Appendix N:
Water Supply Assessment

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BARTON ROAD LOGISTICS CENTER
Water Supply Assessment
July 22, 2021

This Water Supply Assessment (WSA) was prepared to assist EBS Realty Partners to satisfy the requirements of California Water Code Section 10910 (Senate Bill 610) for the Barton Road Logistics Center (Project).

The proposed project is in the City of Colton (City), near the intersection of Barton Road and La Cadena Road.

The project includes the redevelopment of the northerly 45.52 acres of a 54.82-acre site designated as Light Industrial within the Light Industrial (M-1) District in the City of Colton.

The proposed project includes 960,040 square feet of new buildings. Four existing industrial buildings totaling 612,515 square feet and an existing 46,920-square-foot office building will be demolished. The total building square foot age that will be demolished is 659,435 square feet. The project thus results in a net increase of 300,605 square feet of building space when compared to existing conditions which represents the additional water demand to the City of Colton water supply.

The project is currently in the planning approval process. Information about this project used in this WSA was provided by EBS Realty Partners.

The criteria listed in the City's 2016 Water Master Plan (WMP) and information from the 2020 Integrated Regional Urban Water Management Plan for the Upper Santa Ana River Watershed was also used this assessment.
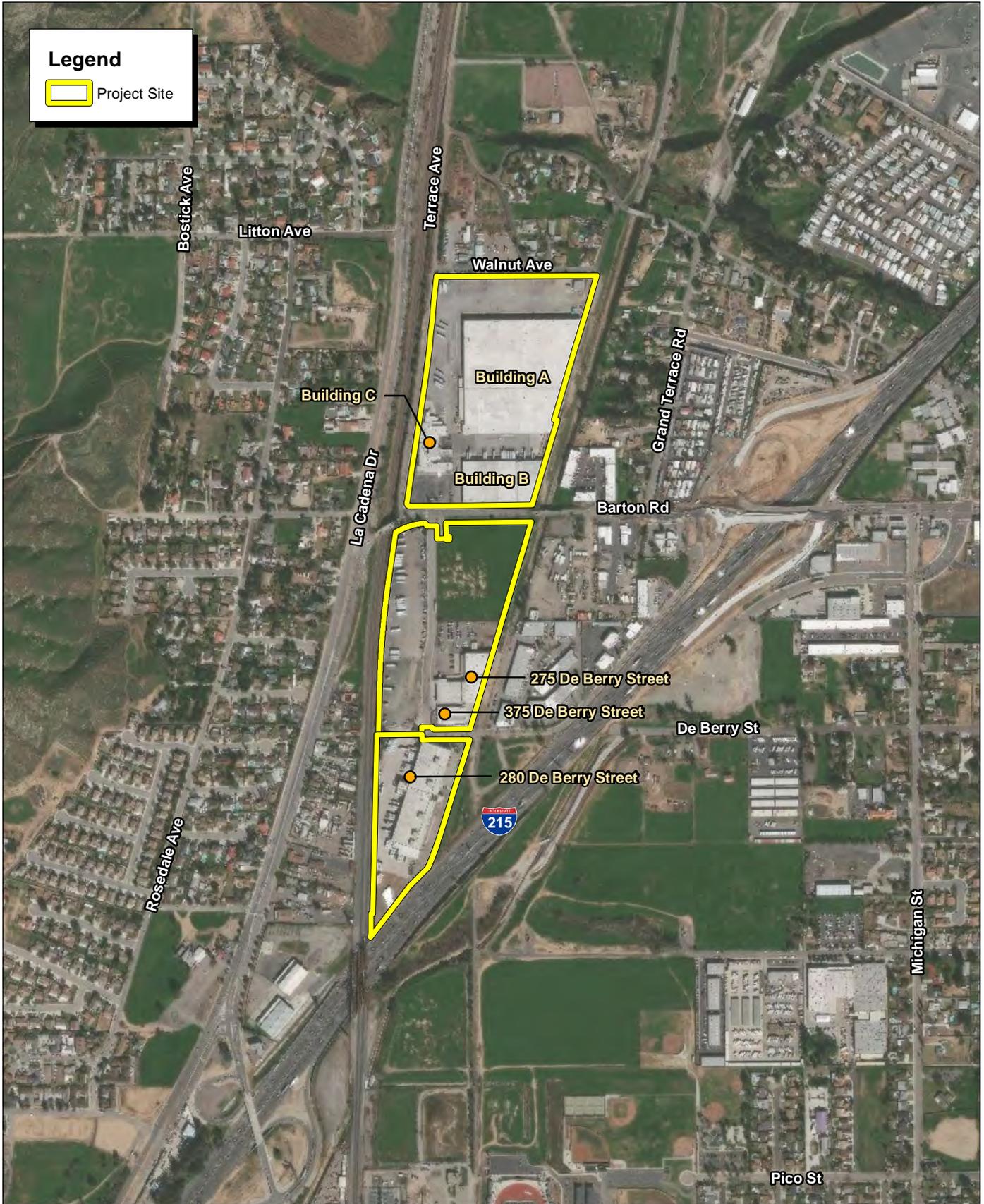
A map of the Project is shown in Exhibit 2-2.

Purpose

The purpose of this WSA is to determine the effect of the development's water demands on the City's water supply and distribution system.

This WSA includes the following:

- Information on the City's water supplies consistent with California Water Code (Water Code) Sections 10620 et. seq. (the Urban Water Management Planning Act) and 10910 et. seq. (Water Supply Planning to Support Existing and Planned Future Users).

Legend

☐ Project Site

Bostick Ave

Litton Ave

Terrace Ave

Walnut Ave

Building A

Building C

Building B

Grand Terrace Rd

Barton Rd

La Cadena Dr

275 De Berry Street

375 De Berry Street

De Berry St

280 De Berry Street

Rosedale Ave

215

Michigan St

Pico St

800 400 0 800

Feet

Exhibit 2-2
Project Site Vicinity

CITY OF COLTON
BARTON ROAD LOGISTICS CENTER
ENVIRONMENTAL IMPACT REPORT

- Information on current and projected water demands, based on the City's WMP and data provided by EBS Realty Partners.

- Comparison of water supplies and water demands for normal, single dry, and multiple dry years.

- Pumping and storage capacity analysis.

- Hydraulic distribution system analysis using the estimated water demands for the proposed Aqua Mansa project.

Proposed Project

The project site is approximately 45.52 acres and is part of a larger 54.82-acre site. The remaining 9.3 acres are located at 280 De Berry Street. The existing 125,801 square-foot cold storage warehouse at 280 De Berry Street will remain in operation.

The proposed project will construct two industrial warehouse logistics buildings with a total square footage of 960,040 square feet (Exhibit 2-5). Building 1 will be 540,920 square feet and will occupy a 26.23-acre site north of Barton Road (Exhibit 2-6). Building 1 will contain 10,000 square feet of office space and 530,920 square feet of warehouse space. Building 2 will be 419,920 square feet and will occupy a 17.62-acre site south of Barton Road (Exhibit 2-7). Building 2 will contain 10,000 square feet of office space and 409,120 square feet of warehouse space.

The project site is within the southwestern portion of the City of Colton and borders the boundary of the City of Grand Terrace on the east, north, and northwest portions of the site. As shown in Exhibit 2-2, the site is roughly bound by the I-215 Freeway to the south and southeast, industrial and commercial uses to the east, Walnut Avenue to the north, and South Terrace Avenue to the west.

Water Demands

The estimated water demands are based on a water demand factor of 0.015 gpd per square foot, which is the typical water demands for a warehouse facility. And peaking factor of 1.5 for maximum day demand (MDD) and 2.0 for peak hour demand (PHD) were used. Table 1 summarized the estimated water demands for the project.
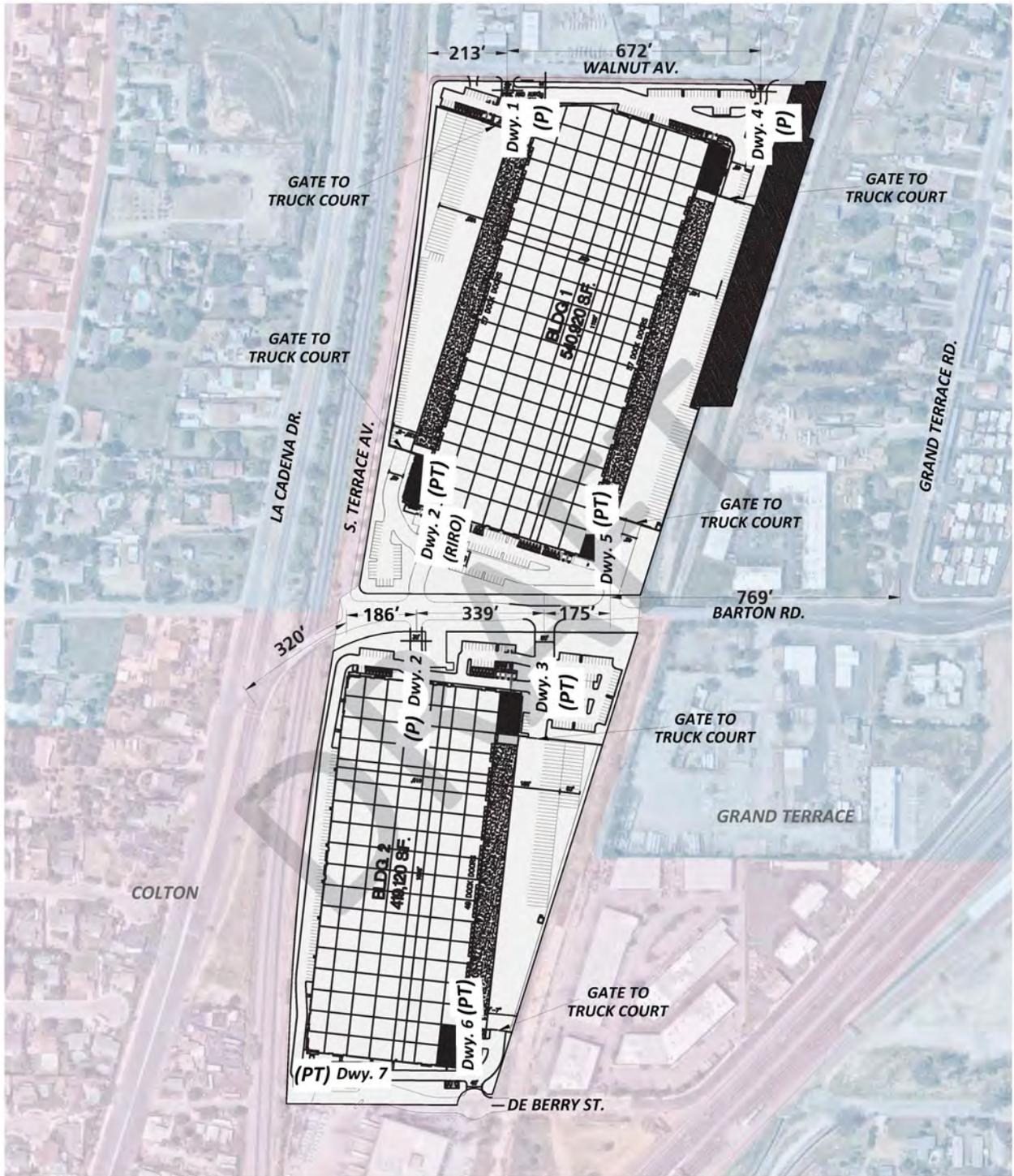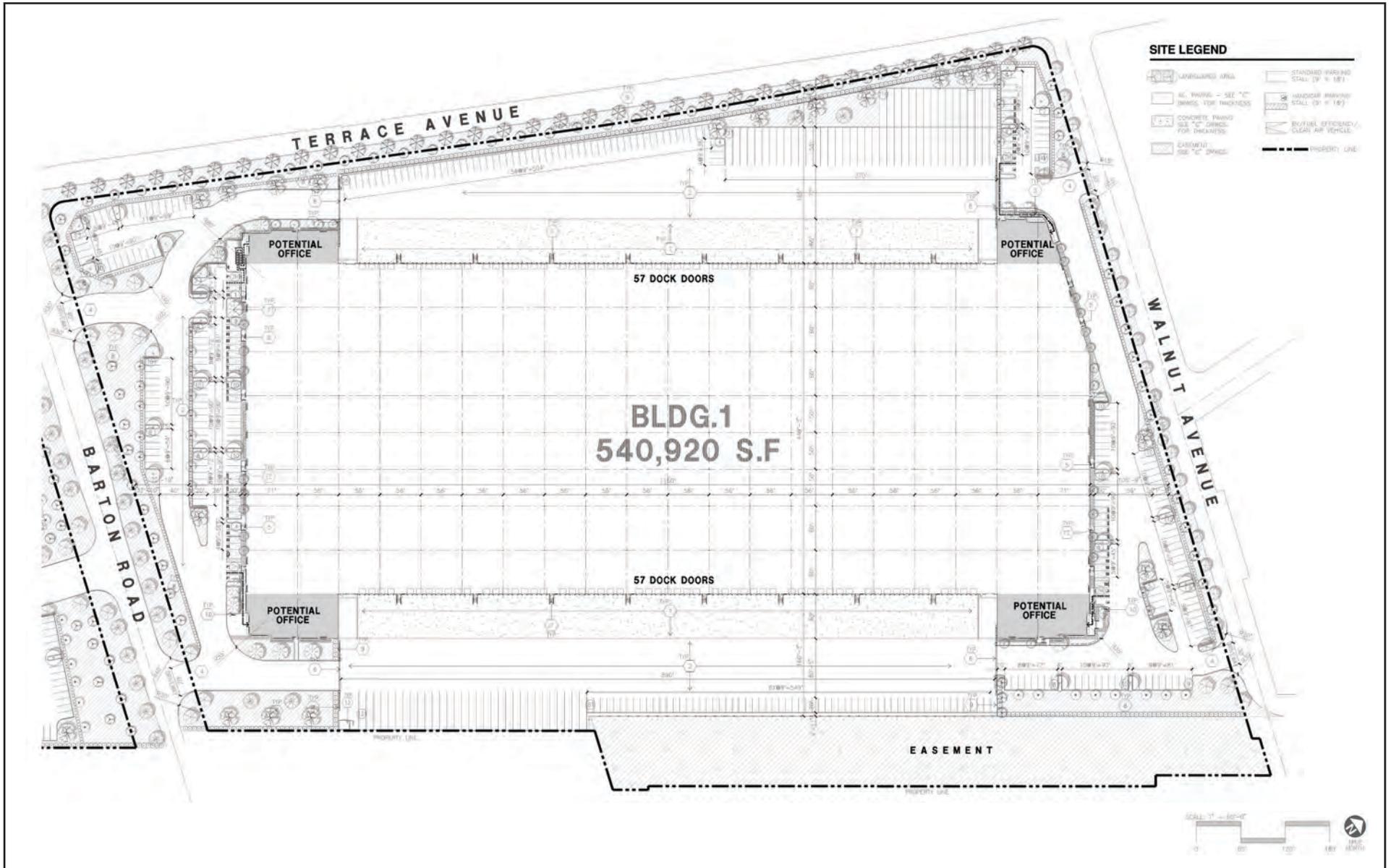
LEGEND:

RIRO = RIGHT-IN/RIGHT-OUT ONLY ACCESS
P = PASSENGER CARS ONLY
T = TRUCKS ONLY
PT = PASSENGER CARS AND TRUCKS

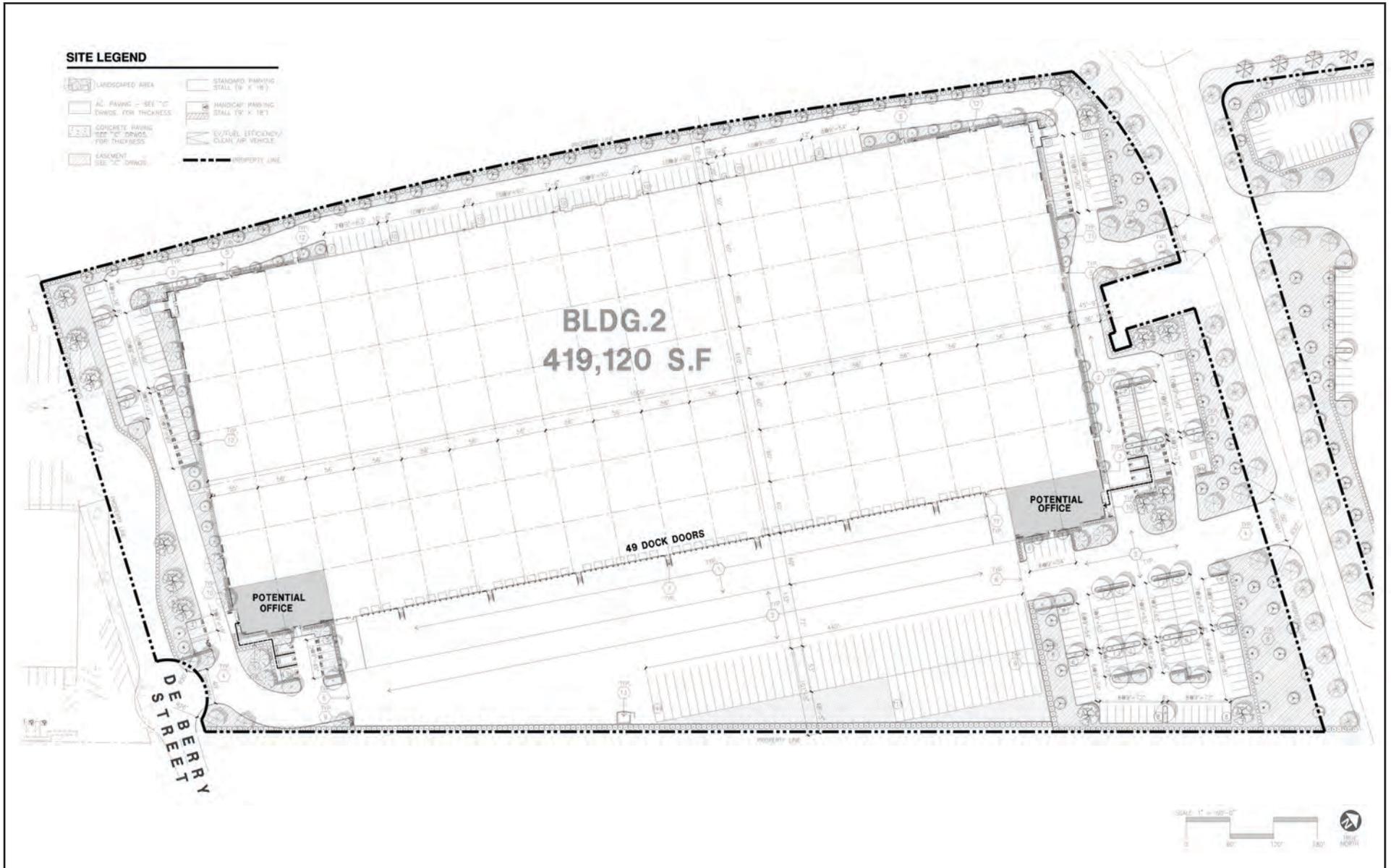NOTE: UNLESS NOTED, ALL DRIVEWAYS ARE ASSUMED TO BE FULL ACCESS.

Source: Urban Crossroads.

Exhibit 2-5
Overall Site Plan

SITE LEGEND

BLDG.1
540,920 S.F

57 DOCK DOORS

57 DOCK DOORS

POTENTIAL OFFICE

POTENTIAL OFFICE

POTENTIAL OFFICE

POTENTIAL OFFICE

TERRACE AVENUE

WALNUT AVENUE

BARTON ROAD

EASEMENT

Source: HPA, Inc. Architecture, 7/3/2019.

FIRSTCARBON SOLUTIONS™

Exhibit 2-6
Overall Site Plan - Building 1

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CITY OF COLTON
BARTON ROAD LOGISTICS CENTER
ENVIRONMENTAL IMPACT REPORT

SITE LEGEND

Landscaped Area

AC Paving – See "C" Drawing for Thickness

Concrete Paving See "C" Drawings for Thickness

Easement See "C" Drawing

Standard Parking Stall (9' x 19')

Handicap Parking Stall (9' x 18')

EV/Fuel Efficiency/Clean Air Vehicle

Property Line

BLDG. 2
419,120 S.F

POTENTIAL OFFICE

POTENTIAL OFFICE

49 DOCK DOORS

DE BERRY STREET

Exhibit 2-7
Overall Site Plan - Building 2

CITY OF COLTON
BARTON ROAD LOGISTICS CENTER
ENVIRONMENTAL IMPACT REPORT

The total square foot of buildings for the proposed project is 960,840 square feet. Based on the 0.015 gpd/sf demand factor, the average daily water demand for the proposed project is approximately 14,413 gpd or 16.1 AF per year. The estimate average daily water demand (ADD) is 10 gpm, the maximum daily demand (MDD) is 15 gpm and the peak hourly demand (PHD) if 30 gpm.

This is the current and future water demand for the project since there will be no future expansion.

Table 1 – **Estimated Water Demands**

	Building Size	Estmated Water Demand			ADD	MDD	PHD
	sq ft	gpd	gal/yr	AF/yr	gpm	gpm	gpm
Proposed Building 1	540,920	8,114	2,961,537	9.1	6	8	17
Proposed Building 2	419,920	6,299	2,299,062	7.1	4	7	13
Total Proposed:	960,840	14,413	5,260,599	16.1	10	15	30
Demo Buildings	-659,435	-9,892	-3,610,407	-11.1	-7	-10	-21
Net Increase	301,405	4,521	1,650,192	5.1	3	5	9

The project includes removal of 659,435 existing square feet of buildings space that have previously been served by the City of Colton. Subtracting the water demands for the existing buildings to be demolished, the net increase in the water demands to the City of Colton water system is 4,521 gpd or 5.1 AF per year.

For this evaluation, the demands for the entire project were used. It is important to note that since 659,435 sf of the proposed 960,040 sf of new buildings is existing demand on the City of Colton water system, proposed project presents only a 31 percent increase in demand overall on the water system. Including the entire square footage of the proposed project is a conservative approach.

The 2040 water demands for the City of Colton is 11,097 AF per year. This is based on the 2020 Integrated Regional Urban Water Management Plan for the Upper Santa Ana River Watershed which has been adopted by the City of Colton. This equals 9.9 MGD ADD and 17.8 MGD MDD. The Barton Road Logistics Center project and is approximately 0.14 percent projected ADD and MDD in 2040.

The City of Colton gets 100 percent of its potable water supply from groundwater in three different basins. These three basins are adjudicated as follows:

- **San Bernardino Basin** is adjudicated as part of the San Bernardino Basin Area (SBBA), which covers surface water and groundwater extractions. It has been

adjudicated as part of the Western Judgment of 1969. The City currently takes no surface water from SBBA, and its groundwater pumping is located within the Bunker Hill Sub-basin. As a member of the Non-Plaintiffs' group of the Western Judgment (covering agencies within San Bernardino County), the City shares 167,238 acre- feet per year (AFY) with neighboring agencies, which is approximately 72.1 percent of the estimated operating safe yield (OSY) for SBBA. When extractions exceed OSY, agencies must collectively purchase imported water for system replenishment. When extraction falls below OSY, that difference is credited to the member agencies. Based on this adjudication, the City is not strictly limited in its withdrawals. However, collective withdrawals must fall below OSY, or additional costs will be incurred.

- **Rialto-Colton Basin** extractions are governed by the Rialto Basin Decree and the Western Judgment outlined above in the SBBA discussion. While there is no defined OSY in AF terms for the Rialto-Colton Basin as part of the Western Judgment or any other agreement, three index wells within the basin must remain above a threshold level from March to May each year. Similar to the SBBA adjudication, San Bernardino County agencies can take unlimited groundwater supplies, as long as the groundwater surface level does not fall below the threshold index. If this occurs, agencies must purchase imported water for replenishment purposes.

- **Riverside North Basin** is adjudicated in the same fashion as the Rialto-Colton Basin, and is also governed under the Western Judgment. Three index wells are used to monitor groundwater surface depth, and extractions for San Bernardino County agencies are unlimited up to this threshold. If it is exceeded, additional replenishment water must be purchased.

Given the adjudications associated with each of the three groundwater basins that the City relies upon, there is no anticipated supply shortage. If the City, along with the other users of the three basins, exceeds the safe yield for groundwater pumping, additional imported water can be purchased for replenishment purposes allowing the City to continue to meet its supply needs solely through groundwater. The actual and projected groundwater supplies are outlined in Table 2.

A water supply assessment was conducted based on information in the 2020 Integrated Regional Urban Water Management Plan for the Upper Santa Ana River Watershed. The population assumption for 2040 is 56,692. Using a demand rate of 193 GPCD, as found in the 2016 Water Master Plan, the resulting 2040 demand estimate is 10,941 AFY.

As shown in Table 3, the City's 2040 projected demand before the proposed project is approximately 11,097 AFY. With the 16 AFY demand for the project, the water supply balance is 838 AFY.

Table 2 – **Projected Water Supply**

Groundwater Basin	2025	2030	2035	2040	2045
Bunker Hill	4,425	4,968	5,510	5,784	6,058
Rialto-Colton	2,800	2,800	2,800	2,800	2,800
Riverside-Arlington	3,800	3,800	3,800	3,800	3,800
Purchased or Imported Water	197	257	317	377	436
Total (AFY)	**11,222**	**11,825**	**12,427**	**12,761**	**13,094**
Average Production (MGD)	**12.6**	**13.2**	**13.9**	**14.3**	**14.7**

Notes:
2005 through 2014 are based on actual water supply volumes provide by the city.
Years 2025 through 2040 are from the 2020 Upper Santa Ana River Watershed Integrated Regional Water Management Plan.

Based on the future demand and system supply projection, the City's projected supply will continue to meet demands for the city in the single and multiple dry year scenarios.

Any potential later supply deficiencies will be addressed through additional groundwater pumping. Should the groundwater basins be pumped beyond their sustainable yield in any year, the city, along with the other users of the three groundwater basins, will need to purchase imported water to replenish the basins or offset the water demands.

Table 3 - **2040 Supply Analysis**

Supply Total	12,761	AF
Demand Total, prior to Project Demands	10,941	AF
Supply Balance, Before Project	1,820	AF
Incremental Project Demands	16	AF
Supply Balance After Project	1,804	AF

Hydraulic Analysis

Water Storage

The WMP outlines the storage volume requirement for the City and any anticipated impacts from the Project. There are three storage criteria:

Operational Storage is the quantity of water required to meet any shortfall between peak demand, and instantaneous water production. Since peak demand can outstrip the pace of water production, storage is needed to ensure a seamless, continuous delivery of water. For the purposes of this analysis, Operational Storage shall be at least 25 percent of MDD, as defined within the WMP.

Emergency Storage is storage needed to cover a range of possible events, such as water contamination, failure at water treatment plants, power outages, transmission pipeline ruptures, widespread fire, or seismic events. The Emergency Storage standard for this analysis is 100 percent of MDD, as defined in the WMP.

Fire Flow Storage is water needed for fire flow events. For this project fire flow is based on 4,000 gpm for 4 hours, which is the requirement for this project.

Based on the entire project, the storage volume requirements for the project are:

- Operational Storage: 25% X 21,619 gal = 5,405 gal
- Emergency Storage: 100% X 21,619 gal = 21,619 gal
- Fire Flow Storage: 4,000 gpm X 4 hours X 60 min/hour = 960,000 gal

Based on the incremental increase, the storage volume requirements for the project are:

- Operational Storage: 25% X 4,521 gal = 1,130 gal
- Emergency Storage: 100% X 4,521 gal = 4,521 gal

The total storage volume required: 1,130 + 4,521 = 5,651 gal. Fire flow storage is already accounted for in the existing buildings to be demolished.

The project is in the Central Zone of the City of Colton water system. To satisfy the storage volume analysis, the Central Zone, must have sufficient available storage capacity to meet all existing and projected future needs, including incremental storage demands from the Project.

Based on the storage analysis in the WMP, the Central Zone currently has a storage deficit of 7.6 MG. The Project will contribute approximately 1.0 MG to this deficit. Additional storage will be needed to meet both baseline storage needs and incremental needs from the Project.

If only the incremental increase is considered, there is no net increase in fire flow storage required, since the fire flow for the existing buildings to be abandoned should already be accounted for because the fire flow requirements are the same for both the existing and the proposed buildings.

To mitigate existing and future storage deficiencies, 13.0 MG of storage capacity improvements have been recommended in the WMP. These improvements are outlined in Section 6.0, along with the Project's allocated share of improvements.

Table 3 - Required Storage for Central Zone through the Year 2030

Storage Criteria	Barton Road (MG)	Central Zone (MG)
Operational (25% of MDD)	0.005	2.4
Emergency (100% of MDD)	0.022	9.6
Fire Flow	0.96	1
Total Storage Required	**0.987**	**13**

Table 4 - Storage Balance for Central Zone through the Year 2030

	Storage Required (MG)	Storage Availability (MG)	Storage Balance (MG)
Central Zone Baseline	12.9	3	-9.9
Barton Road Project	1	0	-1
Subtotal	**13.9**	**3**	**-10.9**

Pumping Capacity

The pumping capacity analysis evaluates whether the existing pump stations meet MDD under firm pumping capacity conditions. The evaluation criteria define firm capacity as a period with the largest pump of each pump station out of service, and the largest well of each pressure zone out of service. In addition, the evaluation criteria require that the demands of any upstream zones served by the pump stations are included in the analysis.

Currently, the City has 10 operating wells with capacities ranging from 500 to 3,000 gpm. These wells are outlined in Table 5. Four wells reside in the Bunker Hill Basin, four in the Rialto-Colton Basin, and two in the Riverside North Basin. The City currently has pumping capacity for 13,900 gpm, which equates to 20 MGD.

From Table 1, the additional MDD of the project is only 15 gpm or 0.022 MGD. Additional pumping capacity is not needed to meet projected demands.

Pipeline Hydraulics

The proposed project will be served by the existing 12-inch ACP water line in La Cadena Drive.

The pressure, velocity, and fire flow requirements, as established in the City's WMP, are listed in Table 6.

Table 5 - **Groundwater Wells and Capacities Water Supply Assessment**

Well	Groundwater Basin	Pressure Zone	Capacity (gpm)
19	Bunker Hill	Central/West	1,600
21	Bunker Hill	Central/West	1,300
27	Bunker Hill	Central/West	1,300
28	Bunker Hill	Central/West	900
15	Rialto-Colton	Western	600
17	Rialto-Colton	Western	1,200
22	Rialto-Colton	Central	500
23	Rialto-Colton	Central	1,300
24	Riverside North	Western	2,200
30	Riverside North	Central	3,000
		Total Capacity (gpm)	**13,900**
		Total Capacity (MGD)	**20.0**

Pipeline Hydraulics

The proposed project will be served by the existing 12-inch ACP water line in La Cadena Drive.

The pressure, velocity, and fire flow requirements, as established in the City's WMP, are listed in Table 6.

A pressure data logger was installed at a fire hydrant on South Terrace Avenue approximately 700 feet south of Barton Road. The data logger was installed from June 30 to July 7, 2021, and recorded water system pressure every 15 minutes. The pressure monitoring results are shown in Figure 2. The water system pressures varied from a minimum 73.2 psi to a maximum of 77.4 psi. The average pressure was 75.6 psi.

A fire flow test was conducted January 29, 2019, at South La Cadena Drive and East De Berry Street. The measured flow was 1,126 gpm and the measured pressure was 80 psi. The calculated fire flow results were 5,826 gpm with 20 psi residual pressure. The results for the fire flow test are shown in Attachment 1.

Based on the observed pressures and the results of the fire flow test, the system should maintain the required minimum system pressures for MDD and MDD plus fire flow conditions. However, the city may need to run the hydraulic model for the system to verify this is true.

Table 6 - Hydraulic Evaluation Criteria

Description	Value	Units
Maximum Pressure		
Without Service Lateral Pressure Regulator	80	psi
With Service Lateral Pressure Regulator	120	psi
Minimum Pressure		
Peak Hour Demand (PHD)	40	psi
Maximum Day Demand (MDD) + Fire Flow	20	psi
Pipeline Criteria		
Maximum Velocity with PHD	7	fps
Maximum Velocity with MDD + Fire Flow	10	fps
Maximum Design Velocity for New Pipelines	5	fps
Hazen-Williams C-factor (new)	110	n/a
Minimum Size for Pipeline Replacement	8	inches
Fire Fighting Capabilities		
Low Density Residential	1,500	gpm for 2 hours
Commercial	3,000	gpm for 4 hours
Industrial	3,000	gpm for 4 hours
Heavy Industrial	4,000	gpm for 4 hours

Figure 2 – System Pressure Measurements at S Terrance Street June 30 to July 7, 2021
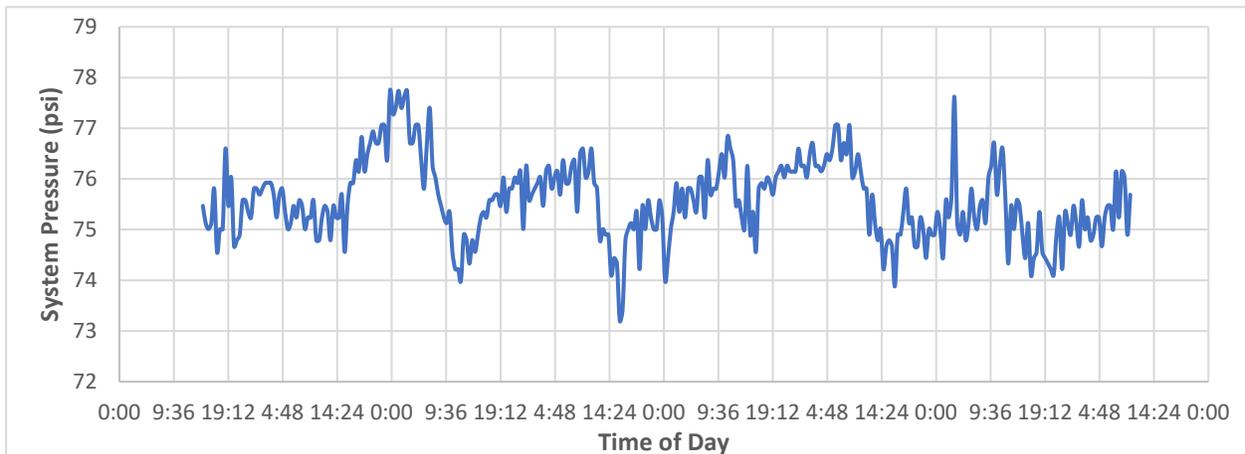
The average daily water demand for the Project based on the entire project is estimated to be 10 gpm ADD and 15 gpm MDD. Incrementally, the change in demand over existing conditions is 3 gpm additional ADD and 5 gpm additional MDD.

The fire flow represents the worst-case conditions for the transmission pipe which is fire flow plus MDD which is 4,015 gpm. Based on the MDD plus fire flow, the flow velocity of the existing 12-inch water line would be approximately 11. 3 feet per second, which exceeds the required maximum 10 feet per second, and does not include the MDD from other services on the existing pipeline. Upgrading approximately 5,000 feet of the existing 12-inch line from West Tropica Rancho Road to the project site maybe required.

Conclusion

The results of this water supply assessment show that the City has sufficient water supply for the proposed project for the next 20 years. This project will result in a small incremental increase in the overall water supply demand, and the increase in the demand is included in the City of Colton's planning documents.

Additional water storage is needed in the water system. The added demands of this project are included in the City's water master plan. The incremental demand on the storage capacity is small. The water master plan identifies the storage deficiencies and the City is implementing projects to add additional storage, and the City's planned projects address the storage deficiencies.

The additional pumping capacity required for this project is small, and there is sufficient pumping capacity in the system. So, no additional pumping is required for the project.

Pipeline improvements from West Tropica Rancho Road to the project site may be required to meet the maximum flow velocities requirements at MDD plus fire flow conditions. The calculated flow velocity for MDD plus fire flow is 11.3 feet per second which exceeds the required maximum 10 feet per second.

Otherwise, flow velocities and system pressures should be adequate for all other conditions based on system pressure measurements taken near the project site and on fire flow test results.

ATTRACHEMENT 1 – Fire Flow Testing Results

Provo Engineering

22931 Savi Ranch Pkwy, Yorba Linda, CA 92887
714-393-3877   ***   714-261-5716
email: george.provencher@gmail.com

Hydrant Flow Test Report

Project	**Property Development - TEI project 3711**	Test date **1/29/19**
Address	**S La Cadena Drive at E De Berry St**	Test time **09:15**
City	**Colton** State **CA**	File no. **T-1110**

Test hydrant location **Hydrant on the west side of La Cadena Dr and South of De Berry St**

Hydr # _____   Elev (ft +/-) **Grade**

Flow hydrant location **Hydrant on the west side of La Cadena Dr and North of De Berry St**

Hydr # _____   Elev (ft +/-) **Grade**

Static Pressure   **83**   PSI   Report Date **1/29/19**

Outlet	C-value	Diam	Pitot		Volume	
A	0.9	2.0	**0**	PSI	**0**	GPM
B	0.9	2.5	**45**	PSI	**1126**	GPM
C	0.9	3.0	**0**	PSI	**0**	GPM
D	0.83	4.0	**0**	PSI	**0**	GPM

Residual Pressure   **80**   PSI   at an observed volume of   **1126**   GPM

Projected Pressure   20   PSI   calculates to a volume of   **5826**   GPM

Although the results are accurate for the date and time given, they may not accurately reflect higher
or lower readings which vary due to seasonal conditions and time of day.

Per NFPA 24-13, Table C.4.10.1(a), note 1, $Q=29.84 \times c(d)^2 (p)^{0.5}$
Per NFPA 24-13, Paragraph C.4.10.1.2, $Q_r = Q_f \times (h_r/h_f)^{0.54}$

Test by: George Provencher

Symbols
(T) = Test hydrant
(F) = Flow hydrant

North

Witness Ray Bruno   (909) 370-5553
Fire Marshal
Colton Fire Department

Client   James Wickenhaueser
Theines Engineering, Inc
14342 Firestone Blvd
La Mirada, CA 90638

cc: Jamesw-at-TheinesEng.com
Rbruno-at-confir.org