APPENDIX Q

Updated Storm Drain Demands

TECHNICAL MEMORANDUM

Date:	July 21, 2010
To:	Bob Shattuck, Lennar Communities
From:	Scott Hartstein, MacKay & Somps
TM No.:	Technical Memorandum No. 7
Subject:	Updated Storm Drain Demands SunCreek Specific Plan Rancho Cordova, CA
Job No.:	7991-10
Task No.:	Task D.3

A. Introduction

In the two years since Sacramento County Water Resources last reviewed the Regional Master Drainage Study (RMDS) for the SunCreek Specific Plan (MacKay & Somps, December 2008), the land use plan has undergone several minor land use changes in response to requirements imposed by the City of Rancho Cordova and other related local agencies. These changes in land use, principally relating to the addition of more employment related land uses to the Specific Plan in favor of low density, medium density, and compact medium density residential land uses, have a minor impact on the storm drain demands generated by development of the project.

The purpose of this technical memorandum is to quantify the magnitude of these land use changes and the resulting changes in storm drain demands. It is believed that the magnitude of change in storm drain demands is nominal when compared to those projected in the RMDS. The goal of this technical memorandum is to demonstrate that the magnitude of these changes is insignificant, and that the RMDS still adequately projects the overall impacts of the project in terms of storm drain supply and related infrastructure for purposes of environmental review.

B. Land Use Plan Changes

The prior and updated land use plans are shown in Appendix A (Figures 1 and 2, respectively). A comparison of the land uses between the version of the land use plan used during the preparation of the RMDS and the updated land use plan for the project is summarized in Table 1.

Table 1
Land Use Comparison

Land Use Description	Prior Land Use Plan (Acres)	Updated Land Use Plan (Acres)	Change (Acres)	Change %
Low Density Residential (LDR)	190.0	169.4	-20.6	-10.8%
Medium Density Residential (MDR)	379.0	322.7	-56.3	-14.9%
Compact Density Residential (CMDR)	27.0	20.1	-6.9	-25.6%
High Density Residential (HDR)	29.0	34.6	5.6	19.3%
Commercial Mixed Use (CMU)	29.0	31.9	2.9	10.0%
Village Center	3.0	0	-3.0	-100.0%
Local Town Center (Commercial & Employment)	0.0	59.4	59.4	100.0%
Public/Quasi Public (PQP)	7.0	13.0	6.0	85.7%
Neighborhood Park (PP)	61.0	44.0	-17.0	-27.9%
Community Park	35.0	43.1	8.1	23.1%
Neighborhood Green	0.0	4.3	4.3	100.0%
Parkway, Paseos and Trails (PC)	28.0	9.1	-18.9	-67.5%
School	112.0	110.9	-1.1	-1.0%
Minor Roads	0.0	23.1	23.1	100.0%
Major Roads	97.0	79.0	-18.0	-18.6%
Wetland Buffer/Bike Path Corridor	30.0	45.2	15.2	50.7%
Detention Basin (DB)	31.0	46.9	15.9	51.3%
Storm Drain Channel	9.0	5.0	-4.0	-44.4%
Wetland Preserve	218.0	203.7	-14.3	-6.6%
Total	1285.0	1265.4	-19.6	-1.5%

Footnote:
Refinement in project boundary resulted in a reduction in total land use areas of approximately 20 acres from the prior to the current land use plan.

Clearly, the amounts of the various land uses for the project have changed during the last two years. Additionally, by inspection it is evident that the spatial distribution of the various land uses of the prior and updated land use plans is relatively the same. Therefore, as long as the resulting total storm drain demands of the two land use plans are identical, or nearly so, and as long as the distribution of said demand across the project area is relatively the same between the prior and the updated land use plans, it is reasonable to conclude that the size and location of the various storm drain infrastructure improvements contemplated in the RMDS to serve the prior land use plan are still adequate and appropriate to serve the updated land use plan.

C. Updated Storm Drain Demands

The storm drain demands resulting from the prior and updated land use plan are summarized in Tables 2 and 3. The unit demand figures used for these demand calculations and the methodology of calculating these demands are identical. The only difference between these two sets of calculations is the change in land use areas.

Table 2
SunCreek Storm Drain Demand - Prior Land Use Plan

Land Use Description	Land Use Classification	Total Acres	Runoff Coefficient	Water Quality Flow (in ft^3/s)
Low Density Residential (LDR)	Single Family	190.0	0.50	1.7
Medium Density Residential (MDR)	Multi-units, detached	379.0	0.60	40.9
Compact Density Residential (CMDR)	Multi-units, detached	27.0	0.60	2.9
High Density Residential (HDR)	Multi-units, attached	29.0	0.75	3.9
Commercial Mixed Use (CMU)	Apartment dwelling areas	29.0	0.75	3.9
Village Center	Neighborhood areas	3.0	0.70	0.4
Local Town Center (Commercial & Employment)	Neighborhood areas	0.0	0.70	0.0
Public/Quasi Public (PQP)	Playgrounds	7.0	0.40	0.5
Neighborhood Park (PP)	Parks	61.0	0.25	2.7
Community Park	Parks	35.0	0.25	1.6
Neighborhood Green	Parks	0.0	0.25	0.0
Parkway, Paseos and Trails (PC)	Parks	28.0	0.25	1.3
School	Neighborhood areas	112.0	0.70	14.1
Minor Roads	Asphaltic	0.0	0.95	0.0
Major Roads	Asphaltic	97.0	0.95	16.6
Wetland Buffer/Bike Path Corridor	Open Space	30.0	0.00	0.0
Detention Basin (DB)	Open Space	31.0	0.00	0.0
Storm Drain Channel	Open Space	9.0	0.00	0.0
Wetland Preserve	Open Space	218.0	0.00	0.0
			Cumulative	**90.5**

Total Acreage **1,285.0**

Developed Acreage **997.0**

Table 3
SunCreek Storm Drain Demand - Updated Land Use Plan

Land Use Description	Land Use Classification	Total Acres	Runoff Coefficient	Water Quality Flow (in ft^3/s)
Low Density Residential (LDR)	Single Family	169.4	0.50	1.5
Medium Density Residential (MDR)	Multi-units, detached	322.7	0.60	34.9
Compact Density Residential (CMDR)	Multi-units, detached	20.1	0.60	2.2
High Density Residential (HDR)	Multi-units, attached	34.6	0.75	4.7
Commercial Mixed Use (CMU)	Apartment dwelling areas	31.9	0.75	4.3
Village Center	Neighborhood areas	0	0.70	0.0
Local Town Center (Commercial & Employment)	Neighborhood areas	59.4	0.70	7.5
Public/Quasi Public (PQP)	Playgrounds	13.0	0.40	0.9
Neighborhood Park (PP)	Parks	44.0	0.25	2.0
Community Park	Parks	43.1	0.25	1.9
Neighborhood Green	Parks	4.3	0.25	0.2
Parkway, Paseos and Trails (PC)	Parks	9.1	0.25	0.4
School	Neighborhood areas	110.9	0.70	14.0
Minor Roads	Asphaltic	23.1	0.95	4.0
Major Roads	Asphaltic	79.0	0.95	13.5
Wetland Buffer/Bike Path Corridor	Open Space	45.2	0.00	0.0
Detention Basin (DB)	Open Space	46.9	0.00	0.0
Storm Drain Channel	Open Space	5.0	0.00	0.0
Wetland Preserve	Open Space	203.7	0.00	0.0
			Cumulative	**91.9**

Total Acreage **1,265.4**

Developed Acreage **964.6**

Source: MacKay & Somps Civil Engineers, July 21, 2010

D. Comparison with Storm Drain Study

A comparison of the storm drain demands resulting from the prior and updated land use plans is shown in Table 4. Like the earlier comparison of land use areas between the prior and the updated land use plans, the differences in the resulting demands for storm drain are nominal. In fact, the projected demands resulting from the updated land use plan are slightly more than those contained in the RMDS, 1.5% more in terms of cumulative water quality flow. While the developed acreage for the project has actually decreased, the increase in cumulative water quality flow is attributable to an increase in the HDR, CMU and Commercial & Employment Land Use Designations. This incremental increase results in insignificant adjustments to the peak flow and hydromodification requirements. The basins are contained within developable parcels and any modifications can be done within the developable footprint, without additional environmental impacts.

Table 4
Comparison of Drainage Demands

Demand	Prior Land Use Plan	Updated Lane Use Plan	Change	Change %
Developed Acreage	997.0	964.6	-32.4	-3.2%
Cumulative Water Quality Flow	90.5	91.9	1.4	1.5%

E. Summary

The magnitude of the land use changes and the resulting changes in storm drain demands between the prior and updated land use plans are nominal. Furthermore, the spatial distribution of proposed land uses is relatively the same between the prior and updated land use plan. Accordingly, it is reasonable to conclude that the RMDS still adequately addresses the infrastructure requirements for the current land use plan, and that the differences in overall impacts on storm drain demand and infrastructure between the prior and updated land use plans are insignificant.

Appendix A

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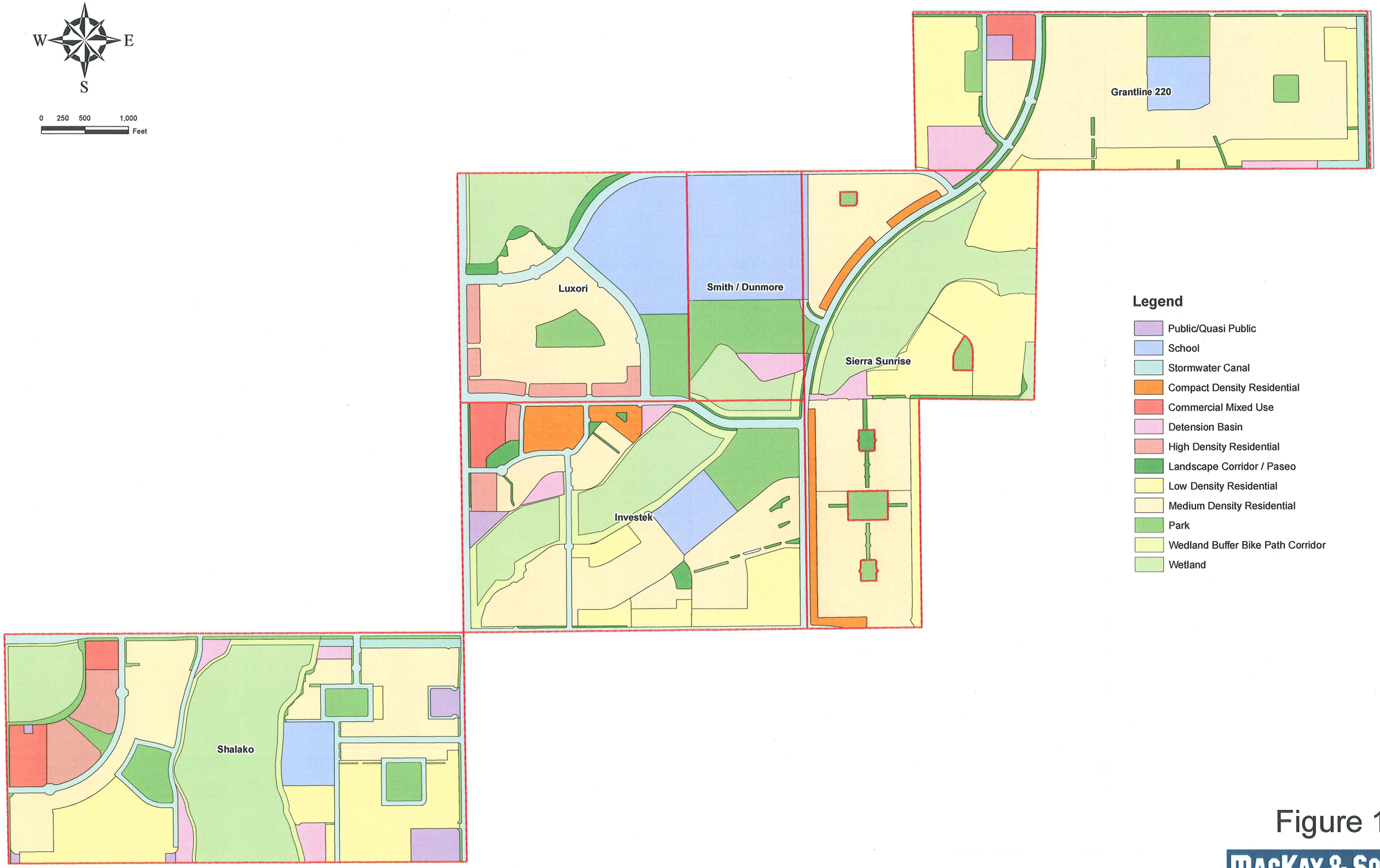
Feet



Legend

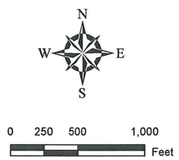
- Public/Quasi Public
- School
- Stormwater Canal
- Compact Density Residential
- Commercial Mixed Use
- Detension Basin
- High Density Residential
- Landscape Corridor / Paseo
- Low Density Residential
- Medium Density Residential
- Park
- Wedland Buffer Bike Path Corridor
- Wetland

Figure 1

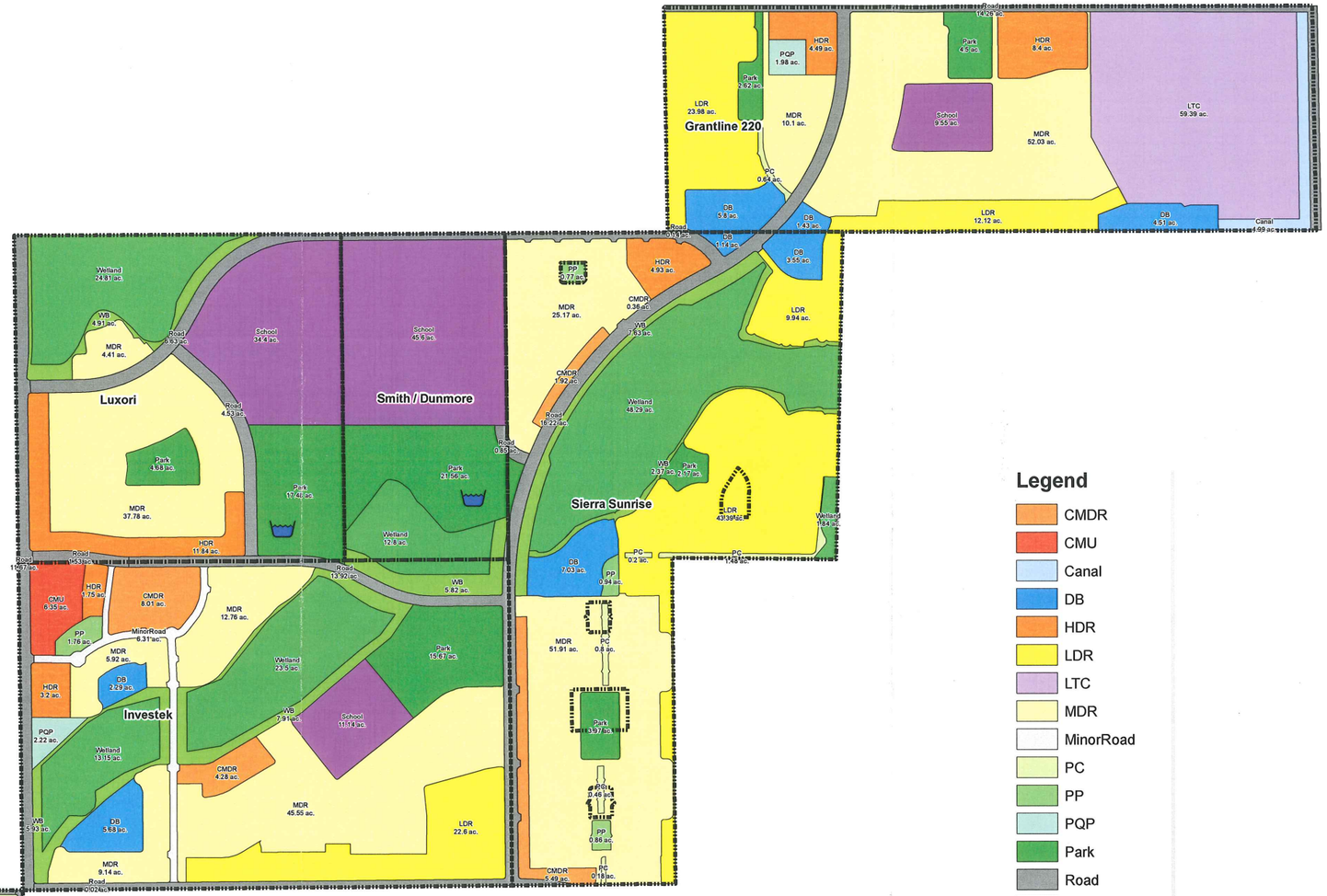
Prior Suncreek Landuse Area Summary (2008)

MacKay & Somps
ENGINEERS PLANNERS SURVEYORS
1771 Tribute Road, Suite E, Sacramento, CA 95815 (916) 929-6092

Date:10/2008



Land Use Summary			
Land Use Type	**Area (acres)**	**Dwelling Units**	**Average Density Per Acre**
LDR - LOW DENSITY (2.1 to 6 du/ac)	169.4	900	5.311461427
MDR - MEDIUM DENSITY RESIDENTIAL (6.1 to 12 du/ac)	322.7	2517	7.800926019
CMDR - COMPACT DENSITY RESIDENTIAL (12.1 to 18 du/ac)	20.1	286	14.26214398
HDR - HIGH DENSITY RESIDENTIAL (18.1 to 40 du/ac)	34.6	735	21.24598938
CMU	31.9	259	
LTC - LOCAL TOWN CENTER COMMERCIAL AND EMPLOYMENT CENTER	59.4		
PQP - PUBLIC/QUASI_PUBLIC	13.0		
PP - NEIGHBORHOOD GREEN	4.3		
PARK	87.1		
PC - PARKWAY, PASEOS AND TRAILS	9.1		
WB - PRESERVE BUFFER	45.2		
DB - DETENTION BASIN	46.9		
STORM WATER CANAL	5.0		
WETLAND PRESERVE	203.7		
SCHOOL	110.9		
MINOR ROADS	23.2		
MAJOR ROADS	79.0		
Grand Total	**1265.5**	**4697**	



Updated Suncreek Landuse Area Summary (2010)

Figure 2

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS

Job Number: 7991.00 Date : 05/28/2010
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