II. PROJECT DESCRIPTION

A. Location

The Bending the River Back into the City Project (proposed project) would be located at 1796 N. Baker Street, Los Angeles. The property, which is currently owned by the Los Angeles County Metropolitan Transportation Authority (Metro), is located approximately 0.4 mile west of the Golden State Freeway and approximately 0.8 mile east of Dodger Stadium. The project area is approximately 2 miles north of downtown Los Angeles. Figure 1 shows the regional location of the proposed project. The project site is mapped within an unsectioned portion (Township 1 South, Range 13 West) of the U.S. Geological Survey (USGS) 7.5-minute Los Angeles topographic quadrangle map (Figure 2).

B. Purpose

The purpose of the proposed project is to support water conservation by providing a source of irrigation water for the Los Angeles State Historic Park (State Park) and other non-potable water demands. The proposed project will also create an aesthetic focal point for the surrounding neighborhood.

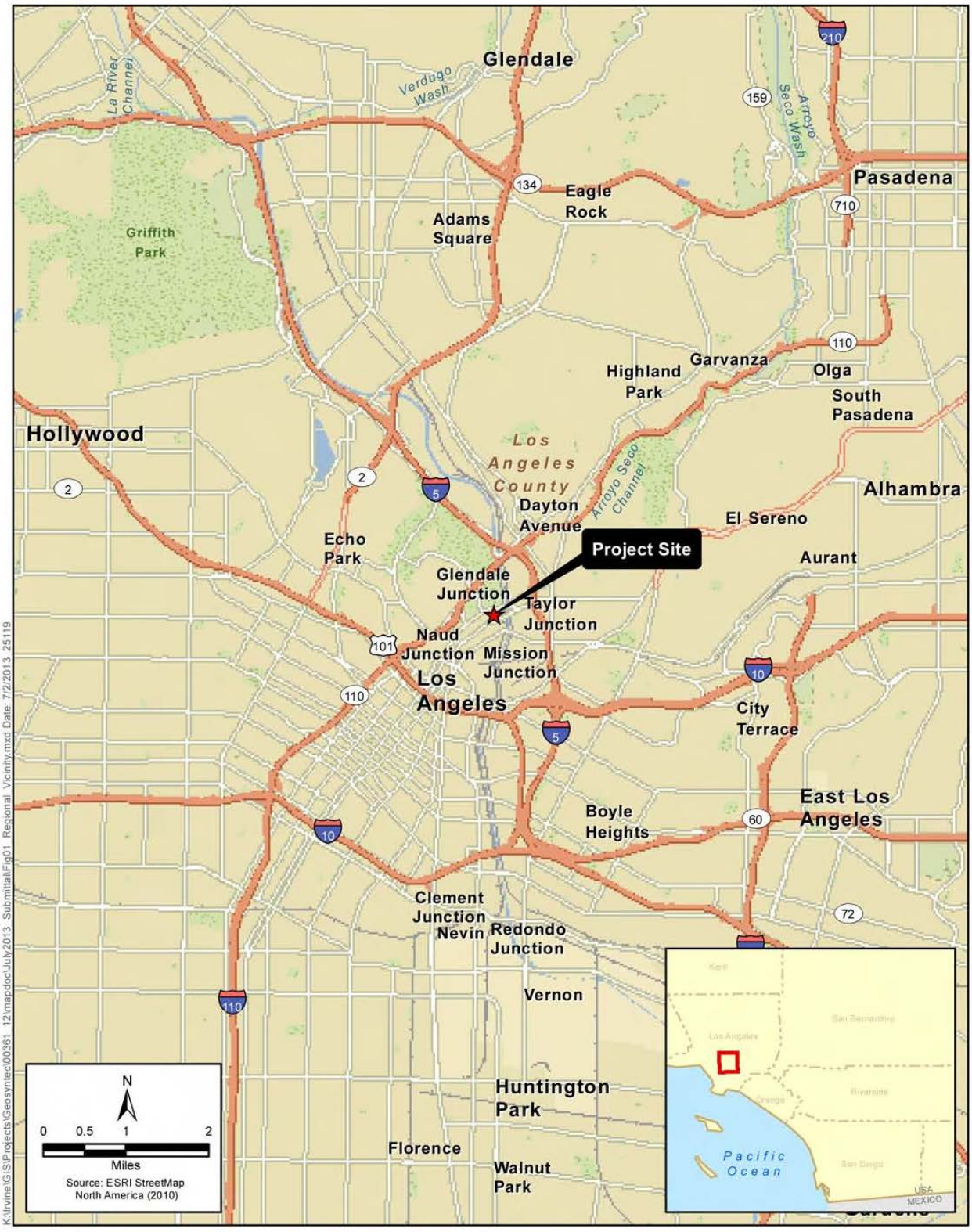

Figure 1
Regional Vicinity Map
Bending the River into the City Project

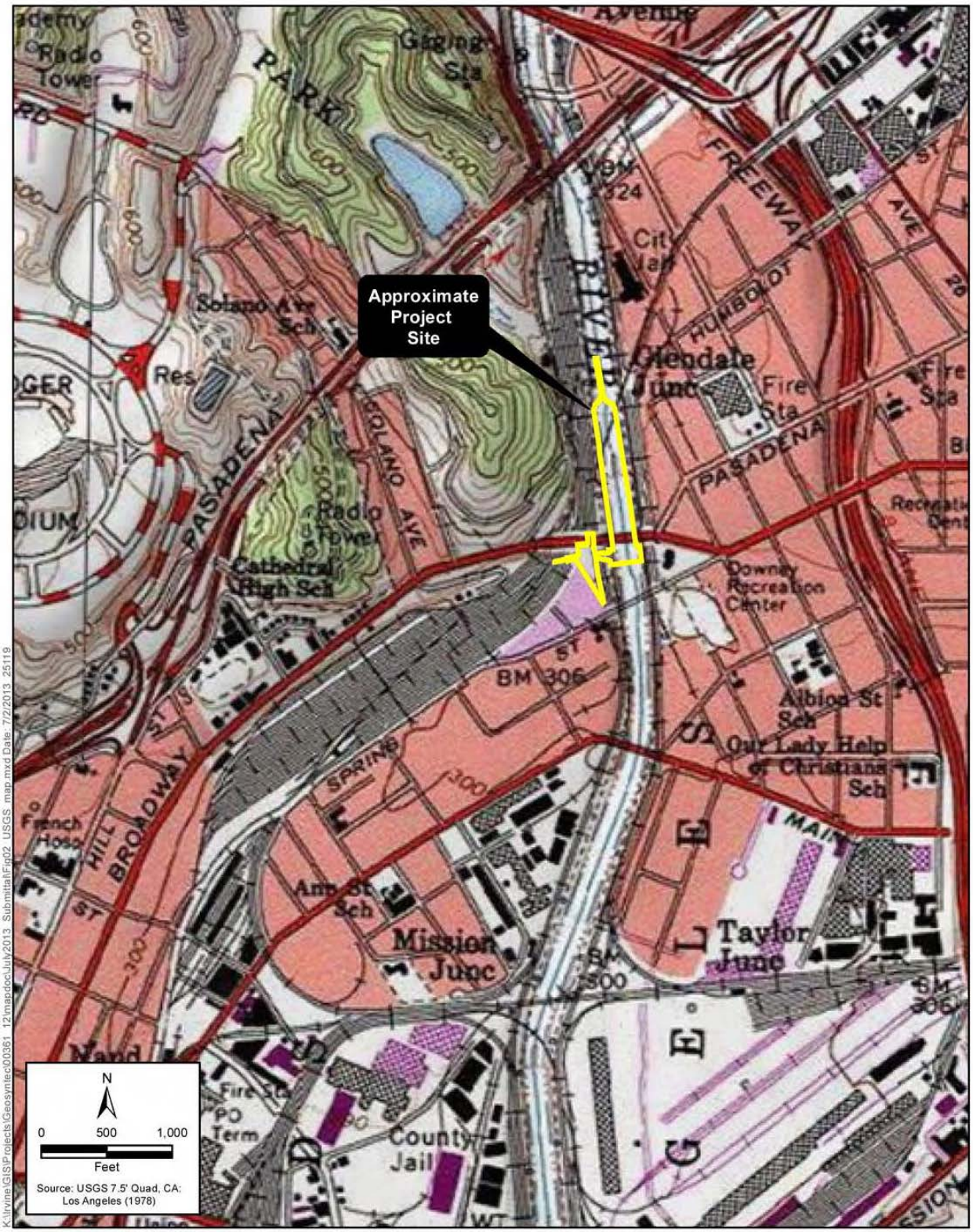

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Figure 2
USGS 7.5-minute Quadrangle Map
Bending the River into the City Project

The proposed project aims to:

- Physically divert water from the Los Angeles River (LA River) and create an aesthetic/educational statement, showing that the LA River can be used as a source of water;
- Create a water wheel, which would be loosely modeled after the historic wheel that existed near the project location;
- Enhance connections between the surrounding community, State Park, and the LA River; and
- Provide a viable long-term non-potable irrigation water source for the State Park and other local demands.

C. Description

The proposed project would involve construction and operation of a water wheel and may include the following elements:

- Excavation of a 1,300-cubic-yard pit for installation of the water wheel;
- Construction of side channel tunnels to the LA River, connecting the LA River to the water wheel pit; and
- Installation of an inflatable dam within the LA River channel, creating a water impoundment area upstream of the proposed inflatable dam.

For the purposes of this document, the term “project site” refers to the proposed 6.29-acre area encompassing the proposed construction limits and the maximum impoundment area upstream of the proposed dam (see Figure 3).

Project Background

The project applicant, Metabolic Studio, desires to create a project that reintegrates the City with its historic source of water. Under the proposed project, funded by the applicant, a water wheel, described in more detail below, with both recreational and utilitarian functions would be installed near the site of the Zanja Madre (Mother Ditch), the original aqueduct that brought water to the Pueblo de Los Angeles from the LA River. In the 1850s, the City constructed a system that increased the water supply to the Zanja Madre. This included a water wheel that raised a portion of LA River water to a height that permitted gravity flow to homes, fields, and storage sites. As part of this system, a brick reservoir was built in the center of the plaza.

Figure 3
Site Plan
Bending the River into the City Project

The proposed project would provide a link between the site of the historic water wheel that operated in the mid-19th century and historic water uses of the LA River in the vicinity. The area adjacent to the project site includes a number of warehouse spaces, which would be enhanced by the presence of the water wheel. The project would also provide recreational, historical, and environmental educational opportunities that would enhance the experience of visitors to the adjacent State Park. Environmental benefits would include increased water use efficiency and water conservation and improved water quality. Economically, the local area stands to reduce irrigation water purchase costs by more than $100,000 annually, which is assumed to increase at a rate of more than 2.5% per year, for a 30-year savings of more than $4.5 million.

Project Elements

The proposed project would divert water from the LA River, lift the water by use of the water wheel, treat the water through filtration and UV disinfection, and then distribute the water for use. The diversion would require an approximately 6-foot-high inflatable dam to be installed in the LA River. The dam would be controlled by a computerized system. For operating the dam, it is anticipated that dual air blowers would be required to inflate/deflate the dam. Pooled water would extend approximately 1,220 feet upstream, creating a surface impoundment of approximately 16 acre-feet. The dam (and associated ponded water) would extend across the entire width of the LA River channel. During rain events, the dam would automatically be lowered, allowing stormwater flows to pass unimpeded. During low-flow conditions, the dam would be raised and pool water to a depth of 6 feet. When the dam is raised, pooled water would be diverted through a side channel that would be bored into the west bank of the river, immediately upstream of the dam. The side channel would direct LA River water to the water wheel, which would be entirely powered by the force of the diverted LA River flows. A small portion of these flows, approximately 80 gallons per minute, would be raised from the inlet tunnel in buckets that would be attached to the wheel. These buckets would lift the water approximately 60 feet and empty it into a collection trough. The collection trough would convey the water under gravity to storage tanks, which would connect to a distribution and treatment system. When demand for irrigation water exists, water would be directed through a 6-inch-diameter pipe, making it available for irrigation. When irrigation water is not required, the water would be diverted back to the LA River. After impacting the blades, more than 99% of the water would be directed into a return-side channel pipe and flow back into the LA River downstream of the dam. Flows from the pipe would re-enter the channel less than 100 feet downstream from the diversion point.

Construction details of the proposed project are provided below.

Construction

Excavation/Earthwork

Following pavement demolition, a 10- by 80-foot pit (approximate finished dimensions) would be excavated to accommodate the water wheel. Excavation would extend to a depth of approximately 40 feet at approximately 8-foot intervals. Steel H-beams would be used to shore the perimeter of the pit. Reinforcement of the pit walls would require bracing and timber lagging. A mud slab would provide a stable, flat surface as the bottom of the pit, and concrete would be used to reinforce the base of the pit from which subsequent tunnel work could be performed. As part of the pavement demolition and excavation process, up to 10,000 square feet of surface asphalt at the water wheel site and in the LA River and 5,500 cubic yards of soil would be removed. The pavement demolition and excavation phases of the proposed project are expected to generate the most construction traffic and require the most equipment.

Side Channel Tunnel Construction; Inflatable Dam Foundation

Once excavation of the pit is complete, the side channel, which would connect the pit to the west bank of the LA River, would be constructed using a microtunnel boring machine (MTBM). The side channel would be approximately 400 feet long. Construction of the side channel would require concrete along the river channel wall to be removed to a height of 10 feet as well as shallow excavation (3 to 6 feet) to accommodate receiving pits for the MTBM. The side channel would be constructed from a reinforced concrete pipe with a maximum diameter of 48 inches.

For installation of the dam, a small crane would be required to lift the rubber dam from the delivery truck to its final position in the channel. The rubber dam would be unrolled from one abutment to the other. A backhoe or excavator could be used to facilitate unrolling.

Water Wheel Structure

The water wheel's foundation and the concrete pads for other elements of the proposed project would be constructed in accordance with the building code and design recommendations in the geotechnical plans. Foundations may include caissons or other foundation structures.

Once the foundations are in place, water wheel installation would commence. The wheel would be fabricated off-site and assembled on-site in the wheel housing pit. Small concrete structures would be poured on opposite sides of the pit to hold the main wheel axle. The water wheel would be a maximum of 70 feet in diameter, with the hub at the level of the existing grade so that half of the wheel would be below the ground surface and the other half would be above (see Figure 5, which provides artistic renderings of the proposed water wheel).

LA River Water Treatment Process

As described above, water would be lifted by the wheel, empty into a collection trough, and then flow by gravity to an underground cistern adjacent to the wheel. As water enters the cistern, it would flow through a concrete vault with a continuous deflective separator (CDS) that would remove trash and particles as small as 100 microns. This vault would be entirely underground.

Water treated through the CDS unit would be stored in the cistern until there is a demand for irrigation water at the State Park. When an irrigation valve opens at the park, a pump would sense a reduction in pressure in the non-potable water supply line and turn on. Water from the cistern would flow through a 25-horsepower variable-speed transfer pump to a disc filter, a flow-through device that filters down to 120 mesh (150 microns), the appropriate standard for drip or spray irrigation. From the filter, water would flow through an ultraviolet light disinfection system and continue on to a pressure tank.

The filter's backwash cycle would be controlled by a 12-volt system that would be set to backwash when the filter inlet/discharge pressure differential reaches 7 pounds per square inch. This would produce approximately 70 gallons per minute of backwash water, which would be conveyed via underground pipe back to the inlet for the CDS unit. Alternatively, if a sanitary sewer permit is obtained, the filter may discharge the backwash water to the sewer.

The industrial-grade ultraviolet light disinfection system would consist of an approximately 8-foot-long (horizontal), 6-inch-diameter stainless steel cylinder fitted with 12 high-output germicidal ultraviolet lamps. The unit, which would be powered by a 120-volt current, would have a 99.9% bacterial kill rate at up to 300 gallons per minute. The lamps would be automatically wiped (cleaned) with use of a pneumatically actuated wiper system.

Disinfected water would flow to an 86-gallon steel pressure tank for storage and for maintaining consistent system pressures. This small pressure tank, measuring 48 inches tall and 26 inches in diameter, would provide instantaneous pressure upon demand and allow the pump to start slowly, thereby reducing wear on the pump's motor. From the pressure tank, water would be conveyed to the State Park through an underground 6-inch-diameter polyvinyl chloride **(**PVC) irrigation supply pipe.

The treatment equipment could be arranged on a small concrete apron (minimum dimensions: 12 by 16 feet). The equipment would be covered by a shade structure or, preferably, a small utility shed or building.

Landscaping

Construction activities associated with this phase of work include the placement of landscaping materials in accordance with design specifications. The project would comply with Ordinance No. 170,978 (Water Management), which imposes water conservation measures for landscape, installation, and maintenance activities (e.g., use drip irrigation and soak hoses in lieu of sprinklers to lower the amount of water lost to evaporation and overspray, set automatic sprinkler systems to irrigate during the early morning or evening hours to minimize water loss due to evaporation, and water less in the cooler months and during the rainy season).

Construction Schedule and Equipment

Construction activities are anticipated to begin in March 2014 and last approximately 9.5 months. Construction activities in the in the river would be limited to between April and October of 2014. The construction equipment used during the different phases would include a hydraulic crane, vibratory sheet pile driver, backhoe/loader, hoe-ram attachment, forklift, hydraulic excavator, muck disposal truck, welder, wheel loader, mini-backhoe, submersible pump, generator (10 kilowatt), concrete pump truck, concrete vibrator, and compressor (185 cubic feet per minute).

No utilities would need to be relocated as a result of construction activities. Access to the project site would be provided from Baker Street, which terminates at a cul-de-sac at the Metro property. During installation of the delivery pipe that would lead from the project site to the State Park, the end of Baker Street may be partially closed for up to 3 days. This process would involve cut-and-cover work to install a 6-inch-diameter PVC pipe. However, only one half of the road would be closed at a given time, thereby allowing continuous use of the road.

Geosyntec consultants

BACKGROUND

The purpose of this document is to demonstrate that there is reasonable likelihood that unappropriated water is available at the point of diversion for the proposed appropriation. An additional analysis was conducted to determine that the water available for the proposed appropriation would be in excess of the flows contributed by discharges from the two upstream Water Reclamation Plants operated by the Los Angeles Bureau of Sanitation (BOS) (Los Angeles/Glendale and Donald C Tillman). This will ensure that should these discharges be redirected for other beneficial uses in the future, there will still be sufficient flows for the proposed appropriation.

The Water Wheel diversion point and the locations of the two gauges used in this analysis, F57C and F277-R are shown in Figure 1.

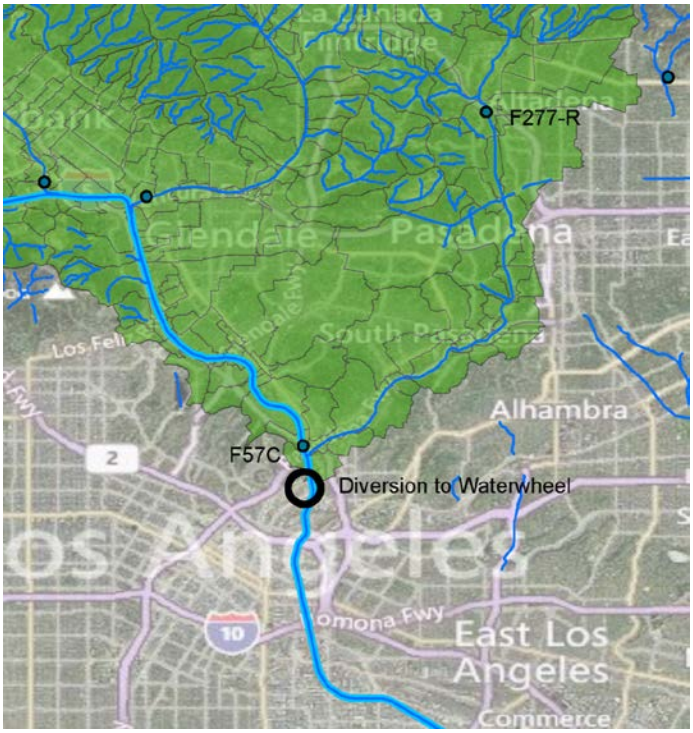


Figure 1: LA River with water wheel diversion location and location of the two gauges used to estimate the flow at the diversion point

FLOW ESTIMATION

An estimate of flow at the diversion point was obtained by summing the flows at the two gauges labeled in Figure 1. Gauge F57C is located on the Los Angeles River, approximately 0.7 miles upstream of the Water Wheel diversion. Gauge F277-R is located on the Arroyo Seco River, approximately 9 miles upstream of the intersection between the Arroyo Seco River and the Los Angeles River. Combining these two gauges accounts for all streamflow upstream of the Water Wheel diversion, minus any additional flow that may occur along the 9-mile stretch between gauge F277-R and the Arroyo Seco/ LA River intersection. Therefore, the only unaccounted for flow (in dry weather) would occur as discharge into the tributary reach between F277-R and the Water Wheel diversion. No major discharges were found along this reach (for example, wastewater treatment facilities or groundwater pump stations), so the sum of the two gauges was taken as a sufficient estimation of the flow at the diversion point.

Five-minute flow data for the two gauges was obtained from the LA Department of Public Works. The flow was summed and aggregated to daily average flows. The flow from F277-R is typically much smaller (about an order of magnitude) than the flow from F57C, though during wet periods it can have an equal or greater contribution to the flow at the Water Wheel diversion. The lowest flow during the period of record was 30 CFS, which is well in exceedance of the requested diversion of 0.17 CFS.

A semi-log flow duration curve was developed using the estimated flow for the Los Angeles River at the Water Wheel diversion during dry and wet weather conditions (Figure 2). The mean dry weather flow value is also shown.

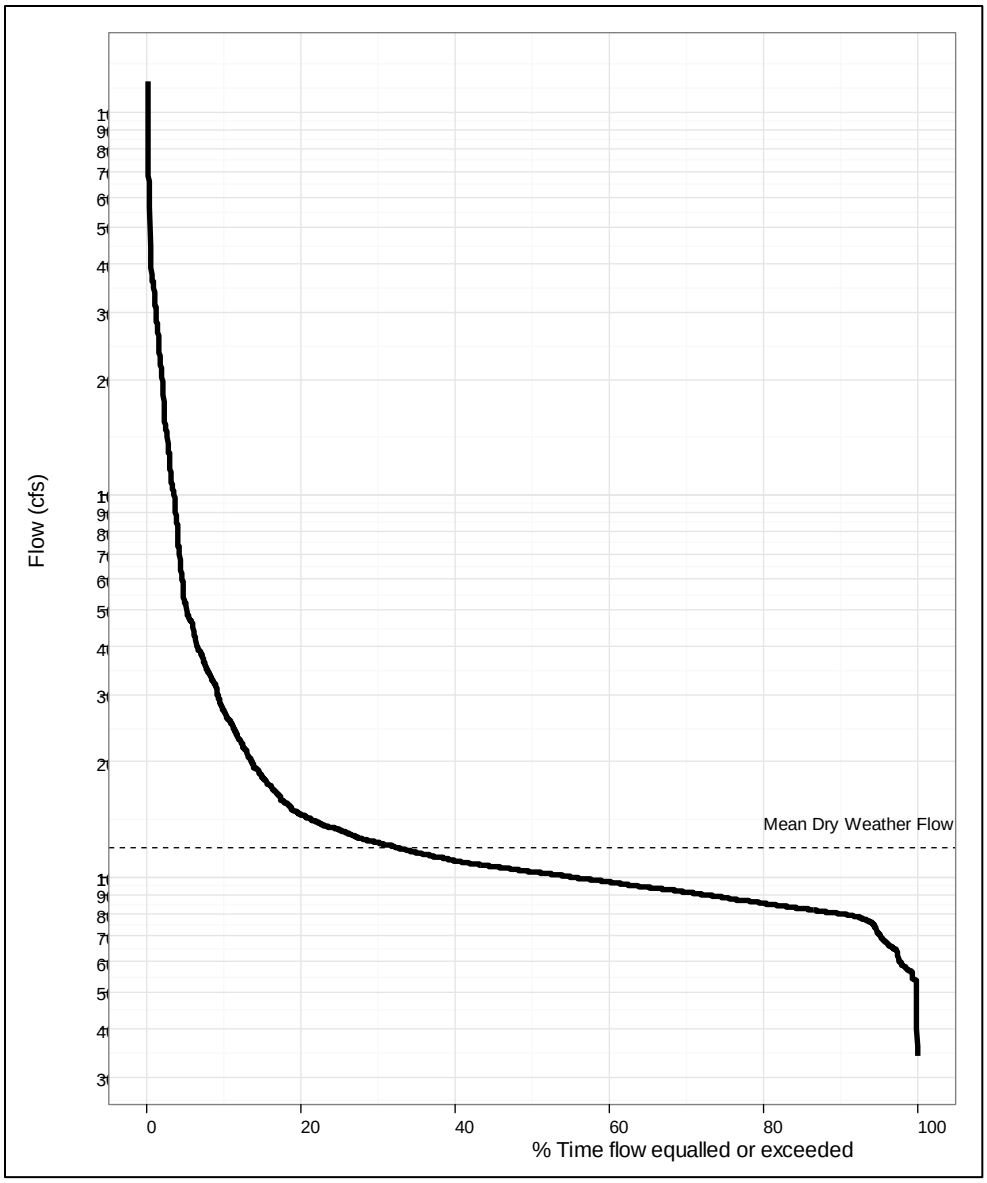


Figure 2: Flow duration curve for the Los Angeles River at the Water Wheel diversion point

FLOWS FROM LADWP WATER RECLAMATION PLANTS

Average daily discharge records for the Los Angeles Glendale (LAG) and Donald C Tilman (DCT) Water Reclamation Plants was obtained from the LADWP. Data from the LAC spanned the 10 year period from January 1, 2003 to December 31, 2012, with an average discharge of 19 cfs. Data from DCT was only 5 years, from June 20, 2006, to December 31, 2011 with an average discharge of 41 cfs. The 5 year period during which there was data from both plants, the combined discharges were compared to the recorded flows in the LA River. The average total discharge from this period is 62 cfs, with a maximum total discharge of 72 cfs. From the flow duration curve shown above, average daily flows in the LA River would be expected to be greater than 72 cfs over 90% of the time. Therefore, it is concluded that there is a reasonable likelihood that there will be sufficient water for the proposed appropriation, even without contributions from upstream recycled water discharges.

Attachment 2: PURPOSE OF USE, DIVERSION/STORAGE AMOUNT AND SEASON

The intention of the project is to promote sustainability by providing a local source of water for beneficial use by public entities that currently rely on expensive imported water supplied by LADWP. The principal beneficial use identified for the water supplied by the project is irrigation at nearby parks, including the California State Historic Park, the Downey Recreation Center, and the proposed Albion Dairy Park. All three of these parks have expressed a willingness to use water from the project should it be made available to them.

The State Historic Park landscape plan[1] (attached) indicates that annual water demand for the 32-acre park will be 79.8 acre-feet, or approximately 2.5 acre-feet per acre of park land. Because irrigation plans for the Downey Recreation Center and Albion Dairy Park are not currently available, irrigation demand for these parks was estimated on a per acre basis, using the irrigation demand per acre for the State Historic Park, as shown in Table 1. This table demonstrates a total potential irrigation demand of 106 acre-feet per year.

Table 1. Annual water demand at area parks using scaling factor

Per acre irrigation demand*	2.5	ac-ft/yr
	Area	Demand
	[acre]	[ac-ft/yr]
State Historic Park	32	79.8
Albion Dairy Park	6	15.0
Downey Recreation Center	4.5	11.2
Total	**42.5**	**106.0**
*based on irrigation plan for State Historic Park		

[1] Prepared by Sweeney and Associates, Inc. October 4, 2011

LOS ANGELES STATE HISTORIC PARK - LOS ANGELES, CALIFORNIA
MONTHLY LANDSCAPE IRRIGATION WATER USE ESTIMATES

PLANT ESTABLISHMENT PERIOD

Prepared October 4, 2011
By Sweeney & Associates, Inc.

ESTIMATED IRRIGATION DEMAND IN GALLONS PER YEAR: **24,076,270** **GALLONS PER YEAR**
ESTIMATED PEAK DAILY IRRIGATION DEMAND IN GALLONS PER DAY: **108,760** **GALLONS PER DAY**

s+a sweeney + associates
IRRIGATION DESIGN AND CONSULTING

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Estimated Evapotranspiration Rates (Inches/Month):	2.20	2.70	3.70	4.70	5.50	5.80	6.20	5.90	5.00	3.90	2.60	1.90	50.10
Historical Rainfall (Inches/Month):	3.12	3.30	2.58	1.02	0.31	0.07	0.01	0.05	0.23	0.52	1.29	2.46	14.96
Percentage of Rainfall to be Applied:	25%	25%	25%	25%	0%	0%	0%	0%	0%	25%	25%	25%	15%
Eapplied Rainfall (Inches/Month):	0.78	0.83	0.65	0.26	0.00	0.00	0.00	0.00	0.00	0.13	0.32	0.62	3.57

DEFINED LANDSCAPE AREAS	Irrigated Area in SFT	Landscape Percentage	Species Ks	Density Kd	M. Climate Kmc	Landscape KL	Irrigation Efficiency	Jan. Gals./Mo.	Feb. Gals./Mo.	Mar. Gals./Mo.	Apr. Gals./Mo.	May Gals./Mo.	Jun. Gals./Mo.	Jul. Gals./Mo.	Aug. Gals./Mo.	Sep. Gals./Mo.	Oct. Gals./Mo.	Nov. Gals./Mo.	Dec. Gals./Mo.	Year Gals./Year
LLEWELLYN	6,045	0.6%	36%	100%	100%	36%	90.0%	50	615	2,876	6,017	8,290	8,742	9,345	8,893	7,536	5,334	2,569	289	**60,557**
NON-IRR-NATIVE	152,079	14.1%	20%	100%	100%	20%	90.0%	0	0	10,007	72,155	115,870	122,190	130,617	124,297	105,336	68,469	20,804	0	**769,745**
ORNAMENTAL	220,094	20.5%	36%	100%	100%	36%	90.0%	1,829	22,410	104,730	219,065	301,843	318,308	340,260	323,796	274,403	194,216	93,526	10,519	**2,204,905**
PARKING EDGES	150,719	14.0%	36%	100%	100%	36%	90.0%	1,253	15,346	71,719	150,014	206,700	217,974	233,007	221,732	187,909	132,998	64,046	7,203	**1,509,899**
WORKERS	1,932	0.2%	36%	100%	100%	36%	90.0%	16	197	919	1,922	2,649	2,793	2,986	2,842	2,408	1,704	821	92	**19,350**
BLOOM STREET	1,593	0.1%	60%	100%	100%	60%	90.0%	596	877	1,738	2,830	3,641	3,840	4,105	3,906	3,310	2,438	1,365	579	**29,226**
BUFFER	63,658	5.9%	60%	100%	100%	60%	90.0%	23,810	35,053	69,445	113,096	145,504	153,441	164,023	156,086	132,276	97,444	54,564	23,148	**1,167,890**
CITRUS GROVE	11,128	1.0%	60%	100%	100%	60%	90.0%	4,162	6,128	12,140	19,771	25,436	26,824	28,674	27,286	23,124	17,035	9,539	4,047	**204,165**
ELMYRA	14,001	1.3%	60%	100%	100%	60%	90.0%	5,237	7,710	15,274	24,874	32,002	33,748	36,075	34,329	29,093	21,432	12,001	5,091	**256,865**
RIVERSTATION	47,424	4.4%	60%	100%	100%	60%	90.0%	17,738	26,114	51,735	84,254	108,397	114,309	122,193	116,280	98,542	72,593	40,649	17,245	**870,047**
STREETSCAPE	34,716	3.2%	60%	100%	100%	60%	90.0%	12,985	19,116	37,872	61,677	79,350	83,678	89,449	85,121	72,137	53,141	29,756	12,624	**636,905**
WELCOME PAVILLION	8,018	0.7%	60%	100%	100%	60%	90.0%	2,999	4,415	8,747	14,245	18,327	19,327	20,659	19,660	16,661	12,273	6,873	2,916	**147,101**
BIOSWALE	72,182	6.7%	84%	100%	100%	84%	62.5%	76,890	103,888	177,323	265,876	332,616	350,758	374,948	356,806	302,378	226,495	134,018	70,627	**2,772,625**
GC1	61,632	5.7%	84%	100%	100%	84%	75.0%	54,710	73,920	126,171	189,180	236,667	249,576	266,788	253,879	215,151	161,159	95,358	50,253	**1,972,810**
LAWN	6,782	0.6%	84%	100%	100%	84%	75.0%	6,020	8,134	13,883	20,817	26,042	27,463	29,357	27,936	23,675	17,733	10,493	5,530	**217,082**
LAWN REINFORCED	223,265	20.8%	96%	100%	100%	96%	75.0%	247,180	327,904	539,455	789,975	979,814	1,033,259	1,104,518	1,051,074	890,740	670,653	403,338	224,355	**8,262,267**
Total Landscaped Area (SFT):	**1,075,267**	**100%**	**Estimated Monthly Water Use for the Landscape (Gals):**					**455,475**	**651,826**	**1,244,034**	**2,035,769**	**2,623,148**	**2,766,229**	**2,957,003**	**2,813,922**	**2,384,680**	**1,755,117**	**979,719**	**434,518**	**21,101,439**
	24.68	**Acres**	**Estimated Daily Water Use for the Landscape (Gals):**					**14,693**	**23,280**	**40,130**	**67,859**	**84,618**	**92,208**	**95,387**	**90,772**	**79,489**	**56,617**	**32,657**	**14,017**	**57,812**

TREES IN THE LANDSCAPE	Number of Trees	Canopy Dia. (Ft.)	Species Ks	Density Kd	M. Climate Kmc	Landscape KL	Irrigation Efficiency	Jan. Gals./Mo.	Feb. Gals./Mo.	Mar. Gals./Mo.	Apr. Gals./Mo.	May Gals./Mo.	Jun. Gals./Mo.	Jul. Gals./Mo.	Aug. Gals./Mo.	Sep. Gals./Mo.	Oct. Gals./Mo.	Nov. Gals./Mo.	Dec. Gals./Mo.	Year Gals./Year
Small Flowering Trees	110	15	60%	100%	100%	60%	90.0%	7,273	10,708	21,214	34,549	44,449	46,873	50,106	47,682	40,408	29,767	16,668	7,071	**356,770**
Industrial / Agricultural Trees	118	15	72%	100%	100%	72%	90.0%	11,617	16,168	29,172	45,211	57,218	60,339	64,500	61,379	52,016	38,694	22,389	10,880	**469,585**
Streetscape Trees	88	20	60%	100%	100%	60%	90.0%	10,344	15,229	30,171	49,136	63,216	66,664	71,262	67,814	57,469	42,336	23,706	10,057	**507,407**
Naturalized Trees	92	20	48%	100%	100%	48%	90.0%	5,528	9,433	22,651	40,074	52,872	55,756	59,601	56,717	48,065	34,887	18,535	5,948	**410,067**
Riparian Trees	123	20	72%	100%	100%	72%	90.0%	21,528	29,962	54,060	83,781	106,031	111,815	119,526	113,742	96,392	71,705	41,489	20,162	**870,191**
Existing Trees to Remain	51	20	72%	100%	100%	72%	90.0%	8,926	12,423	22,415	34,738	43,964	46,362	49,560	47,161	39,967	29,731	17,203	8,360	**360,811**
Total Number of Trees and Canopy Area:	**582**	**151,564**	**Estimated Monthly Water Use for Trees (Gals):**					**65,216**	**93,924**	**179,684**	**287,489**	**367,750**	**387,809**	**414,555**	**394,496**	**334,318**	**247,121**	**139,990**	**62,479**	**2,974,831**
		SFT	**Estimated Daily Water Use for Trees (Gals):**					**2,104**	**3,354**	**5,796**	**9,583**	**11,863**	**12,927**	**13,373**	**12,726**	**11,144**	**7,972**	**4,666**	**2,015**	**8,150**
Total Water Use for All Landscape Areas and Trees:			**Estimated Total Monthly Water Use for the Landscape (Gals):**					**520,691**	**745,750**	**1,423,717**	**2,323,258**	**2,990,898**	**3,154,038**	**3,371,558**	**3,208,418**	**2,718,998**	**2,002,238**	**1,119,708**	**496,997**	**24,076,270**
			Estimated Total Daily Water Use for the Landscape (Gals):					**16,796**	**26,634**	**45,926**	**77,442**	**96,481**	**105,135**	**108,760**	**103,497**	**90,633**	**64,588**	**37,324**	**16,032**	**65,962**

	Canopy Area	Total Area	Peak GPD
Small Flowering Trees	177	19,446	14.69
Industrial / Agricultural Trees	177	20,861	17.63
Streetscape Trees	314	27,657	26.12
Naturalized Trees	314	28,914	20.90
Riparian Trees	314	38,657	31.35
Existing Trees to Remain	314	16,029	31.35
		151,564	

Note: Tree canopy area based on mature canopy diameter listed above. Peak GPD is the amount of water required for a mature tree during the peak evapotransipration season in gallons per day.

Note: Total area shown is the total canopy area of the mature trees by type. The total canopy area is the area of the individual trees multiplied by the quantity of the trees.

Note: Tree canopy area is included in the total landscape area and is redundant. The canopy area is used in the water use calculations for the trees.

Conveyance Pipe Memo
Water Delivery Pipe Crossings with Existing Utilities
May 2013

Attachment 1

Utilities Anticipated to be Crossed

Utility Type	Utility Owner	Size	Estimated Cover	Our Pipe Should Cross	Contact	Phone/email	Status Date	Status, Notes, Crossing Req's
Electrical	MTA	Thre conduits, possibly 4" in size	36" per as-built	under	MTA		8-Jul	Provide 12" vertical clearance.
Water	LADWP	12"	2'-6" per as built	Under	Denise Gardiner	denise.gardiner@ladwp.com	22-May	Received As built information. 12" Cast Iron (1940). Call/email before potholing.
Gas	Socal Gas	2"	assume 2.5-3' per Erin L (will not quote)	Under	Erin Lewis	818-701-3448, 818-427-5906 cell	21-May	1' vertical clearance required, may allow 6", call USA before potholing. Need to see before backfill.
Sewer	City of LA	10"	5.5' to 6.5'	Over	Tony Pueblos	213-482-7050	22-May	5/16, 5/22 Called and left message, 1 foot required
Oil	Pacific Pipeline System	20"	5' per plans	Over	George Gooch / Paula Bowden	Gooch: 562-728-2325, Bowden: (562) 728-2371, pjbawden@paalp.com	20-May	Received pipeline crossing requirements (saved on server under background studies/Existing Utilities). 24" vertical clearance required. Steel/iron pipe required at crossing.
Fiber Optic Bank	AT&T / Verizon	Unknown	6-8' per MTA Ex. Util Plan	Over	Unknown	Unknown	1-Aug	Info from "Metro Gold Line Eastside LRT Division 21 Body Shop: Existing Utilities Plan - South" provided by MTA. Notes on this plan say pot holing results for this line are in a report "Division 21 Ligh Rail Midway Yard…Utility Location Verification Report" dated June 20, 2007.

Not Within Alignment

ATT California (Distributio	Fiber?				Meredith Housto	310-515-4370	20-May	Called and left message
Transmission Line Fiber Optic	ATT Transmission	Possibly three 1.25" conduits	4' assumed per Joe F		Joe Forkert		17-May	Spoke with Joe. 2' clearance all around. Digalert required. Hand dig within 2'. Not within pipe alignment.
Exxon Mobil	Oil	8" Underneath tracks. No Crossing.	Unknown		Dave Kingston		17-May	If needed for other phases: separation requirements from David Aguinaga 310-351-9994

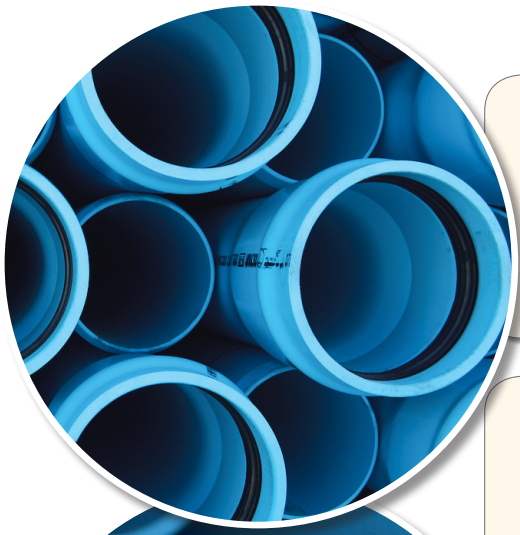
JM Eagle™

Building essentials for a better tomorrow™

BLUE BRUTE™

MEETS AWWA C900 AND ASTM D1784 CELL CLASS 12454; GASKETS MEET ASTM F477; JOINTS MEET ASTM D3139.

QUALITY • PERFORMANCE • LONGEVITY
50-YEAR WARRANTY on JM Eagle Plastic Pipe
GUARANTEED



APPLICATIONS

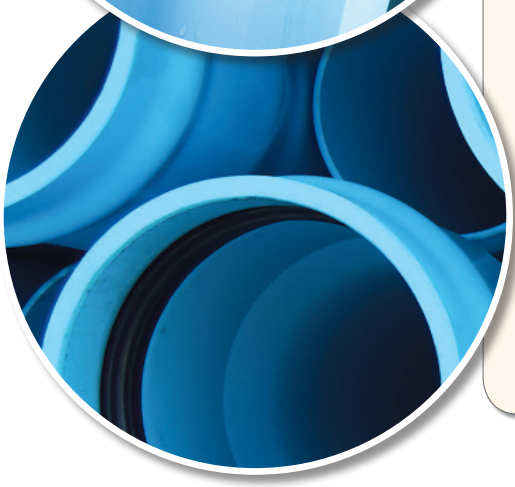
JM Eagle's Blue Brute C900 pipe is suitable for use in distribution pipelines of potable water, as well as gravity sewer, force main and water reclamation projects.

DESCRIPTION

JM Eagle Blue Brute C900 is available in 4- through 12-inch diameters, in blue, white, purple and green. It comes in standard laying lengths of 20 feet.

One length of 8-inch DR 18 pipe weighs approximately 184 pounds.

The pipe conforms to AWWA C900 pressure class 165 psi (DR 25), 235 psi (DR 18) and 305 psi (DR 14). It carries approval of ANSI/NSF Standard 61, UL 1285 and FM 1612 (DR 18 and DR 14 only).



BENEFITS

JM Eagle Blue Brute C900 pipe is the safe, long-lasting and stable solution for a modern infrastructure. Blue Brute:

- Maintains performance against tuberculation, corrosion and external galvanic soil conditions without lining wrapping, coating or cathodic protection.
- Keeps its smooth interior over long years of service with virtually no loss in carrying capacity, allowing for savings in pumping costs, as well as savings on the size of the pipe required.
- Can be field-cut with a power saw or ordinary handsaw and be beveled without the use of expensive or complicated machinery.

Revised 3/5/2012. This information may have been updated. Please download the latest version at www.jmeagle.com/onesheets.

JM Eagle™

Building essentials for a better tomorrow™

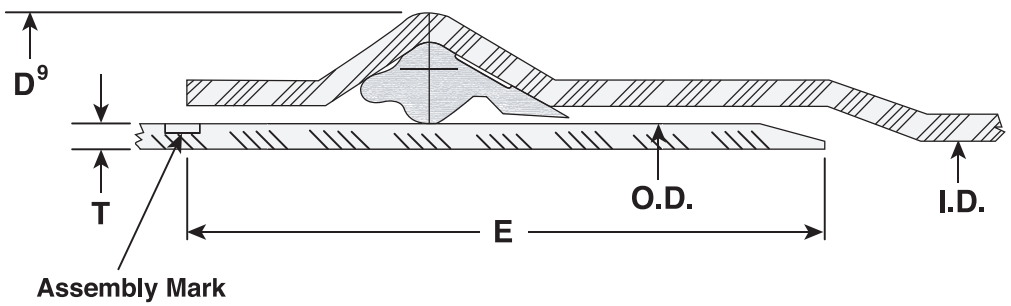
BLUE BRUTE™

SUBMITTAL AND DATA SHEET

QUALITY • PERFORMANCE • LONGEVITY
50-YEAR WARRANTY on JM Eagle Plastic Pipe
GUARANTEED

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D^9 (IN)	APPROX. WEIGHT (LBS/FT)
PRESSURE CLASS 165 psi (DR 25)						
4	4.80	4.39	0.192	5.25	5.57	1.9
6	6.90	6.31	0.276	6.40	8.00	3.9
8	9.05	8.28	0.362	7.05	10.50	6.7
10	11.10	10.16	0.444	8.20	12.88	10.1
12	13.20	12.08	0.528	8.80	15.31	14.4
PRESSURE CLASS 235 psi (DR 18)*						
4	4.80	4.23	0.267	5.25	5.87	2.6
6	6.90	6.09	0.383	6.40	8.43	5.3
8	9.05	7.98	0.503	7.05	11.06	9.2
10	11.10	9.79	0.617	8.20	13.57	13.9
12	13.20	11.65	0.733	8.80	16.13	19.7
PRESSURE CLASS 305 psi (DR 14)*						
4	4.80	4.07	0.343	5.25	6.17	3.2
6	6.90	5.86	0.493	6.40	8.87	6.7
8	9.05	7.68	0.646	7.05	11.63	11.6
10	11.10	9.42	0.793	8.20	14.27	17.6
12	13.20	11.20	0.943	8.80	16.97	25.1

Consult JM Eagle™ for CSA and other listing availability prior to shipment.
Note: *FM Approvals Pressure Class 150 psi for DR 18 and 200 psi for DR 14.
* Contact your JM eagleTM sales representative for location availability.



I.D. : Inside Dameter
O.D. : Outside Diameter
T. : Wall Thickness
D^9 : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot.

Product Standard:	ANSI/AWWA C900
Pipe Compound:	ASTM D1784 Cells Class 12454
Gasket:	ASTM F477
Integral Bell Joint:	ASTM D3139
Certifications:	ANSI/NSF Standard 61
	UL Standard 1285
	Pipe Length: 20 feet laying length
Installation:	AWWA C605
	JM Eagle™ Installation Guide

Revised 3/5/2012. This information may have been updated. Please download the latest version at www.jmeagle.com/onesheets.

PRODUCT DESCRIPTION

AWWA C900 BLUE BRUTE™

FOR USE IN DISTRIBUTION, MUNICIPAL WATER SYSTEMS AND OTHER SERVICES

DESCRIPTION

JM Eagle's Blue Brute™ pipe, produced in blue or white, conforms to the AWWA C900 specification, with gaskets meeting ASTM F477 and joints in compliance with ASTM D3139. Blue Brute™ water pipe has the long-term hydrostatic strength to meet the high safety requirements commonly needed by municipal water systems. This pipe conforms to AWWA C900-07 Pressure Class 165 psi (DR 25), 235 psi (DR 18), 305 psi (DR 14); for sizes 4"-12" in diameter.

Note: Please contact JM Eagle™ Sales Department for availability and locations.

LONG LAYING LENGTHS

The standard laying length of Blue Brute™ PVC pipe is 20 feet. This means that more ground can be covered during installation while eliminating the cost of unnecessary joints.

LISTING STANDARDS ANSI/NSF STANDARD 61, UL 1285, FM APPROVAL

See Short Form Specification.

APPLICATIONS

These products are typically used for distribution pipelines of potable water. However, this pipe may be used for gravity sewer, force main, and water reclamation projects.

PURPLE RECLAIM AND GREEN SEWER FORCE MAIN

JM Eagle™ also manufactures this pipe in purple, specifically for reclaimed water systems and green for sewer force main applications. This pipe is made to the same requirements as our standard products. The only difference is that the pigment used is purple or green. These products will not be marked with UL or NSF listing marks. Additionally, the purple pipe will be marked: "Reclaimed Water... Do Not Drink" and the green pipe will be marked "Forced Sewer."

* For lengths of 14 feet, Non-Hydrotested DR 18 Sewer Pipe is available upon request.

QUALITY CONTROL

Without exception, each length of pipe is hydrostatically tested and subject to inspection by our quality control inspectors throughout every step of the manufacturing process. JM Eagle's Quality Management System is ISO 9001:2000 registered.* Copies of the registration certificates are available on our website at *www.jmeagle.com.*

* JM Eagle™ is in the process of obtaining the ISO 9001-2000 registration of Quality Management System for all locations.

Conveyance Pipe Memo

Conveyance Pipe Pressure Loss Model

H-W = HAZEN WILLIAMS

DESIGN VELOCITY,fps = 4

H-W C, HDPE PIPE= 150

H-W C, PVC PIPE = 130

H-W FRICTION LOSS = (10.44 x LENGTH x FLOW^1.85)/(C^1.85 x I.D.^4.8655)

PIPE LOSS = FRICTION LOSS + MINOR LOSSES

MINOR LOSS = K v^2/2g

TDH = PIPE LOSS + LOSS IN WELL TO HEADWORKS + STATIC

HP = (FLOW x TDH)/(3956*.7) - ASSUMES PUMP EFFICIENCY IS 70%

k Values

45 DEG BENDS	90 DEG BENDS	TEE (flow through line)	Tee (flow through stem)	GATE VALVES	CHECK VALVES	FLOW METER	SUDDEN EXPAND
0.17	0.31	0.35	0.44	0.21	2.50	2.90	0.30

SECTION	DESIGN FLOW GPM	CALC. DIAMETER (IN)	NOMINAL DIAMETER (IN)	MFG. ID (IN)	ACTUAL v, FPS	LENGTH (FT)	H-Z C	CONVEYANCE PIPE FRICTION LOSS (FT)	CONVEYANCE PIPE MINOR LOSS (FT)	STATIC HEAD LOSS, FT. DEPTH TO WATER (ft)	STATIC HEAD LOSS, FT. Well Vacuum (Hg")	STATIC HEAD LOSS, FT. Pressure Head Loss (ft.)	STATIC HEAD LOSS, FT. TOPOG.	STATIC HEAD LOSS, FT. PROCESS	WELL FRICITON HEAD, FT. DEPTH TO PUMP	WELL FRICITON HEAD, FT. PUMP DISCHARGE PIPE DIA.	WELL FRICITON HEAD, FT. WELL LOSS (FT)	STATIC/PIPING LOSS (FT)	PSI	REQ'D TDH (FT)	REQ'D HP	TOTAL MINOR LOSS K'	NPSHa	Minor Losses # 45 DEG BENDS	Minor Losses # 90 DEG BENDS	Minor Losses # TEE (flow through line)	Minor Losses # TEE (flow through stem)	Minor Losses # GATE VALVES	Minor Losses # CHECK VALVES	Minor Losses FLOW METER	Minor Losses SUDDEN EXPAND
Conveyance Pipe																													
Wheel Standpipe to Park Discharge Point	300.0	5.51	6.00	6.0	3.4	1600	130	12.8	0.5	5		0.0	-6	0	0	4.00	0.00	12.3	**5.3**	12.3		2.7		6	2	1	0	2	0	0	1

Summary:

Pressure Loss:	**5.3**	**psi**
Pressure Available:	**60.0**	**psi**
Pressure Differential:	**54.7**	**psi**

La Madre Water Wheel Project
Preliminary Costs for Conveyance Piping
Date: 7/18/2013

Attachment 4

Conveyance Piping

Item	Quantity	Unit	Unit Price	Total	Notes/Source
6" PVC C900 Pipe and Fittings (Street)	110	LF	$ 40	$ 4,400	Open trench, bedding, pipe, backfill, AC replacement over pipe, 3' cover.
6" PVC C900 Pipe and Fittings (Landscape)	1470	LF	$ 32	$ 47,040	Open trench, bedding, pipe, backfill, 3' cover.
6" Ductile Iron C150 (Street)	20	LF	$ 50	$ 1,000	One length of DI pipe centered over 20" oil line, backfill, AC replacement over pipe.
2" Combination Air Valve	1	EA	$ 500	$ 500	Estimated quantity & cost
2" Blow Off Valve	1	EA	$ 400	$ 400	Estimated quantity & cost
				$ 53,400	

Note:
Does not include costs associated with design, procurement, bonds, or permitting.

August 2013

Bending the River back into the City
Permitting and Approval Agencies

City of LA	
BOE	Lead CEQA agency; L.A River Project Office; r-permit for easement under Baker Street; e-permit for pipeline construction under Baker Street; channel access authorization (granted)
LADWP	Review of easement under power lines (MTA is primary easement authority); support of water rights application
Planning	9/21/12 and 5/9/13 determinations that no land use entitlements are required; CUP possibly required for on-site treatment facility; lot line adjustment
Board of Public Works	Approval of CEQA Negative Declaration
Building & Safety	Site grading, excavation and hauling permit; review of final plans likely for on-site treatment facility; condition letter for lot line adjustment
BOS	Possible approval of on-site treatment facility;
LAPD	Emergency response measures
LAFD	Emergency response measures
LA City Council	Approval of CEQA Negative Declaration
County of LA	
LACFCD	Operator of in-River facilities
LACDPH	Alternative Water Supply Permit unless pre-treated; standard reuse permit if pre-treated
State	
State Parks	Water use agreement
Fish & Game	Channel alteration notification; permit for stream channel alteration; application to be submitted shortly; review of water rights application
SWRCB	Water Rights Appropriation; in process
SDPH	Possible permit for treatment facility
Regional	
MTA	Access agreement granted; easements under and over property; sale of property to Metabolic
SCRRA	Authorization to tunnel under Metrolink tracks

RWQCB	Permit for investigatory River channel intrusion; 401 (water quality) and 404 (drainage and fill) permits
LARCC	LA River project recommendation on July 9, 2012
Federal	
USACE	Property access granted; 408 permit for River channel intrusion
USEPA	Office of LA River Ambassador; interested party
National Marine Fisheries Service	Comment on Fish & Game stream alteration permit application ; comment on Fish & Game's water rights comments
US Fish & Wildlife Service	Comment on Fish & Game stream alteration permit application; comment on Fish & Game's water rights comments
Elected Officials	
Mayor Garcetti	
Councilman Cedillo	
Supervisor Gloria Molina	
Congress Member Lucille Roybal-Allard	
Congress Member Xavier Becerra	

BOE	City Bureau of Engineering
BOS	City Bureau of Sanitation
BPW	Board of Public Works
LADWP	Los Angeles Department of Water & Power
Planning	City Planning Department
Building & Safety	City Department of Building & Safety
LACFCD	Los Angeles County Flood Control District
LACDPH	Los Angeles County Department of Health
State Parks	California Department of Parks & Recreation
SDPH	California Department of Public Health
Fish & Game	California Department of Fish & Game
SWRCB	State Water Resources Control Board
MTA	Los Angeles County Metropolitan Transportation Authority
SCRRA	Southern California Regional Rail Authority
RWQCB	Los Angeles Regional Water Quality Control Board

LARCC	Los Angeles River Cooperation Committee
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
NMFS	National Marine Fisheries Service
USFWS	US Fish & Wildlife Service