

To: Gabriel Hinojosa, P.E.

Subject: King's Landing Master Wastewater Plan Amendment

Requested Amendment - This is to request an amendment in the London Area Wastewater Master Plan as associated with the subject site. This amendment will provide for adding about 140 acres to said master plan service area, a portion of the subject site. This amendment request provides an evaluation of the capacity of the 18" gravity main (18" GM) as shown in exhibit attached as we discussed. Said 18" GM main extends from a point near the lift station (LS1 as shown in said exhibit) thru the proposed London Town Subdivision and stubbing into the east boundary of the subject site. Said 18" GM is deep enough to serve the subject site.

18" GM Service Areas – Said 18" GM serves the land west of CR 33 plus about 29 acres at the south side of said 18" GM at CR 33. The flow from LISD land as shown in said exhibit will not be considered in evaluating the capacity of the 18" GM as peak flow from LISD occurs during business hours whereas peak flow from other areas occurs during non-business hours. It is assumed that the land on the east side of County Road 33 and north side of the 18" gravity main will drain directly to the lift station (not thru the 18" GM).

Population of subject site - There are 1,445 lots in the total subdivision less 4 commercial lots = 1,441 residential lots. The population of the residential lots is estimated to be 1,441 lots x 3 persons per lot = 4,323 persons. The 4 commercial lots total 78 acres. With regard to the commercial lots, assume 15 acres are apartments at 21 units per acre = 315 units. At 2.5 persons per unit, the apartments produce 788 persons. The remaining commercial = 78 acres – 15 acres = 63 acres produces 630 persons at 10 persons per acre. Thus, the estimated population of the subject site is $4,323 + 788 + 630 = 5,741$ persons.

Population of London Town - The London Town Subdivision is estimated to have 561 lots and based on 3 persons per lot, a population of 1,683 persons is produced.

Population of Camp Tract – The Camp Tract has a net of 123 acres of which produces 492 lots at 4 lots per acre and at 3 persons per lot, a population of 1,476 persons.

Population of 29 acres on the east side of County Road 33 and south side of the 18" GM at 4 lots per acre produces 116 lots and at 3 persons per lot produces 348 persons.

Population Sum - A total of $5741 + 1683 + 1476 + 348 = 9,248$ persons is produced for flow into the 18" GM at CR 33.

Flow in 18" GM - Using the Babbitt Formula ($5/\text{population in thousands to } 0.2 \text{ power}$), a peaking factor of 3.2 is produced. $9,248 \text{ persons} \times 80 \text{ gallons per person per day} \times 3.2$ produces 2.36 MGD. The infiltration inflow from $429 + 118 + 123 + 29 = 699$ acres, at 400 gal/ac/day produces 0.28 MGD, thus the total flow into the 18" is 2.64 MGD. This is for that portion of the 18" GM east of County Road 33 which will carry the flow from the Camp Tract also. This produces a hydraulic grade requirement of 0.15% between County Road 33 and the 24" pipe near the lift station. This would result in a rise of 0.38' in the hydraulic grade of the 18" at CR 33 with the 18" GM constructed to a slope of 0.12%. This figure is negligible; thus, I request and recommend the Master Plan change to allow the flow from all of the subject site into said 18" GM.


Nixon M. Welsh, P.E.

London Area Wastewater Plan - Proposed

Legend

- Lift Station
- Proposed Mains**
 - Gravity Main (GM)
 - Force Main (FM)
 - LS Service Area
 - City Limit
 - Commercial
 - Estate Residential
 - Low Density Residential
 - Medium Density Residential
 - Parks
 - Public/Semi-Public

0

0.05

0.1

0.2

0.3

0.4

Miles

1.Average Daily Wastewater Flow

The service population and wastewater flow generation for the land use identified in this area are as followed:

Land Use	Units/Acre	Persons/Acre	Average Daily Flow	
			(gal/person/day)	(gal/acre/day)
Low Density Residential	5	15	80	1200
Medium Density Residential	20	40	80	3200
Estate Residential	2	6	80	480
Commercial	N/A	10	80	800
Park	N/A	10	20	200
Public/Semi-Public	N/A	15	80	1200

2.Peaking Factor

The peak flow for all land uses shall be generated using the Babbitt Formula which is commonly used in the industry. The formula is as follows:

$$PF = 5 / (\text{population}/1000)^{0.2}, (\text{Minimum} = 2 \text{ Maximum} = 4)$$

3.Infiltration and Inflow

In this master plan, infiltration and inflow shall be calculated using 400 gallons per day per acre.

4.Peak Design Flow

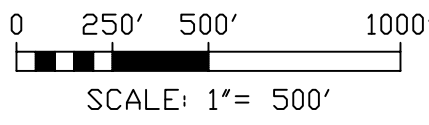
All design of lift stations, force mains and collection systems shall use the peak flow as their basis which will include the peaking factor and infiltration and inflow.

5.Force Mains

Force mains shall be designed to have a velocity between 2 feet per second and 5 feet per second to ensure that they are adequate to move solids.



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KING'S LANDING

WASTE WATER EXHIBIT

OWN. _____

SCALE (H): _____

SCALE (V): _____

DATE PLOTTED 4/11/19

COM. NO. _____

EXB-WW _____

JOB NO. 18068

SHEET 1 OF 1