Appendix N-7

WMWD Conditions of Approval for Proposed Project

WESTERN WATER
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Driven by service.

14205 Meridian Parkway
Riverside, CA 92518
District Business | 951.571.7100
Customer Service | 951.571.7104

July 10, 2024

SENT VIA EMAIL

Jeffrey M. Smith, AICP
Principal Planner
March Joint Powers Authority
14205 Meridian Pkwy., Suite 140
Riverside, CA 92518
smith@marchjpa.com

CONDITIONS OF APPROVAL FOR MARB D-1 AVIATION

This letter provides Western Municipal Water District's (Western Water) Conditions of Approval for the above reference project are as follows:

1. Compliance with water efficient landscape requirements per the March Joint Powers Authority Ordinance.

2. All applicable Added Facilities Charges (for water facilities), Sewer Connection Fees, and Meter Installation Fees must be paid as well as Cross Connection Testing and regulatory compliance approved prior to the installation of any water meter.

3. Proposed facilities for water, sewer, recycled water service as well as onsite irrigation facilities must be designed by a Registered Civil Engineer (engineer) and reviewed and approved by Western Water. Deposit for Plan Check must be received prior to plan submittal and Deposit for Inspection must be received prior to approval of the plans.

4. Western Water, as a member agency of Metropolitan Water District of Southern California (MWD) will enforce MWD's Plan for Water Use Efficiency Guideline requirements for water conservation.

5. The property is located within the 1695 Pressure Zone. Currently, Western Water has an existing 10-inch ACP waterline and 12-inch CIP waterline that run through the property for domestic service connection to the proposed project. The available Fire Flow must be determined by a flow test or fire flow modeling. The fire service protection system will be served by agreement between Western Water and Eastern Municipal Water District as referenced in the Technical Memorandum completed by Dudek in 2023.

6. The Technical Memorandum completed by Dudek in 2023 (enclosed) determined the impacts of the proposed development on Western's potable water system. Deficiencies were identified requiring Developer to upsize of two 50 linear feet segments of existing 12-

inch pipelines to 16-inch and full replacement of approximately 830 linear feet of existing 12-inch pipeline with a 16-inch pipeline as depicted.

7. Developer to be aware that Western Water is planning modifications to the existing potable distribution system northwest of the Global Port interconnection (see enclosed map). These modifications are required to address water quality issues in the area. Western Water will coordinate with Eastern Municipal Water District for this modification.

8. To provide fire protection for the building, an agreement with Eastern Municipal Water District (EMWD) will be required so that supplemental fire flow can be secured and obtained from the EMWD system. All costs associated with this Fire Service Agreement and any improvement costs associated with both Westen Water and EMWD shall be the sole responsibility of the Developer/Owner.

9. Coordinate with fire protection agency of jurisdiction to determine required fire flow for the proposed project and advise Western Water of the fire flow requirements. Submit request to Western Water for fire flow modeling to determine if existing water systems capacity is available to provide the required fire flow. Depending on the results of the fire flow modeling additional conditions of approval such as upsizing of existing pipes, extension of pipes, installation of parallel piping or installation of pumps, at the developer's cost, may be required.

10. Western Water has no recycled water pipeline for service connection to the proposed project.

11. Western Water has an existing 6-inch sewer pipeline at the southwest corner of the property for service connection to the proposed project. There is a 3-inch force main that runs through the property that potentially will require relocation.

12. Developer to submit a 24" x 36" preliminary onsite and/or offsite plan of water, sewer and/or recycled water plan layout to Western Water before formal submittal of Water, Sewer and/or Recycled Improvement Plans.

13. Preliminary water, sewer and/or recycled water plans shall show the following items:
    a. Delineate all existing utility facilities (i.e., pipe diameter, pipe material, manholes, water meters, air/vac, blow-off, fire hydrants, valves, sewer, gas, communication, electrical, etc.) within project boundaries.
    b. Delineate all easements within project boundaries.
    c. Delineate all proposed and existing lots, streets, and storm drains.
    d. Delineate all proposed water, sewer and/or recycled water facilities within project boundaries. Include pipeline diameters and type of material.

14. Developer to submit a detailed engineer's construction cost estimate to Western Water for review and approval. Once approved, developer shall make a deposit for plan checking services for Water, Sewer and/or Recycled Water Improvement Plans.

15. Water, Sewer and/or Recycled Water Improvement Plans shall be designed per Western Water's Standard Specifications. Please review Western Water's Developer Handbook for submittal formats and requirements online at: http://www.wmwd.com/162/Developer-Handbook

16. Water, Sewer, and Recycled Water Commercial Plans for connections only shall be designed per Western Water's Standards and Specifications. Please review Western Water's Commercial Plan Check Package for submittal formats and requirements online at: http://www.wmwd.com/DocumentCenter/Home/View/237

17. Developer to submit grading plans for Western Water's review and approval before grading permit is issued.

18. Water, Sewer and/or Recycled Water Improvement Plans or Commercial Plans shall not be approved until all items mentioned above are received and approved by Western Water.

19. The developer is responsible for installing, paying all costs, and obtaining an encroachment permit from the local jurisdiction having authority over installation of water, sewer and/or recycled water facilities including laterals in the public right-of-way. If the customer chooses to cross private property, then the customer is responsible to obtain private easements from adjacent property owners. Proof of private easement must be provided to Western Water prior to plan approval.

20. Provide and/or pay for all applicable cost and fees including connection facilities, relocation of facilities, and additional facilities that may be necessary to accommodate applicant's proposed water and sewer usage, while maintaining resiliency of pipelines within Western Water's distribution system. This may include the upsizing of pipelines, installation of pressure reduction, and/or pump stations (subject to the application of appropriate credits for additional facilities provided by applicant).

21. For water, sewer and/or recycled water service by Western Water, the developer must comply with the "Standard Conditions," and all applicable Rules, Regulations, and General Policies of Western Water at the time of construction.

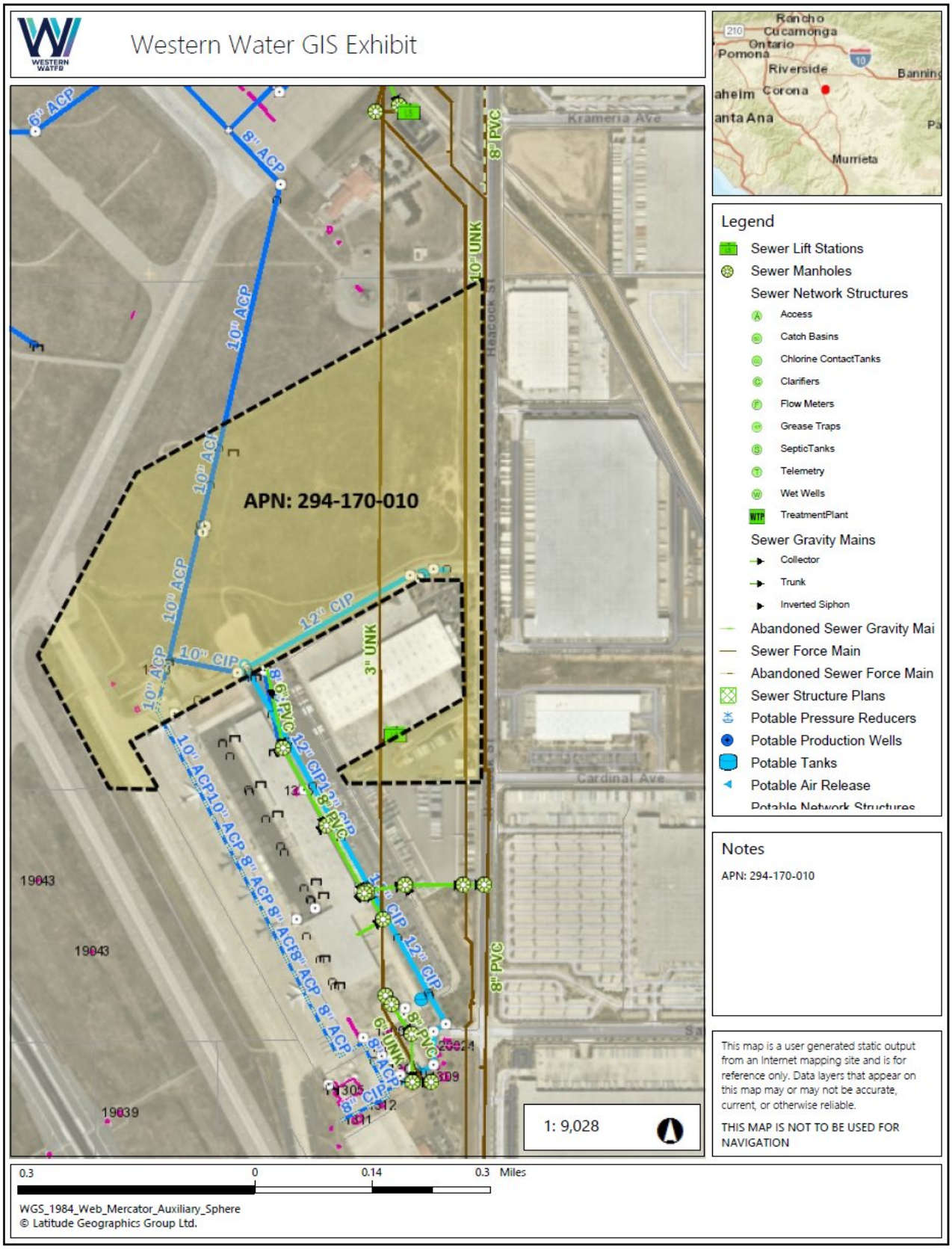
22. Contact Western Water's Development Services Department at (951) 571-7100 for further information.

Thank you for giving Western Water the opportunity to submit these items as part of the Conditions of Approval.

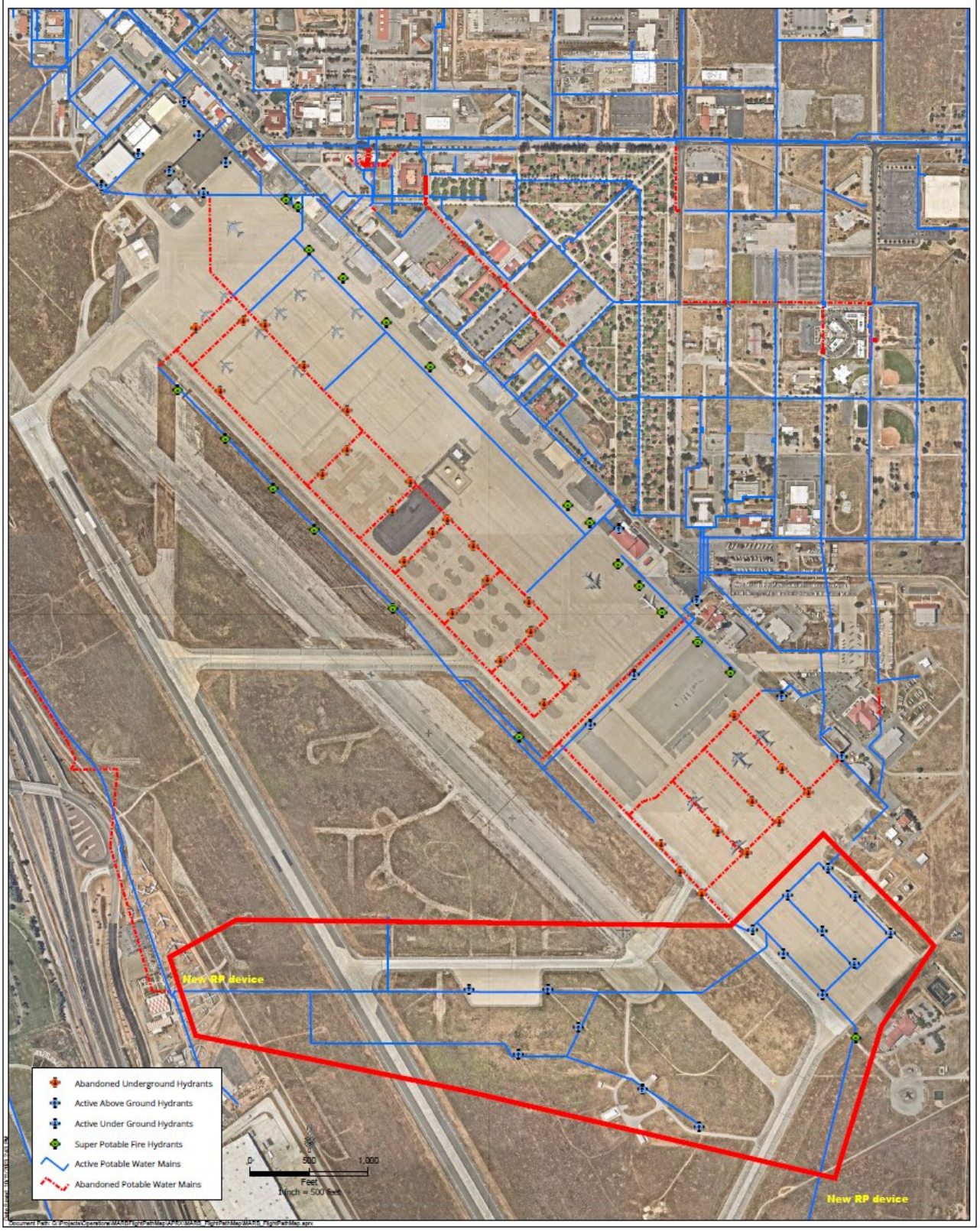
TERI PATTON
Development Services Supervisor

TP:gh:kf

Attachment(s):
1. Western Water GIS Exhibit
2. Western Water Fire System Improvements Exhibit
3. Fire Flow Technical Memorandum dated April 11, 2023


Western Water GIS Exhibit
APN: 294-170-010
Krameria Ave
Cardinal Ave
Hancock St
6" ACP
8" ACP
10" ACP
10" UNK
8" PVC
12" CIP
10" CIP
3" UNK
6" UNK
19043
19039
Rancho Cucamonga
Ontario
Pomona
Riverside
Corona
Murrieta
Legend
Sewer Lift Stations
Sewer Manholes
Sewer Network Structures
Access
Catch Basins
Chlorine ContactTanks
Clarifiers
Flow Meters
Grease Traps
SepticTanks
Telemetry
Wet Wells
TreatmentPlant
Sewer Gravity Mains
Collector
Trunk
Inverted Siphon
Abandoned Sewer Gravity Mai
Sewer Force Main
Abandoned Sewer Force Main
Sewer Structure Plans
Potable Pressure Reducers
Potable Production Wells
Potable Tanks
Potable Air Release
Notes
APN: 294-170-010
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION
1: 9,028
0.3 0 0.14 0.3 Miles
WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

MARB Flightline Hydrants



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TECHNICAL MEMORANDUM

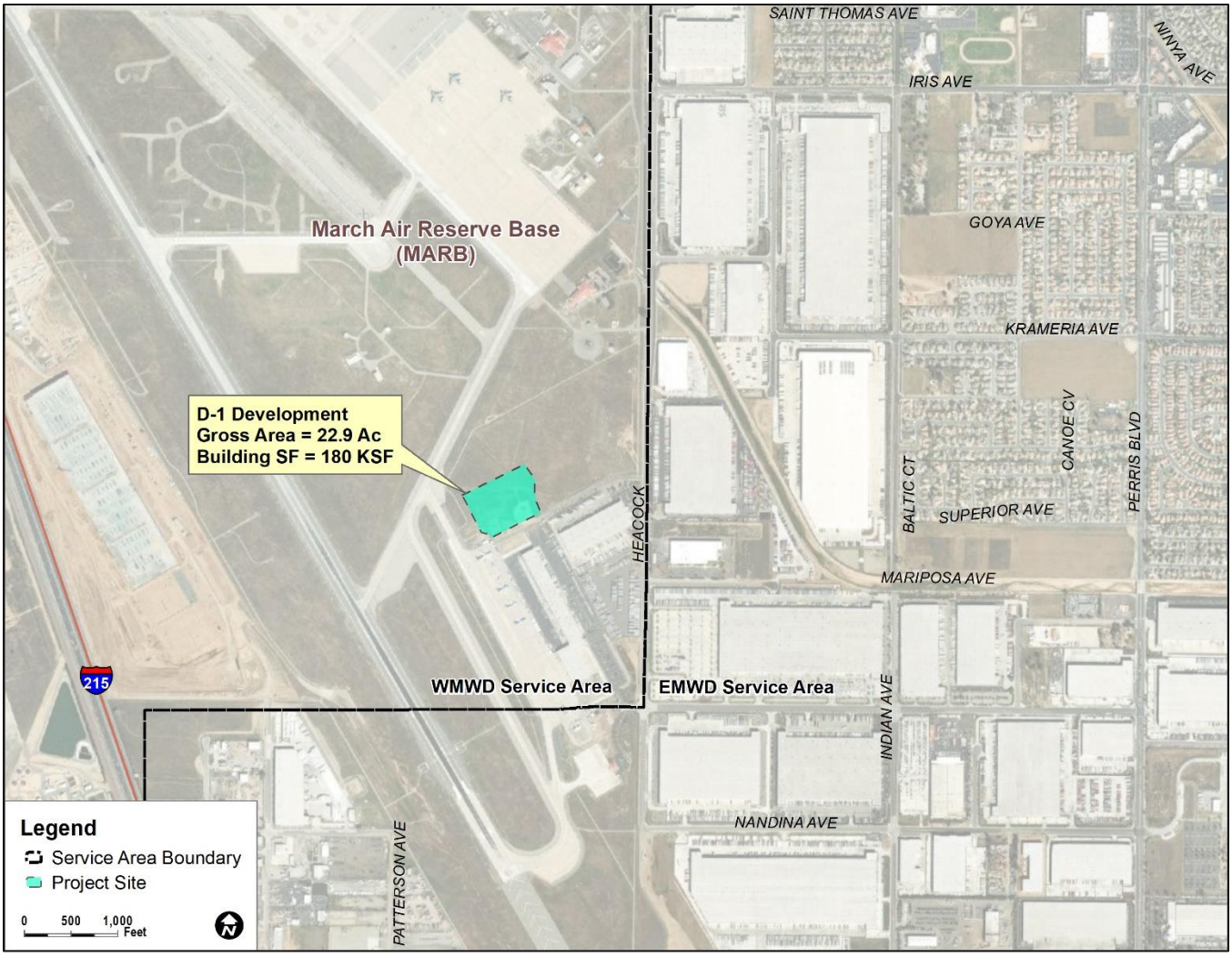
To:	Karl Francis & Ginger Han, Western Municipal Water District
From:	Elizabeth Caliva & Jenny Li, Dudek
Subject:	Fire Flow Hydraulic Modeling for the D-1 Development on MARB
Date:	April 11, 2023
Attachments:	A – Utility Plan – Option 4
	B – Detailed Cost Estimate for Pipeline Upsizing

DRC-Engineering is proposing to construct a 180,800 SF industrial building on March Air Reserve Base (MARB) on approximately 22.9 acres of existing vacant land, of which 8.44 acres would be developed into land requiring water service. The proposed development is currently named the D-1 Development and located west of Heacock Street between Krameria Avenue and Cardinal Avenue. The location of the proposed development is shown on **Figure 1**. A preliminary utility plan for the site is included in Attachment A. Fire Flow to the development would be supplied via the Global Port emergency intertie to the Eastern Municipal Water District (EMWD) potable water system.

The following technical memorandum evaluates the impacts of the proposed development on the Western Municipal Water District (Western or District) potable water system. Existing (2020), near-term (2030) and ultimate (buildout) systems in the District's latest hydraulic water model were analyzed to determine if the proposed on and off-site improvements are adequately sized to deliver water service to the planned development and surrounding customers while maintaining Western design criteria. The memorandum is organized into the following sections:

- ***Section 1 – Potable Water Demands*** – Summarizes the anticipated potable water demands and fire flow requirement of the proposed development.
- ***Section 2 – Proposed Improvements*** – Summarizes the proposed on-site and off-site potable water facility improvements and tie-ins to the District's existing system.
- ***Section 3 – Existing System Analysis & Results*** – Summarizes the impact of the proposed development on the District's existing potable water system.
- ***Section 4 – Near-Term (2030) System Analysis & Results*** – Summarizes the impact of the proposed development on the District's near-term potable water system.
- ***Section 5 – Ultimate System Analysis & Results*** – Summarizes the impact of the proposed development on the District's ultimate (buildout) potable water system.
- ***Section 6 – Recommendations*** – Recommends any improvements to the existing or proposed potable water facilities based on the results of the existing, near-term, and buildout system analyses.

Figure 1: Location Map



1 Potable Water Demands

The potable water domestic demand for the proposed development is based on the developed land gross area of 22.9 acres and Western water use factors from the Draft 2023 Riverside Facilities Master Plan (2023 FMP). The potable water irrigation demand was calculated based on information provided by DRC-Engineering and water use factors from the 2023 FMP. **Table 1** presents the anticipated domestic and irrigation demands of the proposed D-1 Development. This demand is in addition to the MARB demands included in the hydraulic model per the most recent 2023 FMP, as listed in **Table 2** by phase.

Table 1. Potable Water Domestic Demand Projections for the D-1 Development

Water Use Type	Gross Area (Ac)	Unit Water Demand[1]	Average Day Water Demand (gpm)	Maximum Day Water Demand[2] (gpm)	Peak Hour Water Demand[3] (gpm)
Domestic	22.9	179 add units	2.85	4.0	10.3
Irrigation	0.85[4]	2800 gpd/acre	1.65	2.3	5.9
		Total Potable Demand	**4.50**	**6.3**	**16.2**

Notes:
1 Unit demand for Industrial land use type per Table 3-1 of the 2023 FMP.
2 MDD is estimated as 1.4 x ADD per Table 3-4 of the 2023 FMP.
3 Peak hour demand is 3.6 x ADD based on Table 3-4 of the 2023 FMP.
4 Per DRC-Engineering, approximately 37,000 SF or 0.85 Ac of site landscaping will require potable water irrigation.

Table 2. Maximum Day Demands for MARB by Phase from 2023 FMP included in Hydraulic Model

Existing MDD[1]	Near-Term MDD[2]	Ultimate MDD[3]
737 gpm	778 gpm	901 gpm

Notes:
1 Ex. MDD per Table 3-4 for 2020 Max Day from the 2023 FMP.
2 Equal to the Existing MDD plus the Near-Term Demand for the 1695 (MARB) PZ per Table 3-5 of the 2023 FMP, using the MARB MDD peaking factor of 1.4 x ADD per Table 3-4 of the 2023 FMP.
3 Equal to the Near-Term MDD plus the Ultimate Demand for the 1695 (MARB) PZ per Table 3-6 of the 2023 FMP minus the portion of the ultimate demand to be served by the EMWD system per the *MARB Potable Water Study, Draft Final*, dated 3/29/22 by Dudek, and using the MARB MDD peaking factor of 1.4 x MDD per Table 3-4 of the 2023 FMP,

According to the District's 2023 FMP, the fire flow requirement of the proposed development is 4,000 gpm for 4 hours as summarized in **Table 3**.

Table 3. Fire Flow Requirement for the D-1 Development

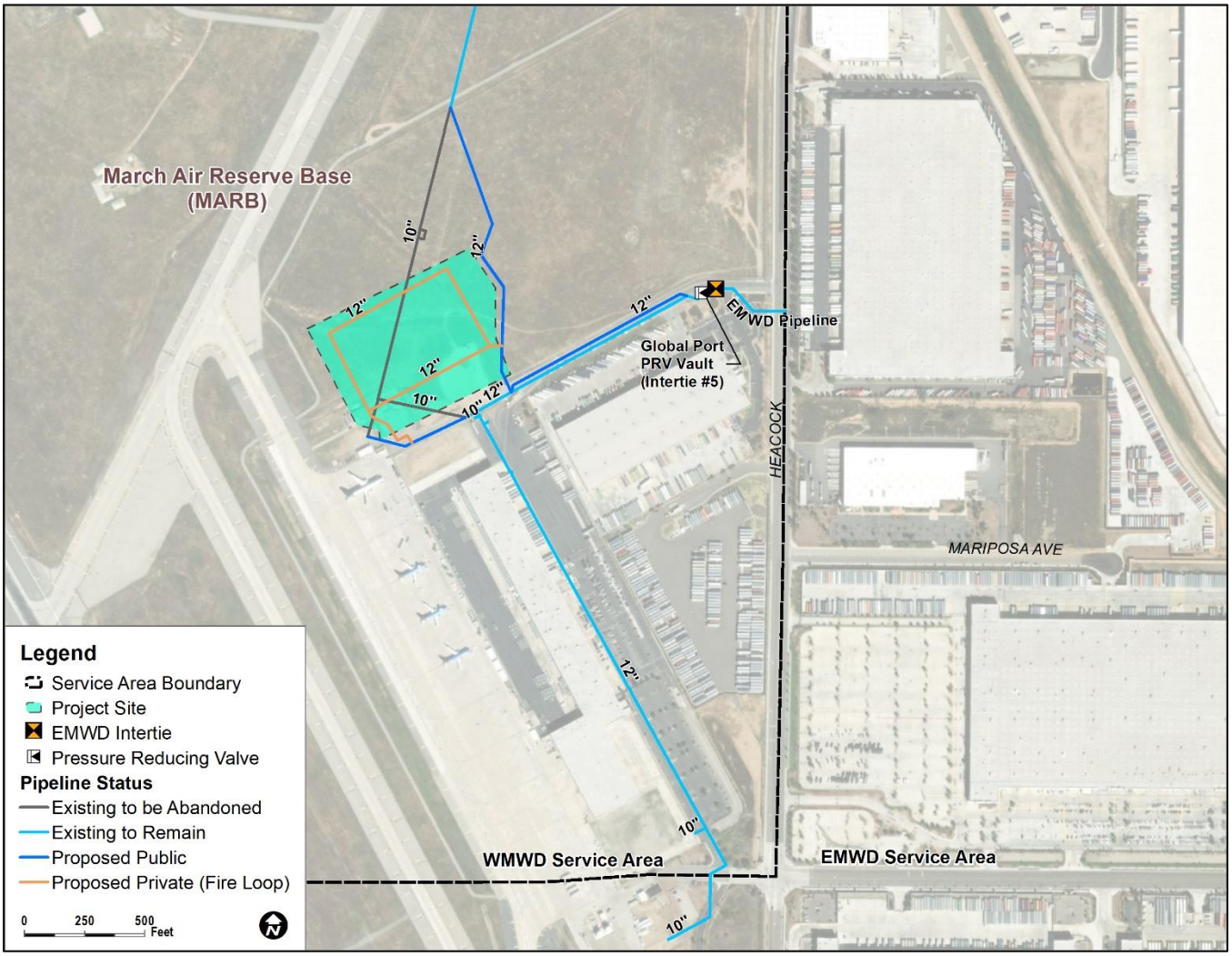
Land Use Category	Fire Flow Requirement (gpm)[1]	Duration (hours)
Industrial	4,000	4

Notes:
1 Fire flow requirement per Table 5-3 from the Western's 2023 FMP.

2 Proposed Improvements

Per the preliminary utility plan by DRC Engineering (Attachment A) and as shown in **Figure 2**, the proposed development will abandon approximately 1,800 LF of existing 10-inch waterline and replace it with new 12-inch waterline in a new alignment around a 180,800 SF industrial building. An on-site fire loop will surround the building and have two points of connection to Western waterlines. Additionally, a parallel waterline is proposed to be constructed from the EMWD Global Port intertie to the new, relocated waterline. All proposed pipelines are 12-inch diameter, PVC waterline throughout the site.

Figure 2: Proposed On-Site and Off-Site Potable Water System Improvements



The proposed on-site facilities were added to the District's latest InfoWater™ potable water model, last updated as part of the 2020 Riverside Facilities Master Plan performed by Dudek and calibrated by HAL. Per Table 2 of HAL's WMWD 2020 Hydraulic Model Update Memorandum, dated July 29, 2020, a Darcy-Weisbach roughness coefficient of 0.85 should be assumed for all new PVC pipelines (coinciding with a Hazen-Williams value of 130).

Model junction elevations for proposed pipeline alignments were approximated from Google Earth.

Lastly, the proposed development lies within the District's 1695 MARB pressure zone, which includes three emergency interties with Eastern Municipal Water District (Eastern). Of the three existing interties, it is assumed that only the Global Port intertie (Intertie #5) will be utilized during a fire flow event at the development. The setting of the pressure reducing valve for water flowing from Eastern to Western is 84 psi, as confirmed by Western staff. Flow can move in both directions. All other interties will remain inactive in the hydraulic analysis.

The latest Eastern potable water model was used to estimate the hydraulic grade line (HGL) of the Global Port intertie. The Eastern supply zone also has an HGL from 1695-ft. The zone has no onsite storage and is supplied via PRVs from a higher zone. The following **Table 3** summarizes the HGLs assumed for the Global Port intertie under maximum day demand (MDD) and MDD plus fire flow (MDD + FF) conditions during the Existing, Near-Term, and Ultimate system analyses.

Table 3. Global Port Intertie (Intertie #5) HGLs Used for D-1 Development Analyses

Model Scenario	Demand Condition	HGL (ft)
Existing	MDD	1654
	MDD + FF	1641
Near-Term[1]	MDD	1654
	MDD + FF	1641
Ultimate	MDD	1664
	MDD + FF	1644

Notes:
1 In the absence of a near-term scenario in the latest Eastern potable water model, the HGL of the Global Port intertie was assumed to remain unchanged between the existing and near-term Western model analyses.

To estimate the HGL of the Global Port intertie under MDD + FF conditions, a 4,000-gpm, 4-hour fire flow was run at the Global Port tie-in location in the Eastern model. A fixed grade node was added to the Western model, upstream of the Global Port intertie, to supply the MARB 1695 zone for this analysis. The HGL of the fixed grade node was adjusted depending on the model scenario and demand condition analyzed, as summarized in the following sections.

3 Existing System Analysis & Results

The existing system model analysis included two (2) extended period simulations (EPS) – maximum day demand (MDD) including peak hour, and MDD plus fire flow. The demands for the existing MDD for the MARB area were also included in the hydraulic modeling (743.3 gpm total). The demands for the existing MDD plus Fire Flow scenario included a 4,000 gpm fire flow for a total of 4,743.3 gpm applied to the MARB area in the model. The following sections summarize the methodology and results of each demand scenario.

3.1 Existing Maximum Day and Peak Hour Demand

Scenario "MDD_2020" in Western's latest potable water model was used to evaluate the impacts of the proposed development on the existing system and verify the on- and off-site improvements are sized appropriately to meet maximum day and peak hour demand conditions. The anticipated industrial MDD for the D-1 Development of 6.3 gpm, calculated in Table 1, was allocated to Junction ID J8018 along the relocated 12-inch waterline running on the east side of the building. A 24-hour EPS was performed under existing MDD conditions.

Model results were compared to Western potable water system design criteria outlined in Tables 5-1 and 5-2 from the 2021 Riverside Facilities Master Plan, which require a minimum service pressure of 40 psi and maximum pipeline velocity of 7.5 fps under peak flow conditions.

The results shown in **Figure 3** indicate pipeline velocities are not expected to exceed 7.5 fps and service pressures are not projected to fall below 40 psi. Therefore, the proposed on and off-site water facility improvements are anticipated to satisfy overall maximum day and peak hour demand while maintaining District design criteria in the existing system.

3.2 Existing Maximum Day Plus Fire Flow Demand

A second 24-hour EPS was performed under MDD plus fire flow conditions to verify the proposed on and off-site improvements can deliver the required fire flow while maintaining District design criteria in the existing system. The District permits a minimum service pressure of 20 psi and maximum pipeline velocity of 7.5 fps under MDD plus fire flow conditions.

The required fire flow of 4,000 gpm was split evenly between two locations on the proposed fire loop (Junction IDs J8016 and J8022) and analyzed under existing MDD plus fire flow conditions. The results shown in **Figure 4** indicate residual pressures are not projected to fall below 20 psi.

Velocities for most pipelines are not expected to exceed 7.5 fps. However, as detailed in **Figure 5**, two short sections of pipe are anticipated to exceed 7.5 fps. These include the 12-inch fire loop connection (approximately 50-LF) to the relocated 12-inch waterline on the east side of the building, which is anticipated to have a maximum pipeline velocity of 7.9 fps and approximately 50-LF of 12-inch pipeline between the dual 12-inch within the access road and the Global Port PRV, which is anticipated to reach a maximum velocity of 8.9 fps.

Figure 3: Minimum Junction Pressures and Maximum Pipeline Velocities – Existing MDD Analysis

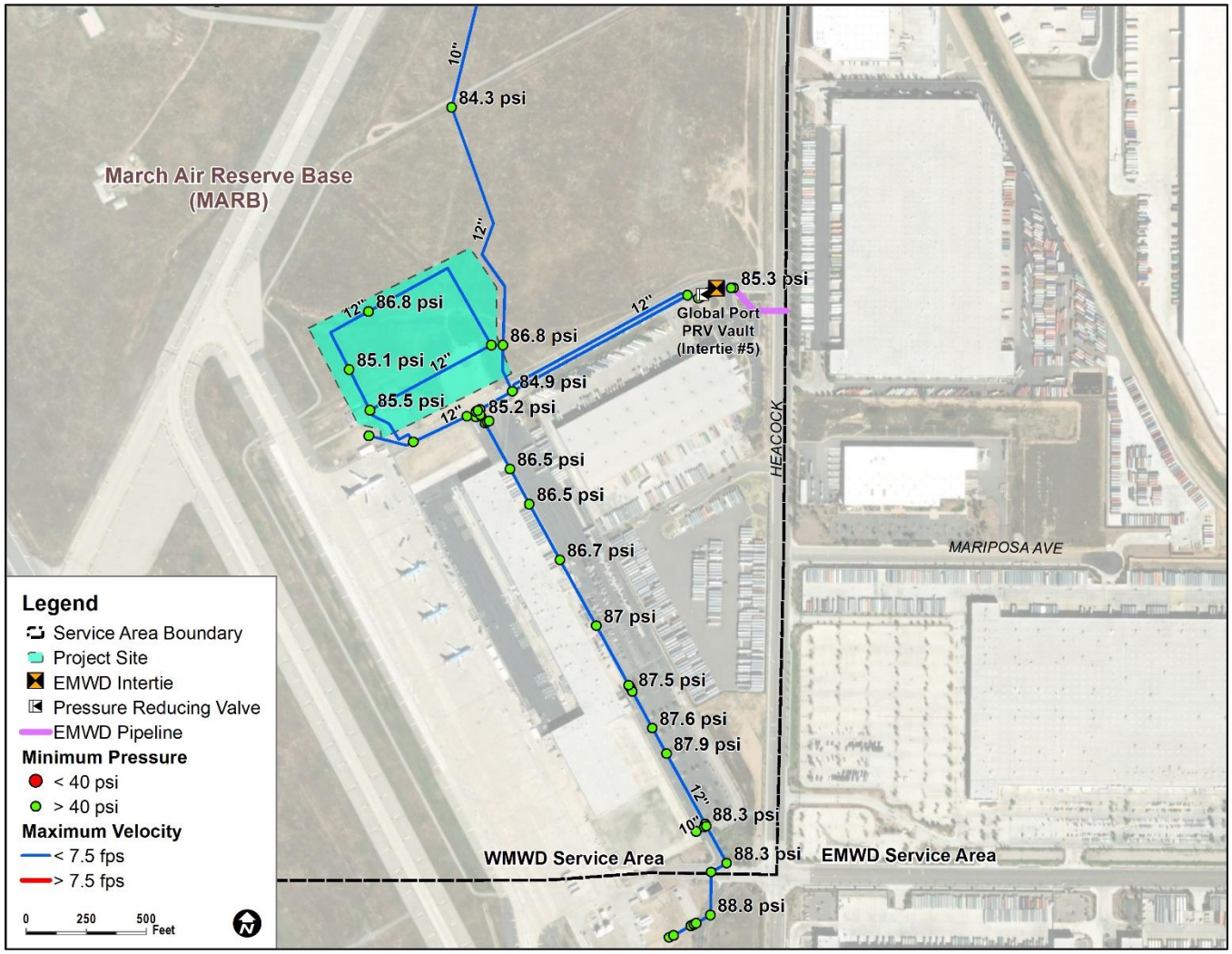


Figure 4: Minimum Junction Pressures and Maximum Pipeline Velocities – Existing MDD + FF Analysis

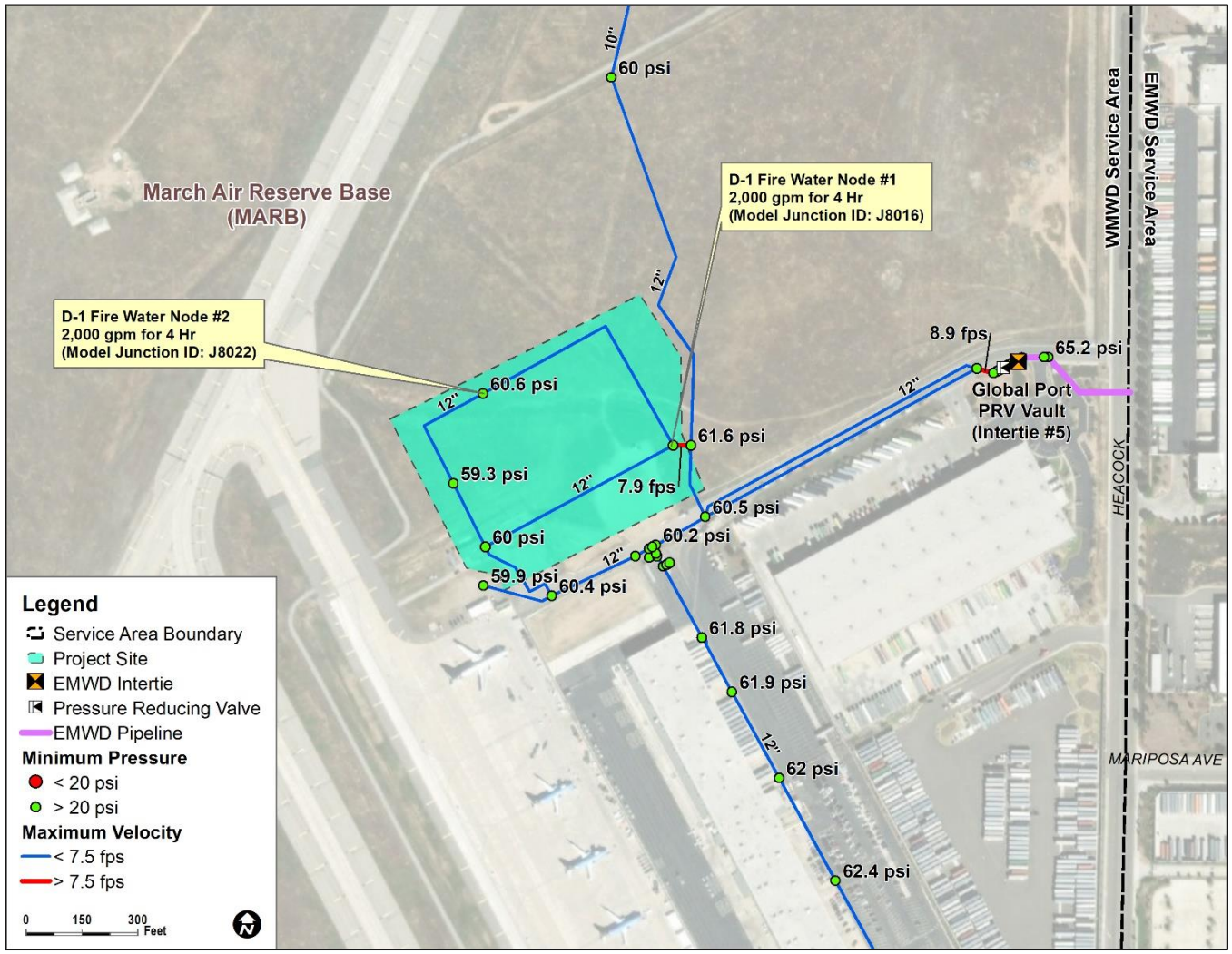
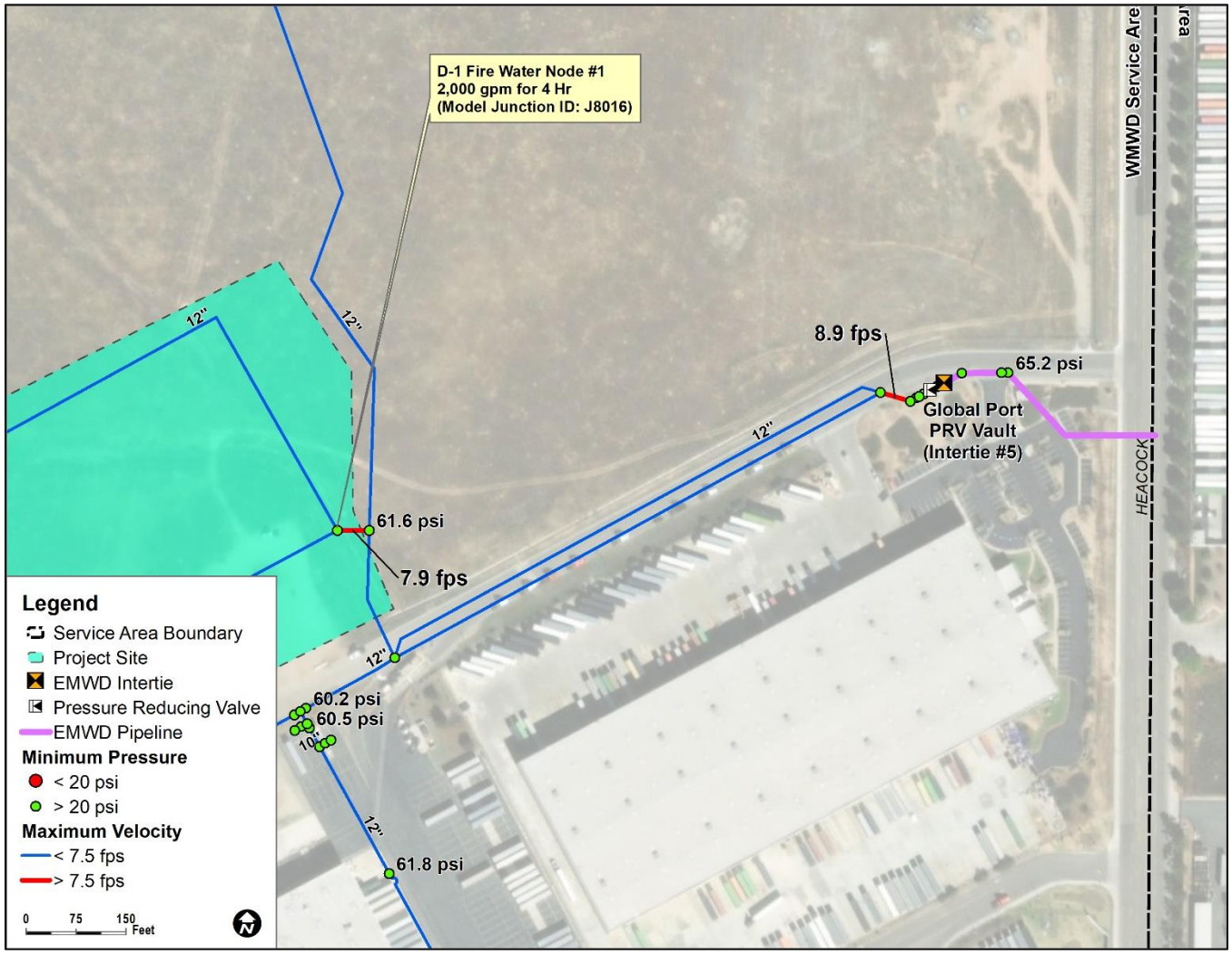


Figure 5: Minimum Junction Pressures and Maximum Pipeline Velocities – Existing MDD + FF Analysis – Detail



4 Near-Term (2030) System Analysis & Results

The Near-Term system model analysis included two (2) EPSs – MDD including peak hour and MDD plus fire flow. The demands for the Near-Term MDD for the MARB area were also included in the hydraulic modeling (784.3 gpm total). The demands for the Near-Term MDD plus Fire Flow scenario included a 4,000 gpm fire flow for a total of 4,843.3 gpm applied to the MARB area in the model. The following sections summarize the methodology and results of each demand scenario.

4.1 Near-Term Maximum Day and Peak Hour Demand

Scenario "MDD_2030" in Western's latest potable water model was used to evaluate the impacts of the proposed development on the anticipated Near-Term system and verify the on and off-site improvements are sized appropriately to meet maximum day and peak hour demand conditions. The anticipated industrial MDD for the D-1 Development of 6.3 gpm, calculated in Table 1, was allocated to Junction ID J8018 along the relocated 12-inch waterline running on the west side of the building. A 24-hour EPS was performed under near-term MDD conditions.

Model results were compared to Western potable water system design criteria outlined in Tables 5-1 and 5-2 from the 2021 Riverside Facilities Master Plan, which require a minimum service pressure of 40 psi and maximum pipeline velocity of 7.5 fps under peak flow conditions.

The results shown in **Figure 6** indicate pipeline velocities are not expected to exceed 7.5 fps and service pressures are not projected to fall below 40 psi. Therefore, the proposed on and off-site water facility improvements are anticipated to satisfy overall maximum day and peak hour demand while maintaining District design criteria in the near-term system.

4.2 Near-Term Maximum Day Plus Fire Flow Demand

A second 24-hour EPS was performed under MDD plus fire flow conditions to verify the proposed on and off-site improvements can deliver the required fire flow while maintaining District design criteria in the near-term system. The District permits a minimum service pressure of 20 psi and maximum pipeline velocity of 7.5 fps under MDD plus fire flow conditions.

The required fire flow of 4,000 gpm was split evenly between two locations on the proposed fire loop (Junction IDs J8016 and J8022) and analyzed under anticipated Near-Term MDD plus fire flow conditions. The results shown in **Figure 7** indicate residual pressures are not projected to fall below 20 psi.

Velocities for most pipelines are not expected to exceed 7.5 fps. However, as shown in **Figure 8**, two short sections of pipe are anticipated to exceed 7.5 fps. These include the 12-inch fire loop connection (approximately 50-LF) to the relocated 12-inch waterline on the east side of the building, which is anticipated to have a maximum pipeline velocity of 7.9 fps and approximately 50 LF of 12-inch pipeline between the dual 12-inch within the access road and the Global Port PRV, which is anticipated to reach a maximum velocity of 8.9 fps.

Figure 6: Minimum Junction Pressures and Maximum Pipeline Velocities – Near-Term MDD Analysis

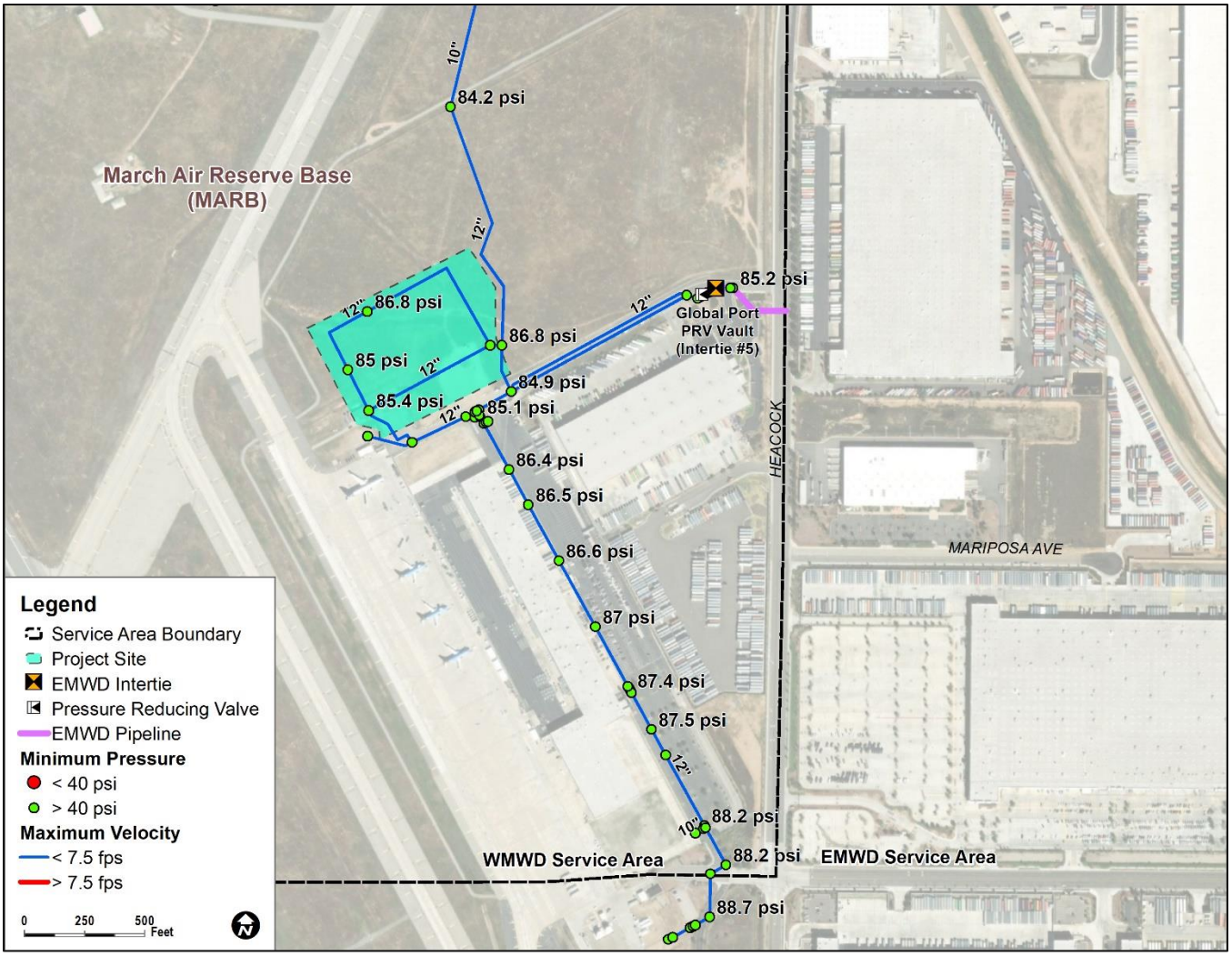


Figure 7: Minimum Junction Pressures and Maximum Pipeline Velocities – Near-Term MDD + FF Analysis

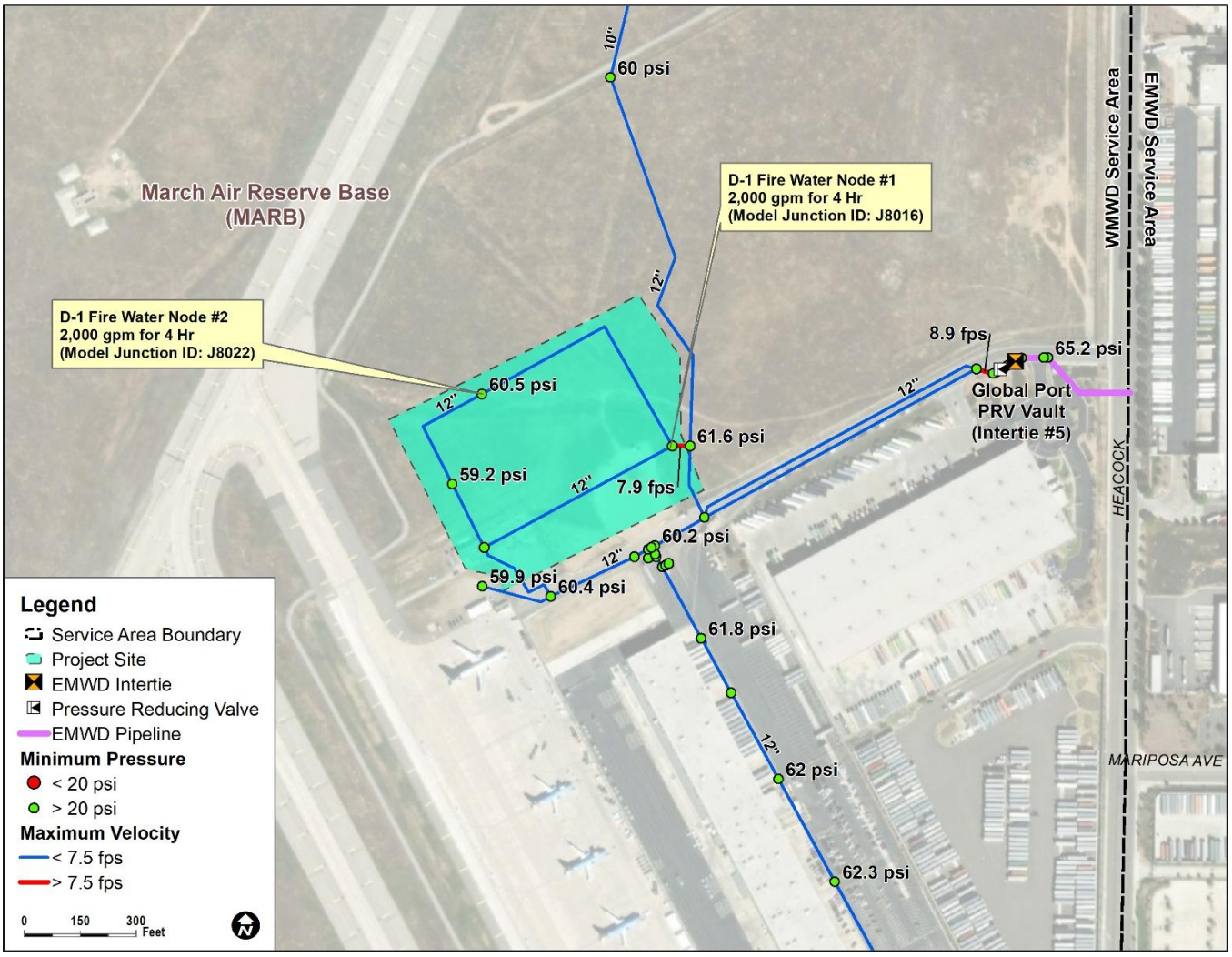
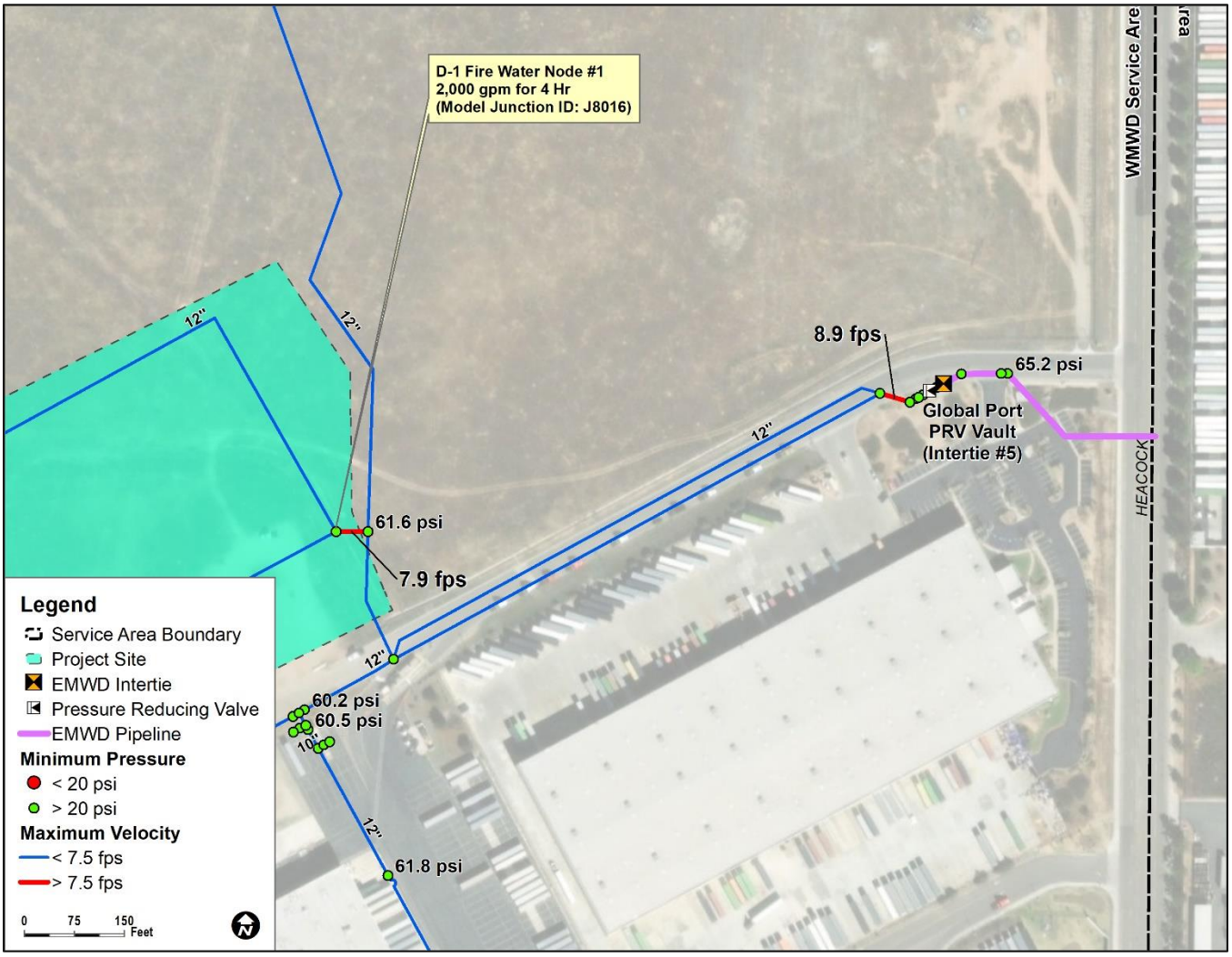


Figure 8: Minimum Junction Pressures and Maximum Pipeline Velocities – Near-Term MDD + FF Analysis – Detail



5 Ultimate System Analysis & Results

The ultimate (buildout) system model analysis included two (2) EPSs – MDD including peak hour and MDD plus fire flow. The demands for the ultimate (buildout) MDD for the MARB area were also included in the hydraulic modeling (907.3 gpm total). The demands for the Ultimate MDD plus Fire Flow scenario included a 4,000 gpm fire flow for a total of 4,907.3 gpm applied to the MARB area in the model. The following sections summarize the methodology and results of each demand scenario.

5.1 Ultimate Maximum Day and Peak Hour Demand

Scenario "MDD_BUILDOUT" in Western's latest potable water model was used to evaluate the impacts of the proposed development on the anticipated ultimate system and verify the on and off-site improvements are sized appropriately to meet maximum day and peak hour demand conditions. The anticipated industrial MDD for the D-1 Development of 6.3 gpm, calculated in Table 1, was allocated to Junction ID J8018 along the relocated 12-inch waterline running on the west side of the building. A 24-hour EPS was performed under ultimate MDD conditions.

Model results were compared to Western potable water system design criteria outlined in Tables 5-1 and 5-2 from the 2021 Riverside Facilities Master Plan, which require a minimum service pressure of 40 psi and maximum pipeline velocity of 7.5 fps under peak flow conditions.

The results shown in **Figure 9** indicate pipeline velocities are not expected to exceed 7.5 fps and service pressures are not projected to fall below 40 psi. Therefore, the proposed on and off-site water facility improvements are anticipated to satisfy overall maximum day and peak hour demand while maintaining District design criteria in the ultimate system.

5.2 Ultimate Maximum Day Plus Fire Flow Demand

A second 24-hour EPS was performed under MDD plus fire flow conditions to verify the proposed on and off-site improvements can deliver the required fire flow while maintaining District design criteria in the ultimate system. The District permits a minimum service pressure of 20 psi and maximum pipeline velocity of 7.5 fps under MDD plus fire flow conditions.

The required fire flow of 4,000 gpm was split evenly between two locations on the proposed fire loop (Junction IDs J8016 and J8022) and analyzed under anticipated ultimate MDD plus fire flow conditions. The results shown in **Figure 10** indicate residual pressures are not projected to fall below 20 psi.

Velocities for most pipelines are not expected to exceed 7.5 fps. However, as shown in **Figure 11**, two short sections of pipe are anticipated to exceed 7.5 fps. These include the 12-inch fire loop connection (approximately 50-LF) to the relocated 12-inch waterline on the east side of the building, which is anticipated to have a maximum pipeline velocity of 7.8 fps and approximately 50 LF of 12-inch pipeline between the dual 12-inch within the access road and the Global Port PRV, which is anticipated to reach a maximum velocity of 9.4 fps.

Figure 9: Minimum Junction Pressures and Maximum Pipeline Velocities – Ultimate MDD Analysis

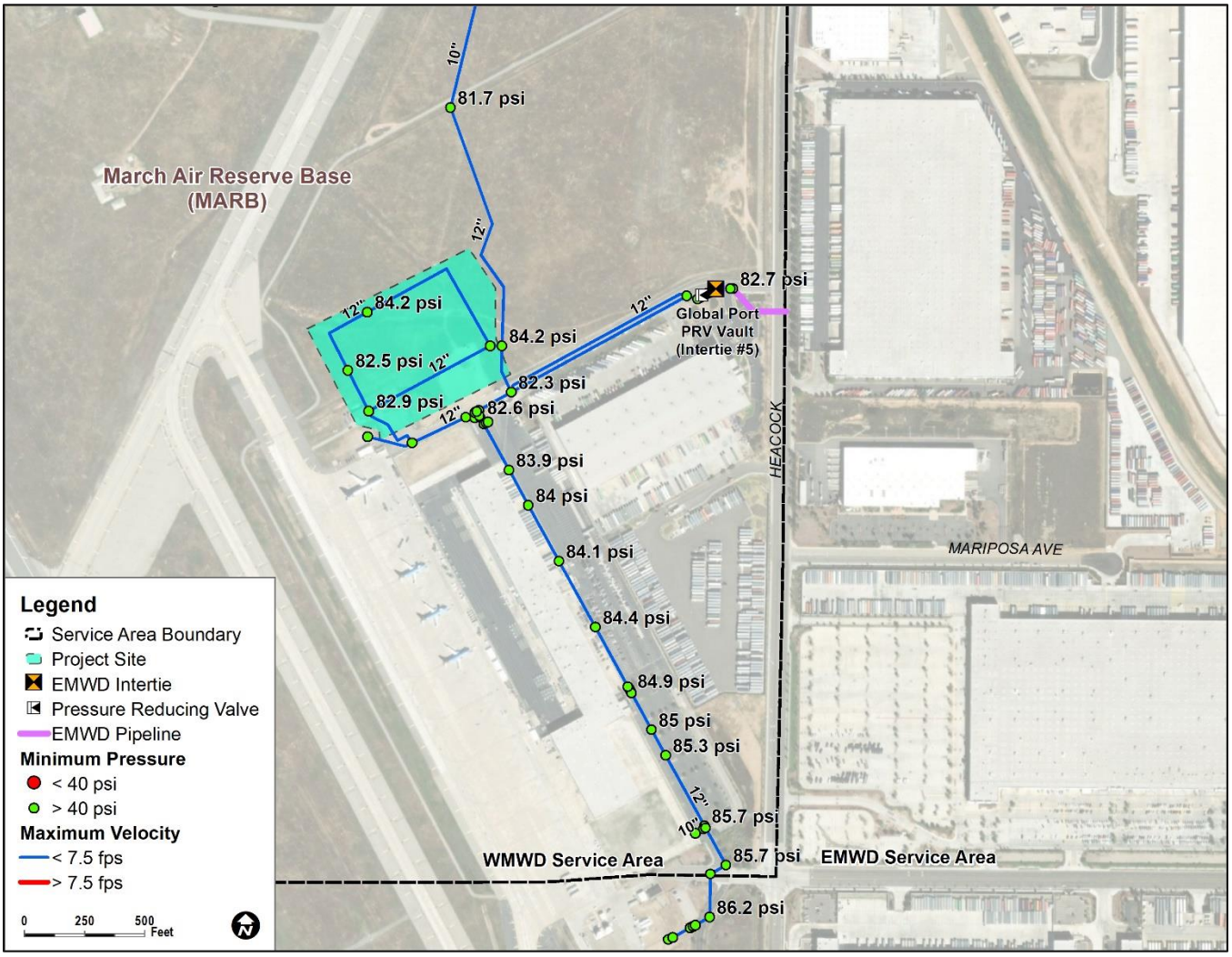


Figure 10: Minimum Junction Pressures and Maximum Pipeline Velocities – Ultimate MDD + FF Analysis

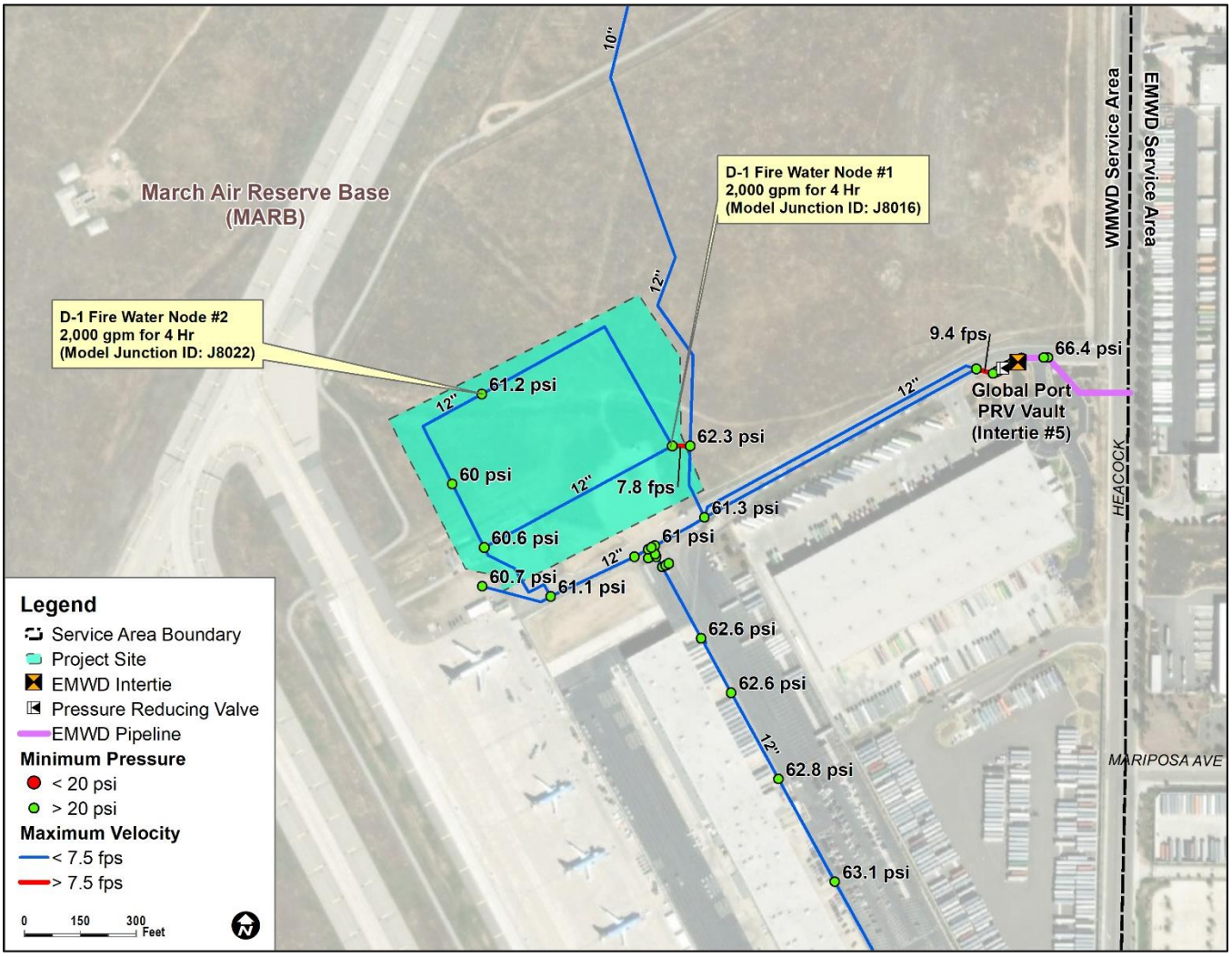
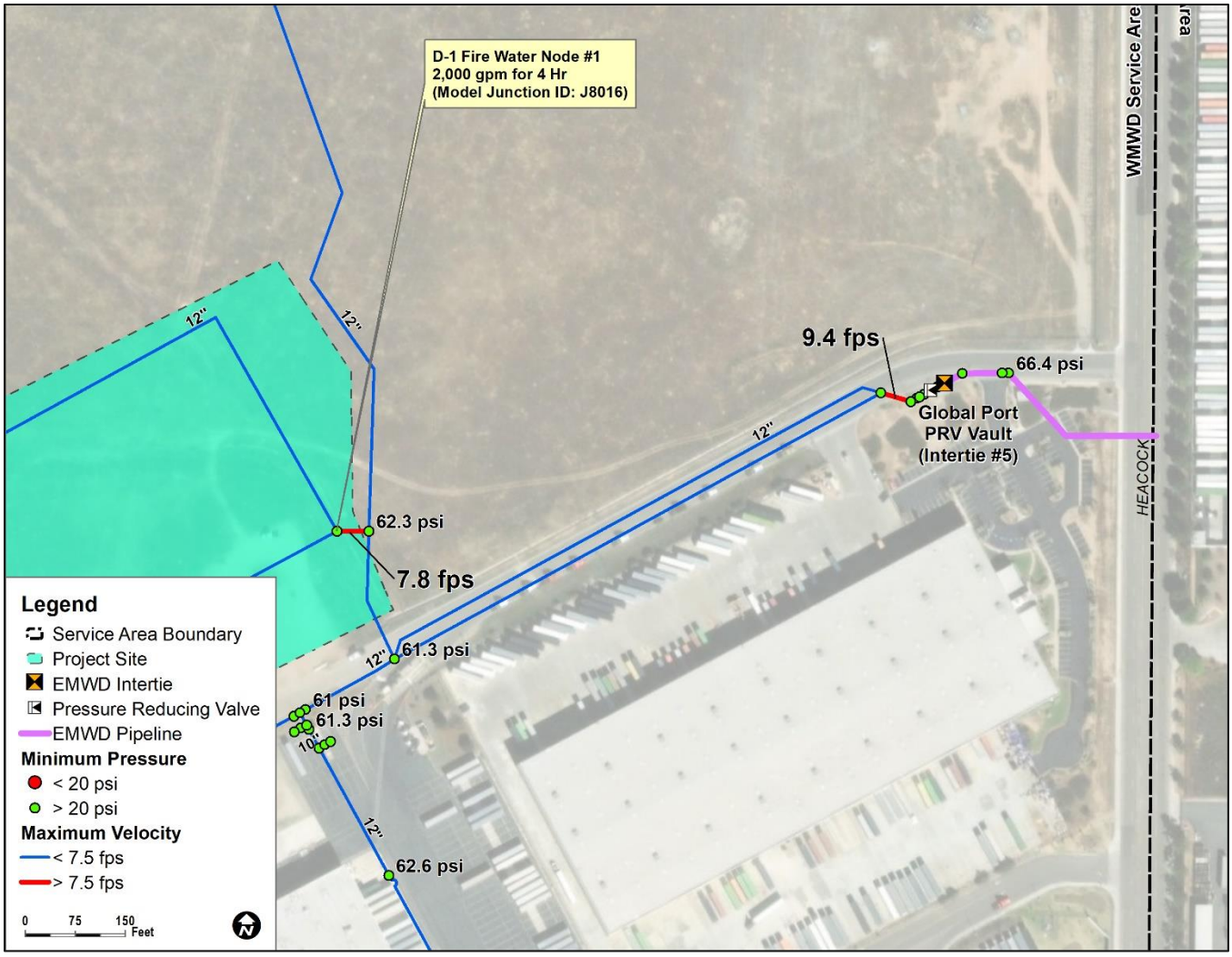


Figure 11: Minimum Junction Pressures and Maximum Pipeline Velocities – Ultimate MDD + FF Analysis – Detail

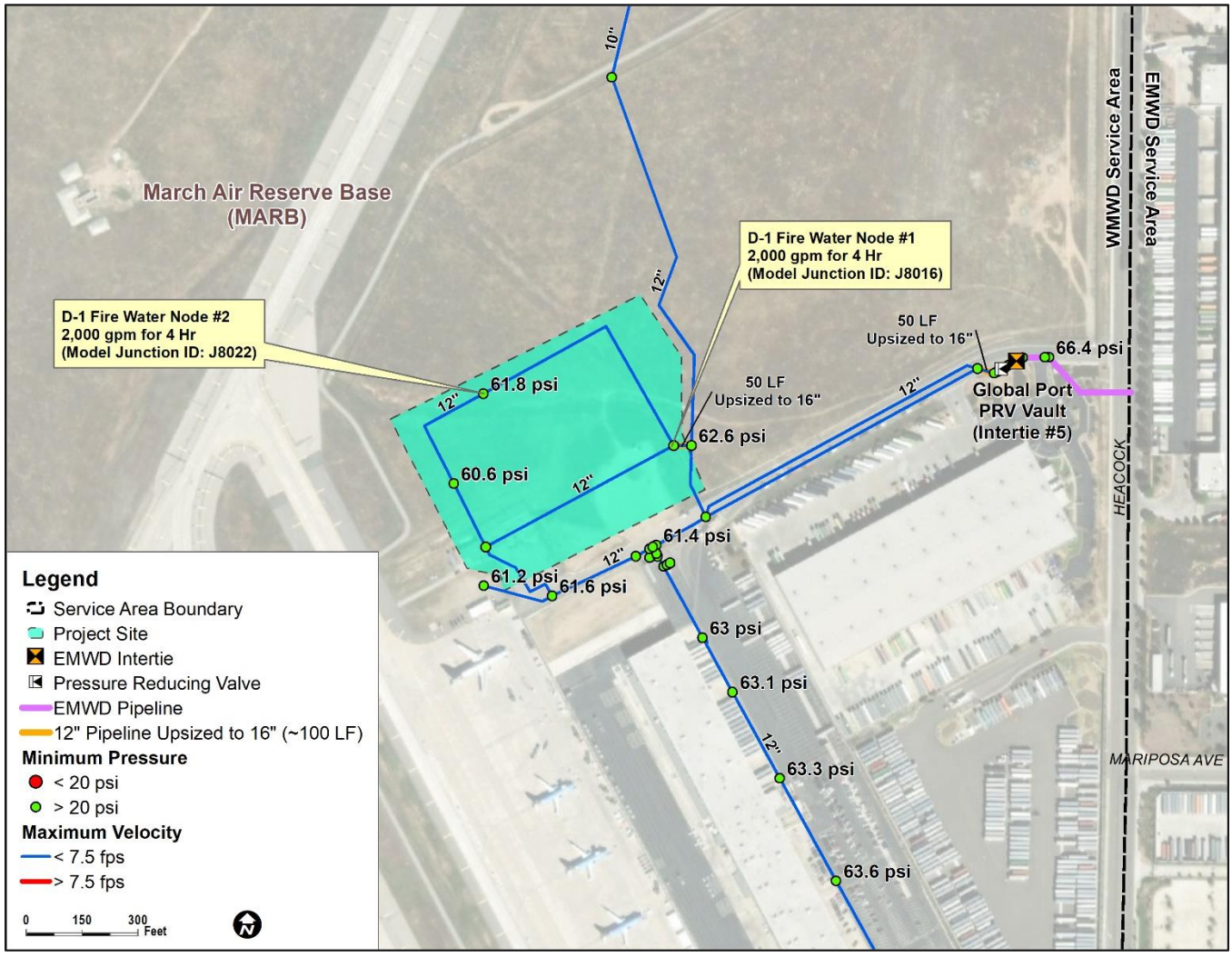


5.2.1 Ultimate Maximum Day Plus Fire Flow Demand – Improved System

The two short segments of pipeline anticipated to exceed the District's maximum velocity criterion of 7.5 fps under existing, near-term, and ultimate MDD plus fire flow conditions were upsized from 12-inch to 16-inch in the ultimate system analysis. The results shown in **Figure 12** indicate that under ultimate MDD plus fire flow conditions and with approximately 100 LF of 12-inch pipeline upsized to 16-inch, residual pressures are anticipated to remain above 20 psi and maximum velocities not to exceed 7.5 fps throughout the District's facilities in the vicinity of the proposed development. The maximum pipeline velocity is anticipated to be 5.3 fps in the short new segment of upsized 16-inch pipeline serving the Global Port PRV vault.

It is assumed that since the recommended pipeline improvements meet the District's design criteria in the ultimate system analysis, the same improvements will be adequate under existing and near-term MDD plus fire flow conditions.

Figure 12: Minimum Junction Pressures and Maximum Pipeline Velocities – Ultimate MDD + FF Analysis with Recommended Pipeline Upsizing



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6 Recommendations

After analysis of the existing, near-term, and ultimate system with information provided by the District and DRC-Engineering, Dudek concludes the following:

- The proposed D-1 Development is not anticipated to result in any new low pressure or high velocity violations in the District's potable water system under existing, near-term, and ultimate peak hour and maximum day demand conditions.

- The as-proposed D-1 development piping plan is anticipated to result in maximum pipeline velocity violations at two locations under existing, near-term, and ultimate maximum day plus fire flow conditions. Approximately 100 LF total of 12-inch pipeline (proposed and existing) is recommended to be upsized to 16-inch to eliminate the high velocity violations at the two locations identified.

- According to Western, the parallel 12-inch pipe as proposed in the D-1 Development drawings provided for this project is unacceptable. The District requires the full replacement of the existing 12-inch pipeline (approximately 830 LF) with a 16-inch pipeline.

- Refer to Attachment B for a detailed cost estimate that includes the cost of upsizing the two 50-LF segments identified in the capacity analysis to 16-inch and the replacement of the 12-inch parallel to full replacement with a 16-inch diameter pipeline.

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ATTACHMENT A
SITE UTILITY MAP

NOT FOR CONSTRUCTION

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860
R.C.E. 83987
DATE
JEPTHA BRANDER

NO:	REVISION:	DATE:

PROJECT: D-1 PARCEL
MARCH AIR RESERVE BASE
RIVERSIDE COUNTY, CA

DRAWING NAME: WMWD UTILITY PLAN - OPTION 4

MARB

EX. 10" ACP PUB. WATER (WMWD)
826 GPM @ 3.37 FPS

(W) 10IN

PR. PERIMETER PATROL ROAD

EX. AIRFIELD SERVICE ROAD

EX. WMWD 4" SFM FLOW TO NORTH

EX. GAS LINE

EX. WMWD 10" SFM FLOW TO SOUTH (ABANDONED)

EX. ELECTRICAL

CALCULATED FLOW AT POC**:
90 PSI STATIC
800 GPM @ 41 PSI RESIDUAL
970 GPM PROJECTED AT 20PSI

INTERCEPT AND CONNECT TO EXISTING 10" WATER LINE AND INSTALL 10" DCDA

38 PSI AT MODELED POC IN FIRE FLOW

EX. WMWD DCDA ASSY & 10" WATER LINE TO BE REMOVED

EX. MW GROUNDWATER SYSTEM (TO REMAIN)

PR. DUAL 36" STORM DRAIN.

PR. PRIVATE HYDRANT (TYP.)

PR. 36" STORM DRAIN.

FIRE FLOW NODE
1500 GPM DEMAND
26 PSI RESIDUAL

FIRE FLOW NODE
1500 GPM DEMAND
26 PSI RESIDUAL

180,800± SF BLDG TYPE III-B
8,000 GPM FIRE FLOW
50% ALLOWED REDUCTION
4000 GPM REQUIRED
SPRINKLER BOOSTER PUMP REQ'D

PR. PUBLIC HYDRANT

PR. 12" PVC PUB. WATER
826 GPM @ 2.34 FPS

BELOW GRADE DETENTION BASINS, TYP.
(FINAL SIZE/LOCATIONS TBD)

EX. WMWD SFM (FROM PHILLIPS BUILDING)

EX. MW GROUNDWATER SYSTEM (TO REMAIN)

EX. NG

SIGNALIZED INTERSECTION AT DRIVEWAY

16850 DWY
HEACOCK STREET

FIRE FLOW NODE
1000 GPM DEMAND
28 PSI RESIDUAL

EX. 10" WATER TO BE ABANDONED

PR. 12" FIRE SERVICE WITH RPDA
29 PSI

PR. 12" PVC PVT. FIRE WATER
1901 GPM @ 5.39 FPS

PR. 12" PVC PVT. FIRE WATER
2099 GPM @ 5.95 FPS

PR. PUBLIC HYDRANT

D-1 SITE
MDD NODE
27.9 GPM DEMAND @ 37 PSI

PR. 12" PVC TIE TO EX. WATER SUPPLY FOR SOUTH MARB AIRFIELD
36 PSI WITH FIRE FLOW DEMANDS

STORM DRAIN CONNECTION TO EX.

PR. WMWD WATER METER LOCATION
1" IRRIGATION
1 1/2" DOMESTIC

PR. PUBLIC HYDRANT

PR. 12" PVC PUB. WATER PARALLEL WITH EXISTING WATER
1660 GPM @ 4.71 FPS

PHILIPS BUILDING AND FUTURE SITE 7
MDD NODE
92.1 GPM DEMAND @ 39 PSI

EX. WMWD INTERCONNECT WITH EMWD PER WMWD DWG 3784 EMWD DWG D-13849 SEE DETAIL HEREON

INTERCEPT AND CONNECT TO EXISTING 10"X12" FTG.

PR. 12" PVC PUB. WATER
1901 GPM @ 5.39 FPS

AMAZON BUILDING
MDD NODE
127.5 GPM DEMAND @ 37 PSI

PR. 12" PVC PUB. WATER
1301 GPM @ 3.69 FPS

EX. 12" PVC PUB. WATER PER WMWD DWG 3784
1670 GPM @ 4.74 FPS

EX. 12" PVC PUB. WATER PER EMWD DWG D-13849
3422 GPM @ 9.71 FPS

HEACOCK STREET

EMWD 8" PVC SEWER PER DWG D-13849

EXISTING 10" WATER LINE (WMWD WATER SYSTEM DEAD-ENDS AT SOUTH MARB AIRFIELD, NO ADDITIONAL WATER SOURCES)

PVT 10" PVC FIRE WATER LOOP PER DWG 3784

WMWD HYDRANT FLOW TEST (11/24/20):
90 PSI STATIC
800 GPM @ 39 PSI RESIDUAL
949 GPM PROJECTED AT 20PSI

INTERCEPT AND CONNECT TO EXISTING 12" WATER LINE

EMWD HYDRANT FLOW TEST (11/20/20):
71.8 PSI STATIC
4000 GPM @ 52 PSI RESIDUAL
6724 GPM PROJECTED AT 20 PSI

PR. PUBLIC SEWER CONNECTION (TO EMWD)

EMWD FLOW TEST: (PRE METER, BFV)
(11/20/20) PRESSURE ZONE 1695
STATIC 71.8 PSI
4000 GPM PROJECTED FLOW AT 52PSI
EMWD ALLOWS >10 FPS FOR FIRE FLOW

EMWD 20" CML&C WATER PER DWG D-13849

EX. 12" PVC PUB. WATER
2029 GPM @ 5.76 FPS

EX. 12" PVC WMWD WATER PER DWG 3784

EX. STORM DRAIN

(W) 12IN

(W) 20IN

(W) 24IN

(W) 10IN

W — PROPOSED PUBLIC WATER
FW — PROPOSED PRIVATE FIRE WATER
FW — PROPOSED PUBLIC FIRE WATER
S — PROPOSED SEWER
(W) — EXISTING WATER
(SS) — EXISTING SEWER
PIPE REMOVAL/ABANDONMENT
W — REMOVE AND REPLACE

EX. WMWD BFV
EX. 12" PVC WATER LINE
EX. GATE VALVE
EX. GATE VALVE
(W) 12IN
EX. EMWD WATER METER

WMWD/EMWD INTERCONNECTION
SCALE: 1" = 20'

NOTES:
* 14.4 PSI PRESSURE LOSS CALCULATED THROUGH WMWD AND EMWD INTERCONNECT
** RESIDUAL PRESSURE AT P.O.C. WAS ESTIMATED BY ADDING CALCULATED HEADLOSS THROUGH EXISTING 10" WATER SYSTEM AT 800 GPM TO THE FIRE FLOW RESIDUAL PRESSURE. (2 PSI HEADLOSS + 39 PSI FIRE FLOW RESIDUAL AT HYDRANT = 41 PSI @ 800 GPM AT P.O.C.)

N

100' 50' 0' 100' 200'
GRAPHIC SCALE: 1 INCH = 100 FT

ISSUE:	EXHIBIT
DATE:	2021/01/08
CHECKED: JB	DRAWN: NS
DRAWING FILE:	EXH500
PROJECT NO.:	20-522
SHEET NUMBER:	1
OF	3 SHEETS
SCALE:	AS NOTED

FILENAME: M:\2020\20-522 Riverside Meridian Base D1 Parcel\EXH\EXH 500 WWMD WATER REALIGNMENT\20-522 D-1_EXH500_WWMD Opt 4.dwg, LAST SAVED ON: Sep 01 2022 2:14pm PLOTTED BY: NICHOLAS, ON: Sep 01 2022 2:14pm, CFG:

ATTACHMENT B
DETAILED COST ESTIMATE FOR PIPELINE UPSIZING

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

Project:	D-1 Development	Job No.	13726.16
Client:	WMWD/DRC-Engineering	Estimator:	JL
Location:	March Air Reserve Base (MARB)	Job Status:	10%
Date:	4/11/2023	Cost Index:	14033.31 - ENR CCI in Los Angeles, Feb 2023

Bid Item No.	Description	Unit	Quantity	Unit Price[1, 2]	Amount
1	16-inch Upsizing	LF	100	$480	$48,000
2	16-inch Single Supply (instead of parallel 12-in)	LF	830	$480	$398,400
				SUBTOTAL	**$447,000**
				Contingency (30%)	**$135,000**
				TOTAL CONSTRUCTION	**$582,000**
				Overhead (40%)	**$233,000**
				TOTAL ESTIMATED PROJECT COST[3]	**$815,000**

Notes:

1. All costs in 2023 dollars.
2. Unit Price for pipeline installation includes all labor, materials, removal/replacement, asphalt, etc. for full waterline replacement.
3. This bid item is assumed to be associated with the pipeline improvements as part of the larger D-1 Development project.