.00	0	13	16	4.17	0.96
1 4B	3.0	3.90	3.0	3.90	0.182	0	0	0.00000	0.00	0.00	0	13	11	4.17	0.03
1 5B	0.0	0.00	3.0	3.90	0.182	0	492	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 6C	0.7	1.25	0.7	1.25	0.041	0	0	0.00000	0.00	0.00	0	13	7	4.17	0.02
1 7C	0.0	0.00	0.7	1.25	0.041	0	576	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 8AB	3.0	0.00	15.8	14.85	2.237	0	0	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 9AC	0.7	0.00	16.5	16.05	2.278	0	766	0.00942	0.00	0.00	0	13	0	4.17	0.00
1 10A	5.8	1.01	22.3	17.04	2.514	0	0	0.00000	0.00	0.00	0	3	30	4.17	0.02
1 11A	0.0	0.00	22.3	17.04	2.514	0	71	0.01085	0.00	0.00	0	3	0	4.17	0.00
1 12A	0.1	0.10	22.4	17.12	2.519	0	0	0.00000	0.00	0.00	0	3	5	4.18	0.02
1 13A	0.0	0.00	22.4	17.12	2.519	0	820	0.00245	0.00	0.00	0	3	0	4.18	0.00
1 14A	1.0	1.06	23.4	18.18	2.674	0	0	0.00000	0.00	0.00	0	13	17	4.19	0.40
1 15A	7.4	8.99	30.8	27.17	4.696	0	0	0.00000	0.00	0.00	0	13	17	4.18	0.86
1 16D	4.5	4.37	4.5	4.37	0.257	0	0	0.00000	0.00	0.00	0	13	16	4.17	0.02
1 17D	0.0	0.00	4.5	4.37	0.257	0	776	0.00244	0.00	0.00	0	13	0	4.17	0.00
1 18AD	4.5	0.00	35.3	31.54	4.953	0	65	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 19A	0.6	0.84	35.9	32.38	4.988	0	0	0.00000	0.00	0.00	0	13	10	4.19	0.02
1 20A	6.6	6.12	42.5	38.49	5.366	0	0	0.00000	0.00	0.00	0	13	17	4.19	0.02
1 21AG	0.0	0.00	42.5	38.49	5.366	0	0	0.00000	0.00	0.00	0	13	0	4.19	0.00
1 22E	4.8	6.26	4.8	6.26	0.280	0	0	0.00000	0.00	0.00	0	13	11	4.18	0.02
1 23E	0.0	0.00	4.8	6.26	0.280	0	505	0.01072	0.00	0.00	0	13	0	4.18	0.00
1 24E	2.5	3.26	7.3	9.52	0.426	0	0	0.00000	0.00	0.00	0	13	11	4.18	0.02
1 25E	0.0	0.00	7.3	9.52	0.426	0	417	0.01457	0.00	0.00	0	13	0	4.18	0.00
1 26E	2.3	3.81	9.6	13.32	0.562	0	0	0.00000	0.00	0.00	0	13	8	4.19	0.02
1 27E	0.0	0.00	9.6	13.32	0.562	0	236	0.00289	0.00	0.00	0	13	0	4.19	0.00
1 28E	2.2	2.55	11.8	15.87	0.690	0	0	0.00000	0.00	0.00	0	13	13	4.19	0.02
1 29E	0.4	0.22	12.2	16.08	0.712	0	0	0.00000	0.00	0.00	0	13	30	4.19	0.02
1 30E	2.9	4.08	15.1	20.15	0.883	0	0	0.00000	0.00	0.00	0	13	10	4.19	0.02
1 31F	7.3	7.99	7.3	7.99	0.423	0	0	0.00000	0.00	0.00	0	13	14	4.18	0.02
1 32F	0.0	0.00	7.3	7.99	0.423	0	307	0.01047	0.00	0.00	0	13	0	4.18	0.00
1 33EF	7.3	0.00	22.4	28.11	1.306	0	128	0.00243	0.00	0.00	0	13	0	4.18	0.00
1 34E	2.3	2.53	24.7	30.63	1.439	0	0	0.00000	0.00	0.00	0	13	14	4.19	0.02
1 35E	0.1	0.22	24.8	30.84	1.445	0	0	0.00000	0.00	0.00	0	13	5	4.19	0.02
1 36E	2.5	1.99	27.3	32.79	1.586	0	0	0.00000	0.00	0.00	0	13	20	4.18	0.02
1 37E	0.0	0.00	27.3	32.79	1.586	0	0	0.00000	0.00	0.00	0	13	0	4.18	0.00
1 39G	7.5	7.10	7.5	7.10	2.211	0	0	0.00000	0.00	0.00	0	13	30	4.18	0.95
1 40G	0.0	0.00	7.5	7.10	2.211	0	398	0.02289	0.00	0.00	0	13	0	4.18	0.00
1 41G	3.2	3.25	10.7	10.31	2.493	0	0	0.00000	0.00	0.00	0	13	16	4.18	0.14
1 42H	0.4	0.79	0.4	0.79	0.024	0	0	0.00000	0.00	0.00	0	13	6	4.17	0.02
1 43H	10.9	8.20	11.3	8.89	0.631	0	0	0.00000	0.00	0.00	0	13	21	4.16	0.02
1 44H	0.0	0.00	11.3	8.89	0.631	0	668	0.01280	0.00	0.00	0	13	0	4.16	0.00
1 45GH	11.3	0.00	22.0	19.17	3.124	0	519	0.00761	0.00	0.00	0	13	0	4.16	0.00
1 46G	2.7	4.54	24.7	23.64	3.866	0	0	0.00000	0.00	0.00	0	13	9	4.19	0.86
1 47G	8.8	10.69	33.5	34.33	6.271	0	0	0.00000	0.00	0.00	0	13	17	4.18	0.86
1 48G	0.0	0.00	33.5	34.33	6.271	0	446	0.00448	0.00	0.00	0	13	0	4.18	0.00
1 49I	3.0	1.62	3.0	1.62	0.162	0	0	0.00000	0.00	0.00	0	13	30	4.17	0.02
1 50I	0.0	0.00	3.0	1.62	0.162	0	0	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 51J	2.2	3.33	2.2	3.33	0.129	0	0	0.00000	0.00	0.00	0	13	9	4.18	0.02
1 52J	0.0	0.00	2.2	3.33	0.129	0	0	0.00000	0.00	0.00	0	13	0	4.18	0.00
1 53K	0.5	0.09	0.5	0.09	0.020	0	0	0.00000	0.00	0.00	0	3	30	4.18	0.02
1 54K	2.8	0.49	3.3	0.58	0.134	0	0	0.00000	0.00	0.00	0	3	30	4.17	0.02
1 55K	0.0	0.00	3.3	0.58	0.134	0	0	0.00000	0.00	0.00	0	3	0	4.17	0.00
1 56L	9.4	15.48	9.4	15.48	0.553	0	0	0.00000	0.00	0.00	0	13	8	4.18	0.02
1 57L	0.0	0.00	9.4	15.48	0.553	0	680	0.00153	0.00	0.00	0	13	0	4.18	0.00
1 58M	2.7	4.10	2.7	4.10	0.159	0	0	0.00000	0.00	0.00	0	13	9	4.19	0.02
1 59M	0.0	0.00	2.7	4.10	0.159	0	0	0.00000	0.00	0.00	0	13	0	4.19	0.00
1 60N	1.2	1.46	1.2	1.46	0.070	0	0	0.00000	0.00	0.00	0	13	12	4.17	0.02
1 61N	0.0	0.00	1.2	1.46	0.070	0	0	0.00000	0.00	0.00	0	13	0	4.17	0.00

Normal End of MODRAT

Appendix E

MODRAT Analysis
Existing Conditions
25-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 15:03:21 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 25

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	8.17	7.3	8.17	0.582	0	0	0.00000	0.00	0.00	0	13	21	5.13	0.03
1 2A	0.0	0.00	7.3	8.17	0.582	0	357	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 3A	5.5	9.29	12.8	17.42	2.601	0	0	0.00000	0.00	0.00	0	13	14	5.13	0.96
1 4B	3.0	6.04	3.0	6.04	0.245	0	0	0.00000	0.00	0.00	0	13	9	5.13	0.03
1 5B	0.0	0.00	3.0	6.04	0.245	0	492	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 6C	0.7	1.77	0.7	1.77	0.055	0	0	0.00000	0.00	0.00	0	13	6	5.13	0.02
1 7C	0.0	0.00	0.7	1.77	0.055	0	576	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 8AB	3.0	0.00	15.8	23.37	2.846	0	0	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 9AC	0.7	0.00	16.5	25.09	2.901	0	766	0.00942	0.00	0.00	0	13	0	5.13	0.00
1 10A	5.8	2.26	22.3	27.29	3.213	0	0	0.00000	0.00	0.00	0	3	22	5.13	0.02
1 11A	0.0	0.00	22.3	27.29	3.213	0	71	0.01085	0.00	0.00	0	3	0	5.13	0.00
1 12A	0.1	0.14	22.4	27.42	3.218	0	0	0.00000	0.00	0.00	0	3	5	5.14	0.02
1 13A	0.0	0.00	22.4	27.42	3.218	0	820	0.00245	0.00	0.00	0	3	0	5.14	0.00
1 14A	1.0	1.59	23.4	29.01	3.414	0	0	0.00000	0.00	0.00	0	13	14	5.15	0.40
1 15A	7.4	11.97	30.8	40.97	5.909	0	0	0.00000	0.00	0.00	0	13	15	5.14	0.86
1 16D	4.5	7.56	4.5	7.56	0.352	0	0	0.00000	0.00	0.00	0	13	12	5.13	0.02
1 17D	0.0	0.00	4.5	7.56	0.352	0	776	0.00244	0.00	0.00	0	13	0	5.13	0.00
1 18AD	4.5	0.00	35.3	48.52	6.261	0	65	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 19A	0.6	1.31	35.9	49.80	6.308	0	0	0.00000	0.00	0.00	0	13	8	5.15	0.02
1 20A	6.6	10.57	42.5	60.37	6.827	0	0	0.00000	0.00	0.00	0	13	13	5.15	0.02
1 21AG	0.0	0.00	42.5	60.37	6.827	0	0	0.00000	0.00	0.00	0	13	0	5.15	0.00
1 22E	4.8	9.69	4.8	9.69	0.378	0	0	0.00000	0.00	0.00	0	13	9	5.14	0.02
1 23E	0.0	0.00	4.8	9.69	0.378	0	505	0.01072	0.00	0.00	0	13	0	5.14	0.00
1 24E	2.5	5.43	7.3	15.12	0.576	0	0	0.00000	0.00	0.00	0	13	8	5.14	0.02
1 25E	0.0	0.00	7.3	15.12	0.576	0	417	0.01457	0.00	0.00	0	13	0	5.14	0.00
1 26E	2.3	5.83	9.6	20.90	0.758	0	0	0.00000	0.00	0.00	0	13	6	5.15	0.02
1 27E	0.0	0.00	9.6	20.90	0.758	0	236	0.00289	0.00	0.00	0	13	0	5.15	0.00
1 28E	2.2	4.17	11.8	25.07	0.931	0	0	0.00000	0.00	0.00	0	13	10	5.15	0.02
1 29E	0.4	0.41	12.2	25.47	0.962	0	0	0.00000	0.00	0.00	0	13	24	5.15	0.02
1 30E	2.9	6.32	15.1	31.79	1.192	0	0	0.00000	0.00	0.00	0	13	8	5.15	0.02
1 31F	7.3	13.01	7.3	13.01	0.575	0	0	0.00000	0.00	0.00	0	13	11	5.14	0.02
1 32F	0.0	0.00	7.3	13.01	0.575	0	307	0.01047	0.00	0.00	0	13	0	5.14	0.00
1 33EF	7.3	0.00	22.4	44.80	1.766	0	128	0.00243	0.00	0.00	0	13	0	5.14	0.00
1 34E	2.3	4.11	24.7	48.91	1.948	0	0	0.00000	0.00	0.00	0	13	11	5.15	0.02
1 35E	0.1	0.28	24.8	49.18	1.956	0	0	0.00000	0.00	0.00	0	13	5	5.15	0.02
1 36E	2.5	3.59	27.3	52.75	2.151	0	0	0.00000	0.00	0.00	0	13	15	5.14	0.02
1 37E	0.0	0.00	27.3	52.75	2.151	0	0	0.00000	0.00	0.00	0	13	0	5.14	0.00
1 39G	7.5	8.78	7.5	8.78	2.720	0	0	0.00000	0.00	0.00	0	13	30	5.14	0.95
1 40G	0.0	0.00	7.5	8.78	2.720	0	398	0.02289	0.00	0.00	0	13	0	5.14	0.00
1 41G	3.2	5.45	10.7	14.13	3.090	0	0	0.00000	0.00	0.00	0	13	12	5.14	0.14
1 42H	0.4	1.10	0.4	1.10	0.031	0	0	0.00000	0.00	0.00	0	13	5	5.13	0.02
1 43H	10.9	15.53	11.3	16.54	0.876	0	0	0.00000	0.00	0.00	0	13	15	5.12	0.02
1 44H	0.0	0.00	11.3	16.54	0.876	0	668	0.01280	0.00	0.00	0	13	0	5.12	0.00
1 45GH	11.3	0.00	22.0	30.67	3.965	0	519	0.00761	0.00	0.00	0	13	0	5.12	0.00
1 46G	2.7	5.97	24.7	36.53	4.880	0	0	0.00000	0.00	0.00	0	13	8	5.15	0.86
1 47G	8.8	14.73	33.5	51.26	7.849	0	0	0.00000	0.00	0.00	0	13	14	5.14	0.86
1 48G	0.0	0.00	33.5	51.26	7.849	0	446	0.00448	0.00	0.00	0	13	0	5.14	0.00
1 49I	3.0	2.44	3.0	2.44	0.223	0	0	0.00000	0.00	0.00	0	13	30	5.12	0.02
1 50I	0.0	0.00	3.0	2.44	0.223	0	0	0.00000	0.00	0.00	0	13	0	5.12	0.00
1 51J	2.2	5.16	2.2	5.16	0.174	0	0	0.00000	0.00	0.00	0	13	7	5.14	0.02
1 52J	0.0	0.00	2.2	5.16	0.174	0	0	0.00000	0.00	0.00	0	13	0	5.14	0.00
1 53K	0.5	0.14	0.5	0.14	0.026	0	0	0.00000	0.00	0.00	0	3	30	5.14	0.02
1 54K	2.8	1.26	3.3	1.40	0.178	0	0	0.00000	0.00	0.00	0	3	19	5.13	0.02
1 55K	0.0	0.00	3.3	1.40	0.178	0	0	0.00000	0.00	0.00	0	3	0	5.13	0.00
1 56L	9.4	22.04	9.4	22.04	0.742	0	0	0.00000	0.00	0.00	0	13	7	5.14	0.02
1 57L	0.0	0.00	9.4	22.04	0.742	0	680	0.00153	0.00	0.00	0	13	0	5.14	0.00
1 58M	2.7	6.35	2.7	6.35	0.214	0	0	0.00000	0.00	0.00	0	13	7	5.15	0.02
1 59M	0.0	0.00	2.7	6.35	0.214	0	0	0.00000	0.00	0.00	0	13	0	5.15	0.00
1 60N	1.2	2.42	1.2	2.42	0.094	0	0	0.00000	0.00	0.00	0	13	9	5.13	0.02
1 61N	0.0	0.00	1.2	2.42	0.094	0	0	0.00000	0.00	0.00	0	13	0	5.13	0.00

Normal End of MODRAT

Appendix F

MODRAT Analysis Existing Conditions 50-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 14:53:32 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	7.3	11.69	7.3	11.69	0.712	0	0	0.00000	0.00	0.00	0	13	17	5.84	0.03
1	2A	0.0	0.00	7.3	11.69	0.712	0	357	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	3A	5.5	10.98	12.8	22.67	3.014	0	0	0.00000	0.00	0.00	0	13	13	5.84	0.96
1	4B	3.0	7.53	3.0	7.53	0.295	0	0	0.00000	0.00	0.00	0	13	8	5.84	0.03
1	5B	0.0	0.00	3.0	7.53	0.295	0	492	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	6C	0.7	2.20	0.7	2.20	0.066	0	0	0.00000	0.00	0.00	0	13	5	5.84	0.02
1	7C	0.0	0.00	0.7	2.20	0.066	0	576	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	8AB	3.0	0.00	15.8	30.08	3.309	0	0	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	9AC	0.7	0.00	16.5	32.22	3.375	0	766	0.00942	0.00	0.00	0	13	0	5.84	0.00
1	10A	5.8	3.72	22.3	35.90	3.748	0	0	0.00000	0.00	0.00	0	3	17	5.84	0.02
1	11A	0.0	0.00	22.3	35.90	3.748	0	71	0.01085	0.00	0.00	0	3	0	5.84	0.00
1	12A	0.1	0.18	22.4	36.07	3.755	0	0	0.00000	0.00	0.00	0	3	5	5.86	0.02
1	13A	0.0	0.00	22.4	36.07	3.755	0	820	0.00245	0.00	0.00	0	3	0	5.86	0.00
1	14A	1.0	2.04	23.4	38.11	3.982	0	0	0.00000	0.00	0.00	0	13	12	5.86	0.40
1	15A	7.4	14.74	30.8	52.83	6.832	0	0	0.00000	0.00	0.00	0	13	13	5.86	0.86
1	16D	4.5	9.51	4.5	9.51	0.427	0	0	0.00000	0.00	0.00	0	13	11	5.84	0.02
1	17D	0.0	0.00	4.5	9.51	0.427	0	776	0.00244	0.00	0.00	0	13	0	5.84	0.00
1	18AD	4.5	0.00	35.3	62.34	7.259	0	65	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	19A	0.6	1.61	35.9	63.94	7.316	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.02
1	20A	6.6	14.04	42.5	77.99	7.947	0	0	0.00000	0.00	0.00	0	13	11	5.87	0.02
1	21AG	0.0	0.00	42.5	77.99	7.947	0	0	0.00000	0.00	0.00	0	13	0	5.87	0.00
1	22E	4.8	12.08	4.8	12.08	0.457	0	0	0.00000	0.00	0.00	0	13	8	5.85	0.02
1	23E	0.0	0.00	4.8	12.08	0.457	0	505	0.01072	0.00	0.00	0	13	0	5.85	0.00
1	24E	2.5	6.29	7.3	18.37	0.695	0	0	0.00000	0.00	0.00	0	13	8	5.85	0.02
1	25E	0.0	0.00	7.3	18.37	0.695	0	417	0.01457	0.00	0.00	0	13	0	5.85	0.00
1	26E	2.3	6.65	9.6	24.95	0.913	0	0	0.00000	0.00	0.00	0	13	6	5.87	0.02
1	27E	0.0	0.00	9.6	24.95	0.913	0	236	0.00289	0.00	0.00	0	13	0	5.87	0.00
1	28E	2.2	5.26	11.8	30.20	1.124	0	0	0.00000	0.00	0.00	0	13	9	5.87	0.02
1	29E	0.4	0.57	12.2	30.76	1.161	0	0	0.00000	0.00	0.00	0	13	20	5.87	0.02
1	30E	2.9	7.78	15.1	38.53	1.438	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.02
1	31F	7.3	16.45	7.3	16.45	0.696	0	0	0.00000	0.00	0.00	0	13	10	5.86	0.02
1	32F	0.0	0.00	7.3	16.45	0.696	0	307	0.01047	0.00	0.00	0	13	0	5.86	0.00
1	33EF	7.3	0.00	22.4	54.97	2.134	0	128	0.00243	0.00	0.00	0	13	0	5.86	0.00
1	34E	2.3	5.50	24.7	60.47	2.354	0	0	0.00000	0.00	0.00	0	13	9	5.87	0.02
1	35E	0.1	0.32	24.8	60.78	2.363	0	0	0.00000	0.00	0.00	0	13	5	5.87	0.02
1	36E	2.5	4.77	27.3	65.54	2.601	0	0	0.00000	0.00	0.00	0	13	13	5.86	0.02
1	37E	0.0	0.00	27.3	65.54	2.601	0	0	0.00000	0.00	0.00	0	13	0	5.86	0.00
1	39G	7.5	10.38	7.5	10.38	3.104	0	0	0.00000	0.00	0.00	0	13	28	5.86	0.95
1	40G	0.0	0.00	7.5	10.38	3.104	0	398	0.02289	0.00	0.00	0	13	0	5.86	0.00
1	41G	3.2	6.81	10.7	17.07	3.541	0	0	0.00000	0.00	0.00	0	13	11	5.86	0.14
1	42H	0.4	1.25	0.4	1.25	0.038	0	0	0.00000	0.00	0.00	0	13	5	5.84	0.02
1	43H	10.9	20.67	11.3	21.86	1.067	0	0	0.00000	0.00	0.00	0	13	13	5.83	0.02
1	44H	0.0	0.00	11.3	21.86	1.067	0	668	0.01280	0.00	0.00	0	13	0	5.83	0.00
1	45GH	11.3	0.00	22.0	38.88	4.608	0	519	0.00761	0.00	0.00	0	13	0	5.83	0.00
1	46G	2.7	7.24	24.7	46.09	5.653	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.86
1	47G	8.8	17.52	33.5	63.59	9.043	0	0	0.00000	0.00	0.00	0	13	13	5.86	0.86
1	48G	0.0	0.00	33.5	63.59	9.043	0	446	0.00448	0.00	0.00	0	13	0	5.86	0.00
1	49I	3.0	3.41	3.0	3.41	0.277	0	0	0.00000	0.00	0.00	0	13	27	5.84	0.02
1	50I	0.0	0.00	3.0	3.41	0.277	0	0	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	51J	2.2	5.89	2.2	5.89	0.209	0	0	0.00000	0.00	0.00	0	13	7	5.85	0.02
1	52J	0.0	0.00	2.2	5.89	0.209	0	0	0.00000	0.00	0.00	0	13	0	5.85	0.00
1	53K	0.5	0.19	0.5	0.19	0.031	0	0	0.00000	0.00	0.00	0	3	30	5.86	0.02
1	54K	2.8	2.01	3.3	2.19	0.212	0	0	0.00000	0.00	0.00	0	3	15	5.84	0.02
1	55K	0.0	0.00	3.3	2.19	0.212	0	0	0.00000	0.00	0.00	0	3	0	5.84	0.00
1	56L	9.4	27.08	9.4	27.08	0.890	0	0	0.00000	0.00	0.00	0	13	6	5.85	0.02
1	57L	0.0	0.00	9.4	27.08	0.890	0	680	0.00153	0.00	0.00	0	13	0	5.85	0.00
1	58M	2.7	7.24	2.7	7.24	0.257	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.02
1	59M	0.0	0.00	2.7	7.24	0.257	0	0	0.00000	0.00	0.00	0	13	0	5.87	0.00
1	60N	1.2	3.01	1.2	3.01	0.114	0	0	0.00000	0.00	0.00	0	13	8	5.84	0.02
1	61N	0.0	0.00	1.2	3.01	0.114	0	0	0.00000	0.00	0.00	0	13	0	5.84	0.00

Normal End of MODRAT

Appendix G

MODRAT Analysis Existing Conditions 100-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 14:32:17 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 1

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	14.82	7.3	14.82	0.848	0	0	0.00000	0.00	0.00	0	13	15	6.55	0.03
1 2A	0.0	0.00	7.3	14.82	0.848	0	357	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 3A	5.5	12.81	12.8	27.62	3.434	0	0	0.00000	0.00	0.00	0	13	12	6.55	0.96
1 4B	3.0	8.99	3.0	8.99	0.347	0	0	0.00000	0.00	0.00	0	13	7	6.55	0.03
1 5B	0.0	0.00	3.0	8.99	0.347	0	492	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 6C	0.7	2.46	0.7	2.46	0.078	0	0	0.00000	0.00	0.00	0	13	5	6.55	0.02
1 7C	0.0	0.00	0.7	2.46	0.078	0	576	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 8AB	3.0	0.00	15.8	36.52	3.781	0	0	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 9AC	0.7	0.00	16.5	38.92	3.858	0	766	0.00942	0.00	0.00	0	13	0	6.55	0.00
1 10A	5.8	5.52	22.3	44.41	4.294	0	0	0.00000	0.00	0.00	0	3	14	6.56	0.02
1 11A	0.0	0.00	22.3	44.41	4.294	0	71	0.01085	0.00	0.00	0	3	0	6.56	0.00
1 12A	0.1	0.21	22.4	44.61	4.302	0	0	0.00000	0.00	0.00	0	3	5	6.57	0.02
1 13A	0.0	0.00	22.4	44.61	4.302	0	820	0.00245	0.00	0.00	0	3	0	6.57	0.00
1 14A	1.0	2.44	23.4	47.05	4.561	0	0	0.00000	0.00	0.00	0	13	11	6.58	0.40
1 15A	7.4	17.28	30.8	64.34	7.767	0	0	0.00000	0.00	0.00	0	13	12	6.57	0.86
1 16D	4.5	11.43	4.5	11.43	0.506	0	0	0.00000	0.00	0.00	0	13	10	6.55	0.02
1 17D	0.0	0.00	4.5	11.43	0.506	0	776	0.00244	0.00	0.00	0	13	0	6.55	0.00
1 18AD	4.5	0.00	35.3	75.77	8.273	0	65	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 19A	0.6	1.95	35.9	77.69	8.341	0	0	0.00000	0.00	0.00	0	13	6	6.59	0.02
1 20A	6.6	16.85	42.5	94.55	9.088	0	0	0.00000	0.00	0.00	0	13	10	6.59	0.02
1 21AG	0.0	0.00	42.5	94.55	9.088	0	0	0.00000	0.00	0.00	0	13	0	6.59	0.00
1 22E	4.8	14.41	4.8	14.41	0.538	0	0	0.00000	0.00	0.00	0	13	7	6.57	0.02
1 23E	0.0	0.00	4.8	14.41	0.538	0	505	0.01072	0.00	0.00	0	13	0	6.57	0.00
1 24E	2.5	7.51	7.3	21.92	0.818	0	0	0.00000	0.00	0.00	0	13	7	6.57	0.02
1 25E	0.0	0.00	7.3	21.92	0.818	0	417	0.01457	0.00	0.00	0	13	0	6.57	0.00
1 26E	2.3	8.13	9.6	30.05	1.076	0	0	0.00000	0.00	0.00	0	13	5	6.59	0.02
1 27E	0.0	0.00	9.6	30.05	1.076	0	236	0.00289	0.00	0.00	0	13	0	6.59	0.00
1 28E	2.2	6.23	11.8	36.26	1.324	0	0	0.00000	0.00	0.00	0	13	8	6.59	0.02
1 29E	0.4	0.73	12.2	36.96	1.369	0	0	0.00000	0.00	0.00	0	13	18	6.59	0.02
1 30E	2.9	8.73	15.1	45.69	1.696	0	0	0.00000	0.00	0.00	0	13	7	6.59	0.02
1 31F	7.3	19.54	7.3	19.54	0.823	0	0	0.00000	0.00	0.00	0	13	9	6.57	0.02
1 32F	0.0	0.00	7.3	19.54	0.823	0	307	0.01047	0.00	0.00	0	13	0	6.57	0.00
1 33EF	7.3	0.00	22.4	65.09	2.519	0	128	0.00243	0.00	0.00	0	13	0	6.57	0.00
1 34E	2.3	6.17	24.7	71.21	2.779	0	0	0.00000	0.00	0.00	0	13	9	6.59	0.02
1 35E	0.1	0.35	24.8	71.57	2.790	0	0	0.00000	0.00	0.00	0	13	5	6.59	0.02
1 36E	2.5	6.09	27.3	77.62	3.073	0	0	0.00000	0.00	0.00	0	13	11	6.57	0.02
1 37E	0.0	0.00	27.3	77.62	3.073	0	0	0.00000	0.00	0.00	0	13	0	6.57	0.00
1 39G	7.5	12.11	7.5	12.11	3.488	0	0	0.00000	0.00	0.00	0	13	26	6.57	0.95
1 40G	0.0	0.00	7.5	12.11	3.488	0	398	0.02289	0.00	0.00	0	13	0	6.57	0.00
1 41G	3.2	8.15	10.7	20.12	3.996	0	0	0.00000	0.00	0.00	0	13	10	6.57	0.14
1 42H	0.4	1.41	0.4	1.41	0.044	0	0	0.00000	0.00	0.00	0	13	5	6.55	0.02
1 43H	10.9	25.27	11.3	26.64	1.268	0	0	0.00000	0.00	0.00	0	13	12	6.54	0.02
1 44H	0.0	0.00	11.3	26.64	1.268	0	668	0.01280	0.00	0.00	0	13	0	6.54	0.00
1 45GH	11.3	0.00	22.0	46.70	5.265	0	519	0.00761	0.00	0.00	0	13	0	6.54	0.00
1 46G	2.7	8.13	24.7	54.81	6.439	0	0	0.00000	0.00	0.00	0	13	7	6.59	0.86
1 47G	8.8	20.55	33.5	75.37	10.253	0	0	0.00000	0.00	0.00	0	13	12	6.57	0.86
1 48G	0.0	0.00	33.5	75.37	10.253	0	446	0.00448	0.00	0.00	0	13	0	6.57	0.00
1 49I	3.0	4.60	3.0	4.60	0.333	0	0	0.00000	0.00	0.00	0	13	23	6.55	0.02
1 50I	0.0	0.00	3.0	4.60	0.333	0	0	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 51J	2.2	7.12	2.2	7.12	0.246	0	0	0.00000	0.00	0.00	0	13	6	6.57	0.02
1 52J	0.0	0.00	2.2	7.12	0.246	0	0	0.00000	0.00	0.00	0	13	0	6.57	0.00
1 53K	0.5	0.25	0.5	0.25	0.036	0	0	0.00000	0.00	0.00	0	3	29	6.57	0.02
1 54K	2.8	3.02	3.3	3.26	0.248	0	0	0.00000	0.00	0.00	0	3	12	6.55	0.02
1 55K	0.0	0.00	3.3	3.26	0.248	0	0	0.00000	0.00	0.00	0	3	0	6.55	0.00
1 56L	9.4	30.39	9.4	30.39	1.050	0	0	0.00000	0.00	0.00	0	13	6	6.57	0.02
1 57L	0.0	0.00	9.4	30.39	1.050	0	680	0.00153	0.00	0.00	0	13	0	6.57	0.00
1 58M	2.7	8.76	2.7	8.76	0.303	0	0	0.00000	0.00	0.00	0	13	6	6.59	0.02
1 59M	0.0	0.00	2.7	8.76	0.303	0	0	0.00000	0.00	0.00	0	13	0	6.59	0.00
1 60N	1.2	3.38	1.2	3.38	0.134	0	0	0.00000	0.00	0.00	0	13	8	6.55	0.02
1 61N	0.0	0.00	1.2	3.38	0.134	0	0	0.00000	0.00	0.00	0	13	0	6.55	0.00

Normal End of MODRAT

County of Los Angeles
Department of Parks
and Recreation
433 South Vermont Avenue
Los Angeles, California 90020

Earvin Magic Johnson Park

Existing Conditions Hydrology Evaluation Report

DRAFT

July 30, 2014

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Earvin Magic Johnson Park
Existing Conditions Hydrology Evaluation Report

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July 30, 2014

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1. Project Background

The Earvin "Magic" Johnson Park is located in the City of Los Angeles and is owned and operated by the County of Los Angeles Department of Parks and Recreation (DPR). The 104-acre recreation area, named after basketball Hall of Famer, Earvin "Magic" Johnson, is used for outdoor activities such as family or corporate gatherings, festivals, and large sports activities. The focal points of the park are the beautiful fishing lakes, picnic areas with barbecue grills, open green space, a children's play area, and a popular walking path.

The park and a housing complex known as Ujima Village were built over the Athens Tank Farm area, previously owned by ExxonMobile. When the old Athens Tank Farm was removed in the 1960s, contaminants were left in the soil and were a source of concern for many years. Local, state and federal agencies have been gathering and analyzing data to determine whether the contamination posed a health risk. Soil, soil gas, groundwater, and air samples ordered by the Los Angeles Regional Water Quality Control Board have all indicated that the present levels of chemicals in the soil are not dangerous to human health. In addition, several homes east of the park have been tested for soil vapor samples, outdoor air samples and air samples taken from crawl spaces beneath for methane, benzene and other volatile organic compounds and were found to not pose a risk to health (Ridley-Thomas, 2013).

A cleanup has begun at the former Ujima Village site and Magic Johnson Park. The cleanup will use soil vapor extraction to remove volatile organic compounds from the ground, as well as the excavation of small areas of the property (Ridley-Thomas, 2013). Plans to re-imagine strategic uses for the existing 104 acre park, as well as the 16 acres that previously comprised Ujima Village are underway.

As part of the re-imagining, plans for alternative must be evaluated for environmental impacts, including impacts to drainage and water quality. This study provides information on the existing hydrologic conditions within the park area and Ujima Village.

2. Hydrology

The area surrounding Earvin "Magic" Johnson Park is highly urbanized within the City of Los Angeles. The park is located on the coastal plain within Dominguez Channel Watershed, which drains to the ocean near the Port of Los Angeles. The region has a mean annual rainfall of 12.11 inches. The general topography around the park slopes from northwest to southeast. Water all around the park is captured in storm drains owned and operated by the City of Los Angeles and the County of Los Angeles. **Figure 2-1** shows the adjacent facilities and subareas of the project area. The yellow lines represent subarea boundaries, and the orange lines indicate parcel boundaries. The yellow circle and blue lines represent catch basins and storm drains near the project site.

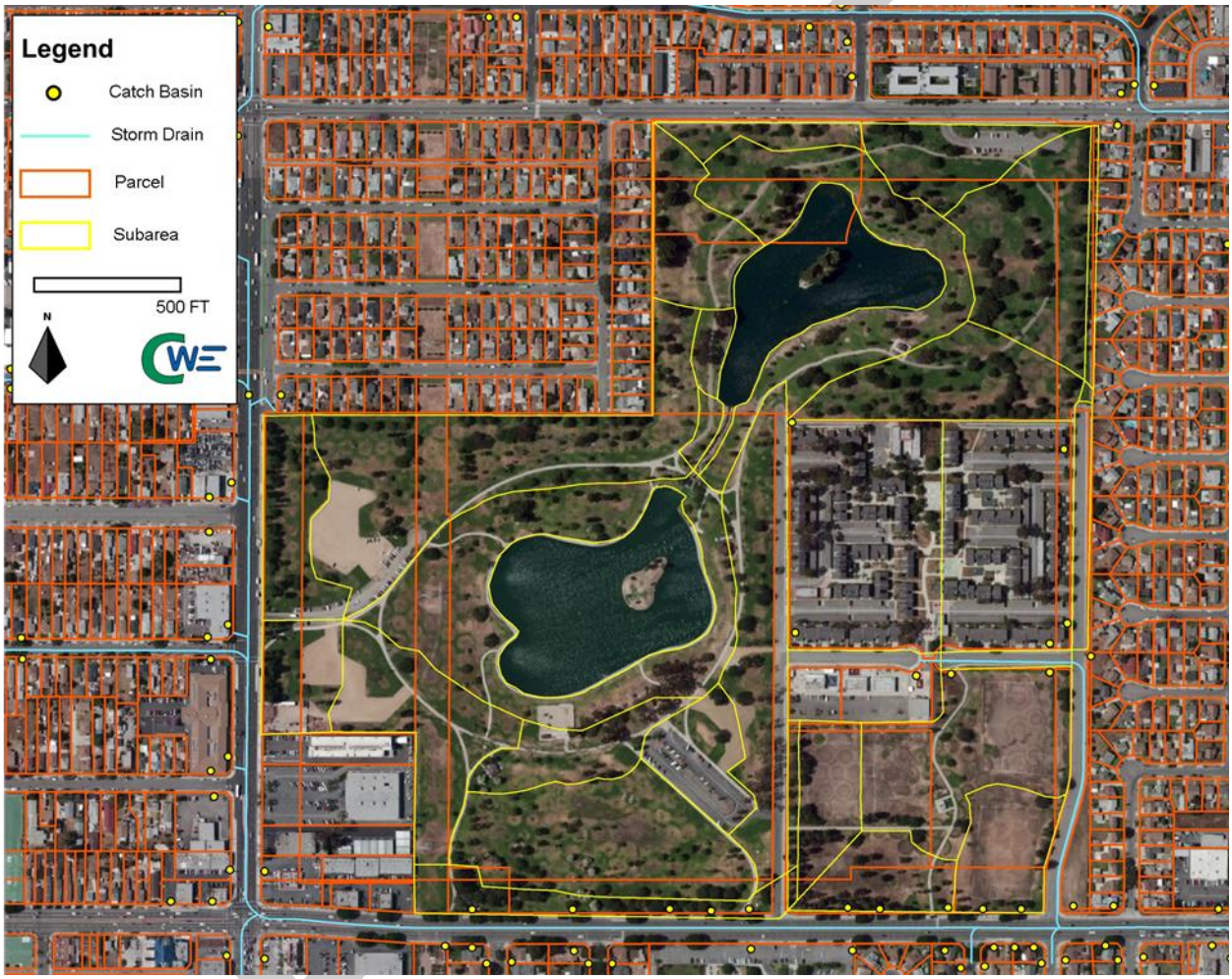

Figure 2-1 Map of Earvin Magic Johnson Park Project Area and Subareas

2.1 Rainfall Event Data

Hydrologic studies within both the City of Los Angeles and the County of Los Angeles are required to use the modified rational method (MODRAT) developed by the Los Angeles County Flood Control District. In urban areas, the design rainfall is the 25-year rainfall event, except where there is a sump which is required to meet higher drainage requirements. Drains that remove water from sumps must carry runoff from the 50-year rainfall event. All other drains must carry at least the 10-year, with streets carrying the remainder of flow. If flow depths exceed the property line or street capacity, the drain size must be

increased until the requirements are met. For water quality considerations, either the 0.75-inch or 85th percentile rainfall depth must be treated. In order to provide the data required to analyze all possible situations, the rainfall events and depths in **Table 2-1** were used for hydrologic calculations. All volume calculations use the 24-hour unit hyetograph with the design rainfall depth to generate runoff hydrographs.

Table 2-1 Rainfall in Project Watershed

Recurrence Interval	24-hr Rainfall (inches)
0.75-inch	0.75
85th Percentile	0.91
10-yr	4.18
25-yr	5.14
50-yr	5.86
100-yr	6.57

2.2 Watershed Subareas Hydrologic Characteristics and Times of Concentration

The characteristics of watershed subareas influence time of concentration (Tc) and flow rates. The most important factors include the subarea size, land use as a percentage of impervious area, the type of soil, and the flow path length and slope. The subareas in the existing condition are mainly open space, therefore the percentage imperviousness is low in most subareas. Areas of Ujima Village, the parking lots, and roads and sidewalks increase imperviousness in some of the subareas. There are two major soil types found within the park based on the County of Los Angeles soil classifications for hydrology studies. **Figure 2-2** provides a map of the park showing the watershed subareas, the land uses, and soil types for the park subwatersheds.

(a)

(b)

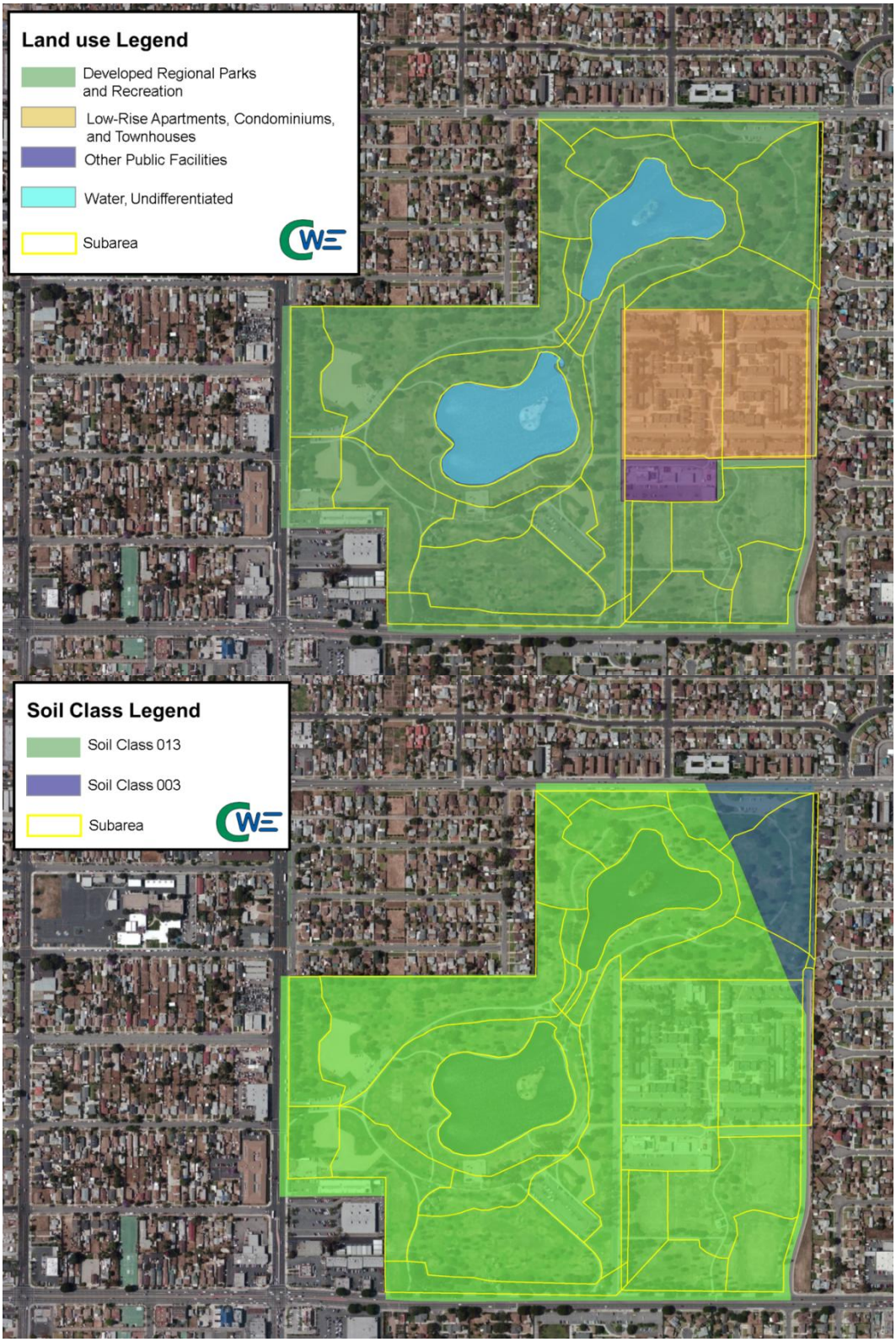

Figure 2-2 Map of Land Use and Soil Class Types

The longest flow path for each subarea was determined and the length and slope were developed based on the LAR-IAC topographic data in the Watershed Modeling System (WMS). **Figure 2-3** shows the subareas and the Tc flow path. **Table 2-2** summarizes the hydrologic characteristics of the subareas used for the hydrologic study, along with the Tc. Intensity is not shown in the table since it varies with the rainfall event recurrence interval.

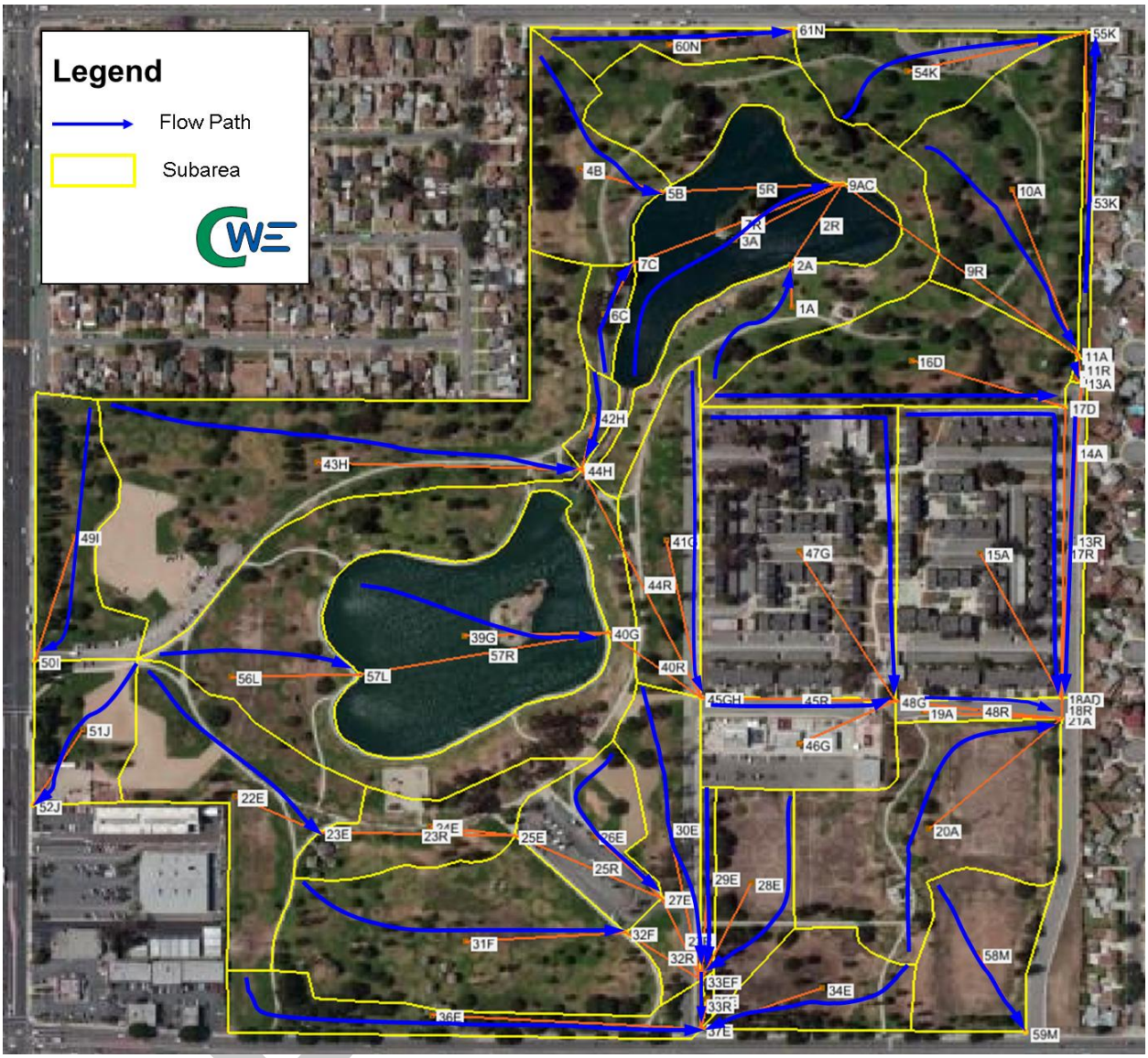

Figure 2-3 Map of Subareas and Tc Flow Paths

Table 2-2 Hydrologic Characteristics of Watershed Subareas							
Subarea	Area (ac)	Land Use % Imp.	Soil #	Flow Path Length (ft)	Flow Path Slope (ft/ft)	Cu/Cd	Tc (min)
1 A	7.28	3	013	401	0.0001	0.82	17
3 A	5.47	96	013	1,007	0.0040	0.90	13
4 B	2.96	3	013	549	0.0082	0.90	8
6 C	0.67	2	013	282	0.0073	0.90	5
10 A	5.79	2	003	705	0.0111	0.33	17
12 A	0.05	2	003	65	0.0130	0.51	5
14 A	1.01	40	013	790	0.0025	0.88	12
15 A	7.45	86	013	1,087	0.0047	0.89	13
16 D	4.49	2	013	898	0.0089	0.88	11
19 A	0.55	2	013	409	0.0049	0.90	7
20 A	6.64	2	013	942	0.0081	0.88	11
22 E	4.85	2	013	594	0.0099	0.90	8
24 E	2.52	2	013	589	0.0116	0.90	8
26 E	2.31	2	013	437	0.0195	0.87	6
28 E	2.23	2	013	589	0.0052	0.90	9
29 E	0.37	2	013	472	0.0000	0.78	20
30 E	2.88	2	013	589	0.0158	0.90	7
31 F	7.3	2	013	852	0.0119	0.89	10
34 E	2.32	2	013	537	0.0025	0.90	9
35 E	0.08	2	013	132	0.0025	0.90	5
36 E	2.49	2	013	1,249	0.0106	0.86	13
39 G	7.49	95	013	663	0.0000	0.89	28
41 G	3.22	14	013	812	0.0055	0.88	11
42 H	0.38	2	013	253	0.0088	0.90	5
43 H	10.85	2	013	1216	0.0085	0.85	13
46 G	2.68	86	013	458	0.0066	0.90	7
47 G	8.79	86	013	1,174	0.0068	0.89	13
49 I	3.04	2	013	637	0.0000	0.72	27
51 J	2.15	2	013	412	0.0073	0.90	7
53 K	0.53	2	003	842	0.0011	0.25	30
54 K	2.76	2	003	673	0.0178	0.35	15
56 L	9.35	2	013	493	0.0198	0.90	6
58 M	2.7	2	013	428	0.0080	0.90	7
60 N	1.21	2	013	612	0.0090	0.90	8

2.3 Subarea Flow Rates for Design Rainfall Events

Subarea flows are dependent on the rainfall event and the subarea characteristics. **Table 2-3** shows the runoff peak flow rates for each subwatershed within the park for the various design flow rates. Each flow rate is provided in cubic feet per second (cfs).

Table 2-3 Subarea Flow Rates for Rainfall Events (cfs)

Subarea	0.75-inch	85th Percentile	10-year	25-year	50-year	100-year
1 A	0.17	0.21	3.98	8.17	11.69	14.82
3 A	0.92	1.12	7.06	9.29	10.98	12.81
4 B	0.07	0.09	3.90	6.04	7.53	8.99
6 C	0.02	0.02	1.25	1.77	2.20	2.46
10 A	0.13	0.16	1.01	2.26	3.72	5.52
12 A	0.00	0.00	0.10	0.14	0.18	0.21
14 A	0.08	0.10	1.06	1.59	2.04	2.44
15 A	1.12	1.36	8.99	11.97	14.74	17.28
16 D	0.10	0.12	4.37	7.56	9.51	11.43
19 A	0.01	0.02	0.84	1.31	1.61	1.95
20 A	0.15	0.18	6.12	10.57	14.04	16.85
22 E	0.11	0.13	6.26	9.69	12.08	14.41
24 E	0.06	0.07	3.26	5.43	6.29	7.51
26 E	0.05	0.06	3.81	5.83	6.65	8.13
28 E	0.05	0.06	2.55	4.17	5.26	6.23
29 E	0.01	0.01	0.22	0.41	0.57	0.73
30 E	0.06	0.08	4.08	6.32	7.78	8.73
31 F	0.16	0.20	7.99	13.01	16.45	19.54
34 E	0.05	0.06	2.53	4.11	5.50	6.17
35 E	0.00	0.00	0.22	0.28	0.32	0.35
36 E	0.06	0.07	1.99	3.59	4.77	6.09
39 G	1.24	1.51	7.10	8.78	10.38	12.11
41 G	0.13	0.16	3.25	5.45	6.81	8.15
42 H	0.01	0.01	0.79	1.10	1.25	1.41
43 H	0.24	0.30	8.20	15.53	20.67	25.27
46 G	0.41	0.51	4.54	5.97	7.24	8.13
47 G	1.34	1.62	10.69	14.73	17.52	20.55
49 I	0.07	0.08	1.62	2.44	3.41	4.60
51 J	0.05	0.06	3.33	5.16	5.89	7.12
53 K	0.01	0.01	0.09	0.14	0.19	0.25
54 K	0.06	0.08	0.49	1.26	2.01	3.02
56 L	0.21	0.26	15.48	22.04	27.08	30.39
58 M	0.06	0.07	4.10	6.35	7.24	8.76
60 N	0.03	0.03	1.46	2.42	3.01	3.38

The design of stormwater BMPs and capture facilities requires understanding both peak and volumes of flows resulting from rainfall events. **Table 2-4** provides a summary of the runoff volume generated in each subarea.

Table 2-4 Subarea Runoff Volumes for Rainfall Events (ac-ft)

Subarea	0.75-inch	85th Percentile	10-year	25-year	50-year	100-year
1 A	0.055	0.067	0.414	0.582	0.712	0.848
3 A	0.348	0.422	2.054	2.601	3.014	3.434
4 B	0.023	0.028	0.182	0.245	0.295	0.347
6 C	0.005	0.006	0.041	0.055	0.066	0.078
10 A	0.417	0.506	2.514	3.213	3.748	4.294
12 A	0.418	0.507	2.519	3.218	3.755	4.302
14 A	0.444	0.538	2.674	3.414	3.982	4.561
15 A	0.801	0.972	4.696	5.909	6.832	7.767
16 D	0.032	0.039	0.257	0.352	0.427	0.506
19 A	0.837	1.016	4.988	6.308	7.316	8.341
20 A	0.884	1.073	5.366	6.827	7.947	9.088
22 E	0.034	0.041	0.28	0.378	0.457	0.538
24 E	0.052	0.063	0.426	0.576	0.695	0.818
26 E	0.068	0.083	0.562	0.758	0.913	1.076
28 E	0.084	0.102	0.69	0.931	1.124	1.324
29 E	0.087	0.105	0.712	0.962	1.161	1.369
30 E	0.107	0.13	0.883	1.192	1.438	1.696
31 F	0.052	0.063	0.423	0.575	0.696	0.823
34 E	0.176	0.213	1.439	1.948	2.354	2.779
35 E	0.176	0.214	1.445	1.956	2.363	2.79
36 E	0.194	0.236	1.586	2.151	2.601	3.073
39 G	0.395	0.48	2.211	2.72	3.104	3.488
41 G	0.437	0.53	2.493	3.09	3.541	3.996
42 H	0.003	0.003	0.024	0.031	0.038	0.044
43 H	0.08	0.097	0.631	0.876	1.067	1.268
46 G	0.648	0.786	3.866	4.88	5.653	6.439
47 G	1.073	1.302	6.271	7.849	9.043	10.253
49 I	0.021	0.026	0.162	0.223	0.277	0.333
51 J	0.016	0.019	0.129	0.174	0.209	0.246
53 K	0.004	0.004	0.02	0.026	0.031	0.036
54 K	0.023	0.028	0.134	0.178	0.212	0.248
56 L	0.067	0.081	0.553	0.742	0.89	1.05
58 M	0.019	0.023	0.159	0.214	0.257	0.303
60 N	0.009	0.01	0.07	0.094	0.114	0.134

Flow rates from each subarea combine and are routed through the internal storm drains to collection points as shown in **Figure 2-3**. The peak flows are slightly reduced based on channel storage and hydrograph superposition. **Table 2-5** provides flow data at each of the outlets.

Table 2-5 Outlet Flow Rates for Rainfall Events (cfs)

Subarea	0.75-inch	85th Percentile	10-year	25-year	50-year	100-year
2A	0.17	0.21	3.98	8.17	11.69	14.82
5B	0.07	0.09	3.9	6.04	7.53	8.99
7C	0.02	0.02	1.25	1.77	2.2	2.46
8AB	1.17	1.42	14.85	23.37	30.08	36.52
9AC	1.18	1.43	16.05	25.09	32.22	38.92
11A	1.31	1.59	17.04	27.29	35.9	44.41
13A	1.31	1.59	17.12	27.42	36.07	44.61
17D	0.1	0.12	4.37	7.56	9.51	11.43
18AD	2.62	3.18	31.54	48.52	62.34	75.77
21A	2.78	3.37	38.49	60.37	77.99	94.55
23E	0.11	0.13	6.26	9.69	12.08	14.41
25E	0.16	0.2	9.52	15.12	18.37	21.92
27E	0.21	0.26	13.32	20.9	24.95	30.05
32F	0.16	0.2	7.99	13.01	16.45	19.54
33EF	0.5	0.61	28.11	44.8	54.97	65.09
37E	0.61	0.74	32.79	52.75	65.54	77.62
40G	1.24	1.51	7.1	8.78	10.38	12.11
44H	0.25	0.31	8.89	16.54	21.86	26.64
45GH	1.63	1.97	19.17	30.67	38.88	46.7
48G	3.37	4.11	34.33	51.26	63.59	75.37
50I	0.07	0.08	1.62	2.44	3.41	4.6
52J	0.05	0.06	3.33	5.16	5.89	7.12
55K	0.07	0.09	0.58	1.4	2.19	3.26
57L	0.21	0.26	15.48	22.04	27.08	30.39
59M	0.06	0.07	4.1	6.35	7.24	8.76
61N	0.03	0.03	1.46	2.42	3.01	3.38

The values found in this report provide information on the volumes and peak flow rates generated within Earvin Magic Johnson Park and Ujima Village. These values can be used for comparison to design alternatives to be proposed for improving these areas.

3. References

Hydrology Manual. Alhambra, CA: Los Angeles County Department of Public Works, Water Resources Division, 2006. Print.

"LAR-IAC." *Project Website*. County of Los Angeles, n.d. Web. 29 Apr. 2014. <http://planning.lacounty.gov/LARIAC/>.

"Ujima Village – Supervisor Mark Ridley Thomas – Environment." *Supervisor Mark Ridley Thomas Environment*. N.p., 06 Aug. 2013. Web. 28 Apr. 2014. <http://ridleythomas.lacounty.gov/Environment/index.php/category/ujima/>

Appendix A
Field Investigation Photos

Figure 1 Aerial Imagery of Earvin Magic Johnson Park and Investigation Sites

Figure 2 Site #1 – Looking East from Site #1. Catch basin in park to collect surface runoff.

Figure 3 Site #2 – Looking north at a drainage ditch that collects flow and directs flow to the road.

Figure 4 Site #3 – Looking northwest towards park wall and catch basin to collect surface flows.

Figure 5 Site #4 – Looking north towards park wall and catch basin to collect surface flows.

Figure 6 Site #5 – Looking east at a grate to collect surface flows from sidewalk and grass.

Figure 7 Site #6 – Looking west towards power lines and at a grate to collect surface flows.

Figure 8 Site #7 – Looking east at parking lot drainage system.

Figure 9 Site #8 – Looking south at a closed restroom facility near Ujima Village.

Figure 10 Site #9 – Looking south towards an abandoned day care center at Ujima Village.

Figure 11 Site #10 – Looking south at a catch basin near Ujima Village Remediation Site.

Figure 12 Site #11 – Looking south towards catch basin on Wadsworth Ave.

Figure 13 Site #12 – Looking south on Clovis Avenue towards El Segundo Boulevard.

Appendix B

MODRAT Analysis
Existing Conditions
0.75-Inch 24-Hour Rainfall

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Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 1

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	0.17	7.3	0.17	0.055	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.03
1 2A	0.0	0.00	7.3	0.17	0.055	0	357	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 3A	5.5	0.92	12.8	1.09	0.348	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.96
1 4B	3.0	0.07	3.0	0.07	0.023	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.03
1 5B	0.0	0.00	3.0	0.07	0.023	0	492	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 6C	0.7	0.02	0.7	0.02	0.005	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 7C	0.0	0.00	0.7	0.02	0.005	0	576	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 8AB	3.0	0.00	15.8	1.17	0.371	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 9AC	0.7	0.00	16.5	1.18	0.376	0	766	0.00942	0.00	0.00	0	13	0	0.75	0.00
1 10A	5.8	0.13	22.3	1.31	0.417	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 11A	0.0	0.00	22.3	1.31	0.417	0	71	0.01085	0.00	0.00	0	3	0	0.75	0.00
1 12A	0.1	0.00	22.4	1.31	0.418	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 13A	0.0	0.00	22.4	1.31	0.418	0	820	0.00245	0.00	0.00	0	3	0	0.75	0.00
1 14A	1.0	0.08	23.4	1.40	0.444	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.40
1 15A	7.4	1.12	30.8	2.52	0.801	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.86
1 16D	4.5	0.10	4.5	0.10	0.032	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 17D	0.0	0.00	4.5	0.10	0.032	0	776	0.00244	0.00	0.00	0	13	0	0.75	0.00
1 18AD	4.5	0.00	35.3	2.62	0.833	0	65	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 19A	0.6	0.01	35.9	2.63	0.837	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 20A	6.6	0.15	42.5	2.78	0.884	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 21AG	0.0	0.00	42.5	2.78	0.884	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 22E	4.8	0.11	4.8	0.11	0.034	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 23E	0.0	0.00	4.8	0.11	0.034	0	505	0.01072	0.00	0.00	0	13	0	0.75	0.00
1 24E	2.5	0.06	7.3	0.16	0.052	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 25E	0.0	0.00	7.3	0.16	0.052	0	417	0.01457	0.00	0.00	0	13	0	0.75	0.00
1 26E	2.3	0.05	9.6	0.21	0.068	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 27E	0.0	0.00	9.6	0.21	0.068	0	236	0.00289	0.00	0.00	0	13	0	0.75	0.00
1 28E	2.2	0.05	11.8	0.26	0.084	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 29E	0.4	0.01	12.2	0.27	0.087	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 30E	2.9	0.06	15.1	0.34	0.107	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 31F	7.3	0.16	7.3	0.16	0.052	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 32F	0.0	0.00	7.3	0.16	0.052	0	307	0.01047	0.00	0.00	0	13	0	0.75	0.00
1 33EF	7.3	0.00	22.4	0.50	0.159	0	128	0.00243	0.00	0.00	0	13	0	0.75	0.00
1 34E	2.3	0.05	24.7	0.55	0.176	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 35E	0.1	0.00	24.8	0.55	0.176	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 36E	2.5	0.06	27.3	0.61	0.194	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 37E	0.0	0.00	27.3	0.61	0.194	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 39G	7.5	1.24	7.5	1.24	0.395	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.95
1 40G	0.0	0.00	7.5	1.24	0.395	0	398	0.02289	0.00	0.00	0	13	0	0.75	0.00
1 41G	3.2	0.13	10.7	1.37	0.437	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.14
1 42H	0.4	0.01	0.4	0.01	0.003	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 43H	10.9	0.24	11.3	0.25	0.080	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 44H	0.0	0.00	11.3	0.25	0.080	0	668	0.01280	0.00	0.00	0	13	0	0.75	0.00
1 45GH	11.3	0.00	22.0	1.63	0.517	0	519	0.00761	0.00	0.00	0	13	0	0.75	0.00
1 46G	2.7	0.41	24.7	2.04	0.648	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.86
1 47G	8.8	1.34	33.5	3.37	1.073	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.86
1 48G	0.0	0.00	33.5	3.37	1.073	0	446	0.00448	0.00	0.00	0	13	0	0.75	0.00
1 49I	3.0	0.07	3.0	0.07	0.021	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 50I	0.0	0.00	3.0	0.07	0.021	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 51J	2.2	0.05	2.2	0.05	0.016	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 52J	0.0	0.00	2.2	0.05	0.016	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 53K	0.5	0.01	0.5	0.01	0.004	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 54K	2.8	0.06	3.3	0.07	0.023	0	0	0.00000	0.00	0.00	0	3	30	0.75	0.02
1 55K	0.0	0.00	3.3	0.07	0.023	0	0	0.00000	0.00	0.00	0	3	0	0.75	0.00
1 56L	9.4	0.21	9.4	0.21	0.067	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 57L	0.0	0.00	9.4	0.21	0.067	0	680	0.00153	0.00	0.00	0	13	0	0.75	0.00
1 58M	2.7	0.06	2.7	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 59M	0.0	0.00	2.7	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00
1 60N	1.2	0.03	1.2	0.03	0.009	0	0	0.00000	0.00	0.00	0	13	30	0.75	0.02
1 61N	0.0	0.00	1.2	0.03	0.009	0	0	0.00000	0.00	0.00	0	13	0	0.75	0.00

Normal End of MODRAT

Appendix C

MODRAT Analysis
Existing Conditions
85th Percentile 24-Hour Rainfall

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Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 1

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	7.3	0.21	7.3	0.21	0.067	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.03
1	2A	0.0	0.00	7.3	0.21	0.067	0	357	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	3A	5.5	1.12	12.8	1.33	0.422	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.96
1	4B	3.0	0.09	3.0	0.09	0.028	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.03
1	5B	0.0	0.00	3.0	0.09	0.028	0	492	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	6C	0.7	0.02	0.7	0.02	0.006	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	7C	0.0	0.00	0.7	0.02	0.006	0	576	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	8AB	3.0	0.00	15.8	1.42	0.450	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	9AC	0.7	0.00	16.5	1.43	0.456	0	766	0.00942	0.00	0.00	0	13	0	0.91	0.00
1	10A	5.8	0.16	22.3	1.59	0.506	0	0	0.00000	0.00	0.00	0	3	30	0.91	0.02
1	11A	0.0	0.00	22.3	1.59	0.506	0	71	0.01085	0.00	0.00	0	3	0	0.91	0.00
1	12A	0.1	0.00	22.4	1.59	0.507	0	0	0.00000	0.00	0.00	0	3	26	0.91	0.02
1	13A	0.0	0.00	22.4	1.59	0.507	0	820	0.00245	0.00	0.00	0	3	0	0.91	0.00
1	14A	1.0	0.10	23.4	1.69	0.538	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.40
1	15A	7.4	1.36	30.8	3.06	0.972	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.86
1	16D	4.5	0.12	4.5	0.12	0.039	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	17D	0.0	0.00	4.5	0.12	0.039	0	776	0.00244	0.00	0.00	0	13	0	0.91	0.00
1	18AD	4.5	0.00	35.3	3.18	1.011	0	65	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	19A	0.6	0.02	35.9	3.20	1.016	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	20A	6.6	0.18	42.5	3.37	1.073	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	21AG	0.0	0.00	42.5	3.37	1.073	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	22E	4.8	0.13	4.8	0.13	0.041	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	23E	0.0	0.00	4.8	0.13	0.041	0	505	0.01072	0.00	0.00	0	13	0	0.91	0.00
1	24E	2.5	0.07	7.3	0.20	0.063	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	25E	0.0	0.00	7.3	0.20	0.063	0	417	0.01457	0.00	0.00	0	13	0	0.91	0.00
1	26E	2.3	0.06	9.6	0.26	0.083	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	27E	0.0	0.00	9.6	0.26	0.083	0	236	0.00289	0.00	0.00	0	13	0	0.91	0.00
1	28E	2.2	0.06	11.8	0.32	0.102	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	29E	0.4	0.01	12.2	0.33	0.105	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	30E	2.9	0.08	15.1	0.41	0.130	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	31F	7.3	0.20	7.3	0.20	0.063	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	32F	0.0	0.00	7.3	0.20	0.063	0	307	0.01047	0.00	0.00	0	13	0	0.91	0.00
1	33EF	7.3	0.00	22.4	0.61	0.193	0	128	0.00243	0.00	0.00	0	13	0	0.91	0.00
1	34E	2.3	0.06	24.7	0.67	0.213	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	35E	0.1	0.00	24.8	0.67	0.214	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	36E	2.5	0.07	27.3	0.74	0.236	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	37E	0.0	0.00	27.3	0.74	0.236	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	39G	7.5	1.51	7.5	1.51	0.480	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.95
1	40G	0.0	0.00	7.5	1.51	0.480	0	398	0.02289	0.00	0.00	0	13	0	0.91	0.00
1	41G	3.2	0.16	10.7	1.67	0.530	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.14
1	42H	0.4	0.01	0.4	0.01	0.003	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	43H	10.9	0.30	11.3	0.31	0.097	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	44H	0.0	0.00	11.3	0.31	0.097	0	668	0.01280	0.00	0.00	0	13	0	0.91	0.00
1	45GH	11.3	0.00	22.0	1.97	0.628	0	519	0.00761	0.00	0.00	0	13	0	0.91	0.00
1	46G	2.7	0.51	24.7	2.49	0.786	0	0	0.00000	0.00	0.00	0	13	28	0.91	0.86
1	47G	8.8	1.62	33.5	4.11	1.302	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.86
1	48G	0.0	0.00	33.5	4.11	1.302	0	446	0.00448	0.00	0.00	0	13	0	0.91	0.00
1	49I	3.0	0.08	3.0	0.08	0.026	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	50I	0.0	0.00	3.0	0.08	0.026	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	51J	2.2	0.06	2.2	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	52J	0.0	0.00	2.2	0.06	0.019	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	53K	0.5	0.01	0.5	0.01	0.004	0	0	0.00000	0.00	0.00	0	3	30	0.91	0.02
1	54K	2.8	0.08	3.3	0.09	0.028	0	0	0.00000	0.00	0.00	0	3	30	0.91	0.02
1	55K	0.0	0.00	3.3	0.09	0.028	0	0	0.00000	0.00	0.00	0	3	0	0.91	0.00
1	56L	9.4	0.26	9.4	0.26	0.081	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	57L	0.0	0.00	9.4	0.26	0.081	0	680	0.00153	0.00	0.00	0	13	0	0.91	0.00
1	58M	2.7	0.07	2.7	0.07	0.023	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	59M	0.0	0.00	2.7	0.07	0.023	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00
1	60N	1.2	0.03	1.2	0.03	0.010	0	0	0.00000	0.00	0.00	0	13	30	0.91	0.02
1	61N	0.0	0.00	1.2	0.03	0.010	0	0	0.00000	0.00	0.00	0	13	0	0.91	0.00

Normal End of MODRAT

Appendix D

MODRAT Analysis Existing Conditions 10-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 15:04:47 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 10

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	3.98	7.3	3.98	0.414	0	0	0.00000	0.00	0.00	0	13	30	4.17	0.03
1 2A	0.0	0.00	7.3	3.98	0.414	0	357	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 3A	5.5	7.06	12.8	11.00	2.054	0	0	0.00000	0.00	0.00	0	13	16	4.17	0.96
1 4B	3.0	3.90	3.0	3.90	0.182	0	0	0.00000	0.00	0.00	0	13	11	4.17	0.03
1 5B	0.0	0.00	3.0	3.90	0.182	0	492	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 6C	0.7	1.25	0.7	1.25	0.041	0	0	0.00000	0.00	0.00	0	13	7	4.17	0.02
1 7C	0.0	0.00	0.7	1.25	0.041	0	576	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 8AB	3.0	0.00	15.8	14.85	2.237	0	0	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 9AC	0.7	0.00	16.5	16.05	2.278	0	766	0.00942	0.00	0.00	0	13	0	4.17	0.00
1 10A	5.8	1.01	22.3	17.04	2.514	0	0	0.00000	0.00	0.00	0	3	30	4.17	0.02
1 11A	0.0	0.00	22.3	17.04	2.514	0	71	0.01085	0.00	0.00	0	3	0	4.17	0.00
1 12A	0.1	0.10	22.4	17.12	2.519	0	0	0.00000	0.00	0.00	0	3	5	4.18	0.02
1 13A	0.0	0.00	22.4	17.12	2.519	0	820	0.00245	0.00	0.00	0	3	0	4.18	0.00
1 14A	1.0	1.06	23.4	18.18	2.674	0	0	0.00000	0.00	0.00	0	13	17	4.19	0.40
1 15A	7.4	8.99	30.8	27.17	4.696	0	0	0.00000	0.00	0.00	0	13	17	4.18	0.86
1 16D	4.5	4.37	4.5	4.37	0.257	0	0	0.00000	0.00	0.00	0	13	16	4.17	0.02
1 17D	0.0	0.00	4.5	4.37	0.257	0	776	0.00244	0.00	0.00	0	13	0	4.17	0.00
1 18AD	4.5	0.00	35.3	31.54	4.953	0	65	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 19A	0.6	0.84	35.9	32.38	4.988	0	0	0.00000	0.00	0.00	0	13	10	4.19	0.02
1 20A	6.6	6.12	42.5	38.49	5.366	0	0	0.00000	0.00	0.00	0	13	17	4.19	0.02
1 21AG	0.0	0.00	42.5	38.49	5.366	0	0	0.00000	0.00	0.00	0	13	0	4.19	0.00
1 22E	4.8	6.26	4.8	6.26	0.280	0	0	0.00000	0.00	0.00	0	13	11	4.18	0.02
1 23E	0.0	0.00	4.8	6.26	0.280	0	505	0.01072	0.00	0.00	0	13	0	4.18	0.00
1 24E	2.5	3.26	7.3	9.52	0.426	0	0	0.00000	0.00	0.00	0	13	11	4.18	0.02
1 25E	0.0	0.00	7.3	9.52	0.426	0	417	0.01457	0.00	0.00	0	13	0	4.18	0.00
1 26E	2.3	3.81	9.6	13.32	0.562	0	0	0.00000	0.00	0.00	0	13	8	4.19	0.02
1 27E	0.0	0.00	9.6	13.32	0.562	0	236	0.00289	0.00	0.00	0	13	0	4.19	0.00
1 28E	2.2	2.55	11.8	15.87	0.690	0	0	0.00000	0.00	0.00	0	13	13	4.19	0.02
1 29E	0.4	0.22	12.2	16.08	0.712	0	0	0.00000	0.00	0.00	0	13	30	4.19	0.02
1 30E	2.9	4.08	15.1	20.15	0.883	0	0	0.00000	0.00	0.00	0	13	10	4.19	0.02
1 31F	7.3	7.99	7.3	7.99	0.423	0	0	0.00000	0.00	0.00	0	13	14	4.18	0.02
1 32F	0.0	0.00	7.3	7.99	0.423	0	307	0.01047	0.00	0.00	0	13	0	4.18	0.00
1 33EF	7.3	0.00	22.4	28.11	1.306	0	128	0.00243	0.00	0.00	0	13	0	4.18	0.00
1 34E	2.3	2.53	24.7	30.63	1.439	0	0	0.00000	0.00	0.00	0	13	14	4.19	0.02
1 35E	0.1	0.22	24.8	30.84	1.445	0	0	0.00000	0.00	0.00	0	13	5	4.19	0.02
1 36E	2.5	1.99	27.3	32.79	1.586	0	0	0.00000	0.00	0.00	0	13	20	4.18	0.02
1 37E	0.0	0.00	27.3	32.79	1.586	0	0	0.00000	0.00	0.00	0	13	0	4.18	0.00
1 39G	7.5	7.10	7.5	7.10	2.211	0	0	0.00000	0.00	0.00	0	13	30	4.18	0.95
1 40G	0.0	0.00	7.5	7.10	2.211	0	398	0.02289	0.00	0.00	0	13	0	4.18	0.00
1 41G	3.2	3.25	10.7	10.31	2.493	0	0	0.00000	0.00	0.00	0	13	16	4.18	0.14
1 42H	0.4	0.79	0.4	0.79	0.024	0	0	0.00000	0.00	0.00	0	13	6	4.17	0.02
1 43H	10.9	8.20	11.3	8.89	0.631	0	0	0.00000	0.00	0.00	0	13	21	4.16	0.02
1 44H	0.0	0.00	11.3	8.89	0.631	0	668	0.01280	0.00	0.00	0	13	0	4.16	0.00
1 45GH	11.3	0.00	22.0	19.17	3.124	0	519	0.00761	0.00	0.00	0	13	0	4.16	0.00
1 46G	2.7	4.54	24.7	23.64	3.866	0	0	0.00000	0.00	0.00	0	13	9	4.19	0.86
1 47G	8.8	10.69	33.5	34.33	6.271	0	0	0.00000	0.00	0.00	0	13	17	4.18	0.86
1 48G	0.0	0.00	33.5	34.33	6.271	0	446	0.00448	0.00	0.00	0	13	0	4.18	0.00
1 49I	3.0	1.62	3.0	1.62	0.162	0	0	0.00000	0.00	0.00	0	13	30	4.17	0.02
1 50I	0.0	0.00	3.0	1.62	0.162	0	0	0.00000	0.00	0.00	0	13	0	4.17	0.00
1 51J	2.2	3.33	2.2	3.33	0.129	0	0	0.00000	0.00	0.00	0	13	9	4.18	0.02
1 52J	0.0	0.00	2.2	3.33	0.129	0	0	0.00000	0.00	0.00	0	13	0	4.18	0.00
1 53K	0.5	0.09	0.5	0.09	0.020	0	0	0.00000	0.00	0.00	0	3	30	4.18	0.02
1 54K	2.8	0.49	3.3	0.58	0.134	0	0	0.00000	0.00	0.00	0	3	30	4.17	0.02
1 55K	0.0	0.00	3.3	0.58	0.134	0	0	0.00000	0.00	0.00	0	3	0	4.17	0.00
1 56L	9.4	15.48	9.4	15.48	0.553	0	0	0.00000	0.00	0.00	0	13	8	4.18	0.02
1 57L	0.0	0.00	9.4	15.48	0.553	0	680	0.00153	0.00	0.00	0	13	0	4.18	0.00
1 58M	2.7	4.10	2.7	4.10	0.159	0	0	0.00000	0.00	0.00	0	13	9	4.19	0.02
1 59M	0.0	0.00	2.7	4.10	0.159	0	0	0.00000	0.00	0.00	0	13	0	4.19	0.00
1 60N	1.2	1.46	1.2	1.46	0.070	0	0	0.00000	0.00	0.00	0	13	12	4.17	0.02
1 61N	0.0	0.00	1.2	1.46	0.070	0	0	0.00000	0.00	0.00	0	13	0	4.17	0.00

Normal End of MODRAT

Appendix E

MODRAT Analysis
Existing Conditions
25-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 15:03:21 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 25

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	8.17	7.3	8.17	0.582	0	0	0.00000	0.00	0.00	0	13	21	5.13	0.03
1 2A	0.0	0.00	7.3	8.17	0.582	0	357	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 3A	5.5	9.29	12.8	17.42	2.601	0	0	0.00000	0.00	0.00	0	13	14	5.13	0.96
1 4B	3.0	6.04	3.0	6.04	0.245	0	0	0.00000	0.00	0.00	0	13	9	5.13	0.03
1 5B	0.0	0.00	3.0	6.04	0.245	0	492	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 6C	0.7	1.77	0.7	1.77	0.055	0	0	0.00000	0.00	0.00	0	13	6	5.13	0.02
1 7C	0.0	0.00	0.7	1.77	0.055	0	576	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 8AB	3.0	0.00	15.8	23.37	2.846	0	0	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 9AC	0.7	0.00	16.5	25.09	2.901	0	766	0.00942	0.00	0.00	0	13	0	5.13	0.00
1 10A	5.8	2.26	22.3	27.29	3.213	0	0	0.00000	0.00	0.00	0	3	22	5.13	0.02
1 11A	0.0	0.00	22.3	27.29	3.213	0	71	0.01085	0.00	0.00	0	3	0	5.13	0.00
1 12A	0.1	0.14	22.4	27.42	3.218	0	0	0.00000	0.00	0.00	0	3	5	5.14	0.02
1 13A	0.0	0.00	22.4	27.42	3.218	0	820	0.00245	0.00	0.00	0	3	0	5.14	0.00
1 14A	1.0	1.59	23.4	29.01	3.414	0	0	0.00000	0.00	0.00	0	13	14	5.15	0.40
1 15A	7.4	11.97	30.8	40.97	5.909	0	0	0.00000	0.00	0.00	0	13	15	5.14	0.86
1 16D	4.5	7.56	4.5	7.56	0.352	0	0	0.00000	0.00	0.00	0	13	12	5.13	0.02
1 17D	0.0	0.00	4.5	7.56	0.352	0	776	0.00244	0.00	0.00	0	13	0	5.13	0.00
1 18AD	4.5	0.00	35.3	48.52	6.261	0	65	0.00000	0.00	0.00	0	13	0	5.13	0.00
1 19A	0.6	1.31	35.9	49.80	6.308	0	0	0.00000	0.00	0.00	0	13	8	5.15	0.02
1 20A	6.6	10.57	42.5	60.37	6.827	0	0	0.00000	0.00	0.00	0	13	13	5.15	0.02
1 21AG	0.0	0.00	42.5	60.37	6.827	0	0	0.00000	0.00	0.00	0	13	0	5.15	0.00
1 22E	4.8	9.69	4.8	9.69	0.378	0	0	0.00000	0.00	0.00	0	13	9	5.14	0.02
1 23E	0.0	0.00	4.8	9.69	0.378	0	505	0.01072	0.00	0.00	0	13	0	5.14	0.00
1 24E	2.5	5.43	7.3	15.12	0.576	0	0	0.00000	0.00	0.00	0	13	8	5.14	0.02
1 25E	0.0	0.00	7.3	15.12	0.576	0	417	0.01457	0.00	0.00	0	13	0	5.14	0.00
1 26E	2.3	5.83	9.6	20.90	0.758	0	0	0.00000	0.00	0.00	0	13	6	5.15	0.02
1 27E	0.0	0.00	9.6	20.90	0.758	0	236	0.00289	0.00	0.00	0	13	0	5.15	0.00
1 28E	2.2	4.17	11.8	25.07	0.931	0	0	0.00000	0.00	0.00	0	13	10	5.15	0.02
1 29E	0.4	0.41	12.2	25.47	0.962	0	0	0.00000	0.00	0.00	0	13	24	5.15	0.02
1 30E	2.9	6.32	15.1	31.79	1.192	0	0	0.00000	0.00	0.00	0	13	8	5.15	0.02
1 31F	7.3	13.01	7.3	13.01	0.575	0	0	0.00000	0.00	0.00	0	13	11	5.14	0.02
1 32F	0.0	0.00	7.3	13.01	0.575	0	307	0.01047	0.00	0.00	0	13	0	5.14	0.00
1 33EF	7.3	0.00	22.4	44.80	1.766	0	128	0.00243	0.00	0.00	0	13	0	5.14	0.00
1 34E	2.3	4.11	24.7	48.91	1.948	0	0	0.00000	0.00	0.00	0	13	11	5.15	0.02
1 35E	0.1	0.28	24.8	49.18	1.956	0	0	0.00000	0.00	0.00	0	13	5	5.15	0.02
1 36E	2.5	3.59	27.3	52.75	2.151	0	0	0.00000	0.00	0.00	0	13	15	5.14	0.02
1 37E	0.0	0.00	27.3	52.75	2.151	0	0	0.00000	0.00	0.00	0	13	0	5.14	0.00
1 39G	7.5	8.78	7.5	8.78	2.720	0	0	0.00000	0.00	0.00	0	13	30	5.14	0.95
1 40G	0.0	0.00	7.5	8.78	2.720	0	398	0.02289	0.00	0.00	0	13	0	5.14	0.00
1 41G	3.2	5.45	10.7	14.13	3.090	0	0	0.00000	0.00	0.00	0	13	12	5.14	0.14
1 42H	0.4	1.10	0.4	1.10	0.031	0	0	0.00000	0.00	0.00	0	13	5	5.13	0.02
1 43H	10.9	15.53	11.3	16.54	0.876	0	0	0.00000	0.00	0.00	0	13	15	5.12	0.02
1 44H	0.0	0.00	11.3	16.54	0.876	0	668	0.01280	0.00	0.00	0	13	0	5.12	0.00
1 45GH	11.3	0.00	22.0	30.67	3.965	0	519	0.00761	0.00	0.00	0	13	0	5.12	0.00
1 46G	2.7	5.97	24.7	36.53	4.880	0	0	0.00000	0.00	0.00	0	13	8	5.15	0.86
1 47G	8.8	14.73	33.5	51.26	7.849	0	0	0.00000	0.00	0.00	0	13	14	5.14	0.86
1 48G	0.0	0.00	33.5	51.26	7.849	0	446	0.00448	0.00	0.00	0	13	0	5.14	0.00
1 49I	3.0	2.44	3.0	2.44	0.223	0	0	0.00000	0.00	0.00	0	13	30	5.12	0.02
1 50I	0.0	0.00	3.0	2.44	0.223	0	0	0.00000	0.00	0.00	0	13	0	5.12	0.00
1 51J	2.2	5.16	2.2	5.16	0.174	0	0	0.00000	0.00	0.00	0	13	7	5.14	0.02
1 52J	0.0	0.00	2.2	5.16	0.174	0	0	0.00000	0.00	0.00	0	13	0	5.14	0.00
1 53K	0.5	0.14	0.5	0.14	0.026	0	0	0.00000	0.00	0.00	0	3	30	5.14	0.02
1 54K	2.8	1.26	3.3	1.40	0.178	0	0	0.00000	0.00	0.00	0	3	19	5.13	0.02
1 55K	0.0	0.00	3.3	1.40	0.178	0	0	0.00000	0.00	0.00	0	3	0	5.13	0.00
1 56L	9.4	22.04	9.4	22.04	0.742	0	0	0.00000	0.00	0.00	0	13	7	5.14	0.02
1 57L	0.0	0.00	9.4	22.04	0.742	0	680	0.00153	0.00	0.00	0	13	0	5.14	0.00
1 58M	2.7	6.35	2.7	6.35	0.214	0	0	0.00000	0.00	0.00	0	13	7	5.15	0.02
1 59M	0.0	0.00	2.7	6.35	0.214	0	0	0.00000	0.00	0.00	0	13	0	5.15	0.00
1 60N	1.2	2.42	1.2	2.42	0.094	0	0	0.00000	0.00	0.00	0	13	9	5.13	0.02
1 61N	0.0	0.00	1.2	2.42	0.094	0	0	0.00000	0.00	0.00	0	13	0	5.13	0.00

Normal End of MODRAT

Appendix F

MODRAT Analysis Existing Conditions 50-year Rainfall

File name: Z:\14083\06 Tasks\D2 H&H\Calcs\WMS_new\Output\untitled.lac Run date: Mon Jul 28 14:53:32 2014

Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 50

LOCATION		SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1	1A	7.3	11.69	7.3	11.69	0.712	0	0	0.00000	0.00	0.00	0	13	17	5.84	0.03
1	2A	0.0	0.00	7.3	11.69	0.712	0	357	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	3A	5.5	10.98	12.8	22.67	3.014	0	0	0.00000	0.00	0.00	0	13	13	5.84	0.96
1	4B	3.0	7.53	3.0	7.53	0.295	0	0	0.00000	0.00	0.00	0	13	8	5.84	0.03
1	5B	0.0	0.00	3.0	7.53	0.295	0	492	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	6C	0.7	2.20	0.7	2.20	0.066	0	0	0.00000	0.00	0.00	0	13	5	5.84	0.02
1	7C	0.0	0.00	0.7	2.20	0.066	0	576	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	8AB	3.0	0.00	15.8	30.08	3.309	0	0	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	9AC	0.7	0.00	16.5	32.22	3.375	0	766	0.00942	0.00	0.00	0	13	0	5.84	0.00
1	10A	5.8	3.72	22.3	35.90	3.748	0	0	0.00000	0.00	0.00	0	3	17	5.84	0.02
1	11A	0.0	0.00	22.3	35.90	3.748	0	71	0.01085	0.00	0.00	0	3	0	5.84	0.00
1	12A	0.1	0.18	22.4	36.07	3.755	0	0	0.00000	0.00	0.00	0	3	5	5.86	0.02
1	13A	0.0	0.00	22.4	36.07	3.755	0	820	0.00245	0.00	0.00	0	3	0	5.86	0.00
1	14A	1.0	2.04	23.4	38.11	3.982	0	0	0.00000	0.00	0.00	0	13	12	5.86	0.40
1	15A	7.4	14.74	30.8	52.83	6.832	0	0	0.00000	0.00	0.00	0	13	13	5.86	0.86
1	16D	4.5	9.51	4.5	9.51	0.427	0	0	0.00000	0.00	0.00	0	13	11	5.84	0.02
1	17D	0.0	0.00	4.5	9.51	0.427	0	776	0.00244	0.00	0.00	0	13	0	5.84	0.00
1	18AD	4.5	0.00	35.3	62.34	7.259	0	65	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	19A	0.6	1.61	35.9	63.94	7.316	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.02
1	20A	6.6	14.04	42.5	77.99	7.947	0	0	0.00000	0.00	0.00	0	13	11	5.87	0.02
1	21AG	0.0	0.00	42.5	77.99	7.947	0	0	0.00000	0.00	0.00	0	13	0	5.87	0.00
1	22E	4.8	12.08	4.8	12.08	0.457	0	0	0.00000	0.00	0.00	0	13	8	5.85	0.02
1	23E	0.0	0.00	4.8	12.08	0.457	0	505	0.01072	0.00	0.00	0	13	0	5.85	0.00
1	24E	2.5	6.29	7.3	18.37	0.695	0	0	0.00000	0.00	0.00	0	13	8	5.85	0.02
1	25E	0.0	0.00	7.3	18.37	0.695	0	417	0.01457	0.00	0.00	0	13	0	5.85	0.00
1	26E	2.3	6.65	9.6	24.95	0.913	0	0	0.00000	0.00	0.00	0	13	6	5.87	0.02
1	27E	0.0	0.00	9.6	24.95	0.913	0	236	0.00289	0.00	0.00	0	13	0	5.87	0.00
1	28E	2.2	5.26	11.8	30.20	1.124	0	0	0.00000	0.00	0.00	0	13	9	5.87	0.02
1	29E	0.4	0.57	12.2	30.76	1.161	0	0	0.00000	0.00	0.00	0	13	20	5.87	0.02
1	30E	2.9	7.78	15.1	38.53	1.438	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.02
1	31F	7.3	16.45	7.3	16.45	0.696	0	0	0.00000	0.00	0.00	0	13	10	5.86	0.02
1	32F	0.0	0.00	7.3	16.45	0.696	0	307	0.01047	0.00	0.00	0	13	0	5.86	0.00
1	33EF	7.3	0.00	22.4	54.97	2.134	0	128	0.00243	0.00	0.00	0	13	0	5.86	0.00
1	34E	2.3	5.50	24.7	60.47	2.354	0	0	0.00000	0.00	0.00	0	13	9	5.87	0.02
1	35E	0.1	0.32	24.8	60.78	2.363	0	0	0.00000	0.00	0.00	0	13	5	5.87	0.02
1	36E	2.5	4.77	27.3	65.54	2.601	0	0	0.00000	0.00	0.00	0	13	13	5.86	0.02
1	37E	0.0	0.00	27.3	65.54	2.601	0	0	0.00000	0.00	0.00	0	13	0	5.86	0.00
1	39G	7.5	10.38	7.5	10.38	3.104	0	0	0.00000	0.00	0.00	0	13	28	5.86	0.95
1	40G	0.0	0.00	7.5	10.38	3.104	0	398	0.02289	0.00	0.00	0	13	0	5.86	0.00
1	41G	3.2	6.81	10.7	17.07	3.541	0	0	0.00000	0.00	0.00	0	13	11	5.86	0.14
1	42H	0.4	1.25	0.4	1.25	0.038	0	0	0.00000	0.00	0.00	0	13	5	5.84	0.02
1	43H	10.9	20.67	11.3	21.86	1.067	0	0	0.00000	0.00	0.00	0	13	13	5.83	0.02
1	44H	0.0	0.00	11.3	21.86	1.067	0	668	0.01280	0.00	0.00	0	13	0	5.83	0.00
1	45GH	11.3	0.00	22.0	38.88	4.608	0	519	0.00761	0.00	0.00	0	13	0	5.83	0.00
1	46G	2.7	7.24	24.7	46.09	5.653	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.86
1	47G	8.8	17.52	33.5	63.59	9.043	0	0	0.00000	0.00	0.00	0	13	13	5.86	0.86
1	48G	0.0	0.00	33.5	63.59	9.043	0	446	0.00448	0.00	0.00	0	13	0	5.86	0.00
1	49I	3.0	3.41	3.0	3.41	0.277	0	0	0.00000	0.00	0.00	0	13	27	5.84	0.02
1	50I	0.0	0.00	3.0	3.41	0.277	0	0	0.00000	0.00	0.00	0	13	0	5.84	0.00
1	51J	2.2	5.89	2.2	5.89	0.209	0	0	0.00000	0.00	0.00	0	13	7	5.85	0.02
1	52J	0.0	0.00	2.2	5.89	0.209	0	0	0.00000	0.00	0.00	0	13	0	5.85	0.00
1	53K	0.5	0.19	0.5	0.19	0.031	0	0	0.00000	0.00	0.00	0	3	30	5.86	0.02
1	54K	2.8	2.01	3.3	2.19	0.212	0	0	0.00000	0.00	0.00	0	3	15	5.84	0.02
1	55K	0.0	0.00	3.3	2.19	0.212	0	0	0.00000	0.00	0.00	0	3	0	5.84	0.00
1	56L	9.4	27.08	9.4	27.08	0.890	0	0	0.00000	0.00	0.00	0	13	6	5.85	0.02
1	57L	0.0	0.00	9.4	27.08	0.890	0	680	0.00153	0.00	0.00	0	13	0	5.85	0.00
1	58M	2.7	7.24	2.7	7.24	0.257	0	0	0.00000	0.00	0.00	0	13	7	5.87	0.02
1	59M	0.0	0.00	2.7	7.24	0.257	0	0	0.00000	0.00	0.00	0	13	0	5.87	0.00
1	60N	1.2	3.01	1.2	3.01	0.114	0	0	0.00000	0.00	0.00	0	13	8	5.84	0.02
1	61N	0.0	0.00	1.2	3.01	0.114	0	0	0.00000	0.00	0.00	0	13	0	5.84	0.00

Normal End of MODRAT

Appendix G

MODRAT Analysis Existing Conditions 100-year Rainfall

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Los Angeles County Flood Control District
Modified Rational Method Hydrology

Storm Day 1 Storm Frequency 1

LOCATION	SUBAREA AREA (ACRES)	SUBAREA Q (CFS)	TOTAL AREA (ACRES)	TOTAL Q (CFS)	TOTAL VOLUME (AC-FT)	CONV TYPE	CONV LNGTH (FT)	CONV SLOPE (FT/FT)	CONV SIZE	CONV Z	CONTROL Q (CFS)	SOIL NAME	TC (MIN)	RAIN (IN)	PCT IMPV
1 1A	7.3	14.82	7.3	14.82	0.848	0	0	0.00000	0.00	0.00	0	13	15	6.55	0.03
1 2A	0.0	0.00	7.3	14.82	0.848	0	357	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 3A	5.5	12.81	12.8	27.62	3.434	0	0	0.00000	0.00	0.00	0	13	12	6.55	0.96
1 4B	3.0	8.99	3.0	8.99	0.347	0	0	0.00000	0.00	0.00	0	13	7	6.55	0.03
1 5B	0.0	0.00	3.0	8.99	0.347	0	492	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 6C	0.7	2.46	0.7	2.46	0.078	0	0	0.00000	0.00	0.00	0	13	5	6.55	0.02
1 7C	0.0	0.00	0.7	2.46	0.078	0	576	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 8AB	3.0	0.00	15.8	36.52	3.781	0	0	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 9AC	0.7	0.00	16.5	38.92	3.858	0	766	0.00942	0.00	0.00	0	13	0	6.55	0.00
1 10A	5.8	5.52	22.3	44.41	4.294	0	0	0.00000	0.00	0.00	0	3	14	6.56	0.02
1 11A	0.0	0.00	22.3	44.41	4.294	0	71	0.01085	0.00	0.00	0	3	0	6.56	0.00
1 12A	0.1	0.21	22.4	44.61	4.302	0	0	0.00000	0.00	0.00	0	3	5	6.57	0.02
1 13A	0.0	0.00	22.4	44.61	4.302	0	820	0.00245	0.00	0.00	0	3	0	6.57	0.00
1 14A	1.0	2.44	23.4	47.05	4.561	0	0	0.00000	0.00	0.00	0	13	11	6.58	0.40
1 15A	7.4	17.28	30.8	64.34	7.767	0	0	0.00000	0.00	0.00	0	13	12	6.57	0.86
1 16D	4.5	11.43	4.5	11.43	0.506	0	0	0.00000	0.00	0.00	0	13	10	6.55	0.02
1 17D	0.0	0.00	4.5	11.43	0.506	0	776	0.00244	0.00	0.00	0	13	0	6.55	0.00
1 18AD	4.5	0.00	35.3	75.77	8.273	0	65	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 19A	0.6	1.95	35.9	77.69	8.341	0	0	0.00000	0.00	0.00	0	13	6	6.59	0.02
1 20A	6.6	16.85	42.5	94.55	9.088	0	0	0.00000	0.00	0.00	0	13	10	6.59	0.02
1 21AG	0.0	0.00	42.5	94.55	9.088	0	0	0.00000	0.00	0.00	0	13	0	6.59	0.00
1 22E	4.8	14.41	4.8	14.41	0.538	0	0	0.00000	0.00	0.00	0	13	7	6.57	0.02
1 23E	0.0	0.00	4.8	14.41	0.538	0	505	0.01072	0.00	0.00	0	13	0	6.57	0.00
1 24E	2.5	7.51	7.3	21.92	0.818	0	0	0.00000	0.00	0.00	0	13	7	6.57	0.02
1 25E	0.0	0.00	7.3	21.92	0.818	0	417	0.01457	0.00	0.00	0	13	0	6.57	0.00
1 26E	2.3	8.13	9.6	30.05	1.076	0	0	0.00000	0.00	0.00	0	13	5	6.59	0.02
1 27E	0.0	0.00	9.6	30.05	1.076	0	236	0.00289	0.00	0.00	0	13	0	6.59	0.00
1 28E	2.2	6.23	11.8	36.26	1.324	0	0	0.00000	0.00	0.00	0	13	8	6.59	0.02
1 29E	0.4	0.73	12.2	36.96	1.369	0	0	0.00000	0.00	0.00	0	13	18	6.59	0.02
1 30E	2.9	8.73	15.1	45.69	1.696	0	0	0.00000	0.00	0.00	0	13	7	6.59	0.02
1 31F	7.3	19.54	7.3	19.54	0.823	0	0	0.00000	0.00	0.00	0	13	9	6.57	0.02
1 32F	0.0	0.00	7.3	19.54	0.823	0	307	0.01047	0.00	0.00	0	13	0	6.57	0.00
1 33EF	7.3	0.00	22.4	65.09	2.519	0	128	0.00243	0.00	0.00	0	13	0	6.57	0.00
1 34E	2.3	6.17	24.7	71.21	2.779	0	0	0.00000	0.00	0.00	0	13	9	6.59	0.02
1 35E	0.1	0.35	24.8	71.57	2.790	0	0	0.00000	0.00	0.00	0	13	5	6.59	0.02
1 36E	2.5	6.09	27.3	77.62	3.073	0	0	0.00000	0.00	0.00	0	13	11	6.57	0.02
1 37E	0.0	0.00	27.3	77.62	3.073	0	0	0.00000	0.00	0.00	0	13	0	6.57	0.00
1 39G	7.5	12.11	7.5	12.11	3.488	0	0	0.00000	0.00	0.00	0	13	26	6.57	0.95
1 40G	0.0	0.00	7.5	12.11	3.488	0	398	0.02289	0.00	0.00	0	13	0	6.57	0.00
1 41G	3.2	8.15	10.7	20.12	3.996	0	0	0.00000	0.00	0.00	0	13	10	6.57	0.14
1 42H	0.4	1.41	0.4	1.41	0.044	0	0	0.00000	0.00	0.00	0	13	5	6.55	0.02
1 43H	10.9	25.27	11.3	26.64	1.268	0	0	0.00000	0.00	0.00	0	13	12	6.54	0.02
1 44H	0.0	0.00	11.3	26.64	1.268	0	668	0.01280	0.00	0.00	0	13	0	6.54	0.00
1 45GH	11.3	0.00	22.0	46.70	5.265	0	519	0.00761	0.00	0.00	0	13	0	6.54	0.00
1 46G	2.7	8.13	24.7	54.81	6.439	0	0	0.00000	0.00	0.00	0	13	7	6.59	0.86
1 47G	8.8	20.55	33.5	75.37	10.253	0	0	0.00000	0.00	0.00	0	13	12	6.57	0.86
1 48G	0.0	0.00	33.5	75.37	10.253	0	446	0.00448	0.00	0.00	0	13	0	6.57	0.00
1 49I	3.0	4.60	3.0	4.60	0.333	0	0	0.00000	0.00	0.00	0	13	23	6.55	0.02
1 50I	0.0	0.00	3.0	4.60	0.333	0	0	0.00000	0.00	0.00	0	13	0	6.55	0.00
1 51J	2.2	7.12	2.2	7.12	0.246	0	0	0.00000	0.00	0.00	0	13	6	6.57	0.02
1 52J	0.0	0.00	2.2	7.12	0.246	0	0	0.00000	0.00	0.00	0	13	0	6.57	0.00
1 53K	0.5	0.25	0.5	0.25	0.036	0	0	0.00000	0.00	0.00	0	3	29	6.57	0.02
1 54K	2.8	3.02	3.3	3.26	0.248	0	0	0.00000	0.00	0.00	0	3	12	6.55	0.02
1 55K	0.0	0.00	3.3	3.26	0.248	0	0	0.00000	0.00	0.00	0	3	0	6.55	0.00
1 56L	9.4	30.39	9.4	30.39	1.050	0	0	0.00000	0.00	0.00	0	13	6	6.57	0.02
1 57L	0.0	0.00	9.4	30.39	1.050	0	680	0.00153	0.00	0.00	0	13	0	6.57	0.00
1 58M	2.7	8.76	2.7	8.76	0.303	0	0	0.00000	0.00	0.00	0	13	6	6.59	0.02
1 59M	0.0	0.00	2.7	8.76	0.303	0	0	0.00000	0.00	0.00	0	13	0	6.59	0.00
1 60N	1.2	3.38	1.2	3.38	0.134	0	0	0.00000	0.00	0.00	0	13	8	6.55	0.02
1 61N	0.0	0.00	1.2	3.38	0.134	0	0	0.00000	0.00	0.00	0	13	0	6.55	0.00

Normal End of MODRAT