Appendix Table of Contents

Appendix A

San Diego County

Invasive Plant List

Undesirable Plant List

Acceptable Plants for a Defensible Space In Fire Prone Areas

INVASIVE PLANT LIST

The following species are considered invasive (i.e., those capable of reproducing and spreading into native, non-irrigated areas and displacing those communities). Non-native plant species are prohibited in all areas adjacent to open space lands. Noxious weeds that have been introduced to San Diego County over the years tend to be more widespread and therefore more difficult to contain. The plants listed below have been identified as invasive and/or as noxious weeds and should not be planted or allowed to sprout in any transitional landscapes (landscapes planted with non-native species next to undeveloped areas).

BOTANICAL NAME	COMMON NAME
Ailanthus altissima	Tree of Heaven
*Anthemis cotula****	Mayweed, Stinking Chamolile
Arctotheca calendola	Cape Weed
Arundo donax	Giant Cane
Atriplex semibaccata	Australian Saltbush
*Brassica species****	Mustard
*Cardaria draba****	Hoary Cress, Perennial Peppergrass
Carpobrotus edulis	Ice Plant
Centaurea solstitialis	Yellow Starthistle
*Cirsium vulgare****	Wild Artichoke
Conium maculatum	Poison Hemlock
*Conyza Canadensis****	Horseweed
Cortaderia selloana	Pampas Grass
Cotoneaster lacteus	Cotoneaster
Cupressus macrocarpa	Monterey Cypress
*Cynara cardunculus****	Artichoke Thistle
Cytisus species	Scotch Broom, French Broom, etc
Elaeagnus angustifolia	Russian Olive
Eucalyptus globulus	Eucalyptus Blue Gum
*Gensita species****	Broom
Hedera helix	English Ivy
Hypericum perforatum	St. John's Wort
Ilex aquifolium	English Holly
*Lactuca serriola****	Prickly Lettuce
Lepidium latifolium	Perennial Pepperweed
Myoporum parvifolium	Trailing Myoporum
Nerium oleander	Oleander
Nicotiana species	Tree Tobacco
Olea europaea	Olive
Pennisetum setaceum	Fountain Grass
Ricinus communis	Castor Bean
Robinia pseudoacacia	Black Locust
*Salsola australis****	Russian Thistle, Tumbleweed
Schinus molle	California Pepper
Schinus terebinthifolius	Brazilian Pepper
*Silybum marianum****	Milk Thistle
Spartium junceum	Spanish Broom

Tamarix species	Tamarisk
*Ulex europea****	Gorse
Vinca major	Periwinkle

*** Introduced Weeds to San Diego County

References: Bell, Carl, Regional Advisor – Invasive Plants. 2004. University of California Cooperative Extension.

California Exotic Pest Plant Council. October, 1999. Exotic Pest Plants of Greatest Ecological Concern in California. Most Invasive Wildland Pest Plants. www.caleppc.org/info/99lista.html.

UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

BOTANICAL NAME	COMMON NAME
Abies species	Fir Trees
Acacia species	Acacia (trees, shrubs, groundcovers)
*Adenostoma sparsifolium***	Red Shanks
*Adenostoma fasciculatum***	Chamise
Agonis juniperina	Juniper Myrtle
Araucaria species	Monkey Puzzle, Norfolk Island Pine
*Artemesia californica***	California Sagebrush
Bambusa species	Bamboo
Cedrus species	Cedar
Chamaecyparis species	False Cypress
Coprosma pumila	Prostrate Coprosma
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leylandii Cypress
*Cupressus forbesii***	Tecate Cypress
Cupressus glabra	Arizona Cypress
Cupressus sempervirens	Italian Cypress
Dodonea viscosa	Hopseed Bush
*Eriogonum fasciculatum***	Common Buckwheat
Eucalyptus species	Eucalyptus
*Heterotheca grandiflora***	Telegraph Plant
Juniperus species	Junipers
Larix species	Larch
Lonicera japonica	Japanese Honeysuckle
Miscanthus species	Eulalia Grass
*Muehlenbergia species***	Deer Grass
Palmae species	Palms
Picea species	Spruce Trees
*Pickeringia Montana***	Chaparral Pea
Pinus species	Pines
Podocarpus species	Fern Pine
Pseudotsuga menziesii	Douglas Fir
Rosmarinus species	Rosemary
*Salvia mellifera***	Black Sage
Taxodium species	Cypress
Taxus species	Yew
Thuja species	Arborvitae
Tsuga species	Hemlock
*Urtica urens***	Burning Nettle

** San Diego County native species

References: Gordon, H. White, T.C. 1994. Ecological Guide to Southern California Chaparral Plant Series. Cleveland National Forest.

Willis, E. 1997. San Diego County Fire Chief's Association. Wildland/Urban Interface Development Standards

City of Oceanside, California. 1995. Vegetation Management. Landscape Development Manual. Community Services Department, Engineering Division.

City of Vista, California 1997. Undesirable Plants. Section 18.56.999. Landscaping Design, Development and Maintenance Standards.

www.bewaterwise.com. 2004. Fire-resistant California Friendly Plants.

www.ucfpl.ucop.edu. 2004. University of California, Berkeley, Forest Products Laboratory, College of Natural Resources. Defensible Space Landscaping in the Urban/Wildland Interface. A Compilation of Fire Performance Ratings of Residential Landscape Plants.

County of Los Angeles Fire Department. 1998. Fuel Modification Plan Guidelines. Appendix I, Undesirable Plant List, and Appendix II, Undesirable Plant List.

Heteromeles arbutifolia**	Ashy Silktassel	I/M
Lantana spp.	Toyon	C/I/M
Lotus scoparius	Lantana	C/I/D
Mahonia spp.	Deerweed	C/I
	Barberry	C/I/M
Malacothamnus		
clementinus		
	San Clemente Island Bush Mallow	C
fasciculatus**		
	Mesa Bushmallow	C/I
Melaleuca spp.		
Mimulus spp.**	Melaleuca	C/I/D
Nolina	Monkeyflower	C/I (R)
parryi		
parryi ssp. wolfii	Parry's Nolina	I
Photinia spp.	Wolf's Bear Grass	D
Pittosporum	Photinia	All Zones
crassifolium		
rhombifolium		CI/I
tobira 'Wheeleri'	Queensland Pittosporum	C/I
undulatum	Wheeler's Dwarf	C/I/D
viridiflorum	Victorian Box	C/I
Plumbago auriculata	Cape Pittosporum	C/I
Prunus	Cape Plumbago	C/I/D
caroliniana		
ilicifolia**	Carolina Laurel Cherry	C
lyonii**	Hollyleaf Cherry	C
Puncia granatum	Catalina Cherry	C
Pyracantha spp.	Pomegranate	C/I/D
Quercus	Firethorn	All Zones
dumosa**		
Rhamus	Scrub Oak	C/I
alaternus		
californica**	Italian Blackthorn	C/I
Rhaphiolepis spp.	Coffeeberry	C/I/M
Rhus	Rhaphiolepis	C/I/D
integrifolia**		
laurina	Lemonade Berry	C/I
lentii	Laurel Sumac	C/I
ovata**	Pink-Flowering Sumac	C/D
trilobata**	Sugarbush	I/M
Ribes	squawbush	I
viburnifolium		
speciosum**	Evergreen Currant	C/I
Romneya coulteri	Fuschia-Flowering Gooseberry	C/I/D
Rosa	Matilija Poppy	I
californica**		
minutifolia		

SHRUBS

Agave	Century Plant	D
americana	Century Plant	D
deserti	Shawis Century Plant	D
shawi**		
Amorpha fruticosa**	False Indigobush	I
Arbutus		
menziesii**	Madrone	C/I
Arctostaphylos spp.**	Manzanita	C/I/D
Atriplex**		
canescens	Hoary Saltbush	I
lentiformis	Quail Saltbush	D
Baccharis**		
glutinosa	Mule Fat	C/I
pilularis	Coyote Bush	C/I/D
Carissa grandiflora	Natal Plum	C/I
Ceanothus spp.**	California Lilac	C/I/M
Cistus spp.	Rockrose	C/I/D
Cneoridium dumosum**	Bushrue	C
Comarostaphylis**		
diversifolia	Summer Holly	C
Convolvulus cneorum	Bush Morning Glory	C/I/M
Dalea		
orcuttii	Orcutt's Delea	D
spinosa**	Smoke Tree	I/D
Elaeagnus		
pungens	Silverberry	C/I/M
Encelia**		
californica	Coast Sunflower	C/I
farinose	White Brittlebush	D/I
Eriobotrya		
deflexa	Bronze Loquat	C/I
Eriophyllum		
confertiflorum**	Golden Yarrow	C/I
staechadifolium	Lizard Tail	C
Escallonia spp.	Escallonia	C/I
Feijoa sellowiana	Pineapple Guava	C/I/D
Fouqueria splendens	Ocotillo	D
Fremontodendron**		
californicum	Flannelbush	I/M
mexicanum	Southern Flannelbush	I
Galvezia		
juncea	Baja Bush-Snapdragon	C
speciosa	Island Bush-Snapdragon	C
Garrya		
elliptica	Coast Silktassel	C/I
flavescens**	Ashy Silktassel	I/M

vera	Pistachio Nut	I
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Populus		
alba	White Poplar	D/M
fremontii**	Western Cottonwood	I
trichocarpa	Black Cottonwood	I/M
Prunus		
xblireiana	Flowering Plum	M
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
serrulata 'Kwanzan'	Flowering Cherry	M
yedoensis 'Akebono'	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I
engelmannii	Engelmann Oak	I
** suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

BOTANICAL NAME	COMMON NAME	Climate Zone
TREES		
Acer		
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brahea		
armata	Blue Hesper Palm	C/D
edulis	Guadalupe Palm	C/D
Ceratonia siliqua	Carob	C/I/D
Cerdidium floridum	Blue Palo Verde	D
Cercis occidentalis**	Western Redbud	C/I/M
Cornus		
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Eriobotrya		C/I/D
japonica	Loquat	C
Erythrina caffra	Kaffirboom Coral Tree	I/M
Gingko biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M
Gleditisia triacanthos	Honey Locust	
Juglans		I
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Lagerstroemia indica	Crape Myrtle	I
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	I
Liriodendron tulipifera	Tulip Tree	
Lyonothamnus floribundus		C
ssp. Asplenifolius	Fernleaf Catalina Ironwood	C/I/D
Melaleuca spp.	Melaleuca	C/I
Parkinsonia aculeate	Mexican Palo Verde	
Pistacia	Chinese Pistache	
chinensis	Pistachio Nut	C/I/D

Salvia spp.**	California Wild Rose	C/I
Sambucus spp.**	Baja California Wild Rose	C/I
Symphoricarpos mollis**	Sage	All Zones
Syringa vulgaris	Elderberry	C/I/M
Tecomaria capensis	Creeping Snowberry	C/I
Teucrium fruticans	Lilac	M
Toxicodendron**	Cape Honeysuckle	C/I/D
diversilobum	Bush Germander	C/I
Verbena		
lilacina	Poison Oak	I/M
Xylosma congestum		
Yucca**	Lilac Verbena	C
schidigera	Shiny Xylosma	C/I
whipplei		
	Mojave Yucca	D
	Foothill Yucca	I

VINES

Antigonon leptopus	San Miguel Coral Vine	C/I
Distictis buccinatoria	Blood-Red Trumpet Vine	C/I/D
Keckiella cordifolia**	Heart-Leaved Penstemon	C/I
Lonicera		
japonica 'Halliana'	Hall's Honeysuckle	All Zones
subspicata**	Chaparral Honeysuckle	C/I
Solanum		
jasminoides	Potato Vine	C/I/D

PERENNIALS

Coreopsis		
gigantean	Giant Coreopsis	C
grandiflora	Coreopsis	All Zones
maritime	Sea Dahlia	C
verticillata	Coreopsis	C/I
Heuchera maxima	Island Coral Bells	C/I
Iris douglasiana**	Douglas Iris	C/M
Iva hayesiana**	Poverty Weed	C/I
Kniphofia uvaria	Red-Hot Poker	C/M
Lavandula spp.	Lavender	All Zones
Limonium californicum		
var. mexicanum	Coastal Statice	C
perezii	Sea Lavender	C/I
Oenothera spp.	Primrose	C/I/M
Penstemon spp.**	Penstemon	C/I/D
Satureja douglasii	Yerba Buena	C/I
Sisyrinchium		
bellum	Blue-Eyed Grass	C/I
californicum	Golden-Eyed Grass	C
Solanum		
xantii	Purple Nightshade	C/I
Zauschneria**		
californica	California Fuschia	C/I
cana	Hoary California Fuschia	C/I
'Catalina'	Catalina Fuschia	C/I

ANNUALS

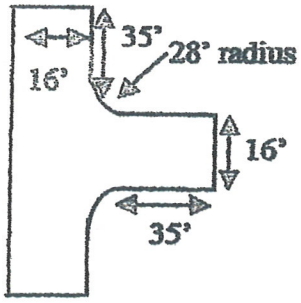
Lupinus spp.**	Lupine	C/I/M

GROUNDCOVERS

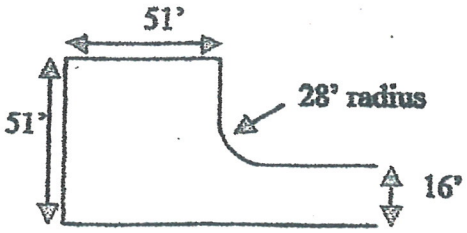
Achillea**	Yarrow	All Zones
Aptenia cordifolia	Apteria	C
Arctostaphylos spp.**	Manzanita	C/I/D
Baccharis**		
pilularis	Coyote Bush	C/I/D
Ceanothus spp.**	California Lilac	C/I/M
Cerastium tomentosum	Snow-in-Summer	All Zones
Coprosma kirkii	Creeping Coprosma	C/I/D
Cotoneaster spp.	Redberry	All Zones
Drosanthemum hispidum	Rosea Ice Plant	C/I
Dudleya		
brittonii	Brittonis Chalk Dudleya	C
pulverulenta**	Chalk Dudleya	C/I
virens	Island Live Fore-ever	C
Eschscholzia californica**	California Poppy	All Zones
Euonymus fortunei		
'Carrierei'	Glossy Winter Creeper	M
'Coloratus'	Purple-Leaf Winter Creeper	M
Ferocactus viridescens**	Coast Barrel Cactus	C
Gaillardia grandiflora	Blanket Flower	All Zones
Gazania spp.	Gazania	C/I
Helianthemum spp.**	Sunrose	All Zones
Lantana spp.	Lantana	C/I/D
Lasthenia		
californica**	Common Goldfields	I
glabrata	Coastal Goldfields	C
Lupinus spp.**	Lupine	C/I/M
Myoporum spp.	Myoporum	C/I
Pyracantha spp.	Firethorn	All zones
Rosmarinus officinalis	Rosemary	C/I/D
Santolina		
chamaecyparissus	Lavender Cotton	All Zones
virens	Santolina	All Zones
Trifolium frageriferum	O'Connor's Legume	C/I
Verbena		
rigida	Verbena	All Zones
Viguiera laciniata**	San Diego Sunflower	C/I
Vinca		
minor	Dwarf Periwinkle	M

Appendix B

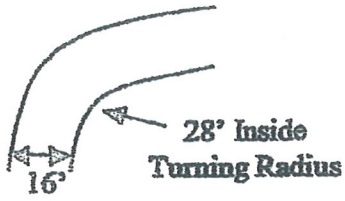
Fire Apparatus Turnaround Configurations



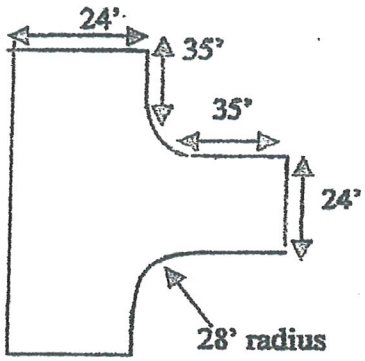
Private Driveway
Hammerhead



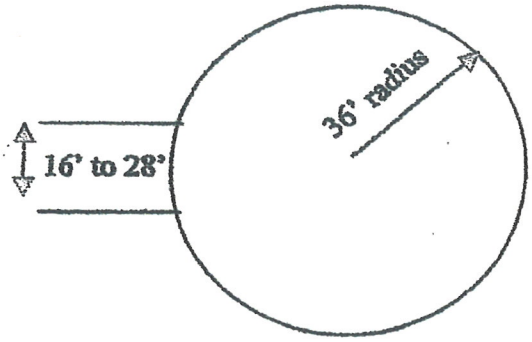
Alternate Private
Driveway Hammerhead

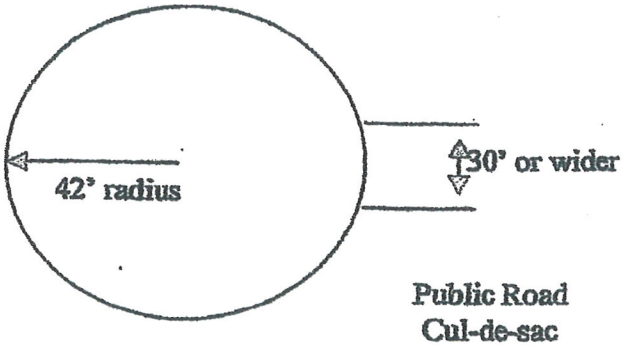


Private Road or
Driveway Cul-de-sac

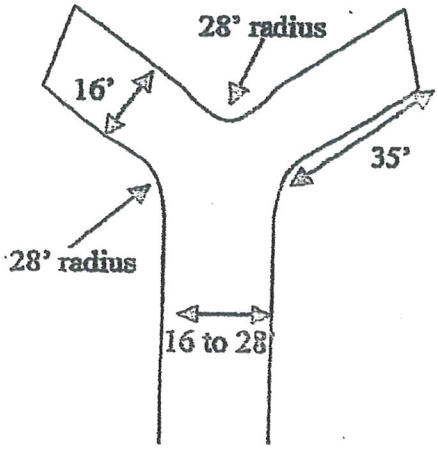


Private Road
Hammerhead

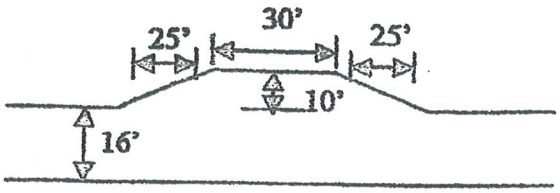




Public Road
Cul-de-sac



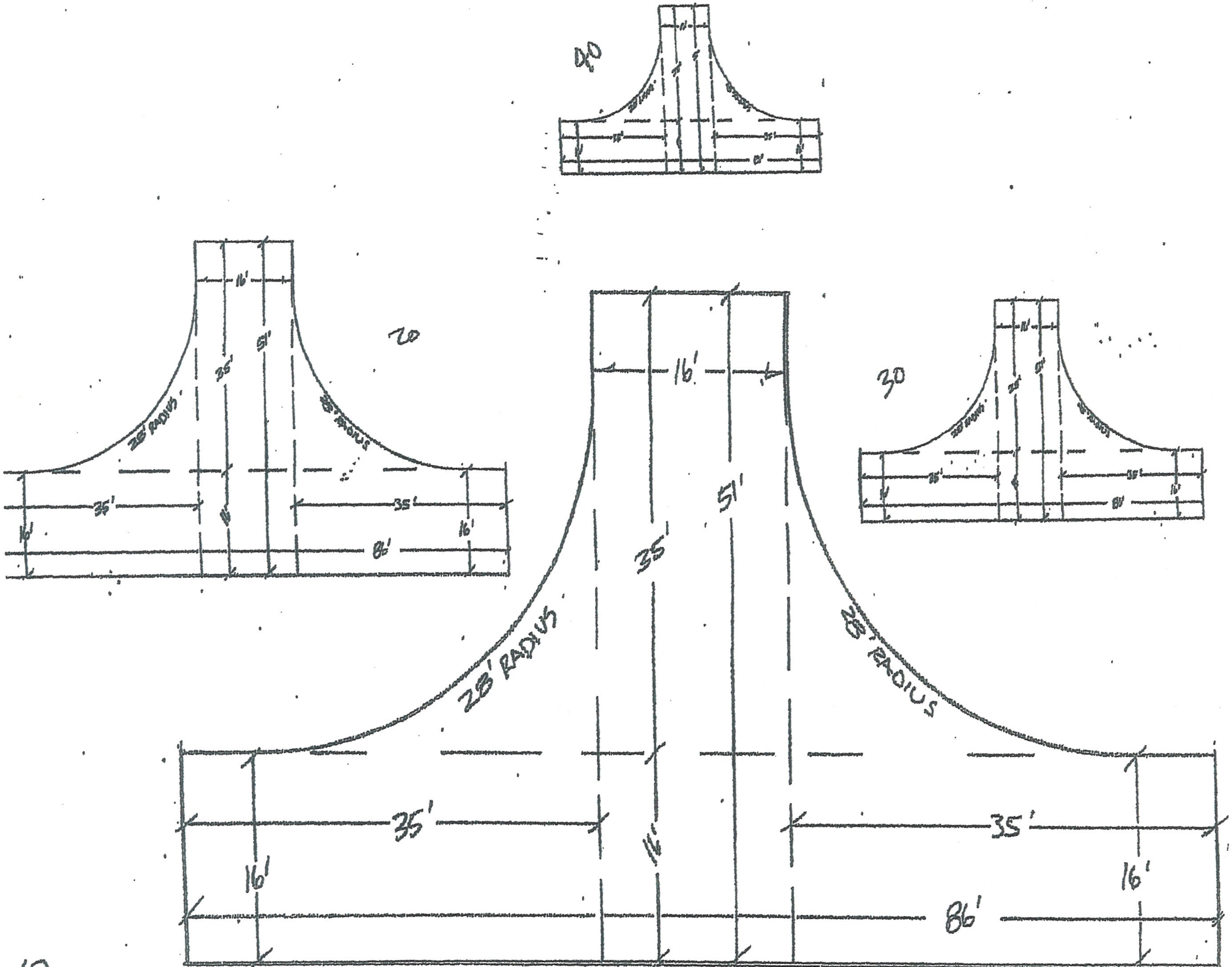
Hammerhead Incorporating Radius



Turnout—Required for driveways
In excess of 300-400'

NOT TO SCALE

(OVER)


40
20
16'
35'
51'
28' RADIUS
28' RADIUS
35'
11'
35'
16'
16'
86'
30
16'
51'
35'
28' RADIUS
28' RADIUS
35'
11'
35'
16'
16'
86'

10

Appendix C

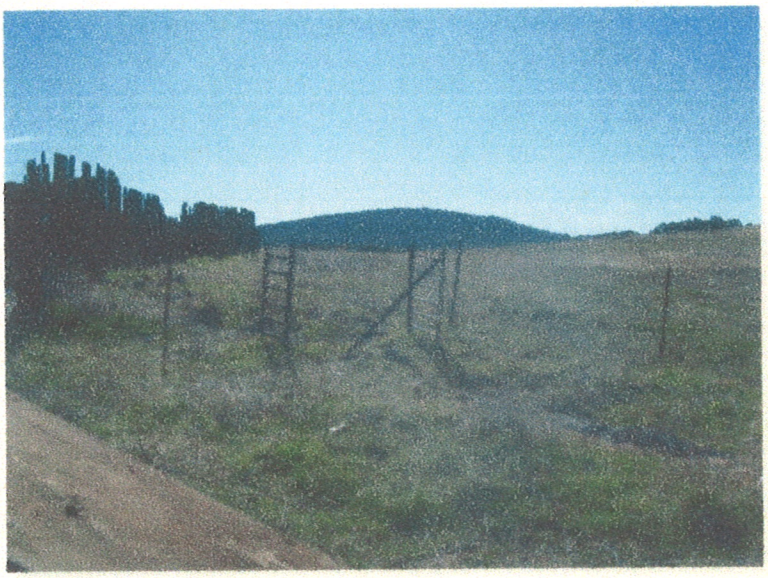
Photos

East side central area

South west side

Southern end

East side



southeast side

West centralside

Northern end

Northern end

North end of property

Central area

South end of property

Appendix D

Behaveplus 4.0.0 Fire Model

Inputs: SURFACE. SPOT

Description		Hosking Ranch
Fuel/Vegetation, Surface/Understory		
Fuel Model		sh5
Fuel/Vegetation, Overstory		
Canopy Height	ft	3
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	
Live Herbaceous Moisture	%	
Live Woody Moisture	%	60
Weather		
20-ft Wind Speed (upslope)	mi/h	60
Wind Adjustment Factor		0.50
Terrain		
Slope Steepness	%	50
Ridge-to-Valley Elevation Difference	ft	200
Ridge-to-Valley Horizontal Distance	mi	.1
Spotting Source Location		vb

Run Option Notes

Maximum reliable effective wind speed limit is imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

Flame Length (ft) [SURFACE]

Midflame Wind Speed (upslope) (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

(continued on next page)

Input Worksheet (continued)

Spot Dist from a Wind Driven Surface Fire (mi) [SPOT]

Notes

Hosking Ranch

Surface Rate of Spread (maximum)	829.9	ch/h
Heat per Unit Area	2023	Btu/ft2
Fireline Intensity	30788	Btu/ft/s
Flame Length	52.2	ft
Midflame Wind Speed (upslope)	30.0	mi/h
Wind Adjustment Factor	0.50	
Spot Dist from a Wind Driven Surface Fire	3.1	mi

Discrete Variable Codes Used
Hosking Ranch

Fuel Model

sh5	High load, dry climate shrub (S) (145)

Spotting Source Location

VB	Valley Bottom

Inputs: SURFACE, SPOT, IGNITE

Description		
Fuel/Vegetation, Surface/Understory		
Fuel Model		1
Fuel/Vegetation, Overstory		
Canopy Height	ft	1
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	
100-h Moisture	%	
Live Herbaceous Moisture	%	
Live Woody Moisture	%	
Weather		
20-ft Wind Speed (upslope)	mi/h	60
Wind Adjustment Factor		0.40
Air Temperature	oF	100
Fuel Shading from the Sun	%	50
Terrain		
Slope Steepness	%	50
Ridge-to-Valley Elevation Difference	ft	200
Ridge-to-Valley Horizontal Distance	mi	.1
Spotting Source Location		vb

Run Option Notes

Maximum reliable effective wind speed limit is imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

Flame Length (ft) [SURFACE]

(continued on next page)

Input Worksheet (continued)

Midflame Wind Speed (upslope) (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Spot Dist from a Wind Driven Surface Fire (mi) [SPOT]

Probability of Ignition from a Firebrand (%) [IGNITE]

Notes

Surface Rate of Spread (maximum)	665.6	ch/h
Heat per Unit Area	116	Btu/ft2
Fireline Intensity	1415	Btu/ft/s
Flame Length	12.7	ft
Midflame Wind Speed (upslope)	24.0	mi/h
Wind Adjustment Factor	0.40	
Spot Dist from a Wind Driven Surface Fire	1.1	mi
Probability of Ignition from a Firebrand	100	%

Discrete Variable Codes Used

Fuel Model

1	Short grass (S)

Spotting Source Location

VB	Valley Bottom

Inputs: SURFACE, SPOT, IGNITE

Description		Hosking Ranch
Fuel/Vegetation, Surface/Understory		
Fuel Model		sh7
Fuel/Vegetation, Overstory		
Canopy Height	ft	1
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	
Live Woody Moisture	%	50
Weather		
20-ft Wind Speed (upslope)	mi/h	60
Wind Adjustment Factor		0.50
Air Temperature	oF	100
Fuel Shading from the Sun	%	50
Terrain		
Slope Steepness	%	50
Ridge-to-Valley Elevation Difference	ft	200
Ridge-to-Valley Horizontal Distance	mi	.1
Spotting Source Location		vb

Run Option Notes

Maximum reliable effective wind speed limit is imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

Flame Length (ft) [SURFACE]

(continued on next page)

Input Worksheet (continued)

Midflame Wind Speed (upslope) (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Spot Dist from a Wind Driven Surface Fire (mi) [SPOT]

Probability of Ignition from a Firebrand (%) [IGNITE]

Notes

Hosking Ranch

Surface Rate of Spread (maximum)	947.1	ch/h
Heat per Unit Area	2068	Btu/ft2
Fireline Intensity	35899	Btu/ft/s
Flame Length	56.0	ft
Midflame Wind Speed (upslope)	30.0	mi/h
Wind Adjustment Factor	0.50	
Spot Dist from a Wind Driven Surface Fire	3.2	mi
Probability of Ignition from a Firebrand	100	%

Appendix E

Project Facility Availability Fire

COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND LAND USE: Zoning
PROJECT FACILITY AVAILABILITY FORM, Fire

8 371

Please type or use pen

Genesee Properties — c/o 619-299-2525
Owner's Name — Phone

PO Box 63
Owner's Mailing Address — Street

Berthold CO 80513
City — State — Zip

ORG_____
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $_____

F

DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

A.
- [X] Major Subdivision (TM)
- [ ] Minor Subdivision (TPM)
- [ ] Boundary Adjustment
- [ ] Rezone (Reclassification) from_____to_____zone.
- [ ] Major Use Permit (MUP), purpose:_____
- [ ] Time Extension...Case No._____
- [ ] Expired Map...Case No._____
- [ ] Other_____
- [ ] Specific Plan or Specific Plan Amendment
- [ ] Certificate of Compliance:_____

B.
- [X] Residential . . . . . Total number of dwelling units 35
- [ ] Commercial . . . . . Gross floor area_____
- [ ] Industrial . . . . . Gross floor area_____
- [X] Agricultural . . . . Gross floor area_____

C. Total Project acreage 1417 Total lots 35 Smallest proposed lot 8 ac

Assessor's Parcel Number(s)
(Add extra if necessary)

289-030-12	289-062-06,07
289-063-04	289-100-12,14
289-120-32,40	289-120-41
289-470-38	289-060-34

Thomas Bros. Page 1135 Grid H7

Pine Hills Rd @ SR78/79
Project address — Street

Julian — 92036
Community Planning Area/Subregion — Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature:_____ Date: 11-18-10

Address: 438 Camino Del Rio South #223 San Diego CA 92108 Phone: 619-299-2525

(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

SECTION 2: FACILITY AVAILABILITY — TO BE COMPLETED BY DISTRICT

District name Julian Cuyamaca Fire Protection District

Indicate the location and distance of the primary fire station that will serve the proposed project: L 2645 Farmer Road Julian CA 92036 - 10/12 miles

A. [X] Project is in the District and eligible for service.
- [ ] Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.
- [ ] Project is not in the District and not within its Sphere of Influence boundary.
- [ ] Project is not located entirely within the District and a potential boundary issue exists with the _____ District.

B. [ ] Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is _____ minutes.
- [ ] Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C. [ ] District conditions are attached. Number of sheets attached:_____
- [ ] District will submit conditions at a later date.

SECTION 3. FUELBREAK REQUIREMENTS

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by the Department of Planning and Land Use.

- [ ] Within the proposed project _____ feet of clearing will be required around all structures.
- [ ] The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Kevin C. Oubler — KEVIN C. OUBLER CHIEF — 7607651510 — 12-2-10

Authorized signature — *Print name and title* — *Phone* — *Date*

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:
Zoning Counter, Department of Planning and Land Use, 5201 Ruffin Road, Suite B, San Diego, CA 92123

Appendix F

Julian Fire Protection District Letter of Approval

COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND LAND USE: Zoning
PROJECT FACILITY AVAILABILITY FORM, Fire

8 7-1

F

Please type or use pen

Genesee Properties — c/o 619-299-2525
Owner's Name — Phone

PO Box 63
Owner's Mailing Address — Street

Berthold CO 80513
City — State — Zip

ORG_____
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $_____
DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — **TO BE COMPLETED BY APPLICANT**

A.
- [X] Major Subdivision (TM)
- [ ] Minor Subdivision (TPM)
- [ ] Boundary Adjustment
- [ ] Rezone (Reclassification) from_____to_____zone.
- [ ] Major Use Permit (MUP), purpose:_____
- [ ] Time Extension...Case No._____
- [ ] Expired Map...Case No._____
- [ ] Other_____
- [ ] Specific Plan or Specific Plan Amendment
- [ ] Certificate of Compliance:_____

B.
- [X] Residential . . . . . Total number of dwelling units 35
- [ ] Commercial . . . . . Gross floor area_____
- [ ] Industrial . . . . . Gross floor area_____
- [X] Agricultural . . . . Gross floor area_____

C. Total Project acreage 1417 Total lots 35 Smallest proposed lot 8 ac

Assessor's Parcel Number(s)
(Add extra if necessary)

289-030-12	289-062-06,07
289-063-04	289-100-12,14
289-120-32,40	289-120-41
289-470-38	289-060-34

Thomas Bros. Page 1135 Grid H7

Pine Hills Rd @ SR78/79
Project address — Street

Julian — 92036
Community Planning Area/Subregion — Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature:_____ Date: 11-18-10

Address: 438 Camino Del Rio South #223 San Diego CA 92108 Phone: 619-299-2525

(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

SECTION 2: FACILITY AVAILABILITY — **TO BE COMPLETED BY DISTRICT**

District name Julian Cuyamaca Fire Protection District

Indicate the location and distance of the primary fire station that will serve the proposed project: 2645 Farmer Road Julian CA 92036 - 10 1/2 miles

A. [X] Project is in the District and eligible for service.
- [ ] Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.
- [ ] Project is not in the District and not within its Sphere of Influence boundary.
- [ ] Project is not located entirely within the District and a potential boundary issue exists with the _____ District.

B. [ ] Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is _____ minutes.
- [ ] Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C. [ ] District conditions are attached. Number of sheets attached:_____
- [ ] District will submit conditions at a later date.

SECTION 3. FUELBREAK REQUIREMENTS

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by the Department of Planning and Land Use.

- [ ] Within the proposed project _____ feet of clearing will be required around all structures.
- [ ] The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized signature	*Print name and title*	*Phone*	*Date*
	KEVIN C. OCBLER CHIEF	7607651510	12-2-10

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:
Zoning Counter, Department of Planning and Land Use, 5201 Ruffin Road, Suite B, San Diego, CA 92123

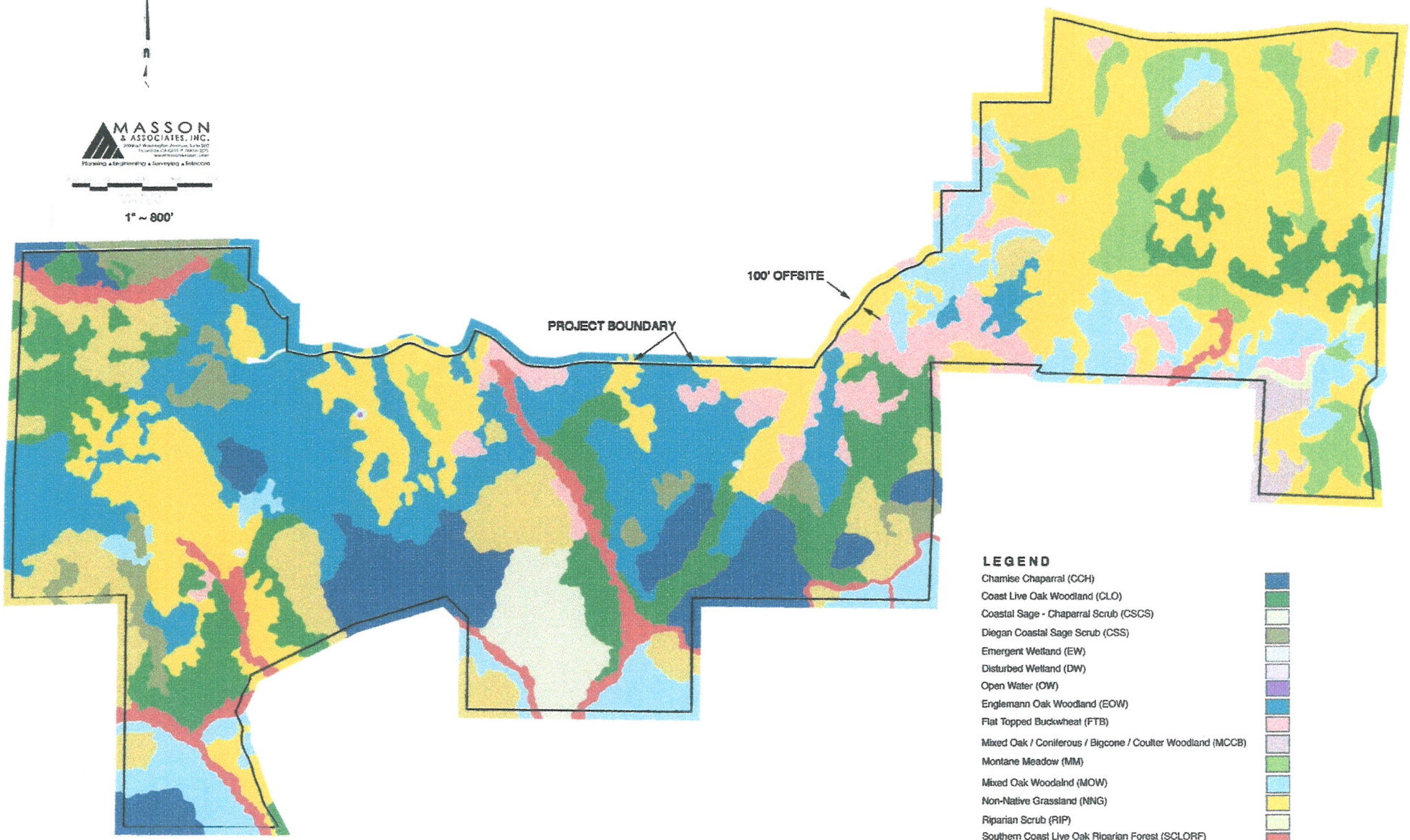
Appendix G

Vegetation Map

Project Biology Map

MASSON & ASSOCIATES, INC.
Planning • Engineering • Surveying • Telecom

1" ~ 800'



Appendix H

Easements for the following Roads

LEGAL DESCRIPTION

Real property in the City of San Diego, County of San Diego, State of California, described as follows:

PARCEL A:

PARCELS 4, 5, 6, 7 AND 8 OF PARCEL MAP 12619 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON MARCH 15, 1983 AS FILE NO. 83-082354 OF OFFICIAL RECORDS, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, EXCEPTING THEREFROM THOSE PORTIONS THEREOF LYING WITHIN PARCELS 6, 7, 8, 9, 10 AND 11 OF RECORD OF SURVEY MAP NO. 10707 RECORDED IN SAID OFFICE OF THE COUNTY RECORDED OF SAN DIEGO COUNTY ON SEPTEMBER 11, 1986 AS FILE NO. 86-399026 OF OFFICIAL RECORDS.

SAID PROPERTY BEING DESCRIBED AS PARCEL "A" IN A CERTIFICATE OF COMPLIANCE RECORDED ON JUNE 22, 2001 AS INSTRUMENT NO. 2001-0421692 OF OFFICIAL RECORDS OF SAID SAN DIEGO COUNTY.

PARCEL A1:

AN EASEMENT AND RIGHT OF WAY FOR ROAD AND PUBLIC UTILITY PURPOSES OVER, UNDER, ALONG AND ACROSS THE SOUTHERLY 30 FEET OF PARCELS 8, 10 AND 11 OF SAID RECORD OF SURVEY MAP 10707, TOGETHER WITH A STRIP OF LAND 60.00 FEET IN WIDTH, THE CENTERLINE OF WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE CENTERLINE OF ORINOCO DRIVE AND DALEY FLAT ROAD DESCRIBED AND DELINEATED ON SAID PARCEL MAP 12619; THENCE NORTHERLY ALONG THE CENTERLINE OF SAID DALEY FLAT ROAD TO THE CENTERLINE OF HOSKINGS RANCH ROAD DESCRIBED AND DELINEATED ON SAID PARCEL MAP 12619; THENCE EASTERLY ALONG SAID CENTERLINE OF HOSKINGS RANCH ROAD TO THE WESTERLY SIDELINE OF STATE HIGHWAY 78/79.

NOTE: SAID PROPERTY IS DESCRIBED IN A CERTIFICATE OF COMPLIANCE RECORDED JUNE 22, 2001 AS INSTRUMENT NO. 2001-0421692 OF OFFICIAL RECORDS.

PARCEL B:

PARCEL 9 OF PARCEL MAP 12619 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON MARCH 15, 1983 AS FILE NO. 83-082354 OF OFFICIAL RECORDS, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, EXCEPTING THEREFROM ALL THAT PORTION THEREOF LYING EASTERLY OF THE FOLLOWING DESCRIBED LINE.

BEGINNING AT AN ANGLE POINT IN THE NORTH LINE OF SAID PARCEL 9 AT THE EASTERN TERMINUS OF THAT CERTAIN COURSE THEREIN BEARING SOUTH 88 DEG. 17'18" EAST 1,285.36 FEET; THENCE SOUTH 10 DEG. 00'46" WEST 384.72 FEET TO THE BEGINNING OF A NONTANGENT 400.00 FOOT RADIUS CURVE, CONCAVE NORTHWESTERLY, A RADIAL BEARING TO SAID CURVE BEARS SOUTH 81 DEG. 03'41" EAST; THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 29 DEG. 27'12" A DISTANCE OF 205.62 FEET TO THE BEGINNING OF A TANGENT 400.00 FOOT RADIUS CURVE, CONCAVE EASTERLY; THENCE SOUTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 38 DEG. 10'01" A DISTANCE OF 267.39 FEET; THENCE SOUTH 00 DEG. 05'30" WEST 305.92 FEET;

THENCE SOUTH 40 DEG. 26'12" EAST 278.57 FEET TO AN ANGLE POINT IN THE EAST BOUNDARY OF SAID PARCEL 9.

SAID PROPERTY BEING DESCRIBED AS PARCEL "B" IN CERTIFICATES OF COMPLIANCE RECORDED ON FEBRUARY 4, 2000 AS FILE NO. 2000-0059314 AND JUNE 22, 2001 AS FILE NO. 2001-0421692, BOTH OF OFFICIAL RECORDS OF SAID SAN DIEGO COUNTY.

INCLUDES A PORTION OF APN 289-120-32 & A PORTION OF APN 289-062-03.

PARCEL B1:

AN EASEMENT AND RIGHT OF WAY FOR ROAD AND PUBLIC UTILITY PURPOSES OVER, UNDER, ALONG AND ACROSS A STRIP OF LAND 60 FEET IN WIDTH, THE CENTERLINE OF WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE EASTERLY TERMINUS OF ORINOCO DRIVE IN THE WEST LINE OF SAID PARCEL 9; THENCE WESTERLY ALONG THE CENTERLINE OF SAID ORINOCO DRIVE TO THE INTERSECTION OF THE CENTERLINES OF ORINOCO DRIVE AND DALEY FLAT ROAD DESCRIBED AND DELINEATED ON SAID PARCEL MAP 12619; THENCE NORTHERLY ALONG THE CENTERLINE OF SAID DALEY FLAT ROAD TO THE CENTERLINE OF HOSKINGS RANCH ROAD DESCRIBED AND DELINEATED ON SAID PARCEL MAP 12619; THENCE EASTERLY ALONG SAID CENTERLINE OF HOSKINGS RANCH ROAD TO THE WESTERLY SIDELINE OF STATE HIGHWAY 78/79.

SAID DISTANCES ARE MEASURED ALONG THE HORIZONTAL GROUND PLANE, SAID PARCEL MAP IS BASED UPON THE CALIFORNIA STATE PLANE COORDINATE SYSTEM; DISTANCES SHOWN ON SAID MAP ARE MEASURED ALONG THE GRID OF SAID COORDINATE SYSTEM.

PARCEL C:

THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 11, TOWNSHIP 13 SOUTH, RANGE 3 EAST, SAN BERNARDINO MERIDIAN AND THAT PORTION OF PARCEL 9 OF PARCEL MAP 12619 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON MARCH 15, 1983 AS FILE NO. 83-082354 OF OFFICIAL RECORDS, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, EXCEPTING THEREFROM ALL THAT PORTION THEREOF LYING WESTERLY AND SOUTHWESTERLY OF THE FOLLOWING DESCRIBED LINE.

BEGINNING AT AN ANGLE POINT IN THE NORTH LINE OF SAID PARCEL 9 AT THE EASTERN TERMINUS OF THAT CERTAIN COURSE THEREIN BEARING SOUTH 88 DEG. 17'18" EAST 1,285.66 FEET; THENCE SOUTH 10 DEG. 00'46" WEST 384.72 FEET TO THE BEGINNING OF A NON TANGENT 400.00 FOOT RADIUS CURVE, CONCAVE NORTHWESTERLY, A RADIAL BEARING TO SAID CURVE BEARS SOUTH 81 DEG. 03'41" EAST; THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 29 DEG. 27'12" A DISTANCE OF 205.62 FEET TO THE BEGINNING OF A TANGENT 400.00 FOOT RADIUS CURVE, CONCAVE EASTERLY; THENCE SOUTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 38 DEG. 18'01" A DISTANCE OF 267.39 FEET; THENCE SOUTH 00 DEG. 05'30" WEST 305.92 FEET; THENCE SOUTH 40 DEG. 26'12" EAST 278.57 FEET TO AN ANGLE POINT IN THE EAST BOUNDARY OF SAID PARCEL 9.

SAID PROPERTY BEING DESCRIBED AS PARCEL "C" IN CERTIFICATES OF COMPLIANCE RECORDED ON FEBRUARY 4, 2000 AS FILE NO. 2000-0059314 AND JUNE 22, 2001 AS FILE NO. 2001-0421692, BOTH OF OFFICIAL RECORDS OF SAID SAN DIEGO COUNTY.

INCLUDES A PORTION OF APN 289-062-04 AND WITH A PORTION OF 289-120-40.

Appendix I

Hydrology Report

Final

Hydrogeologic Investigation, 1,416.5-Acre Hoskings Ranch, Julian, San Diego County, California

Prepared for:
Genesee Properties, Inc.
3550 General Atomics Court
San Diego, CA 92121

Prepared by:
AECOM
7807 Convoy Ct, Suite 200
San Diego, CA 92111

Project No.: 60144610

February 2011

February 25, 2011 60144610

Lettie Flower
Genesee Properties, Inc.
3550 General Atomics Court
San Diego, CA 92121

Subject: Hydrogeologic Investigation, Hoskings Ranch, Julian, San Diego County, California.

Dear Lettie:

In accordance with your request, we have prepared this hydrogeologic report for Hoskings Ranch.

If you have any questions regarding this report, please contact our office. AECOM appreciates this opportunity to be of service.

Very truly yours,

AECOM, Inc.

Douglas F. Roff, CHg 293
Senior Hydrogeologist

Rob Schumann, PG 8354
Project Geologist

Distribution: (2) Addressee
(2) Mark Thompson – TRS Consultants

TABLE OF CONTENTS

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1 EXECUTIVE SUMMARY

AECOM conducted a groundwater investigation of the 1,416.5-acre Hoskings Ranch at the request of Genesee Properties. The subject property is located in the Julian area, in central San Diego County, California. The project proposes two alternatives; 1) to subdivide the property into 28 agricultural/residential lots (main project), and 2) to subdivide the property into 35 lots with 34 lots consolidated in a development area of approximately 233.5 acres in the eastern and north-central parts of the site (consolidated project alternative [CPA]). The study area is approximately 3,185 acres and encompasses the entire project site and an area ¼ mile beyond the property on all sides. The average annual rainfall recharge in the Hoskings Ranch study area was calculated to be about 892 acre-feet per year (afy). Assuming the current general plan (GP) or the GP Update for the undeveloped land within the study area, maximum study area development would allow about 220 or 91 homes, respectively. At maximum usage in the study area under the current GP or GP update, respectively, the annual extraction is expected to be in the neighborhood of 119 acre-feet (less than 20 percent of the average annual recharge) or 54 acre-feet (about 6 percent of the average annual recharge). Based on the rainfall data from 1971/1972 through 2004/2005, the groundwater system could sustain the groundwater demand for both the main project and CPA study area at complete buildout.

2 BACKGROUND

2.1 Purpose

The purpose of this study was to evaluate the groundwater resource from which the proposed water will be extracted, and to evaluate the impact the proposed extraction will have on the groundwater system.

2.2 Scope of Services

The scope of services for the groundwater investigation included the following:

- Discussions with the San Diego County Groundwater Geologist to define the scope of this study;
- Site reconnaissance;
- Coordinating the installation of thirteen production wells;
- Pump testing of eleven production wells;
- Water quality sampling of five production wells;
- Preparation and mailing of questionnaires to neighbors;
- Review of geologic maps and literature, topographic maps, and aerial photographs of the area;

- Evaluation of study area recharge and groundwater in storage;
- Evaluation of sustainable groundwater yield;
- Hydrogeological evaluation; and
- Preparation of this report.

3 PROJECT DESCRIPTION

The 1,416.5-acre site is located in central San Diego County approximately one mile southwest of the town of Julian (Figure 1). The southern and western portions of the property are part of the Cleveland National Forest. Orinoco/Temescal Creek, which carries the runoff from Hoskings Ranch, passes through the site, flowing from east to west and ultimately drains into the San Diego River west of the project site. The site comprises both moderately steep, rocky slopes and rolling hills vegetated with oak, sagebrush and grasses. Figure 2 is a topographic map of the area showing the location of the Hoskings Ranch property and its relative position within the Julian area. The Julian study area includes an area of approximately 3,185 acres and consists of the entire 1,416.5-acre site and a ¼-mile strip around the project site. Approximately 1,050 acres of the study area and an additional 680 acres of the project site are located within the Cleveland National Forest.

Surrounding properties are relatively undeveloped with a few widely spaced single-family homes. Approximately 30 to 40 single-family homes are within ¼ mile of the property. Most of those homes are located along Pine Hills Road immediately east of the site. There are about 5 to 10 homes located along both the northern and southeastern portions of the study area that are located on relatively large lots and utilize groundwater for irrigation, potable uses, and cattle. All homes within the study area are groundwater dependent. The Julian Water District supplies potable water from wells to about 276 acres of downtown Julian located to the northeast of the project site. In addition, the Pine Hills Mutual Water Company provides potable water from wells to homes adjacent to the southern portion of the study area. Apple and pear orchards are successfully cultivated on the low hills and valley bottoms in the Julian area. More than a year after the Cedar fire, which occurred in October 2003, there was no significant replanting of orchards in the area. Although historically more orchards have been located in the area, photoreconnaissance in November 2004 and a review of infrared photos taken in August 2004 suggest that only about 2 acres were actively irrigated within a ¼-mile of the project boundary . As shown in Figure 3 recent photoreconnaissance (2009) suggests that actively irrigated area within the ¼-mile project boundary has increased to approximately 30 acres. We have assumed that this value won't change with time.Figure 1 Vicinity Map

Figure 2 Site Map

Figure 3 - Irrigated Areas within ¼-mile of the Project Boundary

Approximately 160 acres immediately north of the central portion of the property (in the study area) are used for grazing cattle.

XX wells are located on the Hoskings Ranch property. Refer to Figure 2 for well locations and Appendix A for available onsite well logs. .

3.1 Main Project

We understand that the proposed development include 28 lots with a minimum of 40 acres per lot (main project). It is assumed that each of the 28 lots will have an individual well. Water for the project is to be supplied entirely from groundwater. Wastewater will be disposed via individual septic systems.

3.2 Consolidated Project Alternative

The Consolidated Project Alternative (CPA) proposes 35 lots. Thirty-four lots are consolidated within a development area of approximately 233.5 acres in the eastern and north-central parts of the site. Lots will range in size from 8.5 to 709.1 acres. Approximately 1,183.0 acres, or 83.5 percent of the site, will be retained in open space. Lots are focused on two areas. The first is in the eastern part of the site adjacent to SR 78/79 and Pine Hills Road and the second is in the north-central area focused on Daley Flat Road. Most of the site is under a Williamson Act Contract that requires 40-acre minimum lot sizes. The CPA requires the filing of a Notice of Non-Renewal of the Williamson Act Contract over the area currently under contract, consisting of approximately 1,291.9 acres. The General Plan (GP) Update proposes minimum lot sizes of 40 acres on the property. The CPA proposes a density of one dwelling unit per 40 acres (DU/A), which is consistent with the General Plan Update. However, the CPA proposes lot sizes of less than 40 acres in the east and north central as noted above, in order to preserve large blocks of land for open space.

It is assumed that each of the 34 lots will have an individual well. Water for the project is to be supplied entirely from groundwater. Wastewater will be disposed via individual septic systems.

3.3 Groundwater Demand

In accordance with the San Diego County Groundwater Ordinance, groundwater consumptive use for the main project and CPA is assumed to be 0.5 afy per residence or 14 afy and 17 afy respectively on a sustained basis for the Hoskings Ranch project and 96 afy for other residences within the study area, assuming the current GP. Based on the Groundwater Ordinance, this is not considered a water-intensive use project since demand is not anticipated to exceed 20 afy. Groundwater demand is estimated at 31.5 afy for other residences within the study area, assuming the GP Update. We also assumed 2.9 acre-feet of water uses due to cattle and 87 acre-feet for orchards. According to

discussions with TRS (March 29, 2009) onsite agricultural uses are cattle breeding and grazing and some dry land cropping. Currently there are about 30 to 40 dwelling units in the Hoskings Ranch study area. Based on the County of San Diego current GP for Julian, Hoskings Ranch and much of the surrounding study area are designated as Intensive Agricultural where minimum allowable parcel sizes (2, 4 and 8 acres) are based on slope and other criteria. Part of the surrounding study area is designated as Multiple Rural Use where minimum allowable parcel sizes are 4, 8 and 20 acres. The County Groundwater Ordinance also limits minimum parcel size to 4 acres in the area. Additional limitations, such as steep slopes and unfavorable conditions for septic systems, may preclude development of some of these smaller parcels particularly in the southern part of the study area. Because of steep slopes in the southern portion of the study area, a 20-acre parcel size was used in estimating maximum buildout for approximately 600 acres. One home per 40-acre lot was assumed for private in-holdings within the Cleveland National Forest or those lands designated by the Forest Conservation Initiative and no homes on publicly-owned forest land. We estimate a total of 220 homes (28 onsite and 192 offsite) under the main project and 226 homes (34 onsite and 192 offsite) under the CPA could be located in the study area at maximum buildout assuming the current GP in the study area. With the GP Update, much of the study area is designated as either Rural Land with minimum allowable parcel size of 40 acres or Semi-Rural with 10-or 20-acre parcel sizes. This results in an estimated 91 or 97 homes (28 or 34 onsite and 63 offsite) assuming the GP Update.

The following tables summarize the anticipated groundwater needs at maximum buildout for both the main project and CPA.

Table 1. Anticipated Groundwater Needs at Maximum Buildout – Main Project

Use Type	Current GP Quantities	GP Update Quantities	Water Demand (afy)	Current GP Total Use (afy)	GP Update Total Use (afy)
On-site Residential	28 homes	28 homes	0.5/acre	14	14
Off-site Residential	192 homes	63 homes	0.5/acre	96	31.5
Offsite Cattle	100 head	100 head	0.016/head	1.6	1.6
Onsite Cattle	80 head	80 head	0.016/head	1.3	1.3
Offsite Orchards	*30 acres*	*30 acres*	*2.9/acre*	87	87
			Total	***200***	***135***

Table 2. Anticipated Groundwater Needs at Maximum Buildout – Consolidated Project Alternative

Use Type	Current GP Quantities	GP Update Quantities	Water Demand (afy)	Current GP Total Use (afy)	GP Update Total Use (afy)
On-site Residential	34 homes	34 homes	0.5/acre	17	17
Off-site Residential	192 homes	63 homes	0.5/acre	96	31.5
Offsite Cattle	100 head	100 head	0.016/head	1.6	1.6
Onsite Cattle	80 head	80 head	0.016/head	1.3	1.3
Offsite Orchards	30 acres	30 acres	2.9/acre	87	87
			Total	***203***	***138***

3.4 Groundwater Wells

The majority of domestic water within the study area is obtained from private wells. Homes located in the northeast corner of the study area obtain water from the Julian Water District and were not included in our calculations. District water comes from wells located east of the study area. In order to evaluate potential impacts to neighboring wells, questionnaires were mailed to property owners within ¼ mile of the property boundary. Wells of those property owners responding to our questionnaire were included in the monitoring program. Among the information requested, was the depth of the wells on each property. This information is summarized in 3. Groundwater levels of onsite wells were measured during pump testing to evaluate potential impacts from future onsite extraction. The well locations are shown on Figure 2. In order to maintain confidentiality, the wells on the following table are referred to by designators rather than owner names. All known groundwater users in the study area have well depths of at least 100 feet below ground surface (bgs) for one of their wells. Study area groundwater depths were generally between 24 to 220 feet bgs at the time of our investigation.

Table 3. Hoskings Ranch Offsite Well Information[1]

---

[1] Well information provided by homeowners.

Well Designation	Well depth (feet)	Rate (gpm)
A1	750	*
B1	350	10
C1, C2	50?	Not Potable
D1, D2	50, 800	15
E1, E2	60, 100	*
F1	*	*
G1	245	17
H1, H2	*	*
I1	350	*
J1, J2	300	40
K1	*	Not In Use
L1, L2	252, 30	4 – 6
M1	373	6-8
N1, N2	232, 600	25, 1.5
R1	310	*
O1, O2, O3, O4, O5	30, 190, 368, 422, 3 – 400	*
P1	450	5
Q1, Q2	161, 563	10
S1	330	*

* - Information not provided.

4 GEOLOGY

4.1 General

The 1,416.5-acre site is located in the Julian Region of the Peninsular Ranges Province, a 300-mile long California geomorphic province with a long and active geologic history. This portion of the province lies near the geographic center of San Diego County and is predominantly composed of rocks of the Southern California Batholith and generally consists of Mesozoic-aged granitic rocks with steep alluvium-filled valleys. Figure 2 shows a small number of lineaments (potential fractures) within the project site. Three predominant rock types underlie the site. The first is the pre-Cretaceous metasedimentary Julian Schist, which is an interbedded quartz-mica schist and quartzite, local amphibolite schist and quartz-biotite gneiss. The second and more predominate rock type is a combination of pre-Cenozoic rocks consisting of strongly foliated migmatites, which is a mixture of igneous and metamorphic rocks. The metamorphic component is the Julian Schist and the igneous component is the Stonewall quartz diorite. The third rock type is the San Marcos Gabbro, which is a highly variable assemblage of rocks that weathers to deep reddish-brown residual clay (California Division of Mines and Geology 1992). The bedrock typically has a mantle of highly weathered rock known as residuum or decomposed granite (although it is not all weathered from granite or even granitic rock). Residuum is formed from the in-place chemical weathering of rock and can vary from non-existent on steep mountainsides to greater than 50 feet thick in the gentle terrain. According to driller's logs for the onsite wells, up to 50 feet of residuum overly the fractured bedrock in some areas. In some areas, especially the steep valley walls, relatively fresh bedrock materials extend to the surface with no decomposed granite overburden. The decomposed granite contact with unweathered bedrock varies throughout the property. Differential weathering of bedrock due to non-uniform fracturing and differences in mineralogy produces an undulating contact between the unweathered bedrock and decomposed granite. On-site elevations range from approximately 3,100 to 4,200 feet above mean sea level (msl) with gradients ranging from gently sloping hills along the northeastern portion of the property to steep cliffs along the southwestern side of the property. In addition, residuum, organic-rich topsoil, and minor amounts of alluvium, which was derived by weathering and erosion of granitic and metamorphic rock along the valley slopes, exist in the on-site drainages.

4.2 Hydrogeology

The eleven new onsite wells have been reported by the driller to produce from 3 to 130 gallons per minute (gpm) although two additional wells were reported as not capable of producing the required 3 gpm. Since groundwater levels in upland areas are deeper than the alluvium and/or residuum contact

with bedrock, fractured bedrock represents the significant water-bearing unit throughout much of the study area. Because water can only occupy the fractures in the unweathered rock, specific yields (essentially equivalent to the interconnected [or effective] porosity) in this rock are generally lower than in residuum and alluvium. Specific yields in fractured rock wells are generally on the order of 0.0001% to 1%. Onsite wells in the fractured rock range from 271 to 1,010 feet deep.

A review of aerial photographs indicates a few lineaments (potential fault and/or fracture zones) within the property and the study area. These lineaments are centrally located within the study area likely resulting from faulting along the Elsinore fault zone located approximately 3 miles to the east. Various fractures within this aquifer may be only partially interconnected, thereby restricting the hydraulic connection and groundwater flow. A review of driller's logs for this area indicates the presence of fractured and/or weathered zones occurring at various depths in each well. Some wells have as many as 4 to 5 zones in each well, with individual zones averaging one- to two-feet thick. Available driller's logs are provided in Appendix A.

Several ponds and inactive spring boxes were noted on site. These were apparently used in the past to provide water to grazing cattle. Since this field investigation was performed before the winter rains following several years of below average rainfall, few springs were noted on site, however, the presence of spring boxes and correspondence with property owners in the area indicates that seasonal springs are not uncommon throughout the study area.

The Hoskings Ranch property and study area is part of the larger Julian watershed, which includes over 13,000 acres. Groundwater within the study area generally flows towards Orinoco/Temescal Creek to the west and exits the study area near the southwestern portion of the property whereby the creek merges with the San Diego River flowing southwest. The approximate limits of the Hoskings Ranch study area are shown in Figure 2.

4.3 Soils

Based on the San Diego Area Soil Survey (United States Department of Agriculture 1973), soils that make up the majority of the study area and project site are classified as follows:

- The Sheephead series, which consists of well-drained, shallow fine sandy loams that formed in material weathered from micaceous schist and gneiss. These soils comprise the surface soils in the steeper areas throughout much of the western and central part of the study area.

- The Holland series, which consists of well-drained, moderately deep and deep fine sandy loams that formed in material weathered from micaceous schist. These soils comprise the surface soils primarily in the central part of the project site.
- The Crouch series, which consists of well-drained, deep to moderately deep coarse sandy loams that formed in material weathered from acid igneous rock and micaceous schist. These soils comprise the eastern portion of the project site and significant portions of the study area.
- The Reiff series, which consists of well-drained, very deep fine sandy loams that formed in alluvium derived from granititic rock. These soils comprise the creek areas in the western study area.
- Loamy alluvial land, which consists of somewhat poorly drained, very deep, very dark brown to black silt loams and sandy loams. Areas of this land were formerly wet meadows that were subsequently drained by head cutting of gullies. These soils comprise a small portion of the eastern project site.

The principal soil types of the subject site and the surrounding study area with their respective moisture-holding capacities and runoff potentials are noted in Tables 4, 5 and 6.

Table 4. Dominant Soil Types (Higher and Steeper Slopes)

Name	Moisture Holding Capacity (inches)	Runoff Potential	Approximate Area within 3,185-Acre Study area (acres)
Sheephead Rocky Fine Sandy Loam	2 – 3	Rapid to Very Rapid	948
Holland Stony Fine Sandy Loam	2.5 – 3	Rapid to Very Rapid	369
Crouch Rocky Coarse Sandy Loam	3.5 – 5.5	Rapid to Very Rapid	163
Total			***1,480***

Table 5. Dominant Soil Types (Mid Slopes)

Name	Moisture Holding Capacity (inches)	Runoff Potential	Approximate Area within 3,185-Acre Study area (acres)
Holland Fine Sandy Loam	3 – 7	Medium to Rapid	18
Holland Stony Fine Sandy Loam	2.5 – 4	Medium	319
Crouch Coarse Sandy Loam	4.5 – 7.5	Medium	522
Crouch Rocky Coarse Sandy Loam	3.5 – 5.5	Medium	339
Total			***1,199***

Table 6. Dominant Soil Types (Flatter and Lower Areas)

Name	Moisture Holding Capacity (inches)	Runoff Potential	Approximate Area within 3,185-Acre Study area (acres)
Reiff fine sandy loam	7.5 – 9.5	Slow to Medium	28
Holland Fine Sandy Loam	3 – 7	Slow to Medium	416
Loamy alluvial land	6 – 9	Slow	62
Total			***506***

5 FIELD INVESTIGATION

5.1 Well Installation

As part of the Hoskings Ranch Main Project hydrogeologic investigation, seven production wells[2] were installed onsite for testing. Well locations are provided on the Site Map (Figure 2). The San Diego County Groundwater Geologist was consulted prior to choosing the locations of these new wells.

Well A was installed approximately 50 feet south of Orinoco Drive and 3,780 feet east of the intersection of Daley Flat Road and Orinoco Drive at an elevation of approximately 3,925 feet above

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[2] Although seven production wells were installed, only eleven were pump tested. The remaining two were reported by the driller as being unable to produce the required 3gpm.

msl. Based on the County of San Diego Tentative Map (TM) 5312 prepared by TRS Consultants and Masson and Associates, the well is located on Lot 14 of the Hoskings Ranch project. The well was completed to a depth of 331 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 51 feet bgs. Fractured and/or weathered zones were encountered from 126 to 127, 129, 155, and 195 to 251 feet bgs.

Well B was installed approximately 1,010 feet south of Orinoco Drive and adjacent to the southern end of the proposed Tahoe Lane at an elevation of approximately 3,850 feet above msl. Based on TM 5312, the well is located on Lot 16. The well was completed to a depth of 271 feet bgs. According to the driller's log, the geology consisted of approximately 8 feet of clay (assumed to mean topsoil or fill) overlaying decomposed granite from the 8 feet bgs to the contact with unweathered bedrock at 48 feet bgs. Fractured and/or weathered zones were encountered from 95 to 96, and 220 to 221 feet bgs.

Well C was installed approximately 1,875 feet south of the intersection of Daley Flat Road and Orinoco Drive and approximately 785 feet west of the proposed Bear Run Lane at an elevation of approximately 3,900 feet above msl. Based on TM 5312, the well is located on Lot 21. The well was completed to a depth of 851 feet bgs and later redrilled to a depth of 1,032 feet bgs. According to the driller's logs, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 20 feet bgs. Fractured and/or weathered zones were encountered from 226 to 229, 247 to 250, 262 to 263, 300 to 303, 440 to 442, 500 to 502, 558 to 559 and 793 to 794 feet bgs.

Well C1 was installed approximately 1,500 feet south of the intersection of Daley Flat Road and Orinoco Drive and approximately 600 feet west of the proposed Bear Run Lane at an elevation of approximately 3,880 feet above msl. Based on TM 5312, the well is located on Lot 21. The well was completed to a depth of 1,071 feet bgs. According to the driller's log, the geology consisted of approximately 3 feet of topsoil overlaying decomposed granite from 3 feet bgs to the contact with unweathered bedrock at 29 feet bgs. Fractured and/or weathered zones were encountered from 50 to 52 and 674 to 676 feet bgs.

Well C2 was installed approximately 1,300 feet southwest of the intersection of Daley Flat Road and Orinoco Drive and approximately 375 feet east of the proposed Lilac Blossom Lane at an elevation of approximately 3,830 feet above msl. Based on TM 5312, the well is located on Lot 21. The well was completed to a depth of 992 feet bgs. According to the driller's log, the geology consisted of approximately 4 feet of topsoil overlaying an additional 8 feet of red clay (assumed to mean topsoil or fill). The contact with decomposed granite was reported at a depth of 12 feet and the contact with unweathered bedrock at 15 feet bgs. Small fractures were encountered at 42 and 580 feet bgs.

Well C3 was installed approximately 450 feet due west of Well C and at the southern end of the proposed Lilac Blossom Lane at an elevation of approximately 3,730 feet above msl. Based on TM 5312, the well is located on Lot 24. The well was completed to a depth of 211 feet bgs. According to the driller's log, the geology consisted of approximately 5 feet of red clay (assumed to mean topsoil or fill) overlaying decomposed granite from 5 feet bgs to the contact with bedrock at 17 feet bgs. Fractured and/or weathered zones were encountered from 78 to 82 and at 168 feet bgs.

Well D was installed near the northwestern property boundary approximately 3 miles west of the intersection of Pine Hills Road and Highway 78/79 and approximately 500 feet west of the property boundary adjacent to Daley Flat Road at an elevation of approximately 3,615 feet above msl. Based on TM 5312, the well is located on Lot 32. The well was completed to a depth of 591 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 48 feet bgs. Fractured and/or weathered zones were encountered from 140 to 141, 213, 218 to 219, 286 to 290, 328 to 329 and 567 to 568 feet bgs.

Wells A, B, C, and D were installed by air percussion drilling between November 5, 2003 and December 2, 2003 by Acme Drilling Company, Inc. (Acme) and completed using 8 ¼-inch diameter blank steel casing from the surface to 20 feet bgs. Well A was completed using 4 ½-inch diameter PVC screen from 20 feet bgs to well completion depth. Well B was completed without casing and with a borehole diameter of 6 $^{7}/_{16}$ inches. Well C was completed without casing and with a borehole diameter of 6 $^{1}/_{8}$ inches. Well D was completed without casing and with a borehole diameter of 6 ¼ inches.

Wells C1, C2 and C3 were installed by air percussion drilling between January 19, 2004 and April 6, 2004 by Acme and completed using 13-inch diameter blank steel casing from surface to 20 feet bgs. Well C1 was completed without casing and with a borehole diameter of 6 ½ inches. Well C2 was completed without casing and with a borehole diameter of 6 ¼ inches. Well C3 was completed with 8-inch diameter blank steel casing to a depth of 80 feet bgs and no casing from 80 bgs to well completion depth and with a borehole diameter of 6 ½ inches. All wells were completed with a sanitary seal (cement) from the ground surface to 20 feet bgs.

Consolidated Project Alternative Wells

As part of the investigation for the CPA, six additional wells (E through J) were installed on the property; four on the western part of the property, and three on the eastern portion.

Well E was installed approximately 2,000 feet east of Orinoco Drive and 1,000 feet south of Highway 79 at an elevation of approximately 4,040 feet above msl. Based on the County of San Diego

Tentative Map (TM) 5312 prepared by TRS Consultants and Masson and Associates, the well is located on Lot 10 of the CPA. The well was completed to a depth of 310 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 55 feet bgs. Fractured and/or weathered zones were encountered from 150 to 160, 170 to 175, 200 to 260, and 285 to 310 feet bgs. The driller estimated the well yield at 80 gpm based on four hours of airlifting.

Well F was installed approximately 1,000 feet southwest of Orinoco Drive and 500 feet south of the proposed Tenaya Road at an elevation of approximately 4,800 feet above msl. Based on TM 5312, the well is located on Lot 26 of the CPA. The well was completed to a depth of 410 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 32 feet bgs. Fractured and/or weathered zones were encountered from 355 to 365 and 375 to 407 feet bgs. The driller estimated the well yield at 100 gpm based on four hours of airlifting.

Well G was installed just south and adjacent to Orinoco Drive at an elevation of approximately 3,900 feet above msl. Based on TM 5312, the well is located on Lot 29 of the CPA. The well was completed to a depth of 975 feet bgs. According to the driller's logs, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 76 feet bgs. Fractured and/or weathered zones were encountered from 103 to 110, 305 to 310, and 960 to 975 feet bgs. The driller estimated the well yield at 130 gpm based on four hours of airlifting.

Well H was installed approximately 1,000 feet south of Orinoco Drive and approximately 400 feet west of the proposed Tahoe Lane at an elevation of approximately 3,800 feet above msl. Based on TM 5312, the well is located on Lot 30 of the CPA. The well was completed to a depth of 310 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 42 feet bgs. Fractured and/or weathered zones were encountered from 125 to 135 and 225 to 240 feet bgs. The driller estimated the well yield at 40 gpm based on four hours of airlifting.

Well I was installed approximately 200 feet south of Orinoco Drive at an elevation of approximately 3,600 feet above msl. Based on TM 5312, the well is located on Lot 31 of the CPA. The well was completed to a depth of 510 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with unweathered bedrock at 28 feet bgs. Fractured and/or weathered zones were encountered from 195 to 205, 235 to 255, 280 to 295, and 435 to 460 feet bgs. The driller estimated the well yield at 60 gpm based on four hours of airlifting.

Well J was installed approximately 900 feet south Orinoco Drive and 100 feet east of proposed Bear Run Lane at an elevation of approximately 3,840 feet above msl. Based on TM 5312, the well is located on Lot 24. Based on TM 5312, the well is located on Lot 32 of the CPA. The well was completed to a depth of 1,010 feet bgs. According to the driller's log, the geology consisted of decomposed granite from the surface to the contact with bedrock at 28 feet bgs. Fractured and/or weathered zones were encountered from 28 to 34 and 100 to 110 feet bgs. The driller estimated the well yield at 3 gpm based on four hours of airlifting

Wells E, F, G, H, I, and J were installed by air percussion drilling between October 29, 2010 and November 29, 2010 by Stehly Brothers Drilling Company, Inc. (Stehly Brothers) and completed using 8-$^{5/8th}$-inch diameter blank steel casing from the surface to 80, 84, 42, 60, 63, and 42 feet bgs respectively. Each well was completed without casing and with a borehole diameter of 6 ½ inches. All wells were completed with a sanitary seal (cement) from the ground surface to 4 to 6 feet above the end of the surface casing. The bottom 4 to 6 feet of the annular space outside the surface casing was completed with bentonite.

5.2 Aquifer Testing

Section 67.722.C of the County Groundwater Ordinance specifies that a minimum of 3 residential well tests are required to pass the requirements for residential well tests stated in Section 67.703 of the Ordinance. Five onsite production wells were initially selected for well testing, and an additional six wells were selected as part of the CPA investigation. A temporary submersible pump was installed in wells A, B, C, C3 and D by Acme Drilling prior to each pump test, and removed after each production well had recovered approximately 90 percent. A temporary submersible pump was in installed in wells E, F, G, H, I, and J by Stehly Brothers prior to each pump test. Sounding tubes were installed in each production well so that measurements could be made without interference from the plumbing and electrical systems in these wells. Water levels were measured both with an electric water level meter and a pressure transducer. Flow was measured with an in-line flowmeter, and water was discharged and spread on the ground adjacent to the production well. Drawdown and recovery data are presented in graphical format in Appendix E.

Well A

A 24-hour constant-discharge pump test was performed on December 4 and 5, 2003. The temporary submersible pump was installed to a depth of 300 feet bgs. The initial water level was 49.6 feet bgs. Wells B, and C and Monitoring Wells (MW) 1, 2 and 3 were monitored throughout the duration of

the test. A flowrate of 3 gpm was maintained throughout the test. The total volume pumped during the 24-hour test was about 4,320 gallons. With a 6½-inch diameter borehole, this represents approximately 9 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 224.2 feet, which equals a specific capacity of 0.013 gpm per foot.Recovery extrapolated to t/t' = 1 indicates no residual drawdown.. Although there were fluctuations before, during and after testing, there was no drawdown associated with our pump testing observed in the five unpumped monitoring wells (Wells B and C and MW-1, 2 and 3) throughout the duration of the test.

Table 7. Monitoring Wells for Well A

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown Associated with Pump Testing (feet)
Well A	N/A	49.6	273.8	224.2
Well B	*1,580*	*95.31*	*95.26*	*0*
Well C	4,230	219.63	219.05	0
MW-1	6,480	30.79	30.69	0
MW-2	3,450	24.06	24.10	0.04
MW-3	1,680	100.13	100.04	0

Well B

A 24-hour constant-discharge pump test was performed on December 9 and 10, 2003. The temporary submersible pump was installed to a depth of 260 feet bgs. Wells A, C, and MW-3 and 4 were monitored throughout the duration of the test. The initial water level for Well B was 96.1 feet bgs. A flowrate of 3 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 4,320 gallons. With a $6^{7}/_{16}$-inch diameter borehole, this represents approximately 14 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 30.6 feet, which equals a specific capacity of 0.1 gpm per foot. Recovery extrapolated to t/t' = 1 indicates 4 feet of residual drawdown. . No drawdown was observed in the four unpumped monitoring wells (Wells A, C, and MW-3, and MW-4) throughout the duration of the test.

Table 8. Monitoring Wells for Well B

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well B	N/A	96.1	126.7	30.6

Well A	1,580	53.79	53.25	0
Well C	2,835	216.46	215.75	0
MW-3	1,380	100.18	100.10	0
MW-4	3,690	29.83	29.83	0

Well C

A 24-hour constant-discharge pump test was performed on December 22 and 23, 2000. The temporary submersible pump was installed to a depth of 760 feet bgs. Wells B, and D, and MW-3 and MW-4 were monitored throughout the duration of the test. The initial water level for Well C was 211.0 feet bgs. A flowrate of 3 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 4,320 gallons. With a $6^1/_8$-inch diameter borehole, this represents approximately 3 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 268.4 feet, which equals a specific capacity of 0.011 gpm per foot. At the completion of pumping, the water level had declined approximately 268.4 feet. Recovery extrapolated to t/t' = 1 indicates approximately 20 feet of residual drawdown. . No drawdown was observed in nearby unpumped monitoring wells (Wells B, and D, and MW-3 and 4) throughout the duration of the test.

Table 9. Monitoring Wells for Well C

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well C	N/A	211.0	479.4	268.4
Well B	2,835	97.55	97.35	0
Well D	3,225	319.41	319.35	0
MW-3	2,865	100.25	100.03	0
MW-4	1,215	29.99	30.05	0

Since 90% recovery was not achieved with the pump test on Well C, it was redrilled to a depth of 1,032 feet bgs and three additional wells were installed in the vicinity of Well C. According to the driller, the redrilled Well C and Wells C1 and C2 were not capable of producing the required 3 gpm so they were not pump tested. Following are the results of the pump test performed on Well C3.

Well C3

A 12-hour 43-minute constant-discharge pump test was performed on April 4, 2004. The temporary submersible pump was installed to a depth of 190 feet bgs. Wells C, C1, and C2 were monitored

throughout the duration of the test. The initial water level for Well C3 was 59.1 feet bgs. A flowrate of 3 gpm was used throughout the test. The total volume pumped during the 12-hour 43-minute test was about 2,160 gallons. With a 6½-inch diameter borehole, this represents approximately 9 well-bore volumes. After 12 hours 43-minutes of pumping, the maximum drawdown was 8.4 feet, which equals a specific capacity of 0.36 gpm per foot. Recovery extrapolated to t/t' = 1 indicates no residual drawdown. . No drawdown was observed in nearby unpumped monitoring wells (Well C, C1, and C2) throughout the duration of the test.

Table 10. Monitoring Wells for Well C3

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well C3	N/A	59.1	67.5	8.4
Well C	*450*	*228.4*	*228.4*	*0*
Well C1	560	50.9	50.9	0
Well C2	675	17.7	17.7	0

Well D

A 24-hour constant-discharge pump test was performed on December 12 and 13, 2003. The temporary submersible pump was installed to a depth of 540 feet bgs. Well C and MW-3, 4 and 5 were monitored throughout the duration of the test. The initial water level for Well D was 318.5 feet bgs. A flowrate of 3 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 4,320 gallons. With a 6¼-inch diameter borehole, this represents approximately 10 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 3.1 feet, which equals a specific capacity of 0.97 gpm per foot. Recovery extrapolated to t/t' = 1 indicates no residual drawdown. . No drawdown was observed in nearby unpumped monitoring wells (Well C and MW-3, 4 and 5) throughout the duration of the test.

Table 11. Monitoring Wells for Well D

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well D	N/A	318.5	321.6	3.1
Well C	3,225	214.88	214.35	0
MW-3	4,905	100.20	100.13	0

MW-4	2,040	29.90	29.88	0
MW-5	1,260	24.89	24.88	0

Well E

A 24-hour constant-discharge pump test was performed on January 20 and 21, 2011. The temporary submersible pump was installed to a depth of 240 feet bgs. The initial water level was 54.80 feet bgs. MW-1 was also monitored throughout the duration of the test. A flowrate of 3.8 gpm was maintained throughout the test. The total volume pumped during the 24-hour test was about 5,472 gallons. With a 6½-inch diameter borehole, this represents approximately 17 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 5.54 feet, which equals a specific capacity of 0.71 gpm per foot. Recovery extrapolated to t/t' = 1 indicates no residual drawdown. Although there were fluctuations of up to 0.03 before, during and after testing, there was no drawdown associated with our pump testing observed in the unpumped monitoring well (MW-1) throughout the duration of the test.

Table 12. *Monitoring Wells for Well E*

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well E	N/A	54.80	60.34	5.54
MW-1	3,000	19.12	19.15	0.03

Well F

A 24-hour constant-discharge pump test was performed on January 27 and 28, 2011. The temporary submersible pump was installed to a depth of 320 feet bgs. Well A was also monitored throughout the duration of the test. The initial water level for Well F was 204.6 feet bgs. A flowrate of 3.8 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 5,472 gallons. With a 6½-inch diameter borehole, this represents approximately 15 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 1.43 feet, which equals a specific capacity of 2.7 gpm per foot. Recovery extrapolated to t/t' = 1 shows no residual drawdown. No drawdown was observed in the one unpumped monitoring well (Well A) throughout the duration of the test.

Table 13. Monitoring Wells for Well F

Well Name	Distance from Production	Depth to Groundwater at Beginning of Pump	Depth to Groundwater at End of Pump Test	Maximum Drawdown (feet)

	Well (feet)	Test (feet bgs)	(feet bgs)	
Well F	N/A	204.6	206.03	1.43
Well A	2,200	25.15	25.14	0

Well G

A 24-hour constant-discharge pump test was performed on December 16 and 17, 2010. The temporary submersible pump was installed to a depth of 300 feet bgs. Wells H and MW-3 were also monitored throughout the duration of the test. The initial water level for Well G was 116.10 feet bgs. A flowrate of 3.7 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 5,328 gallons. With a $6^{1/2}$-inch diameter borehole, this represents approximately 4 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 13.53 feet, which equals a specific capacity of 0.27 gpm per foot. Recovery extrapolated to t/t' = 1 shows no residual drawdown. No drawdown was observed in nearby unpumped monitoring wells (H, and MW-3) throughout the duration of the test.

Table 14. Monitoring Wells for Well G

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well G	N/A	116.10	129.63	13.53
Well H	900	93.56	93.45	0
MW-3	700	97.12	97.11	0

Well H

A 24-hour constant-discharge pump test was performed on January 17 and 18, 2011. The temporary submersible pump was installed to a depth of 200 feet bgs. Wells B, G, and MW-3 were also monitored throughout the duration of the test. The initial water level for Well H was 94.89 feet bgs. A flowrate of 3.7 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 5,328 gallons. With a $6^{1/2}$-inch diameter borehole, this represents approximately 14 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 8.39 feet, which equals a specific capacity of 0.44 gpm per foot. Recovery extrapolated to t/t' = 1 shows no residual drawdown. No drawdown was observed in nearby unpumped monitoring wells (Wells B, and G, and MW-3 and 4) throughout the duration of the test.

Table15. Monitoring Wells for Well H

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well H	N/A	94.89	103.28	8.39
Well B	900	48.05	48.05	0
Well G	800	104.24	101.70	0
Well MW-3	1,100	96.29	96.0	0

Well I

A 24-hour constant-discharge pump test was performed on February 3 and 4, 2011. The temporary submersible pump was installed to a depth of 260 feet bgs. Well C3, J, and MW-3 were also monitored throughout the duration of the test. The initial water level for Well I was 97.78 feet bgs. A flowrate of 3.9 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 5,616 gallons. With a $6^{1/2}$-inch diameter borehole, this represents approximately 8 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 23.37 feet, which equals a specific capacity of 0.17 gpm per foot. Recovery extrapolated to t/t' = 1 shows no residual drawdown. While we observed fluctuations of up to .02 feet in Well J, it does not appear to be related to pump testing. No drawdown was observed in nearby unpumped monitoring wells (Wells C3 and MW-3) throughout the duration of the test.

Table 16. Monitoring Wells for Well I

Well Name	Distance from Production Well (feet)	Depth to Groundwater at Beginning of Pump Test (feet bgs)	Depth to Groundwater at End of Pump Test (feet bgs)	Maximum Drawdown (feet)
Well I	N/A	97.78	121.15	23.37
Well C3	1,200	212.35	212.31	0
Well J	1,400	50.59	50.61	0.02
MW-3	1,600	94.91	94.84	0

Well J

A 24-hour constant-discharge pump test was performed on February 14 and 15, 2011. The temporary submersible pump was installed to a depth of 260 feet bgs. Well C3 and I, were also monitored throughout the duration of the test. The initial water level for Well J was 52.50 feet bgs. A flowrate

of 3.4 gpm was used throughout the test. The total volume pumped during the 24-hour test was about 4,896 gallons. With a $6^{1/2}$-inch diameter borehole, this represents approximately 3 well-bore volumes. After 24 hours of pumping, the maximum drawdown was 39.85 feet, which equals a specific capacity of 0.09 gpm per foot. Recovery extrapolated to t/t' = 1 shows no residual drawdown. No drawdown was observed in nearby unpumped monitoring wells (Well C3, and I) throughout the duration of the test.

Table 17. Monitoring Wells for Well J

Well Name	Distance from Production Well *(feet)*	Depth to Groundwater at Beginning of Pump Test *(feet bgs)*	Depth to Groundwater at End of Pump Test *(feet bgs)*	Maximum Drawdown (feet)
Well J	N/A	52.5	92.35	39.85
Well C3	1,000	211.41	211.41	0
MW-I	1,400	96.21	96.17	0

Well MW-1

A 24-hour constant-discharge pump test was scoped by the County Groundwater Geologist. However, site conditions prevented 4-wheel drive access to the well. Road improvements are necessary to allow a pump truck, generator, and pump test monitoring equipment.

The following table summarizes the results of pump testing eleven onsite production wells[3].

Table 18. Aquifer Tests of Hoskings Ranch Production Wells

Well Name	Test Start Day	Average Discharge (gpm)	Pumping Period (hours)	Water Depth Prior to Pumping (feet bgs)	Water Depth at Completion of Pumping (feet bgs)	Well Depth (feet bgs)	Maximum Drawdown (feet)	Residual Drawdown (feet)	Predicted Drawdown after Five Years (feet)[1]
Well A	12/4/03	3	24	49.6	273.8	331	224.2	0	60
Well B	12/9/03	3	24	96.1	126.7	271	30.6	4	6.6
Well C	12/22/03	3	24	211.0	479.4	1032	248.4	20	48
Well C3	4/14/04	3	12 hr 43 min	59.1	67.5	211	8.4	0	5.0
Well D	12/12/03	3	24	318.5	321.6	591	3.1	0	1.8
Well E	1/20/11	3.8	24	54.80	60.34	310	5.54	0	0.98
Well F	1/27/11	3.8	24	204.60	206.03	410	1.43	0	0.38
Well G	12/16/10	3.7	24	116.10	129.63	975	13.53	0	5.5
Well H	1/17/11	3.7	24	94.89	103.28	310	8.39	0	4.5
Well I	2/3/11	3.9	24	97.78	121.15	510	23.37	0	3.7
Well J	2/14/11	3.4	24	52.50	92.35	1,010	39.85	0	15.5

1: at a sustained pumping rate of 0.31 gpm

Of the eleven wells tested, nine wells (Well A, WellC3, Well D, Well E, Well F, Well G, Well H, Well I, and Well J) passed the County Groundwater Ordinance residential well test requirements. Wells B and C both failed due to projected residual drawdown of 4 and 10 feet, respectively.

5.3 Evaluation of Pump Test Data

Drawdown and recovery data from the constant discharge pump testing of Wells A, B, C, C3, D, E, F, G, H, I, and J are presented in graphic format in Appendix E.

Aquifer transmissivity (i.e., the capacity to transmit water) can be estimated using the Cooper-Jacobs approximation (Cooper 1946) to the Theis equation, which states:

$T = 2.3\ Q/4\ \pi \Delta s$

Where:

T = Transmissivity (feet^2/minute)

Q = Discharge rate (feet^3/minute)

Δs = Drawdown (or residual drawdown) over 1 logarithmic cycle

Based on this equation, we calculated the following transmissivities for each production well.

Table 19. Calculated Transmissivities

Well Name	Transmissivity (feet^2/day)	
	Drawdown	Recovery
Well A	1	1
Well B	9	26
Well C	1	.3
Well C3	11	7
Well D	50	41
Well E	34	96
Well F	233	40
Well G	12	5
Well H	17	5
Well I	13	9
Well J	3	1

Arithmetic Mean	35	21

Since aquifer thickness and transmissivity do not remain constant with time, the Jacob correction was used to correct measured drawdown during pumping and recovery. These corrected drawdown data are plotted against the logarithm of time since pumping started. Corrected recovery data are plotted against the ratio of time since pumping started divided by time since pumping stopped (t/t').

Recovery data were evaluated to assess long-term affects to the groundwater aquifers. Data plots of residual drawdown versus time since pumping started, divided by time since pumping stopped (t/t'), graphed on semi logarithmic paper, and were evaluated to assess impacts to storage from pumping. At t/t' equal to 1 (infinite time), a residual drawdown would indicate permanent aquifer dewatering. Wells A, C3, D, E, F, G, H, I, and J are predicted to have no residual drawdown. Well B is predicted to have a residual drawdown of 4 feet, and Well C is predicted to have 10 feet of residual drawdown.

Based on an assumed transmissivity of 30 feet^2/day and storativity 0.0001 for proposed onsite production wells and specific yield for fractured rock (Section 5), we used the Theis equation (Theis 1936) to predict drawdown in offsite wells. We assumed a production rate of 0.5 afy (or 0.31 gpm) for a period of five years, as well as a rate of 10 gpm for a period of 24 hours. The rate of 10 gpm for 24 hours is meant to represent drawdown resulting from a homeowner filling a 14,000-gallon swimming pool or similar usage. Calculations are provided in Appendix F and results are summarized on the following table.

Table 20. Predicted Drawdown at Nearest Offsite Well

Well	Rate (gpm)	Elapsed Time (days)	Main Project Predicted Cumulative Drawdown (feet)	Consolidated Project Alternative Predicted Cumulative Drawdown (feet)
Most Likely Impacted Offsite Well	0.31	1825	6	14
	10	1	0	2

Based on the representative aquifer parameters (transmissivity = 30 feet^2/day, storativity = 0.0001) on-site pumping should not pose a significant impact to the most likely impacted offsite well.

The drawdown calculations and accompanying figure depicting the most likely impacted offsite well location are provided in Appendix F..

5.4 Water Quality

AECOM personnel obtained groundwater samples from Wells A and B on September 18, 2008 and Well D on September 17, 2008 after at least two well-bore volumes had been pumped from the wells. The samples were collected in laboratory-provided bottles, kept on ice, and sent via courier to Test America (a California-certified laboratory) to be analyzed for gross alpha, uranium, total dissolved solids (TDS), nitrate (as N) and total coliform. Laboratory analytical methods and preservation methods are provided on Table 21.

No groundwater samples exceeded the MCLs listed on Table 21 with the exception of total and fecal coliform in Well A and total and fecal coliform in Well D. These wells were disinfected and resampled on July 1, 2010 and found to be non-detect for total and fecal coliform. As part of the CPA investigation, water quality samples were collected from Well G on December 17, 2010 and Well E on January 12, 2011. None of these groundwater samples exceeded the MCLs listed on Table 21. All samples were analyzed within prescribed holding times.

Table 21. Laboratory Data

Analyte	Analytical Method	Container	Preservative	MCL	Result	Unit
Well A						
Gross Alpha	EPA 900.0	1 L Poly	HNO_3	15[5]	1.46 +/- 0.833	pCi/L
Uranium	EPA 200.8	500 mL Poly	HNO_3	20	<0.67	pCi/L[6]
TDS	EPA 160.0	1 L Poly	None	1,000[7] (500 recommended)	160	mg/L
Nitrate-N	EPA 300.0	500 mL Poly	None	10	0.11	mg/L
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable[8]	122	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	52	MPN/100 mL
Well A Resample 7/1/2010						
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Well B						

[5] MCL compliant when gross alpha minus uranium is less than 15 Pico Curries per Liter (pCi/L).

[6] Laboratory results provided in ug/L and converted to pCi/L. For uranium, 0.67 pCi/L is equal to 1 ug/L.

[7] Secondary MCL

[8] The presence of total coliform is not necessarily an MCL violation but further testing may be necessary.

Gross Alpha	EPA 900.0	1 L Poly	HNO_3	15[8]	1.41 +/- 0.790	pCi/L
Uranium	EPA 200.8	500 mL Poly	HNO_3	20	<0.67	pCi/L[9]
TDS	EPA 160.0	1 L Poly	None	1,000[10] (500 recommended)	300	mg/L
Nitrate-N	EPA 300.0	500 mL Poly	None	10	<0.11	mg/L
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	52	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	52	MPN/100 mL
Well D						
Gross Alpha	EPA 900.0	1 L Poly	HNO_3	15	2.88 +/- 1.82	pCi/L
Uranium	EPA 200.8	500 mL Poly	HNO_3	20	<0.67	pCi/L[9]
TDS	EPA 160.0	1 L Poly	None	1,000[10] (500 recommended)	280	mg/L
Nitrate-N	EPA 300.0	500 mL Poly	None	10	<0.11	mg/L
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	30	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	<1.0	MPN/100 mL
Well D Resample 7/1/2010						
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Well E						
Gross Alpha	EPA	1 L Poly	HNO_3	15[8]	4.10	pCi/L

[9] Laboratory results provided in ug/L and converted to pCi/L. For uranium, 0.67 pCi/L is equal to 1 ug/L.

[10] Secondary MCL

	900.0				+/- 0.790	
TDS	EPA 160.0	1 L Poly	None	1,000[10] (500 recommended)	210	mg/L
Nitrate-N	EPA 300.0	500 mL Poly	None	10	<0.11	mg/L
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Well G						
Gross Alpha	EPA 900.0	1 L Poly	HNO_3	15	0.399 +/- 0.874	pCi/L
Uranium	EPA 200.8	500 mL Poly	HNO_3	20	<0.67	pCi/L[9]
TDS	EPA 160.0	1 L Poly	None	1,000[10] (500 recommended)	240	mg/L
Nitrate-N	EPA 300.0	500 mL Poly	None	10	<0.11	mg/L
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	8.0	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	<1.0	MPN/100 mL
Well G Resample 1/12/2011						
Total Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL
Fecal Coliform	SM9223B	100 mL Poly	None	Not Detectable	Not Detected	MPN/100 mL

6 GROUNDWATER IN STORAGE

Because there are often many years with little to no recharge, punctuated by years of abundance, water in storage must be adequate to provide for many years without recharge. Although actual site-

[10] Secondary MCL

specific storativity values are not known, these values can be estimated for purposes of this study. While the actual range for specific yield in rock likely ranges from about 0.0001% to 1%. . Specific yield values of 0.01% and 0.1%[3] were used for fractured rock in the slopes and flatter areas, respectively. Assuming a saturated thickness of 500 feet and specific yield values of 0.1% in valleys and mid-slope areas and 0.01% on steeper slopes and upland areas, an estimated 930 acre-feet of groundwater may be stored in the fractured rock within the 3,185-acre study area.

Assuming a specific yield value of 0.5% in decomposed granite and a saturated thickness of 20 feet, approximately 1 acre foot of water per acre may be stored in the residuum within the study area. Approximately 900 acres of decomposed granite is located in the flatter parts within the study area. This yields an estimated 900 acre-feet of groundwater in storage in the residuum within the 3,185-acre study area. Although there may be some saturated alluvium in the study area we have assumed no storage in this unit for this evaluation. The total calculated storage in the 3,185-acre study area is calculated to be 1,826.5 acre-feet ().

Table 22. Groundwater in Storage (acre-feet)

Unit	Approximate Area (acres)	Average Saturated Thickness (feet)	Specific Yield	Water in Storage (acre-feet)
Fractured Bedrock (Flatter Areas)	1,705	500	0. 1%	852.5
Fractured Bedrock (Steep Slopes)	*1,480*	*500*	*0.01%*	*74*
Residuum	900	20	5%	900
Total				*1,826.5*

7 RAINFALL RECHARGE

Infiltration of precipitation can be estimated by calculating the amount of precipitation that percolates through the soil root zone to reach the underlying groundwater system after accounting for losses due to runoff, evapotranspiration, and field capacity (soil moisture capacity). The soil moisture balance equation commonly used to estimate groundwater recharge due to rainfall is:

$R_i = P_i - RO_i - pET_i - (SMC - SM_i)$

Where:

R_i = Recharge during the i^{th} month (inches)

P_i = Precipitation during the i^{th} month (inches)

RO_i = Runoff during the i^{th} month (inches)

pET_i = Potential evapotranspiration during the i^{th} month (inches)

SMC = Soil moisture holding capacity (inches)

SM_i = Soil moisture at beginning of the i^{th} month (inches)

Since Orinoco/Temescal Creek is ungauged, runoff must be estimated. Runoff can be estimated as a function of the average monthly moisture content of the soil using the following equation:

$$RO_i = RO_{max} x (((SM_i + SM_{i+1})/2) SMC)$$

where:

RO_i = Runoff during the i^{th} month (inches)

RO_{max} = Maximum runoff potential (percent)

SM_i = Soil moisture at beginning of the i^{th} month (inches)

SM_{i+1} = Soil moisture at end of i^{th} month (inches)

SMC = Soil moisture holding capacity (inches)

The County provided rainfall data collected from the Wynola, Cuyamaca, and Santa Ysabel Rain Gauge Stations. The project site has an average elevation of approximately 3,600 feet above msl and is approximately 38 miles from the coast. Since Wynola is within the same rainfall belt and located less than 2 miles northwest of the site. At an elevation of approximately 3,600 feet above msl, it would likely be the most representative location. However, since there is only a partial record for this location, monthly data from Cuyamaca and Santa Ysabel were modified to create a representative data set (Appendix C). Those modified data for the rainfall years (July through June) 1971/1972 through 2004/2005 were used in our calculations.

The County of San Diego Groundwater Limitations Map dated May 2004 indicates that the Wynola Rain Gauge Location and the majority of the project site are located in the 21- to 24-inch mean annual rainfall belt, with the eastern portion of the project site situated in the 24- to 27-inch mean annual rainfall belt.

This information along with evapotranspiration rates (study, we provide the following), which were obtained from the State of California Evapotranspiration Zones map, was used in a computer program called *Recharg2*, which solves the soil moisture balance equation

Table 23. Monthly Potential Evapotranspiration

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Evapotranspiration (inches)	9.3	8.37	6.3	4.34	2.4	1.55	1.55	2.52	4.03	5.7	7.75	8.7

Based on Tables 4, 5 and 6, we have assumed the following representative values for the 3,185-acre study area:

Table 24. Moisture Holding Capacity and Maximum Runoff

Location	Moisture Holding Capacity (inches)	Maximum Runoff (Percent)
Higher and Steeper Slopes	2.8	40
Mid-Slope	4.8	25
Flatter and Lower Areas	5.5	20

Utilizing these data in the *Recharg2* program, we calculated the following average rainfall recharge, runoff value, and average annual rainfall recharge volume for the 3,185-acre study area.

Table 25. Rainfall Recharge

Location	Average Annual Recharge (inches)	Average Annual Runoff (percent)	Area in Study Area (acres)[9]	Average Recharge Volume (afy)
Higher and Steeper Slopes	3.1	18.5	1,480	380
Mid-Slope	3.6	11.2	1,200	355
Flatter and Lower Areas	3.7	8.8	505	157
Total			*3,185*	*892*

The output from the *Recharg2* program is presented in Appendix D.

8 SUSTAINABLE YIELD

Based on the San Diego County Groundwater Ordinance (Groundwater Ordinance), the minimum parcel size for a site with mean annual precipitation of more than 21 inches is 4 acres. The proposed

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[9] Determined from soils map.

lot size for the property is a minimum of 40 acres. The Groundwater Ordinance does not specifically require a groundwater study be performed for the property; however, pursuant to the California Environmental Quality Act (CEQA) requirements to evaluate cumulative impacts to groundwater resources, the County has requested that a study be completed for this property. An evaluation of sustainable yield is part of this investigation.

In order to determine long-term sustainable yield for the subbasin, a storage volume of 1,826.5 acre-feet was used for these calculations. Appendix C contains a table that calculates the theoretical maximum groundwater in storage for the subbasin for the period of 1971/1972 to 2004/2005. As stated earlier, approximately 200 acre-feet of water per year would be required at maximum main project buildout assuming the current GP and 135 (afy) assuming the GP Update. Approximately 203 afy would be required at maximum CPA buildout assuming the current GP and 138 afy assuming the GP Update. In accordance with the County of San Diego Guidelines for Determining Significance – Groundwater Resources, storage cannot drop below 50% (or 913.3 acre-feet) of maximum storage. Based on the groundwater in storage calculations, the study area could sustain development at maximum buildout under the current GP and the GP update. The lowest percent of maximum groundwater in storage is estimated to be 56% under the current GP and CPA. Our storage calculations assumed that the study area was full (i.e., contained 1,826.5 acre-feet of water) at the beginning. In addition, we assumed that the study area could not hold more than 1,826.5 acre-feet; therefore, if rainfall recharge was calculated to be in excess of this value, it was assumed the balance would run off, rather than recharge the groundwater system.

Because these calculations are heavily dependent on the assumed storage coefficient and this number is not well known, actual sustainable yield may vary.

Long-term sustainable groundwater yield is a function of several factors including rainfall recharge, streambed infiltration, groundwater inflow, septic system recharge, irrigation return flow, pumpage, phreatophyte loss, baseflow, other groundwater users in the study area, and groundwater outflow. The primary factors affecting sustainable yield on site are assumed to be study area-wide groundwater production, phreatophyte loss, and rainfall recharge. Although groundwater outflow is unknown, it is expected to decrease over time proportional to increased groundwater consumption within the study area. The other factors are expected to be insignificant or non-existent on this site. Rainfall recharge is that portion of the total rainfall in excess of the soil moisture capacity, after runoff and evapotranspiration losses.

9 CONCLUSIONS

Based upon the results of our study, we provide the following conclusions:

- The Main Project is expected to require 14 afy of groundwater for onsite residential and an additional 1.3 afy for onsite agricultural needs.The CPA is expected to require 17 afy of groundwater for onsite residential and an additional 1.3 afy for onsite agricultural needs.

- The site is underlain by granitic and metamorphic rock and mantled by residuum and minor amounts of alluvium. The majority of groundwater within the study area is located in residuum and fractures within unweathered bedrock. Although reported well yields range from 1.5 to 110 gpm, typical yields are more likely to be less than 10 gpm. The County Groundwater Ordinance requires that three wells for the Main Project and four wells for the CPA on the Hoskings Ranch site be able to produce 3 gpm for at least 24 hours (unless after 8 hours of pumping the specific capacity is equal to or greater than 0.5 gpm/ft of10 drawdown), must produce at least 2 full well bore volumes of water, must have no projected residual drawdown, and must indicate the amount of drawdown predicted to occur in the well after five years of continual pumping at the rate of projected water demand will not interfere with the continued production of sufficient water to meet the needs of the anticipated residential use(s).. Of the eleven pump-tested wells, nine wells were approved by the County as having met the Groundwater Ordinance requirements.

- The long-term average annual recharge to the 3,185-acre study area is expected to be approximately 890 afy.

- Based on these conclusions, extraction of up to 230 afy under the GP and 227 afy under the GP Update could be sustained without reducing groundwater in storage to less than 50%.

- A total of approximately 1,826 acre-feet of groundwater are thought to be in storage in the alluvium, residuum and fractured rock in the study area. The lowest percent of maximum groundwater in storage is 56%. Based on our groundwater availability calculations for the current GP and GP update, groundwater in storage is not anticipated to be a significant impact for the project.

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[10] Determined from soils map.

- Based on an analysis of the proposed lot locations for both the main project and the CPA, we estimate that the maximum cumulative drawdown at the nearest potential offsite well from pumping a typical onsite well would be about 14 feet. Based on the representative aquifer parameters (transmissivity = 30 feet^2/day, storativity = 0.0001) on-site pumping as depicted on the figures in Appendix F should not pose a significant impact to offsite wells.. .
- According to the current GP, the study area could be developed into 4 and 8-acre lot sizes depending on slope. However, due to slope limitations, 20-acre lot sizes were used for much of the southern portion of the study area. This could result in an estimated 220 homes in the study area at buildout assuming the current GP and an estimated 91 homes assuming the GP Update. At maximum study area usage, annual extraction for the main project is expected to be in the neighborhood of 200 afy under the current GP and 135 afy under the GP Update. At maximum study area usage, annual extraction for the CPA is expected to be in the neighborhood of 203 afy under the current GP and 138 afy under the GP Update. Development in excess of these densities may result in an overdraft condition during prolonged periods of below average rainfall. This estimate is based on the assumption that groundwater demand will average 0.5 afy per dwelling (in accordance with the San Diego County Groundwater Ordinance).
- With proper disinfection, water quality in the existing wells meets the relevant drinking water standards for the required parameters tested; hence groundwater quality is not anticipated to be a significant impact for the project.

10 RECOMMENDATIONS

- In order to minimize potential impacts to offsite wells, we recommend that future onsite production wells be located a minimum of 300 feet from project and external property lines. The closest current offsite wells are thought to be no closer than 50 feet from the adjacent property line. This would allow for a distance of at least 350 feet from the nearest offsite production well.
- When wells are drilled and pumps are installed, measures should be employed to prevent groundwater contamination.
- We recommend that future onsite production wells be located as far as possible and upgradient of septic systems.

- Since open wells could provide a conduit for groundwater contamination and could present a safety hazard, all onsite wells should be secured with locking covers.

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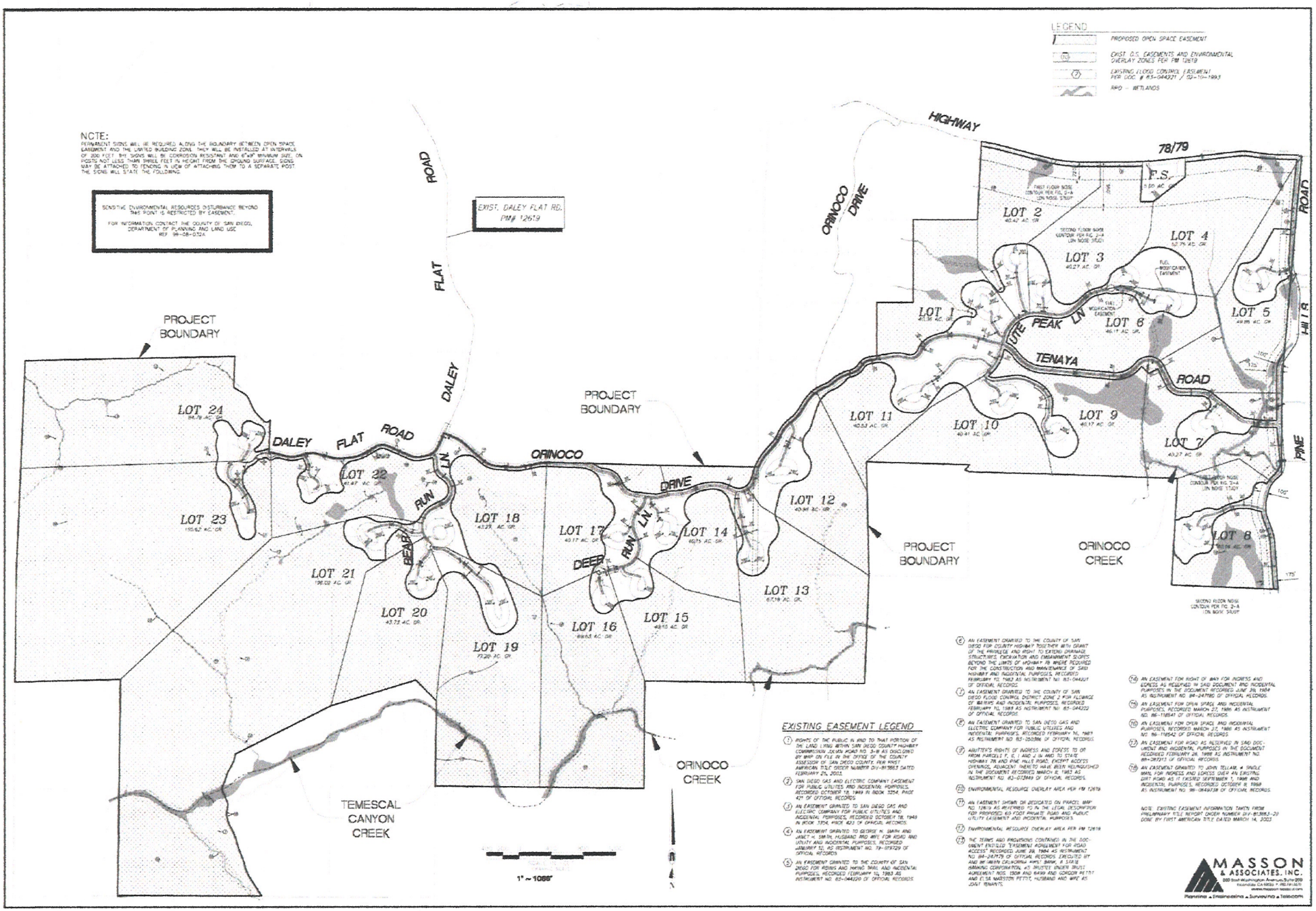
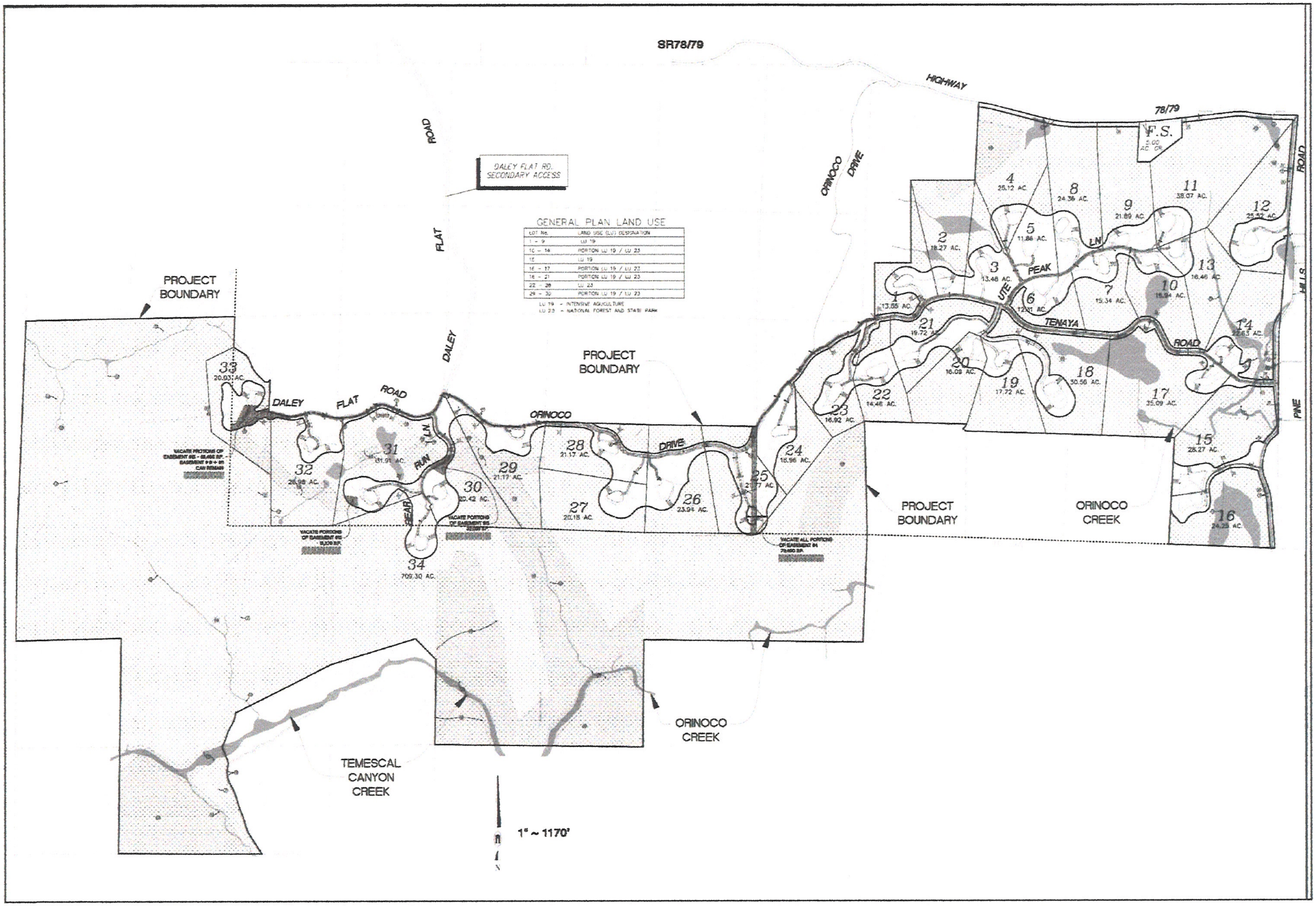
Appendix J

Fuel Modification Map


LEGEND
PROPOSED OPEN SPACE EASEMENT
EXIST. O.S. EASEMENTS AND ENVIRONMENTAL OVERLAY ZONES PER PM 12619
EXISTING FLOOD CONTROL EASEMENT PER DOC. # 83-044227 / 02-10-1983
RHO - WETLANDS
NOTE:
PERMANENT SIGNS WILL BE REQUIRED ALONG THE BOUNDARY BETWEEN OPEN SPACE EASEMENT AND THE LIMITED BUILDING ZONE. THEY WILL BE INSTALLED AT INTERVALS OF 200 FEET. SIGNS WILL BE CORROSION RESISTANT AND 6"x9" MINIMUM SIZE. ON POSTS NOT LESS THAN THREE FEET IN HEIGHT FROM THE GROUND SURFACE. SIGNS MAY BE ATTACHED TO FENCING IN LIEU OF ATTACHING THEM TO A SEPARATE POST. THE SIGNS WILL STATE THE FOLLOWING:
SENSITIVE ENVIRONMENTAL RESOURCES DISTURBANCE BEYOND THIS POINT IS RESTRICTED BY EASEMENT.
FOR INFORMATION CONTACT THE COUNTY OF SAN DIEGO, DEPARTMENT OF PLANNING AND LAND USE
REF: 99-08-012A
EXIST. DALEY FLAT RD. PM# 12619
HIGHWAY 78/79
ORINOCO DRIVE
DALEY FLAT ROAD
PROJECT BOUNDARY
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19
LOT 20
LOT 21
LOT 22
LOT 23
LOT 24
F.S.
UTE PEAK LN
TENAYA ROAD
HILL ROAD
PINE
DEER RUN LN
BEAR RUN LN
ORINOCO CREEK
TEMESCAL CANYON CREEK
1" = 100'
EXISTING EASEMENT LEGEND
(1) RIGHTS OF THE PUBLIC IN AND TO THAT PORTION OF THE LAND LYING WITHIN SAN DIEGO COUNTY HIGHWAY COMMISSION ZOMBA ROAD NO. 5-B AS DISCLOSED BY MAP ON FILE IN THE OFFICE OF THE COUNTY ASSESSOR OF SAN DIEGO COUNTY, PER FIRST AMERICAN TITLE ORDER NUMBER DIV-813983 DATED FEBRUARY 24, 2003.
(2) SAN DIEGO GAS AND ELECTRIC COMPANY EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED OCTOBER 18, 1949 IN BOOK 3254, PAGE 421 OF OFFICIAL RECORDS.
(3) AN EASEMENT GRANTED TO SAN DIEGO GAS AND ELECTRIC COMPANY FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED OCTOBER 18, 1949 IN BOOK 3254, PAGE 423 OF OFFICIAL RECORDS.
(4) AN EASEMENT GRANTED TO GEORGE N. SMITH AND JANET H. SMITH, HUSBAND AND WIFE FOR ROAD AND UTILITY AND INCIDENTAL PURPOSES, RECORDED JANUARY 10, AS INSTRUMENT NO. 79-019729 OF OFFICIAL RECORDS.
(5) AN EASEMENT GRANTED TO THE COUNTY OF SAN DIEGO FOR RIDING AND HIKING TRAIL AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 10, 1983 AS INSTRUMENT NO. 83-044220 OF OFFICIAL RECORDS.
(6) AN EASEMENT GRANTED TO THE COUNTY OF SAN DIEGO FOR COUNTY HIGHWAY TOGETHER WITH GRANT OF THE PRIVILEGE AND RIGHT TO EXTEND DRAINAGE STRUCTURES, EXCAVATION AND EMBANKMENT SLOPES BEYOND THE LIMITS OF HIGHWAY IN WHERE REQUIRED FOR THE CONSTRUCTION AND MAINTENANCE OF SAID HIGHWAY AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 10, 1983 AS INSTRUMENT NO. 83-044301 OF OFFICIAL RECORDS.
(7) AN EASEMENT GRANTED TO THE COUNTY OF SAN DIEGO FLOOD CONTROL DISTRICT ZONE 2 FOR FLOWAGE OF WATERS AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 10, 1983 AS INSTRUMENT NO. 83-044227 OF OFFICIAL RECORDS.
(8) AN EASEMENT GRANTED TO SAN DIEGO GAS AND ELECTRIC COMPANY FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 16, 1967 AS INSTRUMENT NO. 83-050386 OF OFFICIAL RECORDS.
(9) ABUTTER'S RIGHTS OF INGRESS AND EGRESS TO OR FROM PARCELS 'C, E, I AND J' IN AND TO STATE HIGHWAY 78 AND PINE HILLS ROAD, EXCEPT ACCESS OPENINGS, ADJACENT THERETO HAVE BEEN RELINQUISHED IN THE DOCUMENT RECORDED MARCH 8, 1983 AS INSTRUMENT NO. 83-073949 OF OFFICIAL RECORDS.
(10) ENVIRONMENTAL RESOURCE OVERLAY AREA PER PM 12619.
(11) AN EASEMENT SHOWN OR DEDICATED ON PARCEL MAP NO. 12619 AS RESERVED TO IN THE LEGAL DESCRIPTION FOR PROPOSED 60 FOOT PRIVATE ROAD AND PUBLIC UTILITY EASEMENT AND INCIDENTAL PURPOSES.
(12) ENVIRONMENTAL RESOURCE OVERLAY AREA PER PM 12619.
(13) THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "EASEMENT AGREEMENT FOR ROAD ACCESS" RECORDED JUNE 28, 1984 AS INSTRUMENT NO. 84-247479 OF OFFICIAL RECORDS. EXECUTED BY AND BETWEEN CALIFORNIA FIRST BANK, A STATE BANKING CORPORATION, AS TRUSTEE UNDER TRUST AGREEMENT NOS. 1508 AND 6499 AND GORDON PETTIT AND ELSA MADISON PETTIT, HUSBAND AND WIFE AS JOINT TENANTS.
(14) AN EASEMENT FOR RIGHT OF WAY FOR INGRESS AND EGRESS AS RESERVED IN SAID DOCUMENT AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JUNE 28, 1984 AS INSTRUMENT NO. 84-247480 OF OFFICIAL RECORDS.
(15) AN EASEMENT FOR OPEN SPACE AND INCIDENTAL PURPOSES, RECORDED MARCH 27, 1986 AS INSTRUMENT NO. 86-118541 OF OFFICIAL RECORDS.
(16) AN EASEMENT FOR OPEN SPACE AND INCIDENTAL PURPOSES, RECORDED MARCH 27, 1986 AS INSTRUMENT NO. 86-118542 OF OFFICIAL RECORDS.
(17) AN EASEMENT FOR ROAD AS RESERVED IN SAID DOCUMENT AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED FEBRUARY 28, 1998 AS INSTRUMENT NO. 98-087213 OF OFFICIAL RECORDS.
(18) AN EASEMENT GRANTED TO JOHN TELLAM, A SINGLE MAN, FOR INGRESS AND EGRESS OVER AN EXISTING DIRT ROAD AS IT EXISTED SEPTEMBER 7, 1988 AND INCIDENTAL PURPOSES, RECORDED OCTOBER 18, 1988 AS INSTRUMENT NO. 88-484838 OF OFFICIAL RECORDS.
NOTE: EXISTING EASEMENT INFORMATION TAKEN FROM PRELIMINARY TITLE REPORT ORDER NUMBER DIV-813983-20 DONE BY FIRST AMERICAN TITLE DATED MARCH 14, 2003
MASSON & ASSOCIATES, INC.
Planning • Engineering • Surveying • Telecom

Appendix K

Fuel Modification Map
Alternative Project


SR78/79
HIGHWAY
78/79
F.S.
5.00 AC. CR.
DALEY FLAT RD.
SECONDARY ACCESS
GENERAL PLAN LAND USE
LOT No. | LAND USE (LU) DESIGNATION
1 - 9 | LU 19
10 - 14 | PORTION LU 19 / LU 23
15 | LU 19
16 - 17 | PORTION LU 19 / LU 23
18 - 21 | PORTION LU 19 / LU 23
22 - 28 | LU 23
29 - 30 | PORTION LU 19 / LU 23
LU 19 - INTENSIVE AGRICULTURE
LU 23 - NATIONAL FOREST AND STATE PARK
PROJECT BOUNDARY
PROJECT BOUNDARY
PROJECT BOUNDARY
ORINOCO DRIVE
DALEY FLAT ROAD
ORINOCO DRIVE
BEAR RUN LN
UTE PEAK LN
TENAYA ROAD
PINE HILLS ROAD
ORINOCO CREEK
ORINOCO CREEK
TEMESCAL CANYON CREEK
1 13.65 AC.
2 18.27 AC.
3 13.48 AC.
4 25.12 AC.
5 11.86 AC.
6 12.91 AC.
7 15.34 AC.
8 24.36 AC.
9 21.89 AC.
10 15.94 AC.
11 38.07 AC.
12 25.52 AC.
13 16.46 AC.
14 22.63 AC.
15 28.27 AC.
16 24.25 AC.
17 35.09 AC.
18 30.56 AC.
19 17.72 AC.
20 16.09 AC.
21 19.72 AC.
22 14.46 AC.
23 16.92 AC.
24 16.96 AC.
25 21.77 AC.
26 23.94 AC.
27 20.18 AC.
28 21.17 AC.
29 21.17 AC.
30 20.42 AC.
31 31.91 AC.
32 26.98 AC.
33 20.03 AC.
34 709.30 AC.
1" ~ 1170'