Storm Water Management Plan
For Priority Projects
(Major SWMP)

Project Name:	TPM 20948 RPL[1]
Permit Number (Land Development Projects):	LOG NO. 05-02-021
Work Authorization Number (CIP):	
Applicant:	Larry & Kaarla Butts Trust
Applicant's Address:	1508 Black Walnut Drive, San Marcos 92078
Plan Prepare By *(Leave blank if same as applicant):*	*William Karn Surveying, Inc.* *PO Box 518, Fallbrook CA 92028*
Date:	November 15, 2005
Revision Date (If applicable):	

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The County of San Diego Watershed Protection, Storm Water Management and Discharge Control Ordinance (WPO) (Ordinance No. 9424) requires all applications for a permit or approval associated with a Land Disturbance Activity must be accompanied by a Storm Water Management Plan (SWMP) (Section 67.804.f.) The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority project are required to prepare a Major SWMP.

Project Review Stage	YES	NO	If YES, Provide Revision Date
Tentative Parcel Map		X	

Completion of the following checklist and attachments will fulfill the requirements of a Major SWMP for the project listed above.

PROJECT DESCRIPTION:

The 2.14 +/- acre, Butts project is located south of Alvarado Street and north of Debra Ann Drive in the Country Town Area of the Fallbrook Community Plan, San Diego County. The project proposed 4 parcels with a designator remainder parcel and would be considered infilling. The project has a community plan designation of residential (6) and zoning allows 6,000 sq. ft. parcels. Sewer and water mains will be extended to serve this project either from Alvarado or Debra Ann Drive. The proposed project is consistent with or proposed parcel sizes on all sides of this project.

PRIORITY PROJECT	YES	NO
Redevelopment within the County Urban Area that creates or adds at least 5,000 net sq ft. of additional impervious surface area.	X	
Residential development of more than 10 units.		x
Commercial developments with a land area for development of greater than 100,000 square feet.		x
Automotive repairs shops.		x
Restaurants, where the land area for development is greater than 5,000 square feet.		x
Hillside development in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 sq. ft or more of impervious surface.		x
Environmentally Sensitive Area: All development and redevelopment located within or directly adjacent to or discharge adjacent to or discharging directly to an environmentally sensitive area, (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 sq. ft. of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of it's naturally occurring condition.		x
Parking Lots 5,000 sq. ft. or more or with 15 parking spaces or more and potentially exposed to urban runoff.		x
Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 sq. ft. or greater.	x	

Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria above are met.

If you answered **NO** to all the questions, then STOP. Please complete a Minor SWMP for your project.

The following questions provide a guide to collecting information relevant to project stormwater quality issues. Please provide a description of the findings in text box below.

	QUESTIONS	COMPLETED	NA
1.	Describe the topography of the project area.	Grassy nob	
2.	Describe the local land use within the project area and adjacent areas.	S.F.D.	
3.	Evaluate the presence of dry weather flow.	No dry weather	
4.	Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	Bonsall Hyd. Sub Unit & Upper Ysidora HAS	
5.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	No 303d onsite	
6.	Determine if there are any High Risk Areas (municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits.	No high risk areas downstream	
7.	Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.	No special req.	
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	Annual rainfall 15" to 20"	
9.	If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	Soil Group "C" w/ good perc rates	
10.	Determine contaminated or hazardous soils within the project area.	No haz. soil onsite	

Please provide a description of the findings in the following box:

The project is located on a watershed ridge. The easterly portion flows to the Bonsall HAS and the easterly half flows to theupper Ysidora HAS. The area is characterized by grassy nob with some fruit trees for a S.F.D. Runoff from the easterly side flows to Ostrich Creek and into the San Luis Rey River. The flow from the westerly portion flows to Fallbrook Creek and into the Santa Margarita River.

Complete the checklist below to determine if Treatment Best Management (BMP's) are required for this project.

No.	CRITERIA	YES	NO	INFORMATION
1.	Is this an emergency project		X	If YES, go to 6. If NO, continue to 2.
2.	Have TMDLs been established		X	If YES, go to 5.

No.	CRITERIA	YES	NO	INFORMATION
	for surface waters within the project limit?		X	If NO, continue to 3.
3.	Will the project directly discharge to a 303(d) impaired receiving water body?		X	If YES, go to 5. If NO, continue to 4.
4.	Is this project within the urban and environmentally sensitive areas as defined on the maps in Appendix B of the *County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects?*		*X*	If YES, continue to 5. If NO, go to 6.
5.	Consider approved Treatment BMPs for the project.	X		If YES, go to 7.
6.	Project is not required to consider Treatment BMPs			Document for Project Files by referencing this checklist.
7.	End			

Now that the need for a treatment BMPs has been determined, other information is needed to complete the SWMP.

WATERSHED

Please check the watershed(s) for the project.

□ San Juan	☒ Santa Margarita	x San Luis Rey	□ Carlsbad
□ San Dieguito	□ Penasquitos	□ San Diego	□ Pueblo San Diego
□ Sweetwater	□ Otay	□ Tijuana	

The hydrologic sub-area and number(s)

Number	Name
903.12	Bonsall Hydrological Sub Area
902.13	Upper Ysidora Hyd. Sub Area

The beneficial uses for Inland Surface Waters and Ground Waters per attached table.

SURFACE WATERS	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Inland Surface Waters	902.13	X	X	X	X				X	X		X	X	X	X	
Inland Surf. Wat	903.13		X	X					X	X		X		X		
Ground Waters	902.13	X	X	X	X											
Ground Water	903.13	X	X	X												

X Existing Beneficial Use
0 Potential Beneficial Use
** Excepted from Municipal*

POLLUTANTS OF CONCERN
Using Table 1, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

Table 1. Antici ated and Potential Pollutants Generated b Land Use T e

	General Pollutant Catelgoråes								
PrEOrEty Project Categoråes	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P~1~	P~2~	P	X
Commercial Development >100,000 ft²	p~4~	p~1~		p~a~	x	p~s~	x	p~s~	p~s~
Automotive Repair Shops			X	X~4~~~5~	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft²	X	X			X	X	X		X

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

Note: If other monitoring data that is relevant to the project is available. Please include as Attachment C.

CONSTRUCTION BMPs

Please check the construction BMPs that may be used. The BMPs selected are those that will be implemented during construction of the project. The applicant is responsible for the placement and maintenance of the BMPs selected.

- ☒ Silt Fence
- ☒ Fiber Rolls
- ☐ Street Sweeping and Vacuuming
- ☒ Storm Drain Inlet Protection
- ☒ Stockpile Management
- ☒ Solid Waste Management
- ☒ Stabilized Construction Entrance/Exit
- ☐ Dewatering Operations
- ☐ Vehicle and Equipment Maintenance
- ☐ Desilting Basin
- ☒ Gravel Bag Berm
- ☐ Sandbag Barrier
- ☒ Material Delivery and Storage
- ☒ Spill Prevention and Control
- ☒ Concrete Waste Management
- ☒ Water Conservation Practices
- ☒ Paving and Grinding Operations
- ☒ Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

SITE DESIGN

To minimize stormwater impacts, site design measures must be addressed. The following checklist provides options for avoiding or reducing potential impacts during project planning. If YES is checked, it is assumed that the measure was used for this project. If NO is checked, please provide a brief explanation why the option was not selected in the text bow below:

	OPTIONS	YES	NO	N/A
1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?			X
2.	Can the project be designed to minimize impervious footprint?	X		
3.	Conserve natural areas where feasible?	X		
4.	Where landscape is proposed, can rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?	X		
5.	For roadway projects, can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	X		
6.	Can any of the following methods be utilized to minimize erosion from slopes:			
	6.a. Disturbing existing slopes only when necessary?	X		
	6.b. Minimize cut and fill areas to reduce slope lengths?	X		
	6.c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?			X
	6.d. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?			X
	6.e. Rounding and shaping slopes to reduce concentrated flow?	X		
	6.f. Collecting concentrated flows in stabilized drains and channels?			

Retaining walls were not necessary as the cut & fill slopes are minor. Again, terraces and benches were not needed because of the minor cut & fill slopes.

If the project includes work in channels, then complete the following checklist. Information shall be obtained from the project drainage report.

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project increase velocity or volume of downstream flow?		X		If YES go to 5.
2.	Will the project discharge to unlined channels?	X			If YES go to 5.
3.	Will the project increase potential sediment load		X		If YES go to 5.

No.	CRITERIA	YES	NO	N/A	COMMENTS
	of downstream flow?				
4.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect upstream and/or downstream channel stability?		X		If YES go to 7.
5.	Review channel lining materials and design for stream bank erosion.			X	Continue to 6.
6.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	X			Continue to 7.
7.	Include, where appropriate, energy dissipation devices at culverts.	X			Continue to 8.
8.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	X			Continue to 9.
9.	Include, if appropriate, detention facilities to reduce peak discharges.			X	X
10.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.			X	Continue to 11.
11.	Provide other design principles that are comparable and equally effective.			X	Continue to 12.
12.	End				

SOURCE CONTROL

Please complete the following checklist for Source Control BMPs. If the BMP is not applicable for this ro ect, then check N/A onl at the main cate o.

BMP			YES	NO	N/A
1.	Provide Storm Drain System Stenciling and Signage				
	1.a.	All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: "NO DUMPING-DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.			X
	1.b.	Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.			X
2.	Design Outdoors Material Storage Areas to Reduce Pollution Introduction				
	2.a.	This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.	X		

	BMP		YES	NO	N/A
	2.b.	Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.			X
	2.c.	The storage area shall be paved and sufficiently impervious to contain leaks and spills.			X
	2.d.	The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.			X
3.	**Design Trash Storage Areas to Reduce Pollution Introduction**				
	3.a.	Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,	X		
	3.b.	Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.	X		
4.	**Use Efficient Irrigation Systems & Landscape Design**				
	The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible.				
	4.a. Employing rain shutoff devices to prevent irrigation after precipitation.		X		
	4.b. Designing irrigation systems to each landscape area's specific water requirements.		X		
	4.c. Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.		X		
	4.d. Employing other comparable, equally effective, methods to reduce irrigation water runoff.		X		
5.	**Private Roads**				
	The design of private roadway drainage shall use at least one of the following				
	5.a.	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	X		
	5.b.	Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter.	X		
	5.c.	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.			X
	5.d.	Other methods that are comparable and equally effective within the project.			X
6.	**Residential Driveways & Guest Parking**				
	The design of driveways and private residential parking areas shall use one at least of the following features.				
	6.a.	Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.	X		
	6.b.	Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.	X		
	6.c.	Other features which are comparable and equally effective.			X
7.	**Dock Areas**				

BMP			YES	NO	N/A
		Loading/unloading			
	7.a.	Cover loading dock areas, or design drainage to preclude urban run-on and runoff.			X
	7.b.	Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.			X
	7.c.	Other features which are comparable and equally effective.			X
8.	**Maintenance Bays**				
	Maintenance bays shall include the following.				
	8.a.	Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.			X
	8.b.	Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.			X
	8.c.	Other features which are comparable and equally effective.			X
9.	**Vehicle Wash Areas**				
	Priority projects that include areas for washing/steam cleaning of vehicles shall use the following.				
	9.a. Self-contained; or covered with a roof or overhang.				X
	9.b. Equipped with a clarifier or other pretreatment facility.				X
	9.c. Properly connected to a sanitary sewer.				X
	9.d. Other features which are comparable and equally effective.				X
10.	**Outdoor Processing Areas**				
	Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.				
	10.a.	Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.			X
	10.b.	Grade or berm area to prevent run-on from surrounding areas.			X
	10.c.	Installation of storm drains in areas of equipment repair is prohibited.			X
	10.d.	Other features which are comparable or equally effective.			X
11.	**Equipment Wash Areas**				
	Outdoor equipment/accessory washing and steam cleaning activities shall be.				
	11.a. Be self-contained; or covered with a roof or overhang.				X
	11.b. Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate				X
	11.c. Be properly connected to a sanitary sewer.				X
	11.d. Other features which are comparable or equally effective.				X
12.	**Parking Areas**				
	The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County.				
	12.a.	Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	X		

		BMP	YES	NO	N/A
	12.b.	Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.			X
	12.c.	Other design concepts that are comparable and equally effective.			X
13.	**Fueling Area**				
	Non-retail fuel dispensing areas shall contain the following.				
	13.a.	Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.			X
	13.b.	Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.			X
	13.c.	Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.			X
	13.d.	At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.			X

Please list other project specific Source Control BMPs in the following box.: **N/A**

TREATMENT CONTROL

To select a structural treatment BMP using Treatment Control BMP Selection Matrix (Table 2), each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 1). Any pollutants identified by Table 1, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall select a single or combination of stormwater BMPs from Table 2, which **maximizes pollutant removal** for the particular primary pollutant(s) of concern.

Priority projects that are **not** anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall select a single or combination of stormwater BMPs from Table 2, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the "maximum extent practicable" standard.

Table 2. Treatment Control BMP Selection Matrix

Pollutant of Concern	*Treatment Control BMP Categories*						
	Biofilters *	Detention Basins	Infiltration Basins(2)	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Hydrodynamic Separator Systems(3)
Sediment	M	H	H	H	L	H	M
Nutrients	L	M	M	M	L	M	L
Heavy Metals	M	M	M	H	L	H	L
Organic Compounds	U	U	U	M	L	M	L
Trash & Debris	L	H	U	H	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	H	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	L	L	U	L

(1) Copermittees are encouraged to periodically assess the performance characteristics of may of these BMPs to update this table.
(2) Including trenches & porous pavement.
(3) Also known as hydrodynamic devices & baffle boxes.
L: Low removal efficiency:
M: Medium removal efficiency:
H: High removal efficiency:
U: Unknown removal efficiency
Sources: Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) National Stormwater BMP Database(2001), Guide for BMP selection in Urban Development Areas (2001)& Caltrans New Technology

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality values for the project. Label outfalls on the BMP map. Q_{WQ} is dependent on the type of treatment BMP selected for the project.

Outfall	**Tributary Area (acres)**	**Q_{100} (cfs)**	**Q_{WQ} (cfs)**
1	Westerly 1 ac	2.7	0.7 cfs
2	Easterly 1.1 ac	3.0	0.8 cfs

Please check the box(s) that best describes the Treatment BMP(s) selected for this project.

Biofilters

☒ Grass swale
☒ Grass strip
☐ Wetland vegetation swale
☐ Bioretention

Detention Basins

☐ Extended/dry detention basin with grass lining
☐ Extended/dry detention basin with impervious lining

Infiltration Basins

□ Infiltration Basin □ Infiltration Trench □ Porous Asphalt
□ Porous Concrete □ Porous modular concrete block

Wet Ponds or Wetlands

□ Wet pond/basin (permanent pool)
□ Constructed wetland

Drainage Inserts (See note below)

□ Oil/Water separater □ Catch basin insert □ Storm drain inserts
□ Catch basin screens

Filtration

□ Media filtration
□ Sand filtration

Hydrodynamic Separator Systems

□ Swirl Concentrator □ Cyclone Separator □ Baffle Separator
□ Gross solids removal devise □ Linear radial Device

NOTE: Catch basin inserts and storm drain inserts are excluded from use on County maintained right-of-way and easements.

Include Treatment Datasheet as Attachment E. The data sheet Should include the following:	COMPLETED	NO
1. Description of how treatment BMP was designed. Provide a description for each type of treatment BMP.	X	
2. Engineering calculations for the BMP(s).	X	

Please describe why the selected treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a detailed explanation and justification.

Proposed bio filter swale for runoff of newly paved areas. Rock rip rap to reduce velocity at discharge point.

MAINTENANCE

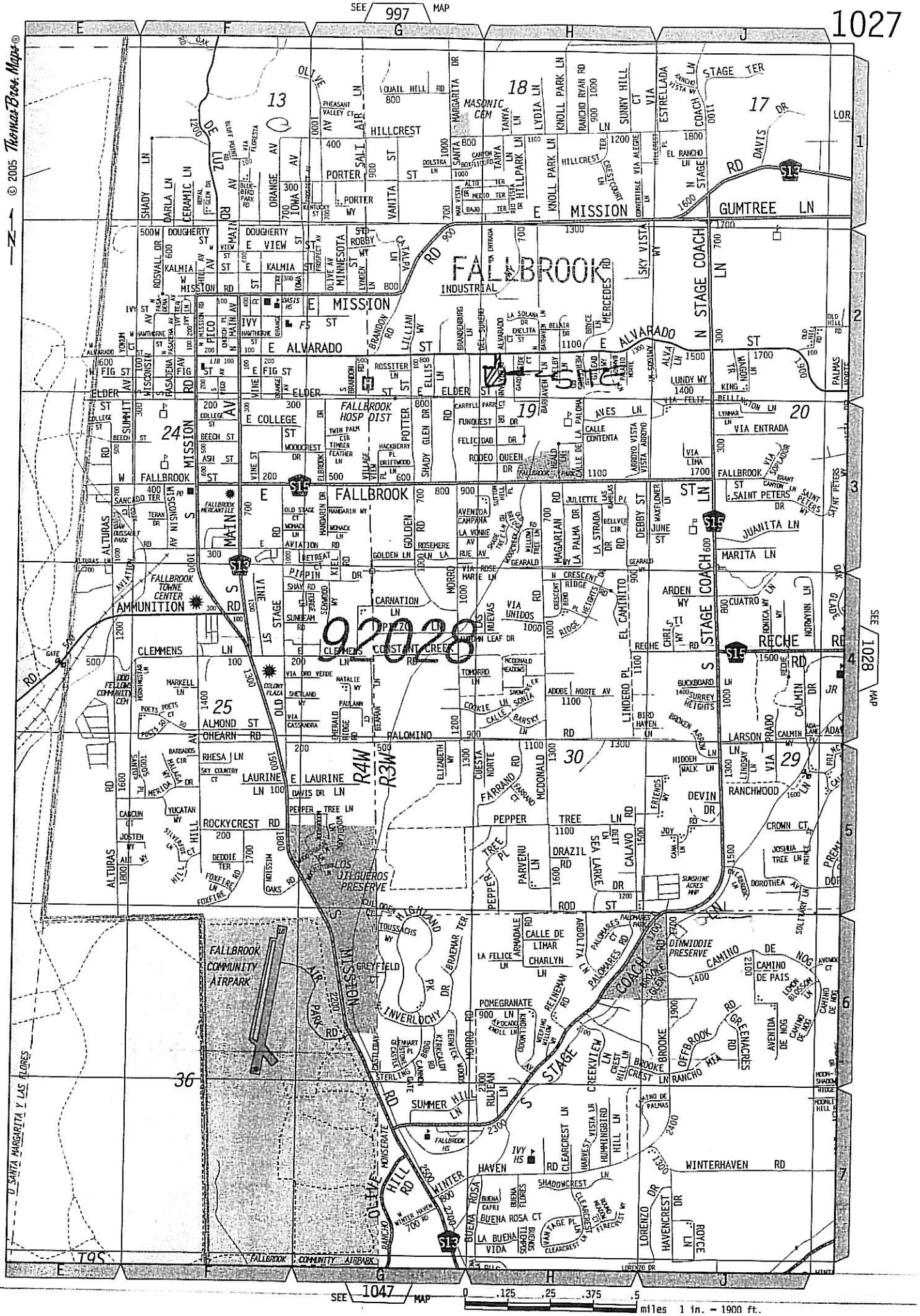
Please check the box that best describes the maintenance mechanism(s) for this project.

CATEGORY	SELECTED YES	NO
First	X	
Second		
Third		
Fourth		

ATTACHMENTS	Completed	N/A
A Project Location Map	X	
B Site Plan	X	
C Relevant Monitoring Data		X
D Treatment BMP Location Map	X	
E Treatment BMP Datasheets	X	
F Operation & Maintenance program for Treatment BMP	X	
G Engineer's certification sheet	X	

ATTACHMENT A

LOCATION MAP


1027
SEE 997 MAP
SEE 1028 MAP
SEE 1047 MAP
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FALLBROOK
INDUSTRIAL
FALLBROOK HOSP DIST
FALLBROOK COMMUNITY AIRPARK
FALLBROOK TOWNE CENTER
LOS JILGUEROS PRESERVE
DIMMIDDIE PRESERVE
92028
MISSION
MAIN ST
E ALVARADO ST
E MISSION
E FIG ST
E ELDER ST
E COLLEGE
W FALLBROOK ST
E FALLBROOK ST
N STAGE COACH LN
S STAGE COACH LN
GUMTREE LN
JUANITA LN
MARITA LN
VIA ENTRADA
RECHE RD
CLEMMENS LN
ALMOND ST
OHEARN RD
PALOMINO RD
LAURINE LN
ROCKYCREST RD
PEPPER TREE LN
DRAZIL RD
RANCHWOOD DR
LARSON PRADO
DEVIN DR
CROWN CT
DOROTHEA AV
CAMINO DE NOG
CAMINO DE PAIS
GREENACRES RD
OFFBROOK RD
BROOKE RD
CREEKVIEW LN
RANCHO MIA
WINTERHAVEN RD
SUMMER HILL LN
WINTER HAVEN RD
OLIVE HILL RD
MORRO RD
REINEHAM RD
POMEGRANATE LN
GREYFIELD PL
INVERLOCHY DR
TOUSSACHS WY
CALLE DE LIMAR
ARMADALE RD
CHARLYN LN
LA FELICE
PALOMARES RD
PALOMARES PARK
CUESTA NORTE RD
FARRAND RD
MCDONALD RD
ELIZABETH WY
LINDERO PL
ADOBE NORTE AV
BIRD HAVEN LN
BROKEN ARROW LN
BUCKBOARD LN
SURREY HEIGHTS
EL CAMINITO
ARDEN WY
CUATRO WY
RONICA WY
NORMYNN LN
CHRIS TI WY
CRESCENT RIDGE DR
CRESCENT RIDGE HEIGHTS PL
VIA UNIDOS
VIA NUEVAS
CARNATION LN
PIEPIN DR
SHAY RD
SUNBEAM RD
SENWOOD WY
MORRO
VINE ST
STAGE
OLD STAGE CT
MONACK LN
AVIATION RD
RETREAT CT
KIEL RD
GOLDEN RD
GOLDEN LN
ROSEMERE LA
MANDARIN WY
MAGARIAN DR
LA PALMA DR
LA STRADA DR
BELLVER CIR
DEBBY ST
JUNE ST
WAXFLOWER LN
JULIETTE LAS AMELIAS PL
AVENIDA CAMPANA
LA VONNE AV
RUE AV
SUTTON HILL PL
WILLOW TREE LN
GEARALD RD
ROSEMERE LA
FALLBROOK MERCANTILE
SAN DIEGUITO PARK
TERAN DR
SANCADO TER
ALTURAS RD
ALTURAS DR
SUMMIT AV
BEECH ST
ASH ST
COLLEGE ST
WOODCREST DR
TWIN PALM CIR
TIMBER LN
FEATHER LN
HACKBERRY PL
DRIFTWOOD LN
VILLAGE GLEN DR
POTTER RD
SHADY GLEN DR
FUNQUEST DR
FELICIDAD DR
RODEO QUEEN DR
CARRYLL PARK CT
CALLE CONTENTA
CALLE DE LA PALOMA
ARROYO VISTA
VISTA ARROYO
AVES LN
LYNMAR LN
BELLINGTON LN
KING TR
LUNDY WY
VIA FELIZ
VIA LIMA
VIA SOPLADOR
BRANT CANYON LN
SAINT PETERS DR
SAINT PETERS WY
PALMAS NORTE DR
OLD HILL RD
ALVA LN
SKY VISTA WY
MERCEDES RD
BRYCE LN
LA SOLANA DR
EXCELITA ST
BARWICK LN
BELAIR DR
ALVARADO CT
BRANDENBURG LN
DEL SUENO
LILLIAN WY
BRANDON RD
ROSSITER LN
ELLIS LN
GADDIS CT
HELBY LN
PALMAS DE LA PALOMA
ROBBY ST
TAMPA LN
LYNDEN LN
OLIVE AV
MINNESOTA ST
IOWA ST
ORANGE AV
KENTUCKY ST
PROSPECT AV
VIA FLORESTA
BLUE POINT RD
ROYAL GLEN DR
CERAMIC LN
DARLA LN
SHADY LN
ROSVALL DR
KALMIA ST
DOUGHERTY ST
E VIEW ST
PORTER ST
PORTER WY
VANITA ST
HILLCREST AV
PHEASANT VALLEY CT
QUAIL HILL RD
OLIVE AV
OAK RD
LOZ RD
MARGARITA DR
MASONIC CEM
TANYA LN
SANTA ROSA DR
CANYON BOX
ALTO TER
BAJO TER
MAR VISTA DR
RIO VISTA DR
HILLPARK LN
KNOLL PARK LN
LYDIA LN
RANCHO RYAN RD
SUNNY HILL CT
VIA ESTRELLADA
RANCHO VISTA WY
STAGE TER
COACH LN
ESTRELLADA LN
EL RANCHO LN
VIA ALEGRE
CONVERTIBLE LN
HILLCREST PL
BESSIDONT LN
DAVIS DR
LOR
S15
R4W
R3W
T9S
U SANTA MARGARITA Y LAS FLORES
0 .125 .25 .375 .5 miles 1 in. = 1900 ft.

ATTACHMENT B

PROJECT MAP

LOG NO. 05-02-021

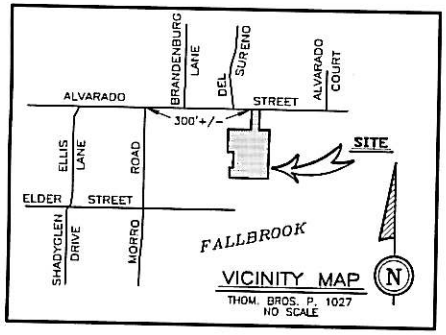
SOLAR ACCESS STATEMENT

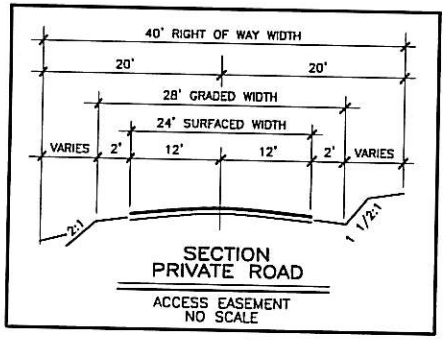
ALL PARCELS WITHIN THIS SUBDIVISION HAVE A MINIMUM OF ONE HUNDRED (100) SQUARE FEET OF SOLAR ACCESS FOR EACH FUTURE DWELLING UNIT ALLOWED BY THIS SUBDIVISION AS REQUIRED BY SECTION 81.401(n) OF THE SUBDIVISION ORDINANCE.

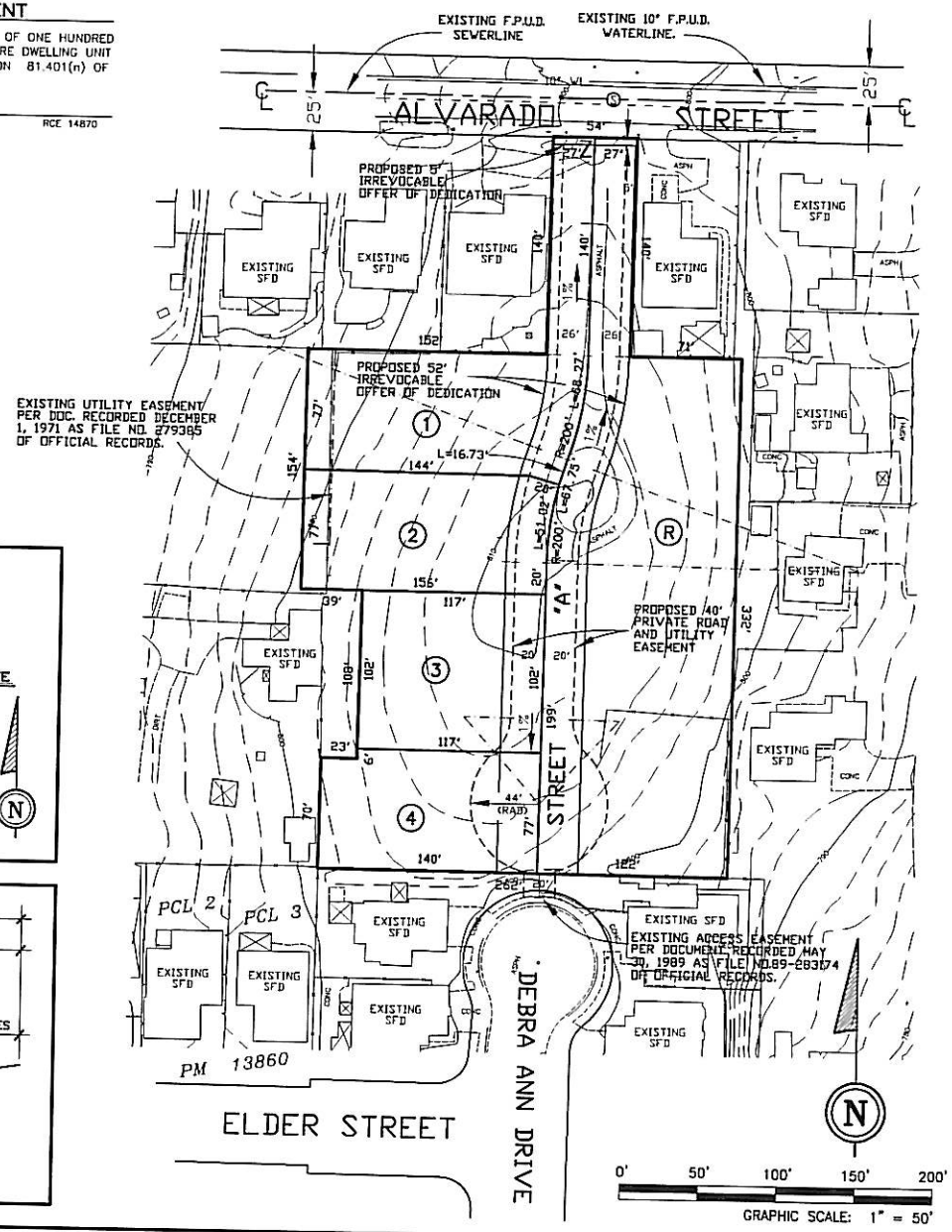
HADLEY JOHNSON RCE 14870

LEGEND

(1)	PARCEL 1	17,320 SQ. FT. GROSS 12,839 SQ. FT. NET
(2)	PARCEL 2	12,033 SQ. FT. GROSS 10,554 SQ. FT. NET
(3)	PARCEL 3	11,946 SQ. FT. GROSS 9,845 SQ. FT. NET
(4)	PARCEL 4	10,604 SQ. FT. GROSS 7,796 SQ. FT. NET
(R)	DESIGNATED REMAINDER PARCEL	42,551 SQ. FT. GROSS 31,678 SQ. FT. NET







REPLACEMENT

TENTATIVE PARCEL MAP NO. 20948

LAND DIVISION STATEMENT – OWNER'S CERTIFICATE

I HEREBY CERTIFY THAT I AM THE RECORD OWNER, AS SHOWN ON THE LATEST EQUALIZED COUNTY ASSESSMENT OF THE PROPERTY SHOWN ON THE TENTATIVE PARCEL MAP ALL OF MY CONTIGUOUS OWNERSHIP WITHIN AND BEYOND THE BOUNDARIES OF THE TENTATIVE PARCEL MAP IS SHOWN. THE BASIS OF CREATION OF THE LOTS IN MY OWNERSHIP (I.E. PARCEL MAP, FINAL MAP, CERTIFICATE OF COMPLIANCE, RECORDED DEED BEFORE 2/1/72) AS INDICATED ON THE TENTATIVE. I UNDERSTAND THAT PROPERTY IS CONSIDERED CONTIGUOUS EVEN IF IT IS SEPARATED BY ROADS, STREETS, UTILITY EASEMENTS OR RAILROAD RIGHTS-OF-WAY. "FREEWAY" AS DEFINED IN SECTION 23.5 OF THE STREETS AND HIGHWAY CODES, SHALL NOT BE CONSIDERED AS ROADS OR STREETS.

I FURTHER CERTIFY THAT I WILL NOT, BY THIS APPLICATION, CREATE OR CAUSE TO BE CREATED, OR WILL NOT HAVE PARTICIPATED IN THE CREATION OF MORE THAN FOUR PARCELS ON CONTIGUOUS PROPERTY UNLESS SUCH PARCELS WERE CREATED BY MAJOR SUBDIVISION. FOR PURPOSES OF THIS CERTIFICATION, THE TERM "PARTICIPATED" MEANS HAVING COOPERATED WITH OR ACTED IN A PLANNING, COORDINATE OR DECISION-MAKING CAPACITY IN ANY FORMAL OR INFORMAL ASSOCIATION OR PARTNERSHIP FOR THE PURPOSE OF DIVIDING REAL PROPERTY.

I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT. EXECUTED THIS _____ DAY OF NOVEMBER, 2005, IN FALLBROOK, CALIFORNIA.

LAWRENCE C. BUTTS AND KAARLA E. BUTTS, DECLARATION OF TRUST

LAWRENCE C. BUTTS TRUSTEE

KAARLA E. BUTTS TRUSTEE

ADDRESS: 1508 BLACK WALNUT DRIVE
SAN MARCOS, CA 92078

PHONE: (760) 803-1223

1. COMPLETE TAX ASSESSOR'S NUMBER: 105-513-02
2. ABBREVIATED LEGAL DESCRIPTION: A PORTION OF LOTS 7&8, TRACT 132 – SHIPLEY TRACT
3. GENERAL PLAN REGIONAL CATEGORY: COUNTRY TOWN
4. COMMUNITY/SUBREGIONAL PLAN AREA: FALLBROOK COMMUNITY PLAN
5. LAND USE DESIGNATION(S): (8) RESIDENTIAL
6. EXISTING ZONING: RS-7 6,000 SQ. FT.
7. GRADING: NONE PROPOSED
8. TOPOGRAPHY: AERIAL PHOTOGRAPHY DATED APRIL 1, 2005
9. TAX RATE AREA: 75002
10. ASSOCIATED PERMITS: N/A
11. LOCATION AND STATUS OF EXISTING LEGAL ACCESS TO SUBJECT PROPERTY FROM A PUBLICLY MAINTAINED ROAD. (i.e. RECORDED EASEMENT, UNRECORDED IDENTIFY AND SPECIFY WIDTH): PROPERTY FRONTS PUBLICLY MAINTAINED ROAD KNOWN AS "ALVARADO STREET"
12. WATER SOURCE/ WATER DISTRICT: FALLBROOK PUBLIC UTILITY DISTRICT
13. SEPTIC/SEWER DISTRICT: (SEWER) FALLBROOK PUBLIC UTILITY DISTRICT
14. FIRE DISTRICT: NORTH COUNTY FIRE PROTECTION DISTRICT
15. SCHOOL DISTRICT: FALLBROOK UNION ELEMENTARY AND FALLBROOK UNION HIGH SCHOOL

USE REGULATIONS	RS-7
NEIGHBORHOOD REGS	O
DENSITY	7.25
LOT SIZE	6,000 SQ.FT.
BUILDING TYPE	C
MAX FIR AREA	–
FIR AREA RATIO	–
HEIGHT	G
COVERAGE	–
SETBACK	J
OPEN SPACE	–
SPECIAL AREA REGS	–

LAWRENCE C. BUTTS TRUSTEE

ADDRESS: 1508 BLACK WALNUT DR.
SAN MARCOS, CA 92078

PHONE: (760) 803-1223

HADLEY JOHNSON RCE 14870

PREPARED BY:
WM. KARN SURVEYING INC.
129 WEST FIG ST.
FALLBROOK, CA 92028
760-728-1134
LS 2961/RCE 14870

I:\8501B\REPLACEMENT#2 TPM 20948

ATTACHMENT D

BMP MAP

LOG NO. 05-02-021

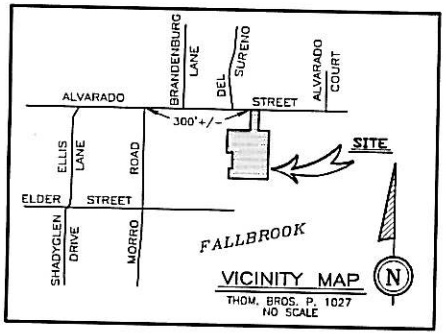
PRELIMINARY GRADING PLAN

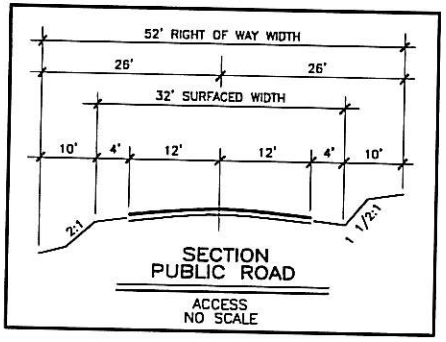
NOTE

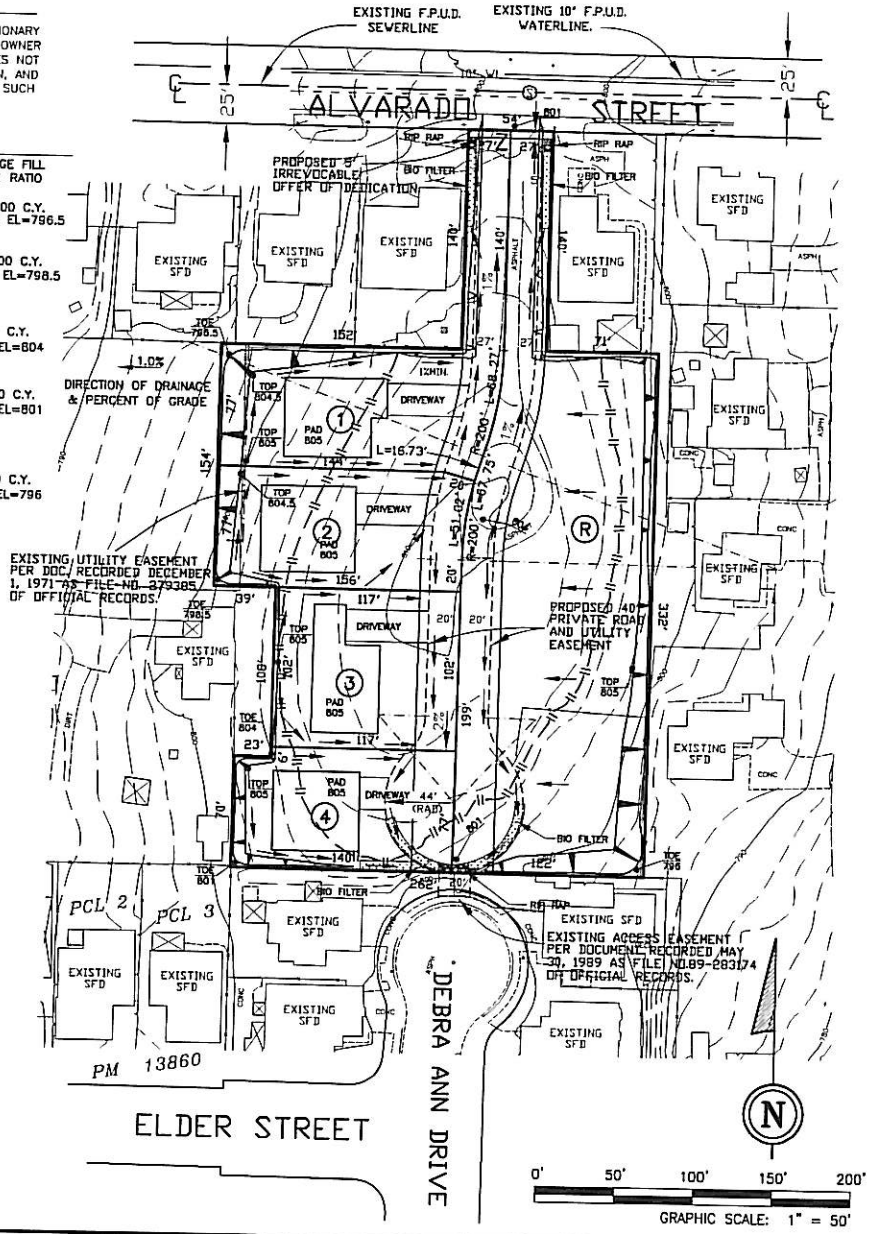
"THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY."

LEGEND

		YARDAGE QUANTITIES YARDAGE CUT 1.5:1 RATIO	YARDAGE FILL 2:1 RATIO
①	PARCEL 1 17,320 SQ. FT. GROSS 12,839 SQ. FT. NET	600 C.Y. TOP EL=805.0	800 C.Y. TOE EL=796.5
②	PARCEL 2 12,033 SQ. FT. GROSS 10,554 SQ. FT. NET	500 C.Y. TOP EL=805	700 C.Y. TOE EL=798.5
③	PARCEL 3 11,946 SQ. FT. GROSS 9,845 SQ. FT. NET	1000 C.Y. TOP EL=805	50 C.Y. TOE EL=804
④	PARCEL 4 10,604 SQ. FT. GROSS 7,796 SQ. FT. NET	200 C.Y. TOP EL=805	600 C.Y. TOE EL=801
Ⓡ	DESIGNATED REMAINDER PARCEL 42,551 SQ. FT. GROSS 31,678 SQ. FT. NET	1800 C.Y. TOP EL=805	500 C.Y. TOE EL=796







REPLACEMENT

TENTATIVE PARCEL MAP NO. 20948

LAND DIVISION STATEMENT – OWNER'S CERTIFICATE

I HEREBY CERTIFY THAT I AM THE RECORD OWNER, AS SHOWN ON THE LATEST EQUALIZED COUNTY ASSESSMENT OF THE PROPERTY SHOWN ON THE TENTATIVE PARCEL MAP. ALL OF MY CONTIGUOUS OWNERSHIP WITHIN AND BEYOND THE BOUNDARIES OF THE TENTATIVE PARCEL MAP IS SHOWN. THE BASIS OF CREATION OF THE LOTS IN MY OWNERSHIP (I.E. PARCEL MAP, FINAL MAP, CERTIFICATE OF COMPLIANCE, RECORDED DEED BEFORE 2/1/72) AS INDICATED ON THE TENTATIVE. I UNDERSTAND THAT PROPERTY IS CONSIDERED CONTIGUOUS EVEN IF IT IS SEPARATED BY ROADS, STREETS, UTILITY EASEMENTS OR RAILROAD RIGHTS-OF-WAY. "FREEWAY" AS DEFINED IN SECTION 23.5 OF THE STREETS AND HIGHWAY CODES, SHALL NOT BE CONSIDERED AS ROADS OR STREETS.

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I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT. EXECUTED THIS _____ DAY OF NOVEMBER, 2005, IN FALLBROOK, CALIFORNIA.

LAWRENCE C. BUTTS AND KAARLA E. BUTTS, DECLARATION OF TRUST — LAWRENCE C. BUTTS TRUSTEE

ADDRESS: 1508 BLACK WALNUT DRIVE
SAN MARCOS, CA 92078 — KAARLA E. BUTTS TRUSTEE

PHONE: (760) 803-1223

1. COMPLETE TAX ASSESSOR'S NUMBER: 105-513-92
2. ABBREVIATED LEGAL DESCRIPTION: A PORTION OF LOTS 7&8, TRACT 132 – SHIPLEY TRACT
3. GENERAL PLAN REGIONAL CATEGORY: COUNTRY TOWN
4. COMMUNITY/SUBREGIONAL PLAN AREA: FALLBROOK COMMUNITY PLAN
5. LAND USE DESIGNATION(S): (6) RESIDENTIAL
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9. TAX RATE AREA: 75002
10. ASSOCIATED PERMITS: N/A
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13. SEPTIC/SEWER DISTRICT: (SEWER) FALLBROOK PUBLIC UTILITY DISTRICT
14. FIRE DISTRICT: NORTH COUNTY FIRE PROTECTION DISTRICT
15. SCHOOL DISTRICT: FALLBROOK UNION ELEMENTARY AND FALLBROOK UNION HIGH SCHOOL

USE REGULATIONS	RS-7
NEIGHBORHOOD REGS	Q
DENSITY	7.25
LOT SIZE	6,000 SQ.FT.
BUILDING TYPE	C
MAX FIR AREA	–
FIR AREA RATIO	–
HEIGHT	G
COVERAGE	–
SETBACK	J
OPEN SPACE	–
SPECIAL AREA REGS	–

LAWRENCE C. BUTTS TRUSTEE
ADDRESS: 1508 BLACK WALNUT DR.
SAN MARCOS, CA 92078
PHONE: (760) 803-1223

HADLEY JOHNSON RCE 14870
PREPARED BY:
WM. KARN SURVEYING INC.
129 WEST FIG ST.
FALLBROOK, CA 92028
760-728-1134
LS 2961/RCE 14870

I:\8501B\REPLACEMENT#2 PRELIM_GP

ATTACHMENT E

BMP DATASHEET

BUTTS TPM
HYDRAULIC CALCULATIONS

PRE CONSTRUCTION

Area 1.0 acres Westerly portion TPM
Soil Group C
Watershed Length 200'
Watershed Height 25'

S = 12%

1 du/ac

C = 0.36

Q_{85} = 0.36(1.6)(1.0) Tc = 1.0 + 6.4

Q_{85} = 0.58 cfs Tc = 7.4

Q_{100} = 0.36(6.2)(1.0) I85 = 1.6 in/hr

Q_{100} = 2.2 cfs I100 = 6.2 in/hr

POST CONSTRUCTION

Watershed Length = 400
Watershed Height = 5'

S = 1.25%

7.3 du/ac

C = 0.55

Tc = 4 + 7.4
Tc = 11.4

I_{85}% = 1.33 in/hr
I_{100} = 4.9 in/hr
$Q_{85\%}$ = 0.55(1.3)(1.0)
$Q_{85\%}$ = 0.72 cfs
Q_{100} = 0.55(4.9)(~~1.9~~ 1.0
Q_{100} = 2.7 cfs

Increase Flow
Q_{85} = 0.1 cfs
Q_{100} = 0.5 cfs

Increase flow will be mitigated by grass lined swale

Area Easterly Portion TPM 20948 RPL[1]
Area = 1.1 acs.

PRE CONSTRUCTION

Watershed L= 200'
Watershed H = 15'

S = 7%

Soil Group C

1 du/ac

C = 0.36

Tc = 1.2 + 7
Tc = 8.2 mins.

$I_{85\%} = 1.6$
$I_{100} = 6.0$

$Q_{85} = 0.36(1.6)(1.1)$
$Q_{85} = 0.63$ cfs

$Q_{100} = 0.36(6.0)(1.1)$
$Q_{100} = 2.4$ cfs

POST CONSTRUCTION

Watershed L = 300
Watershed H = 5'

S = 2%

Soil Group C

Future 7.3 du/ac

C = 0.55

Tc = 3 + 7.4
Tc = 10.7

$Q_{85} = 0.55(1.3)(1.1)$
$Q_{85} = 0.79$ cfs

$Q_{100} = 0.55(5.0)(1.1)$
$Q_{100} = 3.0$ cfs

Increase Flow
$Q_{85} = 0.16$ cfs
$Q_{100} = 0.6$ cfs

Increase flow will be mitigated by grass lined swale

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

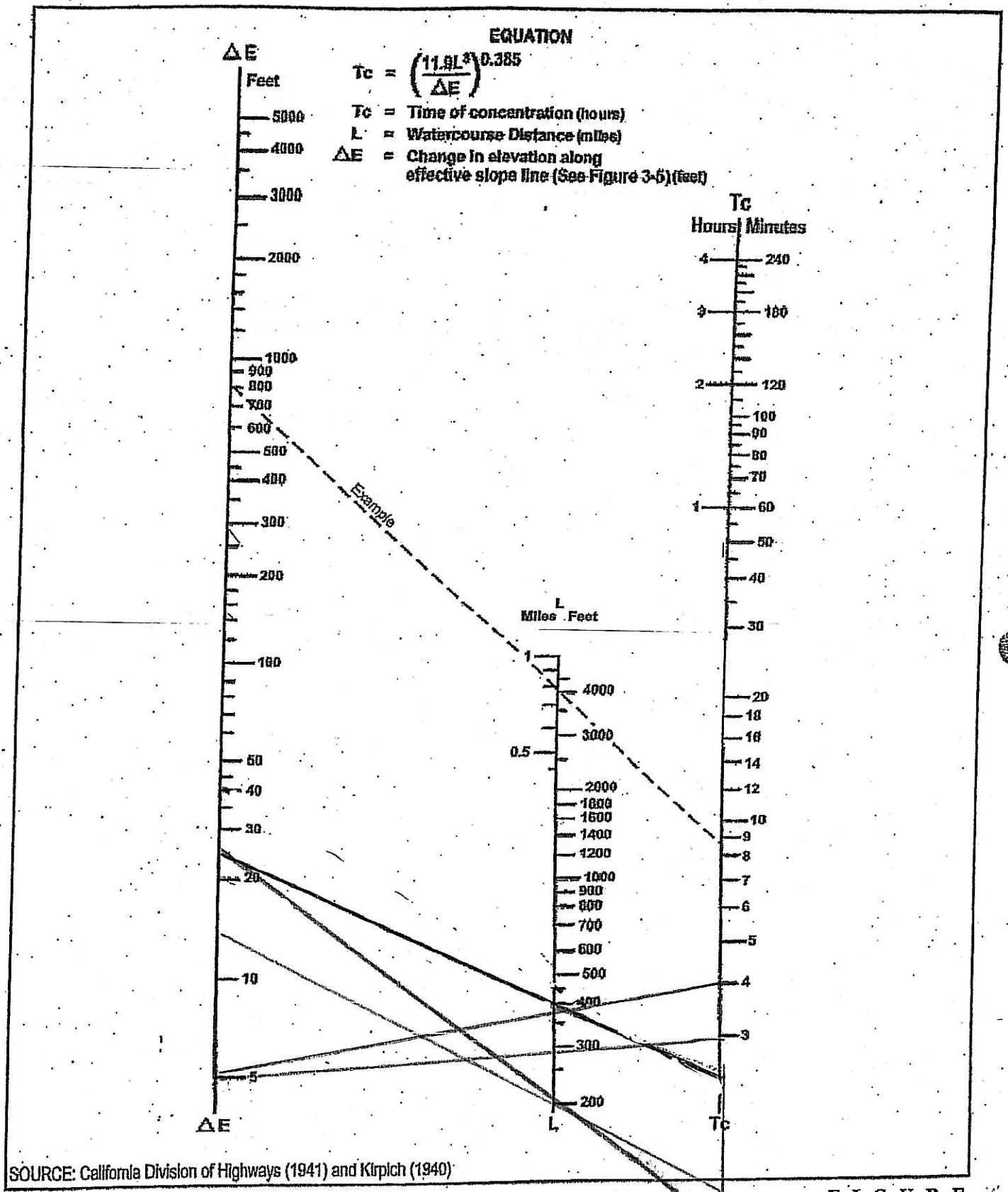
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE 3-4

Nomograph for Determination of Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

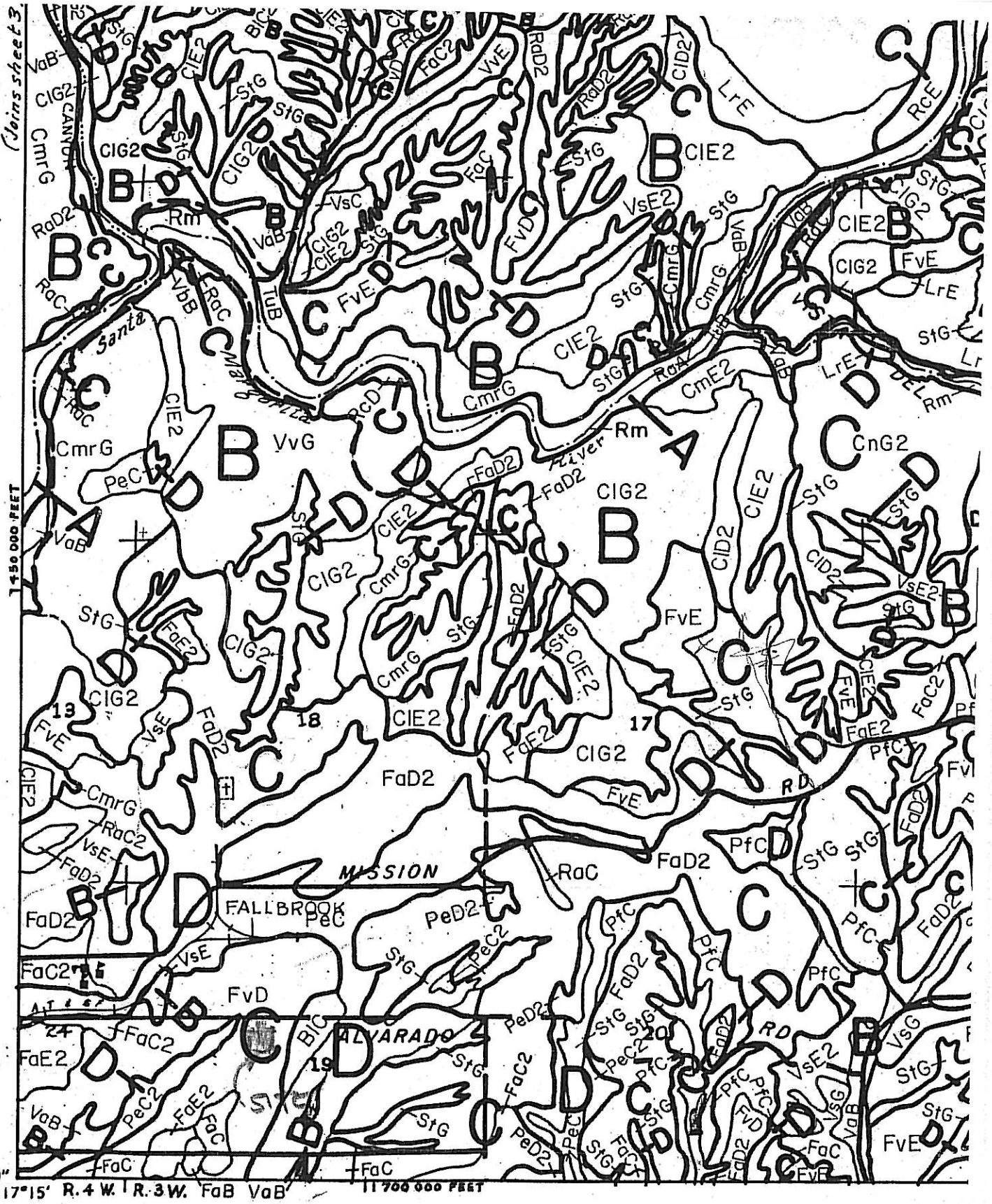
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description



San Diego County Soils Interpretation Stud

HYDROLOGIC SOIL GROUPS - Runoff Poten

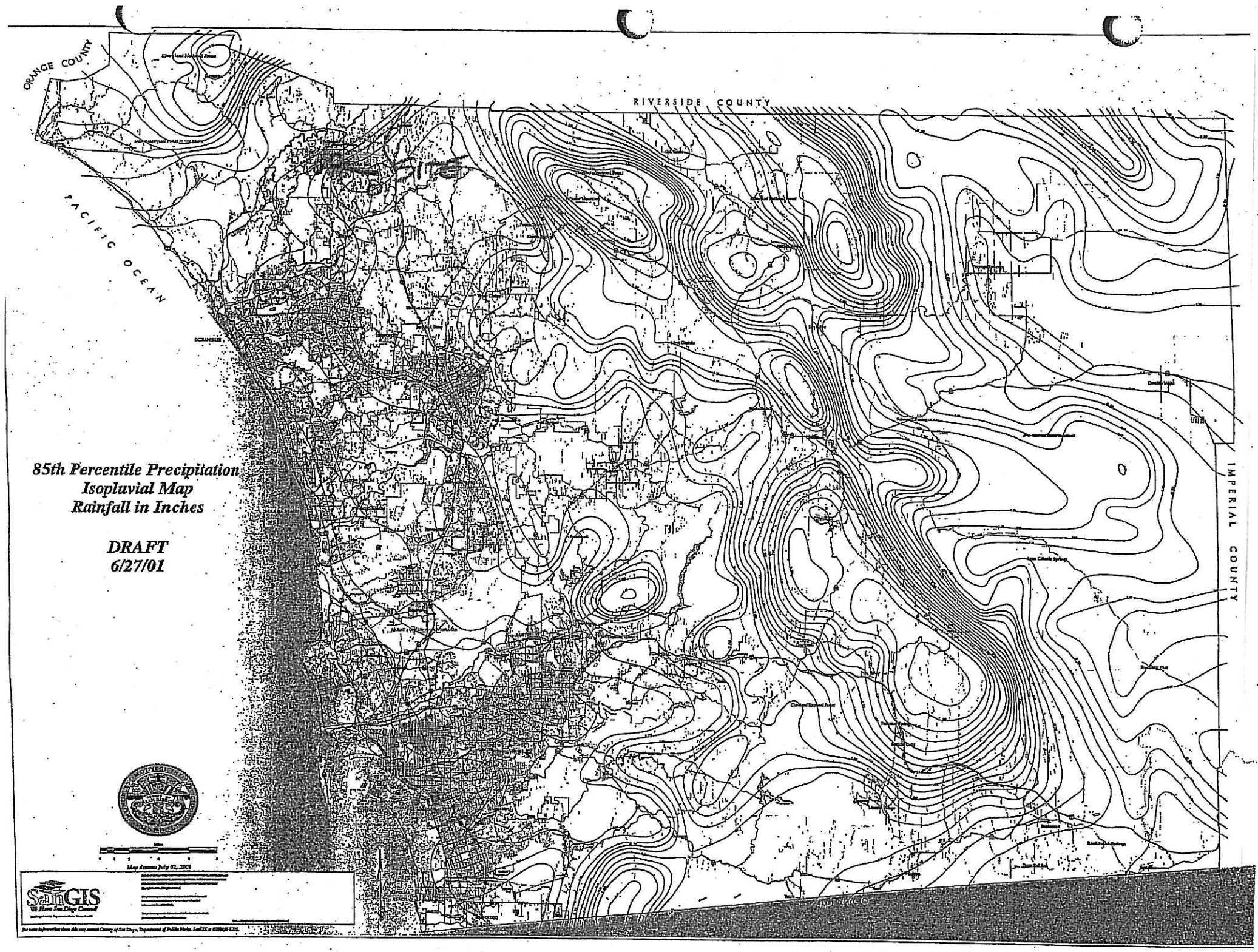
Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

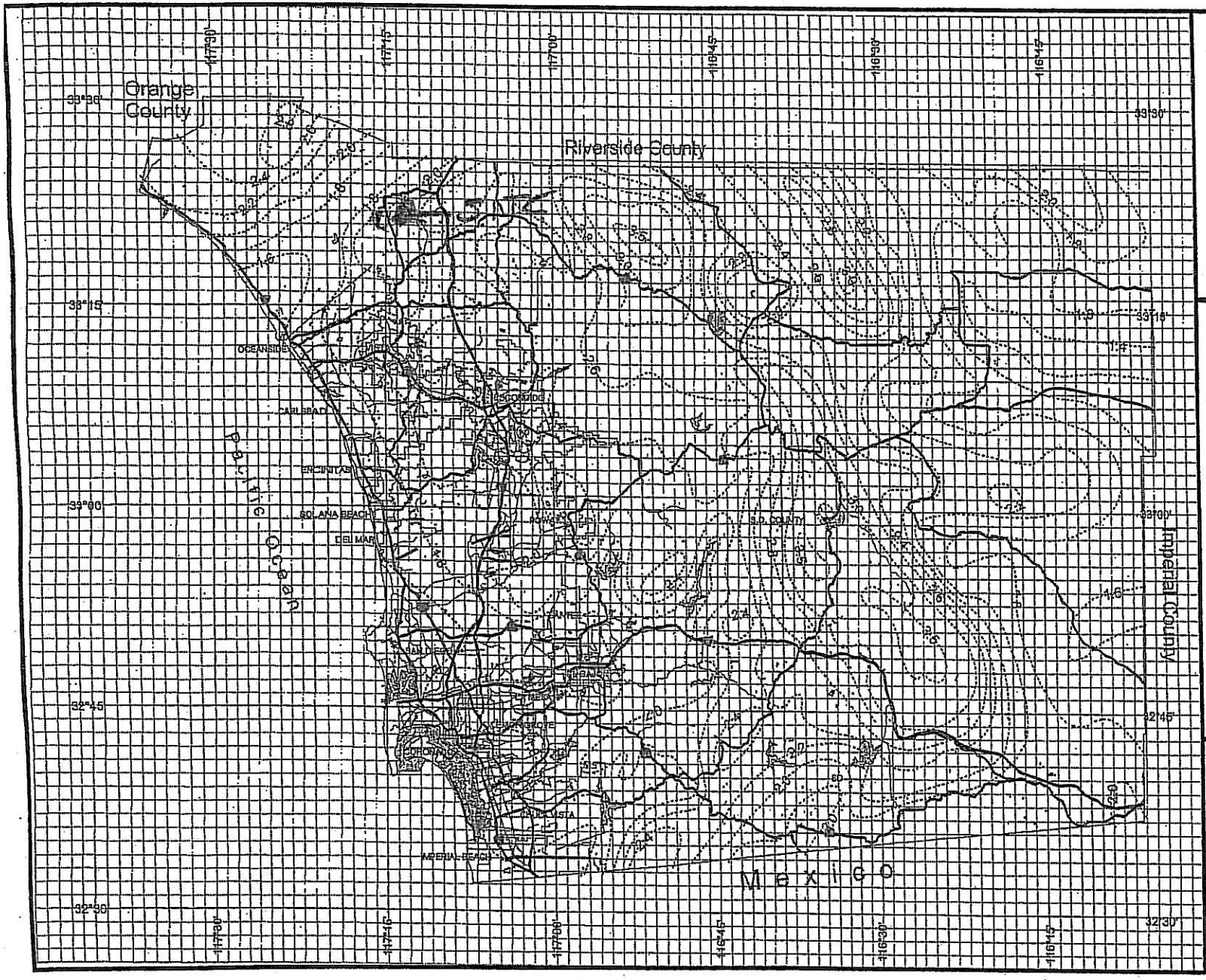
Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre

NRCS = National Resources Conservation Service


ORANGE COUNTY
RIVERSIDE COUNTY
PACIFIC OCEAN
IMPERIAL COUNTY
85th Percentile Precipitation
Isopluvial Map
Rainfall in Inches
DRAFT
6/27/01
SanGIS



County of San Diego Hydrology Manual

Rainfall Isopluvials

10 Year Rainfall Event - 6 Hours

Isopluvial (Inches)

DPW GIS
Department of Public Works Geographic Information Services

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We Have San Diego Covered

N
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3 0 3 Miles

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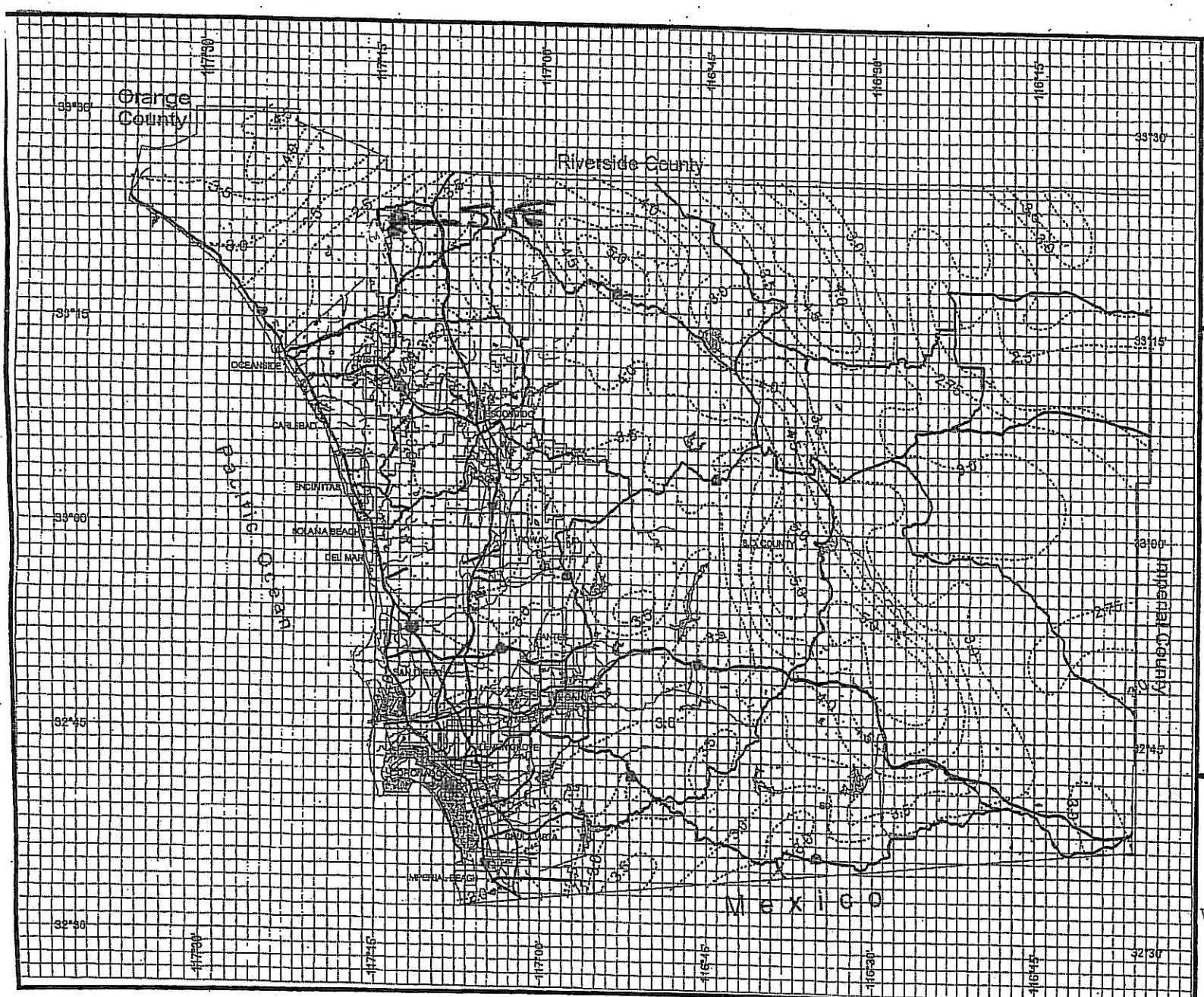

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (Inches)

DPW GIS

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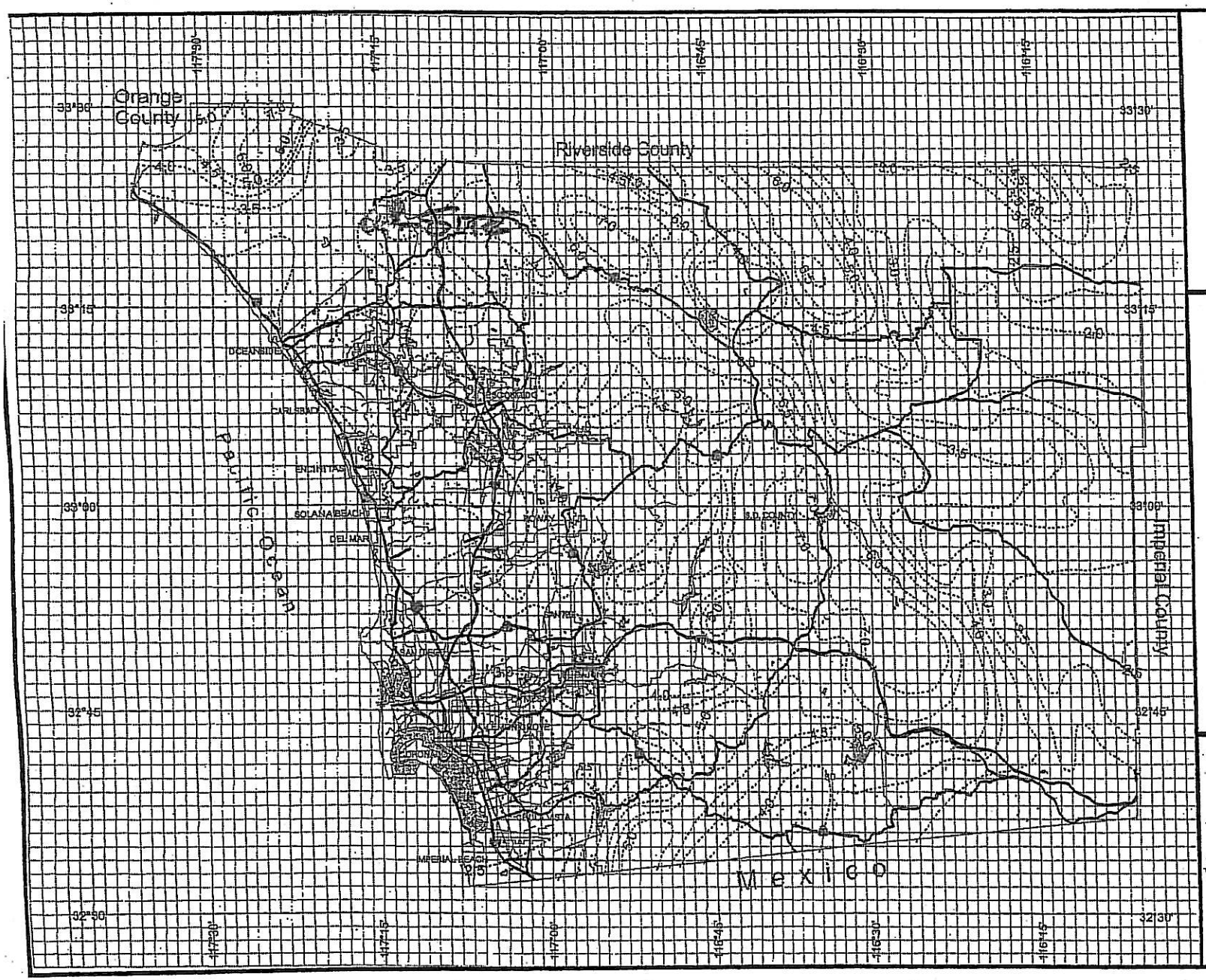

County of San Diego Hydrology Manual

Rainfall Isopluvials

10 Year Rainfall Event - 24 Hours

Isopluvial (Inches)

DPW GIS
Department of Public Works Geographic Information Services

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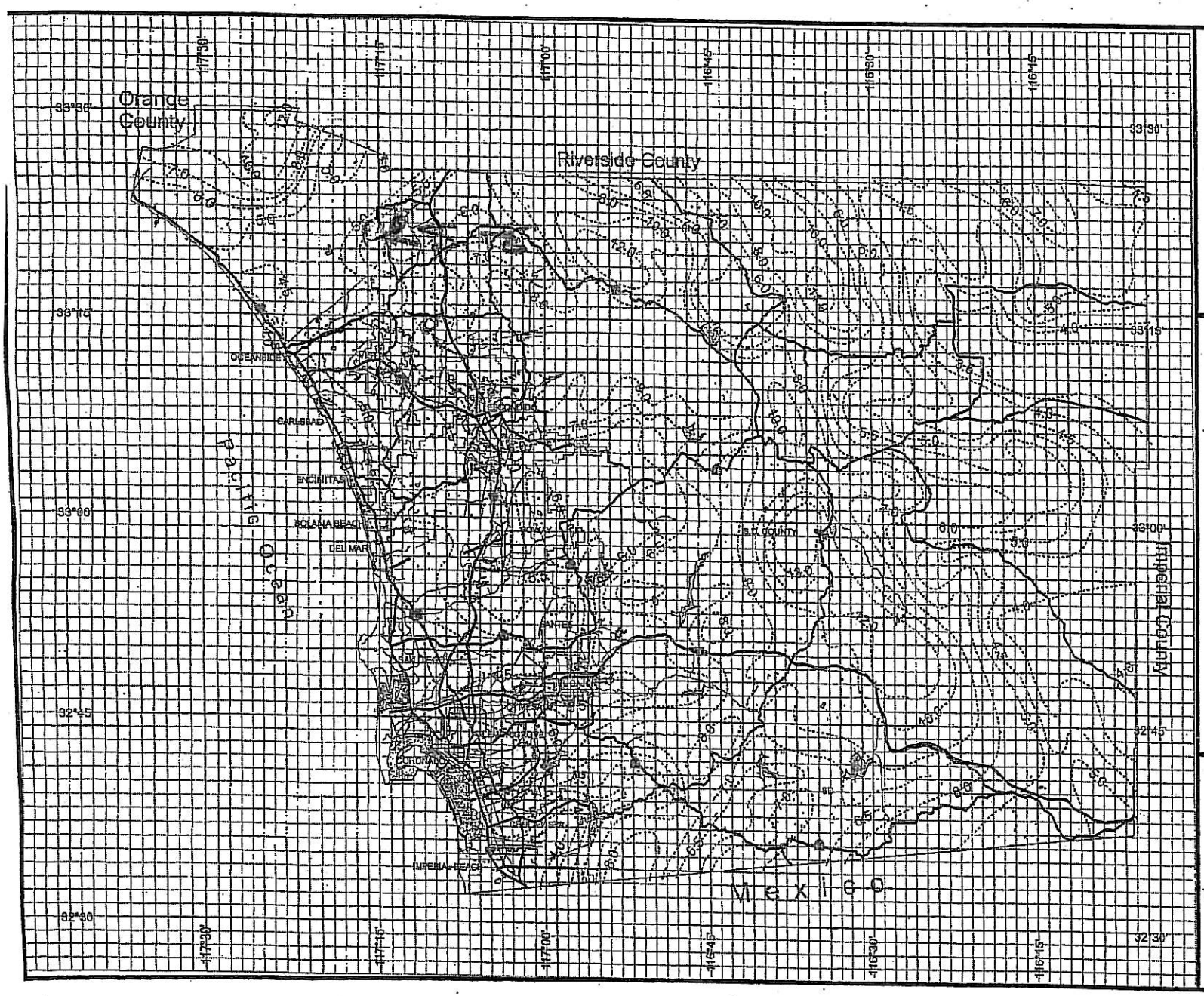

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

DPW GIS

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N
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3 0 3 Miles

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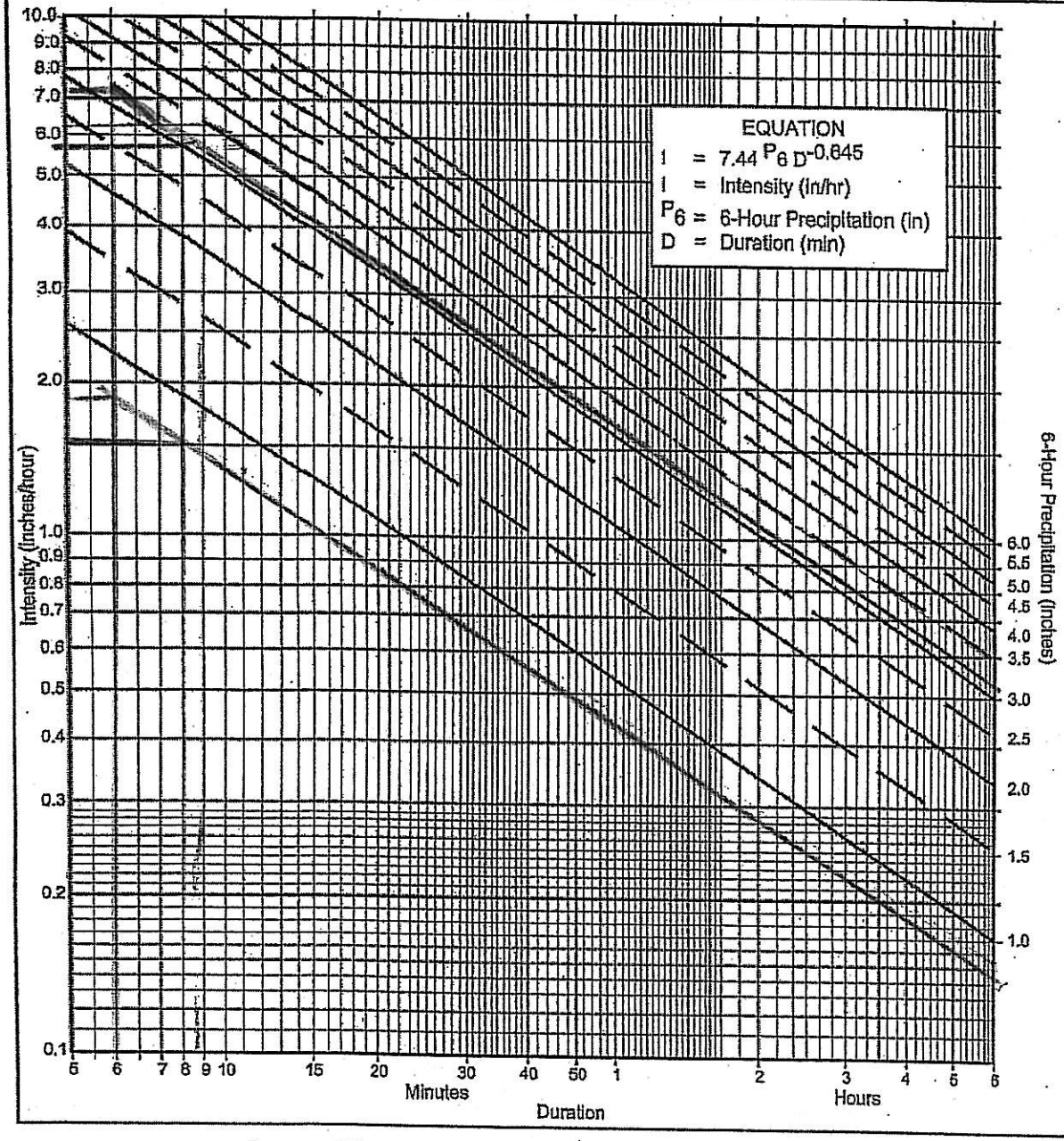

Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

85TH PERCENTILE = 0.75in/HR

Application Form:

(a) Selected frequency 10/100 year

(b) P_6 = 2.2/3.2 in., P_{24} = 4.5/6.0, $\frac{P_6}{P_{24}}$ = 49/53 %(2)

(c) Adjusted P_6(2) = 2.2/3.2 in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE
3-1

ATTACHMENT F

OPERATION AND MAINTENANCE PROGRAM FOR TREATMENT BMP

APPENDIX H Estimated O & M Costs for BMP Project

Estimated Values derived from Caltrans Pilot BMP Study. This spreadsheet will change as additional data becomes available.

						Labor			Equipment				Materials		Total	Comments
BIOFILTER – STRIPS and SWALES						Per. Hrs	Rate	Cost	Type	Days	rate	Cost	Item	Cost	Cost	
Preventive Maintenance and Routine Inspections																
ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS											
Height of vegetation	Average vegetation height exceeds 12 inches, emergence of trees, or woody vegetation	Visual inspection of vegetation throughout strip/swale	Once during wet season, once during dry season.(depending on growth)	Cut vegetation to an average height of 6 inches	Remove any trees, or woody vegetation.	10	43.63	436.3	one-ton truck & hydroseeder	2	26.84	53.68	string trimmer, rake, fork, bags, safety equipment	50	539.98	
Assess adequate vegetative cover	Less than 90 percent coverage in strip invert/swale or less than 70 percent on swale side slope	Visual inspection of strip/swale. Prepare a site schematic to record location and distribution of barren or browning spots to be restored. File the schematic for assessment of persistent problems.	Assess quantity needed in May each year late wet season and late dry season.	Reseed/revegetate barren spots by Nov.		8	43.63	349.04	one-ton truck & hydroseeder	1	48.15	48.15	seed	150	547.19	
				Scarify area to be restored, to a depth of 2-inches. Restore side slope coverage with hydroseed mixture.		0	43.63	0	one-ton truck & hydroseeder	0	26.84	0			0	
Inspect for debris accumulation	Debris or litter present	Visual observation	During routine trashing, per Districts schedule.	If after 2 applications (2 seasons) of reseeding/revegetating and growth is unsuccessful both times, an erosion blanket or equivalent protection will be installed over eroding areas		0	43.63	0	one-ton truck & hydroseeder	0	26.84	0	blanket	0	0	
				Remove litter, and debris.	None	0	0	0	one-ton truck & hydroseeder	0	0	0			0	
Inspect for accumulated sediment	Sediment at or near vegetation height, channeling of flow, inhibited flow due to change in slope.	Visual observation	Annually	Remove sediment. If flow is channeled, determine cause and take corrective action. If sediment becomes deep enough to change the flow gradient, remove sediment during dry season, characterize and properly dispose of sediment, and revegetate.		16	43.63	698.08	one-ton truck & hydroseeder	1	48.15	48.15	seed, testing and disposal of sediment	300	1046.23	once every three years
Inspect for burrows	Burrows, holes, mounds	Visual observation	Annually and after vegetation trimming.	Notify engineer to determine if regrading is necessary. If necessary, regrade to design specification and revegetate swale/strip. If regrading is necessary, the process should start in May. Revegetate strip/swale in Nov. Target completion prior to wet season.	None	2	43.63	87.26				0			87.26	
				Where burrows cause seepage, erosion and leakage, backfill firmly.		0	0	0	one-ton truck & hydroseeder	0	26.84	0			0	
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees, woody vegetation, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season.	Corrective action prior to wet season. Consult engineer if an immediate solution is not evident.	Remove any trees, or woody vegetation.	16	43.63	698.08	one-ton truck & hydroseeder	2	26.84	53.68			751.76	
TOTAL BIOFILTER AND SWALES						52		2288.76				203.66		500	2972.42	

ATTACHMENT G

CERTIFICATION SHEET

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Hadley Johnson
REGISTERED CIVIL ENGINEER

DATE