CEQA HYDROLOGY REPORT

FOR

McCUNE TENTATIVE PARCEL MAP # 21213
1592 GREENACRES ROAD, FALLBROOK, CA 92028
APN 106 – 171 - 10
ENVIRONMENTAL LOG NO. PDS 2014-ER-02-010

Prepared For

Lance and Danielle McCune
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Prepared By

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November 16, 2015

REDLINE UPDATE: 10/8/16

The proposed project is to create four Parcels, 1 acre or more in size, on a 5 acre piece of property in Fallbrook. A vicinity map is attached to show its location.

The surrounding area has single family homes to the west, north and east. The vacant property to the south used to be a grove but the water has been shut off. It does have the potential of becoming a residential subdivision in the future.

This is a fairly straight forward project. There is some offsite water that enters the property from the northeast and flows southwesterly across the property. This drainage will be conveyed by a combination of concrete swales, RCP Pipe, and natural grade drainage courses. The concrete swale shown on Parcel 1 is for protection to the fill slope and proposed leach fields. Pipes are shown to go under the proposed driveway crossings.

The attached calculations do show a minor increase in drainage flow. To mitigate the increase, vegetated swales and biodetention basins will be incorporated on each lot in final design to provide filtration and infiltration. The Type C and D soil limits the ability to promote a lot of infiltration but the calculated increase is not large.

The drainage exits the property near the southwest corner into an existing established drainage course/ditch. The water does go through a downstream plant nursery where they have created retention ponds to capture the run off. Whatever water they don't capture continues under Winterhaven Road near its intersection with Brooke Road. From there the water course makes its way to Mission Road then heads southerly for several miles to join up with the San Luis Rey River water course.

At present the 200 scale topo indicates grades of about 7% for the pipes. An 18" RCP just handles the water. Final design grades on flown topo may necessitate the need to increase the pipe to 21" or 24". Two copies of a portion of the 200 scale topo are included to show the pre construction and post construction drainage basins and flows for the project. A copy of a portion of the Tentative Parcel Map Preliminary Grading Plan is attached to show the possible pad grading, pipe locations, drainage swales, rip rap, bio basins, and driveways. Keep in mind this is preliminary and the lots are intended to be sold individually.

The proposed project would not alter the existing drainage pattern of the site or area. The theoretical increase in flow is 1.58 cfs (40.52 cfs to 42.10 cfs). It would not result in any flooding or any substantial erosion or siltation, on or off site.

The mitigations for the above shown on the preliminary design include, but not limited to, vegetated swales around the pads, biodetention basins for filtration and infiltration, rip rap at exit points of drainage on site, and more larger rip rap at the exit point of all the Site's water and the existing street's water.

The proposed project would not create a situation where existing downstream drainage systems would be exceeded. The possible increase calculated (1.58 cfs) is very small compared to the combination of all the different basins for the area. It is the intent to hold back the minor increases via onsite biodetetion basins. In addition, as noted earlier, collection ponds for the plant nursery have been created just downstream of the project. This is a great detention facility for all of the immediate drainage areas.

The County has no plotted or documented flood limits through the property. I looked at the FEMA Maps and the project is in a non flood zone. I did a calculation in the report that indicates a depth of flow of 1' could be anticipated for the 100 year storm. Parcels 2,3, and 4 are 20' or more above the flow line of the drainage course. The far east pointed corner of proposed Parcel 1's pad is about 2' above the flow line, The rest of the pad gets to be about 15' above the drainage course flow line. In final design the pointed corner of pad could be easily modified to get about a 3' to 4' vertical differential.

The proposed project does not place any structures within a 100 year flood hazard area and no impediment or redirection of flood flows will occur.

In final design Erosion Control Plans will be developed for each lot as they are developed, slopes will have to be planted and irrigated, and on site vegetated swales and basins will be used.

In my professional opinion the project will not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

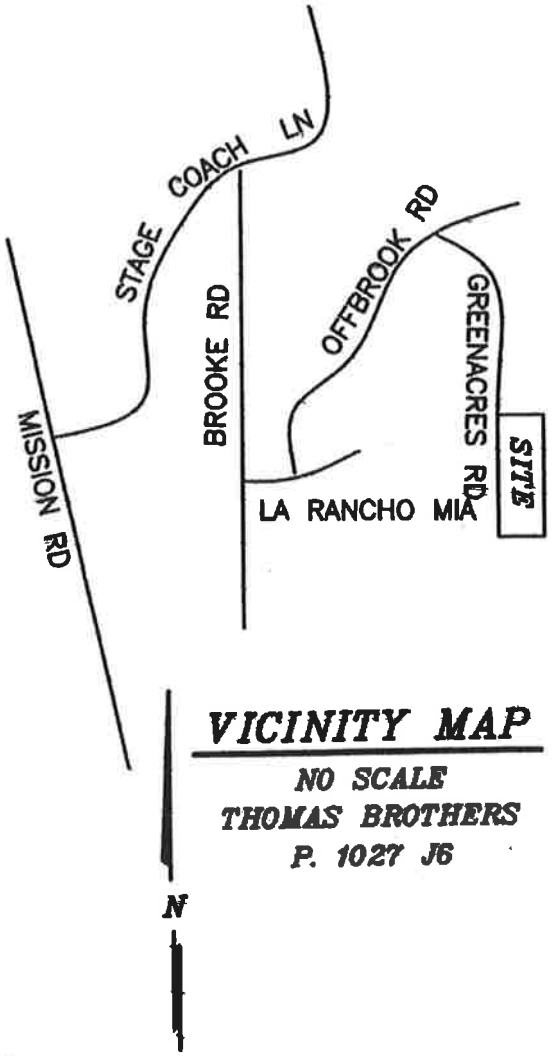
DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT. THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THIS PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

Robert O. Sukup 1/12/15

ROBERT O. SUKUP RCE 28302 DATE



VICINITY MAP

NO SCALE
THOMAS BROTHERS
P. 1027 J6

TPM 21213 - McCUNE
HYDROLOGY CALCS

SOIL TYPE = C & D (USE AVERAGE BETWEEN THE 2)
SEE ATTACHED FROM SHT 12 - BONSAL HYDROLOGIC SOIL GROUP MAP

% IMPERVIOUS FOR PRE = 10% = MINIMUM WE CAN USE

% IMPERVIOUS FOR POST = 15%

$T_c = t_i + t_t$

t_i = 5 MIN

t_t = 700' OF OFFSITE TRAVEL = 700' ÷ 3'/SEC (GRASSY) = 233 SECONDS

233 SEC. / 60 SEC./MIN = 3.9 MIN : SAY 4 MINUTES

T_c = 5 + 4 = 9 MINUTES

I = 6.1 (SEE FIGURE 3-1)

C_{PRE} = .39 TABLE 3-1 - USE AVG OF C & D SOILS

C_{POST} = .42 TABLE 3-1 - USE AVG OF C & D SOILS

I HAVE SHOWN 3 DRAINAGE AREAS THAT COMPRISE" OR PARTICIPATE IN THE SUBJECT PROPERTY. SEE ATTACHED EXISTING HYDROLOGY MAP

AREA "A" = 13.0 ACRES (PRIMARY DRAINAGE AREA

$Q_{PRE} = CIA = .39 \times 6.1 \times 13.0 = 30.93$ cfs

AREA "B" = 1.5 ACRES - PORTION OF TPM THAT FLOWS TO AN ADJACENT BASIN THAT JOINS UP WITH PROJECT BASIN - JUST S.W. OF SITE

$Q_{PRE} = .39 \times 6.1 \times 1.5 = 3.57$ cfs

AREA C = 4.03 Ac (OFFSITE AREA THAT FLOWS DOWN WEST SIDE OF GREENACRES ROAD.

$Q_{PRE} = .39 \times 6.1 \times 4.03\,Ac = 9.59$ cfs

EXISTING CONDITION RECAP:

THE TOTAL Q IN THE PROJECT'S BASIN EQUALS
9.59 cfs (AREA C) + 30.93 cfs (AREA A) = 40.52 cfs

THE TOTAL Q GOING TO THE LARGE BASIN TO THE SOUTH OF THE PROJECT = 3.57 cfs

POST CONSTRUCTION EVALUATION

THE "C" VALUE FOR THE DEVELOPMENT INCREASES FROM .39 (10% IMP.) TO .42 (15% IMP.)

AREA "A" INCREASED SLIGHTLY IN AREA DUE TO THE PROPOSED GRADING & DRAINAGE DIRECTION (.37 Ac)
THE DEVELOPED AREA = 3.87 Ac.

$Q_{POST} = (.42)(6.1)\,3.87 + (.39)\,6.1\,(13.37 - 3.87) = 9.91 + 22.6 = 32.51$ cfs

AREA "B-1"
THIS AREA IS .57 Ac AND BECOMES DEVELOPED
$Q = (.42)(6.1).57 = 1.46$ cfs

AREA "B-2"
THIS AREA IS .56 ACRES AND REMAINS UNDEVELOPED
$Q = (.39)(6.1).56 = 1.33$ cfs

AREA C IS OFFSITE AND REMAINS THE SAME

THE PROJECTS BASIN NOW HAS A TOTAL Q OF
32.51 cfs (AREA A) + 9.59 cfs (AREA B) = 42.1 cfs
OR AN INCREASE OF 1.58 cfs

AREAS "B-1" & B-2 HAVE A TOTAL Q OF 2.79 cfs OR A NET DECREASE OF .78 cfs TO THE ADJACENT BASIN

CHECK OF DEPTH OF FLOODING

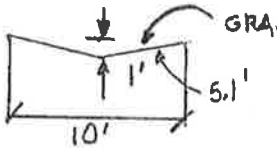
SWALE THROUGH PROPERTY

EXISTING AVERAGE GRADE ≈ 7% ALONG FLOW LINE

SIDES OF SLOPES ALONG FLOW LINE ≈ 20% (5'/25' AVG)

n = .025 = GRASSY SWALE

ASSUME 1' DEPTH OF FLOW - Q = ? $Q = \frac{AR^{2/3}(1.49)\sqrt{S}}{n}$



$A = \frac{1}{2}(10)1 = 5^{\square}$

W.P. = 10 + 5.1 + 5.1 = 20.2 (WETTED PERIMETER)

$R^{2/3} = \left(\frac{A}{WP}\right)^{2/3} = \left(\frac{5}{20.2}\right)^{2/3} = .3942$

n ≈ .025

S ≈ 7%

$Q = \frac{(5)(.3942)(1.49)\sqrt{.07}}{.025}$

Q = 31.08 cfs > 28.27

BASED ON THE ABOVE THE LIMITS OF INUNDATION FOR THE 100 YEAR STORM IN THE GRASSY SWALE @ 7% GRADE WILL BE ABOUT 10' WIDE.

STORM DRAIN CALCULATION

THE AREA FLOWING INTO THE PROPOSED STORM DRAIN IS ABOUT 1 ACRE LESS THAN THE PRE DEVELOPMENT AREA OR 13.0 - 1.0 = 12.0 ACRES. 2.6 OF THOSE ACRES WILL BE DEVELOPED.

$Q = .39 \times .61 \times 9.4 + .42 \times 6.1 \times 2.6 = 22.36 + 6.66 = 29.02$ cfs

THE ATTACHED NOMOGRAPH SHOWS AN 18" RCP HAS A CAPACITY OF 29 cfs ≈ 29.02 cfs ✓

FINAL DESIGN MAY REVISE THE PIPE SIZE.

THE DEPTH OF FLOODING CALCS I DID ON THE NEXT PAGE ASSUMED AN AVERAGE DRAINAGE COURSE AREA OF 5 S.F.

RIP RAP

THE TOTAL Q AT THE END OF THE PROPOSED STREET/DRWY EXTENSION IS 42.1 cfs (SEE SHT 2)

$V = Q/A = 42.1/5 = 8.42$ f/s

AS A MINIMUM, USE #2 BACK OR POSSIBLY FACING FOR THE ROCK TYPE

$V_{PRE} = Q/A = 40.52/5 = 8.10$ f/s

THE PRELIMINARY GRADING DESIGN ALSO ANTICIPATES RIP RAP TO BE INSTALLED AT ALL BIOBASIN OUTLETS AND ANY OTHER CONCENTRATED OUTLETS

PRE & POST CONSTRUCTION COMPARISONS

	PRE	POST
C	.39	.42
T_c	9 MIN	9 MIN
I	6.1	6.1
A	17.03	17.40 *
Q_{100}	40.52 cfs	42.10 cfs
V_{100}	8.10 f/s	8.42 f/s

* ONLY 3.87 ACRES HAS A HIGHER C VALUE. THE OTHER 1.13 ACRES FLOWS SOUTHERLY TO A LARGE BASIN WITH HALF USING .39 AND THE OTHER HALF (.57Ac) USING A C OF .42

the Sea Bright company

4322 Sea Bright Place ◆ Carlsbad, CA 92008 ◆ Telephone/FAX 760-720-0098

MESSAGE

TO County of San Diego - DPW & PDS
5510 Overland Ave - Ste 110
S.D., CA 92123
Att: Emmet

DATE 10/8/16

SUBJECT PDS 2014-TPM 21213
McCune Property off Greenacres Road, Fallbrook

Emmet,

Enclosed please find a hard copy of the revised sheet 3 of the Hydrology Report. This sheet reflects the verbage change you requested

BY Bob Sukup

REPLY

DATE

SIGNED

INSTRUCTIONS TO SENDER:
1. KEEP WHITE COPY. 2. SEND YELLOW AND PINK COPIES INTACT.

INSTRUCTIONS TO RECEIVER:
1. WHITE REPLY. 2. KEEP PINK COPY, RETURN COPY TO SENDER.