

# SPECIAL DISTRICTS DEPARTMENT



COUNTY OF SAN BERNARDINO

WATER AND SANITATION DIVISION  
12402 Industrial Blvd., D-6  
Victorville, CA 92395  
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JEFFREY O. RIGNEY  
Director

MANUEL M. BENITEZ  
Deputy Director

August 22, 2012

Ken Kang  
MK Design  
2021 W Commonwealth Ave, Unit U  
Fullerton, CA 92833

**SUBJECT: WATER SERVICE FEASIBILITY STUDY**  
**APN: 3064-041-02/9722 PHELAN RD**  
**OWNER: DAVID EUM/OAK HILLS PLAZA L.P.**  
**COUNTY SERVICE AREA 70, ZONE J (DISTRICT)**

Dear Mr. Kang:

The District Engineer has completed the water feasibility study for Assessor Parcel Number 3064-041-02. The purpose of the study was to determine the equivalent dwelling unit (EDU) assignment, costs/fees, and water service alternatives. The study indicates the District can serve the above referenced parcel.

The study is valid for one-year from the date of issue. All fees are subject to change.

If you decide to move forward with the project or have questions, please contact this office.

Sincerely,

for James A. Oravets  
Division Chief, Engineering

JAO:cm

cc: David Eum, Owner

encl: Water Feasibility Study

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JEFFREY O. RIGNEY  
Dir. Water & Sewer

MANUEL M. BENITEZ  
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# So & Associates Engineers Inc.

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August 21, 2012

101.0110-433

Water & Sanitation Division  
Special Districts Department  
12402 Industrial Blvd., Building D, Suite 6  
Victorville, CA 92395

Attn: Mr. Gary Martin  
Project Manager

**REFERENCE: COUNTY SERVICE AREA 70, IMPROVEMENT ZONE J (OAK HILLS)-WATER FEASIBILITY STUDY FOR APN 3064-041-02 (David Eum)**

Dear Mr. Martin:

In accordance with District's request, our staff has completed a review and analysis to prepare the "water feasibility study" for APN 3064-041-02. The Draft reports were submitted on or about July 19 and August 14, 2012. We are pleased to submit this Final Report for District's approval.

## **A. PROJECT DESCRIPTION**

The property parcel is currently zoned single family residential, located at the northeast corner of Baldy Mesa Road and Phelan Road (as shown in Figure-1). The proposed development is commercial consisting of four separate buildings as follows:

- Building "A" (Restaurant) 2,850 sq. ft
- Building "B" (Commercial) 2,900 sq. ft
- Building "C" (Commercial) 7,750 sq. ft
- Building "D" (Commercial) 9,000 sq. ft

The subject parcel is currently being served by a 1-inch inactive meter to a vacant residential dwelling. The 1-inch meter is connected to a Phase-1, 8-inch water main on Phelan Road to the south of the parcel. The parcel is credited with one EDU based on the existing water meter and its Phase-1 participation.

TABLE - 1

Building Area	Description Of Facilities	Estimated Quantity	Water Fixture Units	
			PFU/Each	Total PFUs
Total Buildings Area = 22,500 sf	Sinks (bar, commercial)	2	2	4
	Sinks (wash up etc.)	6	4	24
	Water closet (flush type)	18	4	72
	Wash basins	18	1	18
	Floor drains (sewer)	19	N/A	0

The average day water demand (ADD) and maximum day water demand (MDD), based on the number of EDU's and including fire flow requirement, are estimated to assess the impact of project on the existing water system. The original zoning and current zoning is for housing development and developer presumably has been working with the County Planning Department to address the zoning issue (from residential to commercial).

Water Demand: Using information from the latest H2O-Net hydraulic model, demand per EDU for CSA 70J is approximately 583 gallons per day. The estimated total plumbing fixture units for the Project are shown on Table-1 above, estimated to be 118 PFUs (equivalent to 6 EDUs, or equivalent dwelling units; 1 EDU = 20 PFUs). The daily water requirements are estimated as shown below and the max day water demand takes into consideration that water usage occurs over an 8 to 10 hour period each day.

$$\begin{aligned} \text{Average day demand (ADD)} &= 6 \text{ EDUs} \times 583 \text{ gpd/EDU} \\ &= 3,498 \text{ gpd} \end{aligned}$$

$$\begin{aligned} \text{Maximum day demand (MDD)} &= 2.5 \times \text{ADD} / 1,440 \text{ minutes per day} \\ &= 8,745 \text{ gpd} \\ &= 6.07 \text{ gpm (gallons per minute)} \end{aligned}$$

Fire Flow Requirements: At the time the existing water distribution system was constructed, the fire flow requirement was 750 gpm for two and half hours for rural development. The latest fire flow requirement, based on information obtained from San Bernardino County Fire Department, is as follows:

- Building "A" (Restaurant) 2,850 sq. ft Fire Flow = 1,000 gpm \*
- Building "B" (Commercial) 2,900 sq. ft Fire Flow = 1,000 gpm \*
- Building "C" (Commercial) 7,750 sq. ft Fire Flow = 2,250 gpm \*
- Building "D" (Commercial) 9,000 sq. ft Fire Flow = 2,500 gpm \*

\* Fire Flow will be reduced to 50% for building with sprinklers.

Based on maximum square footage for one of the buildings, the fire flow requirement is at 2,500 gpm. This fire flow requirement should further be discussed based on concerns presented later in report. To ensure that the water distribution system is capable of delivering fire flow above the original design (at 750 gpm), a computer model simulation run was performed for the proposed development location. The analysis included on-going system growth demand and additional required water storage for the pressure zone. The computer simulation confirmed that the current system can best be delivering about 750 gpm of fire flow (refer to results attached at the end of this Report). As stated, the County Fire Department will allow 50% fire flow reduction if the proposed Project is equipped with fire sprinklers; and this should be clarified in writing with the County Fire Department.

Note: Recently, California State Building Standards Commission formally adopted the 2009 IRC code that includes fire sprinkler requirements in all new one and two-family homes, and townhomes. The new code requirement becomes effective January 1, 2011. The District will require an approved backflow device installed on the piping per standard H-13 or H-14.

Water Supply & Storage Requirements: Required supply/storage for the proposed development is as shown below. CSA 70J staff will continue to monitor its supply and storage capability to ensure adequate service to its customers.

Domestic Water Supply Requirement	=	6.07	gallons per minute
Operational Storage - (0.3 x MDD)	=	2,623.0	gallons
Emergency Storage - (1.0 x MDD)	=	<u>8,745.0</u>	<u>gallons</u>
Subtotal storage (without fire)	=	11,368.0	gallons
UFC Fire Storage (2,500 gpm x 2 hours, w/o sprinklers)	=	300,000	gallons
UFC Fire Storage (1,250 gpm x 2 hours w/sprinklers)	=	150,000	gallons
Existing Storage (750 gpm x 2 ½ hours)	=	112,500	gallons

## **B. WATER DISTRIBUTION SYSTEM REVIEW**

The proposed project is located at about the middle region of Pressure Zone 2, which receives water from Reservoir 2-A site. Referencing max. water level at Reservoir 2-A (3,849 feet) and the approximate ground elevation at project site (at about 3,685 feet), the static pressure at the project site would be about 71 psig. Figure 1 shows the existing distribution piping system near location of the proposed project. Under maximum day demands plus required fire flow, the minimum residual pressure of 20 psi for a reduced fire flow of about 2,500 gpm (w/installation of sprinklers) cannot be met based on the existing Hydraulic Model run. The hydraulic model simulation indicates that a maximum fire flow of 750 gpm could be met (as the system was originally designed via formation of assessment districts). Therefore, to meet the fire flow in excess of about 1,250 gpm (even with installation of sprinklers and based on the number of buildings), the developer must consider: (a) construct a 2,100 lineal feet looping pipeline along Baldy Mesa Road from Elsinore Road to Phelan Road; and (b) discuss with District and San Bernardino County Fire Department staff regarding the fire protection requirement.

### C. ESTIMATED COST OF SYSTEM IMPROVEMENTS

1. On-site Facilities: The property owner or developer of APN 3064-041-02 will be entirely responsible for all costs of internal plumbing facilities. All on-site distribution and facilities (plumbing, piping, etc) must also meet the requirements of CSA 70J and the San Bernardino County Building & Safety Department.

2. Off-site Facilities: The suggested off-site looping pipeline along Baldy Mesa Road is identified in the CSA 70J Master Plan. If the developer should advance funds and construct this portion of the pipeline, the water connection fee (distribution main portion ) could be credited back to the developer. The estimated construction cost for the 2,100 lineal feet of 8-inch pipeline will be approximately \$150,000. Reimbursement agreement from other property owners that may be benefited by the pipeline will also be considered.

3. County Service Area Connection Fee: : Effective in fiscal year 2012-2013, County Service Area 70-J charges a water facility connection fee of \$9,124.58 per equivalent dwelling unit based on a 1999 rate study and adjusted annually per ENR construction cost index. This connection fee covers water supply capacity, storage reservoir, and transmission and distribution pipeline grid system. According to the parcels location, the District has established two categories of connection fees. The first category is for the parcels that are situated adjacent to an existing District waterline and have a water system assessment credit. These parcels will receive a credit toward the current connection fee from the District. The second category is for parcels that are not adjacent to the District waterline and do not have a water assessment credit. Such parcels will be required to pay the full connection fee and receive no credit. As commented earlier, the subject Parcel has one EDU credit, reducing the total additional EDUs from 6 to 5; see Item D-3 below.

### D. SUMMARY

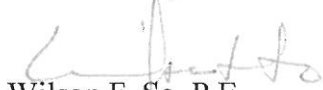
CSA 70-J will review and consider allowing APN 3064-041-02 to connect to its existing water system subject to: (a) resolving the fire flow issue with San Bernardino County Fire Department; (b) construct the off-site looping water main as commented above to improve the fire flow; and (c) pay the required connection fee and all costs are briefly summarized below:

- |     |  |   |
|-----|--|---|
| (1) | On-site piping / plumbing  | = Property owner to construct   |
| (2) | Off-site looping piping  | = \$ 150,000  |
| (3) | CSA 70J water connection fee<br>(5 EDUs X \$9,124.58 /EDU)<br>(restaurant at Bldg. A should be verified) | = \$ 45,622.90 (not reflect line extensions credit)                       |
| (4) | Meter installation charge  | = coordinate with Special Districts Depart.<br>staff (depending on size). |

The requirements for service, including all fees, credits and charges provided in this Study are valid for a period of one year from the date of the Final Feasibility Study. The above water connection fee and costs referenced will be subject to updates as well as further inflationary adjustments by the Water and Sanitation Division, depending on commencement and completion of the Project. We trust that information provided in this Study will be helpful to both the project developer and County Service Area 70J staff.

Very truly yours,

Submitted By:



Wilson F. So, P.E.  
District Engineer

Hydraulic Analysis by: Kanchan J. Bista



EX- TABLE 1  
CSA 70J: FEASIBILITY STUDY FOR APN 3064-041-02  
(Ken Kang/MK Design)

At Maximum Day (Peak) Demand, MDD

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,845.42	85.15
Z2-224	1.63	3,674.00	3,845.41	74.31
Z2-223	1.63	3,674.00	3,845.41	74.31
<b>Z2-221</b>	<b>2.97</b>	<b>3,685.00</b>	<b>3,845.42</b>	<b>69.54</b>
Z2-220	1.63	3,649.00	3,845.42	85.15
Z2-217	1.63	3,643.00	3,845.44	87.76
Z2-313	0	3,600.00	3,845.21	106.3
Z2-222	1.63	3,625.00	3,845.42	95.55
Z2-216	1.63	3,593.00	3,845.32	109.38
Z2-215	1.63	3,595.00	3,845.25	108.49
Z2-213	1.63	3,600.00	3,845.23	106.31
Z2-212	1.63	3,620.00	3,845.18	97.62

500 GPM Fire Flow (At Maximum Day (Peak) Demand, MDD)

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,792.06	62.02
Z2-224	1.63	3,674.00	3,793.99	52.02
Z2-223	1.63	3,674.00	3,793.99	52.02
<b>Z2-221</b>	<b>502.97</b>	<b>3,685.00</b>	<b>3,776.18</b>	<b>39.53</b>
Z2-220	1.63	3,649.00	3,794.00	62.86
Z2-217	1.63	3,643.00	3,803.16	69.43
Z2-313	0	3,600.00	3,804.10	88.48
Z2-222	1.63	3,625.00	3,794.00	73.26
Z2-216	1.63	3,593.00	3,804.21	91.56
Z2-215	1.63	3,595.00	3,804.14	90.66
Z2-213	1.63	3,600.00	3,804.12	88.48
Z2-212	1.63	3,620.00	3,804.07	79.79

600 GPM Fire Flow (At Maximum Day (Peak) Demand, MDD)

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,773.08	53.79
Z2-224	1.63	3,674.00	3,775.78	44.12
Z2-223	1.63	3,674.00	3,775.78	44.12
<b>Z2-221</b>	<b>602.97</b>	<b>3,685.00</b>	<b>3,750.87</b>	<b>28.56</b>
Z2-220	1.63	3,649.00	3,775.79	54.96
Z2-217	1.63	3,643.00	3,788.49	63.07
Z2-313	0	3,600.00	3,789.99	82.36
Z2-222	1.63	3,625.00	3,775.79	65.37
Z2-216	1.63	3,593.00	3,790.09	85.44
Z2-215	1.63	3,595.00	3,790.03	84.55
<b>Z2-213</b>	<b>1.63</b>	<b>3,600.00</b>	<b>3,790.01</b>	<b>82.37</b>
Z2-212	1.63	3,620.00	3,789.96	73.68

750 GPM Fire Flow (At Maximum Day (Peak) Demand, MDD)

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,739.50	39.23



Z2-224	1.63	3,674.00	3,743.58	30.16
Z2-223	1.63	3,674.00	3,743.58	30.16
<b>Z2-221</b>	<b>752.97</b>	<b>3,685.00</b>	<b>3,706.00</b>	<b>9.1</b>
Z2-220	1.63	3,649.00	3,743.58	41
Z2-217	1.63	3,643.00	3,762.58	51.84
Z2-313	0	3,600.00	3,765.11	71.58
Z2-222	1.63	3,625.00	3,743.58	51.41
Z2-216	1.63	3,593.00	3,765.21	74.65
Z2-215	1.63	3,595.00	3,765.15	73.76
Z2-213	1.63	3,600.00	3,765.13	71.58
Z2-212	1.63	3,620.00	3,765.08	62.89

**1,000 GPM Fire Flow (At Maximum Day (Peak) Demand, MDD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,670.54	9.34
Z2-224	1.63	3,674.00	3,677.47	1.5
Z2-223	1.63	3,674.00	3,677.47	1.5
<b>Z2-221</b>	<b>1002.97</b>	<b>3,685.00</b>	<b>3,613.60</b>	<b>-30.95</b>
Z2-220	1.63	3,649.00	3,677.48	12.34
Z2-217	1.63	3,643.00	3,709.47	28.82
Z2-313	0	3,600.00	3,714.23	49.52
Z2-222	1.63	3,625.00	3,677.47	22.75
Z2-216	1.63	3,593.00	3,714.33	52.6
Z2-215	1.63	3,595.00	3,714.27	51.7
Z2-213	1.63	3,600.00	3,714.24	49.52
Z2-212	1.63	3,620.00	3,714.19	40.83

**4,000 GPM Fire Flow (At Maximum Day (Peak) Demand, MDD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	1,719.95	-836.24
Z2-224	1.63	3,674.00	1,809.71	-808.17
Z2-223	1.63	3,674.00	1,809.71	-808.17
<b>Z2-221</b>	<b>4002.97</b>	<b>3,685.00</b>	<b>983.03</b>	<b>-1171.3</b>
Z2-220	1.63	3,649.00	1,809.72	-797.33
Z2-217	1.63	3,643.00	2,215.62	-618.77
Z2-313	0	3,600.00	2,289.44	-568.13
Z2-222	1.63	3,625.00	1,809.72	-786.92
Z2-216	1.63	3,593.00	2,289.54	-565.05
Z2-215	1.63	3,595.00	2,289.48	-565.94
<b>Z2-213</b>	<b>1.63</b>	<b>3,600.00</b>	<b>2,289.45</b>	<b>-568.12</b>
Z2-212	1.63	3,620.00	2,289.40	-576.81

EX- TABLE 2  
 CSA 70J: FEASIBILITY STUDY FOR APN 3064-041-02  
 (Ken Kang/MK Design)

**At Average Day Demand, ADD**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,846.61	85.66
Z2-224	0.65	3,674.00	3,846.61	74.83
Z2-223	0.65	3,674.00	3,846.61	74.83
<b>Z2-221</b>	<b>1.19</b>	<b>3,685.00</b>	<b>3,846.61</b>	<b>70.06</b>
Z2-220	0.65	3,649.00	3,846.61	85.66
Z2-217	0.65	3,643.00	3,846.61	88.27
Z2-313	0	3,600.00	3,846.57	106.89
Z2-222	0.65	3,625.00	3,846.61	96.07
Z2-216	0.65	3,593.00	3,846.59	109.93
Z2-215	0.65	3,595.00	3,846.58	109.06
Z2-213	0.65	3,600.00	3,846.58	106.89
Z2-212	0.65	3,620.00	3,846.57	98.22

**500 GPM Fire Flow (At Average Day Demand, ADD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,797.74	64.48
Z2-224	0.65	3,674.00	3,799.66	54.47
Z2-223	0.65	3,674.00	3,799.66	54.47
<b>Z2-221</b>	<b>501.19</b>	<b>3,685.00</b>	<b>3,781.96</b>	<b>42.03</b>
Z2-220	0.65	3,649.00	3,799.66	65.31
Z2-217	0.65	3,643.00	3,808.48	71.74
Z2-313	0	3,600.00	3,809.87	90.98
Z2-222	0.65	3,625.00	3,799.66	75.71
Z2-216	0.65	3,593.00	3,809.89	94.02
Z2-215	0.65	3,595.00	3,809.88	93.15
Z2-213	0.65	3,600.00	3,809.87	90.98
Z2-212	0.65	3,620.00	3,809.86	82.31

**600 GPM Fire Flow (At Average Day Demand, ADD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,779.26	56.47
Z2-224	0.65	3,674.00	3,781.95	46.8
Z2-223	0.65	3,674.00	3,781.95	46.8
<b>Z2-221</b>	<b>601.19</b>	<b>3,685.00</b>	<b>3,757.17</b>	<b>31.29</b>
Z2-220	0.65	3,649.00	3,781.95	57.64
Z2-217	0.65	3,643.00	3,794.26	65.57
Z2-313	0	3,600.00	3,796.27	85.08
Z2-222	0.65	3,625.00	3,781.95	68.04
Z2-216	0.65	3,593.00	3,796.29	88.13
Z2-215	0.65	3,595.00	3,796.28	87.25
<b>Z2-213</b>	<b>0.65</b>	<b>3,600.00</b>	<b>3,796.27</b>	<b>85.08</b>
Z2-212	0.65	3,620.00	3,796.26	76.41

**750 GPM Fire Flow (At Average Day Demand, ADD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,746.97	42.47
Z2-224	0.65	3,674.00	3,751.03	33.39
Z2-223	0.65	3,674.00	3,751.03	33.39
<b>Z2-221</b>	<b>751.19</b>	<b>3,685.00</b>	<b>3,713.61</b>	<b>12.4</b>
Z2-220	0.65	3,649.00	3,751.03	44.23
Z2-217	0.65	3,643.00	3,769.54	54.86
Z2-313	0	3,600.00	3,772.68	74.86
Z2-222	0.65	3,625.00	3,751.03	54.63
Z2-216	0.65	3,593.00	3,772.70	77.9

**TABLE 2**  
**CSA 70J: FEASIBILITY STUDY FOR APN 3064-041-02**  
**(Ken Kang/MK Design)**

Z2-215	0.65	3,595.00	3,772.69	77.03
Z2-213	0.65	3,600.00	3,772.68	74.86
Z2-212	0.65	3,620.00	3,772.67	66.18

**1,000 GPM Fire Flow (At Average Day Demand, ADD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	3,679.96	13.42
Z2-224	0.65	3,674.00	3,686.87	5.58
Z2-223	0.65	3,674.00	3,686.87	5.58
<b>Z2-221</b>	<b>1001.19</b>	<b>3,685.00</b>	<b>3,623.21</b>	<b>-26.79</b>
Z2-220	0.65	3,649.00	3,686.87	16.42
Z2-217	0.65	3,643.00	3,718.26	32.62
Z2-313	0	3,600.00	3,723.76	53.65
Z2-222	0.65	3,625.00	3,686.87	26.82
Z2-216	0.65	3,593.00	3,723.78	56.69
Z2-215	0.65	3,595.00	3,723.76	55.82
Z2-213	0.65	3,600.00	3,723.76	53.65
Z2-212	0.65	3,620.00	3,723.75	44.98

**4,000 GPM Fire Flow (At Average Day Demand, ADD)**

ID	Demand (gpm)	Elevation (ft)	Grade (ft)	Pressure (psi)
Z2-329	0	3,649.00	1,749.99	-823.22
Z2-224	0.65	3,674.00	1,839.68	-795.18
Z2-223	0.65	3,674.00	1,839.68	-795.18
<b>Z2-221</b>	<b>4001.19</b>	<b>3,685.00</b>	<b>1,013.67</b>	<b>-1158.02</b>
Z2-220	0.65	3,649.00	1,839.68	-784.34
Z2-217	0.65	3,643.00	2,243.61	-606.64
Z2-313	0	3,600.00	2,319.66	-555.03
Z2-222	0.65	3,625.00	1,839.68	-773.94
Z2-216	0.65	3,593.00	2,319.68	-551.98
Z2-215	0.65	3,595.00	2,319.67	-552.85
<b>Z2-213</b>	<b>0.65</b>	<b>3,600.00</b>	<b>2,319.67</b>	<b>-555.02</b>
Z2-212	0.65	3,620.00	2,319.66	-563.7