



WASTEWATER DIVISION

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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September 1, 2020

DIRECTOR OF HEALTH
STATE DEPARTMENT OF HEALTH
ENVIRONMENTAL MANAGEMENT DIVISION
WASTEWATER BRANCH
2827 Waimano Home Road, #207
Pearl City, HI 96782

Project Title:	Pua Force Main Installation and Rehabilitation		
CWSRF Project No:	C150062-43		
Total Project Cost	\$33,000,000 (est)		
	(\$3,500,000 Design) (\$500,000 SDC)		(October 2020 Design)
Task Cost:	(\$2,000,000 CM)		(May 2022 Construction)
	(\$27,000,000 Construction)	Est. Start Date:	

Written by: Eric S. Takamura, Ph.D., P.E., Deputy Division Chief, COH, DEM-WWD

1. Project Description: The existing 24-inch force main sewer that runs from the Pua Sewage Pump Station (SPS) to the Hilo Wastewater Treatment Plant is exhibiting signs of deterioration. The County did experience a break of the existing force main back in 2011. During that repair, it was discovered that the liner in the pipe was starting to peel away from the inner wall causing potential blockage.
2. New 24-inch Diameter Force Main: The County wants to install a second (dual) 24-inch sewer force main (FM) (approximately 16,600 LF) parallel to the existing 24-inch force main that was installed back in the early 90's. When the Pua SPS and FM was originally designed back in the late 80's, the intent was to initially install one 24-inch diameter FM to handle 5 mgd average dry weather flow (ADWF). The Facilities Plan called for an eventual buildout ADWF of 8.3 mgd for Hilo (Design year = 2027) (Hilo District Facilities Plan Amendment (September 14, 1988 DRAFT)). Therefore, the Basis of Design Report (BDOR) for the Pua SPS (October 28, 1988) called for dual 24-inch FM where one was to be installed with the construction of the new Pua SPS and new Hilo Wastewater Treatment Plant (WWTP). (Please recall that the County was moving the existing Hilo WWTP from the grounds where the Pua SPS currently sits to a new location inland south of the Hilo Airport some 3 miles away.) The easements that were established incorporated enough room for the 2 parallel force mains and one 42-inch outfall pipeline to serve the new Hilo WWTP. The expansion of the collection system throughout Hilo town did not occur according to plan due to funding constraints. Therefore, the second 24-inch FM was never installed.

Excerpts taken from the BODR (Chapter 3):

“Two 24-inch-diameter force mains will be needed to accommodate the projected ultimate wastewater flows which will range from 12.8 cfs (8.3 mgd) during ADWF to 31.6 cfs (20.4 mgd) during the PWWF (peak wet weather flow). Force main velocities will vary between 2.0 to 5.0 fps.

In order to reduce the initial construction costs for the wastewater system improvements it is recommended that only one 24-inch force main be installed initially and space be set aside along the easement for the second main. The single force main will be adequate to accommodate the projected design wastewater flows which will range from 7.7 cfs (5.0 mgd) during ADWF to 20.1 cfs (13.0 mgd) during the PWWF. Force main velocities will vary between 2.5 fps to 6.40 fps. The second force main can be installed at a later time as increased wastewater flows warrants another force main.”

3. Rehabilitation of existing (original) 24-inch diameter force main: Upon completion of the (new) second force main, the existing (original) 16,600 LF 24-inch sewer force main will be rehabilitated. Consequently, two 24-inch parallel force mains will increase peak flow capacity from 13 mgd to approximately 21 mgd. The existing easements that was established back in the late 80’s will be utilized for this second parallel force main. Consideration for a new alignment (or alternatives) was not considered because the original design had planned for a second force main and easements were previously established. The County is also anticipating that no new Environmental Assessment work would be required if the original Facilities Plan, design, and construction is followed.
4. Project will not have an impact on water supply because effluent will continue to be discharged through an ocean outfall. Reuse opportunities have not been considered given that this is just a force main.
5. Estimated Cost of the Project:

a) Preliminary Design		
Basis of Design 2 nd Force Main	\$400,000	
Basis of Design Rehab 1 st FM	\$300,000	
EA exemption	\$ 50,000	
b) Design		
Design of 2 nd FM	\$1,650,000	
Design of Rehab 1 st FM	\$1,100,000	
Total Design (a+b):		\$ 3,500,000
c) Services During Construction (SDC)		
2 nd FM	\$250,000	
Rehab 1 st FM	\$250,000	
Total SDC:		\$ 500,000
d) Construction		
2 nd FM (~\$900/LF)	\$15,000,000	
Rehab 1 st FM (~\$700/LF)	\$12,000,000	
Total Construction:		\$27,000,000
e) Construction Management (CM)		
2 nd FM	\$1,000,000	
Rehab 1 st FM	\$1,000,000	
Total CM:		\$ 2,000,000
TOTAL PROJECT:		\$33,000,000