FYI from RTA

From: Mauricio Alvarez <malvarez@riversidetransit.com>
Sent: Thursday, February 23, 2023 9:21 AM
To: Ramaiya, Jarrett <jramaiya@MurrietaCA.gov>
Subject: Terraces Apartment Project

Good Morning Jarrett,

Thank you for including Riverside Transit Agency in the development review of the Terraces Apartment Project. After reviewing the plans, the only recommendation is to incorporate pedestrian walkways in complex, so that residents can easily access public transportation via the nearby bus stops.

Thank you for considering this comment.

Mauricio Alvarez, MBA
Planning Analyst
Riverside Transit Agency
p: 951.565.5260 | e: malvarez@riversidetransit.com
Website | Facebook | Twitter | Instagram
1825 Third Street, Riverside, CA 92507

3/13/2023

City Planner, City of Murrieta
One Town Square
Murrieta, CA 92562

Subject: Notice of Availability and Intent to Adopt a Mitigated Negative Declaration

APN: 910-031-001 through 005, 007 through 010, 015, 017, 018, 021 through 026, and 949-190-012 through 019

Location: North of Murrieta Hot Springs Road, east of the Interstate 15 corridor, south of Vista Murrieta Road and west of Sparkman Court

Project Description: DP 2022-2518, TPM38373, PH2022-2614, 899 apartment units on a 40.03 acre site, consisting of eleven (11), four story apartment buildings and twelve (12) two-story carriage unit buildings

Dear Jarett Ramaiya:

B-1 The subject project requires water and sewer services from EMWD. The details of said service connection points are further detailed in a separate document, known as EMWD's Design Conditions (DC), formerly known as Plan of Service (POS), developed by the project proponent and approved by EMWD.

The subject project was an active project with EMWD's Development Services Department, with Work Order Number 16189, and project Record Number WS2020-1209.

The DC evaluation identified requirements to construct new facilities, such as on-site and offsite water and sewer, as well as associated easements and/or Right-of-Way Permits to adequately serve the project demands.

2270 Trumble Road • P.O. Box 8300 • Perris, CA 92572-8300
T 951.928.3777 • F 951.928.6177 www.emwd.org

Attached, please find a copy of the latest approved/conditional DC for the subject project, as issued by EMWD on 1/11/2023.

If you have questions or concerns, please do not hesitate to contact me at (951) 928-3777, extension 4468 or by email at El-Hagem@emwd.org.

Sincerely,

Maroun El-Hage, MPA, MS, PE
Principal Civil Engineer
Development Services Department
Eastern Municipal Water District

MEH:lm

Attachment(s)/Enclosure(s): Copy of Public Notice

c. Demian Boettcher (EMWD)
Brian Raines (EMWD)

Notice of Availability and Intent to Adopt a Mitigated Negative Declaration for the City of Murrieta Terraces Apartment Project

The City of Murrieta has prepared an Initial Study for the Terraces Apartment Project, which recommends that a Mitigated Negative Declaration (MND) be issued, and the City has authorized the release of the proposed Initial Study/Mitigated Negative Declaration for public review and comment for the above project.

PROJECT NAME: Terraces Apartment Project

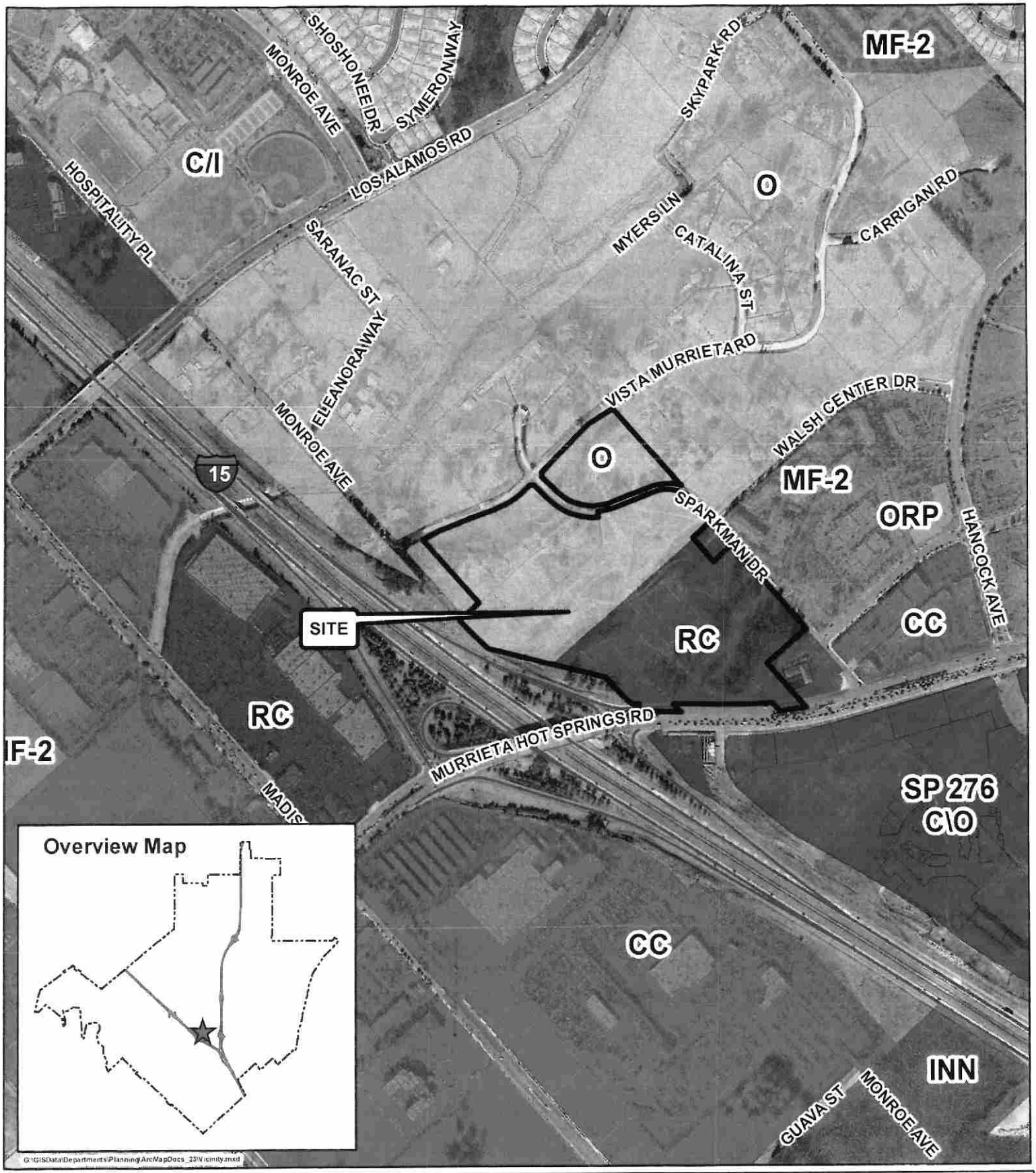
PROJECT DESCRIPTION: Terrace Apartments Project will process a Development Plan (DP) (2022-2518), Tentative Parcel Map (TM38373) & Phasing Plan (PH2022-2614). The proposed Project would construct 899 apartment units on a 40.03 (29.44 net) acre site. The Project consists of eleven (11), four-story apartment buildings and twelve (12) two-story carriage unit buildings. In total, the Project will provide 359 one-bedroom/one-bathroom units, 482 two-bedroom/two-bathroom units and 58 three-bedroom/two-bathroom units. The Project is zoned Regional Commercial/Office and is located within a Transit Oriented Development (TOD) Overlay District, which allows for multi-family at a minimum density of 30 dwelling units per acre. As allowed per State Density Bonus Law, the proposed Project would provide 45 very low-income units, with the city allowing parking waivers to be applied.

PROJECT LOCATION: The project site is located north of Murrieta Hot Springs Road, east of the Interstate 15 corridor, south of Vista Murrieta Road and west of Sparkman Court in the City of Murrieta, (APNs 910-031-001, -002, -003, -004, -005, -007, -008, -009, -010, -015, -017, -018, -021, -022, -023, -024, -025 and -026; 949-190-012, -013, -014, -015, -016 -017, -018 and -019).

The Initial Study/Mitigated Negative Declaration (IS/MND) makes the proposed findings that the project will not have any unavoidable significant negative impacts on the environment upon implementation of the recommended mitigation measures. The 30-day public review period for the Initial Study begins on February 10, 2023 and ends on March 13, 2023.

Pursuant to the California Governor's Executive Order N-54-20, an electronic PDF of the IS/MND is available for download on the City's website at https://murrietaca.gov/290/Public-Notices.

Any interested person or agency may comment on this matter by submitting their written comments before 5:00 pm on March 13, 2023. Comments should be sent to Jarrett Ramaiya, City Planner at City of Murrieta, One Town Square, Murrieta, CA 92562. Please submit comments to Mr. Ramaiya at (951) 461-6069 or at JRamaiya@MurrietaCA.gov. If you are interested in receiving additional information and/or any future updates on the proposed project, please submit your name and contact information or comments before 5:00 pm on March 13, 2023. Notification of the date, time and place of future actions will be provided in compliance with City and California Environmental Quality Act (CEQA) requirements.



DP-2022-2518/TPM 38373/PH-2022-2614
Terraces Apartment Project

2/22/2023

600 300 0 600 Feet

Vicinity Map

APN: 910-031-001 to -005, -007 to -010,-015,-017,-018, -021 to -026; 949-190-012 to -019

Development Services Department (DS)

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

******* NOTE TO APPLICANT: To fill out this form, please use the latest design guidelines, noted below: *******

- EMWD's "Water System Planning & Design" guidelines, Updated Feb 2006, and revised Sep 14, 2006, AND, EMWD's 2015 Water Facilities Master Plan Supplement
- EMWD's "Sanitary Sewer System Planning & Design" guidelines, Updated Feb 1993, and revised Sep 1, 2006, AND, EMWD's 2015 Wastewater Collection System Master Plan Supplement

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

I. PROJECT INFORMATION

Project Reference No. (City View):	2020-1209
DC - Work Order:	16189
Plan Check - Work Order:	N/A

Is LAFCO Fringe Annexation Required?	☐ Yes	☑ No	
Was LAFCO Fringe Annexation Approved?	☐ Yes	☐ No	☑ NA
Project to be transferred to AFS, upon DC approval?	☐ Yes	☑ No	

Project Name: [(a)] The Terraces - Murrieta (PM 910-03 & 949-19)

(a) Include TTM, TR, PM, SP, APN or other applicable number or name

Cross Streets: Sparkman Ct & Murrieta Hot Springs Rd

Existing land use	Proposed Land Use	Acres	# of Units, or Hotel Bedrooms	Building Area (SF)	# of Students	# of Hospital Beds, or Dialysis Seats	Average Flow (GPD)
	Residential, Rural						
	Residential, Low Density (SFR)						
	Residential, Medium Density (SFR)						
	Residential, Accessory Dwelling Unit (ADU)						
	Residential, Condominiums						
Vacant	Residential, Apartments	35.7	900				
	Residential, Age Restricted						
	Residential, Mobile Home Park						
	School		----------	----------			
	Educational: College		----------	----------			
	Church		----------		----------		
	Motel/Hotel						
	Hospital		----------	----------	----------		
	Medical Office Building (offices)		----------		----------	----------	
	Medical Office Building (long term care)		----------		----------	----------	
	Medical Office Building (Dialysis)		----------		----------		
	Mixed Use Policy Area		----------		----------	----------	----------
	Commercial, Retail		----------		----------	----------	----------
	Commercial, Office		----------		----------	----------	----------
	Industrial, Light		----------		----------	----------	----------
	Industrial, Light (Warehouse)		----------		----------	----------	----------
	Industrial, Heavy		----------		----------	----------	
	Open Space, Rural						
	Open Space, Agricultural						
Vacant	Open Space, Conservation	4.4					
	Open Space, Recreation						
	Other						
	Totals:	**40.1**	**900**	**0**	**0**	**0**	**0**

Development Services Department (DS)

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

II. WATER DEMAND AND SEWER FLOW ASSESSMENT

Applicant shall complete with ACTUAL project description(s)/use(s)/size(s)

AREA DESCRIPTION	LAND USE	AREA SIZE AC	AREA SIZE DU	POTABLE WATER DEMAND PROJECTIONS (GAL/AC)	POTABLE WATER DEMAND PROJECTIONS (GAL/EDU)	POTABLE WATER DEMAND PROJECTIONS ADD	POTABLE WATER PEAK FACTOR MDD	POTABLE WATER PEAK FACTOR PKHR	SEWER FLOW PROJECTIONS (GAL/AC)	SEWER FLOW PROJECTIONS (GAL/EDU)	SEWER FLOW PROJECTIONS ADWF
Area A	VHDR		85		290	24,650				153	13,005
Area B	VHDR		279		290	80,910				153	42,687
Area C	VHDR		361		290	104,690				153	55,233
Area D	VHDR		175		290	50,750				153	26,775
											0
											0
											0
							2.0	2.0			
					TOTAL (GPD)	261,000	522,000	1,044,000			
					TOTAL (GPM)	181	363	725			

MDD Peaking Factor Selection:
3.0 PF for Small Pressure Zone, where ADD in the PZ is <500 gpm
2.5 PF for Medium Pressure Zone, where ADD in the PZ is 500 to 2,000 gpm
2.0 PF for Large Pressure Zone, where ADD in the PZ is 2,000+ gpm

SEWER FLOW PROJECTIONS	
ADWF TOTAL (GPD)	137,700
ADWF TOTAL (GPM)	96
ADWF TOTAL (MGD)	0.1377
PEAK FACTOR [a]	2.76
PDWF - PEAK FLOW (GPD)	379,535
PDWF - PEAK FLOW (GPM)	264

Applicant shall complete with ACTUAL project description(s)/use(s)/size(s)

AREA DESCRIPTION	LAND USE	AREA SIZE AC	AREA SIZE DU	IRRIGATION [b] (GAL/AC)	IRRIGATION [b] (GAL/EDU)	POTABLE WATER DEMAND ASSMT. ADD	POTABLE WATER PEAK FACTOR MDD	POTABLE WATER PEAK FACTOR PKHR
Area E	Open Space	4.37		2,200		9,614	2.5	
					TOTAL (GPD)	9,614	24,035	
					TOTAL (GPM)	7	17	

(a) Sewer Peak Factor:
1- Use PF of 3.0 for Temecula Wine Country, Old Town Temecula, or similar hospitality type of use.
2- All other cases, PF is based on the following equation, PF = 2.13 $Q^{-0.13}$, where Q is ADWF in MGD,
3- Use max PF of 2.87, and Min PF of 1.5

III. WATER SUPPLY

Is a Water Supply Assessment Required?	☑ Yes	☐ No		
If WSA is required, did the Land Agency request a WSA from EMWD?	☑ Yes	☐ No	☐ NA	
Water Supply Assessment Issued?	☑ Yes	☐ No	☐ NA	Date Issued: 6/15/2022

Development Services Department (DS)

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

IV. WATER PRESSURE

Pressure Zone: 1384 HWL **Pressure Conditions (in the main pipeline):** ☐ High ☐ Normal ☐ Low ☑ Not Applicable (Commercial Use)

Notes: For only Residential lots, Plan checker shall utilize the attached service-pressure table(s) to determine pressure conditions for each lot, and cause the recordation of High or Low pressure conditions if applicable: Low Pressure Agreement is required for pressures<50 psi; High Pressure Agreement is required for pressures>80 psi; and Lots with pressures <50 psi shall receive a minimum of 1.5" laterals.

V. Fire Flow Demand

Has applicant requested a fire flow letter or fire flow test from EMWD: ☑ Yes, see below ☐ Yes, waiting for results ☐ No, need to request

Did it meet the fire flow demand: ☑ Yes ☐ No

Fire flow demand (GPM): 3750 **(GPM)**

Fire flow duration (HRS): 4 **(HRS)**

Has EMWD received a copy of Fire Flow Conditions or onsite private calculations: ☑ Yes ☐ No Comment: EMWD fire flow test dated February 17, 2022.

Note: -Estimated for planning purposes (at a 20 psi residual pressure). Actual fire flow and duration will be established by the governing Fire Marshall.

VI. WATER TRANSMISSION

Nearest Pipeline Facility w/Capacity: Existing 12-inch PVC waterline in Sparkman Ct (reference EMWD Drawing No. D-15248) and Existing 16-inch waterline in Los Alamos Rd

☐ Not requesting Water Service

Interagency Agency Permit: required? ☐ Yes ☑ No If Yes, Agency name: N/A

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

VII. WATER FACILITY REQUIREMENTS [e]

	Onsite/Offsite	Dia (in)	Length (lf)[f]	Location	Limits	Size needed by Project (in)
Pipeline:	Offsite	18	1600	Monroe Ave	From Los Alamos Rd to Vista Murrieta	18
Pipeline:	Offsite	18	1400	Vista Murrieta	From Monroe Ave to Sparkman Ct	18
Pipeline:	Offsite	18	800	Sparkman Ct	From Vista Murrieta to Walsh Center Dr	18

	Onsite/Offsite	Size	Unit	Easement	Grant Deed	Eligible for Storage Fee Credit	Location	
Booster Plant:	N/A			■	■			N/A
Storage Tank:	N/A			■	☐	☐ Yes ☐ No Effective 1/1/22	If eligible for Storage Fee Credits, see attachment for list of eligible lots.	
Temporary Pipeline Alignment:	N/A							

Implementing facility: N/A

Notes:
1- The Planning & Design Criteria used for this DC is the most current version of the "Development Services Department and Facility Design Guidelines", Section 3: "Design Conditions".
2- On-site water system to be private. The domestic water system shall be separate from the fire system.
3- All off-site facilities must be substantially complete prior to occupancy.

(e) Include attachments (such as hydraulic calculations, maps, etc.) when necessary
(f) Approximate lengths for planning purposes only

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

VIII. SEWER TREATMENT

Location: Temecula Valley Regional Water Reclamation Facility

Remaining Treatment Plant Available Capacity?:	☑ Yes	☐ No
Is the project within 1/4 mile from the Treatment Plant, or Lift Station?	☑ Yes	☐ No

If Yes, a notification letter shall be recorded against each of the lots.

If Yes, identify the facility name and location: Golden Triangle 2 Lift Station

IX. SEWER COLLECTION

Nearest Pipeline Facility w/Capacity: Existing 10-inch VCP gravity main in Sparkman Ct (reference EMWD Drawing No. SD-17372) and Golden Triangle 2 Lift Station

☐ Not requesting Sewer Service

Interagency Agency Permit: required? ☐ Yes ☑ No If Yes, Agency name: N/A

X. SEWER FACILITY REQUIREMENTS [g]

	Onsite/Offsite	Dia (in)	Length (lf)[h]	Location	Limits	Size needed by Project (in)
Pipeline:	Offsite	8	650	Sparkman Ct	From Walsh Center Dr to Medical Center Dr	8
Pipeline:	Offsite	15	50	Golden Triangle 2 LS	From Sparkman Ct to Golden Triangle 2 Lift Station	15
Pipeline:	N/A					N/A
Pipeline:	N/A					N/A

	Onsite/Offsite	Size (gpm)	Interim/Perm	Easement	Grant Deed	Abandonment Deposit Am't	Location	
Lift Station[i][j][k]:	N/A			☐ Yes	☐ Yes			N/A

Implementing facility: N/A

Notes:
1- The Planning & Design Criteria used for this DC is the most current version of the "Development Services Department and Facility Design Guidelines", Section 3: "Design Conditions".
2- On-site sewer system to be private.
3- Project to upsize existing 10" gravity main to 15" in Sparkman Ct upstream of Golden Triangle 2 Lift Station, from MH #9 (STA 15+91.93) to MH #10 (STA 16+29.36) per SD-17372.

(g) Include attachments (such as special studies, maps, etc.) when applicable
(h) Approximate lengths for planning purposes only
(i) If interim, describe method and timing of abandonment, and include Demolition and Abandonment plans during Plan Check. Customer is responsible for Abandonment cost.
(j) If applicant is proposing a Lift Station (either temporary or permanent): Submit a study justifying this use, identifying all other options and why they are not viable.
The study shall include a grading analysis of quantities and cost.
For a proposed temporary Lift Station, the study shall identify an abandonment plan, including plans and calculations, to demonstrate the feasibility of the abandonment.
(k) Proposed Lift Stations shall be presented for consideration by the Waste Water Enterprise Team prior to considering the DC approval.

Development Services Department (DS)

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

XI. RECYCLED WATER TRANSMISSION

Project not a Recycled Water Candidate

Nearest Pipeline Facility w/Capacity: N/A,

XII. RECYCLED WATER FACILITY REQUIREMENTS [j]

(RWUE and/or RWUP)

	Onsite/Offsite	Dia (in)	Length (lf)[k]	Location		Limits		Size needed by Project (in)
Pipeline:	N/A							N/A
Pipeline:	N/A							N/A
Pipeline:	N/A							N/A
	Onsite/Offsite	**Size**	**Unit**	Easement	Grant Deed	Abandonment Deposit Am't	**Location**	
Temporary Inter-Tie	N/A			☐ Yes	☐ Yes			N/A
Booster Plant:	N/A							N/A
Storage Tank:	N/A							N/A
Implementing facility:	N/A							
Notes[l]:	1- The Planning & Design Criteria used for this DC is the most current version of the "Development Services Department and Facility Design Guidelines".							

(j) Include attachments (such as hydraulic calculations, maps, etc.) when necessary

(k) Approximate lengths for planning purposes only

(l) RWUP: has it been completed ? ☐ Yes ☐ No ☑ N/A

RWUE: has it been completed ? ☐ Yes ☐ No ☑ N/A

Comments: The subject project is not a recycled water candidate.

XIII. FRONTAGE [m]

Water/Sewer/RcId	Description/General Location	Existing Frontage Memo #	Type [n,o]	Length (lf) [p]	$ Amt/lf	Total
Existing Water	N/A	12833	Non-Reimbursable	EXPIRED		#VALUE!
Existing Sewer	N/A	12834	Non-Reimbursable	EXPIRED		#VALUE!
Existing Recycled	N/A					$0
Proposed Water	Monroe Ave - From Los Alamos Rd to Vista Murrieta		Potentially Reimbursable	1600		$0
Proposed Water	Vista Murrieta - From Monroe Ave to Sparkman Ct		Potentially Reimbursable	1400		$0
Proposed Water	Sparkman Ct - From Vista Murrieta to Walsh Center Dr		Potentially Reimbursable	800		$0

(n) "Potentially Reimbursable" means: Potentially Reimbursable to project sponsor, in accordance with EMWD Admin Code as amended.

(o) "Non-Reimbursable" means: Payment by this applicant to reimburse original sponsor of facilities

(p) estimated will be finalized during agreement

Estimated for budgetary purposes only

(m) *Special Funding / Agreement Area:* ☐ Yes ☑ No

(If Yes) Name of Area: N/A

Signature (EMWD-FRONTAGE) Beatriz Mercado 12/28/22 **Date**

XIV. COMMUNITY FACILITIES DISTRICT (CFD)

Is this Project in a Facilities CFD ?	☐ Yes ☑ No	If CFD project includes EMWD cost participation for oversizing, sponsor/developer is eligible for EMWD cost participation after EMWD accepts CFD facilities (where punch-list is complete). In addition, sponsor/developer is eligible for reimbursement by CFD after substantial completion of CFD facilities (where punch list items are still in progress). Upon signing a Standard Facilities Agreement, the CFD group (Special Funding District) will deduct District's oversizing participation share from the total project cost, and then provide CFD reimbursement for the remainder project cost.
Is This Project in a Fees CFD ?	☐ Yes ☑ No	If CFD project includes Fees and if project is eligible for Storage Fee Credits, then, the CFD group (Special Funding District) will define FPC net amounts eligible for reimbursement from CFD, which exclude Storage Tank Credits. **(Special case for lot releases BEFORE tank completion)** Whether or not this project is a Fees-CFD, and the project is eligible for Storage Fee Credits, **and if lot releases are allowed prior to tank completion then**, then, upon signing of a Standard Facilities Agreement, EMWD will create a temporary special liability-account to receive and hold FPC funds equivalent to the then-in-effect Storage Tank Credit amount(s). After EMWD accepts the Tank site and associated facilities (where punch-list is complete), any Developer Storage Credit held by District will be reimbursed to the entity which paid the standard connection fees, and, all standard connection fees collected thereafter would be reduced by the Developer Storage Credit at the time the standard connection fees are calculated. This temporary account will cease to exist once the tank facility is accepted by EMWD. **(Special case for lot releases AFTER tank completion)** Whether or not this project is a Fees-CFD, and the project is eligible for Storage Fee Credits, then, when EMWD accepts the Tank site and associated facilities (where punch-list is complete), all standard connection fees collected thereafter (from the entity which paid the standard connection fees) would be reduced by the Developer Storage Credit at the time the standard connection fees are calculated.
If yes, what is the lead agency: EMWD	☐ Yes ☐ No ☑ N/A	
Other:		

XV. FINANCIAL PARTICIPATION CHARGES [(m)]

S.O. by DSD Technician? ☐ Yes ☑ No *If 'Yes', after mainline extension(s) please coordinate with a Development Services Technician for preparation of an Application For Service*

XVI. ESTIMATE CONNECT FEES FOR APPLICANT BENEFIT

All connection fees can be estimated via our EMWD website.
Visit http://www.emwd.org/new_biz/construction_fee-schedule.html for our complete fee schedule.

XVII. TIME LIMITATION of DESIGN CONDITIONS APPROVAL

This Design Conditions (DC) approval is valid for 24 months. From the time the DC is approved and until preparation of the Standard Facilities Agreement, this DC shall be subject to further evaluation if any of the following conditions exist:
a- The project's scope of work has changed substantially from the approved DC, causing the need to re-evaluate the proposed facilities
b- New regulatory requirements are in effect
c- EMWD has significant updates to its Facilities Master Plans/CIP program, and Design Criteria

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

XIII. SPECIAL CONDITIONS: For Conditions 1 and 2, please select one of the choices from the Drop-Down List - For all others, do NOT delete the ones that do not apply, instead, cross them out.

1- Use The Drop Down...	At the time this DC was processed, final Conditions Of Approval (COAs) were not available: Therefore, the COAs shall be provided as part of the first Plan Check submittal
2- ...List for items 1 and 2	Per attached confirmation by the sponsor/developer waiving his/her right for facility oversizing reimbursement from EMWD, the project shall not receive consideration for oversizing reimbursement.
3-	It is the applicant's responsibility to provide any updates or revisions to the Project COA during the development, or after the approval, of the DC. The DC shall be revised and updated as needed, including updating the Fire Flow test if the requirements are different from the original test: Failure to provide timely COA updates or revisions may result in potential additional facility requirements and/or delays in processing the project during subsequent phases (such as Plan Check or Agreement phases).
4-	(Only for Residential lots) Plan checker shall utilize the attached service-pressure table(s) to determine pressure conditions for each lot, and cause the recordation of High or Low pressure conditions if applicable: **Low Pressure Agreement** is required for lot pressures <50 psi; **High Pressure Agreement** is required for lot pressures >80 psi; and Lots with pressures <50 psi shall receive a **minimum of 1.5" service laterals**.
5-	~~The project lies within the _____ Special Benefit Area, and is subject to additional connection fees.~~
6-	(For residential landscaping fed from a potable water source) At FIRST Plan Check, a "Residential Landscaping Water Budget" form shall be completed and submitted (by a Licensed Civil Engineer or a Licensed Landscape Architect). This form will be reviewed by the Conservation Dept. during the Plan Check phase. A final approval of this form is required by EMWD's Conservation Dept., prior to EMWD's facilities "Release" by the Inspection Department.
7-	For Potable Landscape Irrigation and Meter Requirements (applicable to Commercial, Industrial, Institutional use, as well as common-areas within Residential Tract Development), sponsor shall provide information that is requested in the attached "Documents Required": This Information must be provided with the FIRST Plan Check submittal, and shall be submitted by a Licensed Civil Engineer or a Licensed Landscape Architect. This form will be reviewed by the Conservation Dept. during the Plan Check phase. A final approval of this form is required by EMWD's Conservation Dept., prior to EMWD's facilities "Release" by the Inspection Department.
8-	To submit for Plan Check of final design, the applicant shall refer to the Plan Check Submittal Checklist (attached). The Plan Check submittal shall include the appropriate Plan Check deposit in order for it to be considered complete.
9-	~~If this project requires Implementing Facilities, then such Implementing Facilities shall be concurrently in Plan Check with this project's Plan Check.~~
10-	~~For design of all pumping facilities: Provide design capacity, and preliminary site plan and pipeline alignments for DC approval. Final design shall be reviewed during Plan Check. If a an interim Lift Station is proposed, customer shall include Demolition and Abandonment plans during Plan Check.~~
11-	~~Design and install a potable-water sampling station per standard detail B-935, to be located within the project and as designated during the Plan Check review.~~
12-	The project is located within 1/4 mile from an existing EMWD wastewater treatment plant or lift station, and therefore a notification letter shall be recorded against each of the lots, prior to occupancy.
13-	~~Provide an approved Inter Agency Permit during Plan Check and prior to final plan approval.~~
14-	~~If eligible, Storage Fee Credit will be reimbursed to sponsor/developer only upon full EMWD acceptance of new tank facility. Until such acceptance, lots will be assessed the full then-in-effect FPC fees, while EMWD would place the then-in-effect credit amount in a temporary special account for future reimbursement to sponsor.~~
15-	~~For CFD projects: Prepare Project Specifications during the plan check process~~

Development Services Department (DS)

DESIGN CONDITIONS (DC)

[Formerly: Plan Of Service]

- Applicant to complete Gray sections - EMWD to complete Yellow/White sections -

Form No: *DS-045*
Updated: 11/10/2022

XIX. LIST OF APPLICABLE ATTACHMENTS & REFERENCES - note to EMWD engineers: In list below, cross out Attachments & References that do not apply (do NOT delete them)

1- Project Vicinity Map

2- Exhibit(s) of DC Facilities: existing and proposed facilities

~~3- Exhibit(s) of DC Facilities subject to relocation and/or easements~~

4- Available Min/Max Pressure table(s) (Residential only)

5- Fire Dept. Requirements…..... ☐ DRAFT ☑ FINAL

6- Project Conditions Of Approval …. ☐ DRAFT ☐ FINAL

7- EMWD Fire Flow Test Results

8- Hydraulic Boundary Conditions Report

~~9- Accepted Recycled Water Use Exhibit or Plan~~

10- Reports or special studies

~~11- DCDA vs RPDA: EMWD Requirements Memo~~

~~12- DCDA vs RPDA: Customer memo declaring intent of on-site use (Commercial & industrial use only)~~

13- Spreadsheet (template) for "Residential Landscaping Water Budget" and Instructions: **Template form must be filled out and provided with first Plan Check submittal.**

14- "Documents Required" for Potable Landscape Irrigation and Meter Requirements (applicable to Commercial, Industrial, Institutional use, as well as common-areas within Residential Tract Development): **This Information must be provided with the first Plan Check submittal.**

15- Manifold detail, for commercial projects

16- CFD Letter, signed by the Owner (Residential tracts only)

~~17- Prevailing wage requirements and process description~~

~~18- Sponsor/developer e-mail, waiving oversizing reimbursement from EMWD~~

~~19- Application For Service Requirements~~

20- Plan Check Submittal Checklist

21- Plan Check Deposit Schedule

~~22- List of Eligible Lots for Storage Tank Fee Credits (list lot numbers and provide associated exhibit)~~

23- Blank

		Date
Prepared By:	Jenny Li (Dudek, Consultants for EMWD)	1/11/2023
Reviewed By:	Brian Raines, P.E.	1/11/2023
	DC / Consultant Engineer & Initials	
Supervisor's Name:	Maroun El-Hage, P.E.	1/18/2023
	Principal Civil Engineer & Initials	
Work Order Closure processed ?	☑ Yes ☐ No	

EMWD's Disposition:

APPROVED

Initials: BAR **Date:** 1/11/2023

The following ATTACHMENTS & REFERENCES are incorporated herein as part of these Conditions.

Attachment 1

Project Vicinity Map

VICINITY MAP

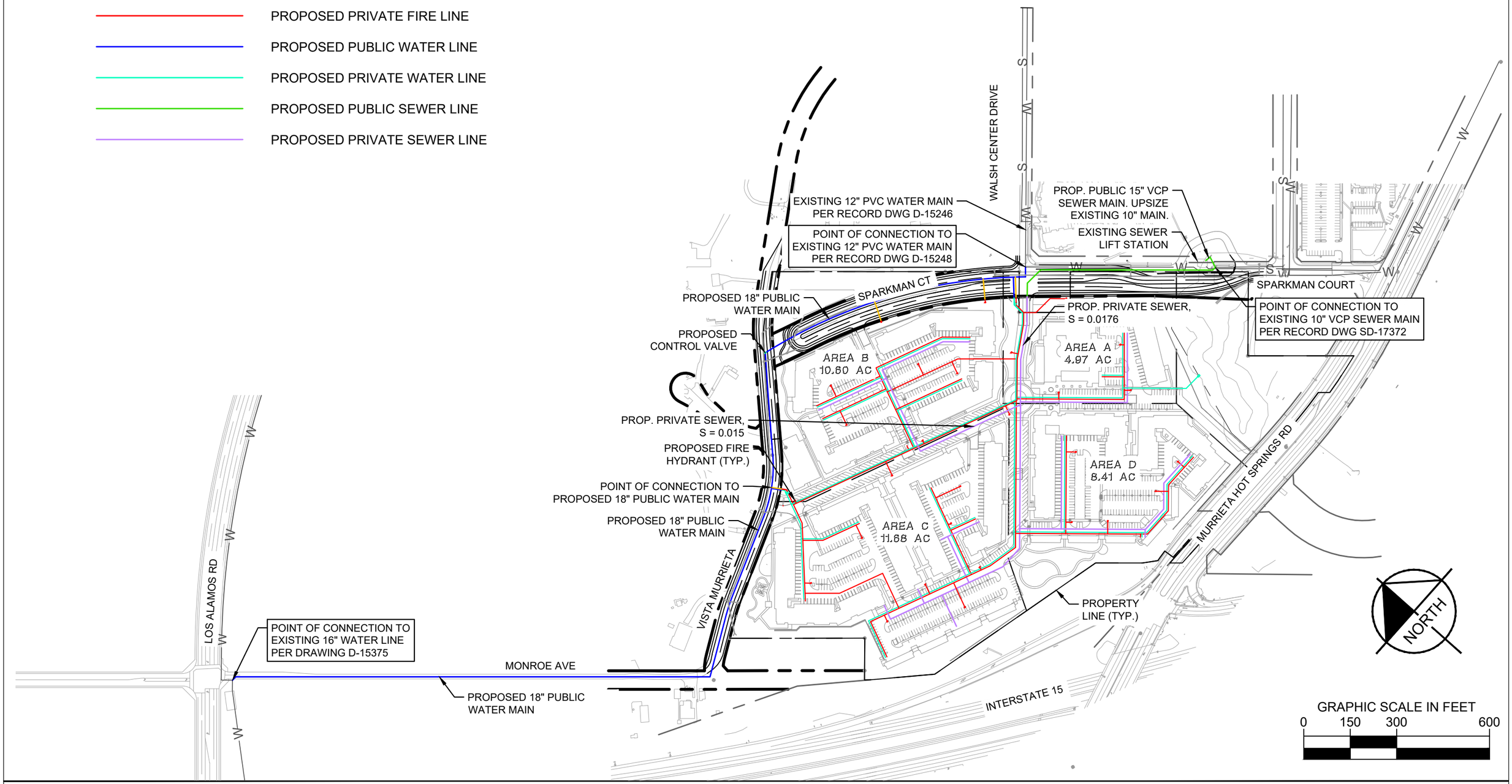
NOT TO SCALE

Attachment 2

Exhibit(s) of DC Facilities:
existing and proposed facilities

LEGEND

- PROPOSED PUBLIC FIRE LINE
- PROPOSED PRIVATE FIRE LINE
- PROPOSED PUBLIC WATER LINE
- PROPOSED PRIVATE WATER LINE
- PROPOSED PUBLIC SEWER LINE
- PROPOSED PRIVATE SEWER LINE



Kimley»Horn

401 B STREET, SUITE 600, SAN DIEGO, CA 92101
PHONE: 619-234-9411
WWW.KIMLEY-HORN.COM

COMPOSITE UTILITIES
THE TERRACES - MURRIETA
MURRIETA, CALIFORNIA

Attachment 3

Exhibit(s) of DC Facilities:

subject to relocation and/or easements

NOT APPLICABLE

All on-site facilities to be private.

Attachment 4

Available Min/Max Pressure table(s) (Residential only)

NOT APPLICABLE

High pressure notice required per EMWD Fire Flow test results.

Attachment 5

Fire Dept. Requirements
(Draft or Final)

MURRIETA FIRE & RESCUE

Life & Fire Safety Division

41825 Juniper Street, Murrieta, CA 92562 (951) 304-3473

December 28, 2021

Greystar Development
444 South Cedros Avenue
Suite 172
Solana Beach, CA 92075

Re: Vacant Lot – APN 910-031-001, 002, 003, 004, 005, 007, 008, 009, 010, 015, 017, 018, 020, 021, 022, 023, 024, 025, 026, ; 949-190-012, 013, 014, 015, 016, 017, 018, 019

Based on the structure size of 168,800 square feet, Type V-A construction, Murrieta Fire & Rescue has made the following determination:

- Closest Fire Station: Station 3 39985 Whitewood Road
- District will submit conditions at a later date, once a formal permit application has been filed with the City Development Services Department
- The required fire flow is 7,500 GPM @ 20 PSI for 4 hours

Please contact me directly at (951) 461-6153 with any questions or comments.

Yours in Service,

Doug Strosnider

Interim Fire Marshal

DS:sah

From: Strosnider, Doug
To: Esparza, Raul
Subject: Terraces
Date: Thursday, January 27, 2022 3:18:43 PM
Attachments: image001.png
CitySeal_e6a8c5dc-d7c3-424e-a429-2a7aa022e7b9.jpg

Rudy,
I am sending this as notification that we allow up to a 50% reduction in the required fire flow when builds are protected throughout with approved automatic fire suppression systems installed in accordance with NFPA 13 and the California Fire Code. Please feel free to call me if you have any questions.

Doug

Doug Strosnider, Interim Fire Marshal
Murrieta Fire & Rescue
41825 Juniper Street, Murrieta, CA 92562
951-461-6153 – Office
Dstrosnider@MurrietaCA.Gov

Attachment 6

Project Conditions Of Approval

(Draft or Final)

Project Conditions of Approval (COAs) were not available at the time of DC approval. The COAs shall be provided as part of the first Plan Check submittal.

Attachment 7

EMWD Fire Flow Test Results
(Draft or Final)

COMPUTER MODEL TEST

Grid Number:	9-A	**Date:**	February 15, 2022
Customer Name:	Greystar Development West, LLC	**Address:**	444 South Cedros Avenue; Suite 172
City, State Zip:	Solana Beach, CA 92075		
Contact Name:	Adam Covington		
Phone:	858-245-1937	**Cell:**	
Fax:		**Email:**	adam.covington@greystar.com
Project Record Number:	WS 2022-0040	**WO/CO:**	WO 16346
Project Name:	PM 910-03, 949-19 Terraces Murrieta	**APN:**	910-031-001
(Approximate) Test & Hydrant Location:	POC1: at intersection of Los Alamos Road and Monroe Avenue. See Figure 1. POC2: at intersection of Walsh Center Drive and Sparkman Court PIQ: Murrieta Hot Springs Road & I-15; Murrieta, CA 92563		

MODEL	**DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd**				
POC Test Location:	**EMWD RESULTS**			**Requested**	**Flow Availability for Fire Department**
	POC1	**POC2**			
Elevation*:	1150.8	1170.6			
Steady State, Dynamic (psi):	93.0	85.5			
Residual Pressure (psi):	81.9	74.7			
Tested FF (gpm):	1875	1875		3750	
Combined Total (gpm):	MDD 358 gpm** plus 3750 gpm fire flow			4108	
Number of Hydrants:	Tested POC1 and POC2 simultaneously			2	
Duration Tested @:	Four Hours			4	
Demand Conditions:	Max Day				
Pressure Zone/Tank Name(s)/Level(s):	1384 / Lower Las Brisas II / Base Elevation 1351.5 ft				
Pump Operating Status:	ON	**Computer Model Setting:**	EPS		

Number of Points of connections (POC):	**POC (Circle One)**		**Reason (Circle what Applies)**						
	One	Two or More	Design Conditions	Limited Capacity (Existing System)	Supply Redundancy	Conditions of Approval	Fire Sprinkler Connection(s)	Single Lot Residential	Existing POC(s)

Comments: Upon installation of proposed pipeline, the water system will be capable of providing 3750 GPM for 4 hours at a minimum of 20 psi, as shown in Figure 1. These Fire Flow test results may need to be complemented by Design Conditions and do not include all facility conditioning that may be required for this project. Fire Agency Conditions were provided (dated 12/28/21), if any Fire Flow changes occur in the Fire Agency Conditions, you may need to resubmit another Fire Flow test at the requester's expense.

The above results are not a guarantee the District's system will supply water to the project at any specific flows or pressures. These results were determined from a computer simulation of the District's water system and/or from hydraulic calculations pertaining to distribution pipelines: The capacity of the service laterals, meters, backflow assemblies, on-site fire system, and other appurtenances were not considered in these results. The design and sizing of service laterals and downstream facilities shall be the responsibility of the Project Sponsor.

EMWD's Fire Flow test results are valid for twelve months from the date of testing.

Completed By: Kris Danielson, Albert A. Webb Associates (consultants for EMWD)

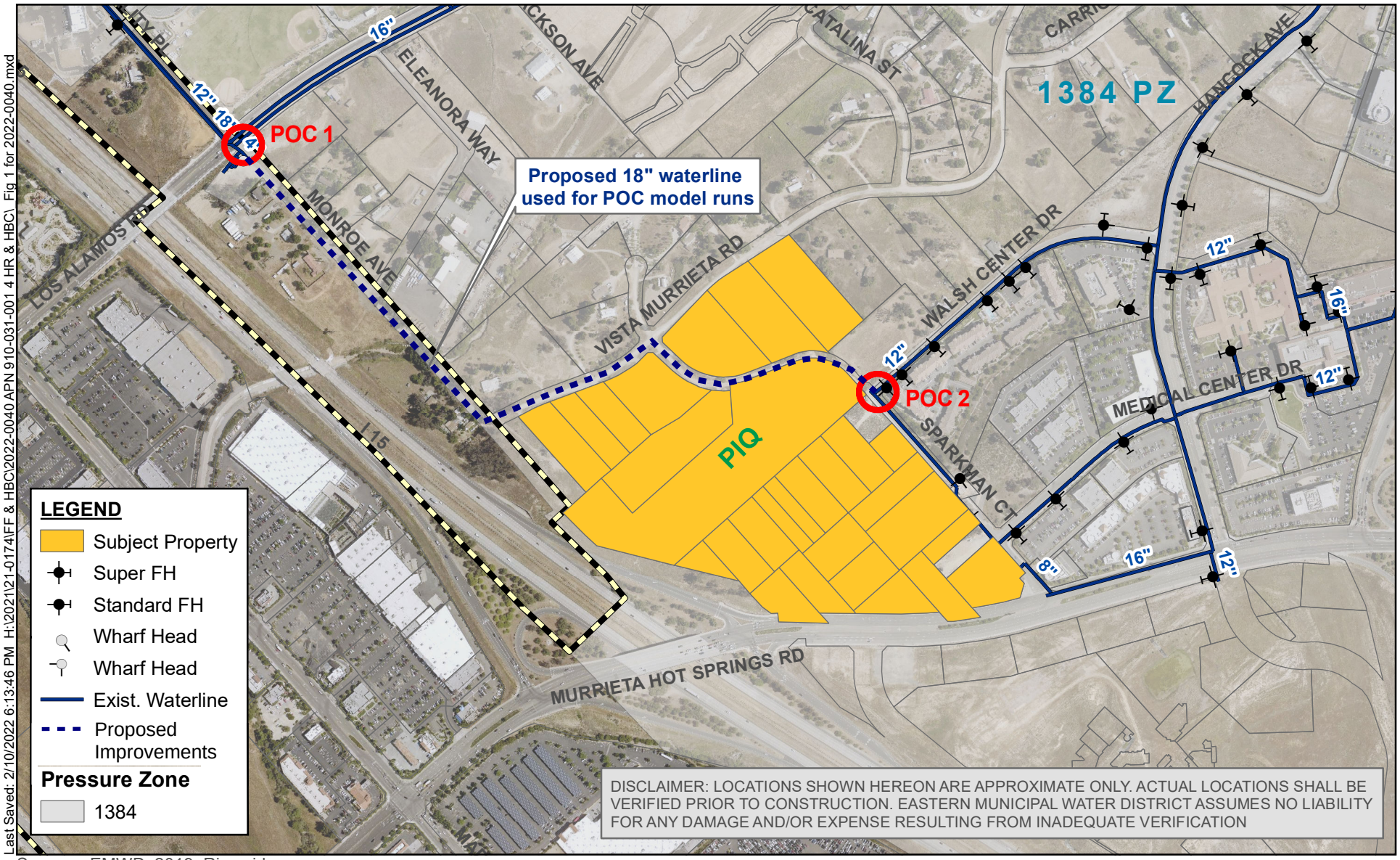
Should you have any questions or need additional information, please contact me at (951) 928-3777, ext. 4478.

Sincerely, Kristyn Danielson Date: 2/15/2022

Rudy Esparza
Sr. Engineering Technician
New Business Development

Reviewed By: RE Date: 2-17-2022

* Elevation based on Riverside County Flood Control digital data.
** Assumed 900 du of Very High Density Residential (ADD = 440 gpd/du, MDD is 2 times average day).



Last Saved: 2/10/2022 6:13:46 PM H:\2021\21-0174\FF & HBC\2022-0040 APN 910-031-001 4 HR & HBC\ Fig 1 for 2022-0040.mxd

Sources: EMWD, 2019; Riverside Co. GIS, 2021; RCIT, 2019.

0 600 1,200 Feet

EASTERN MUNICIPAL WATER DISTRICT

FIGURE 1
APN 910-031-001 thru 005, 007 thru 010, 015, 017, 018, 020 thru 026, 949-190-012 thru 020 FIRE FLOW TEST & HBC

Attachment 8

Hydraulic Boundary Conditions Report

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: PM 910-03, 949-19 Terraces Murrieta
Pressure Zone: 1384, WS 2022-0040
Model Version [12]: DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd

ADD (GPM): 179
FFD (GPM): 3750
Duration (Hours): 4

POC Location: POC 1 (Los Alamos Rd/Monroe Ave Intersection)
Elevation (ft): 1150.8
APN: 910-031-001
(See Attached Figure 1)

	Modeling Scenario [12]	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	179				1,362	91
Operational Demand	EPS, MDD, Pumps On (8)	PHD	358				1352	87
Operational Demand	EPS, ADD, Pumps On (8)	MHD	59				1376	98
Fire Flow Demand		FFD + MDD						
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD	179	1875		82	1340	82

Footnotes (see page 2 for additional footnotes):

(1) If improvements are required, please describe the improvements here:

18" diameter pipeline in Monroe Avenue and Jackson Avenue per Figure 1.
Other model changes were made to account for the recent improvements to this pressure zone including the 24" diameter waterline in Las Brisas Road and Hancock Ave (TVPW-107), the 8" diameter waterline in Berlie Street, and 12" diameter waterline in Los Alamos Rd and 12" diameter in Old Monroe Avenue.

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:

- Equal to or less than 5 fps: ...for MDD
- Equal to or less than 10 fps: ...for PHD
- Equal to or less than 15 fps: ...for FF + MDD

	Adequate?	Comments:
Available Firm Pumping Capacity:	No	(TBD indicates To Be Determined) Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.
Available Firm Pumping Capacity, w/ Electrical Outage :	No	
Available Storage Capacity:	TBD	

Additional Comments:
POC1 & 2 tested simultaneously with demands split evenly between the two POC's.

Prepared by: [signature] **Date:** February 15, 2022

Reviewed by: [signature] **Date:** 2-17-2022

File: 2022-0040 Output Data_V10.xlsx
FORM: NBD-068 (July 25, 2016) --- Date Printed: 2/16/2022, 1:26 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name:	PM 910-03, 949-19 Terraces Murrieta	**ADD (GPM):**	179
Pressure Zone:	1384, WS 2022-0040	**FFD (GPM):**	3750
Model Version [12]:	DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd***

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: PM 910-03, 949-19 Terraces Murrieta
Pressure Zone: 1384, WS 2022-0040
Model Version [12]: DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd

ADD (GPM): 179
FFD (GPM): 3750
Duration (Hours): 4

POC Location: POC 2 (Walsh Center Dr/Sparkman Ct intersectio
Elevation (ft): 1170.6
APN: 910-031-001
(See Attached Figure 1)

	Modeling Scenario [12]	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	179				1,364	84
Operational Demand	EPS, MDD, Pumps On (8)	PHD	358				1354	80
Operational Demand	EPS, ADD, Pumps On (8)	MHD	93				1377	89
Fire Flow Demand		FFD + MDD						
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD	179	1875		75	1343	75

Footnotes (see page 2 for additional footnotes):

(1) If improvements are required, please describe the improvements here:
18" diameter pipeline in Monroe Avenue and Jackson Avenue per Figure 1.
Other model changes were made to account for the recent improvements to this pressure zone including the 24" diameter waterline in Las Brisas Road and Hancock Ave (TVPW-107), the 8" diameter waterline in Berlie Street, and 12" diameter waterline in Los Alamos Rd and 12" diameter in Old Monroe Avenue.

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:

- Equal to or less than 5 fps: ...for MDD
- Equal to or less than 10 fps: ...for PHD
- Equal to or less than 15 fps: ...for FF + MDD

	Adequate?
Available Firm Pumping Capacity:	No
Available Firm Pumping Capacity, w/ Electrical Outage :	No
Available Storage Capacity:	TBD

Comments:
(TBD indicates To Be Determined)
Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.

Additional Comments:
POC1 & 2 tested simultaneously with demands split evenly between the two POC's.

Prepared by: Kristopher Davidson
Date: February 15, 2022

Reviewed by: RE
Date: 2-17-2022

File: 2022-0040 Output Data_V10.xlsx
FORM: NBD-068 (July 25, 2016) --- Date Printed: 2/16/2022, 1:35 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name:	PM 910-03, 949-19 Terraces Murrieta	**ADD (GPM):**	179
Pressure Zone:	1384, WS 2022-0040	**FFD (GPM):**	3750
Model Version [12]:	DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd***

Attachment 9

Accepted Recycled Water Use Exhibit or Plan

NOT APPLICABLE

Attachment 10

Reports or special studies

1.) WATER STUDY
2.) SEWER STUDY

The Terraces Murrieta
Water System Analysis Memorandum

Murrieta, CA

November 2022

Kimley»Horn

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

EXHIBITS

ABBREVIATIONS

ADD: Average Daily Demand
DU: Dwelling Units
FF: Fire Flow Demand
MDD: Maximum Day Demand
MDFF: Maximum Day Demand plus Fire Flow Demand
MHD: Maximum Hour Demand
PHD: Peak Hour Demand
PF: Peaking Factor

1. INTRODUCTION & PURPOSE

The Terraces Murrieta is proposing to develop 40.03 acres of undeveloped land into a 900 unit multifamily development. The Project is located in Murrieta, CA, near the intersection of Interstate 15 and Murrieta Hot Springs Road. It is bounded by Interstate 15 to the southwest, Murrieta Hot Springs Road to the south, Sparkman Ct to the northeast, and a vacant lot to the northwest. The Project exists in EMWD's Pressure Zone 1384. **Figure 1** depicts the project location and surrounding vicinity.

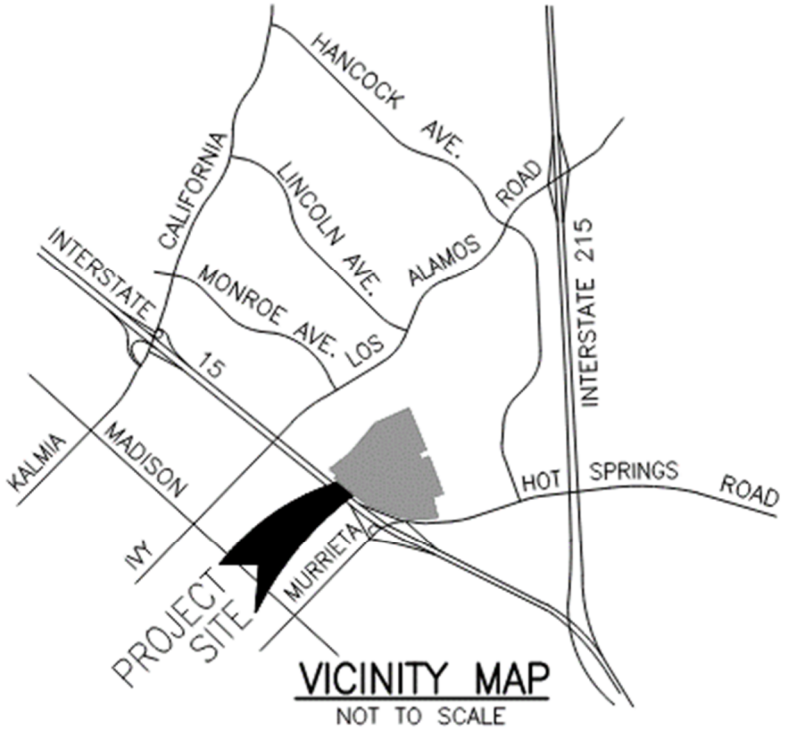


Figure 1: Project Location

A public 18-inch water line will be constructed to create a looped water supply system for the project. This line will connect to the existing 16-inch water line within the intersection of Los Alamos Rd and Monroe Ave, run southeast along Monroe Ave, then northwest along Vista Murrieta, then southeast along Sparkman Ct before connecting to the existing 12-inch water line within the intersection of Walsh Center Drive and Sparkman Ct. Additionally, private domestic and fire water systems will be constructed onsite to serve the project. This analysis determined pipe sizes for the fire and domestic water system. The objectives of the analysis were to maximize the available pressure to each building and on-site fire hydrants while meeting the following design criteria:

- Maintain a static service pressure of 60 to 125 PSI
- Maintain a residual pressure of 60 to 125 PSI for Maximum Day Demand (MDD)
- Maintain a residual pressure of 50 to 125 PSI for Peak Hour Demand (PHD)

- Maintain a minimum residual pressure of 20 PSI for Maximum Day Demand plus Fire Flow (MDFF)
- Maintain flow velocities under 10 fps, except during fire flow conditions.
- Maintain head loss in mains under 3.0 feet/1000 feet for flows up to 20 cfs., 2.0 feet/1000 feet for flows between 20 cfs and 50 cfs and 1.0 feet/1000 feet for flows over 50 cfs.

The fire flow requirements for the site are 7,500 GPM @ 20 PSI for four (4) hours. The Fire Marshal has confirmed that a 50% reduction is allowed "when builds are protected throughout with approved automatic fire suppression systems installed in accordance with NFPA 13 and the California Fire Code." As such, the site is designed to the requirements of 3,750 GPM @ 20 PSI for four (4) hours. The Murrieta Fire and Rescue letter stating the fire flow requirements and confirmation of an allowable reduction are included in **Appendix A**.

2. WATER SYSTEM CALIBRATION

The proposed water system will have two (2) points of connection (POC). One POC will be at the intersection of Monroe Avenue and Los Alamos Road to an existing 16-inch waterline. The second POC will be along Sparkman Court and connect to an existing 12-inch waterline.

BASE MODEL

The water system was analyzed using Bentley's WaterCAD v8i simulation model. WaterCAD is a dynamic water distribution system modeling software that models multiple flow conditions evaluating velocities, pressures, and head losses across the entire system. Preparation and calibration of the model was based on the following information:

- System layout (see **Exhibit A** for node and pipe layout)
- Hazen-Williams head loss coefficient (C) of 130 used for all on-site pipes to account for minor losses

Table 1: Fire Flow Model Test Data

Point of Connection	Elevation (FT)	Flow Condition	Water Demand at POC (GPM)	Fire Flow Demand at Test Hydrant (GPM)	HGL (FT)	Pressure (PSI)
POC-1	1150.8	MDD	179	-	1362	91
		PHD	358	-	1352	87
		MHD	59	-	1376	98
		MDFF	179	1875	1340	82
POC-2	1170.6	MDD	179	-	1364	84
		PHD	358	-	1354	80
		MHD	93	-	1377	89
		MDFF	179	1875	1343	75

Note: Total fire flow was split between each POC in the EMWD Model

Since the off-site water system is looped, the model was set up such that there is one reservoir feeding one pump at each POC. The data presented in **Table 1** was used to develop pump curves to simulate the existing water system conditions modeled by Eastern Municipal Water District (EMWD). The MDD, PHD, and ADD flow conditions were used to calibrate the model. The data provided by EMWD is provided in **Appendix A**.

3. SYSTEM ANALYSIS AND RESULTS

Demand Analysis

As discussed in Section 1, the proposed water system was analyzed to meet the design criteria for MDFF and PHD. The project consists of "Very High Density" residential. The MDFF and PHD demands were calculated by following the steps outlined in *Master Plan Supplement Planning and Sizing Criteria EMWD Water Facility Master Plan Update (2015)*, where ADD=DU*(GPD/DU), MDD=ADD*(Peaking Factor), and PHD=MDD*(Peaking Factor). Per Table 5-1 of the Master Plan, demand for Very High Density Residential is 290 GPD/DU. A Peaking Factor of 2 is used for each calculation for System Hydraulic Evaluations according to Table 5-2 of the *EMWD Water Facilities Master Plan.* A summary of the demands is listed below, and demand calculations are shown in **Table 2.**

- ADD = 181.25 GPM
- FF = 3750 GPM
- MDD = 363 GPM
- PHD = 726 GPM
- MDFF = 4113 GPM

Table 2: Water Demand Calculations

Building	DU	GPD/DU	Average Day Demand		Max Day Demand		Peak Hour Demand	
			ADD (gpd)	ADD (gpm)	Max. Day PF (MDD/ADD)	MDD (gpm)	Peak Hour PF (PHD/MDD)	PHD (gpm)
1A	32	290	9280	6.4	2	12.89	2	25.78
1B	53	290	15370	10.7	2	21.35	2	42.69
2	73	290	21170	14.7	2	29.40	2	58.81
3	61	290	17690	12.3	2	24.57	2	49.14
4	68	290	19720	13.7	2	27.39	2	54.78
5	77	290	22330	15.5	2	31.01	2	62.03
6	112	290	32480	22.6	2	45.11	2	90.22
7	85	290	24650	17.1	2	34.24	2	68.47
8	85	290	24650	17.1	2	34.24	2	68.47
9	71	290	20590	14.3	2	28.60	2	57.19
TH-A	7	290	2030	1.4	2	2.82	2	5.64
10	93	290	26970	18.7	2	37.46	2	74.92
11	76	290	22040	15.3	2	30.61	2	61.22
TH-B	7	290	2030	1.41	2	2.82	2	5.64

Water System Analysis

Once the model was calibrated, six different demand scenarios were run. The required Fire Flow of 3,750 GPM was split between two nodes (1,875 GPM per node) at locations furthest away from the POCs to best represent extreme fire flow conditions. The scenarios are listed in **Table 3**.

Table 3: Demand Scenarios

Scenario	Total Flow (GPM)	Node	Flow (GPM)
1 (PHD)	726	BLDG-1A	26
		BLDG-1B	43
		BLDG-2	59
		BLDG-3	49
		BLDG-4	55
		BLDG-5	62
		BLDG-6	90
		BLDG-7	68
		BLDG-8	68
		BLDG-9	57
		BLDG-10	75
		BLDG-11	61
		BLDG-THA	6
		BLDG-THB	6
2 (MDFF)	4113	FH7	1875
		FIRE-11	1875
		MDD	363
3 (MDFF)	4113	FIRE-8	1875
		FIRE-9	1875
		MDD	363
4 (MDFF)	4113	FIRE-2	1875
		FIRE-4	1875
		MDD	363
5 (MDFF)	4113	FH6	1875
		FIRE-1A	1875
		MDD	363
6 (MDFF)	4113	FIRE-7	1875
		FH10	1875
		MDD	363

Pipe sizes were adjusted and optimized to achieve the design criteria listed in Section 1. **Table 4** (next page) summarizes the results for each scenario. All pipe and node results for all scenarios are included in **Appendix B**.

Table 4: Model Summary

Scenario	Minimum Residual Pressure (PSI)	Maximum Residual Pressure (PSI)	Maximum Velocity (FPS)	Maximum Headloss (FT/1000 FT)	Flow at Maximum Headloss (GPM)
1 (PHD)	83	97	2.08	3	176
2 (MDFF)	72	85	7.66	20	1,875
3 (MDFF)	72	85	7.66	20	1,875
4 (MDFF)	72	85	10.64	29	3,750
5 (MDFF)	72	85	7.66	20	1,875
6 (MDFF)	72	85	7.66	20	1,875

4. SYSTEM RECOMMENDATIONS

The water system analysis was used to size the distribution system to meet the required design criteria for the on-site water system. The system meets all design criteria except in extreme Fire Flow conditions, in which case the headloss exceeds the recommended maximum. **Exhibit A** depicts the proposed water system.

Based on the data provided by EMWD, the on-site fire hydrants and nodes will have residual pressures ranging from 72 PSI to 85 PSI during the MDFF condition, with maximum velocities reaching 10.64 FPS. Additionally, all on-site nodes will maintain residual pressures between 83 and 97 PSI during PHD conditions.

Limitations

The recommendations presented in this report are based upon the modeling data provided by EMWD, which may not represent actual field conditions. **Flow testing should be performed by the developer during construction drawings to confirm the actual field conditions.**

Tammie Moreno, P.E.
C 74417 Exp. 09/30/23

APPENDIX A

EMWD Water System Data, Base Modeling Results and Fire Flow Letter

COMPUTER MODEL TEST

Grid Number:	9-A	**Date:**	February 15, 2022
Customer Name:	Greystar Development West, LLC	**Address:**	444 South Cedros Avenue; Suite 172
City, State Zip:	Solana Beach, CA 92075		
Contact Name:	Adam Covington		
Phone:	858-245-1937	**Cell:**	
Fax:		**Email:**	adam.covington@greystar.com
Project Record Number:	WS 2022-0040	**WO/CO:**	WO 16346
Project Name:	PM 910-03, 949-19 Terraces Murrieta	**APN:**	910-031-001
(Approximate) Test & Hydrant Location:	POC1: at intersection of Los Alamos Road and Monroe Avenue. See Figure 1. POC2: at intersection of Walsh Center Drive and Sparkman Court PIQ: Murrieta Hot Springs Road & I-15; Murrieta, CA 92563		

MODEL	**DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd**				
POC Test Location:	**EMWD RESULTS**			**Requested**	**Flow Availability for Fire Department**
	POC1	**POC2**			
Elevation*:	1150.8	1170.6			
Steady State, Dynamic (psi):	93.0	85.5			
Residual Pressure (psi):	81.9	74.7			
Tested FF (gpm):	1875	1875		3750	
Combined Total (gpm):	MDD 358 gpm** plus 3750 gpm fire flow			4108	
Number of Hydrants:	Tested POC1 and POC2 simultaneously			2	
Duration Tested @:	Four Hours			4	
Demand Conditions:	Max Day				
Pressure Zone/Tank Name(s)/Level(s):	1384 / Lower Las Brisas II / Base Elevation 1351.5 ft				
Pump Operating Status:	ON	**Computer Model Setting:**	EPS		

Number of Points of connections (POC):	**POC (Circle One)**		**Reason (Circle what Applies)**						
	One	Two or More	Design Conditions	Limited Capacity (Existing System)	Supply Redundancy	Conditions of Approval	Fire Sprinkler Connection(s)	Single Lot Residential	Existing POC(s)

Comments: Upon installation of proposed pipeline, the water system will be capable of providing 3750 GPM for 4 hours at a minimum of 20 psi, as shown in Figure 1. These Fire Flow test results may need to be complemented by Design Conditions and do not include all facility conditioning that may be required for this project. Fire Agency Conditions were provided (dated 12/28/21), if any Fire Flow changes occur in the Fire Agency Conditions, you may need to resubmit another Fire Flow test at the requester's expense.

The above results are not a guarantee the District's system will supply water to the project at any specific flows or pressures. These results were determined from a computer simulation of the District's water system and/or from hydraulic calculations pertaining to distribution pipelines: The capacity of the service laterals, meters, backflow assemblies, on-site fire system, and other appurtenances were not considered in these results. The design and sizing of service laterals and downstream facilities shall be the responsibility of the Project Sponsor.

EMWD's Fire Flow test results are valid for twelve months from the date of testing.

Completed By: Kris Danielson, Albert A. Webb Associates (consultants for EMWD)

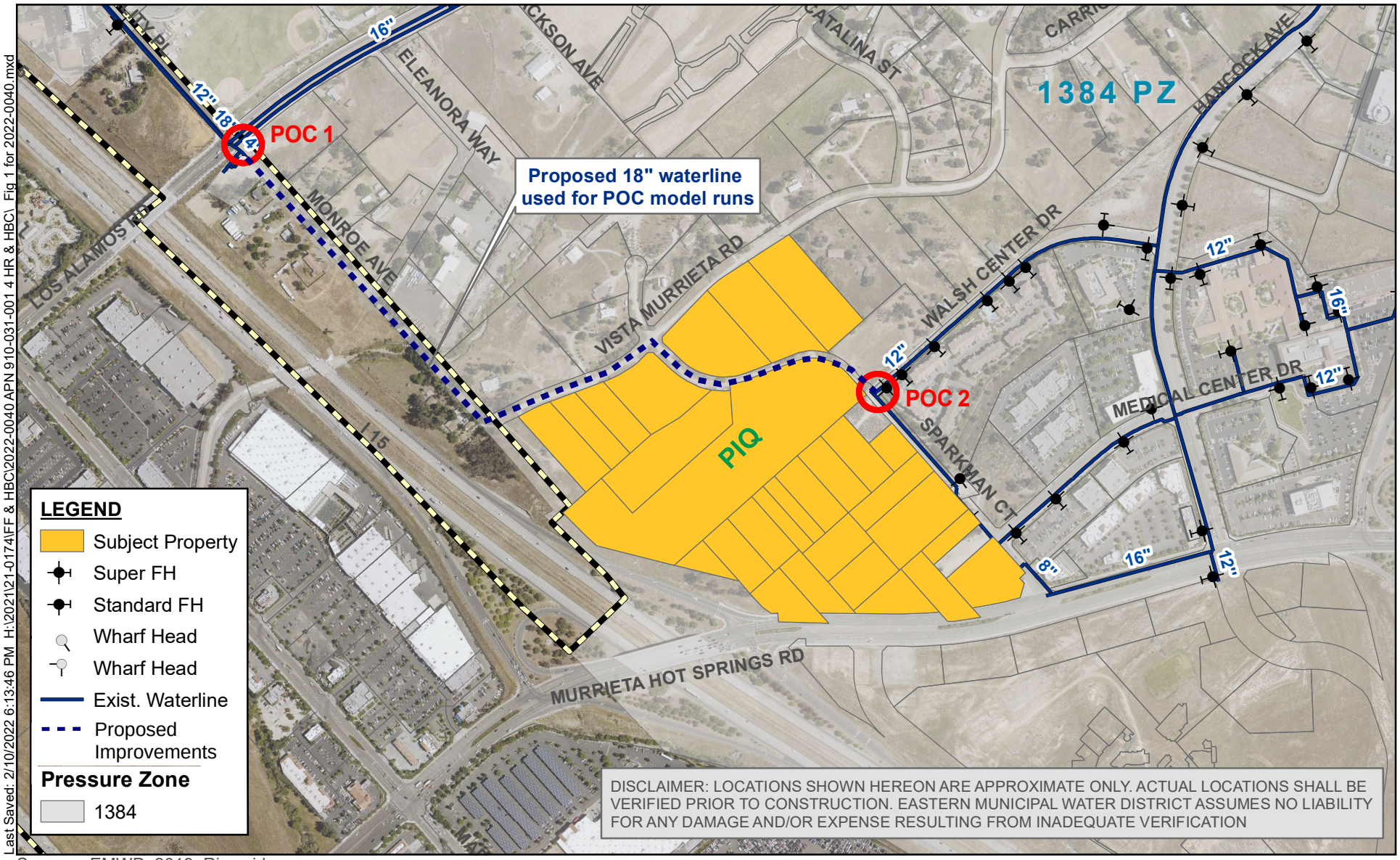
Should you have any questions or need additional information, please contact me at (951) 928-3777, ext. 4478.

Sincerely, Kristyn Danielson Date: 2/15/2022

Rudy Esparza
Sr. Engineering Technician
New Business Development

Reviewed By: RE Date: 2-17-2022

* Elevation based on Riverside County Flood Control digital data.
** Assumed 900 du of Very High Density Residential (ADD = 440 gpd/du, MDD is 2 times average day).



Last Saved: 2/10/2022 6:13:46 PM H:\2021\21-0174\FF & HBC\2022-0040 APN 910-031-001 4 HR & HBC\ Fig 1 for 2022-0040.mxd

Sources: EMWD, 2019; Riverside Co. GIS, 2021; RCIT, 2019.

0 600 1,200 Feet

EASTERN MUNICIPAL WATER DISTRICT

FIGURE 1
APN 910-031-001 thru 005, 007 thru 010, 015, 017, 018, 020 thru 026, 949-190-012 thru 020 FIRE FLOW TEST & HBC

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: PM 910-03, 949-19 Terraces Murrieta
Pressure Zone: 1384, WS 2022-0040
Model Version [12]: DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd

ADD (GPM): 179
FFD (GPM): 3750
Duration (Hours): 4

POC Location: POC 1 (Los Alamos Rd/Monroe Ave Intersection)
Elevation (ft): 1150.8
APN: 910-031-001
(See Attached Figure 1)

	Modeling Scenario [12]	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	179				1,362	91
Operational Demand	EPS, MDD, Pumps On (8)	PHD	358				1352	87
Operational Demand	EPS, ADD, Pumps On (8)	MHD	59				1376	98
Fire Flow Demand		FFD + MDD						
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD	179	1875		82	1340	82

Footnotes (see page 2 for additional footnotes):

(1) If improvements are required, please describe the improvements here:

18" diameter pipeline in Monroe Avenue and Jackson Avenue per Figure 1.
Other model changes were made to account for the recent improvements to this pressure zone including the 24" diameter waterline in Las Brisas Road and Hancock Ave (TVPW-107), the 8" diameter waterline in Berlie Street, and 12" diameter waterline in Los Alamos Rd and 12" diameter in Old Monroe Avenue.

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:

- Equal to or less than 5 fps: ...for MDD
- Equal to or less than 10 fps: ...for PHD
- Equal to or less than 15 fps: ...for FF + MDD

	Adequate?	Comments:
Available Firm Pumping Capacity:	No	(TBD indicates To Be Determined) Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.
Available Firm Pumping Capacity, w/ Electrical Outage :	No	
Available Storage Capacity:	TBD	

Additional Comments:
POC1 & 2 tested simultaneously with demands split evenly between the two POC's.

Prepared by: [signature] **Date:** February 15, 2022

Reviewed by: [signature] **Date:** 2-17-2022

File: 2022-0040 Output Data_V10.xlsx
FORM: NBD-068 (July 25, 2016) --- Date Printed: 2/16/2022, 1:26 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name:	PM 910-03, 949-19 Terraces Murrieta	**ADD (GPM):**	179
Pressure Zone:	1384, WS 2022-0040	**FFD (GPM):**	3750
Model Version [12]:	DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd***

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: PM 910-03, 949-19 Terraces Murrieta
Pressure Zone: 1384, WS 2022-0040
Model Version [12]: DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd

ADD (GPM): 179
FFD (GPM): 3750
Duration (Hours): 4

POC Location: POC 2 (Walsh Center Dr/Sparkman Ct intersectio
Elevation (ft): 1170.6
APN: 910-031-001
(See Attached Figure 1)

	Modeling Scenario [12]	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	179				1,364	84
Operational Demand	EPS, MDD, Pumps On (8)	PHD	358				1354	80
Operational Demand	EPS, ADD, Pumps On (8)	MHD	93				1377	89
Fire Flow Demand		FFD + MDD						
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD	179	1875		75	1343	75

Footnotes (see page 2 for additional footnotes):

(1) If improvements are required, please describe the improvements here:
18" diameter pipeline in Monroe Avenue and Jackson Avenue per Figure 1.
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50 PSI	...under PHD, MDD, and MHD
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Minimum Criteria, Velocities in Pipelines:

- Equal to or less than 5 fps: ...for MDD
- Equal to or less than 10 fps: ...for PHD
- Equal to or less than 15 fps: ...for FF + MDD

	Adequate?
Available Firm Pumping Capacity:	No
Available Firm Pumping Capacity, w/ Electrical Outage :	No
Available Storage Capacity:	TBD

Comments:
(TBD indicates To Be Determined)
Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.

Additional Comments:
POC1 & 2 tested simultaneously with demands split evenly between the two POC's.

Prepared by: Kristopher Davidson
Date: February 15, 2022

Reviewed by: RE
Date: 2-17-2022

File: 2022-0040 Output Data_V10.xlsx
FORM: NBD-068 (July 25, 2016) --- Date Printed: 2/16/2022, 1:35 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name:	PM 910-03, 949-19 Terraces Murrieta	**ADD (GPM):**	179
Pressure Zone:	1384, WS 2022-0040	**FFD (GPM):**	3750
Model Version [12]:	DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

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(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***DS_MM_wya20181018_POS-DC_Combined MDD and FF Diurnals_v3.mxd***

MURRIETA FIRE & RESCUE

Life & Fire Safety Division

41825 Juniper Street, Murrieta, CA 92562 (951) 304-3473

December 28, 2021

Greystar Development
444 South Cedros Avenue
Suite 172
Solana Beach, CA 92075

Re: Vacant Lot – APN 910-031-001, 002, 003, 004, 005, 007, 008, 009, 010, 015, 017, 018, 020, 021, 022, 023, 024, 025, 026, ; 949-190-012, 013, 014, 015, 016, 017, 018, 019

Based on the structure size of 168,800 square feet, Type V-A construction, Murrieta Fire & Rescue has made the following determination:

- Closest Fire Station: Station 3 39985 Whitewood Road
- District will submit conditions at a later date, once a formal permit application has been filed with the City Development Services Department
- The required fire flow is 7,500 GPM @ 20 PSI for 4 hours

Please contact me directly at (951) 461-6153 with any questions or comments.

Yours in Service,

Doug Strosnider

Interim Fire Marshal

DS:sah

From: Strosnider, Doug
To: Esparza, Raul
Subject: Terraces
Date: Thursday, January 27, 2022 3:18:43 PM
Attachments: image001.png
CitySeal_e6a8c5dc-d7c3-424e-a429-2a7aa022e7b9.jpg

Rudy,
I am sending this as notification that we allow up to a 50% reduction in the required fire flow when builds are protected throughout with approved automatic fire suppression systems installed in accordance with NFPA 13 and the California Fire Code. Please feel free to call me if you have any questions.

Doug

Doug Strosnider, Interim Fire Marshal
Murrieta Fire & Rescue
41825 Juniper Street, Murrieta, CA 92562
951-461-6153 – Office
Dstrosnider@MurrietaCA.Gov

APPENDIX B

Water Calculations

Scenario 1 (PHD):

1. Scenario Summary
2. Pipe Flex Table
3. Junction Flex Table
4. Pressure Map
5. Velocity Map
6. Headloss Map

Demands:

Scenario	Total Flow (GPM)	Node	Flow (GPM)
1 (PHD)	726	BLDG-1A	26
		BLDG-1B	43
		BLDG-2	59
		BLDG-3	49
		BLDG-4	55
		BLDG-5	62
		BLDG-6	90
		BLDG-7	68
		BLDG-8	68
		BLDG-9	57
		BLDG-10	75
		BLDG-11	61
		BLDG-THA	6
		BLDG-THB	6

Scenario Summary Report
Scenario: 1 (PHD)

Scenario Summary

ID	284
Label	1 (PHD)
Notes	
Active Topology	Base Active Topology
Physical	Base Physical
Demand	Scenario 1: PHD
Initial Settings	Base Initial Settings
Operational	Base Operational
Age	Base Age
Constituent	Base Constituent
Trace	Base Trace
Fire Flow	Base Fire Flow
Energy Cost	Base Energy Cost
Transient	Base Transient
Pressure Dependent Demand	Base Pressure Dependent Demand
Failure History	Base Failure History
SCADA	Base SCADA
User Data Extensions	Base User Data Extensions
Steady State/EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.100	Start Time	12:00:00 AM
Trials	1000	Calculation Type	Hydraulics Only

Scenario: 1 (PHD)

FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
W25	J-25	J-27	62	6.0	130.0	-176	1.99	0.003
W22	J-8	J-9	120	6.0	130.0	159	1.80	0.002
W5	GPV-1	J-10	317	8.0	130.0	326	2.08	0.002
W6	GPV-1	J-123	89	8.0	130.0	-326	2.08	0.002
W11	J-11	J-12	165	6.0	130.0	142	1.61	0.002
W16	J-11	J-13	221	6.0	130.0	131	1.49	0.002
W10	J-10	J-11	429	8.0	130.0	273	1.74	0.002
W17	J-13	J-14	159	6.0	130.0	126	1.43	0.002
W27	J-15	J-25	60	6.0	130.0	-114	1.29	0.001
W3	J-8	J-2	437	8.0	130.0	240	1.53	0.001
W23	J-27	J-2	128	8.0	130.0	-225	1.43	0.001
W2	GPV-3	J-8	46	10.0	130.0	399	1.63	0.001
W1	J-1	GPV-3	47	10.0	130.0	399	1.63	0.001
W20	J-9	BLDG-6	228	6.0	130.0	90	1.02	0.001
W12	J-12	BLDG-10	308	6.0	130.0	75	0.85	0.001
W7	J-10	J-16	424	6.0	130.0	68	0.78	0.001
W18	J-14	BLDG-8	145	6.0	130.0	68	0.78	0.001
W21	J-9	BLDG-7	199	6.0	130.0	68	0.78	0.001
W13	J-12	J-29	254	6.0	130.0	67	0.76	0.000
W26	J-25	BLDG-5	227	6.0	130.0	62	0.70	0.000
W15	J-29	BLDG-11	318	6.0	130.0	61	0.69	0.000
W29	J-15	BLDG-2	347	6.0	130.0	59	0.67	0.000
W30	J-14	BLDG-9	96	6.0	130.0	57	0.65	0.000
W28	J-15	BLDG-4	231	6.0	130.0	55	0.62	0.000
W24	J-27	BLDG-3	231	6.0	130.0	49	0.56	0.000
W8	J-16	BLDG-1B	68	6.0	130.0	43	0.48	0.000
P9	J-19	POC 2	49	18.0	130.0	725	0.91	0.000
P8	J-123	POC 2	28	18.0	130.0	-720	0.91	0.000
W9	J-16	BLDG-1A	136	6.0	130.0	26	0.29	0.000
P6	FH3	FH4	356	18.0	130.0	-394	0.50	0.000
P5	FH2	FH3	647	18.0	130.0	-394	0.50	0.000
P4	J-1	FH2	184	18.0	130.0	-394	0.50	0.000
P7	FH4	J-123	128	18.0	130.0	-394	0.50	0.000
W4	J-2	J-10	358	8.0	130.0	15	0.10	0.000
W19	J-13	BLDG-THA	481	6.0	130.0	6	0.06	0.000
W14	J-29	BLDG-THB	102	6.0	130.0	6	0.06	0.000
F7	J-32	J-6	136	16.0	130.0	-12	0.02	0.000
F43	J-6	J-7	218	12.0	130.0	-7	0.02	0.000
FEED	R-8	PMP-2	114	100.0	130.0	725	0.03	0.000
FEED	R-7	PMP-1	70	100.0	130.0	0	0.00	0.000
F28	J-4	FIRE-THA	220	10.0	130.0	0	0.00	0.000
F33	J-3	FIRE-7	197	10.0	130.0	0	0.00	0.000
FEED	PMP-1	POC 1	74	100.0	130.0	0	0.00	0.000
F27	J-17	J-4	249	16.0	130.0	5	0.01	0.000
F24	J-17	J-18	157	16.0	130.0	0	0.00	0.000
F26	J-18	FIRE-8	151	10.0	130.0	0	0.00	0.000
F25	J-18	FIRE-9	89	10.0	130.0	0	0.00	0.000
P1	POC 1	FH1	1,824	18.0	130.0	0	0.00	0.000

Scenario: 1 (PHD)

FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F21	FH7	FIRE-11	140	10.0	130.0	0	0.00	0.000
F22	J-5	FH9	174	16.0	130.0	5	0.01	0.000
F23	FH9	J-17	35	16.0	130.0	5	0.01	0.000
F29	FH10	J-4	134	12.0	130.0	-5	0.01	0.000
F14	J-32	J-5	435	16.0	130.0	5	0.01	0.000
FEED	PMP-2	J-19	180	100.0	130.0	725	0.03	0.000
F8	J-6	GPV-6	188	16.0	130.0	-5	0.01	0.000
F9	GPV-6	POC 2	85	16.0	130.0	-5	0.01	0.000
F2	GPV-5	J-20	57	16.0	130.0	-5	0.01	0.000
F40	J-22	FIRE-4	222	10.0	130.0	0	0.00	0.000
F41	J-22	FIRE-2	345	10.0	130.0	0	0.00	0.000
F39	J-23	J-22	60	12.0	130.0	0	0.00	0.000
F42	J-23	J-7	237	12.0	130.0	7	0.02	0.000
F15	J-5	J-24	162	16.0	130.0	0	0.00	0.000
F17	J-24	FH8	130	16.0	130.0	0	0.00	0.000
F16	J-24	FIRE-10	316	10.0	130.0	0	0.00	0.000
F34	J-3	J-20	118	12.0	130.0	5	0.01	0.000
F38	J-23	FIRE-5	216	10.0	130.0	0	0.00	0.000
F35	J-21	J-26	144	12.0	130.0	7	0.02	0.000
F37	J-26	J-23	65	12.0	130.0	7	0.02	0.000
F36	J-26	FIRE-3	240	10.0	130.0	0	0.00	0.000
F32	J-3	J-28	170	12.0	130.0	-5	0.01	0.000
F30	J-28	FH10	263	12.0	130.0	-5	0.01	0.000
F31	J-28	FIRE-6	51	10.0	130.0	0	0.00	0.000
F18	FH8	J-30	105	16.0	130.0	0	0.00	0.000
F20	J-30	FH7	191	16.0	130.0	0	0.00	0.000
F19	J-30	FIRE-THB	98	10.0	130.0	0	0.00	0.000
F12	J-31	FIRE-1A	150	10.0	130.0	0	0.00	0.000
F13	J-31	FIRE-1B	73	10.0	130.0	0	0.00	0.000
F10	J-32	FH6	375	16.0	130.0	0	0.00	0.000
F11	FH6	J-31	37	12.0	130.0	0	0.00	0.000
F3	J-20	FH5	321	16.0	130.0	0	0.00	0.000
F4	FH5	J-21	96	16.0	130.0	0	0.00	0.000
F5	J-21	FH11	306	16.0	130.0	-7	0.01	0.000
F6	FH11	J-32	67	16.0	130.0	-7	0.01	0.000
P2	FH1	J-122	288	18.0	130.0	0	0.00	0.000
P3	J-122	J-1	43	18.0	130.0	5	0.01	0.000
F1	GPV-5	J-122	65	16.0	130.0	5	0.01	0.000

Scenario: 1 (PHD)

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
54	BLDG-6	1,150.12	90	1,355.67	89
112	BLDG-10	1,146.50	75	1,354.37	90
53	BLDG-7	1,147.11	68	1,355.76	90
67	BLDG-8	1,146.66	68	1,354.17	90
379	BLDG-5	1,153.51	62	1,355.17	87
62	BLDG-11	1,145.39	61	1,354.30	90
154	BLDG-2	1,156.28	59	1,355.05	86
66	BLDG-9	1,146.51	57	1,354.21	90
334	BLDG-4	1,153.51	55	1,355.11	87
389	BLDG-3	1,156.28	49	1,355.38	86
159	BLDG-1B	1,149.70	43	1,355.36	89
57	BLDG-1A	1,149.10	26	1,355.37	89
63	BLDG-THA	1,141.25	6	1,354.50	92
399	BLDG-THB	1,143.90	6	1,354.43	91
30	POC 1	1,150.80	0	1,363.44	92
32	J-1	1,146.43	0	1,363.44	94
34	J-2	1,146.43	0	1,355.59	90
35	J-3	1,147.11	0	1,351.93	89
36	J-4	1,141.25	0	1,351.93	91
37	FIRE-7	1,147.11	0	1,351.93	89
38	FIRE-THA	1,141.25	0	1,351.93	91
39	J-5	1,142.40	0	1,351.93	91
41	FIRE-11	1,145.39	0	1,351.93	89
48	J-6	1,153.51	0	1,351.93	86
49	J-7	1,157.60	0	1,351.93	84
51	J-8	1,146.43	0	1,356.16	91
52	J-9	1,147.11	0	1,355.87	90
56	J-10	1,153.18	0	1,355.59	88
60	J-11	1,142.40	0	1,354.88	92
61	J-12	1,143.69	0	1,354.56	91
64	J-13	1,141.25	0	1,354.50	92
65	J-14	1,146.51	0	1,354.25	90
144	J-15	1,153.51	0	1,355.19	87
156	J-16	1,149.10	0	1,355.37	89
161	POC 2	1,170.60	0	1,363.52	83
190	J-17	1,141.25	0	1,351.93	91
193	FIRE-8	1,146.66	0	1,351.93	89
195	J-18	1,146.51	0	1,351.93	89
198	FIRE-9	1,146.51	0	1,351.93	89
200	FH1	1,139.74	0	1,363.44	97
205	FH2	1,152.00	0	1,363.45	91
208	FH3	1,162.60	0	1,363.49	87
218	FH7	1,145.39	0	1,351.93	89
221	FH8	1,140.78	0	1,351.93	91
224	FH9	1,141.25	0	1,351.93	91
227	FH10	1,147.11	0	1,351.93	89
230	J-32	1,153.18	0	1,351.93	86
233	FH4	1,166.37	0	1,363.51	85
308	J-19	1,170.60	0	1,363.53	83

Scenario: 1 (PHD)

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
341	J-20	1,146.43	0	1,351.93	89
343	J-21	1,146.43	0	1,351.93	89
352	J-22	1,153.51	0	1,351.93	86
354	FIRE-4	1,153.51	0	1,351.93	86
356	FIRE-2	1,156.28	0	1,351.93	85
362	J-23	1,153.51	0	1,351.93	86
366	FIRE-1A	1,149.70	0	1,351.93	87
368	J-24	1,141.50	0	1,351.93	91
371	FIRE-10	1,140.78	0	1,351.93	91
374	FIRE-5	1,153.51	0	1,351.93	86
376	J-25	1,151.60	0	1,355.27	88
381	J-26	1,151.29	0	1,351.93	87
384	FIRE-3	1,156.28	0	1,351.93	85
386	J-27	1,149.90	0	1,355.45	89
391	J-28	1,147.11	0	1,351.93	89
394	FIRE-6	1,150.12	0	1,351.93	87
396	J-29	1,143.90	0	1,354.43	91
401	J-30	1,142.44	0	1,351.93	91
404	FIRE-THB	1,143.90	0	1,351.93	90
407	J-31	1,150.61	0	1,351.93	87
411	FIRE-1B	1,149.70	0	1,351.93	87
413	FH6	1,150.84	0	1,351.93	87
416	FH5	1,146.43	0	1,351.93	89
419	FH11	1,152.43	0	1,351.93	86
424	J-122	1,145.98	0	1,363.44	94
428	J-123	1,169.08	0	1,363.52	84

Scenario 1 - PHD

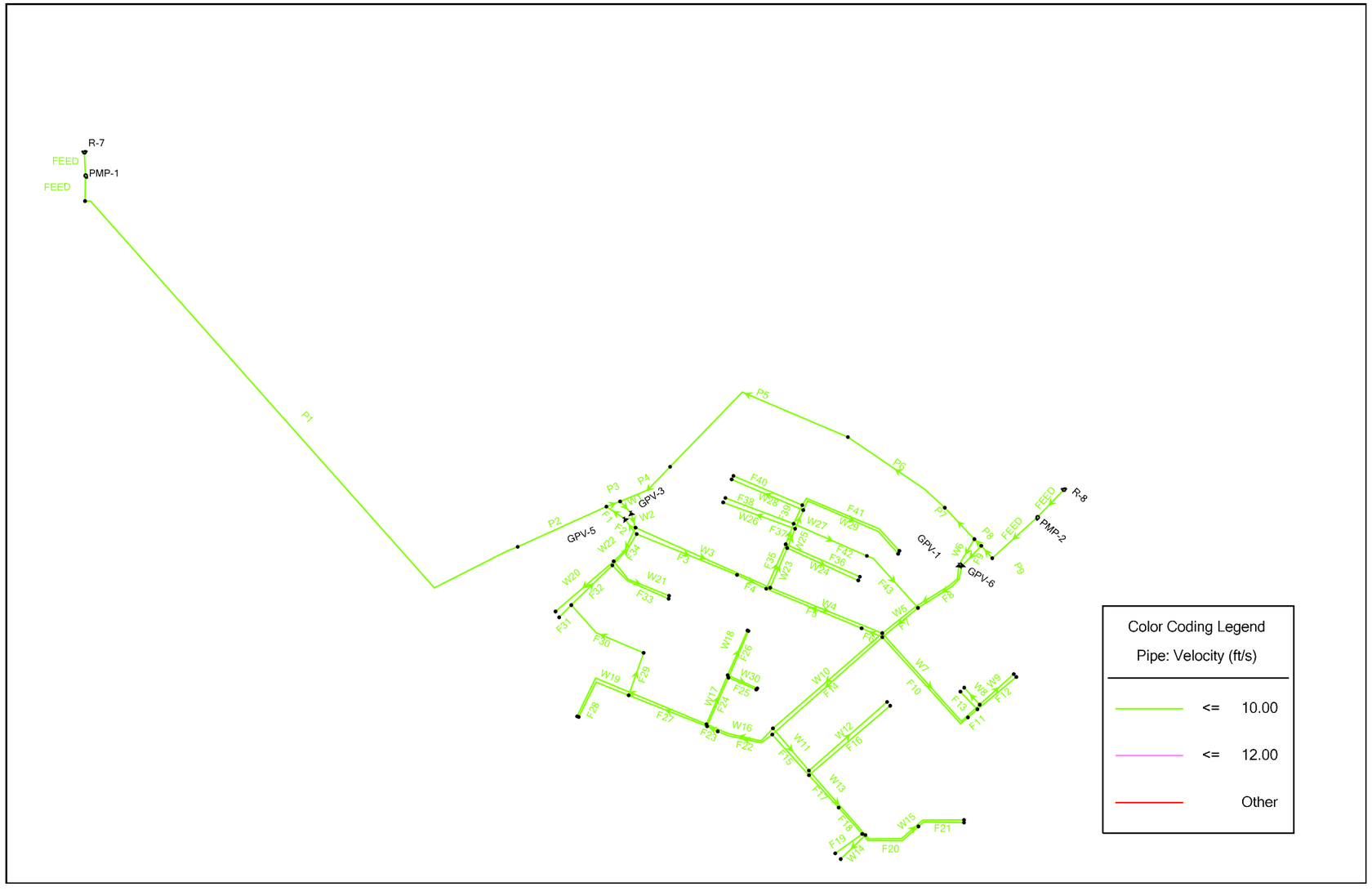
Scenario 1

Pressure Map

Scenario 1 - PHD

Scenario 1

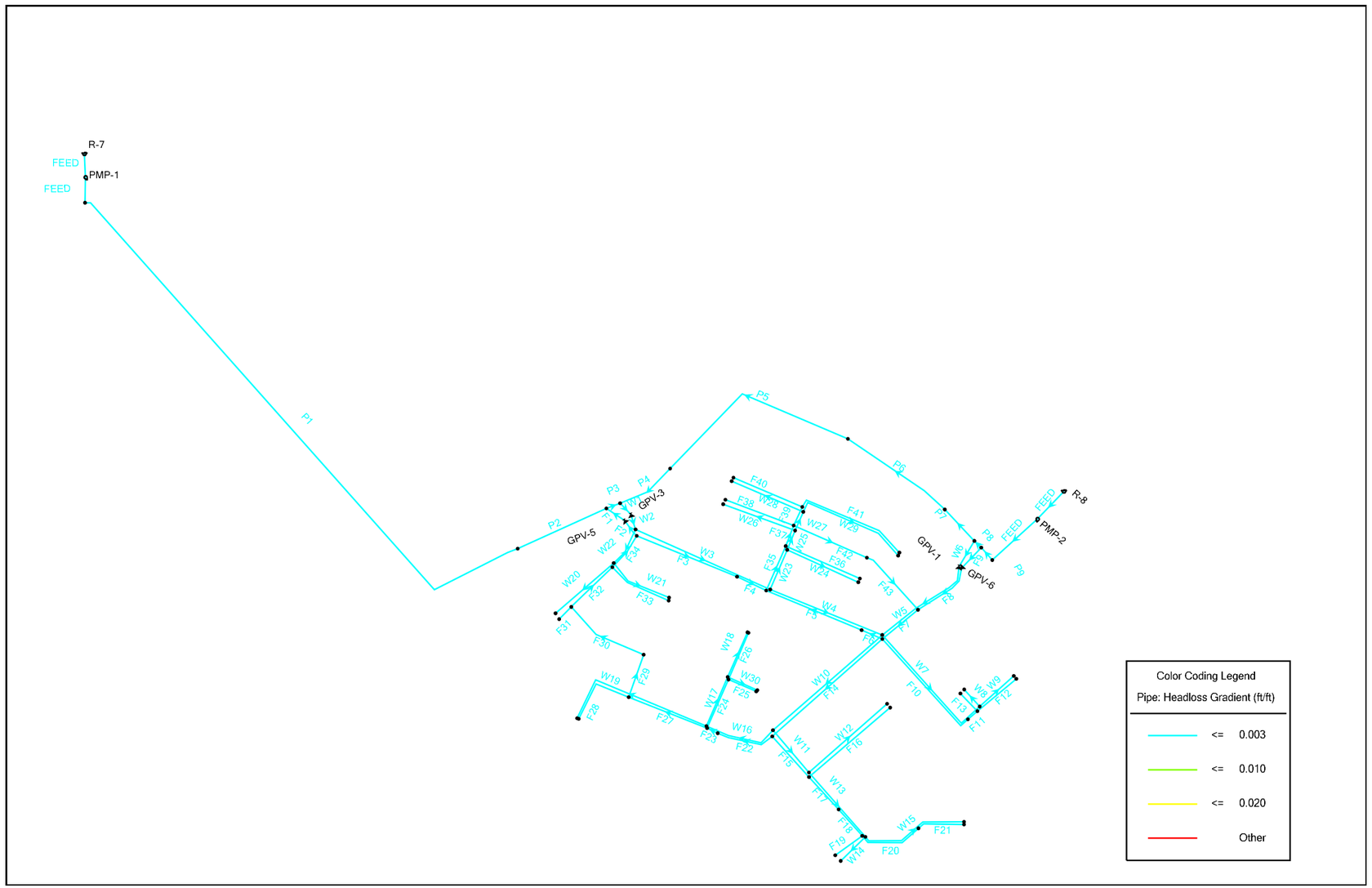
Velocity Map



Scenario 1 - PHD

Scenario 1

Headloss Map



Scenario 2 (MDFF):

1. Scenario Summary
2. Pipe Flex Table
3. Junction Flex Table
4. Pressure Map
5. Velocity Map
6. Headloss Map

Demands:

Scenario	Total Flow (GPM)	Node	Flow (GPM)
2 (MDFF)	4113	FH7	1875
		FIRE-11	1875
		MDD	363

Scenario Summary Report
Scenario: 2 (MDFF - FIRE11, FH7)

Scenario Summary

ID	244
Label	2 (MDFF - FIRE11, FH7)
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	Scenario - 2, FH 7, FIRE11
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base Fire Flow
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.100	Start Time	12:00:00 AM
Trials	1000	Calculation Type	Hydraulics Only

Scenario: 2 (MDFF - FIRE11, FH7)

FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F21	FH7	FIRE-11	140	10.0	130.0	1,875	7.66	0.020
F15	J-5	J-24	162	16.0	130.0	3,750	5.98	0.007
F20	J-30	FH7	191	16.0	130.0	3,750	5.98	0.007
F17	J-24	FH8	130	16.0	130.0	3,750	5.98	0.007
F18	FH8	J-30	105	16.0	130.0	3,750	5.98	0.007
F14	J-32	J-5	435	16.0	130.0	2,720	4.34	0.004
F34	J-3	J-20	118	12.0	130.0	-1,030	2.92	0.003
F29	FH10	J-4	134	12.0	130.0	1,030	2.92	0.003
F32	J-3	J-28	170	12.0	130.0	1,030	2.92	0.003
F30	J-28	FH10	263	12.0	130.0	1,030	2.92	0.003
F1	GPV-5	J-122	65	16.0	130.0	-1,884	3.01	0.002
F2	GPV-5	J-20	57	16.0	130.0	1,884	3.01	0.002
F8	J-6	GPV-6	188	16.0	130.0	-1,866	2.98	0.002
F9	GPV-6	POC 2	85	16.0	130.0	-1,866	2.98	0.002
F7	J-32	J-6	136	16.0	130.0	-1,744	2.78	0.002
P9	J-19	POC 2	49	18.0	130.0	2,140	2.70	0.001
P2	FH1	J-122	288	18.0	130.0	1,972	2.49	0.001
P1	POC 1	FH1	1,824	18.0	130.0	1,972	2.49	0.001
W25	J-25	J-27	62	6.0	130.0	-88	1.00	0.001
W22	J-8	J-9	120	6.0	130.0	79	0.90	0.001
F23	FH9	J-17	35	16.0	130.0	-1,030	1.64	0.001
F27	J-17	J-4	249	16.0	130.0	-1,030	1.64	0.001
F22	J-5	FH9	174	16.0	130.0	-1,030	1.64	0.001
W6	GPV-1	J-123	89	8.0	130.0	-158	1.01	0.001
W5	GPV-1	J-10	317	8.0	130.0	158	1.01	0.001
F6	FH11	J-32	67	16.0	130.0	976	1.56	0.001
F5	J-21	FH11	306	16.0	130.0	976	1.56	0.001
W11	J-11	J-12	165	6.0	130.0	71	0.80	0.001
W16	J-11	J-13	221	6.0	130.0	66	0.75	0.000
W10	J-10	J-11	429	8.0	130.0	137	0.87	0.000
W17	J-13	J-14	159	6.0	130.0	63	0.71	0.000
F3	J-20	FH5	321	16.0	130.0	853	1.36	0.000
F4	FH5	J-21	96	16.0	130.0	853	1.36	0.000
W3	J-8	J-2	437	8.0	130.0	125	0.80	0.000
W27	J-15	J-25	60	6.0	130.0	-57	0.64	0.000
W2	GPV-3	J-8	46	10.0	130.0	205	0.84	0.000
W1	J-1	GPV-3	47	10.0	130.0	205	0.84	0.000
W23	J-27	J-2	128	8.0	130.0	-112	0.72	0.000
W20	J-9	BLDG-6	228	6.0	130.0	45	0.51	0.000
W12	J-12	BLDG-10	308	6.0	130.0	37	0.43	0.000
W18	J-14	BLDG-8	145	6.0	130.0	34	0.39	0.000
W21	J-9	BLDG-7	199	6.0	130.0	34	0.39	0.000
W7	J-10	J-16	424	6.0	130.0	34	0.39	0.000
W13	J-12	J-29	254	6.0	130.0	33	0.38	0.000
W26	J-25	BLDG-5	227	6.0	130.0	31	0.35	0.000
W15	J-29	BLDG-11	318	6.0	130.0	31	0.35	0.000
W29	J-15	BLDG-2	347	6.0	130.0	29	0.33	0.000
W30	J-14	BLDG-9	96	6.0	130.0	29	0.32	0.000

Scenario: 2 (MDFF - FIRE11, FH7)

FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
W28	J-15	BLDG-4	231	6.0	130.0	27	0.31	0.000
W24	J-27	BLDG-3	231	6.0	130.0	25	0.28	0.000
W8	J-16	BLDG-1B	68	6.0	130.0	21	0.24	0.000
F42	J-23	J-7	237	12.0	130.0	-122	0.35	0.000
F35	J-21	J-26	144	12.0	130.0	-122	0.35	0.000
F43	J-6	J-7	218	12.0	130.0	122	0.35	0.000
F37	J-26	J-23	65	12.0	130.0	-122	0.35	0.000
W9	J-16	BLDG-1A	136	6.0	130.0	13	0.15	0.000
P5	FH2	FH3	647	18.0	130.0	-116	0.15	0.000
P6	FH3	FH4	356	18.0	130.0	-116	0.15	0.000
P7	FH4	J-123	128	18.0	130.0	-116	0.15	0.000
P4	J-1	FH2	184	18.0	130.0	-116	0.15	0.000
P3	J-122	J-1	43	18.0	130.0	88	0.11	0.000
P8	J-123	POC 2	28	18.0	130.0	-274	0.35	0.000
W4	J-2	J-10	358	8.0	130.0	13	0.08	0.000
W14	J-29	BLDG-THB	102	6.0	130.0	3	0.03	0.000
W19	J-13	BLDG-THA	481	6.0	130.0	3	0.03	0.000
FEED	R-8	PMP-2	114	100.0	130.0	2,140	0.09	0.000
FEED	R-7	PMP-1	70	100.0	130.0	1,972	0.08	0.000
F28	J-4	FIRE-THA	220	10.0	130.0	0	0.00	0.000
F33	J-3	FIRE-7	197	10.0	130.0	0	0.00	0.000
FEED	PMP-1	POC 1	74	100.0	130.0	1,972	0.08	0.000
F24	J-17	J-18	157	16.0	130.0	0	0.00	0.000
F26	J-18	FIRE-8	151	10.0	130.0	0	0.00	0.000
F25	J-18	FIRE-9	89	10.0	130.0	0	0.00	0.000
FEED	PMP-2	J-19	180	100.0	130.0	2,140	0.09	0.000
F40	J-22	FIRE-4	222	10.0	130.0	0	0.00	0.000
F41	J-22	FIRE-2	345	10.0	130.0	0	0.00	0.000
F39	J-23	J-22	60	12.0	130.0	0	0.00	0.000
F16	J-24	FIRE-10	316	10.0	130.0	0	0.00	0.000
F38	J-23	FIRE-5	216	10.0	130.0	0	0.00	0.000
F36	J-26	FIRE-3	240	10.0	130.0	0	0.00	0.000
F31	J-28	FIRE-6	51	10.0	130.0	0	0.00	0.000
F19	J-30	FIRE-THB	98	10.0	130.0	0	0.00	0.000
F12	J-31	FIRE-1A	150	10.0	130.0	0	0.00	0.000
F13	J-31	FIRE-1B	73	10.0	130.0	0	0.00	0.000
F10	J-32	FH6	375	16.0	130.0	0	0.00	0.000
F11	FH6	J-31	37	12.0	130.0	0	0.00	0.000

Scenario: 2 (MDFF - FIRE11, FH7)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
41	FIRE-11	1,145.39	1,875	1,317.51	74
218	FH7	1,145.39	1,875	1,320.27	76
54	BLDG-6	1,150.12	45	1,322.63	75
112	BLDG-10	1,146.50	37	1,322.26	76
53	BLDG-7	1,147.11	34	1,322.66	76
67	BLDG-8	1,146.66	34	1,322.20	76
379	BLDG-5	1,153.51	31	1,322.48	73
62	BLDG-11	1,145.39	31	1,322.24	77
154	BLDG-2	1,156.28	29	1,322.45	72
66	BLDG-9	1,146.51	29	1,322.22	76
334	BLDG-4	1,153.51	27	1,322.46	73
389	BLDG-3	1,156.28	25	1,322.54	72
159	BLDG-1B	1,149.70	21	1,322.53	75
57	BLDG-1A	1,149.10	13	1,322.54	75
63	BLDG-THA	1,141.25	3	1,322.29	78
399	BLDG-THB	1,143.90	3	1,322.28	77
30	POC 1	1,150.80	0	1,338.80	81
32	J-1	1,146.43	0	1,336.19	82
34	J-2	1,146.43	0	1,322.60	76
35	J-3	1,147.11	0	1,326.34	78
36	J-4	1,141.25	0	1,324.82	79
37	FIRE-7	1,147.11	0	1,326.34	78
38	FIRE-THA	1,141.25	0	1,324.82	79
39	J-5	1,142.40	0	1,324.52	79
48	J-6	1,153.51	0	1,326.49	75
49	J-7	1,157.60	0	1,326.48	73
51	J-8	1,146.43	0	1,322.77	76
52	J-9	1,147.11	0	1,322.69	76
56	J-10	1,153.18	0	1,322.60	73
60	J-11	1,142.40	0	1,322.40	78
61	J-12	1,143.69	0	1,322.31	77
64	J-13	1,141.25	0	1,322.30	78
65	J-14	1,146.51	0	1,322.23	76
144	J-15	1,153.51	0	1,322.49	73
156	J-16	1,149.10	0	1,322.54	75
161	POC 2	1,170.60	0	1,336.21	72
190	J-17	1,141.25	0	1,324.66	79
193	FIRE-8	1,146.66	0	1,324.66	77
195	J-18	1,146.51	0	1,324.66	77
198	FIRE-9	1,146.51	0	1,324.66	77
200	FH1	1,139.74	0	1,336.55	85
205	FH2	1,152.00	0	1,336.19	80
208	FH3	1,162.60	0	1,336.20	75
221	FH8	1,140.78	0	1,322.41	79
224	FH9	1,141.25	0	1,324.63	79
227	FH10	1,147.11	0	1,325.18	77
230	J-32	1,153.18	0	1,326.25	75
233	FH4	1,166.37	0	1,336.21	73
308	J-19	1,170.60	0	1,336.28	72

Scenario: 2 (MDFF - FIRE11, FH7)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
341	J-20	1,146.43	0	1,326.65	78
343	J-21	1,146.43	0	1,326.47	78
352	J-22	1,153.51	0	1,326.48	75
354	FIRE-4	1,153.51	0	1,326.48	75
356	FIRE-2	1,156.28	0	1,326.48	74
362	J-23	1,153.51	0	1,326.48	75
366	FIRE-1A	1,149.70	0	1,326.25	76
368	J-24	1,141.50	0	1,323.35	79
371	FIRE-10	1,140.78	0	1,323.35	79
374	FIRE-5	1,153.51	0	1,326.48	75
376	J-25	1,151.60	0	1,322.51	74
381	J-26	1,151.29	0	1,326.48	76
384	FIRE-3	1,156.28	0	1,326.48	74
386	J-27	1,149.90	0	1,322.56	75
391	J-28	1,147.11	0	1,325.88	77
394	FIRE-6	1,150.12	0	1,325.88	76
396	J-29	1,143.90	0	1,322.28	77
401	J-30	1,142.44	0	1,321.65	78
404	FIRE-THB	1,143.90	0	1,321.65	77
407	J-31	1,150.61	0	1,326.25	76
411	FIRE-1B	1,149.70	0	1,326.25	76
413	FH6	1,150.84	0	1,326.25	76
416	FH5	1,146.43	0	1,326.51	78
419	FH11	1,152.43	0	1,326.29	75
424	J-122	1,145.98	0	1,336.19	82
428	J-123	1,169.08	0	1,336.21	72

Scenario 2 - MDFF - FH7, FIRE 11

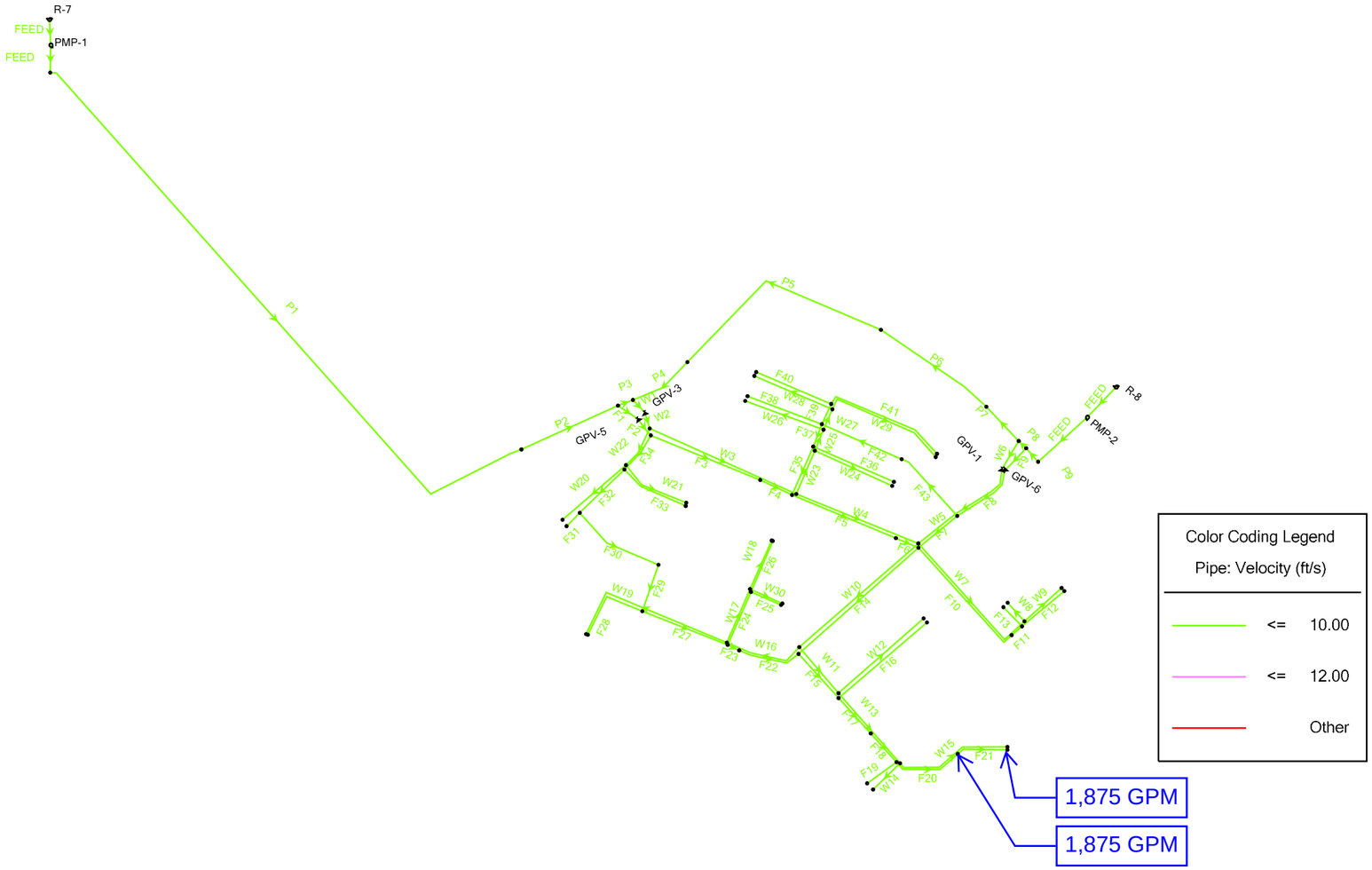
Scenario 2

Pressure Map

Scenario 2 - MDFF - FH7, FIRE 11

Scenario 2

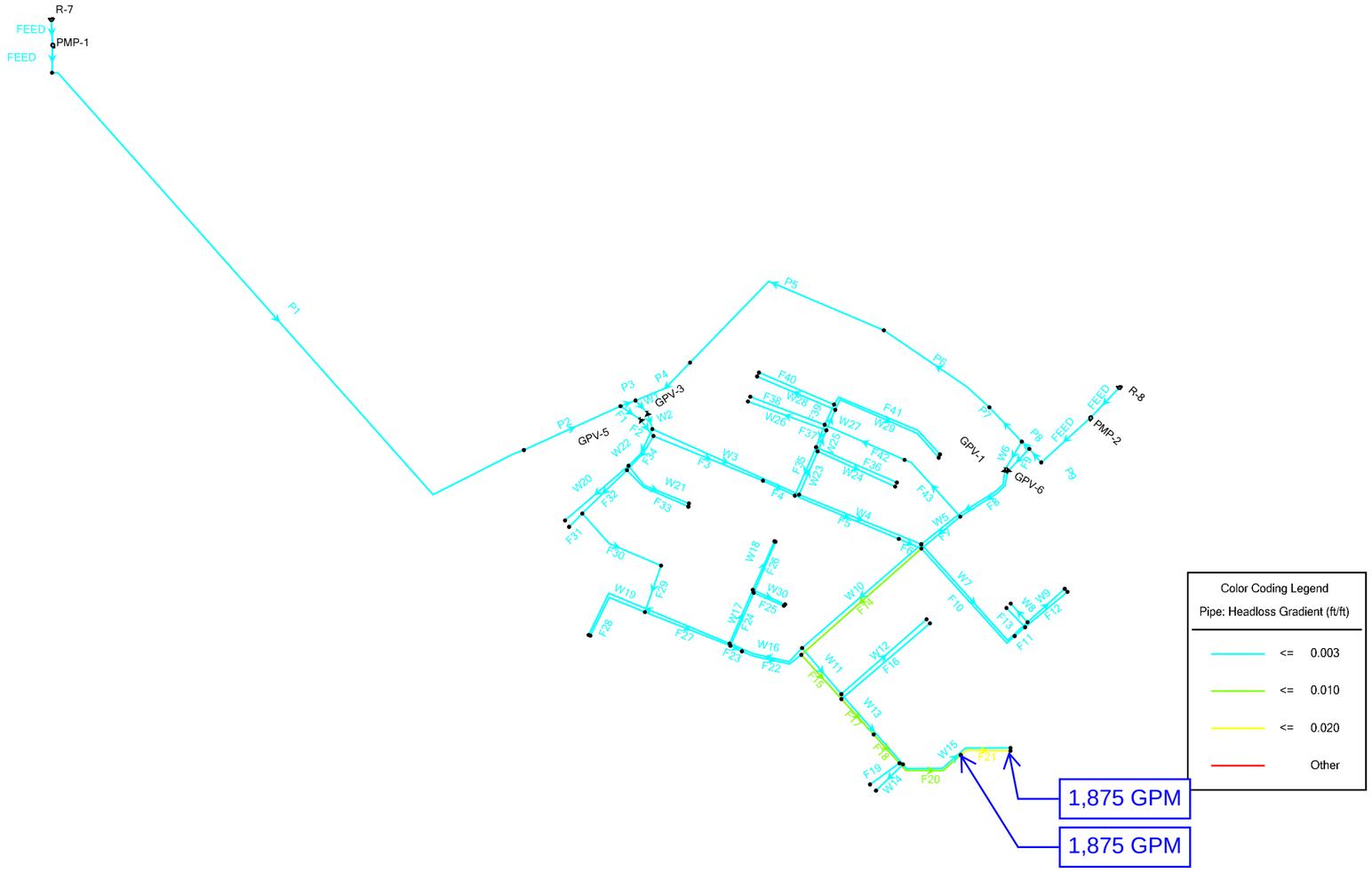
Velocity Map



Scenario 2 - MDFF - FH7, FIRE 11

Scenario 2

Headloss Map



Scenario 3 (MDFF):

1. Scenario Summary
2. Pipe Flex Table
3. Junction Flex Table
4. Pressure Map
5. Velocity Map
6. Headloss Map

Demands:

Scenario	Total Flow (GPM)	Node	Flow (GPM)
3 (MDFF)	4113	FIRE-8	1875
		FIRE-9	1875
		MDD	363

Scenario Summary Report
Scenario: 3 (MDFF - FIRE8, FIRE9)

Scenario Summary

ID	290
Label	3 (MDFF - FIRE8, FIRE9)
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	Scenario - 3, FIRE 8, 9
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base Fire Flow
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.100	Start Time	12:00:00 AM
Trials	1000	Calculation Type	Hydraulics Only

Scenario: 3 (MDFF - FIRE8, FIRE9)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F26	J-18	FIRE-8	151	10.0	130.0	1,875	7.66	0.020
F25	J-18	FIRE-9	89	10.0	130.0	1,875	7.66	0.020
F24	J-17	J-18	157	16.0	130.0	3,750	5.98	0.007
F22	J-5	FH9	174	16.0	130.0	2,562	4.09	0.004
F14	J-32	J-5	435	16.0	130.0	2,562	4.09	0.004
F23	FH9	J-17	35	16.0	130.0	2,562	4.09	0.004
F32	J-3	J-28	170	12.0	130.0	1,188	3.37	0.003
F30	J-28	FH10	263	12.0	130.0	1,188	3.37	0.003
F29	FH10	J-4	134	12.0	130.0	1,188	3.37	0.003
F34	J-3	J-20	118	12.0	130.0	-1,188	3.37	0.003
F2	GPV-5	J-20	57	16.0	130.0	1,890	3.02	0.002
F1	GPV-5	J-122	65	16.0	130.0	-1,890	3.02	0.002
F8	J-6	GPV-6	188	16.0	130.0	-1,860	2.97	0.002
F9	GPV-6	POC 2	85	16.0	130.0	-1,860	2.97	0.002
F7	J-32	J-6	136	16.0	130.0	-1,691	2.70	0.002
P9	J-19	POC 2	49	18.0	130.0	2,140	2.70	0.001
P1	POC 1	FH1	1,824	18.0	130.0	1,972	2.49	0.001
P2	FH1	J-122	288	18.0	130.0	1,972	2.49	0.001
F27	J-17	J-4	249	16.0	130.0	-1,188	1.90	0.001
W25	J-25	J-27	62	6.0	130.0	-88	1.00	0.001
W22	J-8	J-9	120	6.0	130.0	79	0.90	0.001
W5	GPV-1	J-10	317	8.0	130.0	161	1.02	0.001
W6	GPV-1	J-123	89	8.0	130.0	-161	1.02	0.001
W11	J-11	J-12	165	6.0	130.0	71	0.80	0.001
W16	J-11	J-13	221	6.0	130.0	66	0.75	0.000
F5	J-21	FH11	306	16.0	130.0	870	1.39	0.000
F6	FH11	J-32	67	16.0	130.0	870	1.39	0.000
W10	J-10	J-11	429	8.0	130.0	137	0.87	0.000
W17	J-13	J-14	159	6.0	130.0	63	0.71	0.000
W3	J-8	J-2	437	8.0	130.0	123	0.78	0.000
W27	J-15	J-25	60	6.0	130.0	-57	0.64	0.000
W2	GPV-3	J-8	46	10.0	130.0	202	0.83	0.000
W23	J-27	J-2	128	8.0	130.0	-112	0.72	0.000
W1	J-1	GPV-3	47	10.0	130.0	202	0.83	0.000
F4	FH5	J-21	96	16.0	130.0	702	1.12	0.000
F3	J-20	FH5	321	16.0	130.0	702	1.12	0.000
W20	J-9	BLDG-6	228	6.0	130.0	45	0.51	0.000
W12	J-12	BLDG-10	308	6.0	130.0	37	0.43	0.000
W18	J-14	BLDG-8	145	6.0	130.0	34	0.39	0.000
W21	J-9	BLDG-7	199	6.0	130.0	34	0.39	0.000
W7	J-10	J-16	424	6.0	130.0	34	0.39	0.000
W13	J-12	J-29	254	6.0	130.0	33	0.38	0.000
W26	J-25	BLDG-5	227	6.0	130.0	31	0.35	0.000
W15	J-29	BLDG-11	318	6.0	130.0	31	0.35	0.000
W29	J-15	BLDG-2	347	6.0	130.0	29	0.33	0.000
W30	J-14	BLDG-9	96	6.0	130.0	29	0.32	0.000
W28	J-15	BLDG-4	231	6.0	130.0	27	0.31	0.000
W24	J-27	BLDG-3	231	6.0	130.0	25	0.28	0.000

Scenario: 3 (MDFF - FIRE8, FIRE9)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F42	J-23	J-7	237	12.0	130.0	-168	0.48	0.000
F35	J-21	J-26	144	12.0	130.0	-168	0.48	0.000
F43	J-6	J-7	218	12.0	130.0	168	0.48	0.000
F37	J-26	J-23	65	12.0	130.0	-168	0.48	0.000
W8	J-16	BLDG-1B	68	6.0	130.0	21	0.24	0.000
W9	J-16	BLDG-1A	136	6.0	130.0	13	0.15	0.000
P4	J-1	FH2	184	18.0	130.0	-120	0.15	0.000
P5	FH2	FH3	647	18.0	130.0	-120	0.15	0.000
P6	FH3	FH4	356	18.0	130.0	-120	0.15	0.000
P7	FH4	J-123	128	18.0	130.0	-120	0.15	0.000
P8	J-123	POC 2	28	18.0	130.0	-281	0.35	0.000
P3	J-122	J-1	43	18.0	130.0	82	0.10	0.000
W4	J-2	J-10	358	8.0	130.0	10	0.07	0.000
W19	J-13	BLDG-THA	481	6.0	130.0	3	0.03	0.000
W14	J-29	BLDG-THB	102	6.0	130.0	3	0.03	0.000
FEED	R-8	PMP-2	114	100.0	130.0	2,140	0.09	0.000
FEED	R-7	PMP-1	70	100.0	130.0	1,972	0.08	0.000
F28	J-4	FIRE-THA	220	10.0	130.0	0	0.00	0.000
F33	J-3	FIRE-7	197	10.0	130.0	0	0.00	0.000
FEED	PMP-1	POC 1	74	100.0	130.0	1,972	0.08	0.000
F21	FH7	FIRE-11	140	10.0	130.0	0	0.00	0.000
FEED	PMP-2	J-19	180	100.0	130.0	2,140	0.09	0.000
F40	J-22	FIRE-4	222	10.0	130.0	0	0.00	0.000
F41	J-22	FIRE-2	345	10.0	130.0	0	0.00	0.000
F39	J-23	J-22	60	12.0	130.0	0	0.00	0.000
F15	J-5	J-24	162	16.0	130.0	0	0.00	0.000
F17	J-24	FH8	130	16.0	130.0	0	0.00	0.000
F16	J-24	FIRE-10	316	10.0	130.0	0	0.00	0.000
F38	J-23	FIRE-5	216	10.0	130.0	0	0.00	0.000
F36	J-26	FIRE-3	240	10.0	130.0	0	0.00	0.000
F31	J-28	FIRE-6	51	10.0	130.0	0	0.00	0.000
F18	FH8	J-30	105	16.0	130.0	0	0.00	0.000
F20	J-30	FH7	191	16.0	130.0	0	0.00	0.000
F19	J-30	FIRE-THB	98	10.0	130.0	0	0.00	0.000
F12	J-31	FIRE-1A	150	10.0	130.0	0	0.00	0.000
F13	J-31	FIRE-1B	73	10.0	130.0	0	0.00	0.000
F10	J-32	FH6	375	16.0	130.0	0	0.00	0.000
F11	FH6	J-31	37	12.0	130.0	0	0.00	0.000

Scenario: 3 (MDFF - FIRE8, FIRE9)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
193	FIRE-8	1,146.66	1,875	1,319.90	75
198	FIRE-9	1,146.51	1,875	1,321.11	76
54	BLDG-6	1,150.12	45	1,322.59	75
112	BLDG-10	1,146.50	37	1,322.22	76
53	BLDG-7	1,147.11	34	1,322.61	76
67	BLDG-8	1,146.66	34	1,322.16	76
379	BLDG-5	1,153.51	31	1,322.44	73
62	BLDG-11	1,145.39	31	1,322.20	76
154	BLDG-2	1,156.28	29	1,322.41	72
66	BLDG-9	1,146.51	29	1,322.17	76
334	BLDG-4	1,153.51	27	1,322.42	73
389	BLDG-3	1,156.28	25	1,322.50	72
159	BLDG-1B	1,149.70	21	1,322.49	75
57	BLDG-1A	1,149.10	13	1,322.49	75
63	BLDG-THA	1,141.25	3	1,322.25	78
399	BLDG-THB	1,143.90	3	1,322.23	77
30	POC 1	1,150.80	0	1,338.80	81
32	J-1	1,146.43	0	1,336.19	82
34	J-2	1,146.43	0	1,322.56	76
35	J-3	1,147.11	0	1,326.20	77
36	J-4	1,141.25	0	1,324.23	79
37	FIRE-7	1,147.11	0	1,326.20	77
38	FIRE-THA	1,141.25	0	1,324.23	79
39	J-5	1,142.40	0	1,324.76	79
41	FIRE-11	1,145.39	0	1,324.76	78
48	J-6	1,153.51	0	1,326.53	75
49	J-7	1,157.60	0	1,326.52	73
51	J-8	1,146.43	0	1,322.72	76
52	J-9	1,147.11	0	1,322.64	76
56	J-10	1,153.18	0	1,322.56	73
60	J-11	1,142.40	0	1,322.36	78
61	J-12	1,143.69	0	1,322.27	77
64	J-13	1,141.25	0	1,322.25	78
65	J-14	1,146.51	0	1,322.18	76
144	J-15	1,153.51	0	1,322.44	73
156	J-16	1,149.10	0	1,322.50	75
161	POC 2	1,170.60	0	1,336.21	72
190	J-17	1,141.25	0	1,324.01	79
195	J-18	1,146.51	0	1,322.87	76
200	FH1	1,139.74	0	1,336.55	85
205	FH2	1,152.00	0	1,336.19	80
208	FH3	1,162.60	0	1,336.20	75
218	FH7	1,145.39	0	1,324.76	78
221	FH8	1,140.78	0	1,324.76	80
224	FH9	1,141.25	0	1,324.14	79
227	FH10	1,147.11	0	1,324.69	77
230	J-32	1,153.18	0	1,326.31	75
233	FH4	1,166.37	0	1,336.21	73
308	J-19	1,170.60	0	1,336.28	72

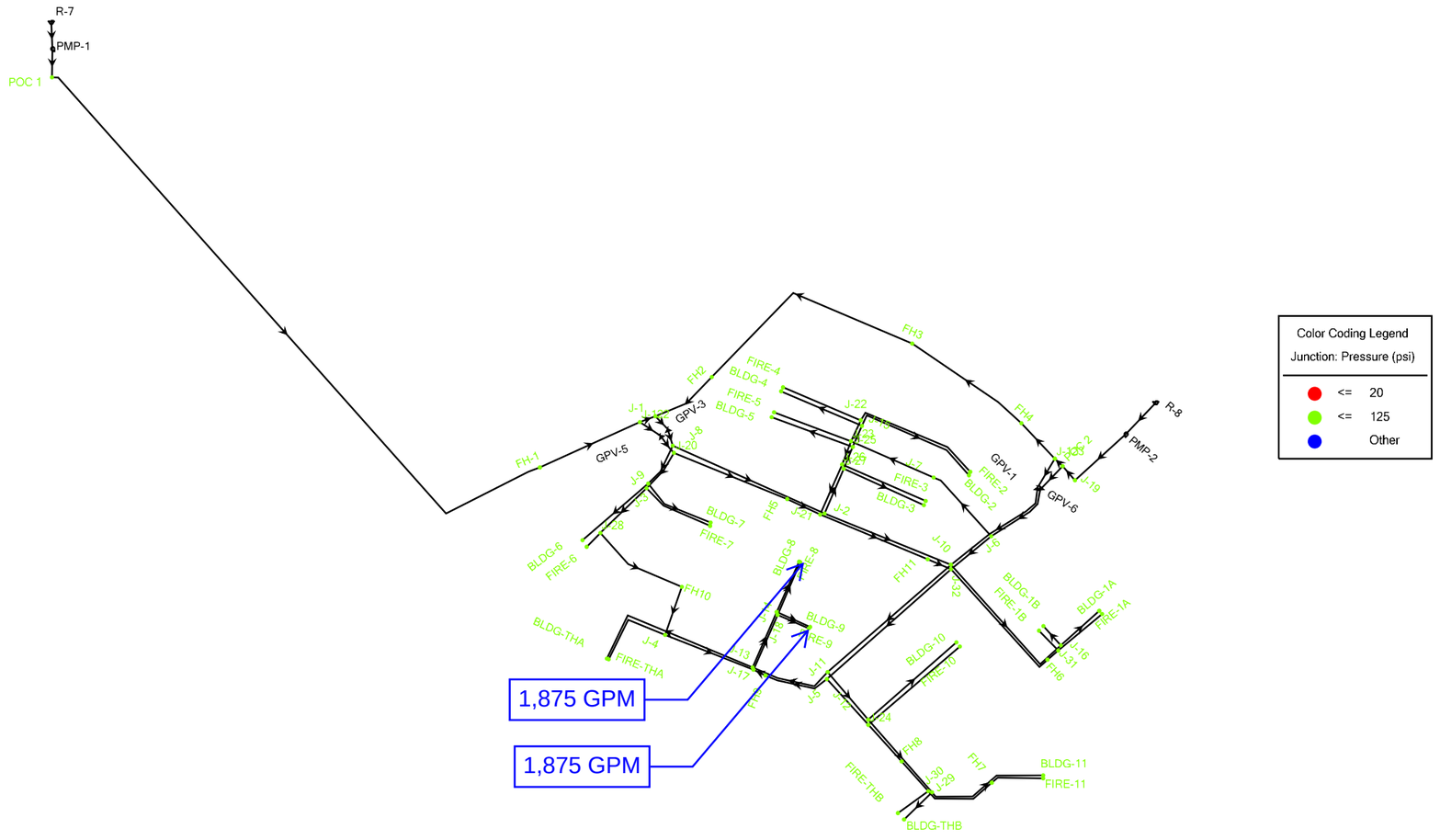
Scenario: 3 (MDFF - FIRE8, FIRE9)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
341	J-20	1,146.43	0	1,326.61	78
343	J-21	1,146.43	0	1,326.49	78
352	J-22	1,153.51	0	1,326.50	75
354	FIRE-4	1,153.51	0	1,326.50	75
356	FIRE-2	1,156.28	0	1,326.50	74
362	J-23	1,153.51	0	1,326.50	75
366	FIRE-1A	1,149.70	0	1,326.31	76
368	J-24	1,141.50	0	1,324.76	79
371	FIRE-10	1,140.78	0	1,324.76	80
374	FIRE-5	1,153.51	0	1,326.50	75
376	J-25	1,151.60	0	1,322.47	74
381	J-26	1,151.29	0	1,326.50	76
384	FIRE-3	1,156.28	0	1,326.50	74
386	J-27	1,149.90	0	1,322.52	75
391	J-28	1,147.11	0	1,325.61	77
394	FIRE-6	1,150.12	0	1,325.61	76
396	J-29	1,143.90	0	1,322.23	77
401	J-30	1,142.44	0	1,324.76	79
404	FIRE-THB	1,143.90	0	1,324.76	78
407	J-31	1,150.61	0	1,326.31	76
411	FIRE-1B	1,149.70	0	1,326.31	76
413	FH6	1,150.84	0	1,326.31	76
416	FH5	1,146.43	0	1,326.52	78
419	FH11	1,152.43	0	1,326.34	75
424	J-122	1,145.98	0	1,336.19	82
428	J-123	1,169.08	0	1,336.21	72

Scenario 3 - MDFF - FIRE 8, FIRE 9

Scenario 3

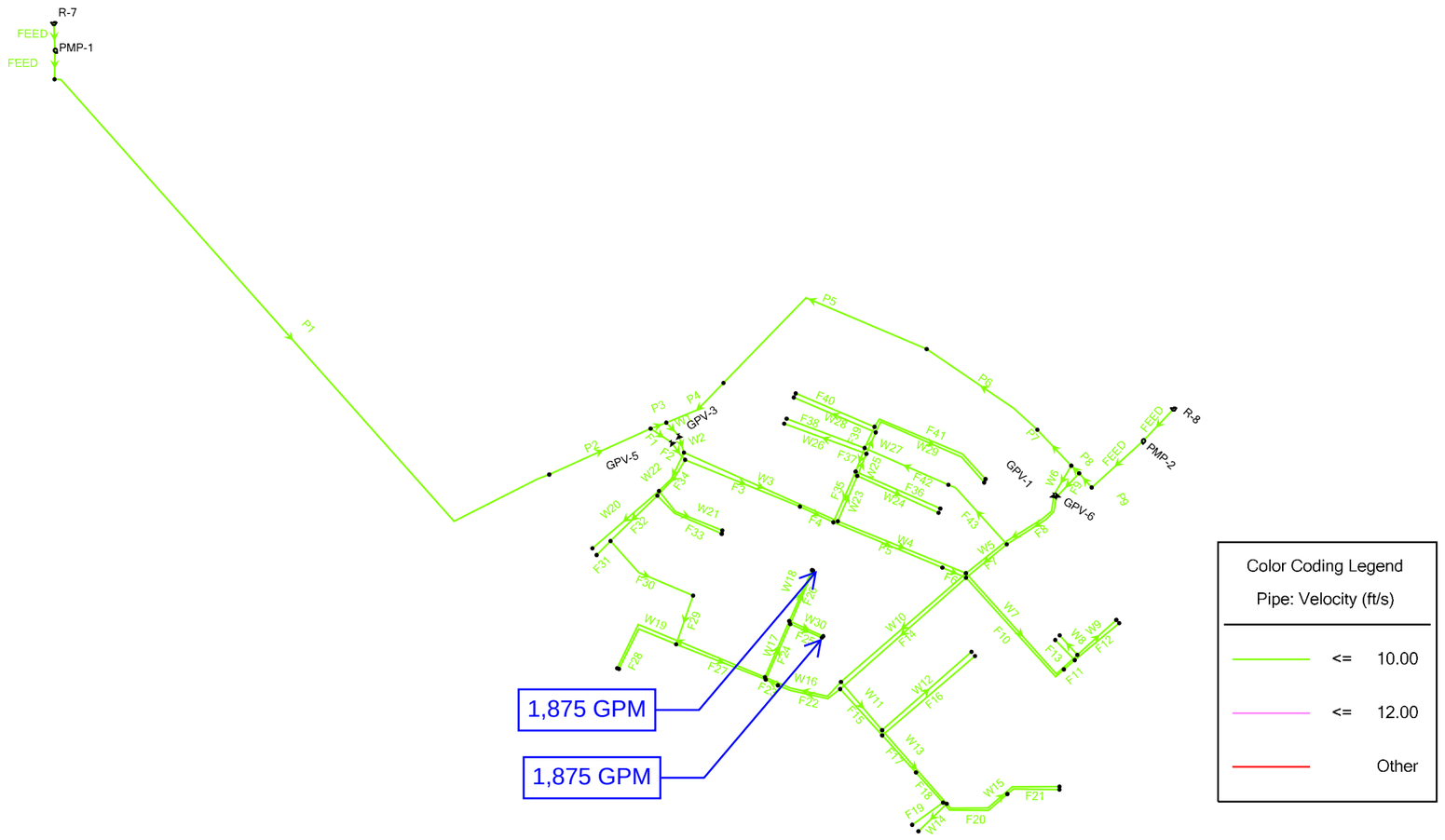
Pressure Map



Scenario 3 - MDFF - FIRE 8, FIRE 9

Scenario 3

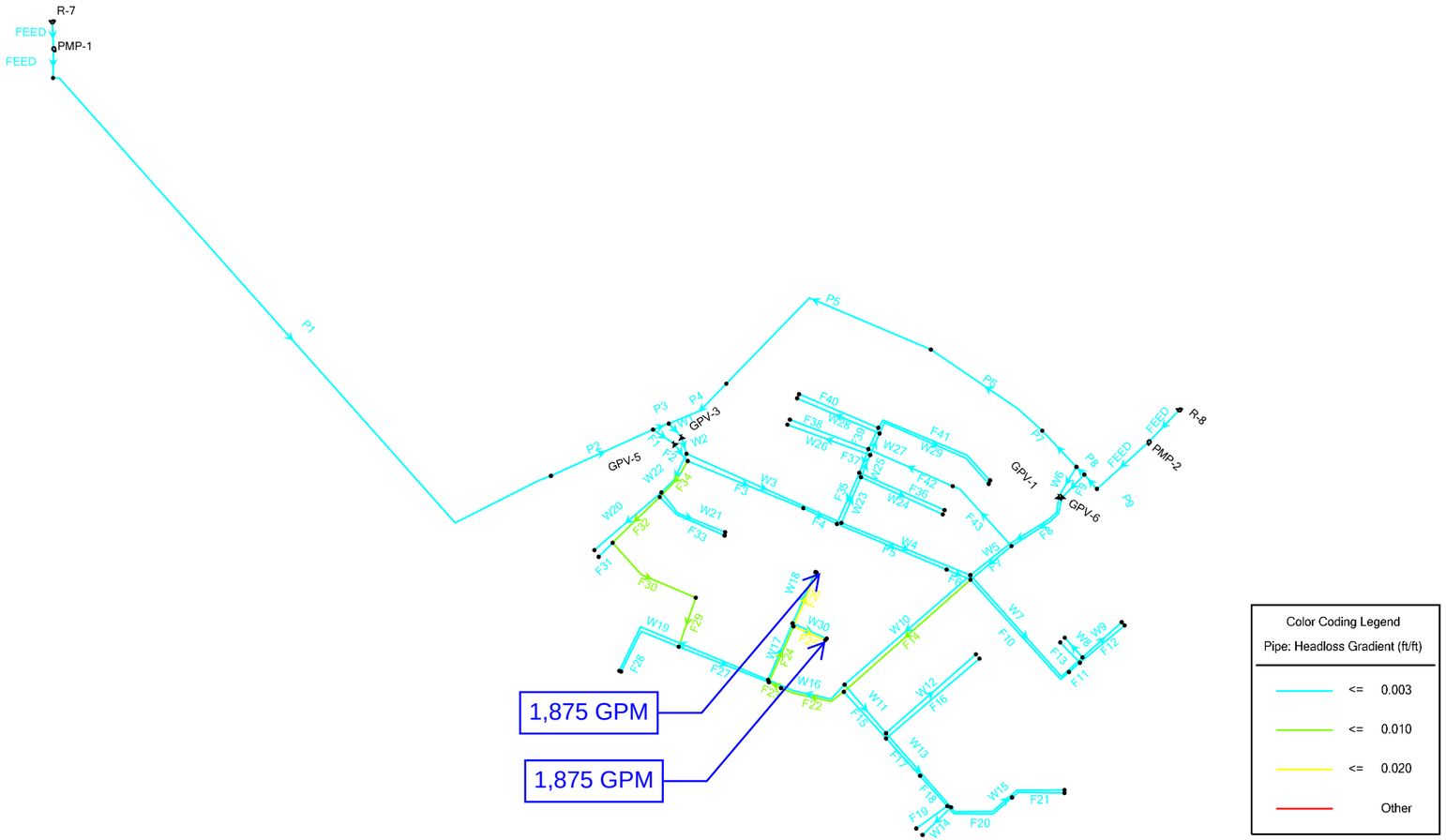
Velocity Map



Scenario 3 - MDFF - FIRE 8, FIRE 9

Scenario 3

Headloss Map



Scenario 4 (MDFF):

1. Scenario Summary
2. Pipe Flex Table
3. Junction Flex Table
4. Pressure Map
5. Velocity Map
6. Headloss Map

Demands:

Scenario	Total Flow (GPM)	Node	Flow (GPM)
4 (MDFF)	4113	FIRE-2	1875
		FIRE-4	1875
		MDD	363

Scenario Summary Report
Scenario: 4 (MDFF - FIRE2, FIRE4)

Scenario Summary

ID	292
Label	4 (MDFF - FIRE2, FIRE4)
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	Scenario - 4, FIRE2, FIRE4
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base Fire Flow
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.100	Start Time	12:00:00 AM
Trials	1000	Calculation Type	Hydraulics Only

Scenario: 4 (MDFF - FIRE2, FIRE4)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F39	J-23	J-22	60	12.0	130.0	3,750	10.64	0.029
F40	J-22	FIRE-4	222	10.0	130.0	1,875	7.66	0.020
F41	J-22	FIRE-2	345	10.0	130.0	1,875	7.66	0.020
F35	J-21	J-26	144	12.0	130.0	2,232	6.33	0.011
F37	J-26	J-23	65	12.0	130.0	2,232	6.33	0.011
F43	J-6	J-7	218	12.0	130.0	1,518	4.31	0.005
F42	J-23	J-7	237	12.0	130.0	-1,518	4.31	0.005
F8	J-6	GPV-6	188	16.0	130.0	-1,883	3.00	0.002
F9	GPV-6	POC 2	85	16.0	130.0	-1,883	3.00	0.002
F1	GPV-5	J-122	65	16.0	130.0	-1,867	2.98	0.002
F2	GPV-5	J-20	57	16.0	130.0	1,867	2.98	0.002
P9	J-19	POC 2	49	18.0	130.0	2,140	2.70	0.001
F3	J-20	FH5	321	16.0	130.0	1,460	2.33	0.001
F4	FH5	J-21	96	16.0	130.0	1,460	2.33	0.001
P1	POC 1	FH1	1,824	18.0	130.0	1,972	2.49	0.001
P2	FH1	J-122	288	18.0	130.0	1,972	2.49	0.001
W25	J-25	J-27	62	6.0	130.0	-88	1.00	0.001
W22	J-8	J-9	120	6.0	130.0	79	0.90	0.001
W5	GPV-1	J-10	317	8.0	130.0	153	0.98	0.001
W6	GPV-1	J-123	89	8.0	130.0	-153	0.98	0.001
W11	J-11	J-12	165	6.0	130.0	71	0.80	0.001
W16	J-11	J-13	221	6.0	130.0	66	0.75	0.000
W10	J-10	J-11	429	8.0	130.0	137	0.87	0.000
W17	J-13	J-14	159	6.0	130.0	63	0.71	0.000
F29	FH10	J-4	134	12.0	130.0	408	1.16	0.000
F34	J-3	J-20	118	12.0	130.0	-408	1.16	0.000
F32	J-3	J-28	170	12.0	130.0	408	1.16	0.000
F30	J-28	FH10	263	12.0	130.0	408	1.16	0.000
W3	J-8	J-2	437	8.0	130.0	130	0.83	0.000
F5	J-21	FH11	306	16.0	130.0	-772	1.23	0.000
F6	FH11	J-32	67	16.0	130.0	-772	1.23	0.000
W27	J-15	J-25	60	6.0	130.0	-57	0.64	0.000
W2	GPV-3	J-8	46	10.0	130.0	209	0.86	0.000
W1	J-1	GPV-3	47	10.0	130.0	209	0.86	0.000
W23	J-27	J-2	128	8.0	130.0	-112	0.72	0.000
W20	J-9	BLDG-6	228	6.0	130.0	45	0.51	0.000
W12	J-12	BLDG-10	308	6.0	130.0	37	0.43	0.000
W21	J-9	BLDG-7	199	6.0	130.0	34	0.39	0.000
W7	J-10	J-16	424	6.0	130.0	34	0.39	0.000
W18	J-14	BLDG-8	145	6.0	130.0	34	0.39	0.000
W13	J-12	J-29	254	6.0	130.0	33	0.38	0.000
W26	J-25	BLDG-5	227	6.0	130.0	31	0.35	0.000
W15	J-29	BLDG-11	318	6.0	130.0	31	0.35	0.000
W29	J-15	BLDG-2	347	6.0	130.0	29	0.33	0.000
F27	J-17	J-4	249	16.0	130.0	-408	0.65	0.000
F22	J-5	FH9	174	16.0	130.0	-408	0.65	0.000
F14	J-32	J-5	435	16.0	130.0	-408	0.65	0.000
W30	J-14	BLDG-9	96	6.0	130.0	29	0.32	0.000

Scenario: 4 (MDFF - FIRE2, FIRE4)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F23	FH9	J-17	35	16.0	130.0	-408	0.65	0.000
W28	J-15	BLDG-4	231	6.0	130.0	27	0.31	0.000
W24	J-27	BLDG-3	231	6.0	130.0	25	0.28	0.000
F7	J-32	J-6	136	16.0	130.0	-365	0.58	0.000
W8	J-16	BLDG-1B	68	6.0	130.0	21	0.24	0.000
W9	J-16	BLDG-1A	136	6.0	130.0	13	0.15	0.000
P6	FH3	FH4	356	18.0	130.0	-105	0.13	0.000
P4	J-1	FH2	184	18.0	130.0	-105	0.13	0.000
P5	FH2	FH3	647	18.0	130.0	-105	0.13	0.000
P7	FH4	J-123	128	18.0	130.0	-105	0.13	0.000
P3	J-122	J-1	43	18.0	130.0	105	0.13	0.000
W4	J-2	J-10	358	8.0	130.0	18	0.11	0.000
P8	J-123	POC 2	28	18.0	130.0	-258	0.32	0.000
W19	J-13	BLDG-THA	481	6.0	130.0	3	0.03	0.000
W14	J-29	BLDG-THB	102	6.0	130.0	3	0.03	0.000
FEED	R-8	PMP-2	114	100.0	130.0	2,140	0.09	0.000
FEED	R-7	PMP-1	70	100.0	130.0	1,972	0.08	0.000
F28	J-4	FIRE-THA	220	10.0	130.0	0	0.00	0.000
F33	J-3	FIRE-7	197	10.0	130.0	0	0.00	0.000
FEED	PMP-1	POC 1	74	100.0	130.0	1,972	0.08	0.000
F24	J-17	J-18	157	16.0	130.0	0	0.00	0.000
F26	J-18	FIRE-8	151	10.0	130.0	0	0.00	0.000
F25	J-18	FIRE-9	89	10.0	130.0	0	0.00	0.000
F21	FH7	FIRE-11	140	10.0	130.0	0	0.00	0.000
FEED	PMP-2	J-19	180	100.0	130.0	2,140	0.09	0.000
F15	J-5	J-24	162	16.0	130.0	0	0.00	0.000
F17	J-24	FH8	130	16.0	130.0	0	0.00	0.000
F16	J-24	FIRE-10	316	10.0	130.0	0	0.00	0.000
F38	J-23	FIRE-5	216	10.0	130.0	0	0.00	0.000
F36	J-26	FIRE-3	240	10.0	130.0	0	0.00	0.000
F31	J-28	FIRE-6	51	10.0	130.0	0	0.00	0.000
F18	FH8	J-30	105	16.0	130.0	0	0.00	0.000
F20	J-30	FH7	191	16.0	130.0	0	0.00	0.000
F19	J-30	FIRE-THB	98	10.0	130.0	0	0.00	0.000
F12	J-31	FIRE-1A	150	10.0	130.0	0	0.00	0.000
F13	J-31	FIRE-1B	73	10.0	130.0	0	0.00	0.000
F10	J-32	FH6	375	16.0	130.0	0	0.00	0.000
F11	FH6	J-31	37	12.0	130.0	0	0.00	0.000

Scenario: 4 (MDFF - FIRE2, FIRE4)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
354	FIRE-4	1,153.51	1,875	1,317.74	71
356	FIRE-2	1,156.28	1,875	1,315.30	69
54	BLDG-6	1,150.12	45	1,322.72	75
112	BLDG-10	1,146.50	37	1,322.33	76
53	BLDG-7	1,147.11	34	1,322.74	76
67	BLDG-8	1,146.66	34	1,322.27	76
379	BLDG-5	1,153.51	31	1,322.55	73
62	BLDG-11	1,145.39	31	1,322.31	77
154	BLDG-2	1,156.28	29	1,322.52	72
66	BLDG-9	1,146.51	29	1,322.28	76
334	BLDG-4	1,153.51	27	1,322.53	73
389	BLDG-3	1,156.28	25	1,322.61	72
159	BLDG-1B	1,149.70	21	1,322.60	75
57	BLDG-1A	1,149.10	13	1,322.60	75
63	BLDG-THA	1,141.25	3	1,322.36	78
399	BLDG-THB	1,143.90	3	1,322.34	77
30	POC 1	1,150.80	0	1,338.80	81
32	J-1	1,146.43	0	1,336.19	82
34	J-2	1,146.43	0	1,322.67	76
35	J-3	1,147.11	0	1,326.71	78
36	J-4	1,141.25	0	1,326.47	80
37	FIRE-7	1,147.11	0	1,326.71	78
38	FIRE-THA	1,141.25	0	1,326.47	80
39	J-5	1,142.40	0	1,326.42	80
41	FIRE-11	1,145.39	0	1,326.42	78
48	J-6	1,153.51	0	1,326.39	75
49	J-7	1,157.60	0	1,325.19	73
51	J-8	1,146.43	0	1,322.85	76
52	J-9	1,147.11	0	1,322.77	76
56	J-10	1,153.18	0	1,322.67	73
60	J-11	1,142.40	0	1,322.47	78
61	J-12	1,143.69	0	1,322.38	77
64	J-13	1,141.25	0	1,322.36	78
65	J-14	1,146.51	0	1,322.29	76
144	J-15	1,153.51	0	1,322.56	73
156	J-16	1,149.10	0	1,322.61	75
161	POC 2	1,170.60	0	1,336.21	72
190	J-17	1,141.25	0	1,326.44	80
193	FIRE-8	1,146.66	0	1,326.44	78
195	J-18	1,146.51	0	1,326.44	78
198	FIRE-9	1,146.51	0	1,326.44	78
200	FH1	1,139.74	0	1,336.55	85
205	FH2	1,152.00	0	1,336.19	80
208	FH3	1,162.60	0	1,336.21	75
218	FH7	1,145.39	0	1,326.42	78
221	FH8	1,140.78	0	1,326.42	80
224	FH9	1,141.25	0	1,326.44	80
227	FH10	1,147.11	0	1,326.52	78
230	J-32	1,153.18	0	1,326.38	75

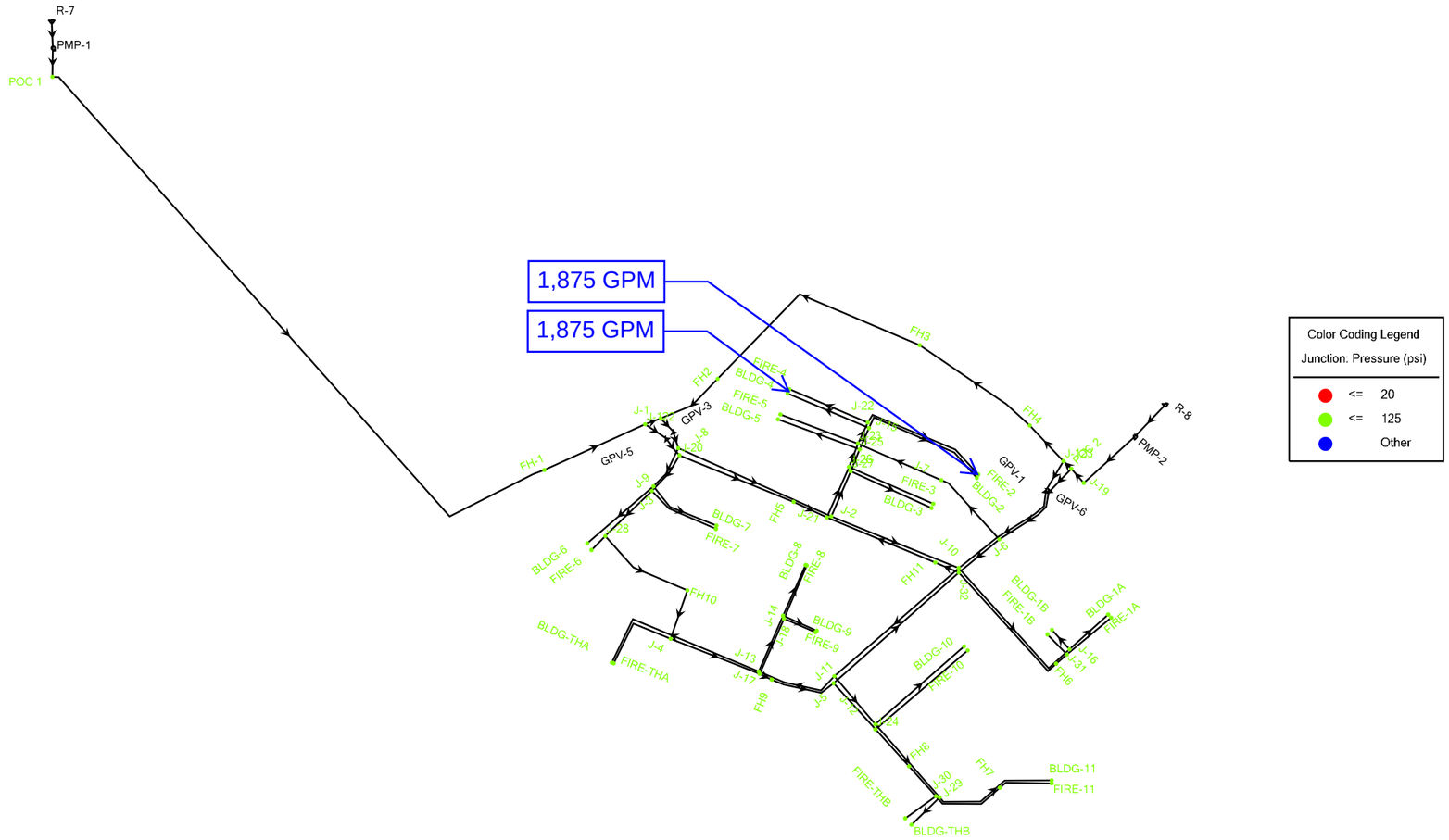
Scenario: 4 (MDFF - FIRE2, FIRE4)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
233	FH4	1,166.37	0	1,336.21	73
308	J-19	1,170.60	0	1,336.29	72
341	J-20	1,146.43	0	1,326.76	78
343	J-21	1,146.43	0	1,326.23	78
352	J-22	1,153.51	0	1,322.12	73
362	J-23	1,153.51	0	1,323.89	74
366	FIRE-1A	1,149.70	0	1,326.38	76
368	J-24	1,141.50	0	1,326.42	80
371	FIRE-10	1,140.78	0	1,326.42	80
374	FIRE-5	1,153.51	0	1,323.89	74
376	J-25	1,151.60	0	1,322.58	74
381	J-26	1,151.29	0	1,324.62	75
384	FIRE-3	1,156.28	0	1,324.62	73
386	J-27	1,149.90	0	1,322.63	75
391	J-28	1,147.11	0	1,326.63	78
394	FIRE-6	1,150.12	0	1,326.63	76
396	J-29	1,143.90	0	1,322.34	77
401	J-30	1,142.44	0	1,326.42	80
404	FIRE-THB	1,143.90	0	1,326.42	79
407	J-31	1,150.61	0	1,326.38	76
411	FIRE-1B	1,149.70	0	1,326.38	76
413	FH6	1,150.84	0	1,326.38	76
416	FH5	1,146.43	0	1,326.35	78
419	FH11	1,152.43	0	1,326.35	75
424	J-122	1,145.98	0	1,336.19	82
428	J-123	1,169.08	0	1,336.21	72

Scenario 4 - MDFF - FIRE 2, FIRE 4

Scenario 4

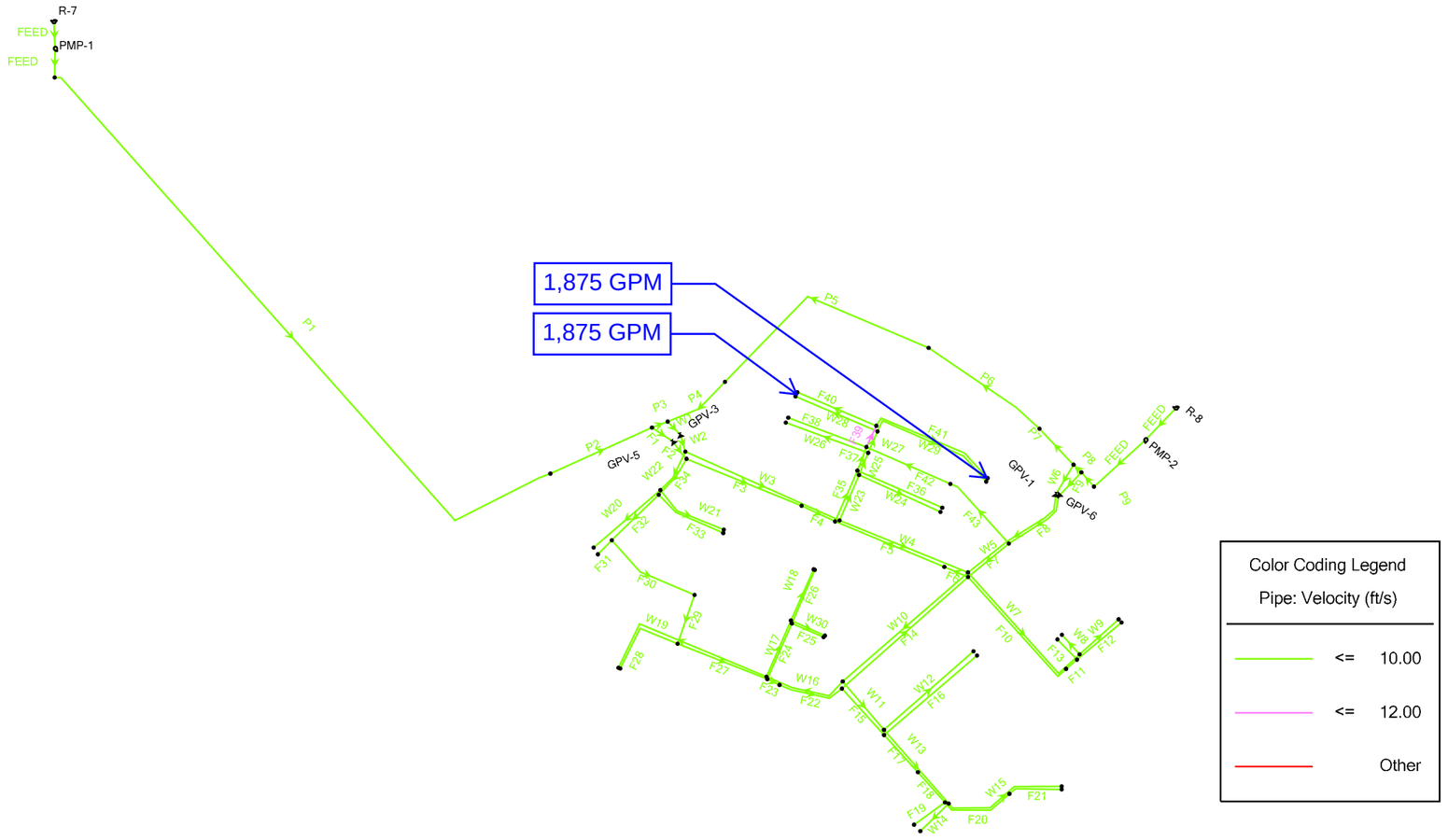
Pressure Map



Scenario 4 - MDFF - FIRE 2, FIRE 4

Scenario 4

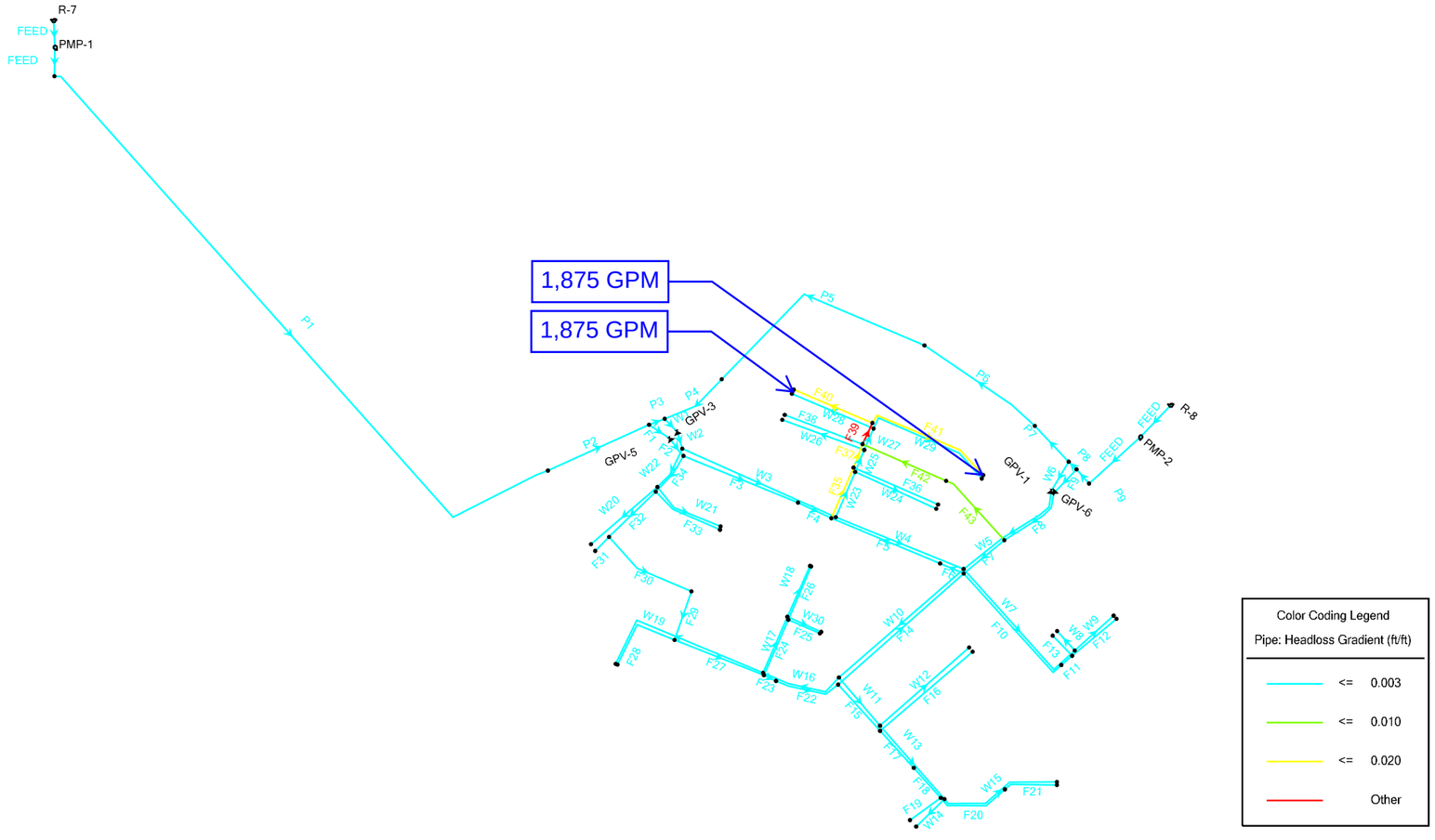
Velocity Map



Scenario 4 - MDFF - FIRE 2, FIRE 4

Scenario 4

Headloss Map



Scenario 5 (MDFF):

1. Scenario Summary
2. Pipe Flex Table
3. Junction Flex Table
4. Pressure Map
5. Velocity Map
6. Headloss Map

Demands:

Scenario	Total Flow (GPM)	Node	Flow (GPM)
5 (MDFF)	4113	FH6	1875
		FIRE-1A	1875
		MDD	363

Scenario Summary Report
Scenario: 5 (MDFF - FIRE1A, FH6)

Scenario Summary

ID	294
Label	5 (MDFF - FIRE1A, FH6)
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	Scenario - 5, FH6, FIRE-1A
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base Fire Flow
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.100	Start Time	12:00:00 AM
Trials	1000	Calculation Type	Hydraulics Only

Scenario: 5 (MDFF - FIRE1A, FH6)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F12	J-31	FIRE-1A	150	10.0	130.0	1,875	7.66	0.020
F11	FH6	J-31	37	12.0	130.0	1,875	5.32	0.008
F10	J-32	FH6	375	16.0	130.0	3,750	5.98	0.007
F7	J-32	J-6	136	16.0	130.0	-2,000	3.19	0.002
F9	GPV-6	POC 2	85	16.0	130.0	-1,887	3.01	0.002
F8	J-6	GPV-6	188	16.0	130.0	-1,887	3.01	0.002
F1	GPV-5	J-122	65	16.0	130.0	-1,863	2.97	0.002
F2	GPV-5	J-20	57	16.0	130.0	1,863	2.97	0.002
P9	J-19	POC 2	49	18.0	130.0	2,141	2.70	0.001
P1	POC 1	FH1	1,824	18.0	130.0	1,972	2.49	0.001
P2	FH1	J-122	288	18.0	130.0	1,972	2.49	0.001
F3	J-20	FH5	321	16.0	130.0	1,313	2.10	0.001
F4	FH5	J-21	96	16.0	130.0	1,313	2.10	0.001
F5	J-21	FH11	306	16.0	130.0	1,200	1.91	0.001
F6	FH11	J-32	67	16.0	130.0	1,200	1.91	0.001
F34	J-3	J-20	118	12.0	130.0	-550	1.56	0.001
F30	J-28	FH10	263	12.0	130.0	550	1.56	0.001
F29	FH10	J-4	134	12.0	130.0	550	1.56	0.001
F32	J-3	J-28	170	12.0	130.0	550	1.56	0.001
W25	J-25	J-27	62	6.0	130.0	-88	1.00	0.001
W22	J-8	J-9	120	6.0	130.0	79	0.90	0.001
W11	J-11	J-12	165	6.0	130.0	71	0.80	0.001
W3	J-8	J-2	437	8.0	130.0	147	0.94	0.001
W16	J-11	J-13	221	6.0	130.0	66	0.75	0.000
W10	J-10	J-11	429	8.0	130.0	137	0.87	0.000
W5	GPV-1	J-10	317	8.0	130.0	136	0.87	0.000
W6	GPV-1	J-123	89	8.0	130.0	-136	0.87	0.000
W17	J-13	J-14	159	6.0	130.0	63	0.71	0.000
W1	J-1	GPV-3	47	10.0	130.0	226	0.92	0.000
W2	GPV-3	J-8	46	10.0	130.0	226	0.92	0.000
W27	J-15	J-25	60	6.0	130.0	-57	0.64	0.000
W23	J-27	J-2	128	8.0	130.0	-112	0.72	0.000
W20	J-9	BLDG-6	228	6.0	130.0	45	0.51	0.000
F23	FH9	J-17	35	16.0	130.0	-550	0.88	0.000
F14	J-32	J-5	435	16.0	130.0	-550	0.88	0.000
F27	J-17	J-4	249	16.0	130.0	-550	0.88	0.000
F22	J-5	FH9	174	16.0	130.0	-550	0.88	0.000
W12	J-12	BLDG-10	308	6.0	130.0	37	0.43	0.000
W21	J-9	BLDG-7	199	6.0	130.0	34	0.39	0.000
W7	J-10	J-16	424	6.0	130.0	34	0.39	0.000
W18	J-14	BLDG-8	145	6.0	130.0	34	0.39	0.000
W13	J-12	J-29	254	6.0	130.0	33	0.38	0.000
W26	J-25	BLDG-5	227	6.0	130.0	31	0.35	0.000
W15	J-29	BLDG-11	318	6.0	130.0	31	0.35	0.000
W29	J-15	BLDG-2	347	6.0	130.0	29	0.33	0.000
W30	J-14	BLDG-9	96	6.0	130.0	29	0.32	0.000
W28	J-15	BLDG-4	231	6.0	130.0	27	0.31	0.000
W24	J-27	BLDG-3	231	6.0	130.0	25	0.28	0.000

Scenario: 5 (MDFF - FIRE1A, FH6)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
W8	J-16	BLDG-1B	68	6.0	130.0	21	0.24	0.000
W4	J-2	J-10	358	8.0	130.0	34	0.22	0.000
P8	J-123	POC 2	28	18.0	130.0	-254	0.32	0.000
F42	J-23	J-7	237	12.0	130.0	113	0.32	0.000
F35	J-21	J-26	144	12.0	130.0	113	0.32	0.000
F43	J-6	J-7	218	12.0	130.0	-113	0.32	0.000
F37	J-26	J-23	65	12.0	130.0	113	0.32	0.000
W9	J-16	BLDG-1A	136	6.0	130.0	13	0.15	0.000
P7	FH4	J-123	128	18.0	130.0	-117	0.15	0.000
P4	J-1	FH2	184	18.0	130.0	-117	0.15	0.000
P6	FH3	FH4	356	18.0	130.0	-117	0.15	0.000
P5	FH2	FH3	647	18.0	130.0	-117	0.15	0.000
P3	J-122	J-1	43	18.0	130.0	109	0.14	0.000
W19	J-13	BLDG-THA	481	6.0	130.0	3	0.03	0.000
W14	J-29	BLDG-THB	102	6.0	130.0	3	0.03	0.000
FEED	R-8	PMP-2	114	100.0	130.0	2,141	0.09	0.000
FEED	R-7	PMP-1	70	100.0	130.0	1,972	0.08	0.000
F28	J-4	FIRE-THA	220	10.0	130.0	0	0.00	0.000
F33	J-3	FIRE-7	197	10.0	130.0	0	0.00	0.000
FEED	PMP-1	POC 1	74	100.0	130.0	1,972	0.08	0.000
F24	J-17	J-18	157	16.0	130.0	0	0.00	0.000
F26	J-18	FIRE-8	151	10.0	130.0	0	0.00	0.000
F25	J-18	FIRE-9	89	10.0	130.0	0	0.00	0.000
F21	FH7	FIRE-11	140	10.0	130.0	0	0.00	0.000
FEED	PMP-2	J-19	180	100.0	130.0	2,141	0.09	0.000
F40	J-22	FIRE-4	222	10.0	130.0	0	0.00	0.000
F41	J-22	FIRE-2	345	10.0	130.0	0	0.00	0.000
F39	J-23	J-22	60	12.0	130.0	0	0.00	0.000
F15	J-5	J-24	162	16.0	130.0	0	0.00	0.000
F17	J-24	FH8	130	16.0	130.0	0	0.00	0.000
F16	J-24	FIRE-10	316	10.0	130.0	0	0.00	0.000
F38	J-23	FIRE-5	216	10.0	130.0	0	0.00	0.000
F36	J-26	FIRE-3	240	10.0	130.0	0	0.00	0.000
F31	J-28	FIRE-6	51	10.0	130.0	0	0.00	0.000
F18	FH8	J-30	105	16.0	130.0	0	0.00	0.000
F20	J-30	FH7	191	16.0	130.0	0	0.00	0.000
F19	J-30	FIRE-THB	98	10.0	130.0	0	0.00	0.000
F13	J-31	FIRE-1B	73	10.0	130.0	0	0.00	0.000

Scenario: 5 (MDFF - FIRE1A, FH6)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
366	FIRE-1A	1,149.70	1,875	1,320.07	74
413	FH6	1,150.84	1,875	1,323.33	75
54	BLDG-6	1,150.12	45	1,323.00	75
112	BLDG-10	1,146.50	37	1,322.56	76
53	BLDG-7	1,147.11	34	1,323.02	76
67	BLDG-8	1,146.66	34	1,322.50	76
379	BLDG-5	1,153.51	31	1,322.79	73
62	BLDG-11	1,145.39	31	1,322.54	77
154	BLDG-2	1,156.28	29	1,322.75	72
66	BLDG-9	1,146.51	29	1,322.51	76
334	BLDG-4	1,153.51	27	1,322.77	73
389	BLDG-3	1,156.28	25	1,322.85	72
159	BLDG-1B	1,149.70	21	1,322.83	75
57	BLDG-1A	1,149.10	13	1,322.83	75
63	BLDG-THA	1,141.25	3	1,322.59	78
399	BLDG-THB	1,143.90	3	1,322.57	77
30	POC 1	1,150.80	0	1,338.81	81
32	J-1	1,146.43	0	1,336.20	82
34	J-2	1,146.43	0	1,322.91	76
35	J-3	1,147.11	0	1,326.69	78
36	J-4	1,141.25	0	1,326.22	80
37	FIRE-7	1,147.11	0	1,326.69	78
38	FIRE-THA	1,141.25	0	1,326.22	80
39	J-5	1,142.40	0	1,326.12	79
41	FIRE-11	1,145.39	0	1,326.12	78
48	J-6	1,153.51	0	1,326.34	75
49	J-7	1,157.60	0	1,326.35	73
51	J-8	1,146.43	0	1,323.13	76
52	J-9	1,147.11	0	1,323.05	76
56	J-10	1,153.18	0	1,322.89	73
60	J-11	1,142.40	0	1,322.70	78
61	J-12	1,143.69	0	1,322.61	77
64	J-13	1,141.25	0	1,322.59	78
65	J-14	1,146.51	0	1,322.52	76
144	J-15	1,153.51	0	1,322.79	73
156	J-16	1,149.10	0	1,322.83	75
161	POC 2	1,170.60	0	1,336.21	72
190	J-17	1,141.25	0	1,326.17	80
193	FIRE-8	1,146.66	0	1,326.17	78
195	J-18	1,146.51	0	1,326.17	78
198	FIRE-9	1,146.51	0	1,326.17	78
200	FH1	1,139.74	0	1,336.55	85
205	FH2	1,152.00	0	1,336.20	80
208	FH3	1,162.60	0	1,336.20	75
218	FH7	1,145.39	0	1,326.12	78
221	FH8	1,140.78	0	1,326.12	80
224	FH9	1,141.25	0	1,326.16	80
227	FH10	1,147.11	0	1,326.33	78
230	J-32	1,153.18	0	1,326.03	75

Scenario: 5 (MDFF - FIRE1A, FH6)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
233	FH4	1,166.37	0	1,336.20	73
308	J-19	1,170.60	0	1,336.28	72
341	J-20	1,146.43	0	1,326.79	78
343	J-21	1,146.43	0	1,326.36	78
352	J-22	1,153.51	0	1,326.35	75
354	FIRE-4	1,153.51	0	1,326.35	75
356	FIRE-2	1,156.28	0	1,326.35	74
362	J-23	1,153.51	0	1,326.35	75
368	J-24	1,141.50	0	1,326.12	80
371	FIRE-10	1,140.78	0	1,326.12	80
374	FIRE-5	1,153.51	0	1,326.35	75
376	J-25	1,151.60	0	1,322.81	74
381	J-26	1,151.29	0	1,326.35	76
384	FIRE-3	1,156.28	0	1,326.35	74
386	J-27	1,149.90	0	1,322.86	75
391	J-28	1,147.11	0	1,326.55	78
394	FIRE-6	1,150.12	0	1,326.55	76
396	J-29	1,143.90	0	1,322.57	77
401	J-30	1,142.44	0	1,326.12	79
404	FIRE-THB	1,143.90	0	1,326.12	79
407	J-31	1,150.61	0	1,323.03	75
411	FIRE-1B	1,149.70	0	1,323.03	75
416	FH5	1,146.43	0	1,326.46	78
419	FH11	1,152.43	0	1,326.09	75
424	J-122	1,145.98	0	1,336.20	82
428	J-123	1,169.08	0	1,336.20	72

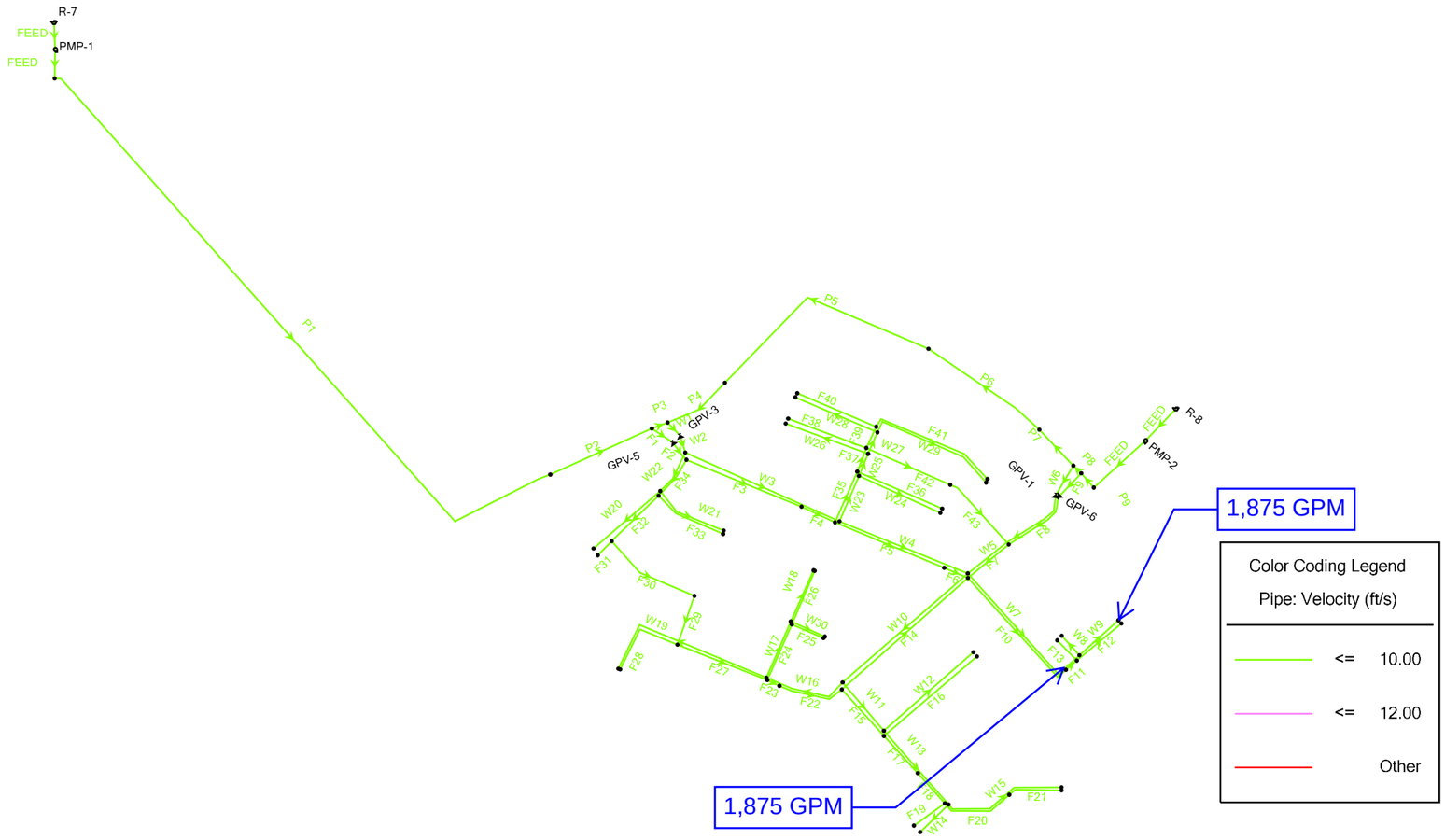
Scenario 5 - MDFF - FIRE 1A, FH6

Scenario 5

Pressure Map

Scenario 5 - MDFF - FIRE 1A, FH6

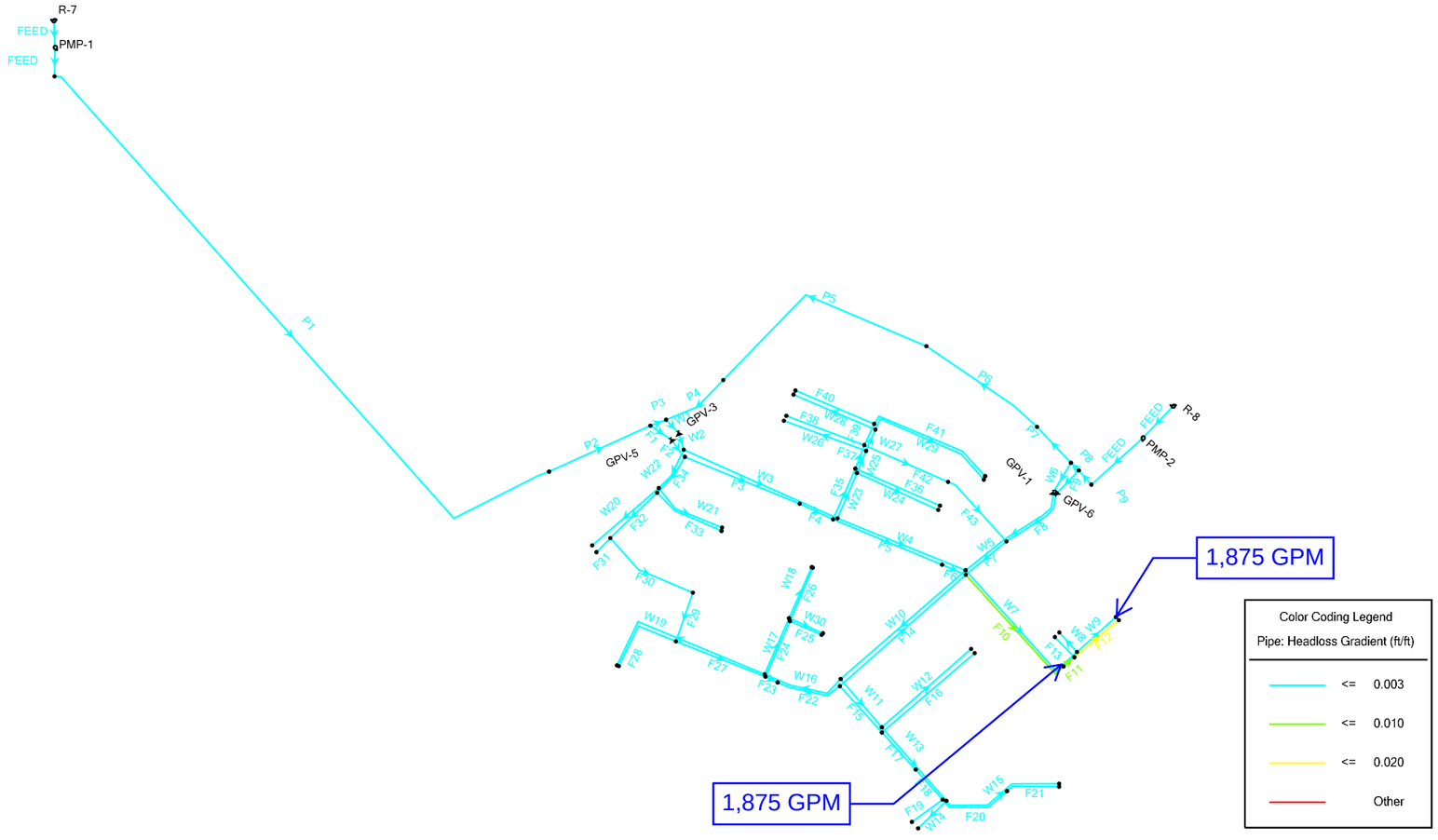
Velocity Map



Scenario 5 - MDFF - FIRE 1A, FH6

Scenario 5

Headloss Map



Scenario 6 (MDFF):

1. Scenario Summary
2. Pipe Flex Table
3. Junction Flex Table
4. Pressure Map
5. Velocity Map
6. Headloss Map

Demands:

Scenario	Total Flow (GPM)	Node	Flow (GPM)
6 (MDFF)	4113	FIRE-7	1875
		FH10	1875
		MDD	363

Scenario Summary Report
Scenario: 6 (MDFF - FIRE7, FH10)

Scenario Summary

ID	423
Label	6 (MDFF - FIRE7, FH10)
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	Scenario - 6, FIRE-7, FH10
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base Fire Flow
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.100	Start Time	12:00:00 AM
Trials	1000	Calculation Type	Hydraulics Only

Scenario: 6 (MDFF - FIRE7, FH10)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
F33	J-3	FIRE-7	197	10.0	130.0	1,875	7.66	0.020
F34	J-3	J-20	118	12.0	130.0	-2,329	6.61	0.012
F29	FH10	J-4	134	12.0	130.0	-1,421	4.03	0.005
F1	GPV-5	J-122	65	16.0	130.0	-1,913	3.05	0.002
F2	GPV-5	J-20	57	16.0	130.0	1,913	3.05	0.002
F9	GPV-6	POC 2	85	16.0	130.0	-1,837	2.93	0.002
F8	J-6	GPV-6	188	16.0	130.0	-1,837	2.93	0.002
P9	J-19	POC 2	49	18.0	130.0	2,141	2.70	0.001
F7	J-32	J-6	136	16.0	130.0	-1,537	2.45	0.001
P2	FH1	J-122	288	18.0	130.0	1,972	2.49	0.001
P1	POC 1	FH1	1,824	18.0	130.0	1,972	2.49	0.001
F23	FH9	J-17	35	16.0	130.0	1,421	2.27	0.001
F14	J-32	J-5	435	16.0	130.0	1,422	2.27	0.001
F27	J-17	J-4	249	16.0	130.0	1,421	2.27	0.001
F22	J-5	FH9	174	16.0	130.0	1,421	2.27	0.001
W25	J-25	J-27	62	6.0	130.0	-88	1.00	0.001
W6	GPV-1	J-123	89	8.0	130.0	-172	1.10	0.001
W5	GPV-1	J-10	317	8.0	130.0	172	1.10	0.001
W22	J-8	J-9	120	6.0	130.0	79	0.90	0.001
F30	J-28	FH10	263	12.0	130.0	454	1.29	0.001
F32	J-3	J-28	170	12.0	130.0	454	1.29	0.001
W11	J-11	J-12	165	6.0	130.0	71	0.80	0.001
W16	J-11	J-13	221	6.0	130.0	66	0.75	0.000
W10	J-10	J-11	429	8.0	130.0	137	0.87	0.000
W17	J-13	J-14	159	6.0	130.0	63	0.71	0.000
W27	J-15	J-25	60	6.0	130.0	-57	0.64	0.000
W23	J-27	J-2	128	8.0	130.0	-112	0.72	0.000
W3	J-8	J-2	437	8.0	130.0	111	0.71	0.000
W2	GPV-3	J-8	46	10.0	130.0	190	0.78	0.000
W1	J-1	GPV-3	47	10.0	130.0	190	0.78	0.000
F35	J-21	J-26	144	12.0	130.0	-299	0.85	0.000
F42	J-23	J-7	237	12.0	130.0	-299	0.85	0.000
F43	J-6	J-7	218	12.0	130.0	299	0.85	0.000
F37	J-26	J-23	65	12.0	130.0	-299	0.85	0.000
W20	J-9	BLDG-6	228	6.0	130.0	45	0.51	0.000
W12	J-12	BLDG-10	308	6.0	130.0	37	0.43	0.000
W18	J-14	BLDG-8	145	6.0	130.0	34	0.39	0.000
W21	J-9	BLDG-7	199	6.0	130.0	34	0.39	0.000
W7	J-10	J-16	424	6.0	130.0	34	0.39	0.000
W13	J-12	J-29	254	6.0	130.0	33	0.38	0.000
W26	J-25	BLDG-5	227	6.0	130.0	31	0.35	0.000
W15	J-29	BLDG-11	318	6.0	130.0	31	0.35	0.000
W29	J-15	BLDG-2	347	6.0	130.0	29	0.33	0.000
W30	J-14	BLDG-9	96	6.0	130.0	29	0.32	0.000
F3	J-20	FH5	321	16.0	130.0	-415	0.66	0.000
W28	J-15	BLDG-4	231	6.0	130.0	27	0.31	0.000
F4	FH5	J-21	96	16.0	130.0	-415	0.66	0.000
W24	J-27	BLDG-3	231	6.0	130.0	25	0.28	0.000

Scenario: 6 (MDFF - FIRE7, FH10)
FlexTable: Pipe Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
W8	J-16	BLDG-1B	68	6.0	130.0	21	0.24	0.000
W9	J-16	BLDG-1A	136	6.0	130.0	13	0.15	0.000
P8	J-123	POC 2	28	18.0	130.0	-304	0.38	0.000
F6	FH11	J-32	67	16.0	130.0	-116	0.18	0.000
F5	J-21	FH11	306	16.0	130.0	-116	0.18	0.000
P3	J-122	J-1	43	18.0	130.0	59	0.07	0.000
P7	FH4	J-123	128	18.0	130.0	-132	0.17	0.000
P6	FH3	FH4	356	18.0	130.0	-132	0.17	0.000
P4	J-1	FH2	184	18.0	130.0	-132	0.17	0.000
P5	FH2	FH3	647	18.0	130.0	-132	0.17	0.000
W4	J-2	J-10	358	8.0	130.0	-1	0.01	0.000
W14	J-29	BLDG-THB	102	6.0	130.0	3	0.03	0.000
W19	J-13	BLDG-THA	481	6.0	130.0	3	0.03	0.000
FEED	R-8	PMP-2	114	100.0	130.0	2,141	0.09	0.000
FEED	R-7	PMP-1	70	100.0	130.0	1,972	0.08	0.000
F28	J-4	FIRE-THA	220	10.0	130.0	0	0.00	0.000
FEED	PMP-1	POC 1	74	100.0	130.0	1,972	0.08	0.000
F24	J-17	J-18	157	16.0	130.0	0	0.00	0.000
F26	J-18	FIRE-8	151	10.0	130.0	0	0.00	0.000
F25	J-18	FIRE-9	89	10.0	130.0	0	0.00	0.000
F21	FH7	FIRE-11	140	10.0	130.0	0	0.00	0.000
FEED	PMP-2	J-19	180	100.0	130.0	2,141	0.09	0.000
F40	J-22	FIRE-4	222	10.0	130.0	0	0.00	0.000
F41	J-22	FIRE-2	345	10.0	130.0	0	0.00	0.000
F39	J-23	J-22	60	12.0	130.0	0	0.00	0.000
F15	J-5	J-24	162	16.0	130.0	0	0.00	0.000
F17	J-24	FH8	130	16.0	130.0	0	0.00	0.000
F16	J-24	FIRE-10	316	10.0	130.0	0	0.00	0.000
F38	J-23	FIRE-5	216	10.0	130.0	0	0.00	0.000
F36	J-26	FIRE-3	240	10.0	130.0	0	0.00	0.000
F31	J-28	FIRE-6	51	10.0	130.0	0	0.00	0.000
F18	FH8	J-30	105	16.0	130.0	0	0.00	0.000
F20	J-30	FH7	191	16.0	130.0	0	0.00	0.000
F19	J-30	FIRE-THB	98	10.0	130.0	0	0.00	0.000
F12	J-31	FIRE-1A	150	10.0	130.0	0	0.00	0.000
F13	J-31	FIRE-1B	73	10.0	130.0	0	0.00	0.000
F10	J-32	FH6	375	16.0	130.0	0	0.00	0.000
F11	FH6	J-31	37	12.0	130.0	0	0.00	0.000

Scenario: 6 (MDFF - FIRE7, FH10)
FlexTable: Junction Table

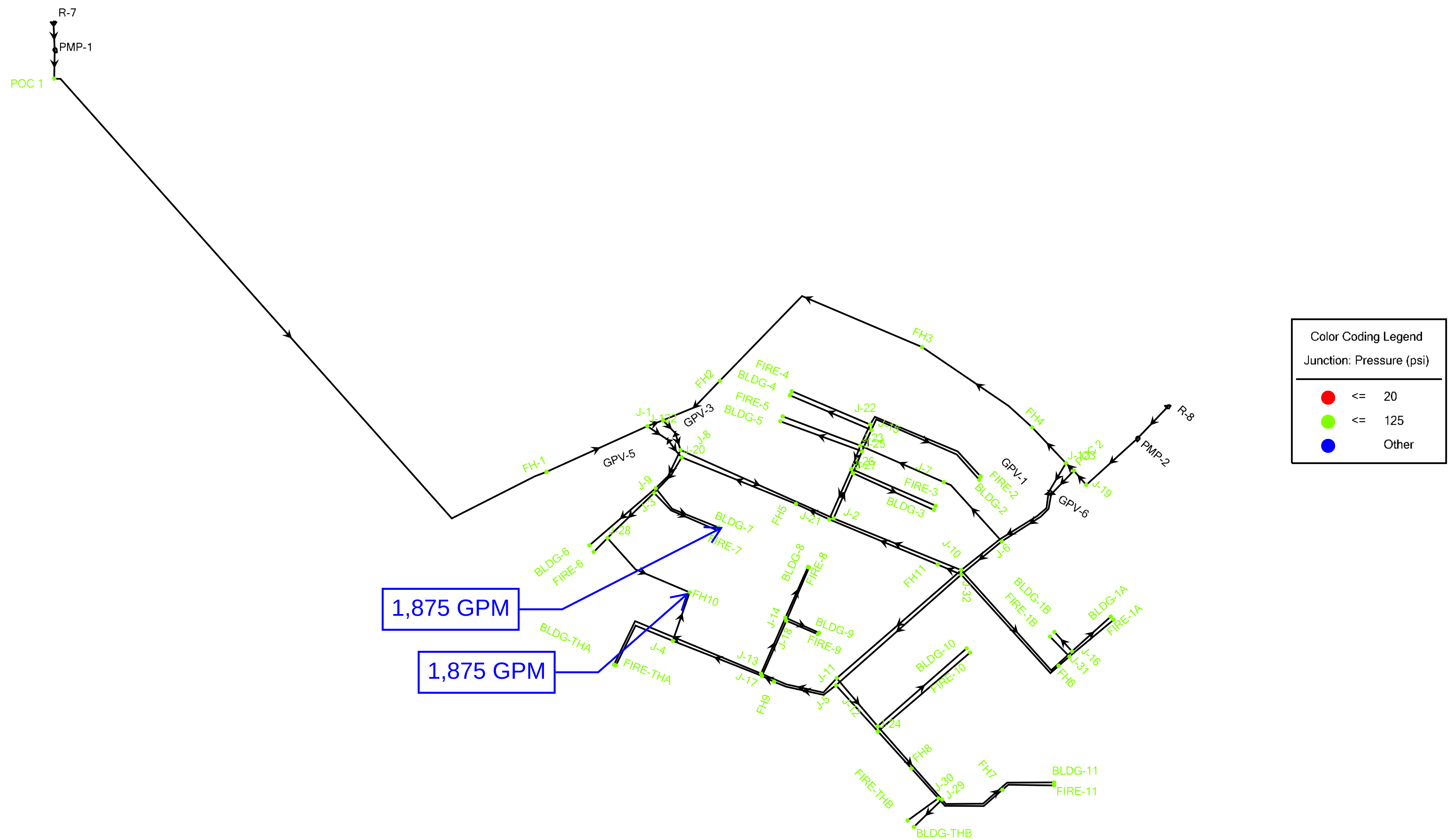
ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
37	FIRE-7	1,147.11	1,875	1,321.14	75
227	FH10	1,147.11	1,875	1,324.78	77
54	BLDG-6	1,150.12	45	1,322.38	75
112	BLDG-10	1,146.50	37	1,322.05	76
53	BLDG-7	1,147.11	34	1,322.41	76
67	BLDG-8	1,146.66	34	1,321.99	76
379	BLDG-5	1,153.51	31	1,322.27	73
62	BLDG-11	1,145.39	31	1,322.03	76
154	BLDG-2	1,156.28	29	1,322.23	72
66	BLDG-9	1,146.51	29	1,322.01	76
334	BLDG-4	1,153.51	27	1,322.25	73
389	BLDG-3	1,156.28	25	1,322.33	72
159	BLDG-1B	1,149.70	21	1,322.32	75
57	BLDG-1A	1,149.10	13	1,322.32	75
63	BLDG-THA	1,141.25	3	1,322.08	78
399	BLDG-THB	1,143.90	3	1,322.06	77
30	POC 1	1,150.80	0	1,338.81	81
32	J-1	1,146.43	0	1,336.19	82
34	J-2	1,146.43	0	1,322.39	76
35	J-3	1,147.11	0	1,325.03	77
36	J-4	1,141.25	0	1,325.43	80
38	FIRE-THA	1,141.25	0	1,325.43	80
39	J-5	1,142.40	0	1,325.98	79
41	FIRE-11	1,145.39	0	1,325.98	78
48	J-6	1,153.51	0	1,326.69	75
49	J-7	1,157.60	0	1,326.63	73
51	J-8	1,146.43	0	1,322.52	76
52	J-9	1,147.11	0	1,322.44	76
56	J-10	1,153.18	0	1,322.39	73
60	J-11	1,142.40	0	1,322.19	78
61	J-12	1,143.69	0	1,322.10	77
64	J-13	1,141.25	0	1,322.08	78
65	J-14	1,146.51	0	1,322.01	76
144	J-15	1,153.51	0	1,322.27	73
156	J-16	1,149.10	0	1,322.33	75
161	POC 2	1,170.60	0	1,336.21	72
190	J-17	1,141.25	0	1,325.73	80
193	FIRE-8	1,146.66	0	1,325.73	77
195	J-18	1,146.51	0	1,325.73	78
198	FIRE-9	1,146.51	0	1,325.73	78
200	FH1	1,139.74	0	1,336.55	85
205	FH2	1,152.00	0	1,336.20	80
208	FH3	1,162.60	0	1,336.20	75
218	FH7	1,145.39	0	1,325.98	78
221	FH8	1,140.78	0	1,325.98	80
224	FH9	1,141.25	0	1,325.77	80
230	J-32	1,153.18	0	1,326.50	75
233	FH4	1,166.37	0	1,336.21	73
308	J-19	1,170.60	0	1,336.28	72

Scenario: 6 (MDFF - FIRE7, FH10)
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
341	J-20	1,146.43	0	1,326.47	78
343	J-21	1,146.43	0	1,326.51	78
352	J-22	1,153.51	0	1,326.56	75
354	FIRE-4	1,153.51	0	1,326.56	75
356	FIRE-2	1,156.28	0	1,326.56	74
362	J-23	1,153.51	0	1,326.56	75
366	FIRE-1A	1,149.70	0	1,326.50	76
368	J-24	1,141.50	0	1,325.98	80
371	FIRE-10	1,140.78	0	1,325.98	80
374	FIRE-5	1,153.51	0	1,326.56	75
376	J-25	1,151.60	0	1,322.29	74
381	J-26	1,151.29	0	1,326.54	76
384	FIRE-3	1,156.28	0	1,326.54	74
386	J-27	1,149.90	0	1,322.34	75
391	J-28	1,147.11	0	1,324.93	77
394	FIRE-6	1,150.12	0	1,324.93	76
396	J-29	1,143.90	0	1,322.07	77
401	J-30	1,142.44	0	1,325.98	79
404	FIRE-THB	1,143.90	0	1,325.98	79
407	J-31	1,150.61	0	1,326.50	76
411	FIRE-1B	1,149.70	0	1,326.50	76
413	FH6	1,150.84	0	1,326.50	76
416	FH5	1,146.43	0	1,326.50	78
419	FH11	1,152.43	0	1,326.50	75
424	J-122	1,145.98	0	1,336.19	82
428	J-123	1,169.08	0	1,336.21	72

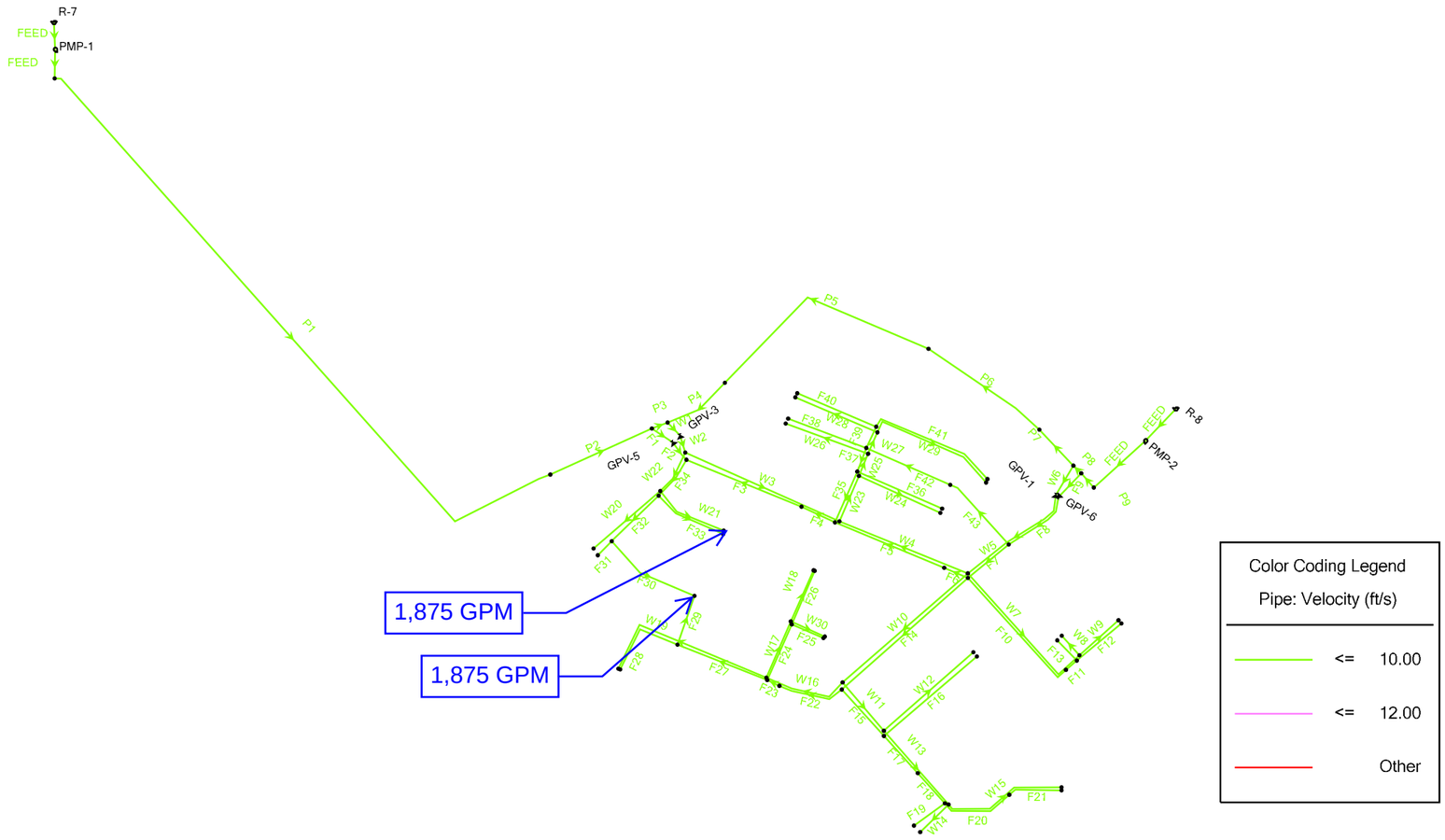
Scenario 6 - MDFF - FH10, FIRE-7

Pressure Map



Scenario 6 - MDFF - FH10, FIRE-7

Velocity Map



Scenario 6 - MDFF - FH10, FIRE-7

Headloss Map

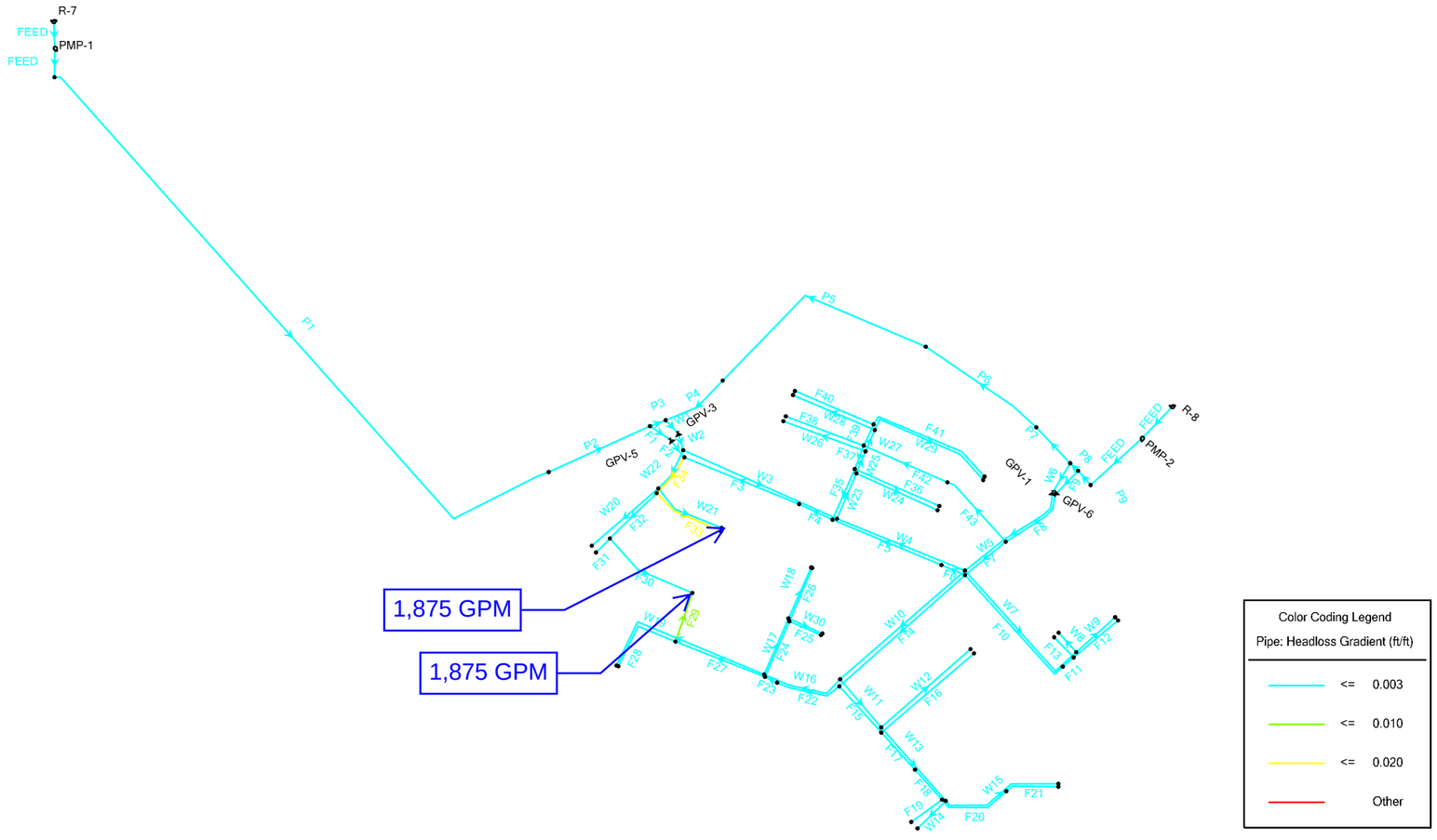
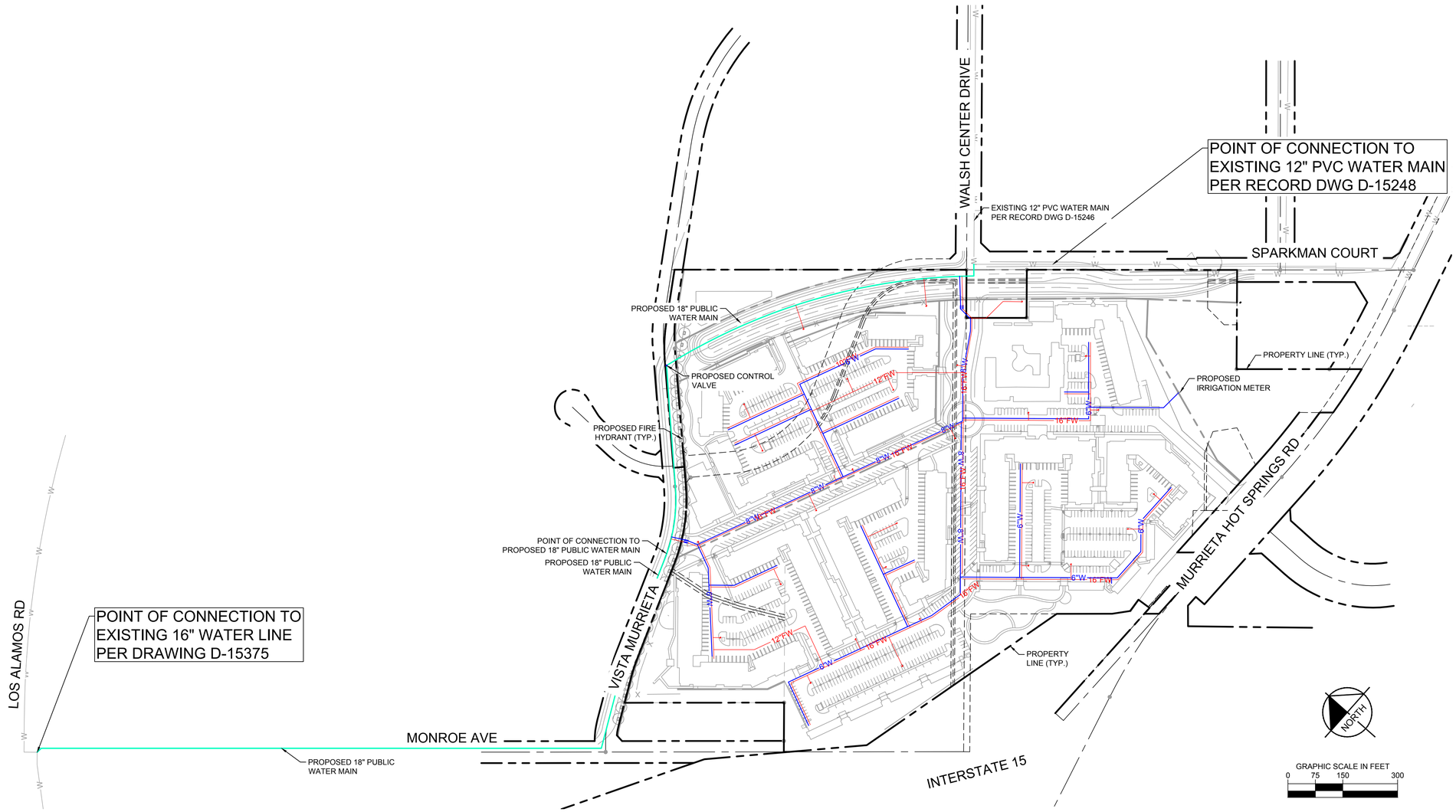


EXHIBIT A

Existing and Proposed Water Exhibit

LEGEND

- EXISTING WATER MAIN — W
- PROPOSED PRIVATE WATER (SIZE PER PLAN) — W
- PROPOSED PUBLIC 18" WATER
- PROPOSED PRIVATE FIRE LINE (SIZE PER PLAN) — FW
- PROPOSED FIRE HYDRANT



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EXISTING AND PROPOSED WATER EXHIBIT
THE TERRACES MURRIETA
MURRIETA, CALIFORNIA

The Terraces Murrieta Sewer Study

Murrieta, CA

November 2022

Kimley»Horn

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

ACRONYMS

AC	Acre
APN	Assessor's Parcel Number
CFS	Cubic Feet Per Second
District	Eastern Municipal Water District
EDU	Equivalent Dwelling Units
EMWD	Eastern Municipal Water District
GPD/AC	Gallons per Day per Acre
GPM	Gallons per Minute
HDR	High Density Residential
Hwy	Highway
IN	Inch
LDR	Low Density Residential
LF	Linear Feet
MG	Million Gallons
MGD	Million Gallons per Day
MDR	Medium Density Residential
MHDR	Medium High Density Residential
OS-CH	Open Space-Conservation Habitat
OS-R	Open Space Recreation
OS-R/Basin	Open Space Recreation/Basin
PA	Planning Area
POC	Point of Connection
SP	Specific Plan

1. INTRODUCTION

Objective

Kimley-Horn was tasked with analyzing the proposed sewer facilities which will serve The Terraces Murrieta development (Project). The results of Kimley-Horn's analysis are presented in this Sewer Study.

Project Description

The Project is a proposed multi-family residential development located Murrieta, CA, near the intersection of Interstate 15 and Murrieta Hot Springs Road. It is bounded by Interstate 15 to the southwest, Murrieta Hot Springs Road to the south, Sparkman Ct to the northeast, and a vacant lot to the northwest. The Project location and surrounding vicinity are depicted in **Figure 1**.

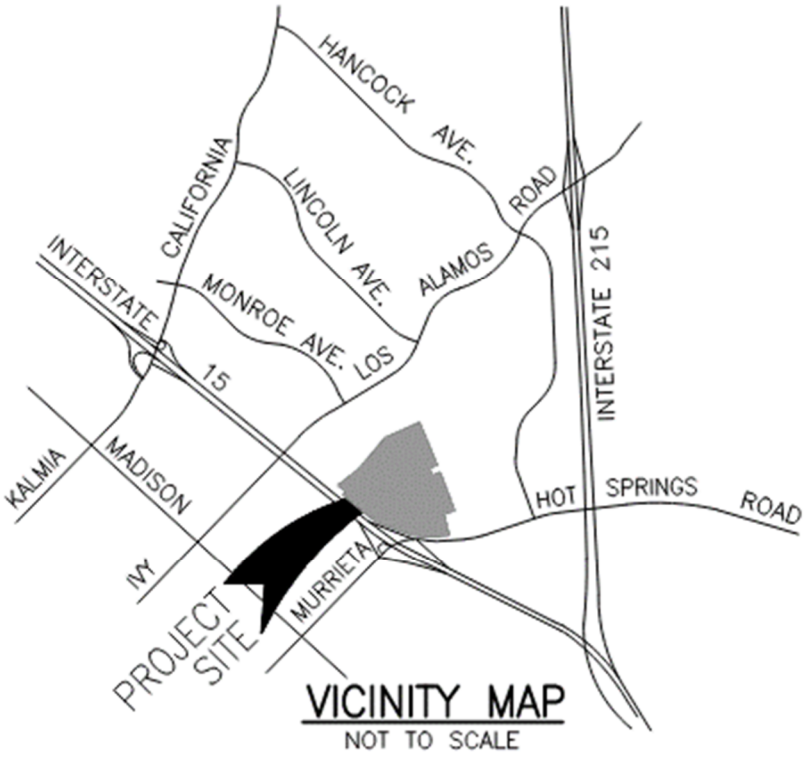


Figure 1 – Project Vicinity

The total project area is 40.03 acres and consists of 900 dwelling units and 4.37 acres of open space (see **Table 1**). The Project is being developed by Greystar (Applicant) and will be served by Eastern Municipal Water District (EMWD or District). The project will be constructed in two phases, with Phase 1 consisting of the construction of Areas A, C, and D and Phase 2 consisting of the construction of Area B. See **Appendix A** "Existing and Proposed Sewer Exhibit" for the area delineations.

Table 1 – The Terraces Murrieta Project Summary

Area	Acreage	Use	Dwelling Units	
A	4.97	Residential	Building 1A	32
			Building 1B	53
B	10.6	Residential	Building 2	73
			Building 3	61
			Building 4	68
			Building 5	77
C	11.68	Residential	Building 6	112
			Building 7	85
			Building 8	85
			Building 9	71
			Building TH-A	8
D	8.41	Residential	Building 10	93
			Building 11	76
			Building TH-B	6
E	4.37	Undeveloped Open Space	-	-
Summary				
Total Area (Acres)				40.03
Total Dwelling Units				900
Density (Gross)[1] (DU/Acre)				22.5
Land Use		Existing		Vacant
		Proposed		Residential
APNs		910-310-001		910-310-023
		910-310-002		910-310-024
		910-310-003		910-310-025
		910-310-004		910-310-026
		910-310-005		949-190-011
		910-310-007		949-190-012
		910-310-008		949-190-013
		910-310-009		949-190-014
		910-310-010		949-190-015
		910-310-015		949-190-016
		910-310-017		949-190-017
		910-310-018		949-190-018
		910-310-021		949-190-019
		910-310-022		

[1]Based on 900 Dwelling Units and 40.03 acres developable area.

2. ANALYSIS CRITERIA

This sewer study has been prepared in accordance with EMWD planning criteria, utilizing Project information provided by the Applicant and land use information published by City of Murrieta. The following reference documents and tools were utilized in the preparation of this sewer study:

- EMWD 2015 Wastewater Collection System Master Plan: Planning and Sizing Criteria
- EMWD Sanitary Sewer System Planning and Design (revised September 1, 2006)
- EMWD Sewer Record Drawings
- Bentley Systems FlowMaster 10.02.00.01 (released December 19, 2018)

Flow Estimation

The EMWD service area receives little rainfall, therefore wastewater collection system capacities within the District are based on peak dry weather flows. An allowance for wet weather flows is provided by adopting maximum depths of flow in the pipe sizing criteria. Wastewater flows are based on land use development type, development density, and flow rate by land use.

Land use development types are assigned an equivalent dwelling unit (EDU) conversion factor. Residential development EDUs are determined based on dwelling units (DU), and other developments are based on acreage. These factors are provided by EMWD and are shown in **Table 2**. Average dry weather flows (ADWF) are then obtained by applying a standard value of 235 gpd per EDU. Peak dry weather flows (PDWF) are calculated by multiplying ADWF with a peaking factor (PF), which has a maximum value of 2.87.

For average dry weather flows greater than 0.1 MGD, the peaking factor is given by the following equation:

$$PF = 2.13 \times {Q_{ADWF}}^{-0.13}$$

Where Q_{ADWF} is in MGD.

Table 2 – Wastewater Flow Estimation Criteria

Development Density[1]	
Residential Very High Density (17 DU/AC)	0.65 EDU/DU
Open Space	5 EDU/AC
ADWF Factor	235 gpd/EDU
Maximum Peaking Factor	2.87

[1]See EMWD 2015, Table 1

Pipe Capacity

Wet weather flows are accommodated by ensuring the peak dry weather flows do not exceed maximum depths of flow established by EWMD. As shown in **Table 3**, the maximum depths of flow (d/D) are 0.5 for pipes less than 15 inches in diameter and 0.7 for pipes equal or greater than 15 inches.

Flow depths are determined using Manning's formula:

$$Q = \frac{1.486}{n} AR^{2/3} S^{1/2}$$

Where Q is the peak dry weather flow (cfs), n is Manning's number, A is the pipe cross sectional area in (ft^2), R is the hydraulic radius (feet), and S is the pipe slope (ft/ft).

Pipe slopes are set to ensure minimum scour velocity and to prevent wear due to excessive flow velocity, with a recommended velocity if 3 ft/s. To achieve this, minimum pipe slopes are established according to pipe diameter. These criteria are presented in **Table 3**.

Table 3 – Pipe Capacity Design Criteria

Manning's n	0.015
Flow Velocity	
Minimum	2 ft/s
Maximum	10 ft/s
Recommended	3 ft/s
Minimum Pipe Slope	
8-inch pipe	0.40%
10-inch pipe	0.32%
12-inch pipe	0.24%
15-inch pipe	0.16%
PDWF Flow Depth (d/D)	
Diameter < 15 inches	< 0.5
Diameter ≥ 15 inches	< 0.7

An 8-inch diameter pipeline has been established by EMWD as the minimum sewer pipe size in order to prevent maintenance problems and allow for sufficient space to convey sewage and debris downstream.

3. SEWER ANALYSIS

Proposed Sewer Facilities

The onsite project area includes a network of private 8-inch sewer lines which generally run from southwest to northeast, sloping between 0.018ft/ft and 0.015ft/ft. At the point of connection to the existing public sewer line, the proposed sewer system will have a total cover depth of approximately 12 FT. At the most up-stream location, the sewer line will have a total cover depth of approximately 9 FT. See **Appendix A** for the Existing and Propose Sewer Exhibit.

The Project intends to connect to the existing 10-inch VCP sewer located in Sparkman Court, just upstream of the existing sewer lift station. Per coordination with EMWD staff, this 10-inch pipe does not have the capacity to carry the additional flows from the proposed project. Therefore, the pipe downstream of the proposed point of connection, which ties into the existing Golden Triangle Lift Station (LS) #2, will be upsized to a 15-inch VCP. EMWD has confirmed that the Golden Triangle Lift Station has capacity to serve the proposed project, see **Appendix G.**

Sewer Service Capacity Check

Onsite pipes will be 8-inch diameter gravity sewer lines. Flows will enter the existing sewer system at a single point of connection as shown on **Appendix A**.

An analysis showing the assumed sewer generation rates, including estimated peak flows from the Project is presented in **Table 4**.

Table 4 – Proposed Wastewater Flows

Area	Residential Density	Acres	DU	EDU/DU[1]	EDU	ADWF[2] (gpm)	Peaking Factor	Peak Flow (gpm)
				Private				
C	Very High	11.68	361	0.65	234.7	38.294	2.87	109.9
D	Very High	8.41	175	0.65	113.8	18.563	2.87	53.3
START		**20.09**	**536**		**348.4**	**56.857**	**2.87**	**163.2**
B	Very High	10.6	279	0.65	181.4	29.595	2.87	84.9
A	Very High	4.97	85	0.65	55.3	9.0165	2.87	25.9
POC-1		**35.66**	**900**	**0.65**	**585.0**	**95.469**	**2.87**	**274.0**
				Public				
Golden Triangle Lift Station (LS) #2 Tributary Area[3]								**554.9**

[1]See Table 2. For Very High residential denisty developments, a value of 0.65EDU/DU is assumed

[2]Using a standard factor of 235 gpd/EDU

[3]Projected peak dry weather flows for public sewer at downstream point of connection was provided by EMWD and includes proposed peak flows from the proposed project.

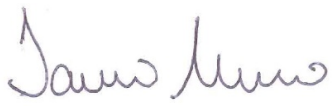
The results of sewer hydraulic calculations are presented in **Table 5**. Bentley FlowMaster was used calculate velocity and flow depth, employing the Manning friction method as discussed in Section 2. Complete FlowMaster program output is provided in **Appendix F**.

Table 5 – Proposed Sewer Hydraulics

Pipe Section							Flow Depth	
No.	Start	End	Peak Flow (gpm)	Diameter (in)	Slope	Velocity (ft/s)	d (in)	d/D
				Private				
1	Start	POC-1	163.2	8	0.021	3.57	2.7	0.3375
2	POC-1	POC-2	274.0	8	0.018	3.89	3.7	0.4625
				Public				
3	POC-3	POC-4	274.0	8	0.018	3.89	3.7	0.4625
4	POC-4	LS #2	554.9	15	0.005	2.77	5.9	0.3933

4. CONCLUSION

Based on the calculations, an onsite 8-inch diameter sewer system will be designed for the project. The system will collect flows and connect to the public 10-inch sewer main within Sparkman Ct. This public sewer line between the project's point of connection and the Golden Triangle Lift Station (LS#2) will be upsized to a 15-inch line. Golden Triangle Lift Station (LS#2), to which the project's flows are tributary, has been shown to have capacity for the anticipated flows to be generated from the project (see correspondence with EMWD and Dudek, attached herein as **Appendix G**). From there, sewage will be discharged into the public sewer system.



Tammie Moreno, P.E.

C 74417 Exp. 9/30/23

5. REFERENCES

1. EMWD 2015, Wastewater Collection System Master Plan, Master Plan Supplement, Planning and Sizing Criteria (accessed July 6, 2020). https://www.emwd.org/sites/main/files/file-attachments/sewer_master_plan_supplement_2015_wwfmp_planning_and_sizing_criteria_appendix_3a.pdf

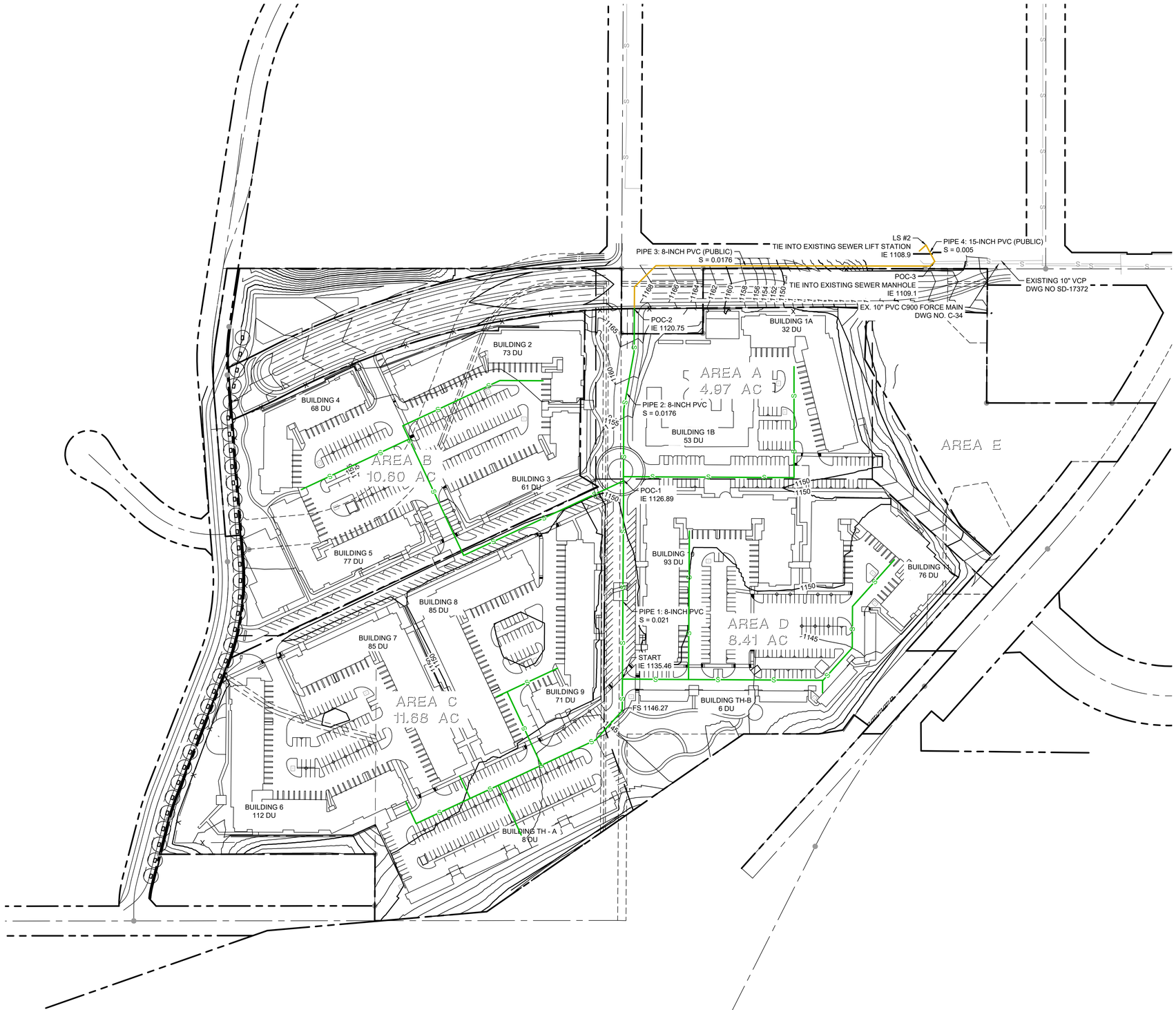
2. EMWD 2006, Sanitary Sewer System Planning and Design (revised September 1, 2006). https://www.emwd.org/sites/main/files/file-attachments/emwdsewer_system_design.pdf.

3. EMWD Will Serve; SAN 53 – Will Serve – WS 20210000951 – APN: 910-031-001 THRU -005, -007 THRU -010, -015, -017, -018, -021, & 949-190-012 THRU -019 (August 27, 2021).

4. Golden Triangle Lift Station (LS#2) Capacity and Tributary Flows Correspondence

APPENDIX A

Existing and Proposed Sewer Exhibit



LEGEND

- EXISTING SEWER MAIN
- PROPOSED PRIVATE SEWER
- PROPOSED PUBLIC SEWER
- TRIBUTARY BOUNDARY

PROJECT SUMMARY

Area	Acreage	Use	Dwelling Units	
A	4.97	Residential	Building 1A	32
			Building 1B	53
B	10.6	Residential	Building 2	73
			Building 3	61
			Building 4	68
			Building 5	77
C	11.68	Residential	Building 6	112
			Building 7	85
			Building 8	85
			Building 9	71
			Building TH-A	8
D	8.41	Residential	Building 10	93
			Building 11	76
			Building TH-B	6
E	4.37	Undeveloped Open Space	-	-

Summary	
Total Area (Acres)	40.03
Total Dwelling Units	900
Density (Gross)[1] (DU/Acre)	22.5

Land Use	Existing / Proposed	Vacant Residential
APNs	910-310-001	910-310-023
	910-310-002	910-310-024
	910-310-003	910-310-025
	910-310-004	910-310-026
	910-310-005	949-190-011
	910-310-007	949-190-012
	910-310-008	949-190-013
	910-310-009	949-190-014
	910-310-010	949-190-015
	910-310-015	949-190-016
	910-310-017	949-190-017
	910-310-018	949-190-018
	910-310-021	949-190-019
	910-310-022	

[1]Based on 900 Dwelling Units and 40.03 acres

PROPOSED SEWER HYDRAULICS

Pipe Section No.	Start	End	Peak Flow (gpm)	Diameter (in)	Slope	Velocity (ft/s)	Flow Depth d (in)	Flow Depth d/D
			Private					
1	Start	POC-1	163.2	8	0.021	3.57	2.7	0.3375
2	POC-1	POC-2	274.0	8	0.018	3.89	3.7	0.4625
			Public					
3	POC-3	POC-4	274.0	8	0.018	3.89	3.7	0.4625
4	POC-4	LS #2	554.9	15	0.005	2.77	5.9	0.3933

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

No.	REVISIONS	DATE	BY

Kimley»Horn
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401 B STREET, SUITE 600; SAN DIEGO, CA 92101
PHONE: 619-234-9411
WWW.KIMLEY-HORN.COM

KHA PROJECT 195120004
DATE 11/7/2022
SCALE AS SHOWN
DESIGNED BY ___
DRAWN BY ___
CHECKED BY ___

EXISTING AND PROPOSED SEWER EXHIBIT
FOR
THE TERRACES MURRIETA

CITY OF MURRIETA CA

SHEET NUMBER 1 OF 1

APPENDIX B

EMWD Wastewater Collection Sewer Master Plan
Planning and Sizing Criteria

Master Plan Supplement

Planning and Sizing Criteria

FINAL

2015 WASTEWATER COLLECTION SYSTEM MASTER PLAN

B&V Project No. 187976

BLACK & VEATCH
Building a world of difference.

emwd EASTERN MUNICIPAL WATER DISTRICT

APPENDIX 3A – PLANNING CRITERIA

3A.1 PLANNING CRITERIA

The purpose of a master plan is to plan for future development and assess the impact of the development to existing infrastructure performance. As part of the master plan process, areas of future growth are projected, additional infrastructure needs to serve future growth areas are identified, and recommendations are made for improvements to existing infrastructure impacted by growth. Recommendations are made using planning criteria specific to the service provider.

The following technical memorandum outlines the planning criteria used for the Eastern Municipal Water District's (District) Wastewater Collection System Master Plan Update (2015 Master Plan). The District serves five collection systems: Moreno Valley, Temecula Valley, Perris Valley, Sun City, and San Jacinto. The Sun City operational boundary is generally combined with the Perris Valley operational boundary since they are both served by the Perris Valley Regional Water Reclamation Facility (RWRF). These criteria have been developed to allow the District to evaluate their existing facilities and plan for the future, while maintaining a reliable and safe wastewater collection system:

- Wastewater Flows
  - Land use density
  - Flow per equivalent dwelling unit (EDU)
  - Peaking factors and diurnal patterns
- Pipe Capacity and Sizing
  - Allowable depth
  - Slope
  - Velocity
  - Roughness factors
- Hydraulic Modeling Approach
- Lift Station Capacity and Sizing

Note that this master planning effort does not negate the need for developers to prepare a site-specific wastewater planning studies to demonstrate that new development or redevelopment does not have negative impacts on the existing wastewater system or to identify required improvements.

3A.2 WASTEWATER FLOWS

Wastewater flows in a collection system vary significantly depending on the time of day and climatic conditions. During dry weather conditions wastewater flows are produced based on wastewater generated from various land uses, while during wet weather conditions, wastewater flows may be significantly impacted by rainfall entering the wastewater collection system. Figure 1 shows typical wastewater flow components.

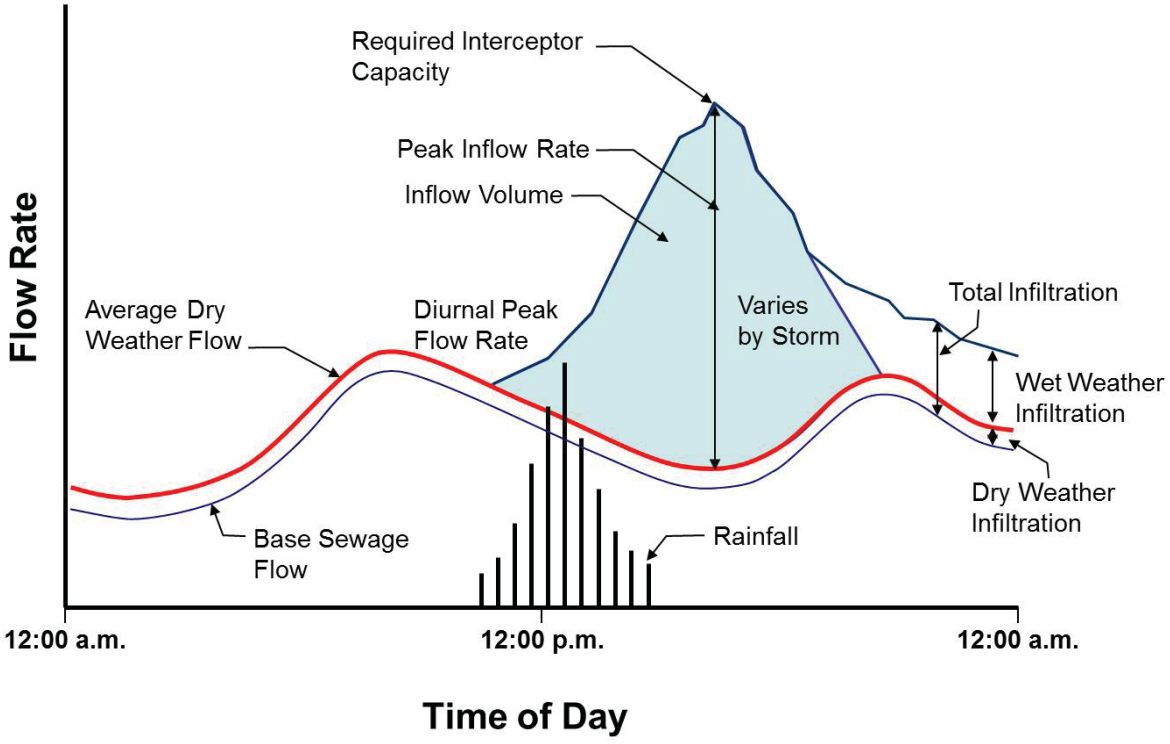


Figure 1: Typical Wastewater Flow Components

As shown, wastewater components include:

- Base sewage flow is the portion of the flow that is the return flow from customer water use.
- Average dry weather flow (ADWF) comprises of base sewage flow and dry weather infiltration. ADWF is the expected wastewater flow on a day with no precipitation events. ADWF can vary seasonally as groundwater levels change (causing fluctuations in dry weather infiltration).
- Diurnal Pattern is the change in ADWF over the course of the day and is attributable to variations in domestic, industrial, and commercial base wastewater generation.
- Infiltration is groundwater that seeps into a collection system through defective pipes, pipe joints, and manhole structures below the manhole corbel and chimney. The rate of infiltration depends on the depth of groundwater above the defects, the size of the defects, and the percentage of the collection system that is submerged. Variation in groundwater levels and the associated infiltration is both seasonal and weather dependent.
- Wet weather flows are comprised of wet weather infiltration and inflow. Wet weather infiltration is the additional infiltration that occurs due to rainfall induced higher groundwater conditions and is typically seen in the hours or days following significant rain events. Inflow is rainfall related

water that enters a collection system from sources such as private laterals, downspouts, manhole defects, foundation piping, and cross-connections with storm sewers.

The District service area receives little rainfall, making it difficult to collect meaningful rainfall data to correlate rainfall to the wet weather response in the collection system. In response to lack of rainfall data and historically low observed rates of wet weather infiltration and inflow, the District has elected to evaluate their wastewater collection system capacity based on peak dry weather flows. An allowance for wet weather flows is provided by adopting a conservative allowable depth of flow in the pipe sizing criteria, as described in Section 4.1.3.

3A2.1 EXISTING AND PROJECTED FLOWS

The District's service area includes both existing and future development. Wastewater flows are based on land use development type, development density, and flow rate by land use (gallons per day [gpd] per acre). Wastewater flows for existing and future development are calculated separately, as described in the following sections.

3A2.1.1 Existing Development

Prior to the Master Plan update, the District performed flow monitoring and sewer model calibration studies for each wastewater service area. The data obtained during the flow monitoring studies was used to calibrate the model, calculate typical unit flow factors, and develop diurnal patterns for various types of development within the service areas.

The District provided GIS land use layers for the existing development areas served by the District. The existing development flows are based on the model-calibrated unit flow factors for each land use type. Actual flows from the calibrated model were used to evaluate and analyze existing collection system capacity.

3A2.1.2 Future Development

The District maintains a Database of Proposed Projects (DOPP). The DOPP tracks information from the planning departments of cities, Riverside County, and District staff regarding proposed developments. The DOPP provides information about the type of development, size, and the anticipated number of EDUs.

In addition to the information from the known developments tracked in the DOPP, General Plan Land Use data was obtained from the cities and Riverside County to project future development to build out conditions. Development in these areas is based on less specific information than the DOPP; generally land use category and acreage.

In addition to the DOPP and general land use planning, the District also maintains detailed information about special development areas (Special Projects). These areas include unusual types of development, or redevelopment of existing areas. The anticipated development from the Special Projects is included in the future development and is described in more detail in Chapter 3.

Future development for each land use and DOPP was assigned a number of EDUs per acre for each land use category. Table 1 summarizes the assumed development densities for various land uses.

Table 1: Development Densities

LAND USE CATEGORY	UNITS	AVERAGE RESIDENTIAL DENSITY (DU/ACRE)	RESIDENTIAL (EDU/DU)	DEVELOPMENT DENSITY (EDU/ACRE)
Residential Land Use				
Estate Density	DU	0.5	1.5	0.8
High Density	DU	12	0.7	8.4
Low Density	DU	2	1.3	2.6
Medium Density	DU	4.5	1	4.5
Medium High Density	DU	6	0.9	5.4
Mobile Home Park	DU	10	0.65	6.5
Rural Mountainous (1)	DU	0.1	3	0.3
Rural (1)	DU	0.2	3	0.6
Very High Density	DU	17	0.65	11.1
Very Low Density (1)	DU	1	1	1.5
Non-Residential Use				
Agriculture (1)	acre			0
Business Park/Light Industrial	acre			5
Business Park/Light Industrial/Warehouse	acre			1.25
Commercial Office	acre			5
Commercial Retail	acre			5
Heavy Industrial	acre			7.5
Hospital	acre			5
Mixed Use Policy Area	acre			5
Open Space (Conservation, Landscape, Recreation, Rural, or Water) (1)	acre			5
Public Facilities (Municipal or School)	acre			5

(1) The following uses were assumed to be served by septic systems and do not contribute flow to the wastewater collection system: Rural Mountainous, Rural, Very Low Density, and Agriculture, and Open Space.

3A2.1.3 Flow Per Equivalent Dwelling Unit

For all types of development, the land use categories were converted to EDUs based on Table 1. Wastewater flow (ADWF) was calculated by multiplying the number of EDUs per land parcel by a rate of 235 gpd/EDU; the District's criteria used for regional planning.

3A2.2 PEAKING FACTORS AND DIURNAL PATTERNS

Peaking factors and diurnal curves are applied to the existing and projected wastewater flows and are used to evaluate the collection system capacity and to appropriately size recommended improvements.

3A2.1.4 Peaking Factor Curve

A peaking factor curve was developed based on the results from the calibration studies to project peak dry weather flow for a given average dry weather flow. The peaking curve is used for sizing pipe replacements or extensions.

The curve is shown in Figure 2 and is described by the equation $PF = 2.13\ Q_{ADWF}^{-0.13}$, where Q_{ADWF} is the average dry weather flow and PF is the peaking factor. The peak flow is estimated by multiplying Q_{ADWF} times PF. The maximum peaking factor was identified as 2.87, so all flows less than or equal to 0.1 mgd are assumed to have a peaking factor of 2.87.

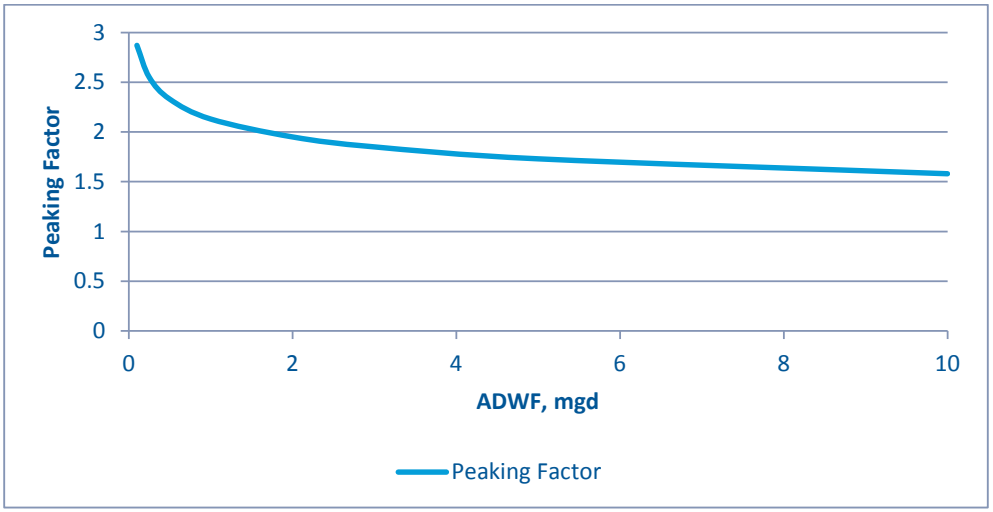


Figure 2: Peaking Factor Curve

3A2.1.5 Diurnal Patterns

The diurnal patterns developed during the calibration studies will be used to evaluate and analyze existing collection systems. For modeling future development, two diurnal patterns were developed; one for use with residential land use and the other for non-residential land use. Each pattern represents a 7-day period beginning at 1:00 a.m. on Saturday and continuing to midnight on Friday. The patterns were developed using the following rules:

- Each day, a peaking factor of 2.87 is achieved for two hours
- The flows are normalized over a 24-hour period (average PF of 1)
- Diurnal patterns can only be applied to loads ≤ 0.1 mgd (~425 EDUs)
- Patterns were based on typical residential or office/retail curves to establish the timing of the peak and minimum flows

Figure 3 shows the standard residential and non-residential diurnal patterns to be used in the model for future flows.

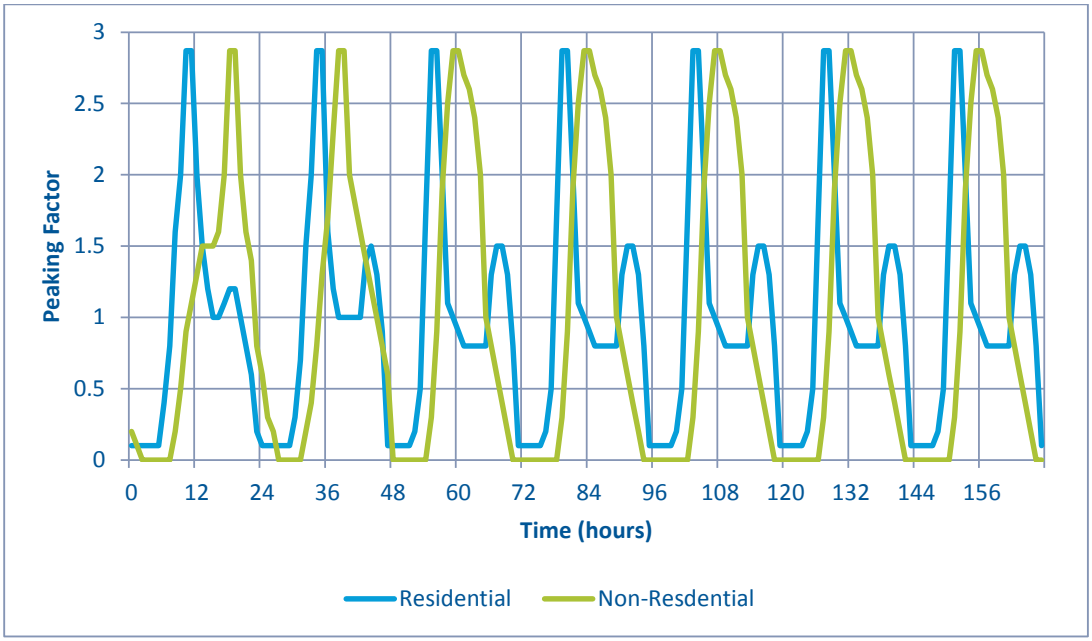


Figure 3: Residential and Non-Residential Patterns

Additional diurnal patterns were created for two of the Special Projects in Temecula Valley, Old Town and Wine Country, to account for the impacts of special events that take place within these areas. These areas in Temecula Valley have been observed to have higher peaking factors at different times in comparison to other areas due to the additional flow generated during special events, such as festivals. These patterns follow the same rules as the standard curves with the exception of having a peaking factor of 3.00 instead of 2.87. Figure 4 shows the patterns for old town and wine country.

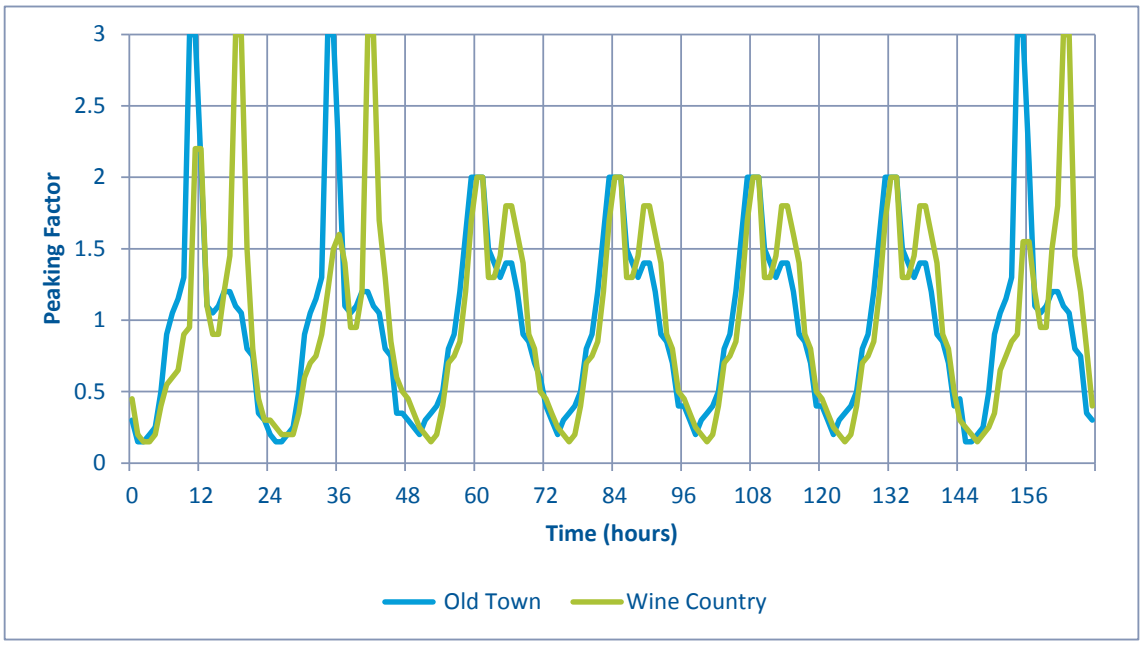


Figure 4: Old Town and Wine Country Patterns

3A.3 HYDRAULIC MODELING APPROACH

The District's existing calibrated wastewater models for each basin use an extended period simulation to analyze their existing collection systems under average dry weather flow and peak dry weather flow. To analyze the collection systems for future growth, various approaches were discussed with the District. Black & Veatch prepared a pilot model using the Moreno Valley hydraulic model to test three different approaches for peaking future flows. The three approaches and general results are summarized below.

- **Approach 1:** Perform steady state runs using a peaking factor equation. This approach may overestimate expected flows, but provides a level of protection/conservatism.

- **Approach 2:** Existing flows are peaked using the calibrated diurnal patterns and future flows are applied to the model using a constant peaking factor of 2.87 (extended period simulation). This approach generally overestimates results as compared to the PF equation.

- **Approach 3:** Existing flows are peaked using the calibrated diurnal patterns (extended period simulation). Representative diurnal patterns identified in Section 2.2.2 reflect the typical shape of the calibration patterns but are adjusted to meet the 2.87 peaking factor. This approach generally underestimates results as compared to the PF equation, but may provide results that better align with existing or expected system flows.

It was decided that the system would be evaluated using Approach 3 to identify CIP projects and Approach 1 will be used to size the new facilities. Approach 3 will generate the most likely/expected flows caused by future development. Model results will be assessed against the District's planning criteria and CIP projects will be identified where the criteria are not met. Where deficiencies are identified using Approach 3, the peaking factor equation (Approach 1) will be used to estimate the projected wastewater flow for the new facility. It has been established that new facilities will be sized for build out conditions, so it is expected that Approach 1 would only be performed under the build-out modeling scenario.

3A.4 CAPACITY AND SIZING CRITERIA

The capacity and sizing criteria are used both to evaluate existing capacity due to future growth and to size new facilities to serve future developments. In some cases the existing facilities are allowed to exceed the criteria especially if additional growth in the area is not expected and no problems with operations have been reported.

3A4.1 GRAVITY PIPES

The capacity of a gravity pipe is a function of its slope, diameter, and roughness. Manning's formula for open-channel flows is used to calculate flow capacity in gravity mains:

$Q = (1.486/n)\ AR^{2/3}\ S^{1/2}$

Where:

Q = flows, cfs
n = Manning's coefficient of roughness
A = cross sectional area of pipe, cu ft
R = hydraulic radius (flow area divided by wetted perimeter), ft
S = slope of the pipe, ft/ft

The District assumes a Manning's coefficient of 0.013 for all wastewater pipe material and uses a minimum pipe size of 8 inches for new collection system pipe. While the District utilizes n=0.013 for Capital Improvement Projects, all private development projects shall use n=0.015 to account for long term pipe conditions.

3A4.1.1 Velocity Criteria

Velocity is an important criterion for proper operation of a wastewater collection system. The District requires that pipe velocities be designed for 2 fps to 10 fps.

The minimum allowable velocity is 2 fps at calculated peak dry weather flow to avoid excessive deposition of solids in the collection system. In pipes where the minimum criterion will not be achieved on a regular basis, or will not be achieved for many years, the District will need to make arrangements to clean the pipes on a regular basis.

Velocities in excess of 10 fps could result in excessive wear on the pipe due to the abrasive nature of grit in the wastewater flow. Typically, drop manholes can be used to avoid peak velocities in excess of 10 fps, but may cause odor problems.

3A4.1.2 Slope

A minimum slope is set for each pipe size to help ensure acceptable velocity and avoid solids deposition in the collection system. Table 2 summarizes the minimum slope for various pipe sizes used for the Master Plan.

Table 2: Minimum Pipe Slopes

PIPE SIZE (INCHES)	MINIMUM SLOPE (FT/FT)	PIPE SIZE (INCHES)	MINIMUM SLOPE (FT/FT)
8	0.0040	21	0.0012
10	0.0032	24	0.0010
12	0.0024	27	0.0010
15	0.0016	30	0.0010
18	0.0014	36	0.0010

3A4.1.3 Depth to Diameter (d/D) Criteria

Depth to Diameter (d/D) is the ratio of the depth of wastewater to the diameter of the pipe. The table below shows the design criteria for gravity mains. All new sewer mains less than 15 inches in diameter shall be sized to carry the projected PDWF at a depth not greater than half of the diameter of the pipe (d/D not to exceed 0.5). New sewer mains 15 inches and larger shall be sized to carry the projected PDWF at a depth of flow not greater than 70 percent of the diameter of the pipe (d/D not to exceed 0.7). Table 3 provides a summary of pipe design criteria for capacity evaluation.

Table 3: Gravity Pipe Capacity Design Criteria

INFRASTRUCTURE	PEAK ADWF D/D	MANNING'S N	MINIMUM VELOCITY (FPS)	MAXIMUM VELOCITY (FPS)
Diameter < 15 inches	< 0.5	0.013	2	10
Diameter ≥ 15 inches	< 0.7	0.013	2	10

Note: The minimum pipe size for new collection system pipe is 8 inches.

3A4.2 LIFT STATIONS AND FORCE MAINS

Based on historical flow data, the District has determined that a 20% allowance for wet weather flows is adequate for lift station capacity planning. The District's lift stations and force mains are evaluated based on the ability to service the Peak LS Flow (Peak ADWF x 1.2).

3A4.1.4 Lift Stations

Lift station capacity is evaluated in terms of total capacity and firm capacity. The total capacity is the maximum capacity of the lift station with all pumps operating. The firm capacity is defined as the capacity of the lift station with the largest pump out of service. Lift stations will be evaluated to determine both total and firm capacity of the station.

The capacity of a lift station is dependent upon the pumping capacity and the system head that is experienced in the downstream force main. The system head is determined by the static pumping requirements as well as the head loss experienced through the force main under the varying flow conditions. The system head is determined using the force main diameter, length, assumed C-factor, and static pump requirements (wet well and discharge elevation).

For each station, the pump curves will be plotted against the system head curve that is expected to occur under the peak lift station flow for all planning years. Figure 5 shows an example lift station capacity assessment graph for the Day Street Lift Station.

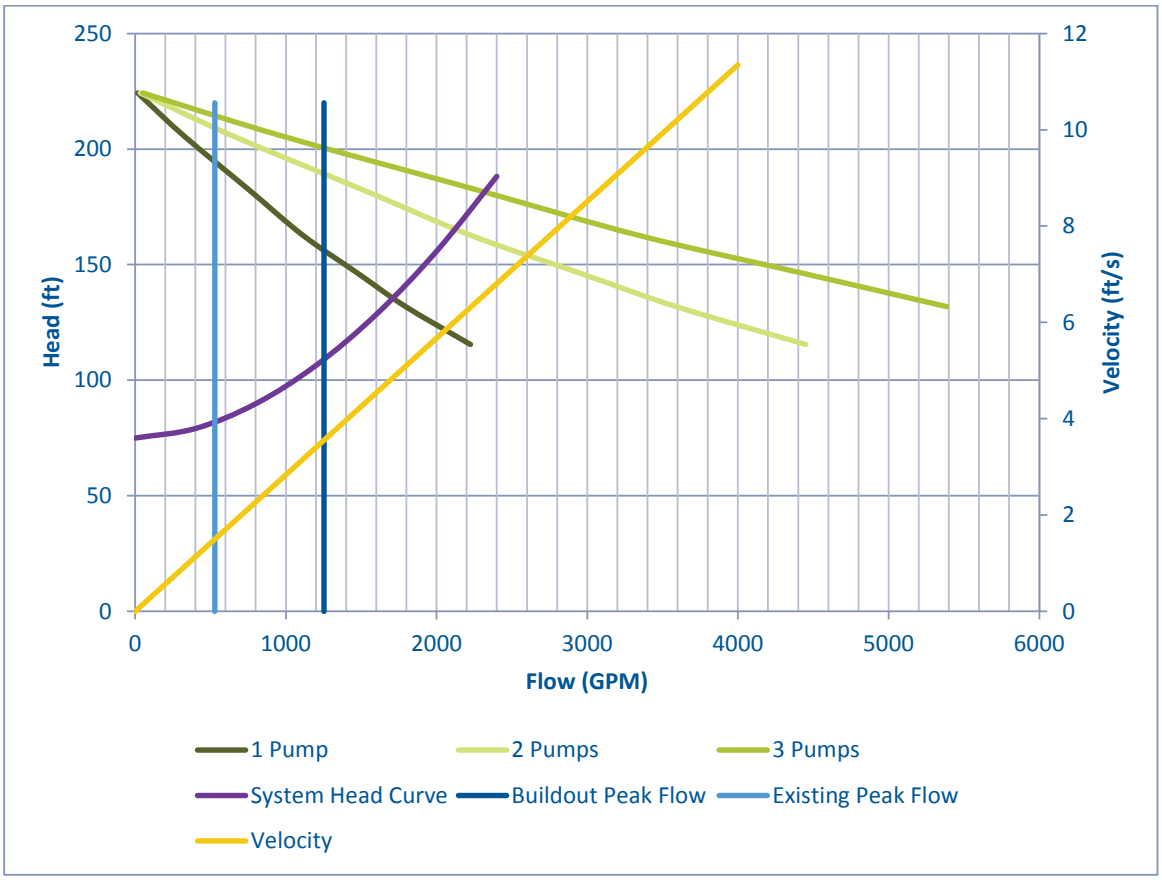


Figure 5: Day Street Lift Station Capacity Assessment

The capacity assessment graph for each lift station will determine the existing lift station capacity as well as future flow and head pumping requirements. All lift stations will be sized to provide adequate firm capacity to pump Peak LS Flow at build-out conditions

3A4.1.5 Force Mains

The capacity of a force main pipe is a function of the velocity in the pipe. The Hazen-Williams equation is used to calculate flows in force mains:

$V = 1.318CR^{0.63}S^{0.54}$

Where:

V = Velocity, fps
C = Hazen-Williams coefficient of roughness
R = hydraulic radius (flow area divided by wetted perimeter), ft
S = Slope of energy grade line, ft/ft

The District assumes a Hazen-Williams coefficient value of 100 for all force mains. Velocity is the major criterion when sizing force mains. In general, force mains should be sized to convey Peak LS Flows at build out conditions with a velocity between 2 fps and 6 fps. Velocities less than 2 fps will result in wastewater spending additional time in the force main, which can cause downstream operational problems. Force mains with a velocity greater than 6 fps tend to have excessive head loss and can affect the ability of the lift station to operate properly.

APPENDIX 3B – COORDINATION WITH WATER MASTER PLAN

3B.1 COORDINATION WITH WATER MASTER PLAN

The 2015 Update is being developed concurrently with the District's Water System Master Plan which is being updated by a separate consultant. The District is interested in maintaining consistency and comparable appearance between its wastewater and potable water hydraulic models. In an effort to maintain consistency, the District provided the following information for the both sewer and potable water models:

- Additional user information fields for the nodes and pipeline tables in the models.
- Model scenarios for all planning years: 2014, 2016, 2018, 2020, 2022, 2025, 2030, 2035, 2045, 2065, 2099 (build-out).
- Pre-set database queries.

3B.1.1 Additional Hydraulic Model Fields

The District added additional fields to the "Element Information" tables in the wastewater hydraulic model for manholes and pipelines. No existing information fields were removed from the table and no existing information was cleared. Table 3B-1 shows the additional fields: 23 additional fields for the manhole table and 8 additional fields for the pipeline table.

Table 3B-1 Wastewater Hydraulic Model Additional Informational Fields

TABLE	LS_LOCAL	LS_REGNL	FLOW_NODE	ALT	CIP_ID	COMMENT	DOPP_NODE	DOPP_ID	METER_Q	METER_YEAR	SUBAGENCY	2016_DOPP	2018_DOPP	2020_DOPP	2022_DOPP	2025_DOPP	2030_DOPP	2035_DOPP	2045_DOPP	2065_DOPP	ULT_DOPP	ULT_LU_Q	ULT_SS_Q	DOPP_PIPE	EXST_D/D	EXST_Q
MH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Pipe	X	X		X	X	X																		X	X	X

3B.1.2 Hydraulic Model Scenarios

All four hydraulic models provided by the District included separate hydraulic model scenarios for each planning year: 2014 (Existing), 2016, 2018, 2020, 2022, 2025, 2030, 2035, 2045, 2065, and Build-out. Each year contains two scenarios: capacity analysis and capital improvement program (CIP) analysis. The capacity analysis uses existing 2014 facilities for all scenarios; however, the flows vary in each scenario, corresponding to respective years. The CIP analysis uses CIP facilities and flows corresponding to each respective year. All scenarios in the model utilize the same pipe data set; however node data changes for each planning year.

3B.1.3 Hydraulic Model Queries

The District created database queries in the wastewater model similar to the queries created in the water model. These queries include database queries for MHs, Pipes (PI), Pumps (PU), and Wet Wells (WW) based on facility installation year. Existing and new facilities are retired

or become active based on the [Installation Year] and [Retirement Year] field. Queries are used to select the appropriate facilities for each scenario. The field called YR_INST is populated with year of installation and the queries can be used to identify facilities needed based on each planning year. The years for these queries correspond to the District's plan for existing and future capital improvements. The same years are used for facility selection as seen in model scenarios: 2014 (Existing), 2016, 2018, 2020, 2022, 2025, 2030, 2035, 2045, 2065, and build-out. The queries have the following naming convention with YA referring to the active year of installation:

- [YA_20XX_MH/PI/PU/WW]. For example for year 2020 pipe query, the naming for that query is YA_2020_PI.

3B.1.4 Future Wastewater Flows

As discussed in Chapter 3, future ADWF is allocated in the model along with corresponding diurnal patterns to simulate flow fluctuations, including the PDWF, within the collection system. The District estimates future wastewater flows using future land use categories and the DOPP. The District owns and maintains the DOPP to track planned development. For the 2015 Update, future development data was extracted from this database into point, line and polygon shapefiles in GIS. The polygons represent the physical area of the proposed / future developments / projects. The point layer places a point at the center of the polygon (called a DOPP point), and the line layer displays a pipe (called a DOPP pipe) from the DOPP point to an existing manhole, which represents the entrance of the flow into the wastewater collection system. The District determines the entrance point (either an existing or future MH) by performing a locating routine using GeoWizard to automatically attribute a downstream manhole to the DOPP pipe based on proximity.

A second step was performed by the District to verify downstream manhole locations for each DOPP node and pipe. This included the following process to verify the location of the downstream manholes and update the DOPP pipe and node databases.

A field called (LOC_VERF) was added to the DOPP pipeline database to document verification progress and populated with the following information:

- "Yes" – Downstream location is verified.
- "Yes, updated" – Downstream location was updated to a more appropriate MH. The length field was recalculated and [Facility] field was updated with correct manhole number (MHXXX).
- "No, large DOPP" – DOPP basin covers a large area over multiple MHs; the DOPP will need to be evaluated and flows split to appropriate MHs as part of the 2015 Update.
- "No, split DOPP" – DOPP basin polygon is not contiguous; the DOPP will need to be evaluated and flows split to appropriate MHs as part of the 2015 Update.
- "No, MP to review" – Downstream location unclear; the DOPP will need to be evaluated and flow allocated to appropriate MHs as part of the 2015 Update.

1. Verified downstream connection using contour layer, existing pipe network and DOPP polygon.
   - Contour layer – Checked direction of grade to verify correct downhill manhole
   - Existing pipe network – Checked existing pipeline to confirm the DOPP pipe is not crossing a property
   - DOPP polygon – Checked if polygon is near the stub-out of another development, if so, track back to that line
2. Added fields to DOPP
   - DOPP MH attribute table (for both commercial and single family residential (SFR)):
     - [INSTALL_YR], [RETIRE_YR], [MHRIM_FT], [MHINV_FT], [DOPP_Node], [MH_DIA_FT], [DOPP_ID]
   - DOPP pipe attribute table (for both commercial and SFR):
     - [INSTALL_YR], [RETIRE_YR], [DOPP_ID], [DOPP_Pipe], [DIA_IN], [MANN_N], [LENGTH_FT], [UpMH], [DnMH], [DnMH_GIS], [Pipe_ID], [UPINV_FT], [DNINV_FT]

As a final step, flows into the appropriate MHs were verified and the DOPP files were populated with information fields for use in importing DOPP nodes and pipes into the wastewater model.

APPENDIX C

EMWD Sewer Design Standards

SANITARY SEWER SYSTEM PLANNING & DESIGN

PRINCIPLE

GUIDELINES

CRITERIA

Updated February 9, 1993

Revised 09/1/2006

DESIGN FLOWS

In 1989, a survey of the District's sewer system was performed to determine flow generation rates from various land uses. This information is contained in the Wastewater Facilities Master Plan prepared by Black & Veatch dated 1990. The results of the survey showed variation in sewage generation not only by type of use but also by location (e.g. Sun City housing had a lower sewage generation per unit than Moreno Valley). However, for design purposes it is important that criteria be developed and used on a consistent basis. To achieve this goal a meeting was held to agree on the criteria for sewer design. The result of the meeting is a compromise of actual measurements vs design criteria. Table 1 attached shows the relationship of land use to the wastewater flow agreed to. The information in Table 1 shall be used by the District for future sewer design. This information has been adjusted to correspond to future conditions that are expected to uniformly occur as development takes place in all areas of the District.

The Wastewater Facility Master Plan also developed peak flow rates and obtained data which correlate peak flow rates with average flow rates. By a plot of this data, a curve has been established which is used in determining the peaking factor to be used in the design of the sewer. The peaking curve that is to be used in District design is shown on Table 2.

The procedure to be followed in determining design flows is to first determine the tributary drainage area for the sewer pipeline, determine the various average flows within the drainage area, add these average flows, and then convert these average flows to a peak flow for the design of the sewer (i.e., $Q_{Design} = Q_{AVE.} \times$ Peaking Factor).

PIPE SIZE SELECTION

Sewers 12-inches in diameter and smaller are designed to flow at a maximum depth of one-half the diameter of the pipe. Sewers 15-inches in diameter and larger are designed to flow at a maximum of three-quarter depth of the pipe diameter.

It is important to maintain an air gap in the top of sewer pipes to convey sewer gases downstream along with the sewage flow. Maintaining the maximum depth of flow to pipe diameter ratio (D/d) conditions described above helps to ensure that sufficient space occurs to meet these conditions.

An 8-inch diameter pipeline has been established as the minimum sewer pipe size. This conclusion was established for two main reasons:

1. Maintenance problems can occur on smaller size pipes.

2. Sufficient space is necessary to convey sewage and debris down stream in the sewer pipe to avoid possible backflow up sewer laterals.

The only exceptions to the 8-inch minimum pipe size criteria are in the Communities of Romoland, Homeland and Green Acres, where 6-inch diameter sewer pipelines were installed due to grant conditions applied to the financing of sewers in these communities.

MANNING "n" VALUES

Pipe size is determined by using mannings equation which is shown below:
$Q = (1.486/n)\ AR^{2/3}\ S^{1/2}$
Q= flows (cfs) n= mannings coefficient
A= cross sectional area of pipe ($feet^2$)
R= hydrologic radius of the wetted cross-section of the pipe (feet)

S= slope of energy gradient

Refer to Handbook of Hydraulics by Brater and King or the Clay Pipe Engineering Manual for use of the equation.

PIPE SLOPES

The minimum slopes for sewer pipelines are based on obtaining a minimum velocity of 2 fps at design peak flow depth. This provides a means to resuspend solids deposited in the sewer during peak flows. Refer to Table 3 for minimum pipe slopes.

On small-size sewers, there is generally no particular concern with maximum slopes or velocities, except where water and ends of sewer may be insufficient in volume to move solids. On large-size sewers, it is necessary to design sewers which would have a peak velocity not exceeding 12 fps to avoid damage to plastic liners on RCP joints.

Table 1
EMWD - System Design and Loading Criteria

Average Daily Flow:

Residential	EDU's / Acre [1] Typical	EDU's / Acre [1] Range	Population / EDU	GPD / Capita	GPD / Acre [2]
Low Density (LDR)	2.5	0 to 2.9	4	105	1,050
Medium Density (MDR)	4.5	3 to 11	3.5	100	1,575
High Density (HDR)	12	12 to 16	2.5	80	2,400
Very High Density (VHDR)	17	17+	2.2	80	2,992
Mobile Homes (MH)	6	varies	2	80	960
Age Restricted Comm.	varies	varies	2	80	960

Non-Residential		
Commercial	1700	GPD / Acre
Industrial	1700	GPD / Acre
Institutional	1000	GPD / Acre
Hospital	250	GPD / Bed
Schools	20	GPD / Student

Manning's Coefficient "n": n = 0.013 (varies with depth for design)
use n = 0.015 (for sizing pipes)

Peaking Factor: See attached sheet (Table 2 - Peak Flow Rates)

Velocity: 2 ft/sec MINIMUM, 3 ft/sec recommended, & 10 ft/sec maximum

Notes:
[1] For calculation of actual flow, use actual Equivalent Dwelling Units (EDU) per Gross Acre
[2] Applies to Typical EDU's / Acre only

TABLE 3

PIPE MINIMUM PIPE SLOPES IN SEWER MAINS

Pipe Diameter	Preferred Minimum	Ordinary Minimum	Preferred Maximum slope (not mandatory)
8-inch	.0065	.0040	.12
10-inch	.0050	.0032	.085
12-inch	.0040	.0024	.066
15-inch	.0032	.0016	.050
18-inch	.0024	.0014	.037
21-inch	.0020	.0012	.030
24-inch	.0017	.0010	.025
27-inch	.0015	.0008	.022
30-inch	.0013	.0007	.018

a) House Connection Laterals

Pipe diameter	4-inch	6-inch	8-inch
Minimum slope	0.020	0.020	0.020

(0.010 Extreme Minimum with prior approval only)

APPENDIX D

EMWD Will Serve

SAN 53 – Will Serve – WS 20210000951 – APN: 910-031-001 THRU -005, -007 THRU -010, -015, -017, -018, -021, & 949-190-012 THRU -019

August 27, 2021

Attn: Adam Covington
444 South Cedros Ave. Ste. 172
Solana Beach, CA 92075

Subject: SAN 53 – Will Serve – WS 20210000951 - APN: 910-031-001 THRU -005, -007 THRU -010, -015, -017, -018, -021, & 949-190-012 THRU -019.

Eastern Municipal Water District (EMWD) is willing to provide water and sewer services to the subject project. The provisions of service are contingent upon the developer completing the necessary arrangements in accordance with EMWD rules and regulations. EMWD expects the developer to provide proper notification when a water demand assessment is required pursuant to Senate Bill 221 and/or 610. EMWD expects the developer to coordinate with the approving agency for the proper notification. Further arrangements for service from EMWD may also include plan check, facility construction, inspection, jurisdictional annexation, and payment of financial participation charges. The developer is advised to contact EMWD's Development Services Department early in the entitlement process to determine the necessary arrangements for service, and to receive direction on the preparation of facility Design Conditions, which is required prior to final engineering.

EMWD's ability to serve is subject to limiting conditions, such as regulatory requirements, legal issues, or conditions beyond EMWD's control.

Expiration – one year from date of issue

Thank you for your cooperation in serving our mutual customers. If you have any questions, please call me at (951) 928-3777, extension 4472.

Sincerely,

Rafael Resendiz, MS, PE
Associate Civil Engineer II
Development Services Department
Eastern Municipal Water District

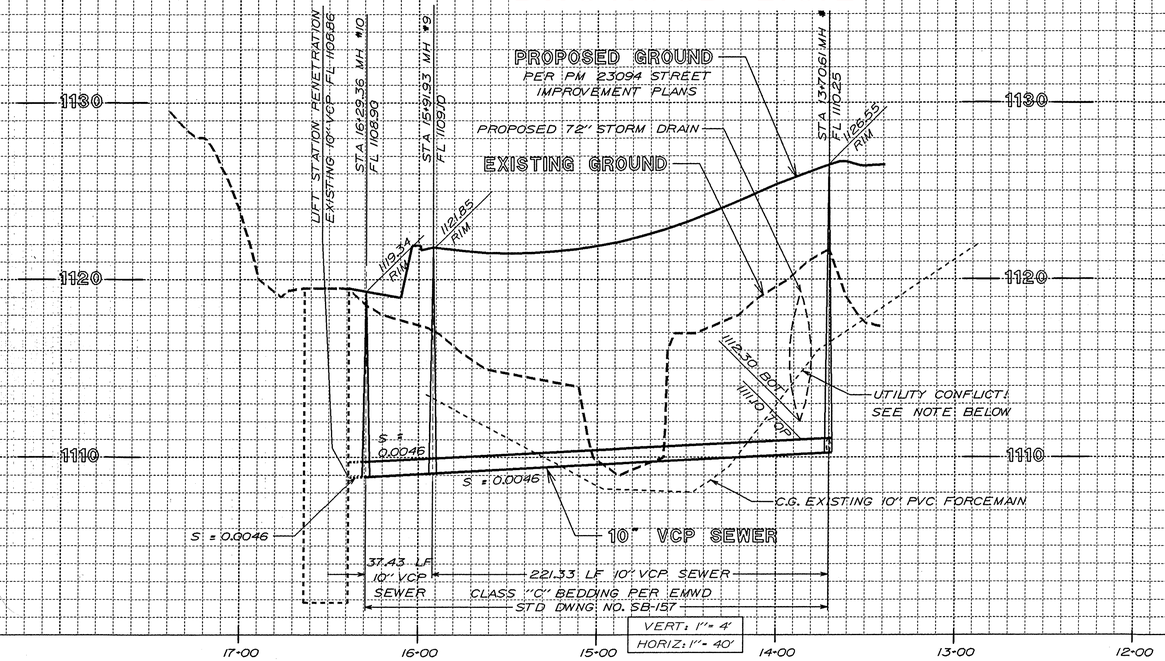
RR:lm

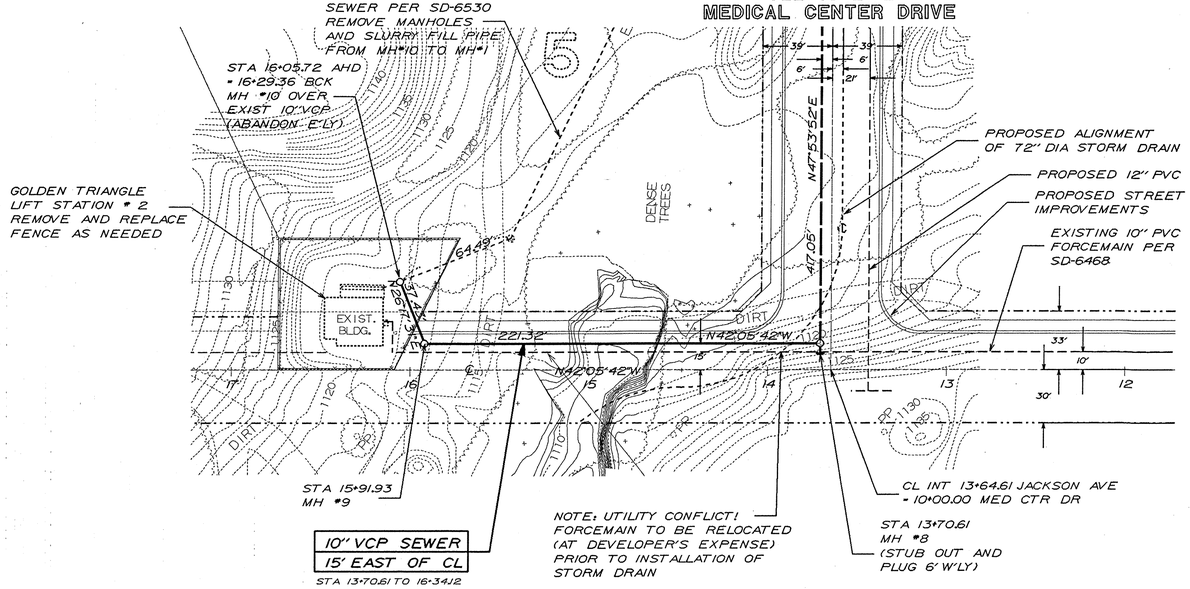
2270 Trumble Road • P.O. Box 8300 • Perris, CA 92572-8300
T 951.928.3777 • F 951.928.6177 www.emwd.org

APPENDIX E

EMWD Sewer Map & Record Drawings

10" VCP
DWG NO SD - 17372





JACKSON AVENUE

REVISIONS				
NO.	DATE	INITIAL	DESCRIPTION	APP'VD / DATE
1	10/31/97	DEWD	AS CONST'D C.O. 54060 (C.R. 6-7-96)	DEWD

APPROVED BY:
DIRECTOR OF ENGINEERING — DATE 11/4/94

REFERENCES
SD-12472, SD-6468, SD-6530

EASTERN MUNICIPAL WATER DISTRICT

APPROVALS	INITIAL	DATE
PROJECT ENG.	J.J.W.	10-24-94
INSPECTION		11/4/94
WTR. OPERATIONS		
SWR. OPERATIONS		10/27/94

	DATE
DESIGNED	
DRAWN	
TRACED	
CHECKED	
SUBMITTED VJB	10/25/94
SCALE:	

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

SANITARY SEWER
JACKSON AVENUE
STA 13+70.61 TO 16+29.36

I.D.	22
S.A.	34
W.O.	
C.O	54060
COORD.	09A20
SHT.	2 OF 2

SD-17372 1

FILE ID = /USR/JOHN/MEDCNSEW.DGN

10" PVC C900
FORCE MAIN
DWG NO. C-34

PIPELINE CONTRACTOR N.I.C.

PUMP STATION CONTRACTOR

PIPELINE CONTRACTOR INCLUDING 90° BEND W/ THRUST BLOCK N.I.C.

PIPELINE CONTRACTOR INCLUDING 90° BEND W/ THRUST BLOCK N.I.C.

SEE SHEET C-33 (D-8419) SD-6467

SEE SHEET C-35 SD-6469 (D-8421)

MATCH LINE

STA. 16+33.52

CG 1160.00

17+00 AV&ARV

EXISTING GROUND AT ℄ OF PIPE

PROPOSED FINISHED GRADE AT ℄ OF PIPE

PROPOSED GROUND AT ℄ OF PIPE

S=-0.0154

S=-0.0732

S=-0.0555

S=-0.0158

S=-0.0963

S=-0.1773

S=-0.1764

S=0.0225

S=-0.0961

S=0.0024

S=-0.0856

S=-0.0362

S=-0.0343

S=0.035

S=0.0700

S=-0.005

S=0.010

S=-0.1320

S=-0.1380

17+00 ABANDONED
AV&ARV SEE DETAIL "A" SHEET C-32 SD-6466 (D-8418)

17+00 CG 1171.77 11 1/4° VERT BEND W/ ANCHOR BLOCK (A-530)

17+50 CG 1171.00 11 1/4° VERT BEND W/ ANCHOR BLOCK (A-530)

18+40 CG 1148.00 11 1/4° VERT BEND W/ 3 SQ. FT. MIN. THRUST BLOCK

20+10 CG 1145.31

⚠ ABANDONED
10" P.V.C. AWWA C900 MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN AND 2" P.V.C. SCH. 80 NON-POTABLE WATER LINE ⚠ ABANDONED

54" MIN COVER

20+30 CG 1143.38

22+50 CG 1141.46

21+40 CG 1125.50

22+04.16 CG 1114.50

CG 1125.59

21+40

⚠ ABANDONED
10" P.V.C. AWWA C900 MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN AND 2" P.V.C. SCH. 80 NON-POTABLE WATER LINE ABANDONED

22+47.49 END FORCE MAIN

0+00 BEGIN FORCE MAIN

0+05

EQ. STA. 0+22.25 BACK
= STA. 22+40.65 AHEAD

CG 1109.50

CG 1114.00

CG 1113.50

24+05 BEG. RESTRAINED JOINTS

88 L.F. RESTRAINED JOINTS

24+90 END RESTRAINED JOINT

24+60 CG 1110.50 22 1/2° BEND

24+80 CG 1117.10 11 1/4° BEND

24+10 CG 1109.40

CG 1108.28

23+40

23+90 CG 1108.00

25+90 A.R.V.

CG 1122.00

25+70 CG 1122.95

26+35 CG 1118.2

26+70 WATER MAIN CG 1118.60 FORCE MAIN CG 1117.00

27+10

WATER MAIN CG 1114.80 FORCE MAIN CG 1113.40

STA. 27+75

MATCH LINE

PROPOSED GROUND AT ℄ OF PIPE

8" ACP CL 200

EXISTING GROUND AT ℄ OF PIPE

10" P.V.C. AWWA C900 MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN AND 2" P.V.C. SCH. 80 NON-POTABLE WATER LINE

18" DIA MIN. 3/16" WALL STEEL CASING PER SB 49 INSTALLED BY OPEN TRENCH CONSTRUCTION

LIMITS OF FORCE MAIN DEDICATION

17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00

SEWAGE FORCE MAIN ONLY

PROPOSED SEWAGE LIFT STATION NO. 2, SEE SITE & GRADING PLAN SHEET PC-2 SD-7351 (D-8979)

PROPOSED 10" SEWER PER P.M. NO. 15647 NOT PART OF THIS CONTRACT

2" BACKFLOW PREVENTER AND 2" P.V.C. SCH. 80 NON-POTABLE WATER LINE

0+00 WELL DISCHARGE

WATER WELL / SEE SITE & GRADING PLAN SHEET PC-4

8" ACP CL. 200 W/ TELEMETRY 23' NE/O ℄

SD-7353 (D-8981)

CONNECT TO SEWAGE LIFT STATION NO. 2 SEE SHEET PC-2 SD-7351 (D-8979)

22+47.49

22+35.16 90° BEND W/ THRUST BLOCK (B-407)

22°04.16 90° BEND W/ THRUST BLOCK (B-407)

22+10± CAP OFF 2" PVC & ABANDONED W'LY

⚠ ABANDONED
10" P.V.C. AWWA C900 MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN 10' NE/O ℄ WITH TELEMETRY CABLE AND TERMINALS (B-533) AND 2" P.V.C. SCH. 80 NON-POTABLE WATER LINE 2" PVC ABANDONED N'WLY OF LIFT STATION

2" P.V.C. SCH. 80 NON-POTABLE WATER LINE

EQ. 0+22.25 BACK = 22+46.45 AHEAD 90° BEND W/ THRUST BLOCK (B-407)

24+80 10" FORCE MAIN RELOCATION XING PROP 72" RCP STORM DRAIN

10" P.V.C. AWWA C900 MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN 10' NE/O ℄ WITH TELEMETRY CABLE AND TERMINALS (B-533) AND 2" P.V.C. SCH. 80 NON-POTABLE WATER LINE

10" DIA MIN. 3/16" WALL STEEL CASING PER SB 49 INSTALLED BY OPEN TRENCH CONSTRUCTION

STA. 26+70.12 8" 90° BEND W/ THRUST BLOCK (B-407)

PROP 72" SD

30' E.M.W.D. EASEMENT

R/W

S 41°37'32" E

S 48°22'29" W

10" FM

8" W

10' S ℄

0.05 P/L ANGLE

N48°22'29"E

PUMP STA. CONTRACTOR

PIPELINE CONTRACTOR INCLUDING 90° BEND W/ THRUST BLOCK

MURRIETA HOT SPRINGS ROAD

714,400 E

506,800 N

ESTIMATED QUANTITIES

PUMP STATION CONTRACTOR	PIPELINE CONTRACTOR	
⚠ 17 L.F.	1160 L.F.	10" P.V.C. AWWA C-900, MIN. CL. 150, 11.1" O.D.
50 L.F.	1205 L.F.	TELEMETRY CABLE
20 L.F.	105 L.F.	8" C.M.L.&C. CL. 150 STEEL PIPE OR CL. 200 A.C.P.
	4 EA.	10" 90° BEND W/ THRUST BLOCK (B-407)
	1 EA.	8" 90° BEND W/ THRUST BLOCK (B-407)
	2 EA.	COMBINATION AIR VALVE (DETAIL "A", DWG. C-32) SD-6466 (D-8418)
25 L.F.	1000 L.F.	2" P.V.C. SCH. 80 NON-POTABLE WATER LINE
RLW approved	3 EA.	11 1/4° VERT BEND W/ ANCHOR BLOCK (A-530)

Robert Bein, William Frost & Associates
PROFESSIONAL ENGINEERS, PLANNERS & SURVEYORS
27555 YNEZ ROAD • SUITE 400 • TEMECULA, CALIFORNIA 92591
(909) 676-8042 • FAX (909) 676-7240

⚠ REVISION PREPARED UNDER THE SUPERVISION OF:
MICHAEL A. TYLMAN R.C.E. 43090 EXP. 3/31/96
DATE: 9/15/95

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. TYLMAN RCE 43090 EXP. 3/31/96 CIVIL STATE OF CALIFORNIA

REV.	REVISION DESCRIPTION	BY	DATE
⚠	RELOCATED LIFT STATION NO. 2	M.P.P.	12/29/95
⚠	ADDED NIC	R.E.L.	12/29/95
⚠	REVISED N.I.C. PORTION		
⚠	ADD NOTES	B.T.B.	2-10-87
⚠	AS CONSTRUCTED C.O. 27240 (C.R.) GR 11-10-94		4/8/97
⚠	RELOCATE F.M. STA. 21+16 TO 24+80 R.B.F. C.B. colorado		
⚠	AS CONST'D F.A. 034-0-53150-63022 (C.R.) GR 12-8-94		
⚠	AS CONSTRUCTED C.O. 29950 & 29970 (5-14-90 C.R.) GR 12-7-94		

DESIGNED BY M.P.P.
DRAWN BY S.T./D.M./W.W.
CHECKED BY W.F.S.

COUNTY OF RIVERSIDE DEPARTMENT OF HEALTH
DATE

PROJECT ENGINEER
MICHAEL PODEGRACZ R.C.E. No. 21145 DATE 3/6/96

SUBMITTED BY
WILSON F. SO R.C.E. No. 21651 DATE 3/6/96

WILSON F. SO & ASSOCIATES, INC.
16016 TUSCOLA RD. SUITE 7 · P.O. BOX 388
APPLE VALLEY, CALIF. 92307
(619) 242-2305

W.O. 85-306
CO 29970
CO 29950
C.O. 27240
CO 30000

APPROVED BY: EASTERN MUNICIPAL WATER DISTRICT
CHIEF ENGINEER DATE Aug 26, 1996

APPROVALS			
DESIGN	CONSTRUCTION	OPERATIONS	SUBMITTED
		AHH	Aug 7-10-96

SCALE:
HORIZ. : 1"=40'
VERT. : 1"=4'

WORK ORDER NO.

IMPROVEMENT DISTRICT 22 & 23

D-8420
SD-6468

EASTERN MUNICIPAL WATER DISTRICT

GOLDEN TRIANGLE ASSESSMENT DISTRICT
E.M.W.D. EASEMENT - 10" FORCE MAIN & 8" WATER
STA. 16+33.54 TO STA. 27+75

SHEET ____ OF ____

DRAWING NO. C-34

COORDINATE 321

27240

SEE SHEET C-34 (D-8420) SD-6468

EQ. 10" FORCE MAIN STA. 28+68.13 BACK = STA. 468+45.30 AHEAD

C.L. 16" WATER MAIN STA. 28+61.10 BACK = STA. 468+53.43 AHEAD SEE DETAIL "A" THIS SHEET

MATCH LINE

STA. 27+75

WATER MAIN CG 1114.80
FORCE MAIN CG 1113.40

CG 1118.00

CG 1116.00

FORCE MAIN

CG 1116.00

CG 1118.00

S=-0.037

S=-0.028

S=-0.0181

470+30

WATER MAIN CG 1121.20
FORCE MAIN CG 1119.20

EXISTING GRADE AT ℄ OF STREET

S=-0.0379

C.G. 16" A.C.P. CL. 150

10" P.V.C. AWWA C900, MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN

S= 0.0223

EQ. STA. 475+56.49 EAST = STA. 0+06.00 NORTH SEE DETAIL "A" SHEET C-1 (D-8387)

S=-0.0200

S=-0.035

475+00

WATER MAIN CG 1139.00
FORCE MAIN CG 1137.00

WATER MAIN CG 1140.26

476+00

CG 1139.00

RESTRAINED JOINTS

STA 475+50.49 EAST = STA 0+06.00 NORTH HOT TAP EXIST 16" W/L W/16"x12" TAPPING SLEEVE W/12" FXF R.S.G.V. BY EMWD @ DEVELOPER'S EXPENSE. INSTALL FXH ADAPTOR 1° ORIF STOP

STA. CH 115.68
38° HIGH DEFLECTION COUPLING
C.G. = 1140.38

EX. 2" GAS 1140.75 E.

12" PVC, C-900 CL-150

1140.42 TOP 12" W/L

S= -0.0170

PROPOSED GRADE @ ℄ OF STREET

EXISTING GRADE @ ℄ OF STREET

1140
1140.06 BOT. 12" W/L
138.59 OF 12" W/L

S= 0.0697

STA. 0+26.72 @ 8, HIGH DEF COUPLING C.G. 1139.92

STA. 1+05.28 INSTALL 12" R.S.G.V. W/END PLUG C.G. 1141.32

FORCE MAIN CG 1146.00

MATCH LINE

STA. 478+00

SEE SHEET C-36 (D-8422) SD-6470

1140 1130 1120

469+00 470+00 471+00 472+00 473+00 474+00 475+00 476+00 477+00 478+00

N.I.C.

SEWAGE FORCE MAIN & 16" WATER MAIN

D-8420 (SD-6468) SEE SHEET C-34

8" ACP CL. 200 W/ TELEMETRY

EQ. STA. 28+61.10 BACK = STA. 468+53.43 AHEAD SEE DETAIL "A" THIS SHEET

16" A.C.P. CL-150 G.W/℄

SEE SHEET C-1 D-8387 (SD-6435)

STA. 475+56.49 E 00+06.00 N

UNDERGROUND TELEPHONE LOCATION VARIES

STA. 475+50.49 EAST = STA 00+06.00 NORTH HOT TAP EXIST 16" W/L W/16"x12" TAPPING SLEEVE W/ 12" FXF R.S.G.V. BY EMWD @ DEVELOPER'S EXPENSE. INSTALL FXH ADAPTOR 1° ORIF STOP C.O. 60610

HANCOCK AVENUE

℄ STA 475+87.49 E = STA. 0+00.00 N

R/W

PROPOSED EP

MURRIETA HOT SPRINGS ROAD

R/W

470+30

VARIES

55'

30'

ROAD

EP

UT

16"W

10"FM

BLIND FLANGE

10" R.S.G.V. V. 23777 W.

STA. 476+19.61 ℄ INT. WYE BRANCH

SEE DETAIL "T" SHEET C-56 SD-6490 (D-8442)

MATCH LINE

SEE SHEET C-36 D-8422 (SD-6470)

STA. 27+75

469 470 471 472 473 474 475 476 477

N 74°23'45" E

CALTRANS BRASS CAP

EQ. STA. 28+68.13 BACK = STA. 468+45.30 AHEAD 10" FORCE MAIN 60° BEND W/ THRUST BLOCK (B-407)

715,000 E

10" P.V.C. AWWA C900 MIN. CL. 150, 11.1" O.D. SEWER FORCE MAIN 6' S/O ℄ WITH TELEMETRY CABLE AND TERMINALS (B-533)

N15°36'38"W 112.86'

8" F.H. W/12"x2" SERVICE CLAMP & 2" CORP STOP BY EMWD AT DEVELOPER'S EXPENSE. INSTALL 2" LDSC MTR. SERVICE PER B-346 WITH BACKFLOW PREV. DEV. PER B-567. (S.O. 179449) FOR CITY OF MURRIETA

STA 1+05.28 F.H. (B-517) 12" R.S.G.V. W/ END PLUG C.O. 60610

12" PVC, C-900 CL-150 41' W/℄

BC = 476+12.27

CALTRANS BRASS CAP

STA. 478+00

ESTIMATED QUANTITIES

703 L.F.	16" A.C.P. CL. 150	PIPE
86 L.F.	8" ACP CL 200	
1,048 L.F.	10" P.V.C. AWWA C900 MIN. CL. 150 11.1" O.D.	
1,837 L.F.	TELEMETRY CABLE	
1 EA.	16" B.V. W/ 16" B.F.	
1 EA.		
1 EA.	8" 45° ELBOW	
1 EA.	WYE BRANCH (SEE DETAIL "I", SHEET C-56) D-8442	

NO RECORD

8" ACP CL. 200
8" F×H ADAPTER
8" F×H B.V. V. 26307
8" C.I. 45° ELBOW W/ THRUST BLOCK
16"×16"×8" FLG'D TEE
16" A.C.P. CL. 150
16" F×H ADAPTOR
16" B.V. W/16" B.F. (B-288) V. 26308

DETAIL "A" NOT TO SCALE

E.M.W.D. INSPECTOR RICHARD KEELINE

CURVE DATA

	① CENTERLINE THIS SHEET	① CENTERLINE TOTAL CURVE	② FORCE MAIN THIS SHEET	② FORCE MAIN TOTAL CURVE
Δ=	5°27'31"	12°36'45"	5°22'31"	12°36'45"
R=	2,000.00'	2,000.00'	1,994.00'	1,994.00'
L=	187.63'	440.26'	187.67'	438.94'
T=	93.88'	221.03'	93.60'	220.36'

CO 30000
CO 27240 - FM. W/O STA 475+87
CO 27220 - 16" WATER
W.O. 85-306. (CO 25910 E/O STA 475+87)

W.O. 98-314 C.O. 60610

COPY TO BE USED AS ORIGINAL

REV.	REVISION DESCRIPTION	BY	DATE
1	MOVED LOCN INTERTIE AT HANCOCK FOR SEWER F.M.	RSD	3-7-86
2	DELETE 16"Ø E/O HANCOCK, CHANGE 8"W TO 16"W W/O HANCOCK, ADD DETAIL "A" & EST. QUANTITIES; REVISE F.M.	M.P.	6-18-86
3	ADDED NIC	R.E.L.	12/23/86
4	UPDATED PER STICK 10-26-89 GR	PM.	10.31.89
5	AS CONSTRUCTED C.O. 25910 (3-10-88 C.R.) 10.22.93	GR	
6	6-30-04 CHS ADDED 12"x2" TAPPED SVC. CLAMP & 2" DSC MTR.	DLJ	7/1/04
7	10.14.99 C.H.S. AS CONST C.O. GOGIO (C.R. 9.13.99)		
8	REVISED PROFILE AND USED HIGH DEFLECTION COUPLING C.O. 60610	WF	9/22/99
9	ADDED 12" R.S.G.V. & T.H. @ HANCOCK AVE. W.O. 98-314,	WF	6/1/00
10	AS CONST'D C.O. 27240 (C.R.) GR 11-10-94		
11	AS CONST'D C.O. 27220 (C.R.) GR 10-31-94		
12	AS CONST'D FA 043.0 (5) SD-62300 (11-27-91 C.R.) GR 11-10-93		

DESIGNED BY M.P.P.
DRAWN BY S.T./D.M./W.W.
CHECKED BY W.F.S.

PROJECT ENGINEER
MICHAEL RIDERMAN RCE No. 19657 DATE 1-30-86

SUBMITTED BY
WILSON F. SO RCE No. 21651 DATE 1-31-86

WILSON F. SO & ASSOCIATES, INC.
16015 TUSCOLA RD. SUITE 7 P.O. BOX 388
APPLE VALLEY, CALIF. 92307
(619) 242-2365

APPROVED BY EASTERN MUNICIPAL WATER DISTRICT
CHIEF ENGINEER DATE Feb 14, 1986

APPROVALS

DESIGN	CONSTRUCTION	OPERATIONS	SUBMITTED
	JTH	DLH	LM 2.13.86

SCALE HORIZ. 1"=40' VERT. 1"=4'
WORK ORDER NO.

IMPROVEMENT DISTRICT 22 & 23

EASTERN MUNICIPAL WATER DISTRICT

GOLDEN TRIANGLE ASSESSMENT DISTRICT

MURRIETA HOT SPRINGS ROAD - 10" FORCE MAIN & 16" WATER STA. 27+75 TO STA. 478+00

D-8421
SD-6469
SHEET ___ OF ___
DRAWING NO. C-35

COORDINATE 32

APPENDIX F

FlowMaster Calculations

The Terraces Murrietta - Pipe 1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.015	
Channel Slope	0.021	ft/ft
Diameter	8.0	in
Discharge	163.20	gpm

Results		
Normal Depth	2.7	in
Flow Area	0.1	ft^2
Wetted Perimeter	0.8	ft
Hydraulic Radius	1.5	in
Top Width	0.63	ft
Critical Depth	3.4	in
Percent Full	33.3	%
Critical Slope	0.009	ft/ft
Velocity	3.57	ft/s
Velocity Head	0.20	ft
Specific Energy	0.42	ft
Froude Number	1.566	
Maximum Discharge	732.71	gpm
Discharge Full	681.14	gpm
Slope Full	0.001	ft/ft
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.0	%
Normal Depth Over Rise	33.3	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.7	in
Critical Depth	3.4	in
Channel Slope	0.021	ft/ft
Critical Slope	0.009	ft/ft

The Terraces Murrietta - Pipe 2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.015
Channel Slope	0.018 ft/ft
Diameter	8.0 in
Discharge	274.00 gpm

Results	
Normal Depth	3.7 in
Flow Area	0.2 ft²
Wetted Perimeter	1.0 ft
Hydraulic Radius	1.9 in
Top Width	0.66 ft
Critical Depth	4.4 in
Percent Full	46.1 %
Critical Slope	0.010 ft/ft
Velocity	3.89 ft/s
Velocity Head	0.23 ft
Specific Energy	0.54 ft
Froude Number	1.409
Maximum Discharge	678.35 gpm
Discharge Full	630.61 gpm
Slope Full	0.003 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	46.1 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.7 in
Critical Depth	4.4 in
Channel Slope	0.018 ft/ft
Critical Slope	0.010 ft/ft

The Terraces Murrietta - Pipe 3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.015
Channel Slope	0.018 ft/ft
Diameter	8.0 in
Discharge	274.00 gpm

Results	
Normal Depth	3.7 in
Flow Area	0.2 ft²
Wetted Perimeter	1.0 ft
Hydraulic Radius	1.9 in
Top Width	0.66 ft
Critical Depth	4.4 in
Percent Full	46.1 %
Critical Slope	0.010 ft/ft
Velocity	3.89 ft/s
Velocity Head	0.23 ft
Specific Energy	0.54 ft
Froude Number	1.409
Maximum Discharge	678.35 gpm
Discharge Full	630.61 gpm
Slope Full	0.003 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	46.1 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.7 in
Critical Depth	4.4 in
Channel Slope	0.018 ft/ft
Critical Slope	0.010 ft/ft

The Terraces Murrietta - Pipe 4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.015
Channel Slope	0.005 ft/ft
Diameter	15.0 in
Discharge	554.86 gpm

Results	
Normal Depth	5.9 in
Flow Area	0.4 ft²
Wetted Perimeter	1.7 ft
Hydraulic Radius	3.2 in
Top Width	1.22 ft
Critical Depth	5.3 in
Percent Full	39.3 %
Critical Slope	0.007 ft/ft
Velocity	2.77 ft/s
Velocity Head	0.12 ft
Specific Energy	0.61 ft
Froude Number	0.806
Maximum Discharge	1,833.17 gpm
Discharge Full	1,704.15 gpm
Slope Full	0.000 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	5.9 in
Critical Depth	5.3 in
Channel Slope	0.005 ft/ft
Critical Slope	0.007 ft/ft

APPENDIX G

Golden Triangle Lift Station (LS#2) Capacity and Tributary Flows Correspondence

From: Hanna Dodd <hdodd@dudek.com>
Sent: Tuesday, May 10, 2022 5:11 PM
To: Musashi Liu; Adam Covington; Moreno (Cheung), Tammie; Raines, Brian; Krieps, Ramsey; El-Hage, Maroun
Cc: Jenny Li
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Categories: External

Adam, Tammie, and Musashi,

Dudek and EMWD have calculated the projected peak dry weather flows (PDWF) to the existing 10" sewer in Sparkman Ct just downstream of your project's POC to be 0.799 mgd PDWF (Note: This 0.799 mgd includes the PDWF from the Terraces at Murrieta project). Since the existing 10" sewer downstream of your POC is sloped at 0.0046 ft/ft, the existing 10" sewer can only handle 0.416 mgd at 50% full (Note: This is less than the 0.799 mgd PDWF). Therefore, you would be tasked with upsizing the existing 10" sewer in Sparkman Ct when you connect to that existing sewer.

Dudek and EMWD also performed a capacity analysis on the existing Golden Triangle Lift Station (LS) #2 and determined that it has sufficient capacity to handle the additional PDWFs from your Terraces at Murrieta project.

Please update your "The Terraces Murrieta Sewer Study" to reflect these findings.

Please let me know if you have any questions or concerns about the information above.

Hanna Dodd, PE
Senior Engineer

605 Third Street, Encinitas, CA 92024
O: 760.479.4133 C: 626.348.3753
www.dudek.com

From: Musashi Liu <musashi.liu@greystar.com>
Sent: Tuesday, May 10, 2022 2:06 PM
To: Hanna Dodd <hdodd@dudek.com>; Adam Covington <adam.covington@greystar.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Thanks Hanna sounds good

Musashi Liu | Associate, Development
Greystar | 620 Newport Center Drive | 15th Floor | Newport Beach, CA 92660
c 202.680.0620 | musashi.liu@greystar.com | **greystar.com**

From: Hanna Dodd <hdodd@dudek.com>
Sent: Tuesday, May 10, 2022 8:54 AM

To: Musashi Liu <musashi.liu@greystar.com>; Adam Covington <adam.covington@greystar.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: [EXTERNAL] RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Musashi,

I had a meeting with EMWD yesterday and we are putting together a sewer tributary packet for the Terraces project based on that meeting. I am hoping to get that packet to you sometime this week.

Hanna Dodd, PE
Senior Engineer

605 Third Street, Encinitas, CA 92024
O: 760.479.4133 C: 626.348.3753
www.dudek.com

From: Musashi Liu <musashi.liu@greystar.com>
Sent: Monday, May 9, 2022 10:35 AM
To: Hanna Dodd <hdodd@dudek.com>; Adam Covington <adam.covington@greystar.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Hi Hanna,

Hope you had a great weekend. Just checking in - Did you have the meeting yet?

Best,
Musashi

Musashi Liu | Associate, Development
Greystar | 620 Newport Center Drive | 15th Floor | Newport Beach, CA 92660
c 202.680.0620 | musashi.liu@greystar.com | **greystar.com**

From: Hanna Dodd <hdodd@dudek.com>
Sent: Wednesday, May 4, 2022 4:33 PM
To: Musashi Liu <musashi.liu@greystar.com>; Adam Covington <adam.covington@greystar.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: [EXTERNAL] RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Musashi,

I am having a meeting with EMWD to confirm the additional ADWF from the other development upstream of your POC to the existing EMWD sewer system and after that meeting I will send you the sewer tributary map.

Hanna Dodd, PE
Senior Engineer
605 Third Street, Encinitas, CA 92024
O: 760.479.4133 C: 626.348.3753
www.dudek.com

From: Musashi Liu <musashi.liu@greystar.com>
Sent: Wednesday, May 4, 2022 2:24 PM
To: Adam Covington <adam.covington@greystar.com>; Hanna Dodd <hdodd@dudek.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Hi Hanna, Just following up on this

Musashi Liu | Associate, Development
Greystar | 620 Newport Center Drive | 15th Floor | Newport Beach, CA 92660
c 202.680.0620 | musashi.liu@greystar.com | **greystar.com**

From: Musashi Liu
Sent: Monday, May 2, 2022 1:30 PM
To: Adam Covington <adam.covington@greystar.com>; Hanna Dodd <hdodd@dudek.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Hi Hanna,

Are we still good to track this to get an update this week?

Musashi Liu | Associate, Development
Greystar | 620 Newport Center Drive | 15th Floor | Newport Beach, CA 92660
c 202.680.0620 | musashi.liu@greystar.com | **greystar.com**

From: Adam Covington <adam.covington@greystar.com>
Sent: Wednesday, April 27, 2022 7:58 AM
To: Hanna Dodd <hdodd@dudek.com>; Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>; Musashi Liu <musashi.liu@greystar.com>
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

Thanks, Hannah. Any idea when you'll be able to confirm?

We'll be in touch on the water components shortly

Adam Covington | Senior Director, Development
Greystar | 380 Stevens Ave | Suite 305| Solana Beach, CA 92075
c 858.245.1937 | adam.covington@greystar.com | **greystar.com**

From: Hanna Dodd <hdodd@dudek.com>
Sent: Monday, April 25, 2022 3:15 PM
To: Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; Adam Covington <adam.covington@greystar.com>; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: [EXTERNAL] RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

All,

There are still potential developments nearby the Terraces at Murrieta project that may or may not connect to the existing sewer system that the Terraces at Murrieta project will also connect to. EMWD is still trying to gather more information on these projects from their developers before sending you a sewer tributary area map for your sewer study analysis.

In the meantime, please feel free to submit the water components of your DC Submittal for review if those components are ready for review.

Hanna Dodd, PE
Senior Engineer

605 Third Street, Encinitas, CA 92024
O: 760.479.4133 C: 626.348.3753
www.dudek.com

From: Hanna Dodd
Sent: Thursday, April 14, 2022 4:45 PM
To: Moreno (Cheung), Tammie <Tammie.Moreno@kimley-horn.com>; Raines, Brian <rainesb@emwd.org>; Krieps, Ramsey <Ramsey.Krieps@kimley-horn.com>; adam.covington@greystar.com; El-Hage, Maroun <el-hagem@emwd.org>
Cc: Jenny Li <jli@dudek.com>
Subject: RE: Terraces at Murrieta - PPI# 2020-1209 - Work Order Number 16189 - DC Submittal

All,

Attached find minutes from today's Terraces at Murrieta meeting with action items.

EMWD and Dudek have a meeting scheduled for Monday, 4/25 about the sewer tributary area and capacity of the Golden Triangle #2 LS. If we have any sewer information to share with the development team before that 4/25 meeting, we will. But it might take us longer than the one week we originally thought.

Again, if you have any questions or concerns, please let me know.

Hanna Dodd, PE
Senior Engineer

605 Third Street, Encinitas, CA 92024
O: 760.479.4133 C: 626.348.3753

Attachment 11

DCDA vs RPDA:

EMWD Requirements Memo

NOT APPLICABLE

Project is a residential apartment complex

Attachment 12

DCDA vs RPDA:

Customer memo declaring intent of on-site use (Commercial & industrial use only)

NOT APPLICABLE

Project is a residential apartment complex

Attachment 13

Spreadsheet (template) for

"Residential Landscaping Water Budget"

and

Instructions

(Template form must be filled out and provided with first Plan Check submittal)

Licensed Civil Engineer or Landscape Architect:

Company MJS Design Group
Address 507 30th St. Newport Beach, CA 92663
Contact Matt Vaughan / Mark Schattinger
Email mattv@mjs-la.com / mark@mjs-la.com
The following information is true and accurate

MARK ALAN SCHATTINGER #3235

Landscape Water Budgets

Residential Sub-Division Tracts

emwd EASTERN MUNICIPAL WATER DISTRICT

Developer Contact Information
Name Greystar
Address 380 Stevens Ave - Suite 305, Solana Beach, CA
Contact Adam Covington
Email Adam Covington <adam.covington@greystar.com>

For questions regarding this form please contact:

Conservation Department
Eastern Municipal Water District
P.O. Box 8300, Perris, CA 92572-8300

Phone: (951) 928-3777, Ext. 4384
Fax: (951) 928-6120

Phase No.

Tract No.

This form must be completed and approved by the EMWD Conservation Department prior to meter release*

EMWD USE ONLY
Date received from developer:

🟥 **Required information**
🟨 **EMWD Use**

Reference ETo 57.33

Conservation Department Approval
Name **Date**

EMWD USE ONLY
ET Zone:

EMWD USE ONLY
Plan Check / WO No.

Landscape Water Budget Calculation Criteria

EMWD USE ONLY SO #	EMWD USE ONLY Annual Maximum Allowable Water Budget (AMAWB)	APN No.	Lot Number	Lot Size (Square Feet)	Footprint of House and Garage (Square Feet)	Hardscape Including Driveway (Square Feet)	**Irrigation Type**			**Shrubs** Planter (Square Feet)	**Shrubs** Plant Type	**Shrubs** Irrigation Adjustment Factor	**Trees** Planter (Square Feet)	**Trees** Plant Type	**Trees** Irrigation Adjustment Factor	**Turf** Plant Type	**Turf** (Square Feet)	**Turf** Irrigation Adjustment Factor	Estimated Annual Water Budget	Future Landscape Area (Square Feet)	Current Landscape Area (Square Feet)	Total Landscape Area (Square Feet)
	needs revision	910-031, 949-1900		1374754	357206	775011	Drip	Bubblers	Rotor	171405	**Shrubs**	0.55	10848	**Trees**	0.59	**Turf**	76227	0.59	6921	0	258480	242537
	0																		0	0	0	0
	0																		0	0	0	0
	0																		0	0	0	0
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	0																		0	0	0	0

***Typical front yard plans meeting EMWD Administrative Code 5111 with a .50 factor for all new construction as of 6/1/15 (no turf in front yards) with water use calculations, may be submittted in place of Landscape Water Budget Calculation Criteria.**

Form No. RD-001 05/28/2015

Revised 6/8/21

Attachment 14

"Documents Required"
for
Potable Landscape Irrigation and Meter Requirements

(applicable to Commercial, Industrial, Institutional use, as well as common-areas within Residential Tract Development)

This Information must be provided with the first Plan Check submittal.

Potable Landscape Irrigation

Meter Requirements

DOCUMENTS REQUIRED FOR PLAN CHECK

Landscape Plans- from a Registered Landscape Architect (RLA) or a Practicing Landscape Architect (PLA)

**The project applicant shall provide the calculated maximum applied water allowance (MAWA) and estimated applied water use (EAWU) for the landscape project area as part of the final landscape documentation package submittal*

LANDSCAPE IRRIGATION WATER BUDGET AGREEMENT

The intent of the Landscape Irrigation Water Budget Agreement is to provide information for a water budget and to ensure that all individually metered landscape/irrigation projects comply with Article 6 – Water Conservation of EMWD's Administrative Code. All dedicated landscape meters will be subject to tiered rate billing, which entails a monthly water budget based on the size of the irrigated landscape sq ft and current weather data (ETo). Effective, June 1, 2015 all outdoor water budgets will have to meet a 0.5 Conservation Factor (50% of ETo).

Prior to the issuance of landscape meter(s), the following shall be agreed to:

1. Any landscape project with a total area greater than or equal to 2,500 square feet shall be supplied through a separate metered service connection.

2. Onsite irrigation systems served from one irrigation meter **cannot** be connected to another irrigation system supplied from a different meter (**looped system**).

3. Owner or representing agent must provide a copy of the site **Landscape Plan**, depicting the square footage of the irrigated area, type of irrigation equipment being installed and the plant legend.

4. Only functional turf areas will be considered. Functional Turf is defined as a turf area that serves as a surface for such purposes as playing a sport or gathering for group activities. Projects that include turf for aesthetic purposes will not be approved.

5. All landscape shall meet the following Regulations and Ordinances

- Eastern Municipal Water District Administrative Code
- Model Water Efficient Landscape Ordinance (MWELO)
- Ordinance No. 859, Ordinance of the County of Riverside, Establishing Water Efficient Landscape Requirements
- All applicable Federal, State, or Local statutes, regulations, ordinances, and policies

Failure to submit required documents and receive approval can result in a delay of meter installation/release and or incorrect water budget.

If you have any questions regarding the EMWD Conservation Plan Check process or Program, please contact:

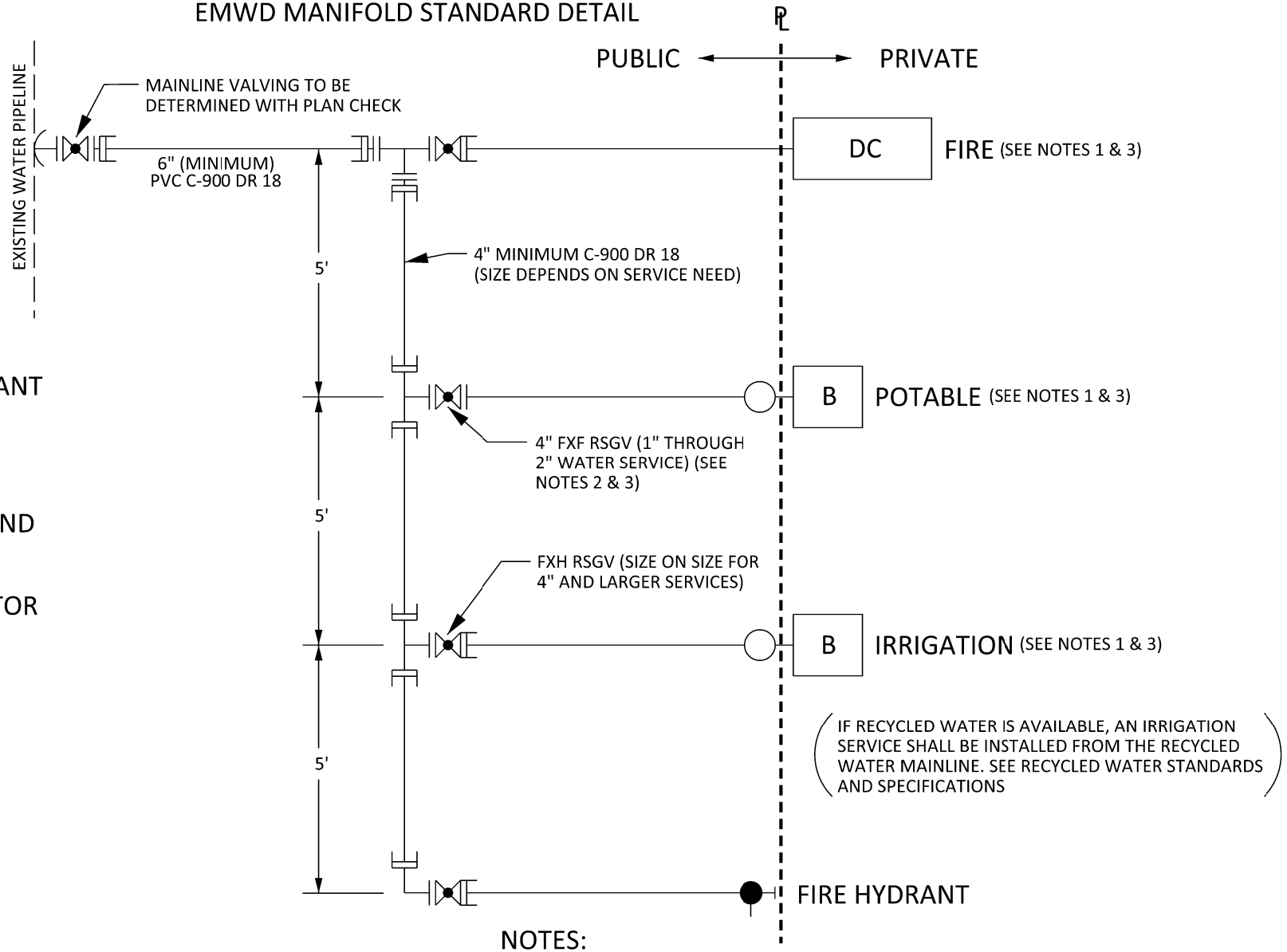
Juan Zamora at 951-928-3777 ext. 4384

Isaac Flores at 951-928-3777 ext. 4308

Attachment 15

Manifold detail, for commercial projects

EMWD MANIFOLD STANDARD DETAIL



- FIRE HYDRANT
- HOT TAP
- FXH 90° BEND
- FXH ADAPTOR
- FXF TEE
- FXH TEE
- FXF RSGV
- FXH RSGV
- METER BOX

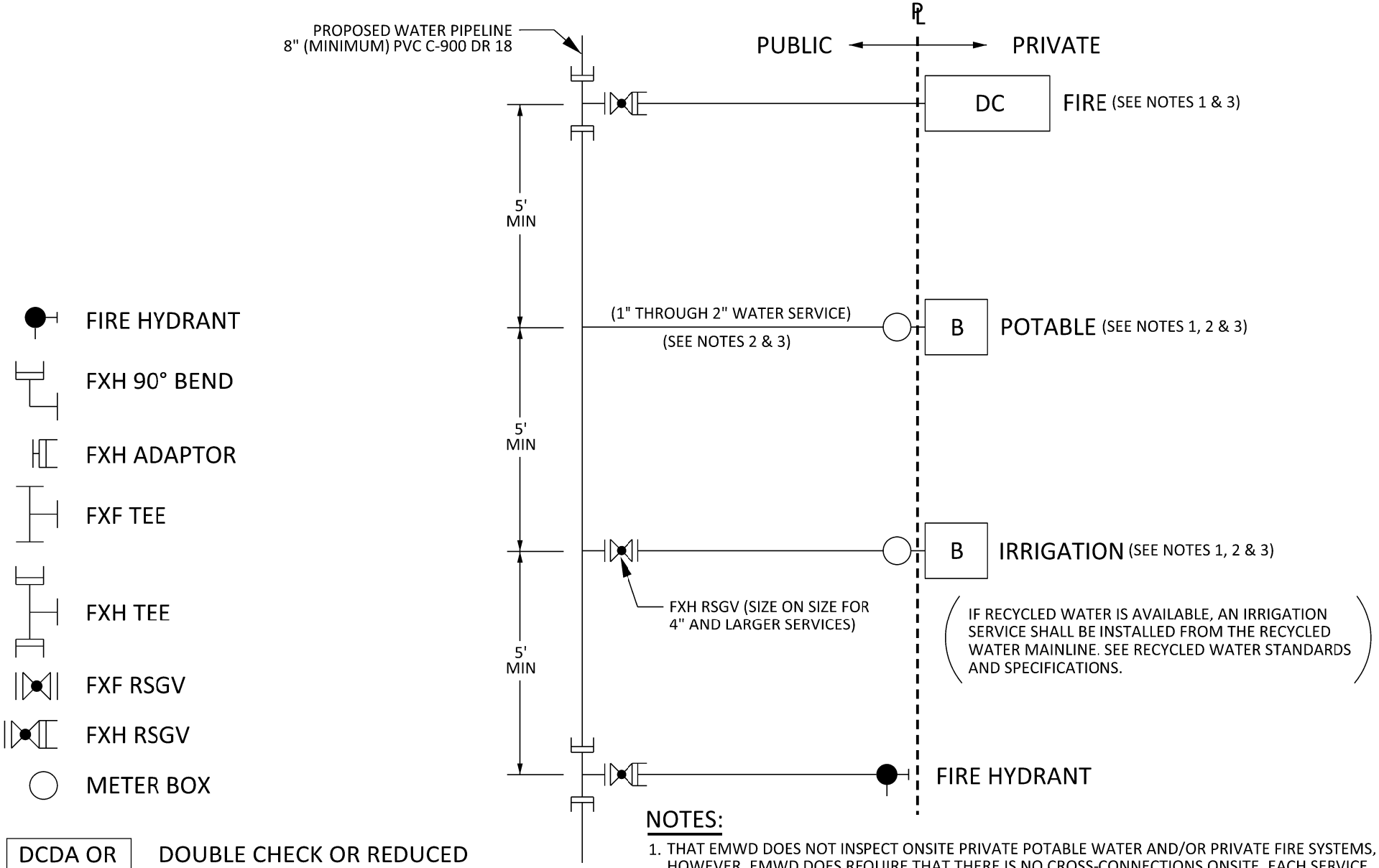
DCDA OR RPDA	DOUBLE CHECK OR REDUCED PRESSURE DECTECTOR ASSEMBLY
B	REDUCED PRESSURE BACK FLOW PREVENTER

NOTES:

1. THAT EMWD DOES NOT INSPECT ONSITE PRIVATE POTABLE WATER AND/OR PRIVATE FIRE SYSTEMS, HOWEVER, EMWD DOES REQUIRE THAT THERE IS NO CROSS-CONNECTIONS ONSITE. EACH SERVICE CONNECTION MUST MAINTAIN THEIR SEPARATE SYSTEMS ONSITE. (EXAMPLE: DOMESTIC POTABLE, FIRE SERVICES MUST REMAIN A DUAL SYSTEM ONSITE).
2. A FLANGE BY FLANGE RSGV AND COMPANION FLANGE WILL BE REQUIRED FOR 1" THROUGH 2" WATER SERVICE CONNECTIONS PER B-658.
3. THE MAXIMUM VELOCITY THROUGH THE MANIFOLD SHALL BE 10 FEET PER SECOND, BASED ON CAPACITIES OF THE BACK FLOW DEVICES AND METERS.

REV DATE 10/25/19

EMWD STANDARD SERVICE CONNECTIONS FOR PROPOSED WATERLINES



NOTES:

1. THAT EMWD DOES NOT INSPECT ONSITE PRIVATE POTABLE WATER AND/OR PRIVATE FIRE SYSTEMS, HOWEVER, EMWD DOES REQUIRE THAT THERE IS NO CROSS-CONNECTIONS ONSITE. EACH SERVICE CONNECTION MUST MAINTAIN THEIR SEPARATE SYSTEMS ONSITE. (EXAMPLE: DOMESTIC POTABLE, FIRE SERVICES MUST REMAIN A DUAL SYSTEM ONSITE).
2. TYPE "K" COPPER FOR 1" THROUGH 2" SERVICE LATERAL CONNECTIONS. SEE EMWD STANDARD DRAWINGS B-590A, B-342A, B-344A OR PB-10A.
3. THE MAXIMUM VELOCITY THROUGH THE MANIFOLD SHALL BE 10 FEET PER SECOND, BASED ON CAPACITIES OF THE BACK FLOW DEVICES AND METERS.

REV DATE 10/25/19

Attachment 16

CFD Letter, signed by the Owner (Residential tracts only)

Community Facilities District (CFD) Letter

Re: **SPECIAL FUNDING DISTRICTS**

Project Name	The Terraces
Tract Number	910-03, 949-19
Work Order Number	16189

Special Funding Districts have a special set of requirements for construction. In some cases, EMWD is not aware of the need to process projects differently using CFD requirements. In order to make sure your project is processed correctly, please have the project owner/developer complete the questions below:

1. Will the project be funded using Assessment District or Community Facilities District funds? ☐ Yes ☒ No

If YES, please answer questions 2 through 5:

2. Who will be the lead agency? (supply CFD number and name of project, if known)

3. Will the CFD fund the water and/or sewer financial participation fees? ☐ Yes ☐ No
4. Will the CFD fund the water facilities? ☐ Yes ☐ No
5. Will the CFD fund the sewer facilities? ☐ Yes ☐ No

If you answered **YES** to Question 1, please contact Matt Chesney, Finance Manager, Webb Municipal Finance at (951) 248-4219, for CFD formation requirements.

I AM THE OWNER OR DEVELOPER OF TRACT _____. THE INFORMATION ABOVE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. FURTHERMORE, I UNDERSTAND THAT DEVELOPER AGREEMENTS FOR PROJECTS, INCLUDING FACILITIES TO BE FUNDED BY A CFD, MUST BE IN PLACE PRIOR TO SCHEDULING A BID OPENING FOR THE PROJECT.

Adam Covington — Digitally signed by Adam Covington Date: 2022.02.21 16:46:06 -08'00'	Greystar
Signature	Company Name
Adam Covington	380 Stevens Ave, Suite 305
Print Name	Address
Senior Director	Solana Beach, CA 92075
Title	City, State ZIP
858-245-1937	858-245-1937
Contact Number	Contact Number
2/21/22	
Date	

RETURN THIS FORM WITH THE NEXT PLAN OF SERVICE / PLAN CHECK SUBMITTAL

Attachment 17

Prevailing-wage requirements and process description

NOT APPLICABLE

Attachment 18

Sponsor/developer e-mail, waiving oversizing reimbursement from EMWD

NOT APPLICABLE

Attachment 19

Application For Service Requirements

NOT APPLICABLE

Attachment 20

Plan Check Submittal Checklist

Date: _____

Project Name: _____

Office Use	
EDUs	
W/S/R	
CFD	○ YES ⊙ NO
Res/OS/Com/Misc	
Plan Checker	
Completed Date	

DOCUMENTS REQUIRED FOR PLAN CHECK

Note: EMWD will perform a completeness check of the documents identified below within the first week of submittal. If the package is found to be incomplete, your submittal will not be accepted. A submittal will **NOT** be placed in the queue for the next available plan checker until it is found to be complete.

We are providing the following (**electronic submittal required**):

Yes	N/A	
☐	☐	An Approved Design Conditions (DC) Summary Spreadsheet & Exhibits *If approved DC is expired (older than 24 months), please follow up with DC Engineer*
☐	☐	Water & Sewer Improvement Plans (Per EMWD Standards and Guidelines)
☐	☐	Street Improvement Plans
☐	☐	Storm Drain Plans (if not included with Street Improvement Plans)
☐	☐	Grading Plans
☐	☐	Approved Tentative Tract Map
☐	☐	Parcel or Tract Map
☐	☐	Current Conditions of Approval including documentation indicating extensions (if any), and Fire Flow Requirements *If the Conditions of Approval are not available, provide one set of Fire Flow Conditions from the governing Fire Prevention Agency*
☐	☐	A Plan Check Deposit: Attached Amount $ _____ *Refer to Work Order Deposit Work Sheet (Form: DS-053) for plan check deposit amount*
☐	☐	A Community Facilities District (CFD) Letter (Form: DS-008)
☐	☐	A Work Order Request Form: DS-050
☐	☐	Fire Plans
☐	☐	Fire Pump Plans (if required for the project)
☐	☐	Potable Landscape Irrigation Plans for Commercial, Industrial, High-Density, Institutional, or residential (common irrigated areas) developments

Current guidelines for preparation of sewer and water plans and standard drawings are available on our website at www.emwd.org.

_____
Signature of Registered Civil Engineer

_____
Print Name

_____
Phone

_____
Company Name

_____
Address

_____
Email

Attachment 21

Plan Check Deposit Schedule

Development Service Department

Work Order Deposit Worksheet (DC/Plan Check)

Project:
Meeting Date:
Design Conditions Engineer:
File Name:

Phase I: Due Diligence Phase

			Deposit[1] Amount Required For This
1	Water, Sewer & Recycled Water	(No Charge for initial research and Due Diligence meeting)	$0

Phase II: Design Conditions Phase

	Project Size: EDUs:	Small 1-100	Medium 101-200	Large Over 200	
1	Water Design Conditions	$ 2,500	$ 3,000	$ 3,500	
2	Fire Flow Tests and Hydraulic Boundary Conditions	Amount Varies (Use FF Application - Form DS-001)			Submit a Separate Check
3	Sewer Design Conditions	$ 2,500	$ 3,000	$ 3,500	
		RWUP	RWUE (Parks, Strtscp, Basins)	RWUE (TM, Comm, Med, Schools)	
4	Recycled Water Use Plan (RWUP) or Recycled Water Use Exhibit (RWUE)	$ 2,000	$ 3,000	$ 4,000	
5	Recycled Water Public Facilities (Design Conditions)	$ 2,500	$ 3,000	$ 3,500	
6	Sewer Flow Monitoring By Applicant	$ -	$ -	$ -	
7	Sewer Flow Monitoring By District Staff	Amount Varies (min. $2,000 per manhole)			
8	Plan Check Support (amount included with Plan Check)	$ -	$ -	$ -	
9	Project Complexity, such as: PZ Realignment	$ 3,000	$ 3,000	$ 3,000	
10	Storage, Booster/Lift Station	$ -	$ -	$ -	
			Phase II (Design Conditions) Total:		$ -

Phase III: Plan Check Phase

On-site Recycled Water Irrigation Plan Check:
Required deposit shall be calculated and submitted seperately to Developer per Work Sheet-Form DS-042 — Submit a Separate Check

Water, Sewer & Recycled Water Facilities[2,3]

	No. of Sheets	Deposit Cost/Sheet 1 Facility[4]	Deposit Cost/Sheet 2 or More Facilities[5]	Per Easement, Add	CFD Specs, Add
1	1	$ 3,000	$ 3,500	$ 2,000	$ 3,000
2	2	$ 4,500	$ 5,500	$ 2,000	$ 3,000
3	3	$ 5,500	$ 8,000	$ 2,000	$ 3,000
4	4	$ 6,500	$ 9,500	$ 2,000	$ 3,000
5	5	$ 7,000	$ 11,000	$ 2,000	$ 3,000
6	6	$ 7,500	$ 12,000	$ 2,000	$ 3,000
7	7	$ 8,000	$ 13,000	$ 2,000	$ 3,000
8	8	$ 9,000	$ 13,500	$ 2,000	$ 3,000
	No. of Additional Sheets [6]	Add'l Cost/Sheet 1 Facility	Add'l Cost/Sheet 2 or More Facilities		
9	Additional Cost Beyond 8 sheets	$ 1,100	$ 1,400		
10	Hydro-Pneumatic Booster Station				$ 50,000
11	Booster Pump Station				$ 50,000
12	Water Storage Reservoir				$ 35,000
13	Small Sewer Lift Station				$ 35,000
			Phase III (Plan Check) Total:		$ -

(1) Deposit amount is based on the average District cost to review and process a typical project.
(1) During the Design Conditions and the Plan Check phases, the District reserves the right to review charges to a project and request additional funds if necessary
(1) Initial deposits may be increased based on project complexity, as determined by District staff.
(2) All Plan Check charges must be paid prior to approval of the plans.
(3) Recheck of approved plans: Apply two-thirds (2/3) of the above Plan Check deposit (Additional fees to be determined based on the amount of design changes)
(4) Water only, or Sewer only, or Recycled Water only
(5) Water and Sewer, or Water & Recycled Water, or Sewer & Recycled Water, or Water & Sewer & Recycled Water
(6) Only inlcude the number of sheets beyond 8 (Example 1: For a 14 sheet plan set, the additional number of sheets would be 6. If 1 facility, no easements, and non-CFD, write $9,000 in line 8, and $6,600 in line 9. Example 2: For an 18 sheet plan set, the additional number of sheets would be 10. If 2 or more facilities ($13,500), 3 easements ($6,000), and CFD ($3,000), write $22,500 in line 8, and $14,000 in line 9).

Attachment 22

NOT APPLICABLE

Attachment 23

WATER SUPPLY ASSESSMENT

EASTERN MUNICIPAL WATER DISTRICT

Water Supply Assessment Report

The Terraces

June 15, 2022

Section I: Introduction

I.1 Purpose

Water Code §10910 (a)(b)(c)

The purpose of this Water Supply Assessment (WSA) Report is to satisfy the requirements of Water Code §10910 et seq. and Government Code §66473.7 as amended by Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) in 2001. Senate Bill 610 focuses on the content of a water supply agency's Urban Water Management Plan (UWMP) and stipulates that when a project is subject to the California Environmental Quality Act (CEQA) and exceeds project size thresholds defined in the California Water Code, the appropriate water supply agency must provide an assessment (Exhibit A) of whether its total projected water supplies will meet the projected water demands associated with the proposed project. SB 610 applies to proposed residential developments of more than 500 dwelling units, or commercial, industrial, or mixed-use developments that exceed various thresholds for size. SB 221 requires water supply verification when a tentative map, parcel map, or development agreement for a project is submitted to a land use agency for approval. SB 221 applies to proposed residential developments of more than 500 dwelling units (with some exceptions). The need for an assessment or verification is determined by the lead agency for a project.

I.2 Project Description

The City of Murrieta, the lead agency for the preparation of an environmental document as required by CEQA for the proposed The Terraces Project (Project), has requested a WSA for the Project from the Eastern Municipal Water District (EMWD). The Project proposes construction of up to 900 very high-density residential dwelling units, to be located on a site approximately 37 acres in size, northwest of Sparkman Drive and Murrieta Hot Springs Road. The developer for the Project is Greystar, Incorporated, and the location is shown in Figure 2.

I.3 Projected Water Demand

Water Code §10910 (c)(1)

In EMWD's 2020 UWMP, the demand projections for the parcels covering the project site were estimated based on Commercial Retail and Commercial Office land uses, with a total demand of 92.15 acre-feet per year (AFY). The total water demand for this project is estimated to be 292.56 AFY, which represents an increase to estimated demand considered in the 2020 UWMP. However, the cumulative demand from this project and other new/planned developments that are being tracked in EMWD's service area remain within the level of demand accounted for in the 2020 UWMP. The specific facilities needed to serve the Project's water demands will be defined in the design conditions phase of EMWD's New Development Process.

I.4 Requirements

The City of Murrieta has requested that EMWD prepare a WSA for the Project. Although the land use changes proposed by the Project would increase demands compared to what was considered in the 2020 UWMP, EMWD has planned for this possibility by including a planning buffer in the

2020 UWMP and projecting future water use at lower levels of water efficiency compared to present day water use. After accounting for the cumulative demands from the Project and other developments in EMWD's service area (including other WSAs), over 11,000 AFY of buffer remains. This buffer is expected to grow in the future due to factors such as ongoing water use efficiency legislation and potable water offsets from recycled water conversions. Accordingly, demands from new development in EMWD's service area, including the Project, ultimately fall within the levels of demand considered in the 2020 UWMP. As authorized by Water Code §10910 (c) (2) – (3), EMWD has elected to incorporate information from the 2020 UWMP in this WSA (attached as Appendix A).

In accordance with Water Code §10910 (d) – (f), the WSA shall:

1. Identify any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the Project, and provide a description of the quantities of water received in prior years by the public water system under existing water supply entitlements, water rights, water service contracts;
2. If no water has been received in prior years by the public water system, identify other public water systems of water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts to the same source of water as the public water system; and
3. If groundwater is included in the proposed supply, identify the groundwater basin or basins from which the Project will be supplied and include any applicable documentation of adjudicated rights to pump. If the basin is not adjudicated, regardless of whether the basin has been identified as over drafted, provide a detailed description and analysis of the amount and location of groundwater pumped by the public water system for the past five years from any groundwater basin from which the Project will be supplied; and provide a detailed description and analysis of the amount and location of groundwater from the basin or basins from which the Project will be supplied to meet the projected water demand associated with the Project.

If the proposed Project includes a "subdivision" of more than 500 residential dwelling units as defined by Government Code §66473.7 (a)(1), the public water system shall also provide verification as to whether the public water system is able or unable to provide a sufficient water supply based upon an analysis of whether water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection will meet the projected demand associated with the proposed subdivision which considers:

1. The historical record for at least 20 years;
2. The applicability of any urban water shortage contingency analysis;
3. The reduction in water supply for "specific water use sector" per an adopted resolution, ordinance, or contract; and
4. The amount of water that can be reasonably relied upon from specified supply projects.

This assessment is a technical, informational, and advisory opinion only. It is a supporting document for an environmental document and is not a commitment by EMWD to supply water for the Project. The information included is based on information available at the time of the report and changing circumstances could affect EMWD's water supply evaluation presented in this document.

This assessment does not specifically address funding of new or existing supplies. The cost of water supplies will increase over time and the developer of this Project may be required to fund the acquisition of new, supplemental supplies, treatment facilities, potable, wastewater, or recycled water infrastructure, and water efficiency measures for existing customers. The extent of additional funding will be determined by EMWD and may take the form of a new component of connection fees or a separate charge. New customers may also be required to pay a higher commodity rate for water used than existing customers to help offset the rising costs of new supplies.

Prior to project construction, the developer of the Project is required to meet with EMWD staff to establish development design conditions, which will detail water, wastewater, and recycled water requirements to serve the Project. If there is a change in the circumstances detailed in this assessment, EMWD will address the changes in the development design conditions for the Project. Modifications at the development design conditions stage could reduce the amount of water available to serve the Project.

I.5 Background

EMWD was formed in 1950 and annexed into the Metropolitan Water District of Southern California (MWD) in 1951, to deliver imported water. In 1971, EMWD assumed the additional role of a groundwater producer with the acquisition of the Fruitvale Mutual Water Company. Presently, EMWD's supply portfolio includes desalinated brackish groundwater, recycled water, potable groundwater and imported water.

EMWD provides both retail and wholesale water supplies to a service area encompassing approximately 555 square miles with an estimated population of over 859,000 people. Agencies through which EMWD provides water supplies indirectly via wholesale service include the following:

- City of Hemet Water Department
- City of Perris and the North Perris Water System
- City of San Jacinto Water Department
- Lake Hemet Municipal Water District (LHMWD)
- Murrieta Division of Western Municipal Water District (WMWD – Murrieta)
- Nuevo Water Company (NWC)
- Rancho California Water District (RCWD)

I.6 Urban Water Management Plan

The 2020 UWMP was adopted by the EMWD Board of Directors on June 30, 2021. This plan documents EMWD's projected supplies and demands in five-year increments through the year 2045, certifies EMWD's compliance with water use efficiency targets defined in the Water Conservation Act of 2009, and demonstrates EMWD's supply reliability, even under dry year hydrologic conditions lasting multiple years. Approximately half of EMWD's existing and future retail demand will be supplied through local sources such as groundwater, brackish groundwater desalination, and recycled water, with the balance coming from imported water delivered by MWD. Demands shown in the 2020 UWMP are not project specific, but rather, projected in aggregate using best available current and planned land use information over EMWD's entire service area. The 2020 UWMP relies heavily on information and assurances contained within MWD's 2020 Urban Water Management Plan (MWD UWMP) when evaluating service area supply reliability. The 2020 MWD UWMP is attached as Appendix B.

I.7 Population Projection

The population projections for EMWD's service area were updated in the 2020 UWMP using information obtained from the most recent regional transportation plan/sustainable communities strategy completed by the Southern California Association of Governments (SCAG). This study, known as Connect SoCal, forecasted regional growth through 2045, and was adopted by SCAG on September 3, 2020. The data available from Connect SoCal includes projections of population, households, and employment within each of SCAG's Traffic Analysis Zones, which closely resemble block groups in the United States Census.

Consistent with the significant percentage of undeveloped land within EMWD's service area, growth is anticipated to continue throughout the 2020 UWMP's 25-year planning horizon (as shown in Table 1). Currently, approximately 40 percent of the District's service area is built out. As population and the associated water demands increase, EMWD will continue to proactively manage its water supply portfolio through the development of local resources in conjunction with additional imported water purchases from MWD as outlined in the 2020 UWMP.

TABLE 1: PROJECTED POPULATION

Population Served	2020	2025	2030	2035	2040	2045
Retail	603,950	649,700	695,500	741,300	774,300	807,200
Wholesale	255,210	271,500	287,800	304,000	314,000	324,100
Total	**859,160**	**921,200**	**983,300**	**1,045,300**	**1,088,300**	**1,131,300**

Section II: Identification of Supplies and Description of Quantities

Water Code §10910 (d)(1)

II.1 Overview of Supplies

EMWD has four sources of water supply: imported water purchased from MWD, potable groundwater, desalinated brackish groundwater, and recycled water.

A. Retail Water Supply Portfolio

Approximately half of EMWD's retail demands are supplied through local water sources, which consists of potable groundwater, desalinated brackish groundwater, and recycled water. The remaining demands are supplied by a mix of raw and treated water purchased from MWD. EMWD treats most of its raw water for potable use at two water filtration plants, located in Perris and Hemet. A small quantity of raw water is supplied directly to agricultural customers.

Over the past five years, EMWD's retail water supply portfolio averaged approximately 49 percent imported water, 11 percent groundwater, six percent desalinated brackish groundwater, and 34 percent recycled water. An annual breakdown of EMWD's retail water supplies over this five-year period is shown in Table 2. The proportions of local to imported water supplies are impacted by EMWD's participation in MWD's cyclic storage program in 2019, where MWD offered an incentive for member agencies to voluntarily reduce local groundwater production and purchase additional imported water due to wet hydrologic conditions at the time.

TABLE 2: RETAIL WATER SUPPLY PORTFOLIO, PAST 5 YEARS (AFY)

Type	Source	2017	2018	2019	2020	2021
Imported – Treated[1]	Metropolitan Water District	47,527	42,419	41,167	44,726	44,866
Imported – EMWD Treated	Metropolitan Water District	12,860	18,288	18,969	17,584	18,028
Imported – Raw[2]	Metropolitan Water District	407	503	501	642	547
Groundwater[3],[4]	San Jacinto Groundwater Basin	13,270	13,605	8,044	14,410	14,883
Desalination	San Jacinto Groundwater Basin	6,342	7,544	7,433	7,310	7,653
Recycled Water[5]	Regional Water Reclamation Facilities	42,746	44,016	40,676	39,642	46,042
	Total	**123,152**	**126,375**	**116,790**	**124,314**	**132,019**

1. EMWD increased treated imported water purchases in 2019 to offset groundwater pumping reductions made as part of its participation in MWD's Cyclic Storage Program.
2. Raw water total does not include replenishment water recharged under the Soboba Settlement Agreement.
3. Groundwater totals may include raw, brackish groundwater used to augment recycled water system for agricultural use.
4. A portion of the San Jacinto Groundwater Basin is adjudicated under the Hemet-San Jacinto Watermaster. EMWD pumping in this portion is subject to an adjusted base production right. EMWD also receives pumping credits for a portion of any Soboba Settlement recharge water unused by the Soboba Tribe.
5. Recycled water total excludes discharge but includes system losses (such as storage pond evaporation and incidental recharge). Due to the interconnected nature of EMWD's recycled water system, it is difficult to split retail and wholesale losses, therefore all recycled water losses are reported with the retail portfolio.

B. Wholesale Water Supply Portfolio

EMWD imports raw and treated water from MWD to supplement the local water supplies of its wholesale agencies. In addition, EMWD has agreements to provide recycled water to some of its wholesale agencies. An annual breakdown of EMWD sales to wholesale agencies is shown in Table 3. Note that this table only documents sources of water sold by EMWD on a wholesale basis and does not include local supplies (such as groundwater) available and used by EMWD's wholesale agencies to meet customer demands.

TABLE 3: WHOLESALE WATER SUPPLY PORTFOLIO, PAST 5 YEARS (AFY)

Type	Source	2017	2018	2019	2020	2021
Imported – Treated	Metropolitan Water District	14,103	14,672	11,070	15,008	13,719
Imported – Raw	Metropolitan Water District	10,448	14,385	11,293	14,909	14,999
Imported – Recharge (Raw)	Metropolitan Water District	19,686	4,783	20,730	6,647	0
Recycled Water	Regional Water Reclamation Facilities	1,387	1,878	1,619	1,285	1,605
	Total	**45,624**	**35,718**	**44,712**	**37,849**	**30,323**

1. Table does not include local supply sources used by suppliers to which EMWD provides wholesale service.
2. Raw water is imported and recharged by EMWD, LHMWD, and the Cities of Hemet and San Jacinto for the Soboba Tribe under the Soboba Settlement Agreement, which requires a long-term average of 7,500 AFY to be recharged. MWD can pre-deliver recharge water. The annual volume of the 7,500 AFY requirement unused by the Soboba Tribe is credited to the agencies for use.
3. Due to the interconnected nature of EMWD's recycled water system, it is difficult to distinguish between retail and wholesale losses, therefore, all recycled water losses are reported in Table 2, which documents retail water supplies.

C. Projected Future Water Supply Portfolios

As development increases the water demands within EMWD's service area, it is anticipated that new demands will be met through a combination of additional imported water from MWD and the development of local supply projects including increased production of potable groundwater, desalination of brackish groundwater, and use of recycled water. EMWD also plans to continue its efforts to enhance water use efficiency within its service area. Table 4 and Table 5 show EMWD's projected water supplies for both retail and wholesale service throughout the planning horizon set within its UWMP. These estimates do not account for all potential new local supply projects that could potentially be developed by EMWD or by agencies to which EMWD provides wholesale service.

TABLE 4: PROJECTED RETAIL WATER SUPPLIES - AVERAGE YEAR HYDROLOGY

Type	Source	2025	2030	2035	2040	2045
Imported	Metropolitan Water District	66,447	72,147	70,247	74,747	78,847
Groundwater	San Jacinto Groundwater Basin	18,753	18,753	18,753	18,753	18,753
Desalination	San Jacinto Groundwater Basin	13,400	13,400	13,400	13,400	13,400
Other	Purified Water Replenishment	4,000	4,000	12,000	12,000	12,000
Recycled Water	Regional Water Reclamation Facilities	39,230	44,920	42,200	47,500	51,800
	Total	**141,830**	**153,220**	**156,600**	**166,400**	**174,800**

1. Imported water total represents planned EMWD purchases, not the maximum volume of water available from MWD.
2. Groundwater total includes only 7,303 AFY of pumping from the adjudicated Hemet/San Jacinto Management Plan Area, which is EMWD's long term adjusted base production right. EMWD is also able to pump a portion of water recharged under the Soboba Settlement Agreement that is not used by the Soboba Tribe. EMWD is also able to carry over production rights into future years. As of the end of calendar year 2020, EMWD has accrued a carry-over credit balance of over 25,000 acre-feet.
3. Purified Water Replenishment is a planned indirect potable reuse project.
4. Recycled water supply total excludes volumes to be recharged under Purified Water Replenishment to avoid double counting as well as projected losses due to evaporation and incidental storage pond percolation.

TABLE 5: PROJECTED WHOLESALE WATER SUPPLIES - AVERAGE YEAR HYDROLOGY

Type	Source	2025	2030	2035	2040	2045
Imported	Metropolitan Water District	50,700	44,900	46,900	49,200	51,300
Imported	Soboba Settlement Water	7,500	7,500	7,500	7,500	7,500
Recycled Water	Regional Water Reclamation Facilities	4,770	5,180	5,600	5,600	5,600
	Total	**62,970**	**57,580**	**60,000**	**62,300**	**64,400**

1. Imported water total represents planned EMWD purchases, not the maximum volume of water available from MWD.
2. Under the Soboba Settlement Agreement, MWD must provide an annual average of 7,500 AFY of recharge water, however, this water can be pre- or post-delivered based on supply availability and coordination between MWD and EMWD.
3. Due to the interconnected nature of EMWD's recycled water system, losses can be hard to allocate between retail and wholesale service – for simplicity, all recycled water losses are excluded from wholesale and shown in the retail table instead.

II.2 Wholesale Water Supplies

A. Written Contracts or Other Proof of Entitlement

Water Code §10910 (d)(2)(A)

EMWD is one of the 26 member agencies that make up MWD. The statutory relationship between MWD and its member agencies establishes the scope of EMWD's entitlements from MWD. Typically, MWD does not set limits on the quantity of supply available to member agencies and MWD has provided evidence in the 2020 MWD UWMP that its supplies will meet member agency demands during normal, single-dry, and multiple-dry years within a 20-year projection.

During shortage events, the MWD Water Supply Allocation Plan (WSAP) is implemented in order to promote a reduction in demand by member agencies. Member agencies are allocated a portion of their anticipated demand with the assurance that a member agency will not see a retail shortage greater than the regional shortage. The WSAP includes adjustments for member agency population growth and investments in local resources. Member agency purchases are not limited under the WSAP, but any amount purchased over a member agency's allocation is charged at a much higher rate.

B. MWD Water Supplies

EMWD relies on MWD to provide approximately half of its retail water supply. The northern portion of EMWD's service area is supplied by MWD's Mills Water Filtration Plant (WFP), while the southern portion of EMWD's service area is supplied by MWD's Skinner WFP. Untreated water from MWD is primarily treated at EMWD's Perris and Hemet WFPs with a small quantity that is delivered directly to agricultural customers. EMWD also imports water from MWD to supply wholesale customers.

EMWD plans to supply new water demands through a combination of additional imported water purchases from MWD, as well as ongoing projects and programs expanding EMWD's local water supply portfolio. The 2020 MWD UWMP provides information about MWD's supply reliability and projected demands. In this document, MWD states that it will be able to reliably supply projected member agency demands through 2045 even under historic single-dry and multiple-dry years. Unprecedented shortages are addressed in the Water Shortage Contingency Analysis and Catastrophic Supply Interruption Planning portions of the 2020 MWD UWMP.

EMWD actively coordinated with MWD staff during the development of the 2020 MWD UWMP, however, note that MWD does not provide supply projections for each member agency; instead, MWD uses a regional approach to developing projections. Demand for the entire Southern California region is calculated, and then, based on available information about existing and proposed local projects, MWD determines the amount of imported water needed during future years. The 2020 MWD UWMP is included as Appendix B of this WSA.

II.3 Local Water Supplies

Water Code §10910 (d)

EMWD has made extensive investments in local water supply sources to increase system resiliency and reduce dependence on imported water from MWD. These local resources include potable groundwater, desalinated brackish groundwater, and recycled water.

A. Groundwater

Water Code §10910 (f)

Groundwater information is included in this assessment to assist the lead agency in determining the adequacy of EMWD's total supply. While EMWD does not plan to develop new groundwater supplies specifically for this project, the advancement of new local supplies represents a major component of EMWD's planned water supply portfolio. Therefore, new developments, including

the Project, may be supplied with a combination of additional imported water and/or projects and programs expanding EMWD's local supplies, including groundwater.

i. Urban Water Management Plan Review

Water Code §10910 (f)(1)

The 2020 UWMP discusses projected groundwater use by EMWD and explains assumptions made about groundwater. In the following sections, portions of the 2020 UWMP are summarized or excerpted below for informational purposes.

ii. Groundwater Basin Description

Water Code §10910 (f)(2)

EMWD's service area overlies the San Jacinto Groundwater Basin, which is primarily comprised of alluvium-filled valleys carved into the elevated bedrock plateau of the Perris Block. The San Jacinto Groundwater Basin is generally considered a closed basin surrounded by impermeable bedrock mountains and hills. For groundwater management plan and reporting purposes, the San Jacinto Groundwater Basin is further separated into the Hemet/San Jacinto Management Plan Area, where the San Jacinto Fault Zone strongly influences the groundwater hydrology and is adjudicated under the Hemet-San Jacinto Watermaster, and the West San Jacinto Management Plan Area, for which EMWD is the designated Groundwater Sustainability Agency (GSA).

The San Jacinto Groundwater Basin is delineated into eight groundwater management zones (GMZ) based on groundwater flow, groundwater divides, and changes in groundwater quality. The Hemet/San Jacinto Management Area is comprised of the Hemet South, Canyon, and San Jacinto Upper Pressure GMZs, as well as the Hemet North portion of the Lakeview/Hemet North GMZ. The West San Jacinto Basin covers the Perris North, Perris South, San Jacinto Lower Pressure, and Menifee GMZs, and the Lakeview portion of the Lakeview/Hemet North GMZ. EMWD produces water for potable use or blending in four of the GMZs: Perris North, Hemet South, San Jacinto Upper Pressure and Canyon. Desalter wells are located in the Perris South and Lakeview/Hemet North GMZs.

Detailed descriptions of each Management Zone and other additional information may be found in Chapter 6 of the 2020 UWMP attached as Appendix A of this WSA.

iii. Groundwater Management

Water Code §10910 (f)(2)

The San Jacinto Groundwater Basin is managed under two groundwater management plans. The Hemet/San Jacinto Groundwater Management Plan (HSJ Management Plan) covers the Hemet South, Canyon, San Jacinto Upper Pressure, and Hemet North portion of the Lakeview/Hemet North Groundwater Management Zones. The West San Jacinto Groundwater Basin Management Plan (WSJ Management Plan) covers the Perris North, Perris South, San Jacinto Lower Pressure, Menifee, and the Lakeview portion of the Lakeview/Hemet North Management Zones.

(1) Hemet/San Jacinto Groundwater Management Plan

In 2001, the Cities of Hemet and San Jacinto, LHMWD, EMWD, and representatives of the private groundwater producers, with the Department of Water Resources (DWR) acting as an impartial mediator, began working on a groundwater management plan for the Hemet/San Jacinto Basin. The group discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment and Decree, export of groundwater from the basins, and how to maximize the use of recycled water. As a result of their efforts, a final HSJ Management Plan was completed in 2007, and a Stipulated Judgment was entered with the Superior Court of the State of California for the County of Riverside in April of 2013.

The HSJ Management Plan:

- Limits the amount of water being extracted from the basin free of the replenishment charge to a sustainable yield
- Implements continued recharge of the basin using imported water through the Integrated Recharge and Recovery Program (IRRP)
- Ensures settlement claims by the Soboba Tribe are facilitated and accommodated
- Expands the existing water production and water services system to meet future urban growth through the use of imported water recharged into the basin
- Protects and/or enhances water quality in the Hemet/San Jacinto Basin
- Supports cost-effective water supplies and treatment by the public agencies
- Eliminates groundwater overdraft and enhances basin yield
- Continues the monitoring program to promote and provide for best management and engineering principles to protect water resources

Long-term groundwater management includes plans for artificial recharge using MWD replenishment water via permanent facilities through the IRRP Program. An agreement with the Soboba Tribe requires MWD to deliver, on average, 7,500 AFY of water for the next 30 years to EMWD, LHMWD, and the Cities of Hemet and San Jacinto to be recharged into Hemet/San Jacinto Basin, fulfilling the Soboba Tribe's water rights and addressing chronic groundwater overdraft. Since this agreement has gone into effect, MWD has fulfilled the average requirement of 7,500 AFY and in addition, has made pre-deliveries to buffer against dry periods where replenishment water may not be readily available.

EMWD's has the right to a long-term adjusted base production right of 7,303 AFY of groundwater under the HSJ Management Plan. EMWD's base production right was gradually adjusted downward on an annual basis until the long-term value was reached in 2019. EMWD also receives credits to pump a portion of any amount of water recharged under the Soboba Settlement Agreement that is not used by the Soboba Tribe. Volumes of EMWD's adjusted base production right and unused recharge water can be carried over into future years. Any pumping above these amounts is subject to replenishment fees.

(2) West San Jacinto Groundwater Basin Management Plan

In the West San Jacinto area, a cooperative groundwater management plan helps insure the reliability and quality of the water supply. In June 1995, EMWD adopted the WSJ Management Plan in accordance with the statutes in the California Water Code §10750 through §10755 resulting from the passage of AB 3030. The plan was adopted after extensive public outreach and meetings with interested individuals and agencies.

Implementation of the WSJ Management Plan began directly after its adoption. Initial efforts to implement the WSJ Management Plan included establishing an advisory committee; prioritizing the management zones; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. The West San Jacinto Groundwater Basin Management Plan Annual Report, documenting the implementation of the plan and activities in the groundwater management zones, has been published annually since 1996.

The Sustainable Groundwater Management Act (SGMA) was passed into law in 2014 and required that medium and high priority groundwater basins designated by the DWR be managed by GSAs. The San Jacinto Groundwater Basin was deemed a high priority basin by the DWR. Subsequently, EMWD notified the DWR of its intent to become the GSA for the non-adjudicated portion of the San Jacinto Groundwater Basin in January 2017. EMWD performed an extensive public outreach effort to ensure that the interests of all beneficial uses and users of groundwater would be considered in the process of forming the GSA, and in the development and implementation of this GSP. After EMWD staff conducted public workshops, reached out to stakeholder agencies (e.g., cities, counties, water districts, watermasters, and state agencies), and circulated notices in the press, the EMWD Board of Directors approved Resolution No. 2016-135 in December 2016, which formalized EMWD's intention to be the GSA for the West San Jacinto GSA Area and, EMWD's Board of Directors became the exclusive GSA for the western portion of the San Jacinto Groundwater Basin on April 24, 2017.

EMWD, as the GSA, initiated the development of the San Jacinto Groundwater Basin GSP in February 2019 and is anticipated to adopt and submit the GSP to the DWR by January 31, 2022. The purpose of the GSP is to define the conditions under which the groundwater resources of the West San Jacinto GSA Plan Area, which support agricultural, domestic, municipal and industrial, and environmental uses, will be managed sustainably in the future. The adoption of the GSP represents the commitment of the West San Jacinto GSA to maintain long-term, sustainable use of groundwater resources within the West San Jacinto GSA Plan Area, as required by SGMA. Over the next 20 years, data will continue to be gathered, analyzed, and used to refine the estimated sustainable yield and understanding of the sources of and influences on degraded water quality. As the understanding of the West San Jacinto GSA Plan Area improves, the findings of this GSP will be evaluated and updated as necessary. The GSP documents a viable approach, determined by the GSA in collaboration with stakeholders and

informed by the best available information, to maintaining the long-term sustainability of the groundwater resources within the West San Jacinto GSA Plan Area.

iv. Groundwater Recharge

EMWD has undertaken groundwater recharge operations with imported surplus MWD water within the Hemet/San Jacinto area since 1990, initially through the use of temporary facilities constructed under various pilot programs. Long term facilities for recharge were placed in operation under the IRRP, which plays an integral role in both the HSJ Management Plan and the Soboba Settlement Agreement. Facilities for the first phase of the IRRP include approximately 35 acres of basins/ponds for recharge, three extraction wells, three monitoring wells, modifications to two existing pump stations and pipelines within and adjacent to the San Jacinto River. EMWD is currently expanding its groundwater recharge and banking capabilities through Phase 1 of the Enhanced Recharge and Recovery Program (ERRP), the Santa Ana Conservation and Conjunctive Use Program (SARCCUP). Planned future phases of the ERRP will further expand the groundwater recharge and banking capabilities.

EMWD also contributes to the replenishment of the basin by providing recycled water to customers for use in lieu of private groundwater production. This program can deliver up to 8,540 AF annually to local agricultural users and the costs are borne jointly by EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Agreements that set limits on groundwater production and support portions of operational and maintenance costs have been in place since 2008.

v. Groundwater Pumping Rights

Water Code §10910 (f)

The Hemet/San Jacinto area forms the bulk of the eastern portion of EMWD's service area and is adjudicated through the Hemet-San Jacinto Watermaster and managed under the HSJ Management Plan. The groundwater native to this region is generally of high quality and is a major source of municipal as well as private production. EMWD's long term adjusted base groundwater production right in this area is 7,303 AF. Any pumping above this amount is subject to replenishment fees or must be offset by groundwater recharge. EMWD also receives the right to pump a portion of water recharged under the Soboba Settlement Agreement that is unused by the Soboba Tribe. Both EMWD's adjusted base production right and unused recharge water right can be carried over into future years. At the end of 2020, EMWD's balance of carry over credits exceeded 25,000 AF.

EMWD also operates potable wells in the Moreno Valley/North Perris area as well as brackish wells that feed EMWD's desalination facilities. These wells are located outside of the Hemet/San Jacinto area and will be managed by EMWD as the GSA under the San Jacinto Groundwater Basin GSP. Pumping in the GSA area is currently not subject to any restrictions.

(1) Past Groundwater Extraction

Water Code §10910 (f)(3)

Historic groundwater extractions by EMWD are documented in Table 2. The majority of EMWD's groundwater is extracted from the Hemet/San Jacinto area, with the remainder coming from the area covered by the WSJ Management Plan. The general location of wells and desalination facilities are shown in Figure 1.

(2) Projected Groundwater Extraction

Water Code §10910 (f)(4)

EMWD's projected groundwater supplies are shown in Table 4. Groundwater produced from the Hemet/San Jacinto area is adjudicated by the Hemet-San Jacinto Watermaster. For 2021, EMWD has an adjusted base production right of 7,303 AF, in addition to its balance of carry over credits. Any pumping above the adjusted base production right and carry over credits will be subject to replenishment fees or offset by groundwater recharge. Groundwater production outside the Hemet/San Jacinto area is not restricted and includes EMWD's wells located in Menifee and North Perris, as well as the wells feeding EMWD's desalter system. The general locations of the facilities shown in Figure 1 are anticipated to remain consistent for the foreseeable future.

vi. Analysis of the Sufficiency of Groundwater

Water Code 10910 (f)(5)

Protecting the groundwater supply available to EMWD is an important part of the District's planning efforts. EMWD is actively working with other agencies and groups to ensure that groundwater will continue to serve as a reliable water resource in the future. This effort includes the replacement of groundwater extracted beyond a given basin's safe yield.

EMWD extracts groundwater within its service area under the HSJ and WSJ Management Plans. Under the HSJ Management Plan, imported water will be recharged in the Hemet/San Jacinto area to support groundwater extractions, while pumping in the WSJ area, where groundwater levels have been rising, is planned to increase in the future as EMWD constructs new wells as part of the Perris North Groundwater Contamination Prevention and Remediation Program.

B. Surface Diversion Rights

License Number 10667

EMWD holds a right to divert up to 5,760 AF of San Jacinto River flows for recharge and subsequent use. The diversion right applies annually from November 1 through June 30 each year. EMWD's diversion and recharge of San Jacinto River flows take place within the Canyon GMZ at EMWD's Grant Avenue Ponds located in the Valle Vista area. Diversions are recharged into the groundwater basin and are not sold or used directly. Flows in the San Jacinto River are ephemeral and in any given year, flows may not be sufficient for any amount of diversion at all. Additional information about surface water diversions can be found in the Annual Report of the HSJ Management Plan.

C. Recycled Water

Water Code §10910 (d)(1)

Recycled water is used extensively in EMWD's service area in place of potable water. This offset to municipal demand comes from recycled water use to irrigate landscape and for industrial purposes. The majority of EMWD's agricultural customers also use recycled water, in some cases, in lieu of groundwater production.

EMWD's recycled water supply will expand as the population within EMWD's service area continues to grow. EMWD generally uses all of its recycled water and is limited only by the amount available to serve during peak demands and by system losses. EMWD stores recycled water during low demand periods and does not typically discharge recycled water. The District anticipates that this will continue even as the recycled water supply grows via programs to retrofit additional landscape customers currently using potable water and future recharge for indirect potable reuse.

D. Water Use Efficiency Measures

Water Code §10631 (e)

The Water Conservation Act of 2009 (SBx7-7) set a requirement for water agencies to reduce their per capita water use by the year 2020. The overall goal is to reach a statewide reduction of per capita urban water use of 20 percent by December 31, 2020, with an intermediate 10 percent reduction by December 31, 2015. Demand reduction can be achieved through both conservation and the use of recycled water as a potable demand offset. EMWD's retail customers used approximately 125 gallons per capita per day (gpcd) in 2020, which exceeds the per capita use water use efficiency target set under SBx7-7 of 176 gpcd.

In 2018, California passed Assembly Bill 1668 (AB 1668) and Senate Bill 606 (SB 606), collectively known as the Making Conservation a California Way of Life legislation. AB 1668 and SB 606 will require additional increases in water use efficiency beyond the targets set under SBx7-7. Rulemaking for AB 1668 and SB 606 remains in progress and EMWD's new target has not been set.

EMWD's conservation effort primarily utilizes three methodologies:

1. Budget Based Tiered Rates – EMWD implemented a tiered rate billing structure for its residential and landscape customers in April of 2009. Customers are provided an allocation for reasonable water use and are required to pay a higher rate for water use over their allocated limit. A study by the University of California, Riverside showed that budget-based rates reduced demand from existing residential customers by 15 percent;
2. Water Use Efficiency Requirements for New Development – These requirements focus on the installation of lower water use landscape and interior fixtures. Water use efficiency is mandated statewide through existing ordinances, plumbing codes, and legislation. To enforce water use efficiency, EMWD has lowered the water budget allocations for new developments. Any residential or dedicated landscape account installed after

January 1, 2011, has an outdoor budget allocation based on only 70 percent of evapotranspiration (ET) and non-functional turf is prohibited. Similar accounts installed after April 2015, have an outdoor budget allocation that is reduced to 50 percent of ET. As of January 2018, accounts with an outdoor budget allocation of 100 percent of ET have been reduced to 80 percent of ET; and

3. Active Conservation Program – EMWD implements a variety of water use efficiency programs that encourage the replacement of inefficient devices and includes monetary rebates, distribution, and direct installation programs.

In addition to these outlined conservation efforts, EMWD continues to expand its recycled water system to offset potable demand.

E. Local Resources Documentation

i. Written Contracts or Other Proof

Water Code §10910 (d)(2)(A)

The following is a list of documents related to EMWD's local water supply:

- EMWD 2020 Urban Water Management Plan (June 2021): EMWD's 2020 Urban Water Management Plan is attached as Appendix A. This plan supplies additional information on EMWD, its service area, water management, and supply capabilities.
- Hemet/San Jacinto Groundwater Management Area – 2019 Annual Report (May 2020): This annual report contains detailed information on the history and progress of groundwater management and the groundwater monitoring program in the Hemet/San Jacinto area. This report can be found on EMWD's website (www.emwd.org).
- Hemet/San Jacinto Groundwater Management Area – Water Management Plan: This plan was developed by stakeholders in the Hemet/San Jacinto area to provide a foundation to guide and support responsible water management into the future. The plan was finalized in 2007.
- West San Jacinto Groundwater Management Area – 2019 Annual Report (May 2020): This annual report contains detailed information on the history and progress of groundwater management and the groundwater monitoring program in the West San Jacinto area (including Perris and Menifee). This report can be found on EMWD's website (www.emwd.org).

With respect to EMWD's ownership and use of reclaimed/recycled water, the California Water Code, §1210 states:

> *The owner of a wastewater treatment plant operated for the purpose of treating wastes from a sanitary sewer system shall hold the exclusive right to the treated wastewater as against anyone who has supplied the water discharged into the wastewater collection and treatment system, including a person using water under a water service contract, unless otherwise provided by agreement.*

With respect to the Water Use Efficiency Ordinance that will result in additional supplies through conservation:

- The County of Riverside Board of Supervisors approved an update to Ordinance Number 859 on October 20, 2009, requiring water efficient landscaping in any new development requiring a permit.
- EMWD's Administrative Code requires water efficient landscaping in new developments and water efficiency by all customers. The efficiency is enforced through allocation based tiered rates. EMWD's Administrative Code can be found on EMWD's website (www.emwd.org).

ii. EMWD's Capital Improvement Plan

Water Code §10910 (d)(2)(B)

EMWD maintains and periodically updates a comprehensive Water Facilities Master Plan (WFMP). This working plan defines water supplies, transmission mains, and storage facilities required for the accommodation of projected growth within EMWD. On a yearly basis, a five-year Capital Improvement Plan (CIP) is prepared, which is based on a further refinement of the WFMP. The CIP outlines specific projects and their funding source. Each project is also submitted individually to the EMWD Board of Directors for authorization and approval. This allows EMWD to accurately match facility needs with development trends. Financing information for the desalter plant construction, expansion of the regional water reclamation facilities, and well replacement can also be found in the CIP.

iii. Federal, State, and Local Permits Needed for Construction

Water Code §10910 (d)(2)(c)

As part of EMWD's CIP, representatives from the Engineering, Water Resources and Facilities Planning, and Environmental and Regulatory Compliance Departments discuss each project and the steps needed to comply with regulatory requirements. EMWD works with various government agencies, including the United States Department of Fish and Wildlife, the United States Army Corps of Engineers, the California Department of Public Health, the California Division of Drinking Water, the California State Water Resources Board, the California Air Quality Management District, and the California Department of Fish and Game to obtain permits when necessary. The Engineering Department procures additional construction permits on a case-by-case basis. EMWD has already, or is in the process of, obtaining Environmental Impact Reports or other environmental documents necessary for desalter construction, expansion of regional water reclamation facilities, and well replacements. Any necessary permits secured by EMWD are kept on file at the District's headquarters facility.

iv. Regulatory Approvals

Water Code §10910 (d)(2)(D)

The California Division of Drinking Water (DDW) has issued a system-wide permit for EMWD's water supply system. EMWD's Environmental and Regulatory Compliance Department conforms

to specific regulations and obtains any additional necessary approvals. As new facilities are constructed by EMWD, they are subject to inspection and testing by regulatory agencies and the DPH permit is amended.

Section III: Demands

III.1 Demand Projections

Water Code §10910 (c)(2)

EMWD's primary retail customers for potable and raw water can be divided into residential, commercial, industrial, institutional, landscape, and agricultural sectors. The residential sector is EMWD's largest customer segment; however, each sector plays a role in the growth and development of EMWD's service area. The historic and projected customer water use by the various potable/raw retail customer types are shown in Table 6.

TABLE 6: RETAIL POTABLE/RAW WATER USE BY CUSTOMER TYPE

	Actual Water Use - AFY				Projected Water Use - AFY				
Use Type	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Single Family	62,300	54,000	45,700	52,200	66,900	71,700	76,700	80,500	84,000
Multi-Family	5,500	6,100	5,800	6,500	8,500	9,100	9,700	10,200	10,600
Commercial	3,900	4,200	4,600	4,300	6,100	6,500	7,000	7,300	7,600
Industrial	400	400	300	600	600	600	700	700	700
Institutional	2,900	2,300	2,000	1,600	2,700	2,900	3,100	3,200	3,400
Landscape	7,500	8,900	7,700	8,200	8,400	7,600	6,800	6,200	5,500
Agricultural	2,500	2,300	2,800	1,600	2,000	2,000	2,000	2,000	2,000
Total	**85,000**	**78,200**	**68,900**	**75,000**	**95,200**	**100,400**	**106,000**	**110,100**	**113,800**

EMWD also provides wholesale water service to a number of sub-agencies, serves recycled water, and imports water for recharge purposes. These demands are shown in Table 7.

TABLE 7: WHOLESALE DELIVERIES TO OTHER AGENCIES

	Actual Deliveries - AFY				Projected Deliveries - AFY				
Supplier	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
City of Hemet	100	0	0	0	0	0	0	0	0
City of Perris	1,900	1,700	1,500	1,685	1,800	1,900	2,100	2,200	2,300
City of San Jacinto	0	0	0	0	0	0	0	0	0
LHMWD	100	1,300	4,300	986	5,100	5,500	5,900	6,300	6,700
NWC	800	600	200	409	500	1,000	1,100	1,200	1,200
RCWD	26,300	21,900	15,000	25,028	42,300	35,200	36,200	37,500	38,800
WMWD (Murrieta)	100	1,600	700	1,809	1,000	1,300	1,600	2,000	2,300
Recharge (Soboba)	0	0	0	6,467	7,500	7,500	7,500	7,500	7,500
Total	**29,300**	**27,100**	**21,700**	**36,384**	**58,200**	**52,400**	**54,400**	**56,700**	**58,800**

1. The Cities of Hemet and San Jacinto plan to meet 100% of demands using local groundwater supplies, however, EMWD can deliver water to the cities during high demand periods or when city wells are undergoing maintenance.
2. Under the Soboba Settlement Agreement, MWD must provide an annual average of 7,500 AFY of water to be recharged in the Hemet/San Jacinto Management Plan Area by EMWD, LHMWD, and the Cities of Hemet and San Jacinto to fulfill the Soboba Tribe's water right. Actual deliveries will vary from year to year, and MWD has the option to pre-deliver water. Recharge water unused by the Soboba Tribe is proportioned between the four agencies.

Other water demands including recycled water use, recharge that occurred prior to or outside the scope of the Soboba Settlement Agreement, system losses, non-revenue water deliveries, and other, miscellaneous water usage are shown in Table 8.

TABLE 8: OTHER AND NON-POTABLE WATER USAGE

	Actual Water Use - AFY				Projected Water Use - AFY				
Use Type	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Recycled[(1),(2)]	32,600	28,200	46,100	40,900	44,000	50,100	47,800	53,100	57,400
Recharge[(3)]	7,000	0	0	0	0	0	0	0	0
Other / Losses[(4)]	7,700	8,400	9,100	9,800	7,400	7,900	8,400	8,800	9,200
Total	**47,300**	**36,600**	**55,200**	**50,700**	**51,400**	**58,000**	**56,200**	**61,900**	**66,600**

1. Recycled water projections include recycled water that is delivered to sub-agencies but excludes the volume of recycled water that is planned to be recharged as part of EMWD's Purified Water Replenishment (indirect potable reuse) project to avoid double counting.
2. Recycled water supply may be supplemented by brackish groundwater or raw water during high demand months.
3. Volume of recharge water excludes water that is imported under the Soboba Settlement Agreement (shown in prior table).
4. Other/losses category includes unbilled, authorized consumption use as well as real and apparent losses in the potable system.

Total demands on EMWD's water system are summarized in Table 9.

TABLE 9: SUMMARY OF TOTAL SYSTEM WATER DEMANDS

	Actual Water Use - AFY				Projected Water Use - AFY				
Category	2005	2010	2015	2020	2025	2030	2035	2040	2045
Retail	85,000	78,200	68,900	75,000	95,200	100,400	106,000	110,100	113,800
Wholesale	29,300	27,100	21,700	36,384	58,200	52,400	54,400	56,700	58,800
Other	47,300	36,600	55,200	50,700	51,400	58,000	56,200	61,900	66,600
Total	**161,600**	**141,900**	**145,800**	**162,084**	**204,800**	**210,800**	**216,600**	**228,700**	**239,200**

III.2 Project Demands

The Project is proposing construction of up to 900 very high-density residential dwelling units along, to be located on a site approximately 37 acres in size northwest of Sparkman Drive and Murrieta Hot Springs Road.

In the 2020 UWMP, the demand projections for the parcels covering the project site were estimated based on Commercial Retail and Commercial Office land uses, with a total demand of 92.15 AFY.

TABLE 10: 2020 UWMP LAND USE DEMAND ESTIMATE

Land Use Category	Average Day Demand (gpd)	Annual Demand (AFY)
Commercial Retail	35,354	39.63
Commercial Office	46,860	52.52
Total	**82,214**	**92.15**

Based on the land use information provided by the developer and the lead agency, the total water demand for this project is estimated to be 292.56 AFY, which represents an increase in the limits of estimated demand considered in the 2020 UWMP. However, EMWD has planned for this possibility by including a planning buffer in the 2020 UWMP and projecting future water use at lower levels of water efficiency compared to present day water use. After accounting for the cumulative demands from the Project and other developments in EMWD's service area (including other WSAs), over 11,000 AFY of buffer remains. This buffer is expected to grow in the future due to factors such as ongoing water use efficiency legislation and potable water offsets from recycled water conversions. Accordingly, demands from new development in EMWD's service area, including the Project, ultimately fall within the levels of demand considered in the 2020 UWMP.

TABLE 11: PROJECT SPECIFIC DEMAND ESTIMATE

Land Use Category	Average Day Demand (gpd)	Annual Demand (AFY)
Very High Density Residential	261,000	292.56
Total	**261,000**	**292.56**

All new development is required to install water efficient devices and landscaping. The use of turf for non-functional purposes is prohibited. For reference, a document titled "Water Efficient Guidelines for New Development" is available on EMWD's website (www.emwd.org) to help increase water use efficiency for this Project.

III.3 Database of Proposed Projects

Water Code §10910 (c)(3)

To develop the projections used in this WSA, EMWD uses a development tracking database that assesses future water demands for specific projects. EMWD uses this database to help plan for future water supply and infrastructure needs by monitoring new projects through various stages of development. Subject to the Board of Director's approval of this WSA, information associated with this Project will be updated in the supply and demand projections EMWD uses for planning. Changes in density and land use are also tracked in this database for planning purposes. The developer is required to notify EMWD if any changes to project density or land use occur.

Section IV: Evaluation of Supply and Demand

Water Code §10910 (c)(2)

IV.1 Supply and Demand Evaluation under Historic Conditions

EMWD's 2020 UWMP includes an evaluation of EMWD's water supply reliability under a range of potential hydrologic conditions. The results for normal year conditions are shown in Table 12 and Table 13 for EMWD's retail and wholesale service respectively. The single dry year evaluation is documented in Table 14 and Table 15, and the results of the multiple dry year evaluation are shown in Table 16 and Table 17. The supply totals shown in the table reflect EMWD's planned production and not EMWD's supply capacity. Under drought conditions, EMWD may increase local supply production, pump from stored water supplies, or purchase additional imported water from MWD if necessary. More details on this analysis can be found in Chapter 7 of the 2020 UWMP.

A. Normal Year Supply and Demand Comparisons

TABLE 12: RETAIL SUPPLY AND DEMAND COMPARISON, NORMAL YEAR (AFY)

	2025	2030	2035	2040	2045
Supply Totals	145,930	157,320	168,900	178,700	187,100
Demand Totals	145,930	157,320	168,900	178,700	187,100
Difference	**0**	**0**	**0**	**0**	**0**

Table 13: Wholesale Supply and Demand Comparison, Normal Year (AFY)

	2025	2030	2035	2040	2045
Supply Totals	62,970	57,580	60,000	62,300	64,400
Demand Totals	62,970	57,580	60,000	62,300	64,400
Difference	**0**	**0**	**0**	**0**	**0**

B. Single Dry Year Supply and Demand Comparisons

Table 14: Retail Supply and Demand Comparison, Single Dry Year (AFY)

	2025	2030	2035	2040	2045
Supply Totals	151,130	162,820	174,700	184,700	193,300
Demand Totals	151,130	162,820	174,700	184,700	193,300
Difference	**0**	**0**	**0**	**0**	**0**

Table 15: Wholesale Supply and Demand Comparison, Single Dry Year (AFY)

	2025	2030	2035	2040	2045
Supply Totals	64,770	59,080	61,600	63,600	65,900
Demand Totals	64,770	59,080	61,600	63,600	65,900
Difference	**0**	**0**	**0**	**0**	**0**

C. Multiple Dry Years Supply and Demand Comparison

Table 16: Retail Supply and Demand Comparison, Multiple Dry Years (AFY)

		2025	2030	2035	2040	2045
First Year	Supply Totals	151,130	162,820	174,700	184,700	193,300
	Demand Totals	151,130	162,820	174,700	184,700	193,300
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	132,700	143,300	153,700	162,500	170,300
	Demand Totals	132,700	143,300	153,700	162,500	170,300
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	134,900	145,500	155,500	164,100	171,900
	Demand Totals	134,900	145,500	155,500	164,100	171,900
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	137,100	147,600	157,400	165,700	173,500
	Demand Totals	137,100	147,600	157,400	165,700	173,500
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	140,200	150,800	160,000	168,000	175,800
	Demand Totals	140,200	150,800	160,000	168,000	175,800
	Difference	**0**	**0**	**0**	**0**	**0**

TABLE 17: WHOLESALE SUPPLY AND DEMAND COMPARISON, MULTIPLE DRY YEARS (AFY)

		2025	2030	2035	2040	2045
First Year	Supply Totals	64,770	59,080	61,600	63,600	65,900
	Demand Totals	64,770	59,080	61,600	63,600	65,900
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	63,200	59,100	61,400	63,400	65,600
	Demand Totals	63,200	59,100	61,400	63,400	65,600
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	62,100	59,600	61,800	63,900	66,000
	Demand Totals	62,100	59,600	61,800	63,900	66,000
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	61,000	60,100	62,200	64,300	66,400
	Demand Totals	61,000	60,100	62,200	64,300	66,400
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	59,800	60,600	62,600	64,700	66,900
	Demand Totals	59,800	60,600	62,600	64,700	66,900
	Difference	**0**	**0**	**0**	**0**	**0**

EMWD's 2020 UWMP discusses the supply reliability for EMWD during dry years. EMWD expects its local supplies to remain highly reliable and resilient, even under severe hydrologic conditions.

Similarly, MWD's UWMP shows that MWD would have the ability to meet all of its member agencies' project supplemental demand through 2045, even under a repeat of historic drought scenarios.

IV.2 Contingency Planning

EMWD maintains a Water Shortage Contingency Plan (WSCP) that aims to reduce demand during water shortage using significant penalties for wasteful water use. EMWD's WSCP details demand reductions for several stages of shortage through a 50 percent or greater reduction. Additional information about contingency planning is included in Chapter 8 of EMWD's 2020 UWMP.

The WSCP was last updated on June 30, 2021, and is located in Title 5, Article 10 of the EMWD Administrative Code, which is available on EMWD's website (www.emwd.org).

EMWD continues to encourage voluntary reduction of water use and is currently in Stage 2 of the WSCP based on statewide water supply conditions.

Section V: Water Supply Assessment

V.1 Potable Water

From a facilities perspective, the Project may be conditioned to construct off-site and on-site water facilities needed to distribute water throughout the project area. Prior to construction, the developer should contact EMWD staff to establish development design conditions and determine if any revisions are required to the master plan. Figure 2 shows existing water facilities in relation to the Project.

EMWD plans to supply new water demands in its service area, including the Project, through a combination of additional imported water purchases from MWD and the ongoing development of EMWD's local supply resources.

V.2 Recycled Water

EMWD policy recognizes recycled water as the preferred source of supply for all non-potable water demands, including irrigation of recreation areas, greenbelts, open space common areas, commercial landscaping, and supply for aesthetic impoundment or other water features.

According to the District's policies, the Project may be conditioned to construct a recycled water system separately from the potable water system, which would need to be constructed to recycled water standards. The Project may also be conditioned to construct off-site recycled water facilities. EMWD will make a final determination on requirements for recycled water use and facilities during the development design conditions phase of the Project.

V.3 Duration of Approval

This assessment will be reviewed every three years until the Project begins construction. The Project applicant shall notify EMWD when construction has begun. The review will ensure that the information included in this assessment remains accurate and no significant changes to either the Project or EMWD's water supply have occurred. Furthermore, if the environmental document for the Project is not certified within three years after the adoption of this WSA, the WSA may be updated at such time if there are changed circumstances warranting updated analysis. If the environmental document is certified within three years of the adoption of the WSA, then the applicant shall provide updates to EMWD every three years on the status of the Project until construction commences; however, in such an instance, the WSA shall not be amended or invalidated by EMWD. If neither the Project applicant nor the lead agency contacts EMWD within three years of approval of this WSA, it is assumed that the Project no longer requires the estimated water demand calculated, and the demand for this project will not be considered in assessments for future projects. The assessment provided by this document will then become invalid.

V.4 Conclusion

EMWD relies on MWD and local resources to meet the needs of its growing population. MWD demonstrated in the 2020 MWD UWMP that with the addition of all water supplies, existing and planned, MWD has the ability to meet all of its member agencies' projected supplemental demand through 2045, even under a repeat of historic multiple-year drought scenarios.

Based on present information and the assurance that MWD is engaged in identifying solutions that, when combined with the rest of its supply portfolio, will ensure a reliable long-term water supply for its member agencies, EMWD has determined that it will be able to provide adequate water supplies to meet the potable water demand for this project as part of its existing and future demands.

In the event that the lead agency determines adequate water supply exists for the Project, the developer of this project is required to meet with EMWD Development Services Staff to establish development design conditions. The development design conditions will detail water, wastewater, and recycled water requirements to serve the Project. An agreement may be developed prior to construction if additional funding is determined to be required to reduce existing customer demand on imported supplies through the expansion of local resources. The reduction of existing customer demand on imported water supplies will free up allocated imported water to be used to serve this Project under multiple dry year conditions. The amount of funding will be determined by EMWD (if required) and may take the form of a new component of connection fees or a separate charge.

If there is a change in the circumstances detailed in this assessment, EMWD will address the changes in the development design conditions for the Project. Modifications at the development design conditions stage could reduce the amount of water available to serve this Project.

Section VI: Conditions of Approval

This assessment is not a commitment to serve the project, but a review of EMWD supplies based on present information available. This assessment is conditioned on MWD's ability to continue to supply imported water to meet EMWD's requirements, including the requirements for the evaluated Project area. This project is subject to any special or additional requirements imposed by MWD or EMWD on such deliveries, including increased pricing or a different pricing structure.

All new development is required to install water efficient devices and landscaping. The use of turf for non-functional purposes is prohibited. A document titled "Water Efficient Guidelines for New Development" is available on EMWD's website to help increase water efficiency for this project.

The lead agency for the Project is responsible for evaluating the adequacy of the water supply assessment and making the ultimate decision of the sufficiency of the water supply. The developer for the Project is responsible for keeping EMWD informed about progress in the planning and development of the Project. The Project applicant will contact EMWD with Project status information and updates every three years until the Project begins construction. This will ensure that the information included in this assessment remains accurate and no significant changes to either the project or EMWD's water supply have occurred. Furthermore, if the environmental document for the Project is not certified within three years after the adoption of this WSA, the WSA may be updated at such time if there are changed circumstances warranting updated analysis. If the environmental document is certified within three years of the adoption of the WSA, then the applicant shall provide updates to EMWD every three years on the status of the Project until construction commences; however, in such instance, the WSA shall not be amended or invalidated by EMWD. If neither the Project applicant nor the lead agency contacts EMWD within three years of approval of this WSA, it is assumed that the Project no longer requires the estimated water demand calculated, and the demand for this Project will not be

considered in assessments for future projects. The assessment provided by this document will then become invalid.

If the lead agency determines adequate water supply exists for this project, to the greatest extent possible, recycled water shall be used on the Project. Details about the feasibility of recycled water use shall be included in the development design conditions for the Project.

Section VII: Figures

FIGURE 1: EMWD SUPPLY SOURCES

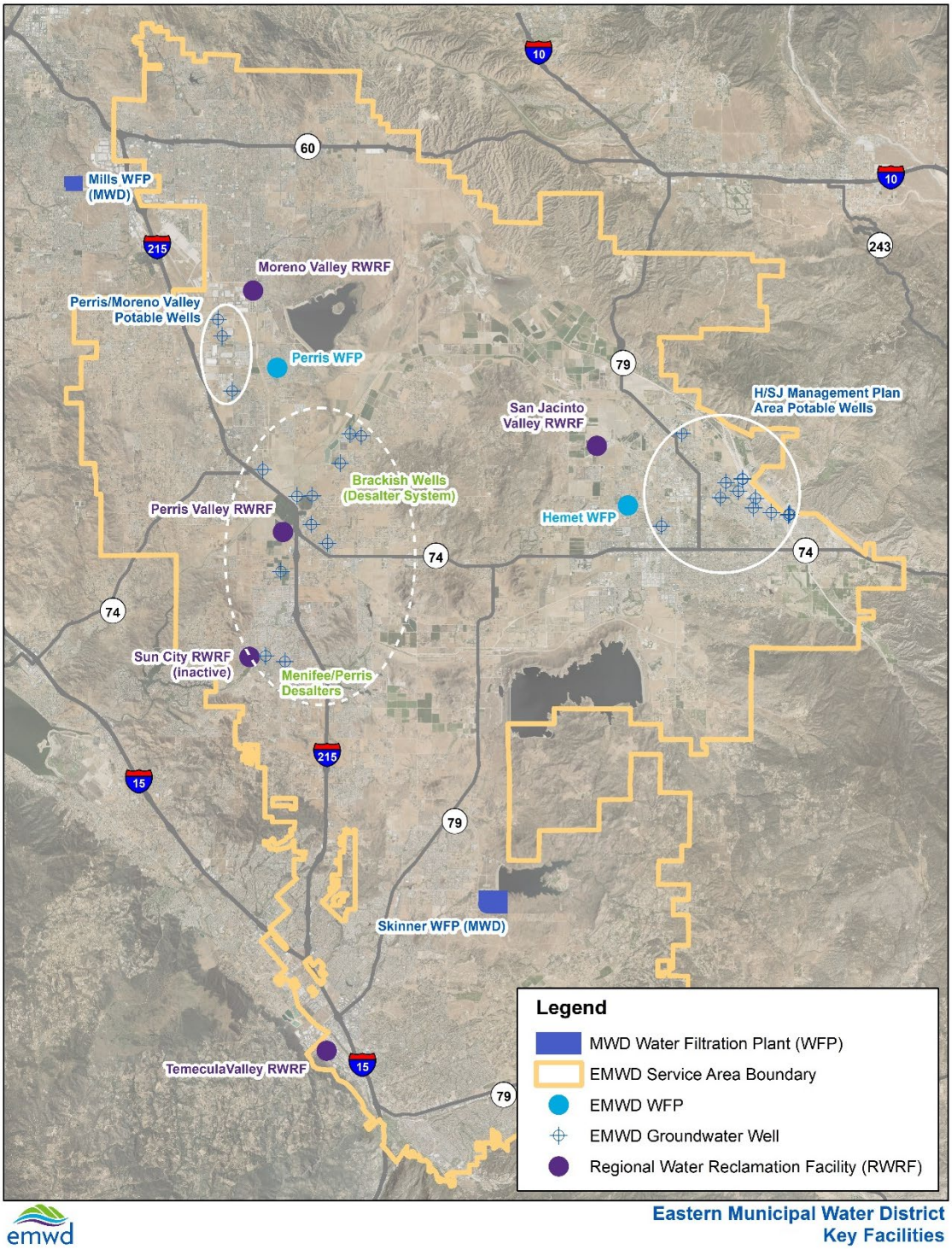
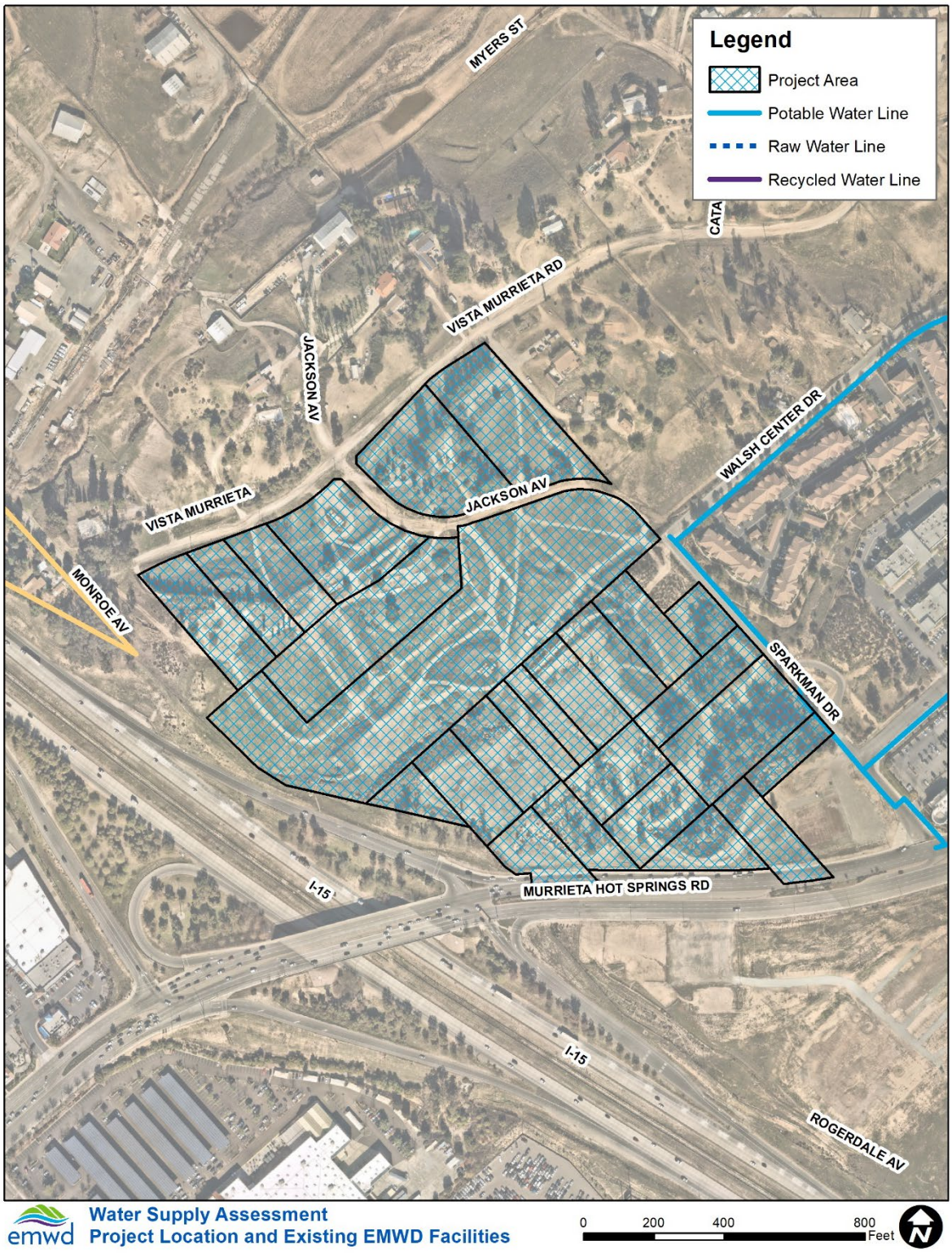


FIGURE 2: PROJECT LOCATION AND EXISTING EMWD WATER LINES



Water Supply Assessment Report

Supplemental Information

Appendix A
EMWD – 2020 Urban Water Management Plan

Appendix B
MWD – 2020 Urban Water Management Plan

Appendix C
EMWD CIP Budget

Jackson Tidus
A LAW CORPORATION

March 13, 2023

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File No: 10406-128444

VIA HAND DELIVERY &
E-MAIL (JRAMAIYA@MURRIETACA.GOV)

Jarrett Ramaiya
City Planner/Deputy Director
Development Services Department
City of Murrieta Planning Division
1 Town Square
Murrieta, CA 92562

Re: Comments on Initial Study/Mitigated Negative Declaration for the Terrace Apartments Project (Development Plan, DP 2022-2518; Tentative Parcel Map, TM 38373; and, Phasing Plan, PH 2022-2614)

Dear Mr. Ramaiya:

This office represents Tres Estrellas, LLC, and Domenigoni Barton Properties, LLC, the owners of The Murrieta Triangle project ("***Triangle Project Owners***"). This letter provides the Triangle Project Owners' comments on the Initial Study and Mitigated Negative Declaration ("***MND***") for the Terrace Apartments Project (Development Plan, DP 2022-2518; Tentative Parcel Map, TM 38373; and, Phasing Plan, PH 2022-2614), which proposes to construct 899 residential units,[1] generally located at the intersection of Walsh Center Drive and Sparkman (future Monroe Avenue) (Assessor's Parcel Nos. 910-031-001–005; 910-031-007–010; 910-031-015; 910-031-017; 910-031-018; 910-031-021–026; 910-190-012–019) (the "***Terrace Project***"), in the City of Murrieta ("***City***").[2]

C-1 The Triangle Project Owners support the development of new housing and the City's efforts to address the critical shortage of attainable housing in California. However, in this case, the Terrace Project's MND simply does not comply with the California Environmental Quality Act (Pub. Resources Code, §§ 21000–21189.70.10, "***CEQA***") and CEQA Guidelines (Cal. Code Regs., tit. 14, §§ 15000–15387, "***CEQA Guidelines***"). As discussed in greater depth below, the MND fails as an informational document, is procedurally deficient, and CEQA requires that the City prepare an

[1] As detailed below, the Terrace Project's MND contains a Project description that is inconsistent and unclear as to *how many buildings are being built* as well as *the unit count*. These inconsistencies prohibit a meaningful opportunity for the public to comment and the City and responsible agencies to make informed decisions regarding the proposed Project.

[2] The Triangle Project Owners reserve the right to submit additional public comments up to the close of the public hearing on the Project.

environmental impact report ("***EIR***") for the Terrance Project rather than a MND, for reasons including the following:

- The information about the proposed Terrace Project provided in the MND and public notices is misleading, inconsistent and confusing. For example:

    - The public notices, MND and supporting technical analyses have materially differing acreage, unit count and number of buildings. The lack of a stable and finite project description makes it impossible for the public and decision-makers to understand what is being proposed as necessary to meaningfully consider and comment on the issues the Terrace Project raises.

    - The discussion of the Terrace Project's potential impacts is likewise inconsistent, including differing numbers of truck trips and amounts of earthwork cut and fill that affect the technical analyses of project impacts to Air Quality, Energy, and Greenhouse Gas, and necessary mitigation measures to reduce those impacts to below significant.

    - The MND's traffic impact analysis includes unsubstantiated and erroneous assumptions, and inconsistently assumes that certain traffic improvements benefitting the Terrace Project will be constructed by the nearby Triangle Project, yet omits the Triangle Project from the Terrace Project's cumulative traffic impact analysis.

  As stated in *McQueen v. Board of Directors of the Mid-Peninsula Regional Open Space District* (202 Cal. App. 3d 1136, 1143), "An accurate project description is necessary for an intelligent evaluation of potential environmental effects of a proposed activity." The inaccurate Terrace Project description necessarily renders all further analyses and determinations ineffectual. Without a clear definition of the activities to be undertaken, the CEQA process cannot ensure that all Terrace Project impacts have been mitigated to the extent feasible, because the ultimate extent of project activities is not fully defined.

- The MND fails to include a Water Supply Assessment ("***WSA***") in violation of Water Code section 10910, et seq., and is legally deficient.

- The MND fails to disclose, analyze and mitigate the Terrace Project site's zoning inconsistency with its General Plan designation. The General Plan designates the site for two non-residential uses: Commercial (C) 0.25–0.75 Floor Area Ratio and Office and Research Park (ORP) 0.6–2.5 Floor Area Ratio. The Project site's zoning (Transit Oriented Development Overlay) purports to allow residential use inconsistent with the General Plan's designations. A General Plan amendment is necessary to make the zoning consistent with the General Plan before any residential use may be approved for the Terrace Project site.

- The Triangle Project Owners' peer review of the Terrace Project's traffic analysis (attached as **Exhibit 1**) confirms that the MND has underestimated the Project's potential traffic impacts, both individually and cumulatively. In fact, the Terrace Project's cumulative impacts analysis completely omits the Triangle Project, an approved mixed use project located within ¼ mile of the Terrace Project that is entitled for a 1,767,914 square foot regional shopping center/mall, comprised of retail, office, restaurant, entertainment and hotel uses on approximately 64 acres. The MND's Traffic Impact Analysis analysis fails to comply with CEQA and does not support the MND's conclusion that traffic-related impacts are below significant, including General Plan consistency (Circulation Element's LOS and fair share contribution policies; Safety Element policies to design streets to minimize traffic conflicts), VMT, public safety resulting from overwhelming storage capacity of existing and planned traffic lanes, air quality, noise and greenhouse gas impacts. An EIR must be prepared because there is substantial evidence that the Terrace Project may have a significant cumulative effect on the environment. (See Pub. Resources Code, § 21080, subd. (c)(2); Cal. Code Regs., tit. 14, § 15070, subd. (b).)

- The MND fails to comply with the requirements of the Western Riverside County Multiple Species Habitat Conservation Plan's ("***MSHCP***") requirement to avoid impacts to riparian/riverine habitat unless it is infeasible to do so. (MSHCP § 6.1.2.) The MND includes no analysis of an avoidance alternative as required by the MSHCP, and no information that avoidance is infeasible.

The information in the MND must be revised to accurately define the current Terrace Project proposal, evaluate its potential impacts (both individually and cumulatively) and identify available mitigation measures. (See *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193 ["An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient [CEQA document]"); *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 510 [the MND must include "sufficient detail to enable those who did not participate in its preparation to understand and to consider meaningfully the issues the proposed project raises..."].) CEQA requires that the data presented "must not only be sufficient in quantity, it must be presented in a manner calculated to adequately inform the public and decision makers, who may not be previously familiar with the details of the project". (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442.) The MND violates all of these most basic CEQA requirements.

C-2

I. The Project Description is Inaccurate, Inconsistent, and Inadequate, and the Resulting Environmental Analysis is Ineffectual.

A. The Project Description Inconsistently Describes the Proposed Number of Buildings and Unit Count.

"CEQA mandates '... that environmental considerations do not become submerged by chopping a large project into many little ones—each with a minimal potential impact on the environment—

which cumulatively may have disastrous consequences.'" (*Citizens Assn. for Sensible Development of Bishop Area v. County of Inyo* (1985) 172 Cal.App.3d 151, 165, internal citations omitted.) CEQA avoids such a result by broadly defining "project" to mean "the whole of an action" and an "accurate, stable, finite project description is the [*s]ine qua non* of an informative and legally sufficient" environmental document. (See *County of Inyo, supra*, 71 Cal.App.3d at p. 193 [applied in the context of an EIR]; *Center for Sierra Nevada Conservation v. County of El Dorado* (2012) 202 Cal.App.4th 1156, 1171 [applied in the context of a negative declaration] (*El Dorado*); see *ibid.*, internal citations omitted ["The negative declaration is inappropriate where the agency has failed either to provide an accurate project description or to gather information and undertake an adequate environmental analysis."].) Indeed, "[a]n accurate and complete project description is necessary for an intelligent evaluation of the potential environmental impacts of the agency's action." (*Ibid.*, internal citations omitted.) "'Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal ... and weigh other alternatives in the balance.'" (*Ibid.*, citing *County of Inyo, supra*, 71 Cal.App.3d at pp. 192–93.)

The public notices, although both dated February 10, 2023 (see Notice of Completion and Notice of Intent, both dated Feb. 10, 2023, at p. 2), provide materially inconsistent Project Descriptions—an issue that is mirrored throughout the underlying MND. For example, the Notice of Completion's Project Description describes the proposed Terrace Project as including only nine (9) two-story, carriage-style buildings; whereas the Notice of Intent (including the Notice of Availability and Intent prepared by the Project applicant) describe the Project as proposing to construct twelve (12) two-story, carriage-style buildings. (Compare NOC, at p. 1, under "Project Description;" with NOI, at p. 1; and Notice of Availability & Intent, at p. 1, both also under "Project Description.") The Notice of Completion's Project Description (also as described in the attached Summary Form for Electronic Submittal, at p. 1), describes the proposed Terrace Project as including three (3) fewer two-story buildings. (See, sources cited, *supra.*) The Project description in the MND, by contrast, includes only (9) two-story, carriage-style buildings. (MND, at p. 3.) The public notices likewise inconsistently describe the Project site in terms of its gross acreage. The Notice of Completion describes the Terrace Project as constructing 899 apartment units on total of 37.8 acres, i.e., 2.2 acres less than that provided in the Notice of Intent (see Notice of Completion, at p. 1 [under both "Project Location" and "Development Type"]), which describes the Project site as 40.03 acres (see Notice of Intent to Adopt MND, at p. 1).

Inconsistencies are also reflected in the description of unit composition. The Notice of Completion describes the Terrace Project's units as comprised of 360 one-bedroom units, 471 two-bedroom units, and 69 three-bedroom units (see also MND, App. A, at p. 1 ["The project would provide 360 one-bedroom units, 471 two-bedroom units and 69 three-bedroom units. Each building would be four stories or approximately 45 feet in height."]). The Notice of Intent, by contrast, describes the unit composition as including 359 one-bedroom units, 482 two bedroom units, and 58 three-bedroom units. (Compare NOC, at p. 1, under "Project Description;" with NOI, at p. 1; and Notice of Availability & Intent, at p. 1, both also under "Project Description.") Appendix A also

describes the Project as constructing a total of 900 apartment units. (MND, App. A, at pp. 1, 4, fig. 2 Site Plan [900 units at 30.70 dwelling units per acre].)

The result of the project description inconsistencies is that the MND has failed to disclose the scope of Terrace Project features that will contribute to potential environmental impacts. For example, the traffic and air quality-related analyses cannot properly evaluate the project impacts because basic information is missing such as the number and type of buildings and residential units to be constructed. The inconsistencies directly impair project impact information such as the number of short-term construction vehicles and anticipated number of residents who will be using roads and transit serving the project vicinity. Additionally, mitigation measures necessary to reduce potential impacts to below significant cannot be properly analyzed. The City must correct these inconsistencies, provide accurate public notice of the Project to enable a meaningful opportunity for public comment, and accurately disclose and reevaluate the Project's potential impacts and mitigation measures.

C-3

B. <u>The Project Description Inconsistently Describes Soil Import Material Without Accounting for 269 Haul Trips in the Air Quality, Energy, and Greenhouse Gas Analyses</u>.

The Notice of Intent describes the Project as consisting of 319,200 cubic yards of cut, 322,000 cubic yards of fills and import of 3,200 cubic yards of material. (NOI, at p. 1.) The Project description, however, describes that the "Project would require approximately 4,300 cubic yards of imported material." (MND, at p. 4; MND, App. A, at p. 3 ["4,300 cubic yards of fill import"].)

Aside from this general inconsistency in the amount of import material, the Project Description "[a]ssum[es] 16 cubic yards per truck, a total of 269 trips would be required" to haul-in the imported material. (MND, at p. 4.) However, Appendix A to the MND, including the data from the CalEEMod Program provided in support thereto, does not appear to incorporate these haul trips; instead, the MND assumes that only "approximately 20 haul trips would be required to remove remnant foundation material associated with previous development on the site." (MND, at p. 21; see also, App. A, at p. 13.) While this may be true, it does not account for the approximately 269 trips required to import the fill material (MND, at p. 4).[3]

Thus, all of the MND impact analyses that rely on Appendix A and the data therein must be redone and recirculated accordingly.

[3] CalEEMod User Guide requires that "[i]f demolition, grading, and/or site preparation activities are part of the project, then the user will need to enter additional information on the appropriate construction screens, including but not limited to, the amount of material to be demolished and transported to or from the site." (MND, App. A, Air Quality/Greenhouse Gas Study, App. A, CalEEMOD Air Quality and Greenhouse Gas Emissions Model Results Summer/Annual at pp. 1-2 ["beyond default" inputs not showing import]; see also pp. 1-32 [for all data related to CalEEMod Air Quality and Greenhouse Gas Emissions Model Results].)

C-4 **II. Substantial Evidence Supports a Fair Argument that the Terrace Project Has Significant Environmental Impacts Requiring an EIR.**

It is well-established that "[t]he foremost principle under CEQA is that the Legislature intended CEQA 'to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language.'" (See *Protect Niles v. City of Fremont* (2018) 25 Cal.App.5th 1129, 1138 [finding that substantial evidence supported a fair argument of significant impacts on aesthetics and traffic, more significant than reflected in the MND]; see also *Citizens for Responsible & Open Government v. City of Grand Terrace* (2008) 160 Cal.App.4th 1323, 1333–41 [finding that substantial evidence supported a fair argument of significant impacts from increase in population density, building height, and noise attributable to the project, even taking into consideration mitigation measures, requiring an EIR and not MND]; *Georgetown Preservation Society v. County of El Dorado* (2018) 30 Cal.App.5th 358, 374–77 [finding the "low-threshold fair argument test has been met" based on public comments objecting to the size and overall appearance of the proposed building requiring an EIR and not MND].)

"CEQA and the regulations implementing it 'embody California's strong public policy of protecting the environment.'" (*Save the Agoura Cornell Knoll v. City of Agoura Hills* (2020) 46 Cal.App.5th 665, 673, quoting *Tomlinson v. County of Alameda* (2012) 54 Cal.4th 281, 285.) "At the heart of CEQA is the requirement that public agencies prepare an EIR for any project that may have a significant effect on the environment." (*Id.* at p. 674, internal punctuation omitted, citing *Friends of College of San Mateo Gardens v. San Mateo County Community College Dist.* (2016) 1 Cal.5th 937, 944.) "Given the statute's text, and its purpose of informing the public about potential environmental consequences, it is quite clear that an EIR is required even if the project's ultimate effect on the environment is far from certain." (*Ibid.*, internal punctuation and citations omitted.) It follows that, if a lead agency like the City, here, is "presented with a fair argument that a project may have a significant effect on the environment, the lead agency shall prepare an EIR even though it may also be presented with other substantial evidence that the project will not have a significant effect." (See *ibid.*, internal punctuation and citations omitted.)

An agency's decision to rely on a MND under CEQA is reviewed for abuse of discretion under the "fair argument" standard:

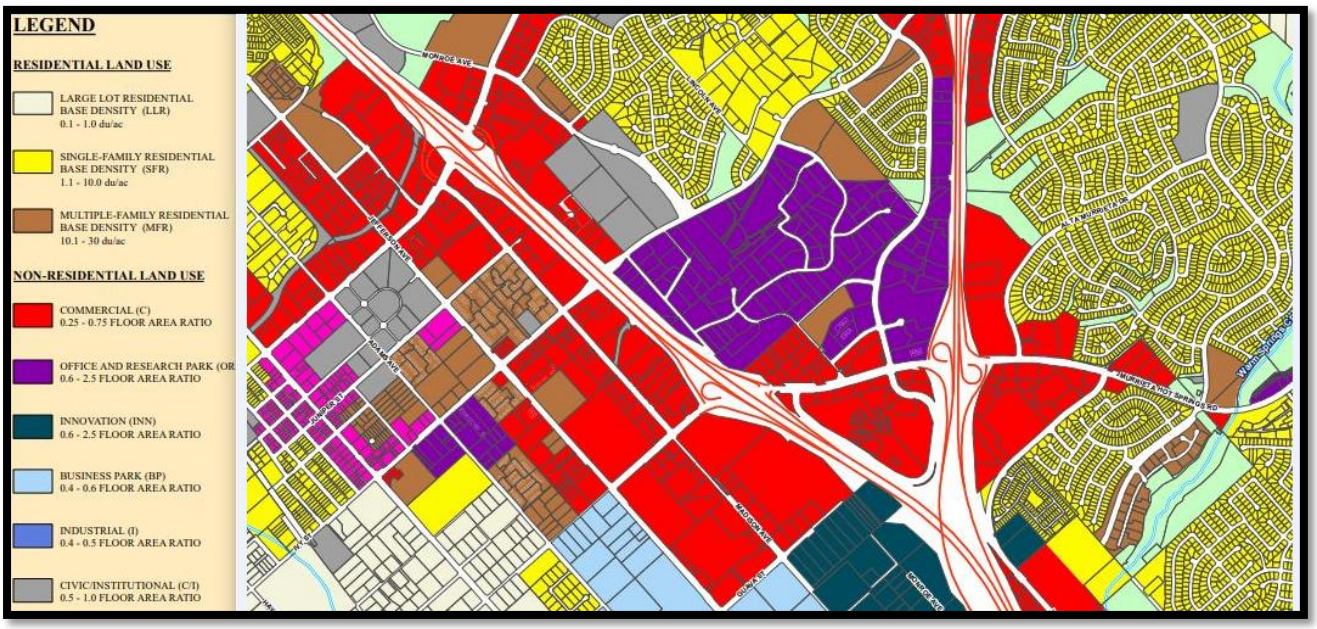
> "[A] reviewing court may not uphold an agency's decision [not to prepare an initial EIR under the fair argument test] 'merely because substantial evidence was presented that the project would not have [a significant environmental] impact. The [reviewing] court's function is to determine whether substantial evidence support[s] the agency's conclusion as to whether the prescribed "fair argument" could be made. If there [is] substantial evidence that the proposed project might have a significant environmental impact, evidence to the contrary is not sufficient to support a decision to dispense with preparation of an EIR and adopt a negative declaration, because it [can] be "fairly argued" that the project might have a significant environmental impact. Stated another way, if the [reviewing] court perceives substantial evidence that the project might have

> such an impact, but the agency failed to secure preparation of the required EIR, the agency's action is to be set aside because the agency abused its discretion by failing to proceed "in a manner required by law.'"

(*Id.* at pp. 675–76.)

C-5 **A. <u>The MND Does Not Disclose the Inconsistency with Between the General Plan and Zoning, Which Must Be Resolved Through General Plan Amendment</u>.**

Per the General Plan 2035 Land Use Map, the Project site is designated with two non-residential land uses: Commercial (C) 0.25–0.75 Floor Area Ratio and Office and Research Park (ORP) 0.6–2.5 Floor Area Ratio. As further detailed below, while the Project's zoning purports to allow for residential uses under the Transit Oriented Development overlay, a General Plan Amendment is required to remedy the inconsistency. (See *Families Unafraid to Uphold Rural El Dorado County v. El Dorado County Bd. of Sup'rs* (1998) 62 Cal.App.4th 1332, 1342.)



The General Plan, Land Use Element (at p. 3-26) defines non-residential designations of Commercial and Office and Research Park as follows: the designations as follows:

> Commercial (0.25 – 0.75 FAR). The Commercial designation provides for a broad mix of commercial retail, service, and office uses that serve the local and regional consumer. Typical uses include retail stores, personal services, restaurants, motor fuels, business offices, and lodging

> intended to meet the needs of city residents, travelers, and the daily employment population.
>
> Office and Research Park (0.60 – 2.5 FAR). The Office and Research Park designation provides for a variety of employment intensive uses such as business and medical offices, corporate headquarters, medical services, research and development, and technological advancement. Retail and service uses are limited to those that best meet the needs of the local businesses and their employees. Development will reflect the high freeway visibility of the areas and the appropriate buffering of adjacent residential areas.

Per the Murrieta Zoning Map, the Project site's zoning is Office (O) and Regional Commercial (RC), with a Transit Oriented Development Overlay, which purports to allow for residential development. (Murrieta Municipal Code ("***MMC***"), §§ 16.11.010, subd. (A); 16.16.040.) However, the Project site's General Plan designations make no such allowance for residential development.

There is a hierarchy in land use regulation. At the top is the general plan, which is the constitution for future development. (*DeVita v. County of Napa* (1995) 9 Cal.4th 763, 773.) Beneath the general plan is the applicable zoning. (Gov. Code. § 65455.) The Terrace Project site's zoning is invalid as inconsistent with the General Plan and the Project requires a General Plan amendment. The MND fails to disclose the Terrace Project's inconsistency with the General Plan, the General Plan amendment necessary to mitigate the inconsistency, and the impediments to processing a General Plan amendment within the timeframes for Project implementation evaluated in the MND and supporting technical analyses. Additionally, absent preparation of an EIR analyzing the correct project description, the City will be unable to make the mandatory findings required for a General Plan amendment, including findings that the amendment would not be detrimental to public health and safety, and that the amendment is in compliance with CEQA. (City Municipal Code § 16.58.080(A)(2), (3).)

C-6

B. <u>The MND Fails to Include a Water Supply Assessment In Violation of Water Code Section 10910, et seq</u>.

Because the Terrace Project proposes a residential development of more than 500 residential units that the City determined requires a MND, the City must include a water supply assessment ("***WSA***") as part of the MND. The WSA is to be provided by the water supplier to the Project site, Eastern Municipal Water District, and is required to include specific information enumerated by statute to enable a determination whether EMWD's total projected water supplies are adequate and available during normal, single dry, and multiple dry water years for a 20-year projection, to meet the projected water demands associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses. (Water Code §§ 10910, 10912; *Center for Biological Diversity v. County of San Bernardino*, 185 Cal. App. 4th 866.)

The MND fails to include the required WSA in violation of Water Code sections 10910-10915, and its conclusion that the Terrace Project will have a less than significant impact on water supplies is deficient as a matter of law.

C-7

C. The Traffic Impact Analysis Fails to Properly Consider Project-Specific and Cumulative Impacts.

The CEQA Guidelines define a MND as follows:

> "Mitigated negative declaration" means a negative declaration prepared for a project when the initial study has identified potentially significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) ***there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment.***

(Cal. Code Regs., tit. 14, § 15369.5, emphasis added.) "Substantial evidence" as used in the CEQA Guidelines includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts" and, in the context of a decision supported by "substantial evidence," means:

> [E]nough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on the environment is to be determined by examining the whole record before the lead agency. Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.

(Cal. Code Regs., tit. 14, § 15384.) Substantial evidence ***does not*** include:

> Argument, speculation, unsubstantiated opinion or narrative, or evidence that is clearly inaccurate or erroneous, or evidence that is not credible, shall not constitute substantial evidence. Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.

(Cal. Code Regs., tit. 14, § 15064, subd. (f)(5).)

When assessing whether a cumulative effect requires an EIR, the City must consider: “"whether the cumulative impact is significant and whether the effects of the project are cumulatively considerable. An EIR must be prepared if the cumulative impact may be significant and the project's incremental effect, though individually limited, is cumulatively considerable.” (Cal. Code Regs., tit. 14, § 15064, subd. (h)(1).) “‘Cumulatively considerable’ means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.” (*Ibid.*)

As to cumulative impacts, MND Appendix N (Traffic Impact Analysis) lists sixteen (16) projects for consideration with respect to cumulative impacts. (Cal. Code Regs., tit. 14, § 15130, subd. (b)(1)(A) [lists].) At the end of that list, the Triangle Project appears as a single, non-numbered item, misleadingly presented as though the Triangle Project was among the listed items considered for cumulative impacts. However, the text says that it was not:

> **Triangle Project**
>
> In addition to the above, the Triangle Specific Plan bounded by I-15 to the west, 1-215 to the east and Murrieta Hot Springs Road to the north was first approved by City Council back in 2008, and then subsequently again in 2013. ***This project has not begun construction on any of the five phases of development. No Development Plans have been submitted to the City and therefore, this project was not included as a Cumulative project***.

(MND, App. N, at p. 35, emphasis added.) Because the MND uses the “list” approach for evaluating cumulative impacts, the CEQA Guidelines mandate that the City include in that list future projects producing related or cumulative impacts. (Cal. Code Regs., § 15130, subds. (b)(1)(A), (2).) The CEQA Guidelines do not authorize the City to exclude approved projects producing related or cumulative impacts simply because they have not yet pulled permits.

Specifically, the list, itself, includes *probable* future products and, when utilizing such a list, factors to be considered do not allow for the omission of probable future projects on grounds that have not yet submitted development plans as the MND wrongly attempts to do here. (Cal. Code Regs., tit. 14, § 15130, subds. (b)(1)(A), (b)(2).) In fact, development plans *have* been submitted to the City, on or about October 24, 2022, and the Triangle Project Owners have been in constant communication with the City for the past year to coordinate development plan submittal for the Triangle Project. The MND’s statement that the Triangle Project has not submitted development plans is incorrect and does not justify excluding the Triangle Project from the MND’s cumulative impact analysis. The City’s decision not to include the Triangle Project in the MND’s cumulative impact analysis is based on erroneous information, not substantial evidence, and is therefore arbitrary. The MND’s cumulative impacts analysis is inadequate.

The City's failure to include the Triangle Project in its cumulative impacts analysis is only made more specious by the fact that, in the same analysis, the MND relies on the Triangle Project's installation of a traffic signal at the Monroe Avenue / Murrieta Hot Springs Road Intersection for required improvements. (MND, App. N, at pp. 83–84.)

One result of excluding the Triangle Project from the MND's cumulative impact analysis is that the MND fails to disclose and plan for the true extent of traffic related impacts and wrongfully relieves the Terrace Project from the obligation to contribute 25% or more of the costs of the road improvements required to mitigate cumulative traffic impacts. According to the City's General Plan, level of service (LOS) will continue to be a key performance measure used to analyze traffic congestion. (General Plan Circulation Element § 5.4, p. 5-5.) Here, substantial evidence supports a fair argument that the Terrace Project as mitigated in the MND has a significant effect on the environment requiring an EIR rather than the MND, given the non-exhaustive list of impacts that were improperly analyzed or unconsidered. (See Pub. Resources Code, § 21080, subd. (c)(2); Cal. Code Regs., tit. 14, § 15070, subd. (b).)

C-8 As discussed in the RK Engineering Group, Inc. Letter Report attached to this letter as Exhibit 1, the MND's Traffic Impact Analysis also contains various flawed assumptions. For example, the analysis is based on an unsubstantiated assumption that 60% of the AM and PM peak traffic will utilize Monroe/Sparkman. The Traffic Impact Analysis failed to disclose, analyze and mitigate the impacts that will result from redistribution of the Project's trips as a result of the need for a traffic signal at the intersection of Monroe Avenue and Murrieta Hot Springs Road (Intersection #9).

The Traffic Impact Analysis also omitted any analysis of queuing at Project study intersections and the resulting impacts that may result from exceeding the capacity of existing and planned traffic lanes. As noted in the General Plan, traffic congestion results in adverse air pollution impacts to "sensitive land uses" including residential uses, health care or child care facilities, and recreation facilities; and adverse noise pollution. (General Plan Healthy Community Element, p. 7-5.) By failing to analyze such basic information as traffic queuing, the MND fails to analyze and mitigate these potential environmental impacts that are known to result from congested roadways.

Additionally, the Traffic Impact Analysis did not use the proper timeframes when the Project will be occupied for Opening Year Phase 1 and Phase 2 traffic analyses. For the opening year short-term traffic analysis, the Traffic Impact Analysis utilized the Year 2025 for Phase 1 and Year 2028 for Phase 2. However, elsewhere the Traffic Impact Analysis notes that the actual Phase 1 and Phase 2 Project construction would not be completed until Years 2026 and 2029, respectively. Full occupancy of the Project would necessarily result sometime later. Therefore, the MND's Traffic Impact Analysis should have assumed a later date for full Project occupancy. The effect of this error is that the MND fails to disclose, analyze and mitigate additional traffic impacts occurring as a result of additional ambient growth likely to require additional road improvements to mitigate traffic impacts.

The Traffic Impact Analysis' evaluation of the Project's fair share contribution and required improvements needs to be reassessed based upon a corrected trip distribution, Opening Year analysis.

And queuing analysis, all of which would affect the LOS. The MND's failure to properly analyze the Project's traffic impact and accurately allocate the Project's fair share contribution to necessary road improvements violates the General Plan. ("Traffic impact analysis requirements for individual development projects would continue to be used to effectively determine the operational effect of development projects on the circulation system and define appropriate improvements which adequately address project traffic increases." (General Plan Circulation Element, § 5.6.))

C-9 **D. Mitigation Measures are Insufficiently Described and Lack Proper Enforcement Mechanisms.**

Relatedly, the MND is not based on adopted, binding, enforceable mitigation measures included in the MND. (See, e.g., *Quail Botanical Gardens Foundation, Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; Cal. Code Regs., tit. 14, § 15071, subd. (e) [negative declaration must contain any mitigation measures included to avoid significant effects]; see also Pub. Resources Code, § 21081.6, subd. (b) [providing mitigation measures must be made "fully enforceable through permit conditions, agreements, or other measures"]; Cal. Code Regs., tit. 14, § 15126.4, subd. (a)(2) ["[M]itigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments. In the case of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation, or project design."].) For example, with respect to circulation impacts, the MND discusses that the "Project shall pay a fair share cost towards the installation of a new traffic signal at the intersection of Hancock Avenue and Walsh Center Drive." (MND, at p. 104.) This factor was incorporated into its analysis of circulation. However, Appendix N further reveals that this assumption is based on contingent assumptions: "[i]f the improvements are not built by The Triangle Specific Plan, the Project should install a traffic signal at this intersection and provide the following ultimate intersection geometry based on the geometry assumed in the Triangle Specific Plan." (MND, App. N, at p. 84.) Such conditional language does not amount to the adopted, binding, enforceable mitigation measures contemplated by CEQA properly incorporated into an analysis of potential environmental impacts.

C-10 **E. The MND's Habitat Assessment MSHCP Consistency Analysis is Deficient.**

The MND's conclusion that the Terrace Project is consistent with the MSHCP is not supported by substantial evidence. In fact, information in the MND indicates that the Project is inconsistent with the MSHCP. The MSHCP requires development projects to avoid riparian/riverine areas, explaining that conservation of these areas is intended to protect habitat that is essential to a number of listed or special-status water-dependent fish, amphibian, avian and plant species. (MSHCP § 6.1.2.)

The Project, however, proposes to construct within two drainages qualifying as riparian/riverine areas under the MSHCP, resulting in the loss of protected habitat. To ensure that the MSCHP's riparian/riverine standards are met, the City must have the Project proponent demonstrate, through the CEQA process, its efforts to avoid impacts to riparian/riverine habitat. The MSHCP requires avoidance if feasible. If avoidance is not feasible, then "a practicable alternative that

minimizes direct and indirect effects to riparian/riverine areas and vernal pools and associated functions and values to the greatest extent possible shall be selected." Those impacts that are unavoidable shall be mitigated such that the lost functions and values as they relate to MSHCP-covered species are replaced by way of a "Determination of Biologically Equivalent or Superior Preservation ("***DBESP***"). (MSHCP § 6.1.2.)

A DBESP for the Terrace Project is attached as Appendix F to the MND. However, there is no evaluation of a Project alternative to avoid the riparian/riverine habitat included in the MND or DBESP, no information explanation why avoiding the riparian/riverine habitat is not feasible, and no information confirming that the Project and proposed off-site mitigation "minimizes direct and indirect effects to riparian/riverine areas" to the greatest extent possible". Rather, the MND simply states that the applicant proposes to purchase mitigation credits in a "Riverpark Mitigation Bank" at a ratio of 3:1 to compensate for the loss of riparian/riverine habitat. (MND proposed mitigation measure MM BIO-2.)

The DBESP procedure is one of several mechanisms in the MSHCP requiring advance notification to the U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife (collectively, the "***Wildlife Agencies***") for review and oversight of the City's MSHCP activities. (MSHCP §§ 6.6.2(F), 6.11.) Specifically, the City is required to provide the Wildlife Agencies a 60-day advance review and response period for DBESPs.

When a DBESP is proposed, it is not uncommon for the Wildlife Agencies to disagree that the mitigation proposed by a project developer is biologically equivalent or superior, or to exercise their oversight authority by calling for certain project changes as a condition of determining MSHCP consistency. For this reason, the Western Riverside County Regional Conservation Agency ("***RCA***", the agency that administers the MSHCP) recommends that the DBESP and other MSHCP consistency information should be submitted for review by the Wildlife Agencies before release of the draft CEQA document. RCA explains that this "would provide some level of assurance by the CEQA lead agency that any potential conflicts with applicable regional habitat conservation plans have been addressed." (https://www.wrc-rca.org/wordpress/wp-content/uploads/MSHCP_DBESP_Template_revised_04.11.19.pdf.)

The MND, however, includes no such assurance. There is no indication in the MND whether the MSHCP Consistency Analysis (MND Appendix C) DBESP (MND Appendix F) have been submitted to RCA and the Wildlife Agencies and whether any determination of the Project's consistency with the MSHCP has been received by the City. Without some level of assurance that any potential conflicts with the application regional habitat conservation plans have been addressed, the City should not approve the MND or the DBESP attached as Appendix F. The MND must be recirculated to include the Wildlife Agencies' determination whether the DBESP provides assurance that the Project's proposal to substitute off-site mitigation is adequate to make the Project consistent with the MSHCP, instead of avoiding riparian/riverine habitat onsite to the extent feasible as required by the MSHCP.

C-11 **F. At the Very Least, a *Complete and Accurate* MND Must Be Recirculated.**

At the very least, a substantially revised MND must be recirculated (Cal. Code Regs., tit. 14, § 15073.5) to include an accurate description of the Terrace Project and account for the deficiencies identified above. (*Id.*, subd. (b).)

Additionally, the MND as circulated for public review was incomplete, on its face. Appendix N, the Transportation Impacts Analysis discussed above, references supporting data purportedly attached as Appendix I thereto, but failed to include that data. (See MND, App. N, at pp. 57, 84.)

For all of these reasons, the MND as circulated for public review was incomplete and deficient and must be recirculated for the full public review period.

C-12 **III. Conclusion**

For all of the above reasons, an EIR is the appropriate CEQA document to evaluate the Terrace Project. There is substantial evidence that the Terrace Project may have a significant effect on the environment, for example, in the areas of air quality and traffic. We urge the City to prepare an EIR including corrected information about the Terrace Project, its potential environmental impacts and necessary mitigation measures.

At the very least, the MND's errors, inconsistencies and faulty (or missing) analyses must be corrected and the MND must be recirculated for public review and comment. The MND includes many significant errors that violate applicable laws and deprive the interested public of a meaningful opportunity to understand and comment on the Terrace Project's potential environmental impacts.

Sincerely,

Michele A. Staples

Enclosure: **Exhibit 1**, RK Engineering Group, Inc. Letter Report

cc: Greg Mattson, Contract Planner, gmattson@murrietaca.gov*
Gregory P. Regier, Esq., Jackson Tidus*
Stephanie L. Talavera, Esq., Jackson Tidus*
* Via email, with Enclosure

EXHIBIT 1

March 10, 2023

Mr. Saul Jaffe
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618 West Baseline Road
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Andy Domenigoni
DOMENIGONI BARTON PROPERTIES, LLC
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Subject: The Terraces at Murrieta TIA (Traffic Impact Analysis) Review - MND (Mitigated Negative Declaration) Development Plan (DP) (2022-2518), Tentative Parcel Map (TM38373) & Phasing Plan (PH2022-2614), City of Murrieta

Dear Sirs,

Introduction

RK engineering group, Inc. (RK) is pleased to provide this review of the Terraces at Murietta TIA (Traffic Impact Analysis), dated December 12, 2022, which was prepared by Linscott, Law and Greenspan Engineers. The TIA is part of the technical studies for the MND (Mitigated Negative Declaration) for the Terraces at Murietta project. The proposed project includes the construction of 899 multifamily units in two phases. The project is located north of Murietta Hot Springs Road between the I-15 Freeway and Sparkman Court (which will become Monroe Avenue), in the City of Murietta. Monroe Avenue will be the primary access route serving the Terrace's project. RK has reviewed the TIA with respect to standard traffic engineering practice and the City of Murietta Traffic Impact Analysis Guidelines**.**

This review has been prepared by Robert Kahn, PE and Justin Tucker, PE on behalf of Domenigoni Barton Properties, LLC. Mr. Kahn and Mr. Tucker have over 60 years of experience in transportation planning and the preparation of traffic impact studies. RK is a full-service transportation and Environmental engineering consulting firm that provides services to a wide variety of public sector and private sector clients. RK provides peer review services for the review of traffic impact studies for a number of cities throughout Southern California. Copies of the reviewer's resumes are included in Appendix A.

RK has reviewed the TIA and has a number of concerns with the technical analysis of the study as it has been presented in the MND for the project. The primary technical issues that RK has identified include the following:

1. The TIA did not consider the trip generation for the Murietta Triangle project in the Opening Year traffic analyses. The Murrieta Triangle project is a mixed-use project located within ¼ mile of the project and is entitled for 1,767,914 square feet of development. This would change the results of the study.

2. The study did not consider the redistribution of the project's trip distribution that will occur as a result of the need for a traffic signal at the intersection of Monroe Avenue and Murietta Hot Springs Road (i.e., Intersection #9). This will affect the impacts of the project and the improvements required for the project.

3. The TIA did not include an evaluation of queuing at the project study area intersections, which may result in exceeding the storage capacity of the existing/planned traffic lanes. This would affect traffic operations and the ability for roadways such as Murrieta Hot Springs Road to adequately function.

4. The study did not utilize reasonable time frames when the project will be occupied for the Opening Year Phase 1 and Phase 2 traffic analyses. This will potentially result in greater impacts and improvement requirements than what is reported in the TIA.

5. The traffic impact assessment needs to be revised to include the Murrieta Triangle Project and the redistribution of project traffic with the required traffic signal at Monroe Avenue and Murrieta Hot Springs Road (i.e., Intersection #9). As a result, the fair share analysis and the project improvement responsibilities need to be reassessed, based upon the adjusted project trip distribution which includes the future signalization of the intersection of Monroe Avenue and Murietta Hot Springs Road.

Comments

1. **The traffic impact analysis did not consider the Murietta Triangle project in the opening year analyses.** The traffic impact analysis did not include any of the potential traffic generated by the Murrieta Triangle project for Opening Year 2025 or Opening Year 2028 conditions, which would likely result in different impacts and improvement requirements. The Murietta Triangle project has been known and approved for over 10 years and has an approved Specific Plan, FEIR (Final Environmental Impact Report), Development Plans, a preliminary grading plan,

a tentative tract map, roadway improvement plans and an addressing plan have been submitted to the City of Murietta.

The Murietta Traffic Impact Analysis Guidelines clearly indicate that "Proposed projects in the study area that have been submitted to the city for processing, but not yet approved, may also be included at the discretion of the city engineering department". The Murrieta Triangle project has an approved Specific Plan, approved FEIR (Final Environmental Impact Report) that included an extensive traffic impact analysis, preliminary development plans have been submitted to the City, and proposed roadway improvement plans and other related plans have been submitted to the City. Therefore, it should be included in the study.

The Murietta Triangle project has been known for over 10 years and it is typical traffic engineering practice to include all or a portion of an approved Specific Plan that is likely to be developed in the near future. It should be noted that the traffic study reviewed both Opening Year Conditions for Years 2025 and 2028, as well as Horizon Year Conditions for 2040. As noted later in this letter (Comment 4), the actual full occupancy for the Terraces at Murrieta project will occur later than Years 2025 and 2028. The 2040 analysis did include the buildout of the City of Murrieta including the Murietta Triangle project. However, the 2040 analysis utilized model-provided turning movement volumes for the Murrieta Triangle Project, which are understated compared to the forecasted volumes as provided in the August 2008 Urban Crossroads TIA which was the basis for the Murrieta Triangle Traffic Analysis.

2. **The Trip Distribution for the Terraces at Murietta Project (which was the basis for the Murietta Triangle projects traffic analysis).** The TIA distribution of the project trips did not assume the correct amount of project traffic utilizing Monroe Avenue at the Murietta Hot Springs intersection. The study routed all of the eastbound (outbound) project trips (towards the I-215 Freeway) to Walsh Center Drive and Medical Center Drive, instead of making a southbound left turn at the Monroe Avenue at Murietta Hot Springs intersection. This was assumed for all project scenarios including existing plus project, Opening Year 2024, Opening Year 2028, and City General Plan Buildout Year 2040.

   As noted in the traffic study, the intersection of Monroe Avenue and Murietta Hot Springs Road does not achieve an acceptable LOS (level of service) for Year 2028 and Year 2040 conditions (unsignalized and no southbound left-turn). As a result, the study has not identified the project's full traffic contribution to the intersection

of Monroe Avenue at Murietta Hot Springs Road nor the project's responsibility to contribute to its improvements, including signalization and other roadway improvements.

Due to the project's location, the utilization of Monroe Avenue as a primary means of access is logical and is necessary for the full development of the project. The distance from the intersection of Monroe Avenue at Walsh Center Drive near the project to the intersection of Hancock Avenue is nearly 50% shorter using the route of Monroe Avenue to Murrieta Hot Springs Road rather than using the Walsh Center Drive route and nearly 25 % shorter than using the Medical Center Drive route to the same location. Therefore, the Monroe Avenue route would be the more likely route of travel for the Terrace's at Murrieta project to the I-215 Freeway.

3. **The TIA did not consider queuing impacts at the study area intersections that are likely to adversely impact traffic operations, especially along Murrieta Hot Springs Road.** Typically, traffic studies need to assess the queuing at left-turn lanes, right-turn lanes and through lanes to determine whether queuing would backup into adjoining intersections and roadway segments. This is critical at a number of locations, in particular the intersection of Monroe Avenue at Murietta Hot Springs Road, and at the I-15 Freeway Ramp intersections. Murrieta Hot Springs Road, between the I-15 and I-215, is congested under existing conditions and the project will add to any existing queuing deficiencies.

   The City of Murrieta *Traffic Impact Analysis Preparation Guidelines*, dated March 2021, provides guidance for queuing deficiency analyses. Furthermore, the City's Guidelines also state that for locations where closely spaced intersections occur or queues build over space and time (extending to upstream or downstream intersections), microsimulation should be utilized to accurately evaluate the intersections as a system. This may require inclusion of freeway facilities. Lastly, as it relates to traffic counts, the City's Guidelines recommend that for congested conditions, back of queue estimates by approach (and turning movement) should be conducted every 15 minutes.

   Specifically, the existing eastbound left-turn at the intersection of Monroe Avenue and Murrieta Hot Springs Road is relatively short (approximately 200 feet of available stacking) and does not appear to be sufficient length to contain the potential left-turn volumes under any traffic scenario. This would result in left-turn queues backing up into the through lanes of eastbound traffic on Murietta Hot Springs Road. Other critical areas to consider for queuing are the intersections at the I-215 Freeway ramps where queues could block the intersections and through movements of traffic at the interchange. As a result of this, a full queuing analysis is necessary for each of the scenarios studied in the TIA.

To provide supporting evidence, Appendix B contains Vistro calculation worksheets (utilizing the latest version of the HCM methodology) for the intersection of Monroe Avenue and Murrieta Hot Springs Road. Specifically, RK ran LOS calculations for Opening Year 2028 + Entire Project AM and PM peak hours. These calculations utilize the same traffic volumes utilized in the Terraces at Murrieta TIA. As shown, the reported delays are much worse than what are reported in the Terraces at Murrieta TIA (i.e., 713.5 seconds/vehicle during the AM peak hour; 1,353.1 seconds/vehicle during the PM peak hour). These are the worse-case movement delays for the two-way stop-controlled conditions, which is a very poor LOS F. This is significantly worse than the AM delay/LOS of 31.0 seconds (LOS D) and the PM Delay/LOS of 36.6 seconds (LOS E) reported in the TIA.

Additionally, the reported queues far exceed the available storage (i.e., 671 feet during the AM peak hour; 772 feet during the PM peak hour). These deficiencies need to be addressed in the traffic study and appropriate recommendations/fair-share contributions should be identified.

To summarize, the following table shows the comparison (LLG traffic study results vs. RK sample calculations) in intersection delay/LOS and eastbound left-turn 95th percentile queueing for the intersection of Sparkman Court (future Monroe Avenue) and Murrieta Hot Springs Road. This comparison is for Opening Year 2028 + Project traffic conditions.

Key Study Intersection		Peak Hour	Level of Service (LOS) Comparisons		Eastbound Left-Turn 95th % Queuing Comparisons	
			LLG Synchro Calculations	RK Vistro Calculations	LLG Synchro Calculations	RK Vistro Calculations
9.	Sparkman Court at	AM Peak Hour	31.0 s/v / LOS D	713.5 s/v / LOS F	3.9 vehicles	671 feet
	Murietta Hot Springs Road	PM Peak Hour	36.6 s/v / LOS E	1,353.2 s/v / LOS F	2.7 vehicles	772 feet

It should be noted that Synchro reports the 95th percentile queue for unsignalized intersections as number of vehicles. A rule of thumb is assuming approximately 25 feet per vehicle (length of vehicle plus gap in between cars). This results in a distance of 98 feet during the AM peak hour (i.e. 3.9 vehicles * 25 feet) and 68 feet in the PM peak hour (i.e. 2.7 vehicles * 25 feet).

4. **The time frames used for study area scenarios for opening year conditions do not accurately reflect the times when full occupancy of Phase 1 and Phase 2 of the project would occur.** For the opening year short-term traffic analysis, the TIA utilized the Year 2025 for Phase 1 and Year 2028 for Phase 2.

However, it is noted in the TIA that the actual Phase 1 and Phase 2 project construction would not be completed until Years 2026 and 2029, respectively. Furthermore, even if the construction is completed in that timeframe, the full occupancy of the project for Phase 1 and Phase 2 development not would occur until sometime later. Therefore, the traffic study should have assumed a later completion date for the full occupancy of the project in the future (at least two years after the Year 2025 and 2028 timeframe). The effect of this would be that additional traffic impacts could occur as a result of additional ambient growth which could require additional improvements for the project.

5. **Project Fair Share calculations and Improvement Responsibilities.** The project's fair share contribution and required improvements need to be reassessed based upon a corrected trip distribution for the project that would assume a traffic signal at the intersection of Monroe Avenue and Murietta Hot Springs Road. As noted in Comment 2, approximately 90% of the project traffic would utilize Monroe Avenue which would increase its required contribution for additional improvements along this roadway and at the adjacent intersection of Monroe Avenue and Murrieta Hot Springs Road. Also, the fair share analysis has to be completed for all "With Project" traffic scenarios (e.g., Opening Year 2025 + Project Phase 1, Opening Year 2028 + Entire Project, and Horizon Year 2045 + Entire Project).

   This change in project trip distribution will potentially change the traffic conditions (level of service and queuing), and the project's required operational improvements to the study area intersections and roadway segments. Potential roadway improvements required by the project cannot rely on the improvements conditioned by nearby projects if they are not implemented in an appropriate timeframe. The project must pay its fair share for improvements, based upon the revised TIA analysis as noted in this letter.

Conclusions

RK has reviewed the TIA for The Terraces at Murietta project and determined that a number of changes are needed to adequately assess the overall impacts of the project and its required intersection and roadway segment improvements. RK recommends that the project traffic analysis be revised to account for traffic from the Murietta Triangle development under all traffic scenarios, reassess the project's trip distribution based upon logical travel routes and the signalization of the intersection of Monroe Avenue and Murrieta Hot Springs Road which would allow for full-access, utilize later opening year timeframes, and assess vehicular queuing especially along Murietta Hot Springs Road as the project would likely affect traffic operations. Level service is not the only consideration at intersections, as queuing of traffic at turn lanes could back into through traffic along Murietta Hot Springs Road causing safety concerns and operational delays.

RK appreciates the opportunity to work with Domenigoni Barton Properties, LLC on reviewing The Terraces at Murietta Project TIA. If you have any questions, please call me at 949-293-9639.

Sincerely,
RK ENGINEERING GROUP, INC.

Robert Kahn, P.E.
Founding Principal

Justin Tucker, P.E.
Principal Engineer

Registered Civil Engineer 20285
Registered Traffic Engineer 0555

XC: Michele Staples, Jackson Tidus Law Corporation

Attachment

rk17993.doc
JN:2850-2023-01

Appendix A

Reviewer Resumes

Robert Kahn, P.E., T.E

Founding Principal

Areas of Expertise

Traffic Engineering

Transportation Planning

Transportation Solutions

Traffic Impact Analysis

Circulation Systems for Planned Communities

Traffic Control Device Warrants

Traffic Calming

Traffic Safety Studies

Bicycle Planning

Parking Demand Studies

Transportation Demand Management

Traffic Signal, Signing and Striping Plans

Traffic Control Plans

Parking Lot Design

Acoustical Engineering

Noise Impact Studies

Expert Witness / Legal Services

Professional History

RK Engineering Group, Inc., Founding Principal
2001-Present

RKJK & Associates, Inc., Principal, 1990-2000

Robert Kahn and Associates, Inc., Principal, 1988-1990

Jack G. Raub Company,
Vice President Engineering Planning, 1977-1988

The Irvine Company, Program Engineer, 1972-1977

Caltrans CA Division of Highways, Assistant Engineer, 1968-1972

Representative Experience

Robert Kahn, P.E., has worked professionally in traffic engineering and transportation planning since 1968. He received his Master of Science degree in civil engineering from the University of California, Berkeley, Institute of Transportation and Traffic Engineering. Mr. Kahn received his Bachelors degree in Civil Engineering from the University of California, Berkeley.

Mr. Kahn started his career in California Division of Highways (Caltrans) and developed the first computerized surveillance and control system for the Los Angeles area. Mr. Kahn developed the California Incident Detection Logic which is utilized throughout California for the detection of traffic incidents on the freeway system.

Mr. Kahn has worked for a major land development company preparing Master Plans for infrastructure. He also has worked eleven years with a multi-disciplined consulting engineering firm in charge of the Engineering Planning Department. This included all facets of preliminary design, tentative map preparation, transportation and environmental engineering, and public agency coordination.

Mr. Kahn has provided traffic and transportation services to major planned communities including Aliso Viejo, Coto De Caza, Foothill Ranch, Highlands Ranch in Denver, Colorado, Mission Viejo, Talega Planned Community in San Clemente, and Wolf Valley Ranch in Temecula. He has also provided contract traffic engineering services to the Cities of Irvine, Norwalk, Perris and San Jacinto in Riverside County, California.

Mr. Kahn has prepared traffic impact studies for numerous communities throughout Southern California, Nevada and in Colorado. Major traffic impact studies include the Aliso Viejo Town Center, the Summit Development, the Shops at Mission Viejo, Kaleidoscope, Dana Point Headlands, Foothill Ranch, Talega, Majestic Spectrum, and Centre Pointe in the City of Chino.

His work in the area of parking demand studies and parking lot design has been extensive. Shared parking studies for the Aliso Viejo Town Center, Foothill Ranch Towne Centre, Trabuco Plaza and numerous commercial sites have been completed to accurately determine the peak parking demand for mixed use projects. Mr. Kahn has been able to make the most efficient utilization of parking lots by maximizing efficient and safe systems.

Robert Kahn, P.E., T.E

Founding Principal

Education

University of California, Berkeley, M.S., Civil Engineering, 1968

University of California, Berkeley, B.S., Civil Engineering, 1967

University of California, Los Angeles, Graduate Courses in Transportation Systems, 1970

Registrations

California Registered Civil Engineer
No. 20285 – April 1971

California Registered Professional Engineer
Traffic, No. 0555 – June 1977

Colorado Professional Engineer
No. 22934, November 1984

Nevada Professional Engineer Civil
No. 10722 – March 1994

County of Orange, California Certified Acoustical Consultant
No. 201020 - 1984

Affiliations

Institute of Transportation Engineers (ITE)

American Society of Civil Engineers (ASCE)

Urban Land Institute (ULI)

Orange County Traffic Engineers Council (OCTEC)

Teaching

UCI Graduate Urban Design Studio Class – Guest Instructor

ITS Berkeley – Tech Transfer
Fundamentals of Traffic Engineering – Instructor

UCI Senior Civil Engineering Mentoring Program (CE181)

Mr. Kahn has been an innovator in developing and implementing traffic calming techniques. Over twenty years ago, Mr. Kahn refined the design and implementation standards for speed humps for use in local neighborhoods. Most recently, he has been involved in the development of modern roundabouts in lieu of traffic signals or other traffic control devices at intersections. Mr. Kahn previously presented the use of traffic calming devices in newly developing communities to the Institute of Transportation Engineers Traffic Calming Conference in Monterey, California.

Mr. Kahn has been involved in the design of traffic signal systems, signing and striping plans on hundreds of projects for both the public and private sector. Most recently, he has completed the design of several traffic signals which will serve the renovated Shops at Mission Viejo Mall. Mr. Kahn was in charge of a major ITS project for the City of Irvine, which provided fiberoptic interconnect and closed circuit TV along Barranca Parkway, Alton Parkway and Lake Forest Drive.

Mr. Kahn has been involved in acoustical engineering since 1978. He was in responsible charge of the Aliso Viejo Noise Monitoring Program which redefined the 65 CNEL noise contours for MCAS El Toro. He has also developed computer applications of the FHWA Noise Model.

Mr. Kahn has prepared numerous noise impact reports in the Aliso Viejo, Mission Viejo, Foothill Ranch, Santa Margarita, Ladera and Talega Planned Communities. Noise impacts from stationery sources including car washes, loading docks, air conditioning compressors, drive-thru speakers and other sources have been evaluated in the Aliso Viejo Auto Retail Center Noise Study, Albertsons Store 606 Noise Study-Rancho Cucamonga, Pro Source Distribution Building Final Noise Study in Ontario. Major specific plan and zone change noise studies have been prepared for the Summit Heights Specific Plan in Fontana, Lytle Creek Land and Resources Property in Rialto, Tamarack Square in Carlsbad, California, International Trade and Transportation Center in Kern County, California, and Sun City/Palm Springs.

Mr. Kahn founded the firm of Robert Kahn and Associates in 1988, which was the predecessor to RKJK & Associates, Inc. in 1990. He has made presentations to the ITE and the California Public Works Conference. Mr. Kahn has published numerous articles on traffic impact assessment, traffic calming, striping and the status of Bicycle Sharing in the USA. He was awarded the Wayne T property award in 2011-2012. Mr. Kahn has been a mentor and advisor to the UCI Senior Civil Engineering Project (CE181) for the past several years. He provides students the opportunity to develop a real life transportation project for the program.

Justin Tucker, P.E.

Principal Engineer

Areas of Expertise

Traffic Engineering

Transportation Planning

Transportation Solutions

Traffic Impact Analysis

Circulation Systems for Planned Communities

Traffic Control Device Warrants

Traffic Calming

Traffic Safety Studies

Parking Demand Studies

Transportation Demand Management

Traffic Control Plans

Parking Lot Design

Education and Registrations

University of California, Irvine

B.S. in Civil Engineering (Transportation Specialization)

California Registered Civil Engineer

No. 92866 – July 2021

Professional History

RK Engineering Group, Inc.

Principal Engineer (2022 – Present)

Linscott, Law & Greenspan Engineers

Transportation Engineer (2013 – 2022)

Certificates and Affiliations

Institute of transportation Engineers (ITE)

Orange County Traffic Engineers Council (OCTEC)

American Society of Civil Engineers (ASCE)

Representative Experience

Mr. Justin Tucker was born and raised in Southern California where he graduated from El Toro High School before attending The Henry Samueli School of Engineering at the University of California, Irvine, where he received a Bachelor of Science degree in Civil Engineering with a specialization in Transportation.

Mr. Tucker began his career as a project engineer for a large residential developer in Southern California. He gained valuable knowledge and experience across all phases of the land development process, from planning to construction. He used this experience to catapult into the transportation planning world where he has worked as a traffic engineer since 2013.

Mr. Tucker entered the world of transportation engineering where he spent 9 years at Linscott, Law & Greenspan Engineers learning all facets of the industry. During these years, he developed a specialty for Traffic Impact Analyses utilizing the HCM and/or ICU methodologies using Synchro/Traffix/Vistro software, Traffic Signal Warrant Analyses, Trip Generation Analyses, Drive-Thru Queueing and On-Site Circulation Studies, Freeway Mainline and Merge/Diverge/Weaving Analyses using the Highway Capacity Software, Progression Analyses with Simulations using Synchro, and Vehicle Miles Traveled (VMT) Analyses consistent with the newest CEQA requirements.

Mr. Tucker is now a principal engineer at RK Engineering Group, Inc. where he manages the planning and traffic projects.

Mr. Tucker has provided traffic and transportation services to projects of all sizes, from small single-tenant sites to major planned communities. He has performed studies across the entirety of California, but most notably within Orange County, Riverside County, San Bernardino County, and Los Angeles County.

Mr. Tucker has obtained his licensure as a Professional Engineer in Civil Engineering in the state of California.

Appendix B

Sample Vistro Calculation Worksheets
Intersection of Monroe Avenue at Murrieta Hot Springs Road
Opening Year 2028 Plus Entire Project AM & PM Peak Hours

The Terraces at Murrieta TS Peer Review

Vistro File: O:\...\28502301_Vistro.vistro
Report File: O:\...\01_OY+P_AM.pdf
Scenario 1 Opening Year (2028) + Project AM
3/6/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sparkman Court (NS) at Murrieta Hot Springs Road (EW)	Two-way stop	HCM 7th Edition	EB Left	2.412	713.5	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sparkman Court (NS) at Murrieta Hot Springs Road (EW)

Control Type:	Two-way stop	Delay (sec / veh):	713.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.412

Intersection Setup

Name	Sparkman Court		Murrieta Hot Springs Road		Murrieta Hot Springs Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	153.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Sparkman Court		Murrieta Hot Springs Road		Murrieta Hot Springs Road	
Base Volume Input [veh/h]	0	351	293	1750	1829	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	351	293	1750	1829	54
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	92	77	461	481	14
Total Analysis Volume [veh/h]	0	369	308	1842	1925	57
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	1.75	2.41	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	397.64	713.50	0.00	0.00	0.00
Movement LOS		F	F	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	25.30	26.84	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	632.60	671.01	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	397.64		102.21		0.00	
Approach LOS	F		F		A	
d_I, Intersection Delay [s/veh]	81.42					
Intersection LOS	F					

The Terraces at Murrieta TS Peer Review

Vistro File: O:\...\28502301_Vistro.vistro
Report File: O:\...\02_OY+P_PM.pdf
Scenario 2 Opening Year (2028) + Project PM
3/6/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sparkman Court (NS) at Murrieta Hot Springs Road (EW)	Two-way stop	HCM 7th Edition	EB Left	3.763	1,353.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sparkman Court (NS) at Murrieta Hot Springs Road (EW)

Control Type:	Two-way stop	Delay (sec / veh):	1,353.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.763

Intersection Setup

Name	Sparkman Court		Murrieta Hot Springs Road		Murrieta Hot Springs Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	153.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Sparkman Court		Murrieta Hot Springs Road		Murrieta Hot Springs Road	
Base Volume Input [veh/h]	0	280	291	2344	2263	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	280	291	2344	2263	79
Peak Hour Factor	0.9500	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	71	74	598	577	20
Total Analysis Volume [veh/h]	0	286	297	2392	2309	81
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	1.86	3.76	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	462.36	1353.15	0.00	0.00	0.00
Movement LOS		F	F	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	21.54	30.87	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	538.59	771.67	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	462.36		149.45		0.00	
Approach LOS	F		F		A	
d_I, Intersection Delay [s/veh]	99.56					
Intersection LOS	F					

From: Saul Jaffe <sjaffe@claremontlaw.com>
Sent: Wednesday, February 15, 2023 3:04 PM
To: Chantarangsu, David <DChantarangsu@MurrietaCA.gov>
Cc: Ramaiya, Jarrett <jramaiya@MurrietaCA.gov>; Watts, Dennis <DWatts@MurrietaCA.gov>; Moehling, Bob <BMoehling@MurrietaCA.gov>; Domenigoni Barton Properties/Sky Canyon Enterprises <sky.canyon@verizon.net>; Lisa DeForest <lsdeforest@gmail.com>; Holler, Ivan <IHoller@MurrietaCA.gov>; Israel, Tiffany <tisrael@awattorneys.com>; Warren, Cindy <CWarren@MurrietaCA.gov>; Stone, Lori <LStone@MurrietaCA.gov>; jlovell@murrietaCA.gov <jlovell@murrietaCA.gov>; Holliday, Ron <RHolliday@MurrietaCA.gov>; Summers, Kim <KSummers@MurrietaCA.gov>; Agajanian, Scott <SAgajanian@MurrietaCA.gov>
Subject: Comment on Initial Study and Notice of Intent to Adopt Mitigated Negative Declaration; Terraces Apartment Project; Development Plan 2022-2518; Tentative Parcel Map (TM38373 and Phasing Plan PH2022-2614 (collectively "the Terraces Projec")

Mr. Chantarangsu,

D-1 As you know, this office represents Tres Estrellas, LLC and Domenigoni Barton Properties, LLC, the owners of the Triangle project. We are writing with respect to the clear deficiencies in the environmental analysis related to the Terraces Project and specifically the Traffic Impact Analysis prepared by Lindscott Law & Greenspan. As we have discussed with you, the traffic analysis is inadequate and fails to comply with CEQA including, but not limited to, the failure to consider the Triangle Project in the Cumulative Projects for trip generation. The Triangle is an approved project with an approved EIR, Specific Plan and Design Guidelines. In addition, the Lindscott Analysis is fatally flawed and in error as it states on page 35:

"Triangle Project

In addition to the above, the Triangle Specific Plan bounded by I-15 to the west, 1-215 to the east and Murrieta Hot Springs Road to the north was first approved by City Council back in 2008, and then subsequently again in 2013. This project has not begun construction on any of the five phases of development. **No Development Plans have been submitted to the City and therefore, this project was not included as a Cumulative project**." (emphasis added)

The Triangle is an approved project with an Approved EIR and must be considered in a cumulative impact analysis under the CEQA guidelines. In addition, the Development Plan Application and Tentative Tract Map for the first phase of the project was submitted to the City on or about October 24, 2022. The Addressing Plan was submitted to the City on or about February 9, 2023. The statement that "No Development Plans have been submitted to the City and therefor, this project was not included as a Cumulative project" is false on its face. The City cannot in good faith continue to process the Terraces Project approvals in light of these fundamental errors. The Triangle Project is well known by staff. As recently as November 15, 2022, the Council subcommittee, staff and Triangle representatives met to discuss certain traffic issues. The City's traffic engineer was present when we reviewed the Triangle Site Plan and discussed the Project's Tentative Tract Map and Development Plan Application which had been submitted on October 24, 2022.

We have numerous other concerns with respect to the Traffic Analysis, including the unsupported assumption that 60% of the AM and PM peak traffic will utilize Monroe/Sparkman. We believe that this assumption is in error and grossly underestimates the traffic volumes for Monroe/Sparkman. The Traffic Analysis has no basis to support this assumption.

We are writing to put the City on notice that the City's proposed Mitigated Negative Declaration for the Terraces project fails to comply with CEQA, and that the City must require and complete appropriate cumulative impact traffic analysis which includes the Triangle Project. We further believe that upon such analysis, it will not be possible to mitigate the traffic impacts of the Terraces project to a level of non-significance and that an EIR must be prepared to fully analyze traffic, air quality, greenhouse gases and other environmental impacts.

As you are aware, the City has a duty to investigate issues relating to a project's potential environmental impacts (See County Sanitation Dist. No. 2 v. County of Kern, (2005) 127 Cal. App 4th 1544, 1597-98. ["[U]nder CEQA the lead agency bears the burden to investigate potential environmental impacts.;]) Given the lack of a cumulative impact traffic analysis, inappropriate and unsupported distribution of traffic, deferred mitigation of traffic mitigation without security to insure mitigation is completed and reliance on the completion of traffic improvements by the Triangle Project (which is not included in the cumulative impact analysis), the Lindscott report is fatally flawed and internally inconsistent and the City must now prepare an EIR which fully analyzes traffic, air quality, greenhouse gases and other cumulative environmental impacts and identifies appropriate mitigation measures. Please understand that these comments are preliminary and that we are in the process of completing a full review of the proposed project documents and will supplement this email as appropriate.

We reserve all rights and remedies.

Saul Jaffe | Claremont Law Group, Inc.

618 West Baseline Road | Claremont, CA 91711

t +1.909.445.9135 | f +1.909.445.9138

sjaffe@claremontlaw.com