

MATTAWOMAN INTERCEPTOR
PHASE 1 & 2 CAPACITY STUDY

Prepared for:

**CHARLES COUNTY DEPARTMENT OF PLANNING AND
GROWTH MANAGEMENT**

VCI 06-0082

**WALDORF SANITARY DISTRICT NUMBER ONE
4th ELECTION DISTRICT**

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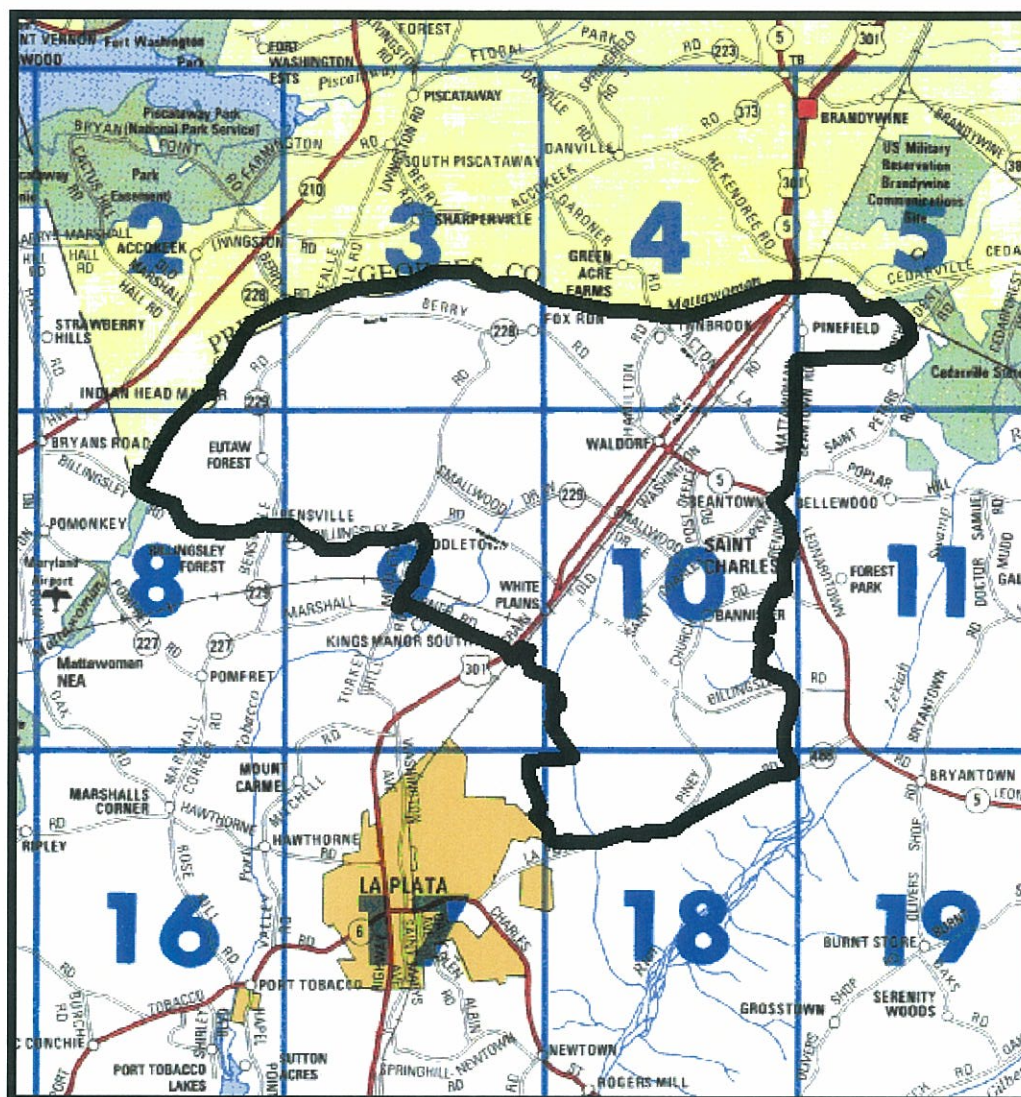
I. INTRODUCTION

A. Purpose of Study

The existing Mattawoman interceptor was designed and constructed in the 1970s based on the design criteria and zoning in place at that time. The entire sewer shed and most notably the Waldorf area has experienced tremendous growth in residential and commercial development, which has resulted in changes to the Water and Sewer Ordinance design criteria, and zoning. Due to this growth and the age of the facilities, it is anticipated that the Mattawoman Interceptor will require an upgrade to accommodate projected future flows. The Charles County Department of Planning and Growth Management have contracted with KCI Technologies, Inc., to develop a feasibility study addressing the condition and capacity of the sewer between Interceptor manhole (MH) numbers 40-125. The purpose of this study is to evaluate the current condition and capacities of the Interceptor, forecast future flows, identify potential capacity improvement alternatives, evaluate alternatives, and make recommendations to the County for the selection of an alternative to implement.

B. Project Location

The Mattawoman Interceptor is located in northern Charles County, Maryland, and conveys sewage from the Mattawoman Interceptor sewer shed to the Mattawoman Wastewater Treatment Plant. The limit of this study includes Mattawoman Interceptor manhole numbers 40-125, and the sub-sewer sheds which are conveyed to this section of the Interceptor (called the “project area”). The project area is comprised of approximately 30,000 acres within Charles County and another 11,500 acres within Washington Suburban Sanitary Commission’s (WSSC) territory in Prince Georges County. The limits of the project consist of: The Charles County/ Prince Georges County Border to the north, Billingsley Road and Marshall Corner Road to the southwest, La Plata Road to the South, and the Transmission Line easement and Mattawoman Beantown Road to the east (see Figure 1).



Mattawoman Interceptor Phase 1 & 2 Capacity Study
PGM # VCI 06-0082
Vicinity Map

February 2008

10,000 5,000 0 10,000 Feet



Figure 1

C. Scope of Work

The overall scope of the feasibility report within the project area noted above is to:

1. Evaluate the current condition and capacity of the Mattawoman Interceptor.
2. Identify alternatives that address the capacity and condition of the Mattawoman Interceptor.
3. Analyze alternatives with regard to construction requirements, projected future flows, environmental impacts; permit requirement easement requirements and project costs (capital, operations and maintenance costs).
4. Recommend selection of an alternative for the County to implement.

II. EXISTING CONDITIONS

A. Description of Existing Mattawoman Sewer shed

The existing Mattawoman Interceptor was designed and constructed in the 1970s based on the design criteria and zoning in place at that time. The existing interceptor from MH 40 to MH 125 includes approximately 26,900 feet of 60" diameter pipe, 13,900 feet of 54" diameter pipe, 6500 feet of 48" diameter pipe, 4,800 feet of 42" diameter pipe, and 86 manholes, for the purpose of the feasibility report.

The mapping within this report includes existing sewers; sewers sheds, and pump stations, provided by the County and obtained by KCI within the scope of work and within the project area. Infrastructure information was obtained from Charles County. The Mattawoman Interceptor was field surveyed and sub-sewer sheds were mapped by evaluating the surface topography and the sewer collection system. The Central Development District Study was utilized to develop sub-sewer shed boundaries to the west of Middletown Road.

1. Land Use Map

KCI provided the recently updated existing land use map developed for Charles County's storm water National Pollutant Discharge Elimination System (NPDES) permit. This map was created using Maryland Department of Planning's (MDP) land use coverage derived from US Geological Survey Land sat Imagery. MDP's current Land Use Map characterizes existing land use for the study area (Appendix A). Charles County's 2025 Land Use Map indicates the projected land uses by 2025. Development is planned to occur within the County's Development district and the Mattawoman Drainage Basin, as well as redevelopment of existing developed commercial parcels.

The 2025 Land Use Map (Appendix A) is more simplified than the existing Land Use/Land Cover Map since it is intended to provide guidance for zoning purposes. Elements such as forest, agriculture, and rural residential are simplified into Agricultural or Rural Conservation Areas.

Land use codes for this map will be those used by the MDP. These codes delineate among several densities of residential development, commercial, industrial, and open space as follows:

Table 1: Land Use Codes

MDP Land Use Code	Land Use Description
11	Low Density Residential
12	Medium Density Residential
13	High Density Residential
14	Commercial
15	Industrial
16	Institutional
17,18	Open Urban Land
191,192	Large Lot Subdivisions
20-29	Agriculture
40-49	Forest
50	Water
70	Barren Land
80	Transportation

2. Zoning Map

The Zoning Map (Appendix B) was derived from the Charles County, La Plata, and Indian Head zoning coverage's using a lookup table linking zoning codes to land use codes, which was created and used to recode the polygons, as shown in Table 2:

Table 2: Zoning Map Codes

Code	Zoning	Future Land Use	MDP Code
AC	Agricultural Conservation	Low Density Residential	11
RC	Rural Conservation	Low Density Residential	17

Table 2: Zoning Map Codes

Code	Zoning	Future Land Use	MDP Code
RR	Rural Residential	Low Density Residential	18
RV	Village Residential	Low Density Residential	11
RL	Low Density Residential	Low Density Residential	11
RM	Medium Density Residential	Medium Density Residential	12
RH	High Density Residential	High Density Residential	13
RO	Residential Office	Commercial	14
CV	Village Commercial	Commercial	14
CN	Neighborhood Commercial Zone	Commercial	14
CC	Community Commercial Zone	Commercial	14
CB	Central Business Zone	Commercial	14
BP	Business Park Zone	Commercial	14
IG	General Industrial	Industrial	15
IH	Heavy Industrial	Industrial	15
R-1	Single Family, Low Density	Low Density Residential	11
R-2	Single Family, Medium Density	Medium Density Residential	12
RM	Multi-Family Residential	High Density Residential	13
RMX	Residential Mixed Use	Medium Density Residential	12
PUD	Planned Unit Development	Medium Density Residential	12
TCC	Town Center Commercial	Commercial	14
GC	General Commercial	Commercial	14
WMX	Waterside Mixed Use	Commercial	14
OS	Open Space	Mixed Forest	44
R-21	Residential	Medium Density Residential	12
R-10	Residential District	Medium Density Residential	12
R-8	Residential District	High Density Residential	13
R-5	Residential District	High Density Residential	13
R-3	Residential District	High Density Residential	13
P-L	Public Lands	Mixed Forest	43
F-P	Floodplain	Brush	44
C-B	Central Business	Commercial	14
C-H	Commercial Highway	Commercial	14
LI	Light Industrial	Industrial	15

Table 2: Zoning Map Codes

Code	Zoning	Future Land Use	MDP Code
I	Industrial	Industrial	15
I-P	Industrial Park	Industrial	15
M-U	Mixed Use	Commercial	14

The Zoning Map is considered both existing and future for the purposes of this project, given the Zoning classifications are not expected to change.

3. Existing Development List

KCI developed a list of existing development within the project area, including residential, commercial and industrial development (Appendix C, Table 3). KCI performed a query in the Zoning shape file for commercial and industrial zoning classifications and associated acres. MDP provided KCI with a list of residential parcels per zoning classification with associated number of parcels (Appendix C, Table 1). MDP assigned density yields (dwelling units per acre) as agreed upon by the County based on zoning classification within each of the Mattawoman Interceptor sub-sewer sheds.

4. Existing Pump Stations

Existing pump stations, as shown on the sewer shed mapping, are provided in Appendix D. Available information is provided regarding average daily flow, peak capacity and design information. Proposed and potential pump stations, are included based on the best available information.

B. Evaluation of Existing Conditions

1. As-built Drawings

KCI updated and revised the existing Mattawoman Interceptor (PGM #s VCI 74-111, 74-114, 74-121, 74-500). "As-Built" drawings by field verifying the existing invert elevations, the distance between manholes, and calculating the slopes. Revisions are shown on the as-built plans in red and appear in both plan and profile. The field survey was performed in January 2007 in accordance with NAD 83/91 horizontal control and NAVD 88 vertical datum. Survey control points were established in the field and are indicated on the as-built. As-built information is reflected on the alternative drawings within this Feasibility Report. The As-Built Drawings are provided under separate cover.

2. TV Inspection and Hydrogen Sulfide Analysis

The existing system conditions were evaluated using Closed-Circuit Television (CCTV) videotapes and inspection log sheets. The CCTV inspection log sheets were compiled by the CCTV contractor TRB during fieldwork from January 12 to February 13, 2007. These log sheets and videos were conveyed to the County as part of the current project. The evaluation included survey of the Mattawoman Interceptor from manhole 40 to 125: 85 manholes and 52,000 linear feet of sewer.

The general condition of the Mattawoman Interceptor piping within the project area was found to be in excellent condition. The RCP has with stood 30-years of service remarkably well. All sections of pipe inspected appeared to be homogenous with light deterioration, mineral deposits, and minor infiltration.

At various points throughout the system there are mineral deposits. These deposits in most cases are noted as light, one is noted as medium. The mineral deposits have generally formed near infiltration sources, and are the results of a slow leaching of dissolved solid material into the pipe at the infiltration point. They are all located on the top half of the pipe and out of the normal flow area of the pipe, thus are not generally causing any flow restriction, except in heavy flow conditions. In heavy flow conditions if the mineral deposits where submerged and restricting cross sectional area of the pipe, their size is generally less than 1% of the cross sectional area. The one noted medium mineral deposit, located within the reach from manhole 66 to 65, may cause a 2% reduction in cross sectional area in full flow conditions. In general the mineral deposits are of very little to no consequence to the current operational effectiveness of the Mattawoman Interceptor.

Infiltration witnessed on the video inspection recordings was quite small for a system of this size, except at one location. This location, 486 feet going downstream from manhole 51 is leaking approximately 5.0 gpm. It is recommended that this point be repaired.

3. Existing Flow Conditions and Pipe Capacity

KCI calculated existing pipe capacity utilizing information from field surveyed manhole inverts, pipe lengths, and slopes. Pipe capacity is defined as the hydraulic flow at which the pipe is flowing 2/3 full (i.e. the hydraulic grade line, $D/d = 0.67$). The Manning formula was used to calculate existing pipe capacity (Q) and is directly proportional to pipe area (A), hydraulic radius (R) and slope (S) and is indirectly proportional to Manning's n .

$$Q = A \frac{1.49 \left(R^{\frac{2}{3}} \cdot S^{\frac{1}{2}} \right)}{n}$$

The resistance factor, Manning's n , which characterizes the roughness of the pipe surface, is also known as the pipe friction factor. Due to the accuracy of the other factors in Manning's equation, n is assumed to be constant. An n factor of 0.013, typical of trowel-finished concrete, would be applicable due to the good condition and homogeneity of the existing pipe surfaces, however, for design purposes, a more conservative 0.015 is utilized. The design pipe capacity varies throughout the Interceptor, and ranges from 20 mgd (32 cfs) to 84 mgd (131 cfs) (see Appendix C, Table 6, and Column N). The design pipe capacity generally increases as the Interceptor continues downstream, with slight fluctuations where the pipe slope is nearly flat.

KCI utilized the residential parcels provided by MDP together with the commercial and industrial acreage and applied the usage factors in the Charles County Water and Sewer Ordinance "Appendix V" to calculate an estimated average flow. In addition, WSSC provided KCI with average flows at the six connection points to the Mattawoman Interceptor within the project area (Appendix C, Table 2).

Average flows were summed consecutively down the Interceptor to arrive at a cumulative average flow, which represents the total average flow seen at a given manhole, not just the direct input at that location. A peaking factor was then applied to the flow at each manhole based on the Maryland Department of the Environment (MDE) peak flow equation ($Q_p = 0.25$ to 16 MGD, $Q_p = 3.2 \times Q_a$ 5/6; $Q_p > 16$ MGD, $Q_p = 2.0 \times Q_a$). I/I was accounted for using the Charles County Water and Sewer Ordinance guidelines of 400 gpd/acre. The peak flow (Q_p) plus a factor to account for Infiltration and Inflow (I/I) was used as a design flow for modeling and analysis for the feasibility study (Appendix C, Table 5). Existing cumulative design flow at the lowest point in the Mattawoman Interceptor reach is estimated to be 50 mgd (78 cfs) (Appendix C, Table 6, Column O).

Although the County requires design of new sewers and evaluation of existing sewers based on 2/3 capacity, it is important to note that the pipe achieves maximum capacity at 94% depth, not 2/3. When evaluating the full capacity of the pipe, compared to flow conditions, the 94% capacity should be utilized. See Appendix C, Table 6, Column K, for the maximum capacity of each pipe reach, and how it relates to the full pipe capacity, Column I, and the 2/3 capacity, Column M.

4. Existing Conditions Model Results

Utilizing existing flow figures as discussed in Section II.B.3, the XP-SWMM sewer modeling program, selected by the County, was utilized to evaluate the existing Mattawoman Interceptor hydraulic capacity. XP-SWMM is a wastewater link-node model that performs hydraulic analysis of open and closed channel systems.

The model was generated by importing the Mattawoman Interceptor field survey data from the GIS shape file. Existing flows were manually entered into the model at each manhole location which received flow. Drainage boundaries were established for each manhole, defined by acreage from which base flow and I/I would contribute. The furthest downstream point in the Mattawoman Interceptor, manhole 40, is simulated in the model as a free outfall structure, thereby simulating no restrictions imposed by the downstream pipe segments or manholes on the Mattawoman Interceptor project area model analysis.

The model provides information regarding surcharge and flooding, both of which are considered unfavorable in the sewer system and may result in basement flooding and sewer overflows. Surcharge is a condition in which a closed conduit flows full and under pressure, which may result in manholes with sewage above the crown of the highest pipe. A flooded manhole occurs when the water level in the manhole rises above the manhole rim elevation, allowing sewage to flow onto the ground surface at that location.

See Appendix E for Existing Interceptor/ Existing Flow Model Results. The Junction Summary Table provides important output criteria such as: feet of surcharge and feet of freeboard in an individual MH, as well as the volume of waters that overflow the system during a flooded condition. Ideally, a manhole would have 0 feet of surcharge, maximum feet of freeboard, and 0 flooded volumes.

Under existing peak flow plus I/I conditions, no manholes surcharged or overflowed, however, County design standards require that conduits shall be designed to not exceed 2/3 capacity. Column P of Appendix C, Table 6 indicates which pipe reaches exceed the 2/3 design capacity by highlighted blocks. In addition, the Conduit Summary Table in Appendix E, shows a column labeled "Ratio of Computed to 2/3 Design Flow. Wherever the ratio exceeds 1.0, the 2/3 design capacity is exceeded for the corresponding reach of pipe. The existing design flow (peak + I/I) in the pipe segment between Manhole numbers 51 and 50 significantly exceeds the design capacity (2/3 capacity). The design pipe capacity is so poor in this location because of a 0.06% slope. The Model does not report this location as a surcharge or overflow due to the hydraulic grade line being greater than the pipe slope in this condition. Several other pipe reaches exceed 2/3 capacity

under existing conditions by a minimal amount, specifically between manhole numbers 118 and 117, 52 and 51, 47 and 46, and 45 and 44.

These model results indicate that the existing interceptor is adequate for the existing conditions, and does not need immediate infrastructure improvements at this time.

Metering was not included as part of this scope of services for this contract, and the County does not have recent meter records. However, the model results can be confirmed by depth measurements at critical manholes during storm events.

III. FUTURE CONDITIONS

A. Basis of Flow Projection

1. Future Development List

KCI developed a list of future development within the project area, including residential, commercial and industrial development (Appendix C, Table 4). KCI performed a query in the Zoning shape file for commercial and industrial zoning classifications and associated acres, which did not change as compared to existing conditions. MDP provided KCI with a list of additional future residential parcels per zoning classification with associated number of parcels (Appendix C, Table 1). MDP assigned density yields (dwelling units per acre) as agreed upon by the County based on zoning classification within each of the Mattawoman Interceptor sub-sewer sheds.

2. Projected Flow

Future flow conditions for the Mattawoman Interceptor were determined by calculating complete build out of the Mattawoman Interceptor Sewer shed given the MDP potential residential development, full utilization of industrial and commercial zoned lands, and build out of all authorized developments within the WSSC territory draining to the project area. Methods for calculating average flow; peak flow and I/I are discussed in Section II.B.3, and apply to both existing and future flows. Future cumulative design flow at the lowest Mattawoman Interceptor reach within the project area is estimated to be 85 mgd (130 cfs) (Appendix C, Table 6, and Column J).

Manhole number 82 receives flow from the Piney Branch Interceptor, and nearly doubles the flow seen in the Mattawoman at this point. This manhole represents the single largest increase in flow within the project area.

B. Evaluation of Existing Facilities under Future Flow Conditions

1. Future Conditions Model Results

The XP-SWMM sewer-modeling program, as discussed in Section II.B.4, was utilized to evaluate the existing Mattawoman Interceptor hydraulic capacity under future flow conditions.

See Appendix F for Existing Interceptor/ Future Flow Model Results. Under future peak flow plus I/I conditions, 39 of the MHs surcharged specifically between MH 125 to 119 and 96 to 45, however, no manholes overflow under future conditions. Column T of Appendix C, Table 6 indicates which pipe reaches exceed the 2/3 design capacity by highlighted blocks. In addition, the Conduit Summary Table in Appendix F, shows a column labeled “Ratio of Computed to 2/3 Design Flow. Wherever the ratio exceeds 1.0, the 2/3 design capacity is exceeded for the corresponding reach of pipe. The future design flow (peak + I/I) exceeds the design capacity (2/3 capacity) in the majority of the study area. The upper segment between manhole numbers 125 - 105A as well as the bottom half of the study area from manhole numbers 82 - 40 exceed design capacity, when compared to the future design flow.

Appendix F, Junction Summary Table lists the height of surcharge in the manhole stack at each manhole under future flow conditions. Notice that a surcharged condition occurs between manholes 125-119 and downstream of manhole number 96, although the 2/3 design capacity issue begins downstream of manhole number 82. This occurs due to a backflow of water up through the system caused by the capacity problems downstream of manhole number 82. Once a remedy is in place to correct the capacity problem downstream of manhole number 82, backflow will no longer occur.

These model results indicate that the existing Mattawoman Interceptor will exceed the 2/3 capacity for a significant portion of its length and approximately half of manholes will surcharge under future flow conditions.

IV. ALTERNATIVE DEVELOPMENT AND COMPARISON

A. Engineering Criteria

The average flow was derived from the Charles County Water and Sewer Ordinance “Appendix V” (base flow in gpd/dwelling unit for residential or gpd/acre for commercial and industrial). The MDE peak flow equation was utilized to calculate peak flow. The Charles County Water and Sewer Ordinance were used to calculate I/I contribution (gpd/acre). General engineering practice

guidelines for design of wastewater systems, utilized for this project, follows the Charles County guidelines, MDE requirements and Ten States Standards.

The Manning's Formula was used to calculate the recommended pipe size for proposed gravity pipe under the three Alternatives. Pipe sizing was recommended based on maintaining a maximum 2/3 capacity.

The Hazen-Williams formula was used to calculate the recommended pipe size for proposed force main pipe for Alternatives I, II and III.

Hazen-Williams formula (English units):

$$Q = A \cdot C \cdot R^{0.63} \cdot S^{0.54}$$

Q= Pipe capacity

A= pipe area

R= hydraulic radius

S= slope

C= Coefficient of Roughness

B. Alternative Alignment Layouts

See Appendix G for Alternative alignments. The following summarized the alternative alignments:

Alternative 1 – Parallel Existing Mattawoman Interceptor (MH 125-40).

Alternative II – Parallel only future flow deficit segments (MH 125-105A and MH 82- 40).

Alternative III- Parallel necessary segments for 20% increase in Residential Zoning Densities (MH 125-105A and MH 82- 40).

- 1. Alternative I (constant *n* method)** – For this alternative, the entire Mattawoman Interceptor of approximately 52,085 LF of sewer length was paralleled from MH 125 to MH 40. The XP-SWMM sewer-modeling program, as discussed in Section II.B.4, was utilized to evaluate Alternative I for Mattawoman Interceptor hydraulic capacity under future flow conditions. A constant *n* method was utilized as discussed in Section II.B.3.

See Appendix H for flow model results. None of the manholes overflow under future peak flow plus I/I conditions; however existing flow in pipe segment 118, 108 and 51 exceed design 2/3rd capacity. This is shown in Conduit Summary table in Appendix

H in a column labeled “Ratio of Computed to design flow”. Wherever the ratio exceeds 1, the 2/3rd design capacity is exceeded for the corresponding reach of pipe segment. Although the ratio exceeds 1 in the two listed pipe segments, the long section view of the pipe in the model does not show that the depth is above the 2/3rd capacity (see Appendix H). This is because the slope of the hydraulic line is greater than the slope of the pipe segment, and creates a condition which is not represented in the table. The parallel line modeled in this scenario can handle the 2/3 future design flow in all segments.

The model results show that the existing and parallel line, shown under Alternative I, can handle future plus peak I/I flow conditions.

2. **Alternative II (constant *n* method)** – For this alternative, only the pipe segments which cannot handle future plus peak I/I flow conditions, were paralleled. The pipe segments include pipes between MH 125 and MH 105A, and MH 82 and MH 40 with a total sewer length of approximately 38,529 LF. The existing reach of pipe between manholes MH 105A and MH 82 can handle future plus peak I/I conditions, and they do not need to be paralleled. The XP-SWMM sewer-modeling program, as discussed in Section II.B.4, was utilized to evaluate Alternative II for Mattawoman Interceptor hydraulic capacity under future flow conditions. A constant *n* method was utilized as discussed in Section II.B.3.

See Appendix H for flow model results. None of the manholes overflow under future peak flow plus I/I conditions; however existing flow in pipe segment 118, 108 and 51 exceed design 2/3rd capacity, however the long section view of the pipe in the model does not show that the depth is above the 2/3rd capacity (see Appendix H). The conduit summary in Appendix H shows that the flow in the parallel Interceptor is under the 2/3rd design capacity. Also the junction summary in Appendix H shows no surcharge or flooding in any of the manholes.

3. **Alternative III (constant *n* method)** – For this alternative, KCI evaluated the impact of a 20% increase in zoning densities within the RL, RM and RH zoning districts (Appendix C, Table 7, 8, 9). The XP-SWMM sewer-modeling program, as discussed in Section II.B.4, was utilized to evaluate Alternative III for Mattawoman Interceptor hydraulic capacity under new future flow conditions. A constant *n* method was utilized as discussed in Section II.B.3. The analysis shows that the increase in flow is minor, and the same pipe segments require upgrade as that in Alternative II.

From the model results, it is clearly seen that the parallel line as recommended in Alternative III can handle the future plus peak I/I flow conditions (Appendix H). The flow at downstream MH 40 increased from 84.59 mgd to 86.8 mgd. The conduit

summary in Appendix H shows that the flow in the parallel Interceptor is under the 2/3rd design capacity, however, the 2/3 design capacity is only slightly exceeded in several existing sections of pipe, specifically in pipe segments 118, 108, 101, 100 and 51. Just as in Alternative I and II, the long section view of the pipe in the model does not show that the depth is above the 2/3rd capacity (see Appendix H). Also the junction summary in Appendix H shows no surcharge or flooding in any of the manholes.

4. **Varying n Method**– For this scenario, KCI recalculated the flow calculations for Alternatives I, II and II utilizing the variable n method for full flow capacity and 2/3 design capacity. See Appendix H1 for model results. The variable n method at $d/D = 0.67$ has an n/n_{full} ratio of 1.18. Utilizing $n = 0.015$ for RCP 2/3 design capacity flow per Water and Sewer Ordinance Appendix “Z” and as directed by ARRO, n_{full} equates to 0.0127 ($0.015/1.18$). KCI recalculated the full flow capacity of the pipe with $n_{full} = 0.0127$ and multiplied by the q/Q ratio= 0.65 to calculate the 2/3 design flow. Analysis by variable n method provides approximately a 4% reduction in capacity compared to the 2/3 design capacity of the pipe computed using the constant n method, however no pipes as presented in Alternatives I, II and III, exceed the 2/3 depth design limitation for the reduced design flows calculated using the variable n method. Therefore, KCI concludes that the analysis is valid and accurate for both the variable n and constant n methods and the report meets the intent of the Charles County Water and Sewer Ordinance requirements.

C. Preliminary Cost Estimates

The cost estimates for Alternative I was derived from Charles County “Central Development District Cost Estimating Table” from the Department of Planning and Growth Management Plan Preparation Package Document, updated to May 2007 values with ENR Construction Cost Indices, in conjunction with engineering judgment from past design projects with similar job conditions (See Appendix I).

Alternative I - Mattawoman Parallel Interceptor requires approximately 52,050 LF of gravity sanitary sewer ranging in size from 30-60” and approximately 86 new sewer manholes and is estimated to cost approximately \$35 million.

Alternative II – Mattawoman Parallel Interceptor requires approximately 38,500 LF of gravity sanitary sewer ranging in size from 30-60” and approximately new sewer manholes and is estimated to cost approximately \$29 million.

Alternative III – The cost estimate is similar to Alternative II.

D. Environmental Impacts

ENVIRONMENTAL FEATURE MAP

Environmental features were mapped to provide a planning-level estimate of impacts from each of the alternatives (see Appendix J, K) including the following:

Streams	Derived from MSHA mapping
Wetlands	Obtained from US Fish and Wildlife Service
Floodplains	Obtained from DNR Technology Toolbox
Forest Conservation	Mapped by KCI from Charles County records
Forests	Derived from existing land use map

E. Permit Requirements

Table 3: Potential Permits

Permit	Permit Subject	Alt I	Alt II	Alt III
MDE/ACOE Joint (Wetlands)	Wetland or Waters of the U.S. Impacts	X	X	X
MDE Construction	Change in Sewerage Capacity	X	X	X
MSHA Construction	Existing State Roadway Impacts	X	X	X
Forest Conservation (County/DNR)	Forested land impacts	X	X	X
RTE (U.S. Fish and Wildlife)	Rare Threatened and Endangered Species	X	X	X
Soil Conservation District Approval	Sediment and Erosion Control	X	X	X
SMECO	Electric Utility Impacts	X	X	X
Dominion Gas	Gas Utility Impacts	X	X	X
Railroad Construction (CSXT)	Railroad ROW Impact	X	X	X

F. Easement Requirements

Charles County Comprehensive Water and Sewer Plan require the following minimum easement widths for 30" to 48" sewer pipe: 30' perpetual easement and 40' temporary easement; and for widths for 54" to 66" sewer pipe: 40' perpetual easement and 40' temporary easement.

There is currently a 50' perpetual easement along the Mattawoman Interceptor. The parallel Interceptor is planned with a 20' offset from the existing Interceptor, within the current easement. Therefore, construction of the parallel line can utilize this existing easement, requiring an additional 20' or 30' for the construction of the 30" to 48" pipe and 54" to 66" pipe, respectively. The necessary easements for the 30" to 48" pipe include 5' of perpetual easement and 15' of temporary easement and the necessary easements for the 54" to 66" pipe include 15' of perpetual easement and 15' of temporary easement.

G. Feasibility and O&M Considerations

Alternative I include a parallel to the entire Mattawoman Interceptor from MH 125 to MH 40. Operation and Maintenance Costs would be associated with the upkeep of the proposed sewer only. Assuming a cost of \$1.50/linear foot/year, the O & M costs for Alternative I would be approximately \$78,127/year.

Alternative II include a parallel to part of the Mattawoman Interceptor from MH 125 to MH105 A and MH 82 to MH 40. Operation and Maintenance Costs would be associated with the upkeep of the proposed sewer only. Assuming a cost of \$1.50/linear foot/year, the O & M costs for Alternative I would be approximately \$57,793/year.

Alternative III will have similar operation and maintenance as Alternative II.

V. PROPOSED ALTERNATIVE AND CONCLUSION**A. Recommended Alternative**

KCI recommends implementing Alternative II, because it improves specific areas calculated to be below the minimum design capacity, rather than paralleling the entire Interceptor. Alternative II is the implementation of a parallel line between MH 125 and MH 105A, and MH 82 and MH 40. The existing Interceptor would remain in use, and the two lines would interconnect. In the event that the residentially zoned areas redevelop at a rate 20% higher than that which is currently planned,

the improvements recommended in Alternative II will be able to accommodate the increase in flow (analyzed under Alternative III).

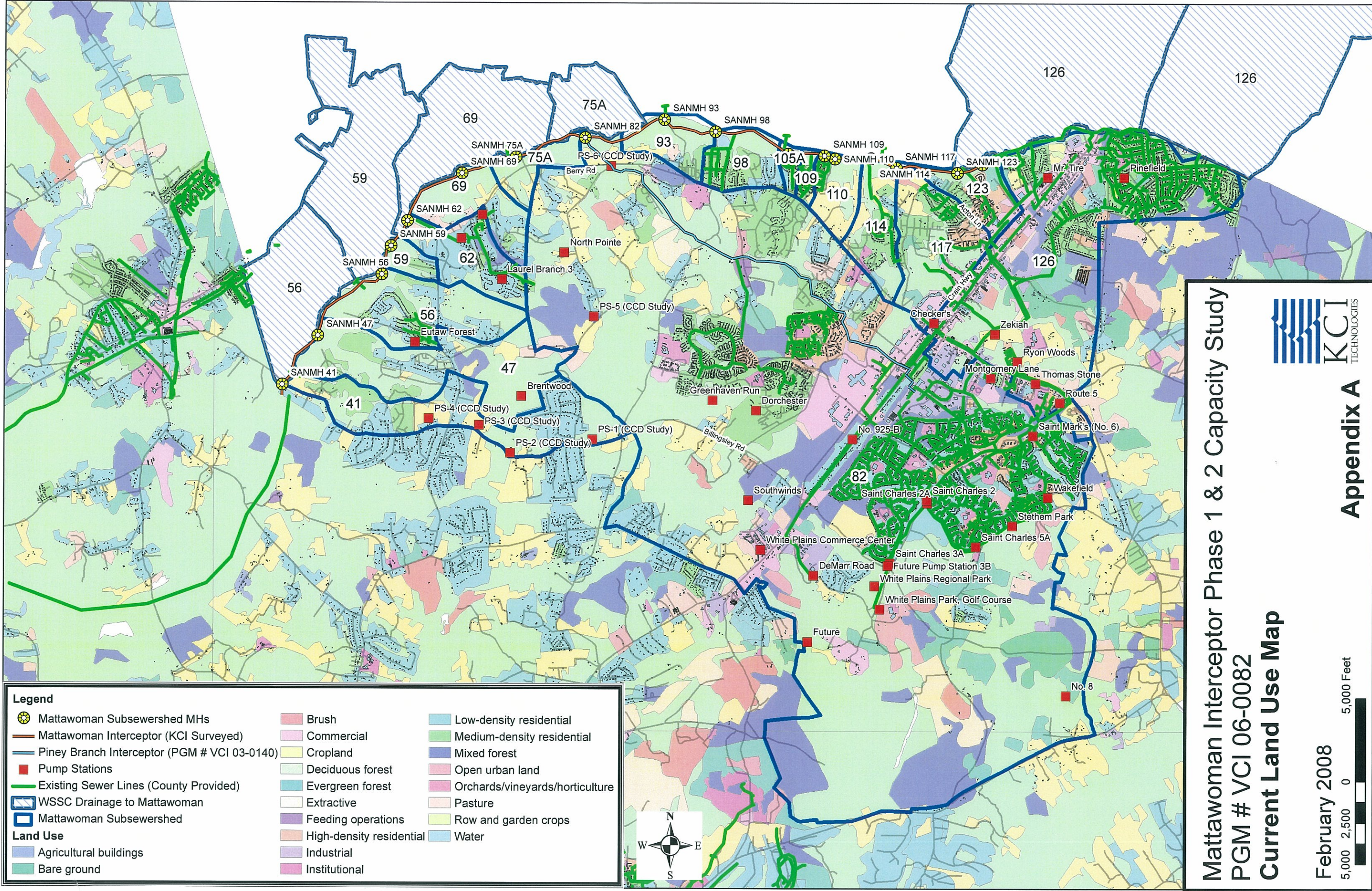
B. Reason for Selection

Alternative II is least expensive and has the least impact to environmental features and permitting of the options presented in the report.

C. Outline of Official Actions and Procedures to Implement

The model results indicate that existing reaches within the Mattawoman Interceptor study area have adequate capacity for the existing flow conditions, and do not need immediate infrastructure improvements. However, future flow conditions will exceed the capacity of the Interceptor, as defined by the 2/3 full pipe criteria. The Charles County Department of Planning and Growth Management will need to make improvements to the Interceptor prior to future flow conditions, in order to accommodate anticipated growth within the study area.

APPENDIX A: CURRENT LAND USE MAP / 2025 LAND USE MAP



Legend

- Mattawoman Subsewershed MHs
- Mattawoman Interceptor (KCI Surveyed)
- Piney Branch Interceptor (PGM # VCI 03-0140)
- Pump Stations
- Existing Sewer Lines (County Provided)
- WSSC Drainage to Mattawoman
- Mattawoman Subsewershed
- Land Use**
 - Agricultural buildings
 - Bare ground
 - Brush
 - Commercial
 - Cropland
 - Deciduous forest
 - Evergreen forest
 - Extractive
 - Feeding operations
 - High-density residential
 - Industrial
 - Institutional
 - Low-density residential
 - Medium-density residential
 - Mixed forest
 - Open urban land
 - Orchards/vineyards/horticulture
 - Pasture
 - Row and garden crops
 - Water

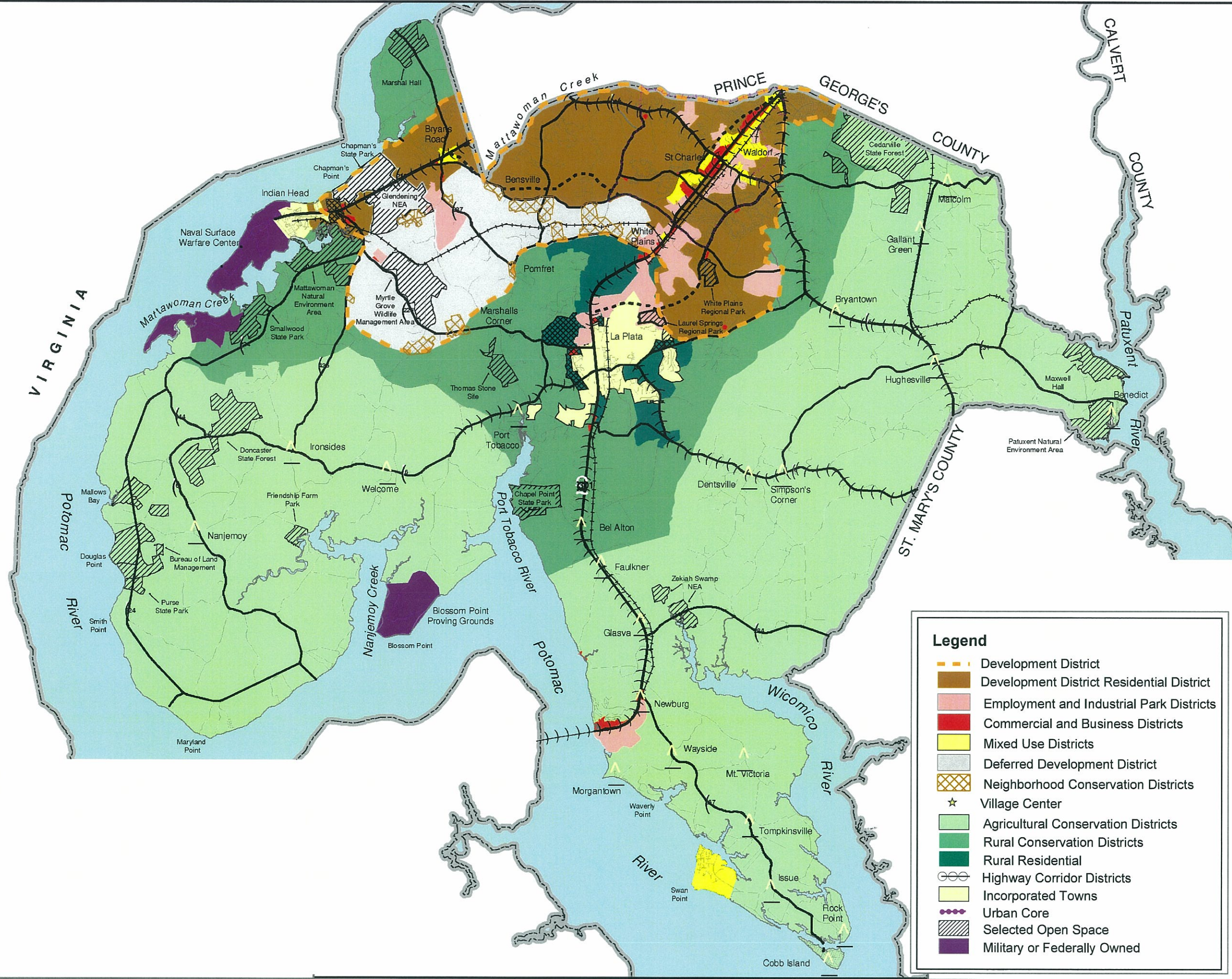
Mattawoman Interceptor Phase 1 & 2 Capacity Study
PGM # VCI 06-0082
Current Land Use Map



Appendix A

February 2008

5,000 2,500 0 5,000 Feet



Legend

- Development District
- Development District Residential District
- Employment and Industrial Park Districts
- Commercial and Business Districts
- Mixed Use Districts
- Deferred Development District
- Neighborhood Conservation Districts
- ★ Village Center
- Agricultural Conservation Districts
- Rural Conservation Districts
- Rural Residential
- Highway Corridor Districts
- Incorporated Towns
- Urban Core
- Selected Open Space
- Military or Federally Owned

Mattawoman Interceptor Phase 1 & 2 Capacity Study
PGM # VCI 06-0082
2025 Land Use Map

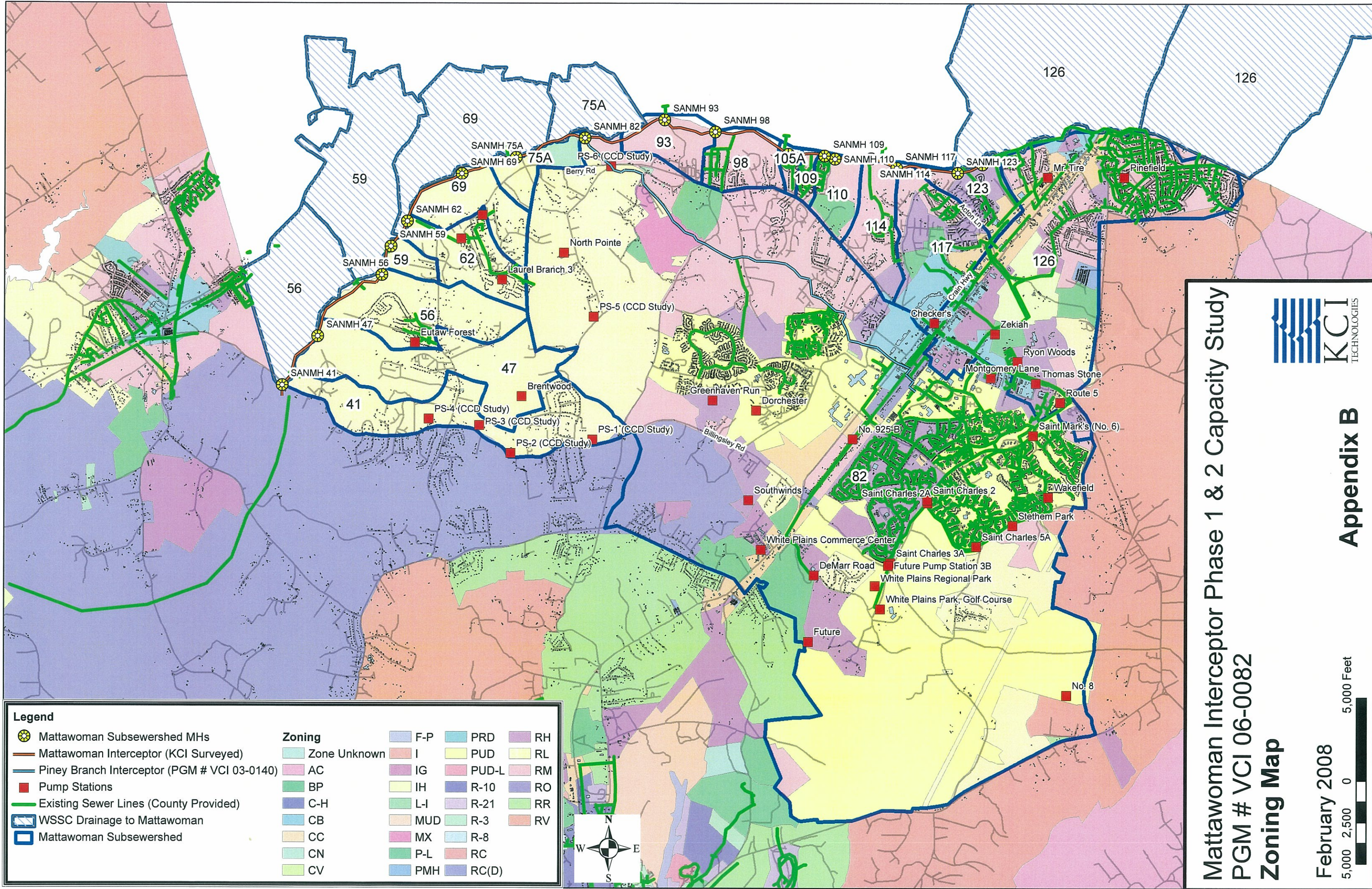


Appendix A

February 2008



APPENDIX B: ZONING MAP



APPENDIX C: DEVELOPMENT LIST / FLOW CALCULATION

Appendix C: Development List/ Flow Calculations

Table 1: MDP Residential Development
Mattawoman Sewer Shed Area - New Household Capacity
April 13, 2007

Existing Development

SWSHED_ID	Zoning District	Improved Residential Parcels	Acres Associated with Improved Residential Parcels
126	BP	14	1.0
126	CB	19	26.9
126	CC	7	5.6
126	IG	4	3.1
126	IH	0	0.0
126	PMH	0	0.0
126	PUD	68	3.0
126	RH	591	55.9
126	RL	5	11.5
126	RM	2310	751.0
123	CC	23	5.2
123	RH	395	41.5
123	RM	82	49.3
117	BP	0	0.0
117	CB	13	14.4
117	CC	2	1.7
117	RH	886	90.4
117	RM	357	111.2
114	CB	0	0.0
114	RH	3	1.3
114	RM	516	165.1
110	BP	1	8.8
110	RM	127	32.1
109	RM	143	30.0
105A	RM	69	24.9
98	RM	394	190.3
93	RM	251	48.5
82	BP	5	13.2
82	CB	6	11.3
82	CC	0	0.0
82	CN	1	0.5
82	CV	32	1.3
82	IG	18	32.9
82	MX	292	25.0
82	PUD	7538	1105.3
82	RC	5	12.6
82	RC(D)	98	176.2
82	RH	3033	639.5
82	RL	496	581.5
82	RM	1828	858.9
82	RO	96	74.2
82	RR	1	2.2
75A	CN	0	0.0
75A	RL	27	28.3
69	RL	133	82.1
62	RL	327	337.0
59	RL	52	65.5
56	RL	338	282.0
47	RL	577	274.5
41	RL	641	481.5
41	RM	0	0.0

21,824

6,758

Potential Development

SWSHED_ID	Zoning District	New Household Capacity
126	BP	0
126	CB	0
126	CC	0
126	IG	0
126	IH	0
126	PMH	64
126	PUD	25
126	RH	1089
126	RL	180
126	RM	623
123	CC	0
123	RH	567
123	RM	65
117	BP	0
117	CB	0
117	CC	0
117	RH	29
117	RM	28
114	CB	0
114	RH	17
114	RM	210
110	BP	0
110	RM	60
109	RM	2
105A	RM	37
98	RM	181
93	RM	47
82	BP	0
82	CB	0
82	CC	0
82	CN	0
82	CV	0
82	IG	0
82	MX	0
82	PUD	6666
82	RC	71
82	RC(D)	84
82	RH	2341
82	RL	2213
82	RM	2519
82	RO	25
82	RR	5
75A	CN	0
75A	RL	22
69	RL	235
62	RL	294
59	RL	134
56	RL	298
47	RL	1323
41	RL	303
41	RM	1

19,758

Table 2: WSSC flow to Mattawoman Interceptor
Prince George's County

Existing Flow

Average Quarterly Flow per Connection to Mattawoman Interceptor						
Year 2006	Timothy Branch (mgd)	Bealle Hill (mgd)	Will Court (mgd)	Mattawoman Way West (mgd)	Clinton Drive (mgd)	Catherine Fran Drive (mgd)
Jan-Mar	0.12	0.02	0.01	0.01	0.1	0.1
Apr-June	0.13	0.02	0.02	0.01	0.11	0.1
July-Sep	0.17	0.02	0.02	0.04	0.11	0.12
Oct-Dec	0.13	0.02	0.01	0.01	0.13	0.09
Average	0.14	0.02	0.02	0.02	0.11	0.10
Connection Manhole #	MH 126+	MH 75	MH 69	MH 66	MH 59	MH 51
Size of Connection to 60" Mattawoman Trunk Sewer	24"	18"	8"	10"	12"	12"

Increase in Future Flow

Basins	Flow from Remaining WSSC Units Based on Authorizations				
	SFDU	TH	GA	HIRISE	COMML
21	396,224	45,864			146,600
22	25,368				
	421,592	45,864	0	0	146,600
Total Flow	639,424				

Additional Future Flow Per Connection Location
 (Total Future /6)=

0.11 mgd

Table 3: Existing Development List
Mattawoman Interceptor (MH # 125-40) Service Area- MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP-Improved Residential Parcels	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Existing Average Flow (gpd)	Existing Sub-Sewershed Sub-Total
126	BP	14		260		3,640	
126	CB	19		260		4,940	
126	CC	7		260		1,820	
126	IG	4		260		1,040	
126	PUD	68		260		17,680	
126	RH	591		173		102,243	
126	RL	5		260		1,300	
126	RM	2310		202		466,620	
126	--	--	WSSC Timothy Branch Connection Reported Avg. Flow (MH 126+)			140,000	
126	BP		192.9		4000	771,600	
126	CB		324.6		3000	973,800	
126	CC		429.2		2000	858,400	
126	IG		305.0		2000	610,000	
126	IH		306.5		4000	1,226,000	5,179,083
123	CC	23		260		5,980	
123	RH	395		173		68,335	
123	RM	82		202		16,564	
123	CC		75.3		2,000	150,600	241,479
117	CB	13		260		3,380	
117	CC	2		260		520	
117	RH	886		173		153,278	
117	RM	357		202		72,114	
117	BP		68.9		4,000	275,600	
117	CB		254.0		3,000	762,000	
117	CC		77.0		2,000	154,000	1,420,892
114	RH	3		173		519	
114	RM	516		202		104,232	
114	CB		6.8		3,000	20,400	125,151
110	BP	1		260		260	
110	RM	127		202		25,654	
110	BP		90.3		4,000	361,200	387,114
109	RM	143		202		28,886	
109	BP		1.8		4,000	7,200	36,086
105A	RM	69		202		13,938	13,938
98	RM	394		202		79,588	
98	BP		2.0		4,000	8,000	87,588

Table 3: Existing Development List
Mattawoman Interceptor (MH # 125-40) Service Area- MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP-Improved Residential Parcels	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Existing Average Flow (gpd)	Existing Sub-Sewershed Sub-Total
93	RM	251		202		50,702	51,102
93	BP		0.1		4,000	400	
82	BP	5		260		1,300	8,581,309
82	CB	6		260		1,560	
82	CN	1		260		260	
82	CV	32		260		8,320	
82	IG	18		260		4,680	
82	MX	292		202		58,984	
82	PUD	7538		260		1,959,880	
82	RC	5		260		1,300	
82	RC(D)	98		260		25,480	
82	RH	3033		173		524,709	
82	RL	496		260		128,960	
82	RM	1828		202		369,256	
82	RO	96		260		24,960	
82	RR	1		260		260	
82	BP		644.2		4,000	2,576,800	
82	CB		282.5		3,000	847,500	
82	CC		368.4		2,000	736,800	
82	CN		10.8		2,000	21,600	
82	CV		2.7		2,000	5,400	
82	IG		570.2		2,000	1,140,400	
82	RO		142.9		1,000	142,900	
75A	RL	27		260		7,020	228,420
75A	--	--	WSSC Bealle Hill Rd. Connection Reported Avg. Flow (MH 75)		20,000	20,000	
75A	CN		100.7		2000	201,400	74,580
69	RL	133		260		34,580	
69	--	--	WSSC Will Court Connection Reported Avg. Flow (MH 69)		20,000	20,000	85,020
69	--	--	WSSC Mattawoman Way Connection Reported Avg. Flow (MH 66)		20,000	20,000	
62	RL	327		260		85,020	123,520
59	RL	52		260		13,520	
59	--	--	WSSC Clinton Drive Connection Reported Avg. Flow (MH 59)		110,000	110,000	187,880
56	RL	338		260		87,880	
56	--	--	WSSC Catherine Fran Drive Connection Reported Avg. Flow (MH 51)		100,000	100,000	150,020
47	RL	577		260		150,020	
41	RL	641		260		166,660	167,860
41	CN		0.6		2,000	1,200	
Note: The commercial/industrial land use is based on total build-out potential of each parcel and the subject flows that would be generated by that build-out							Total Flow
							17,141,042

Table 4: Future Development List
Mattawoman Interceptor (MH # 125-40) Service Area - MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP New Household Capacity	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Future Average Flow (gpd)	Future Sub-Sewershed Sub-Total	Existing Sub-Sewershed Sub-Total	Future Sub-Sewershed Total
126	PMH	64		260		16,640			
126	PUD	25		260		6,500			
126	RH	1089		173		188,397			
126	RL	180		260		46,800			
126	RM	623		202		125,846			
126	--	--	WSSC Timothy Branch Connection Reported Avg. Flow (MH 126+)			110,000			
126	BP		192.9		4000	771,600			
126	CB		324.6		3000	973,800			
126	CC		429.2		2000	858,400			
126	IG		305.0		2000	610,000			
126	IH		306.5		4000	1,226,000	4,933,983	5,179,083	10,113,066
123	RH	567		173		98,091			
123	RM	65		202		13,130	111,221	241,479	352,700
117	RH	29		173		5,017			
117	RM	28		202		5,656			
117	BP		68.9		4,000	275,600			
117	CB		254.0		3,000	762,000			
117	CC		77.0		2,000	154,000	1,202,273	1,420,892	2,623,165
114	RH	17		173		2,941			
114	RM	210		202		42,420			
114	CB		6.8		3,000	20,400	65,761	125,151	190,912
110	RM	60		202		12,120			
110	BP		90.3		4,000	361,200	373,320	387,114	760,434
109	RM	2		202		404			
109	BP		1.8		4,000	7,200	7,604	36,086	43,690
105A	RM	37		202		7,474	7,474	13,938	21,412
98	RM	181		202		36,562			
98	BP		2.0		4,000	8,000	44,562	87,588	132,150

Table 4: Future Development List
Mattawoman Interceptor (MH # 125-40) Service Area - MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP New Household Capacity	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Future Average Flow (gpd)	Future Sub-Sewershed Sub-Total	Existing Sub-Sewershed Sub-Total	Future Sub-Sewershed Total
93	RM	47		202		9,494			
93	BP		0.1		4,000	400	9,894	51,102	60,996
82	PUD	6666		260		1,733,160			
82	RC	71		260		18,460			
82	RC(D)	84		260		21,840			
82	RH	2341		173		404,993			
82	RL	2213		260		575,380			
82	RM	2519		202		508,838			
82	RO	25		260		6,500			
82	RR	5		260		1,300			
82	BP		644.2		4,000	2,576,800			
82	CB		282.5		3,000	847,500			
82	CC		368.4		2,000	736,800			
82	CN		10.8		2,000	21,600			
82	CV		2.7		2,000	5,400			
82	IG		570.2		2,000	1,140,400			
82	RO		142.9		1,000	142,900	8,741,871	8,581,309	17,323,180
75A	RL	22		260		5,720			
75A	--	--	WSSC Bealle Hill Rd. Connection Reported Avg. Flow (MH 75)			110,000			
75A	CN		100.7		2000	201,400	317,120	228,420	545,540
69	RL	235		260		61,100			
69	--	--	WSSC Will Court Connection Reported Avg. Flow (MH 69)			110,000			
69	--	--	WSSC Mattawoman Way Connection Reported Avg. Flow (MH 66)			110,000	281,100	74,580	355,680
62	RL	294		260		76,440	76,440	85,020	161,460
59	RL	134		260		34,840			
59	--	--	WSSC Clinton Drive Connection Reported Avg. Flow (MH 59)			110,000	144,840	123,520	268,360
56	RL	298		260		77,480			
56	--	--	WSSC Catherine Fran Drive Connection Reported Avg. Flow (MH 51)			110,000	187,480	187,880	375,360
47	RL	1,323		260		343,980	343,980	150,020	494,000
41	RL	303		260		78,780			
41	RM	1		202		202			
41	CN		0.6		2,000	1,200	80,182	167,860	248,042
Note: The commercial/industrial land use is based on total build-out potential of each parcel and the subject flows that would be generated by that build-out							Total Flow	16,929,105	34,070,147

Table 5: Subsewershed Design Flow Calculation

Existing- Sorted by MH Subsewershed, (MDP Residential parcels + GIS Commercial & Industrial parcels+ WSSC Contribution)

A		B		"Appendix V", Charles County Water and Sewer Ordinance							J	
MH Sub-sewershed	County Collection Area (Acres)	WSSC Collection Area (Acres)	Avg. Flow based on Q/EDU or Q/Acre (gpd)	Avg. Flow (cfs)	Cum Avg Flow (cfs)	Cumulative Avg (gpd)	Peak Factor	Cumulative Peak (gpd)	Cumulative I/I (gpd)	Cumulative Existing Peak Q +/-I (gpd)		
126	3,496	7,724	5,179,083	8.0	8.0	5,179,083	2.4	12,599,714	4,488,040	17,087,754		
123	333		241,479	0.4	8.4	5,420,562	2.4	13,087,406	4,621,120	17,708,526		
117	814		1,420,892	2.2	10.6	6,841,454	2.3	15,889,381	4,946,880	20,836,261		
114	499		125,151	0.2	10.8	6,966,605	2.3	16,131,236	5,146,480	21,277,716		
110	282		387,114	0.6	11.4	7,353,719	2.3	16,874,821	5,259,280	22,134,101		
109	72		36,086	0.1	11.4	7,389,805	2.3	16,943,799	5,288,160	22,231,959		
105A	63		13,938	0.0	11.5	7,403,743	2.3	16,970,427	5,313,520	22,283,947		
98	344		87,588	0.1	11.6	7,491,331	2.3	17,137,566	5,451,240	22,588,806		
93	300		51,102	0.1	3.7	7,542,433	2.3	17,234,930	5,571,360	22,806,290		
82	18,655		8,581,309	13.3	24.9	16,123,742	2.0	32,461,719	13,033,320	45,495,039		
75A	283	432	228,420	0.4	25.3	16,352,162	2.0	32,844,498	13,319,480	46,163,978		
69	500	1,120	74,580	0.1	25.4	16,426,742	2.0	32,969,283	13,967,360	46,936,643		
62	534		85,020	0.1	25.5	16,511,762	2.0	33,111,422	14,180,800	47,292,222		
59	134	1,407	123,520	0.2	25.7	16,635,282	2.0	33,317,708	14,797,000	48,114,708		
56	843	899	187,880	0.3	26.0	16,823,162	2.0	33,630,991	15,493,960	49,124,951		
47	1,278		150,020	0.2	26.3	16,973,182	2.0	33,880,726	16,005,200	49,885,926		
41	1,130		167,860	0.3	26.5	17,141,042	2.0	34,159,722	16,457,360	50,617,082		
29,561		11,582				27		53		78		
						cfs		cfs		cfs		

Future- Sorted by MH Subsewershed, (MDP Future Residential parcels + GIS Future Commercial & Industrial parcels+ WSSC Contribution)

A		B		"Appendix V", Charles County Water and Sewer Ordinance							J	
MH Sub-sewershed	County Collection Area (Acres)	WSSC Collection Area (Acres)	Avg. Flow based on Q/EDU or Q/Acre (gpd)	Avg. Flow (cfs)	Cum Avg Flow (cfs)	Cumulative Avg (gpd)	Peak Factor	Cumulative Peak (gpd)	Cumulative I/I (gpd)	Cumulative Future Peak Q +/-I (gpd)		
126	3,496	7,724	10,113,066	15.6	15.6	10,113,066	2.2	22,006,569	4,488,040	26,494,609		
123	333		352,700	0.5	16.2	10,465,766	2.2	22,644,314	4,621,120	27,265,434		
117	814		2,623,165	4.1	20.3	13,088,931	2.1	27,283,712	4,946,880	32,230,592		
114	499		190,912	0.3	20.5	13,279,843	2.1	27,614,939	5,146,480	32,761,419		
110	282		760,434	1.2	21.7	14,040,277	2.1	28,926,532	5,259,280	34,185,812		
109	72		43,690	0.1	21.8	14,083,967	2.1	29,001,523	5,288,160	34,289,683		
105A	63		21,412	0.0	21.8	14,105,379	2.1	29,038,261	5,313,520	34,351,781		
98	344		132,150	0.2	22.0	14,237,529	2.1	29,264,796	5,451,240	34,716,036		
93	300		60,996	0.1	22.1	14,298,525	2.1	29,369,238	5,571,360	34,940,598		
82	18,655		17,323,180	26.8	48.9	31,621,705	2.0	63,243,410	13,033,320	76,276,730		
75A	283	432	545,540	0.8	49.8	32,167,245	2.0	64,334,490	13,319,480	77,653,970		
69	500	1,120	355,680	0.6	50.3	32,522,925	2.0	65,045,850	13,967,360	79,013,210		
62	534		161,460	0.2	50.6	32,684,385	2.0	65,368,770	14,180,800	79,549,570		
59	134	1,407	268,360	0.4	51.0	32,952,745	2.0	65,905,490	14,797,000	80,702,490		
56	843	899	375,360	0.6	51.6	33,328,105	2.0	66,656,210	15,493,960	82,150,170		
47	1,278		494,000	0.8	52.3	33,822,105	2.0	67,644,210	16,005,200	83,649,410		
41	1,130		248,042	0.4	52.7	34,070,147	2.0	68,140,294	16,457,360	84,597,654		
29,561		11,582				53		105		131		
						cfs		cfs		cfs		

Peak Factor: For cumulative $Q_a = 0.25$ to 16 MGD, $Q_p = 3.2 \times Q_a^{.56}$, $Q_p > 16$ MGD, $Q_p = 2.0 \times Q_a^{.56}$
 I/I = 400 gpd/acre in drainage basin.

M:\2008\01065913\Engr\TotalFlow Calc.xls] Summary-Ex. & Fut.

Table 7: Alternative 3 Existing Development List
Mattawoman Interceptor (MH # 125-40) Service Area- MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP-Improved Residential Parcels	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Existing Average Flow (gpd)	Existing Sub-Sewershed Sub-Total
126	BP	14		260		3,640	
126	CB	19		260		4,940	
126	CC	7		260		1,820	
126	IG	4		260		1,040	
126	PUD	68		260		17,680	
126	RH	709		173		122,692	
126	RL	6		260		1,560	
126	RM	2772		202		559,944	
126	--	--	WSSC Timothy Branch Connection Reported Avg. Flow (MH 126+)			140,000	
126	BP		192.9		4000	771,600	
126	CB		324.6		3000	973,800	
126	CC		429.2		2000	858,400	
126	IG		305.0		2000	610,000	
126	IH		306.5		4000	1,226,000	5,293,116
123	CC	23		260		5,980	
123	RH	474		173		82,002	
123	RM	98		202		19,877	
123	CC		75.3		2,000	150,600	258,459
117	CB	13		260		3,380	
117	CC	2		260		520	
117	RH	1063		173		183,934	
117	RM	428		202		86,537	
117	BP		68.9		4,000	275,600	
117	CB		254.0		3,000	762,000	
117	CC		77.0		2,000	154,000	1,465,970
114	RH	4		173		623	
114	RM	619		202		125,078	
114	CB		6.8		3,000	20,400	146,101
110	BP	1		260		260	
110	RM	152		202		30,785	
110	BP		90.3		4,000	361,200	392,245
109	RM	172		202		34,663	
109	BP		1.8		4,000	7,200	41,863
105A	RM	83		202		16,726	16,726
98	RM	473		202		95,506	103,506
98	BP		2.0		4,000	8,000	

Table7: Alternative 3 Existing Development List
Mattawoman Interceptor (MH # 125-40) Service Area- MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP-Improved Residential Parcels	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Existing Average Flow (gpd)	Existing Sub-Sewershed Sub-Total
93	RM	301		202		60,842	61,242
93	BP		0.1		4,000	400	
82	BP	5		260		1,300	
82	CB	6		260		1,560	
82	CN	1		260		260	
82	CV	32		260		8,320	
82	IG	18		260		4,680	
82	MX	292		202		58,984	
82	PUD	7538		260		1,959,880	
82	RC	5		260		1,300	
82	RC(D)	98		260		25,480	
82	RH	3640		173		629,651	
82	RM	595		260		154,752	
82	RM	2194		202		443,107	
82	RO	96		260		24,960	
82	RR	1		260		260	
82	BP		644.2		4,000	2,576,800	
82	CB		282.5		3,000	847,500	
82	CC		368.4		2,000	736,800	
82	CN		10.8		2,000	21,600	
82	CV		2.7		2,000	5,400	
82	IG		570.2		2,000	1,140,400	
82	RO		142.9		1,000	142,900	
75A	RL	32		260		8,424	
75A	--	--	WSSC Bealle Hill Rd. Connection Reported Avg. Flow (MH 75)		20,000	20,000	
75A	CN		100.7		2000	201,400	
69	RL	160		260		41,496	
69	--	--	WSSC Will Court Connection Reported Avg. Flow (MH 69)		20,000	20,000	
69	--	--	WSSC Mattawoman Way Connection Reported Avg. Flow (MH 66)		20,000	20,000	
62	RL	392		260		102,024	
59	RL	62		260		16,224	
59	--	--	WSSC Clinton Drive Connection Reported Avg. Flow (MH 59)		110,000	110,000	
56	RL	406		260		105,456	
56	--	--	WSSC Catherine Fran Drive Connection Reported Avg. Flow (MH 51)		100,000	100,000	
47	RL	692		260		180,024	
41	RL	769		260		199,992	
41	CN		0.6		2,000	1,200	
Total Flow							17,691,362

Note: The commercial/industrial land use is based on total build-out potential of each parcel and the subject flows that would be generated by that build-out
Alternative 3: A 20% increase in future flows within the RL, RM and RH Zoning Districts

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Table 8: Alternative 3 Future Development List
Mattawoman Interceptor (MH # 125-40) Service Area - MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP New Household Capacity	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Future Average Flow (gpd)	Future Sub-Sewershed Sub-Total	Existing Sub-Sewershed Sub-Total	Future Sub-Sewershed Total
126	PMH	64		260		16,640			
126	PUD	25		260		6,500			
126	RH	1307		173		226,076			
126	RL	216		260		56,160			
126	RM	748		202		151,015			
126	--	--	WSSC Timothy Branch Connection Reported Avg. Flow (MH 126+)		4000	110,000			
126	BP		192.9		3000	771,600			
126	CB		324.6		2000	973,800			
126	CC		429.2		2000	858,400			
126	IG		305.0		2000	610,000			
126	IH		306.5		4000	1,226,000	5,006,192	5,293,116	10,299,307
123	RH	680		173		117,709			
123	RM	78		202		15,756	133,465	258,459	391,924
117	RH	35		173		6,020			
117	RM	34		202		6,787			
117	BP		68.9		4,000	275,600			
117	CB		254.0		3,000	762,000			
117	CC		77.0		2,000	154,000	1,204,408	1,465,970	2,670,378
114	RH	20		173		3,529			
114	RM	252		202		50,904			
114	CB		6.8		3,000	20,400	74,833	146,101	220,934
110	RM	72		202		14,544			
110	BP		90.3		4,000	361,200	375,744	392,245	767,989
109	RM	2		202		485			
109	BP		1.8		4,000	7,200	7,685	41,863	49,548
105A	RM	44		202		8,969	8,969	16,726	25,694
98	RM	217		202		43,874			
98	BP		2.0		4,000	8,000	51,874	103,506	155,380

Table 8: Alternative 3 Future Development List
Mattawoman Interceptor (MH # 125-40) Service Area - MDP Scenario 1B

Sub-Sewershed	Zoning District	MDP New Household Capacity	Commercial & Industrial Acres (Charles Co. Land Use Map)	Flow/ DU (Charles Co. W & S Ordinance)	Flow/ acre (Charles Co. W & S Ordinance)	Future Average Flow (gpd)	Future Sub-Sewershed Sub-Total	Existing Sub-Sewershed Sub-Total	Future Sub-Sewershed Total
93	RM	56		202		11,393			
93	BP		0.1		4,000	400	11,793	61,242	73,035
82	PUD	6666		260		1,733,160			
82	RC	71		260		18,460			
82	RC(D)	84		260		21,840			
82	RH	2809		173		485,992			
82	RL	2656		260		690,456			
82	RM	3023		202		610,606			
82	RO	25		260		6,500			
82	RR	5		260		1,300			
82	BP		644.2		4,000	2,576,800			
82	CB		282.5		3,000	847,500			
82	CC		368.4		2,000	736,800			
82	CN		10.8		2,000	21,600			
82	CV		2.7		2,000	5,400			
82	IG		570.2		2,000	1,140,400			
82	RO		142.9		1,000	142,900	9,039,713	8,785,894	17,825,607
75A	RL	26		260		6,864			
75A	--	--	WSSC Bealle Hill Rd. Connection Reported Avg. Flow (MH 75)			110,000			
75A	CN		100.7		2000	201,400	318,264	229,824	548,088
69	RL	282		260		73,320			
69	--	--	WSSC Will Court Connection Reported Avg. Flow (MH 69)			110,000			
69	--	--	WSSC Mattawoman Way Connection Reported Avg. Flow (MH 66)			110,000	293,320	81,496	374,816
62	RL	353		260		91,728	91,728	102,024	193,752
59	RL	161		260		41,808			
59	--	--	WSSC Clinton Drive Connection Reported Avg. Flow (MH 59)			110,000	151,808	126,224	278,032
56	RL	358		260		92,976			
56	--	--	WSSC Catherine Fran Drive Connection Reported Avg. Flow (MH 51)			110,000	202,976	205,456	408,432
47	RL	1,588		260		412,776	412,776	180,024	592,800
41	RL	364		260		94,536			
41	RM	1		202		242			
41	CN		0.6		2,000	1,200	95,978	201,192	297,170
Total Flow							17,481,526	17,691,362	35,172,888

Note:The commercial/industrial land use is based on total build-out potential of each parcel and the subject flows that would be generated by that build-out

Alternative 3: A 20% increase in future flows within the RL, RM and RH Zoning Districts

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Table 9: Alternative 3 Subsewershed Design Flow Calculation

Existing- Sorted by MH Subsewershed, (MDP Residential parcels + GIS Commercial & Industrial parcels+ WSSC Contribution)

A		B		"Appendix V", Charles County Water and Sewer Ordinance									
MH Sub-sewershed	County Collection Area (Acres)	WSSC Collection Area (Acres)	Avg. Flow based on Q/EDU or Q/Acre (gpd)	Avg. Flow (cfs)	Cum Avg Flow (cfs)	Cumulative Avg (gpd)	Peak Factor	Cumulative Peak (gpd)	Cumulative I/I (gpd)	Cumulative Existing Peak Q +I/I (gpd)			
126	3,496	7,724	5,293,116	8.2	8.2	5,293,116	2.4	12,830,478	4,488,040	17,318,518			
123	333		258,459	0.4	8.6	5,551,575	2.4	13,350,478	4,621,120	17,971,598			
117	814		1,465,970	2.3	10.9	7,017,545	2.3	16,229,469	4,946,880	21,176,349			
114	499		146,101	0.2	11.1	7,163,646	2.3	16,510,558	5,146,480	21,657,038			
110	282		392,245	0.6	11.7	7,555,891	2.3	17,260,553	5,259,280	22,519,833			
109	72		41,863	0.1	11.8	7,597,754	2.3	17,340,209	5,288,160	22,628,369			
105A	63		16,726	0.0	11.8	7,614,480	2.3	17,372,015	5,313,520	22,685,535			
98	344		103,506	0.2	11.9	7,717,986	2.3	17,568,579	5,451,240	23,019,819			
93	300		61,242	0.1	3.8	7,779,228	2.3	17,684,674	5,571,360	23,256,034			
82	18,655		8,785,894	13.6	25.6	16,565,122	2.0	33,200,568	13,033,320	46,233,888			
75A	283	432	229,824	0.4	26.0	16,794,946	2.0	33,583,979	13,319,480	46,903,459			
69	500	1,120	81,496	0.1	26.1	16,876,442	2.0	33,719,727	13,967,360	47,687,087			
62	534		102,024	0.2	26.3	16,978,466	2.0	33,889,515	14,180,800	48,070,315			
59	134	1,407	126,224	0.2	26.5	17,104,690	2.0	34,099,341	14,797,000	48,896,341			
56	843	899	205,456	0.3	26.8	17,310,146	2.0	34,440,326	15,493,960	49,934,286			
47	1,278		180,024	0.3	27.1	17,490,170	2.0	34,738,549	16,005,200	50,743,749			
41	1,130		201,192	0.3	27.4	17,691,362	2.0	35,071,233	16,457,360	51,528,593			
29,561		11,582				27		54		80			
						cfs		cfs		cfs			

Future- Sorted by MH Subsewershed, (MDP Future Residential parcels + GIS Future Commercial & Industrial parcels+ WSSC Contribution)

A		B		"Appendix V", Charles County Water and Sewer Ordinance									
MH Sub-sewershed	County Collection Area (Acres)	WSSC Collection Area (Acres)	Avg. Flow based on Q/EDU or Q/Acre (gpd)	Avg. Flow (cfs)	Cum Avg Flow (cfs)	Cumulative Avg (gpd)	Peak Factor	Cumulative Peak (gpd)	Cumulative I/I (gpd)	Cumulative Future Peak Q			
126	3,496	7,724	10,299,307	15.9	15.9	10,299,307	2.2	22,343,780	4,488,040	26,831,820			
123	333		391,924	0.6	16.5	10,691,231	2.2	23,050,114	4,621,120	27,671,234			
117	814		2,670,378	4.1	20.7	13,361,609	2.1	27,756,558	4,946,880	32,703,438			
114	499		220,934	0.3	21.0	13,582,543	2.1	28,138,496	5,146,480	33,284,976			
110	282		767,989	1.2	22.2	14,350,532	2.1	29,458,230	5,259,280	34,717,510			
109	72		49,548	0.1	22.3	14,400,080	2.1	29,542,964	5,288,160	34,831,124			
105A	63		25,694	0.0	22.3	14,425,774	2.1	29,586,885	5,313,520	34,900,405			
98	344		155,380	0.2	22.6	14,581,154	2.0	29,852,215	5,451,240	35,303,455			
93	300		73,035	0.1	22.7	14,654,189	2.0	29,976,768	5,571,360	35,548,128			
82	18,655		17,825,607	27.6	50.3	32,479,796	2.0	64,959,592	13,033,320	77,992,912			
75A	283	432	548,088	0.8	51.1	33,027,884	2.0	66,055,768	13,319,480	79,375,248			
69	500	1,120	374,816	0.6	51.7	33,402,700	2.0	66,805,400	13,967,360	80,772,760			
62	534		193,752	0.3	52.0	33,596,452	2.0	67,192,904	14,180,800	81,373,704			
59	134	1,407	278,032	0.4	52.4	33,874,484	2.0	67,748,968	14,797,000	82,545,968			
56	843	899	408,432	0.6	53.0	34,282,916	2.0	68,565,832	15,493,960	84,059,792			
47	1,278		592,800	0.9	54.0	34,875,716	2.0	69,751,432	16,005,200	85,756,632			
41	1,130		297,170	0.5	54.4	35,172,886	2.0	70,345,772	16,457,360	86,803,132			
29,561		11,582				54		109		134			
						cfs		cfs		cfs			

Alternative 3: A 20% increase in future flows within the RL, RM and RH Zoning Districts
Peak Factor: For cumulative $Q_a = 0.25$ to 16 MGD, $Q_p = 3.2 \times Q_a^{5/6}$, $Q_a > 16$ MGD, $Q_p = 2.0 \times Q_a^{5/6}$
I/I = 400 gpd/acre in drainage basin.

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APPENDIX D: EXISTING / PROPOSED PUMPING STATION LIST

Mattawoman Sewershed
Existing/Proposed Pumping Station List

PUMPING STATION NAME	Ex.	Future	Mattawoman receiving MH	No. of Pumps	Individual Pump Rates * (gpm)	Pump Station Annual Average Daily Flow** (gpd)
Lynbrook Outfall						
Checkers	✓		117			
Montgomery Lane	✓		117	2	199, 160	9,069
Route 5	✓		117	2	500, 500	164,280
Ryon Woods	✓		117	2	204, 209	42,977
Thomas Stone	✓		117	2	126, 178	11,633
Zekiah	✓		117	3	711, 1041, 1181	700,180
Mattawoman Outfall						
Brentwood	✓					8,613
Eutaw Forest	✓			2	238, 264	9,153
Laurel Branch #3	✓			2	156, 127	14,269
Piney Branch Outfall						
925B	✓		82	2	382, 315	34,864
White Plains Regoinal Park	✓		82	2	205, 244	4,636
White Plains Commerce Center	✓		82	2	110, 85	21,015
DeMarr Road Business Park	✓		82	2	835, 819	70,953
Southwinds	✓		82	2	372, 370	110,313
No. 5A	✓		82	2	1508, 1540	430,843
No. 3A	✓		82	2	480, 489	161,437
No. 6 (St. Mark's)	✓		82	3	382, 1162, 392	397,975
No. 2	✓		82	2	280, 280	34,717
No. 2A	✓		82	2	2320, 2100	1,037,105
Greenhaven Run	✓		82	2	279, 260	73,958
Dorchester	✓		82	2	628, 583	289,146
Wakefield	✓		82	2	388, 447	137,207
North Pointe	✓		82	2	417, 417	4,546
Future St. Charles 3B (by others)		✓	82	3		
Stadium		✓	82			

* Flow Rate derived from November 2006 Flow Data provided by Charles County Department of Utilities

** Pump Station Annual Average Daily Flow derived from 2006 Flow Data provided by Charles County Department of Utilities

Mattawoman Sewershed
Existing/Proposed Pumping Station List

PUMPING STATION NAME	Ex.	Future	Mattawoman receiving MH	No. of Pumps	Individual Pump Rates * (gpm)	Pump Station Annual Average Daily Flow** (gpd)
Piney Branch Outfall						
PS-1 (CCD Study)		✓	41			
PS-2 (CCD Study)		✓	41			
PS-3 (CCD Study)		✓	41			
PS-4 (CCD Study)		✓	41			
PS-5 (CCD Study)		✓	82			
PS-6 (CCD Study)		✓	82			

* Flow Rate derived from November 2006 Flow Data provided by Charles County Department of Utilities

** Pump Station Annual Average Daily Flow derived from 2006 Flow Data provided by Charles County Department of Utilities

APPENDIX E: EXISTING INTERCEPTOR / EXISTING FLOW MODEL RESULTS

EXISTING INTERCEPTOR, EXISTING FLOW

CONDUIT SUMMARY

Conduit Name	Manhole		Pipe Diameter in	Pipe Length ft	Flow			Ratio of Computed to Design flow
	Upstream	Downstream			Full mgd	2/3 Design mgd	Computed mgd	
126	126	125	42	583	59.82	47.98	21.84	0.46
125	125	124	42	493	29.72	23.84	18.91	0.79
124	124	123	42	551	30.59	24.54	17.48	0.71
123	123	122	42	770	31.44	25.22	18.25	0.72
122	122	121	42	757	27.75	22.26	17.74	0.80
121	121	120	42	640	31.79	25.50	17.83	0.70
120	120	119	42	778	30.75	24.67	17.88	0.73
119	119	118	42	388	28.39	22.77	17.71	0.78
118	118	117	42	428	25.72	20.63	17.71	0.86
117	117	116	48	456	52.88	42.41	20.83	0.49
116	116	115	48	499	40.95	32.84	20.83	0.63
115	115	114	48	708	37.42	30.01	20.83	0.69
114	114	113	48	711	37.18	29.82	21.28	0.71
113	113	112	48	436	35.84	28.75	21.28	0.74
112	112	111	48	677	39.57	31.74	21.28	0.67
111	111	110	48	404	39.72	31.86	21.28	0.67
110	110	109	48	666	39.57	31.74	22.13	0.70
109	109	108	48	669	39.48	31.66	22.23	0.70
108	108	107	48	516	33.94	27.22	22.23	0.82
107	107	106	48	744	49.08	39.37	22.23	0.56
106	106	105A	54	301	41.45	33.51	22.23	0.66
105A	105A	105	54	385	51.41	41.07	22.28	0.54
105	105	104	54	662	52.28	41.93	22.28	0.53
104	104	103	54	727	57.92	46.46	22.28	0.48
103	103	102	54	722	62.74	50.32	22.28	0.44
102	102	101	54	432	53.97	43.29	22.28	0.51
101	101	100	54	604	50.95	40.86	22.28	0.55
100	100	99	54	602	51.00	40.91	22.28	0.54
99	99	98	54	743	54.59	43.79	22.28	0.51
98	98	97	54	649	54.43	43.66	22.58	0.52
97	97	96	54	622	52.23	41.89	22.58	0.54
96	96	95	54	709	52.07	41.76	22.58	0.54
95	95	94	54	719	59.59	47.80	22.58	0.47
94	94	93	54	694	57.48	46.11	22.58	0.49
93	93	92	54	419	61.78	49.55	22.80	0.46
92	92	91	54	467	59.97	48.10	22.80	0.47
91	91	90	54	440	54.17	43.45	22.80	0.52
90	90	89	54	492	54.96	44.08	22.80	0.52
89	89	88	54	317	54.85	43.99	22.80	0.52
88	88	87	54	554	58.16	46.65	22.80	0.49
87	87	86	54	789	58.13	46.63	22.80	0.49
86	86	85	54	508	55.26	44.32	22.80	0.51
85	85	84	54	391	54.18	43.46	22.80	0.52
84	84	83	54	402	72.59	58.22	22.80	0.39

EXISTING INTERCEPTOR, EXISTING FLOW

CONDUIT SUMMARY

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	143.15	148.08	582.52	42.00	19.32	51.86	40.65	0.48
125	142.12	143.15	492.93	42.00	17.08	25.77	20.20	0.85
124	140.90	142.12	551.25	42.00	17.08	26.52	20.79	0.82
123	139.10	140.90	769.94	42.00	17.71	27.25	21.37	0.83
122	137.72	139.10	757.48	42.00	17.71	24.06	18.86	0.94
121	136.19	137.72	640.21	42.00	17.71	27.56	21.60	0.82
120	134.45	136.19	777.95	42.00	17.71	26.66	20.90	0.85
119	133.71	134.45	388.35	42.00	17.71	24.60	19.29	0.92
118	133.04	133.71	428.41	42.00	17.71	22.29	17.47	1.01
117	131.56	133.04	456.16	48.00	20.83	45.84	35.94	0.58
116	130.59	131.56	498.59	48.00	20.83	35.49	27.83	0.75
115	129.44	130.59	708.13	48.00	20.83	32.43	25.43	0.82
114	128.30	129.44	710.73	48.00	21.28	32.23	25.27	0.84
113	127.65	128.30	435.97	48.00	21.28	31.07	24.36	0.87
112	126.42	127.65	677.00	48.00	21.28	34.30	26.89	0.79
111	125.68	126.42	404.29	48.00	21.28	34.43	26.99	0.79
110	124.47	125.68	666.18	48.00	22.13	34.30	26.89	0.82
109	123.26	124.47	669.25	48.00	22.23	34.21	26.82	0.83
108	122.57	123.26	516.27	48.00	22.23	29.42	23.06	0.96
107	120.49	122.57	744.22	48.00	22.23	42.54	33.35	0.67
106	120.17	120.49	300.79	54.00	22.23	35.93	28.17	0.79
105A	119.54	120.17	385.13	54.00	22.28	44.56	34.93	0.64
105	118.42	119.54	661.87	54.00	22.28	45.32	35.53	0.63
104	116.91	118.42	727.05	54.00	22.28	50.21	39.36	0.57
103	115.15	116.91	722.25	54.00	22.28	54.38	42.64	0.52
102	114.37	115.15	432.47	54.00	22.28	46.79	36.68	0.61
101	113.40	114.37	603.63	54.00	22.28	44.16	34.62	0.64
100	112.43	113.40	602.42	54.00	22.28	44.21	34.66	0.64
99	111.06	112.43	742.52	54.00	22.28	47.32	37.10	0.60
98	109.87	111.06	648.76	54.00	22.59	47.18	36.99	0.61
97	108.82	109.87	621.76	54.00	22.59	45.27	35.50	0.64
96	107.63	108.82	709.10	54.00	22.59	45.13	35.38	0.64
95	106.05	107.63	718.72	54.00	22.59	51.65	40.50	0.56
94	104.63	106.05	694.17	54.00	22.59	49.83	39.06	0.58
93	103.64	104.63	419.02	54.00	22.81	53.55	41.98	0.54
92	102.60	103.64	467.08	54.00	22.81	51.98	40.76	0.56
91	101.80	102.60	440.31	54.00	22.81	46.96	36.82	0.62
90	100.88	101.80	492.09	54.00	22.81	47.63	37.35	0.61
89	100.29	100.88	316.78	54.00	22.81	47.54	37.27	0.61
88	99.13	100.29	553.88	54.00	22.81	50.41	39.52	0.58
87	97.48	99.13	788.71	54.00	22.81	50.39	39.50	0.58
86	96.52	97.48	507.84	54.00	22.81	47.90	37.55	0.61

EXISTING INTERCEPTOR, EXISTING FLOW

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
85	95.81	96.52	390.71	54.00	22.81	46.96	36.82	0.62
84	94.50	95.81	401.63	54.00	22.81	62.92	49.33	0.46
83	93.47	94.50	508.48	54.00	22.81	49.59	38.88	0.59
82	91.74	93.47	674.46	60.00	45.49	73.90	57.94	0.79
81	90.12	91.74	775.53	60.00	45.49	66.68	52.28	0.87
80	88.88	90.12	676.35	60.00	45.49	62.48	48.98	0.93
79	87.68	88.88	581.47	60.00	45.49	66.28	51.97	0.88
78	86.41	87.68	721.47	60.00	45.49	61.22	47.99	0.95
77	85.68	86.41	414.11	60.00	45.49	61.26	48.03	0.95
76	84.71	85.68	538.69	60.00	45.49	61.91	48.54	0.94
075A	84.00	84.40	193.99	60.00	46.16	66.25	51.94	0.89
75	84.40	84.71	184.46	60.00	45.49	59.81	46.89	0.97
74	82.61	84.00	676.89	60.00	46.16	66.12	51.84	0.89
73	81.67	82.61	481.81	60.00	46.16	64.45	50.53	0.91
72	80.25	81.67	716.56	60.00	46.16	64.95	50.92	0.91
71	78.90	80.25	716.22	60.00	46.16	63.35	49.67	0.93
70	77.36	78.90	728.81	60.00	46.16	67.07	52.58	0.88
69	76.15	77.36	628.45	60.00	46.94	64.02	50.19	0.94
68	74.91	76.15	645.36	60.00	46.94	63.96	50.14	0.94
67	73.59	74.91	685.38	60.00	46.94	64.03	50.20	0.93
66	72.23	73.59	787.63	60.00	46.94	60.63	47.53	0.99
65	71.10	72.23	659.04	60.00	46.94	60.41	47.36	0.99
64	69.84	71.10	680.27	60.00	46.94	62.79	49.23	0.95
63	68.40	69.84	620.78	60.00	46.94	70.27	55.09	0.85
62	67.08	68.40	572.56	60.00	47.29	70.06	54.93	0.86
61	65.84	67.08	655.58	60.00	47.29	63.46	49.75	0.95
60	64.70	65.84	600.00	60.00	47.29	63.60	49.86	0.95
59	63.41	64.70	634.44	60.00	48.11	65.79	51.58	0.93
58	62.22	63.41	653.55	60.00	48.11	62.26	48.81	0.99
57	61.12	62.22	604.39	60.00	48.11	62.24	48.80	0.99
56	59.45	61.12	599.99	60.00	49.12	76.97	60.35	0.81
55	57.86	59.45	770.58	60.00	49.12	66.28	51.96	0.95
54	56.55	57.86	671.37	60.00	49.12	64.45	50.53	0.97
53	55.26	56.55	624.66	60.00	49.12	66.30	51.98	0.94
52	53.88	55.26	758.90	60.00	49.12	62.22	48.78	1.01
51	53.45	53.88	749.37	60.00	49.12	34.95	27.40	1.79
50	51.21	53.45	567.65	60.00	49.12	91.65	71.86	0.68
49	50.48	51.21	392.59	60.00	49.12	62.92	49.33	1.00
48	48.92	50.48	768.36	60.00	49.12	65.75	51.55	0.95
47	47.90	48.92	605.03	60.00	49.88	59.91	46.97	1.06
46	46.51	47.90	598.94	60.00	49.88	70.29	55.11	0.91
45	45.49	46.51	605.00	60.00	49.88	59.91	46.97	1.06
44	43.73	45.49	785.84	60.00	49.88	69.05	54.14	0.92
43	42.55	43.73	525.25	60.00	49.88	69.15	54.22	0.92
42	41.24	42.55	687.29	60.00	49.88	63.70	49.94	1.00
41	39.58	41.24	678.52	60.00	50.61	72.17	56.58	0.89

EXISTING INTERCEPTOR, EXISTING FLOW

JUNCTION SUMMARY

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	17.09	149.65	0.00	9.09	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.23	0.00	10.32	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.17	0.00	5.13	0.00
SANMH 123	140.90	154.05	144.40	0.62	142.98	0.00	11.07	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.32	0.00	20.58	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.77	0.00	11.38	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.30	0.00	10.84	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.66	0.00	12.43	0.00
SANMH 118	133.71	147.92	137.21	0.00	135.94	0.00	11.98	0.00
SANMH 117	133.04	148.12	137.04	3.13	134.99	0.00	13.13	0.00
SANMH 116	131.56	147.80	135.56	0.00	133.81	0.00	13.99	0.00
SANMH 115	130.59	145.49	134.59	0.00	132.94	0.00	12.55	0.00
SANMH 114	129.44	144.68	133.44	0.44	131.82	0.00	12.86	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.68	0.00	11.64	0.00
SANMH 112	127.65	141.84	131.65	0.00	129.94	0.00	11.90	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.73	0.00	10.74	0.00
SANMH 110	125.68	139.67	129.68	0.86	128.03	0.00	11.64	0.00
SANMH 109	124.47	138.07	128.47	0.10	126.85	0.00	11.22	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.70	0.00	11.11	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.66	0.00	10.46	0.00
SANMH 106	120.49	133.54	124.99	0.00	122.87	0.00	10.67	0.00
SANMH 105A	120.17	135.19	124.67	0.05	122.41	0.00	12.78	0.00
SANMH 105	119.54	133.09	124.04	0.00	121.76	0.00	11.33	0.00
SANMH 104	118.42	132.62	122.92	0.00	120.53	0.00	12.10	0.00
SANMH 103	116.91	130.31	121.41	0.00	118.94	0.00	11.37	0.00
SANMH 102	115.15	129.75	119.65	0.00	117.36	0.00	12.39	0.00
SANMH 101	114.37	128.97	118.87	0.00	116.63	0.00	12.34	0.00
SANMH 100	113.40	125.65	117.90	0.00	115.65	0.00	10.00	0.00
SANMH 99	112.43	125.43	116.93	0.00	114.61	0.00	10.82	0.00
SANMH 98	111.06	127.00	115.56	0.31	113.27	0.00	13.73	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.12	0.00	11.67	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.07	0.00	10.16	0.00
SANMH 95	107.63	120.31	112.13	0.00	109.72	0.00	10.59	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.18	0.00	12.59	0.00
SANMH 93	104.63	117.88	109.13	0.22	106.70	0.00	11.18	0.00
SANMH 92	103.64	116.31	108.14	0.00	105.76	0.00	10.55	0.00
SANMH 91	102.60	115.70	107.10	0.00	104.81	0.00	10.89	0.00
SANMH 90	101.80	114.40	106.30	0.00	103.99	0.00	10.41	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.06	0.00	10.60	0.00
SANMH 88	100.29	113.09	104.79	0.00	102.42	0.00	10.68	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.26	0.00	11.03	0.00
SANMH 86	97.48	109.88	101.98	0.00	99.67	0.00	10.22	0.00
SANMH 85	96.52	108.97	101.02	0.00	98.69	0.00	10.28	0.00
SANMH 84	95.81	109.11	100.31	0.00	97.79	0.00	11.33	0.00

EXISTING INTERCEPTOR, EXISTING FLOW

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 83	94.50	108.44	99.00	0.00	96.92	0.00	11.52	0.00
SANMH 82	93.47	106.10	98.47	22.69	96.36	0.00	9.74	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.81	0.00	10.75	0.00
SANMH 80	90.12	103.87	95.12	0.00	93.27	0.00	10.60	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.98	0.00	9.36	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.89	0.00	9.34	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.60	0.00	8.93	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.85	0.00	9.16	0.00
SANMH 75	84.71	101.02	89.71	0.67	87.85	0.00	13.17	0.00
SANMH 75A	84.40	98.30	89.40	0.00	87.49	0.00	10.81	0.00
SANMH 74	84.00	95.82	89.00	0.00	87.10	0.00	8.72	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.74	0.00	8.92	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.80	0.00	8.38	0.00
SANMH 71	80.25	91.95	85.25	0.00	83.40	0.00	8.55	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.99	0.00	9.72	0.00
SANMH 69	77.36	89.38	82.36	0.77	80.55	0.00	8.83	0.00
SANMH 68	76.15	87.87	81.15	0.00	79.35	0.00	8.52	0.00
SANMH 67	74.91	86.88	79.91	0.00	78.13	0.00	8.75	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.89	0.00	8.80	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.50	0.00	8.40	0.00
SANMH 64	71.10	82.30	76.10	0.00	74.28	0.00	8.02	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.86	0.00	9.04	0.00
SANMH 62	68.40	82.75	73.40	0.36	71.48	0.00	11.27	0.00
SANMH 61	67.08	80.48	72.08	0.00	70.30	0.00	10.18	0.00
SANMH 60	65.84	78.87	70.84	0.00	69.05	0.00	9.82	0.00
SANMH 59	64.70	78.08	69.70	0.82	67.91	0.00	10.17	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.69	0.00	11.07	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.44	0.00	9.99	0.00
SANMH 56	61.12	74.90	66.12	1.01	64.11	0.00	10.79	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.68	0.00	11.17	0.00
SANMH 54	57.86	72.54	62.86	0.00	61.15	0.00	11.39	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.88	0.00	11.34	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.79	0.00	12.57	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.65	0.00	11.03	0.00
SANMH 50	53.45	67.80	58.45	0.00	56.16	0.00	11.64	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.51	0.00	12.15	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.76	0.00	12.47	0.00
SANMH 47	48.92	64.87	53.92	0.76	52.30	0.00	12.57	0.00
SANMH 46	47.90	63.50	52.90	0.00	51.10	0.00	12.40	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.88	0.00	12.85	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.65	0.00	12.54	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.93	0.00	12.79	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.83	0.00	13.32	0.00
SANMH 41	41.24	59.82	46.24	0.73	44.33	0.00	15.49	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.67	0.00	14.38	0.00

APPENDIX F: EXISTING INTERCEPTOR / FUTURE FLOW MODEL RESULTS

EXISTING INTERCEPTOR, FUTURE FLOW

CONDUIT SUMMARY

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	143.15	148.08	582.52	42.00	27.07	51.86	40.65	0.67
125	142.12	143.15	492.93	42.00	26.50	25.77	20.20	1.31
124	140.90	142.12	551.25	42.00	27.27	26.52	20.79	1.31
123	139.10	140.90	769.94	42.00	27.27	27.25	21.37	1.28
122	137.72	139.10	757.48	42.00	27.27	24.06	18.86	1.45
121	136.19	137.72	640.21	42.00	27.27	27.56	21.60	1.26
120	134.45	136.19	777.95	42.00	27.27	26.66	20.90	1.30
119	133.71	134.45	388.35	42.00	27.27	24.60	19.29	1.41
118	133.04	133.71	428.41	42.00	32.23	22.29	17.47	1.84
117	131.56	133.04	456.16	48.00	32.23	45.84	35.94	0.90
116	130.59	131.56	498.59	48.00	32.23	35.49	27.83	1.16
115	129.44	130.59	708.13	48.00	32.76	32.43	25.43	1.29
114	128.30	129.44	710.73	48.00	32.76	32.23	25.27	1.30
113	127.65	128.30	435.97	48.00	32.76	31.07	24.36	1.34
112	126.42	127.65	677.00	48.00	32.76	34.30	26.89	1.22
111	125.68	126.42	404.29	48.00	34.18	34.43	26.99	1.27
110	124.47	125.68	666.18	48.00	34.29	34.30	26.89	1.28
109	123.26	124.47	669.25	48.00	34.29	34.21	26.82	1.28
108	122.57	123.26	516.27	48.00	34.29	29.42	23.06	1.49
107	120.49	122.57	744.22	48.00	34.29	42.54	33.35	1.03
106	120.17	120.49	300.79	54.00	34.35	35.93	28.17	1.22
105A	119.54	120.17	385.13	54.00	34.35	44.56	34.93	0.98
105	118.42	119.54	661.87	54.00	34.35	45.32	35.53	0.97
104	116.91	118.42	727.05	54.00	34.35	50.21	39.36	0.87
103	115.15	116.91	722.25	54.00	34.35	54.38	42.64	0.81
102	114.37	115.15	432.47	54.00	34.35	46.79	36.68	0.94
101	113.40	114.37	603.63	54.00	34.35	44.16	34.62	0.99
100	112.43	113.40	602.42	54.00	34.35	44.21	34.66	0.99
99	111.06	112.43	742.52	54.00	34.35	47.32	37.10	0.93
98	109.87	111.06	648.76	54.00	34.71	47.18	36.99	0.94
97	108.82	109.87	621.76	54.00	34.71	45.27	35.50	0.98
96	107.63	108.82	709.10	54.00	34.71	45.13	35.38	0.98
95	106.05	107.63	718.72	54.00	34.71	51.65	40.50	0.86
94	104.63	106.05	694.17	54.00	34.71	49.83	39.06	0.89
93	103.64	104.63	419.02	54.00	34.94	53.55	41.98	0.83
92	102.60	103.64	467.08	54.00	34.94	51.98	40.76	0.86
91	101.80	102.60	440.31	54.00	34.94	46.96	36.82	0.95
90	100.88	101.80	492.09	54.00	34.94	47.63	37.35	0.94
89	100.29	100.88	316.78	54.00	34.94	47.54	37.27	0.94
88	99.13	100.29	553.88	54.00	34.94	50.41	39.52	0.88
87	97.48	99.13	788.71	54.00	34.94	50.39	39.50	0.88
86	96.52	97.48	507.84	54.00	34.94	47.90	37.55	0.93
85	95.81	96.52	390.71	54.00	34.94	46.96	36.82	0.95
84	94.50	95.81	401.63	54.00	34.94	62.92	49.33	0.71

EXISTING INTERCEPTOR, FUTURE FLOW

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
83	93.47	94.50	508.48	54.00	34.94	49.59	38.88	0.90
82	91.74	93.47	674.46	60.00	74.36	73.90	57.94	1.28
81	90.12	91.74	775.53	60.00	72.98	66.68	52.28	1.40
80	88.88	90.12	676.35	60.00	72.29	62.48	48.98	1.48
79	87.68	88.88	581.47	60.00	71.67	66.28	51.97	1.38
78	86.41	87.68	721.47	60.00	71.22	61.22	47.99	1.48
77	85.68	86.41	414.11	60.00	71.17	61.26	48.03	1.48
76	84.71	85.68	538.69	60.00	71.14	61.91	48.54	1.47
075A	84.00	84.40	193.99	60.00	72.41	66.25	51.94	1.39
75	84.40	84.71	184.46	60.00	71.13	59.81	46.89	1.52
74	82.61	84.00	676.89	60.00	72.26	66.12	51.84	1.39
73	81.67	82.61	481.81	60.00	72.17	64.45	50.53	1.43
72	80.25	81.67	716.56	60.00	71.98	64.95	50.92	1.41
71	78.90	80.25	716.22	60.00	71.92	63.35	49.67	1.45
70	77.36	78.90	728.81	60.00	71.76	67.07	52.58	1.36
69	76.15	77.36	628.45	60.00	72.91	64.02	50.19	1.45
68	74.91	76.15	645.36	60.00	72.60	63.96	50.14	1.45
67	73.59	74.91	685.38	60.00	72.40	64.03	50.20	1.44
66	72.23	73.59	787.63	60.00	72.38	60.63	47.53	1.52
65	71.10	72.23	659.04	60.00	72.27	60.41	47.36	1.53
64	69.84	71.10	680.27	60.00	72.04	62.79	49.23	1.46
63	68.40	69.84	620.78	60.00	71.55	70.27	55.09	1.30
62	67.08	68.40	572.56	60.00	72.08	70.06	54.93	1.31
61	65.84	67.08	655.58	60.00	72.12	63.46	49.75	1.45
60	64.70	65.84	600.00	60.00	71.97	63.60	49.86	1.44
59	63.41	64.70	634.44	60.00	73.09	65.79	51.58	1.42
58	62.22	63.41	653.55	60.00	73.01	62.26	48.81	1.50
57	61.12	62.22	604.39	60.00	72.98	62.24	48.80	1.50
56	59.45	61.12	599.99	60.00	74.41	76.97	60.35	1.23
55	57.86	59.45	770.58	60.00	74.39	66.28	51.96	1.43
54	56.55	57.86	671.37	60.00	74.36	64.45	50.53	1.47
53	55.26	56.55	624.66	60.00	74.16	66.30	51.98	1.43
52	53.88	55.26	758.90	60.00	73.82	62.22	48.78	1.51
51	53.45	53.88	749.37	60.00	73.54	34.95	27.40	2.68
50	51.21	53.45	567.65	60.00	73.27	91.65	71.86	1.02
49	50.48	51.21	392.59	60.00	73.13	62.92	49.33	1.48
48	48.92	50.48	768.36	60.00	73.10	65.75	51.55	1.42
47	47.90	48.92	605.03	60.00	74.60	59.91	46.97	1.59
46	46.51	47.90	598.94	60.00	74.60	70.29	55.11	1.35
45	45.49	46.51	605.00	60.00	74.60	59.91	46.97	1.59
44	43.73	45.49	785.84	60.00	74.60	69.05	54.14	1.38
43	42.55	43.73	525.25	60.00	74.60	69.15	54.22	1.38
42	41.24	42.55	687.29	60.00	74.60	63.70	49.94	1.49
41	39.58	41.24	678.52	60.00	75.55	72.17	56.58	1.34

EXISTING INTERCEPTOR, FUTURE FLOW

JUNCTION SUMMARY

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	26.50	149.95	0.00	8.61	0.00
SANMH 125	143.15	155.55	146.65	0.00	146.88	0.23	8.67	0.00
SANMH 124	142.12	149.30	145.62	0.77	145.85	0.23	3.45	0.00
SANMH 123	140.90	154.05	144.40	0.00	144.64	0.24	9.41	0.00
SANMH 122	139.10	161.90	142.60	0.00	142.95	0.35	18.95	0.00
SANMH 121	137.72	151.15	141.22	0.00	141.28	0.06	9.87	0.00
SANMH 120	136.19	149.14	139.69	0.00	139.81	0.12	9.33	0.00
SANMH 119	134.45	149.09	137.95	0.00	138.04	0.09	11.05	0.00
SANMH 118	133.71	147.92	137.21	4.96	137.15	0.00	10.77	0.00
SANMH 117	133.04	148.12	137.04	0.00	135.73	0.00	12.39	0.00
SANMH 116	131.56	147.80	135.56	0.00	134.73	0.00	13.07	0.00
SANMH 115	130.59	145.49	134.59	0.53	133.91	0.00	11.58	0.00
SANMH 114	129.44	144.68	133.44	0.00	132.76	0.00	11.92	0.00
SANMH 113	128.30	142.32	132.30	0.00	131.59	0.00	10.73	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.85	0.00	10.99	0.00
SANMH 111	126.42	139.47	130.42	1.42	129.69	0.00	9.78	0.00
SANMH 110	125.68	139.67	129.68	0.10	128.96	0.00	10.72	0.00
SANMH 109	124.47	138.07	128.47	0.00	127.74	0.00	10.33	0.00
SANMH 108	123.26	136.81	127.26	0.00	126.51	0.00	10.30	0.00
SANMH 107	122.57	135.12	126.57	0.00	125.38	0.00	9.74	0.00
SANMH 106	120.49	133.54	124.99	0.06	123.59	0.00	9.96	0.00
SANMH 105A	120.17	135.19	124.67	0.00	123.10	0.00	12.09	0.00
SANMH 105	119.54	133.09	124.04	0.00	122.42	0.00	10.67	0.00
SANMH 104	118.42	132.62	122.92	0.00	121.15	0.00	11.47	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.58	0.00	10.73	0.00
SANMH 102	115.15	129.75	119.65	0.00	118.09	0.00	11.66	0.00
SANMH 101	114.37	128.97	118.87	0.00	117.38	0.00	11.59	0.00
SANMH 100	113.40	125.65	117.90	0.00	116.44	0.00	9.21	0.00
SANMH 99	112.43	125.43	116.93	0.00	115.55	0.00	9.88	0.00
SANMH 98	111.06	127.00	115.56	0.36	114.58	0.00	12.42	0.00
SANMH 97	109.87	123.79	114.37	0.00	113.95	0.00	9.84	0.00
SANMH 96	108.82	121.22	113.32	0.00	113.38	0.06	7.84	0.00
SANMH 95	107.63	120.31	112.13	0.00	112.71	0.58	7.60	0.00
SANMH 94	106.05	120.77	110.55	0.00	112.03	1.48	8.74	0.00
SANMH 93	104.63	117.88	109.13	0.23	111.34	2.21	6.54	0.00
SANMH 92	103.64	116.31	108.14	0.00	110.92	2.78	5.39	0.00
SANMH 91	102.60	115.70	107.10	0.00	110.46	3.36	5.24	0.00
SANMH 90	101.80	114.40	106.30	0.00	110.02	3.72	4.38	0.00
SANMH 89	100.88	113.66	105.38	0.00	109.53	4.15	4.13	0.00
SANMH 88	100.29	113.09	104.79	0.00	109.22	4.43	3.88	0.00
SANMH 87	99.13	112.29	103.63	0.00	108.67	5.04	3.62	0.00
SANMH 86	97.48	109.88	101.98	0.00	107.88	5.90	2.00	0.00
SANMH 85	96.52	108.97	101.02	0.00	107.38	6.36	1.59	0.00

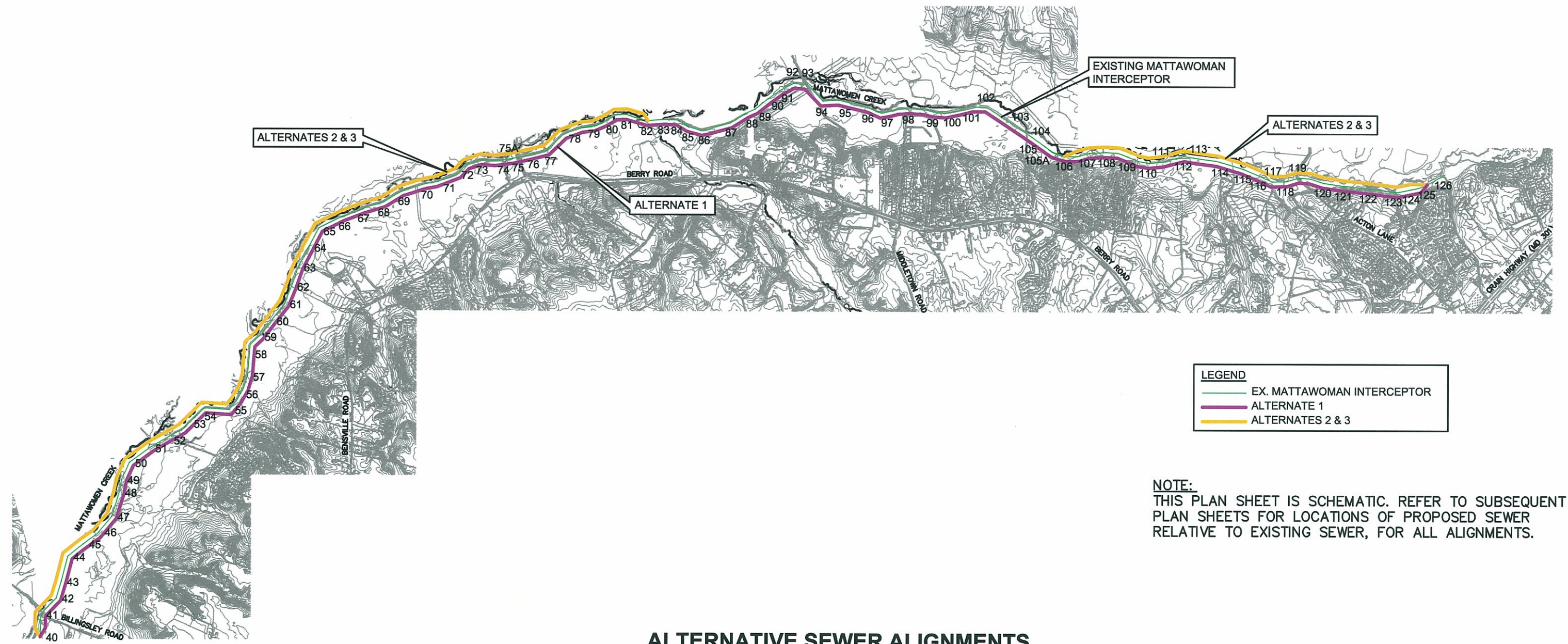
EXISTING INTERCEPTOR, FUTURE FLOW

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 84	95.81	109.11	100.31	0.00	107.00	6.69	2.11	0.00
SANMH 83	94.50	108.44	99.00	0.00	106.60	7.60	1.84	0.00
SANMH 82	93.47	106.10	98.47	41.34	106.10	7.63	0.00	0.00
SANMH 81	91.74	105.56	96.74	0.00	104.59	7.85	0.97	0.00
SANMH 80	90.12	103.87	95.12	0.00	102.86	7.74	1.02	0.00
SANMH 79	88.88	101.34	93.88	0.00	101.34	7.46	0.00	0.00
SANMH 78	87.68	100.23	92.68	0.00	100.09	7.41	0.14	0.00
SANMH 77	86.41	98.53	91.41	0.00	98.53	7.12	0.00	0.00
SANMH 76	85.68	98.01	90.68	0.00	97.66	6.98	0.35	0.00
SANMH 75	84.40	98.30	89.40	1.38	96.14	6.74	2.16	0.00
SANMH 75A	84.71	101.02	89.71	0.00	96.53	6.82	4.49	0.00
SANMH 74	84.00	95.82	89.00	0.00	95.72	6.72	0.10	0.00
SANMH 73	82.61	94.66	87.61	0.00	94.24	6.63	0.43	0.00
SANMH 72	81.67	93.18	86.67	0.00	93.18	6.51	0.00	0.00
SANMH 71	80.25	91.95	85.25	0.00	91.62	6.37	0.33	0.00
SANMH 70	78.90	91.71	83.90	0.00	90.06	6.16	1.65	0.00
SANMH 69	77.36	89.38	82.36	1.36	88.48	6.12	0.90	0.00
SANMH 68	76.15	87.87	81.15	0.00	87.05	5.90	0.82	0.00
SANMH 67	74.91	86.88	79.91	0.00	85.59	5.68	1.29	0.00
SANMH 66	73.59	85.69	78.59	0.00	84.04	5.45	1.65	0.00
SANMH 65	72.23	83.90	77.23	0.00	82.25	5.02	1.65	0.00
SANMH 64	71.10	82.30	76.10	0.00	80.75	4.65	1.55	0.00
SANMH 63	69.84	81.90	74.84	0.00	79.21	4.37	2.69	0.00
SANMH 62	68.40	82.75	73.40	0.54	77.80	4.40	4.95	0.00
SANMH 61	67.08	80.48	72.08	0.00	76.47	4.39	4.01	0.00
SANMH 60	65.84	78.87	70.84	0.00	74.96	4.12	3.91	0.00
SANMH 59	64.70	78.08	69.70	1.15	73.57	3.87	4.51	0.00
SANMH 58	63.41	77.76	68.41	0.00	72.06	3.65	5.70	0.00
SANMH 57	62.22	75.43	67.22	0.00	70.50	3.28	4.94	0.00
SANMH 56	61.12	74.90	66.12	1.45	69.05	2.93	5.85	0.00
SANMH 55	59.45	73.85	64.45	0.00	67.56	3.11	6.30	0.00
SANMH 54	57.86	72.54	62.86	0.00	65.64	2.78	6.91	0.00
SANMH 53	56.55	71.22	61.55	0.00	63.96	2.41	7.26	0.00
SANMH 52	55.26	71.36	60.26	0.00	62.40	2.14	8.96	0.00
SANMH 51	53.88	68.68	58.88	0.00	60.51	1.63	8.17	0.00
SANMH 50	53.45	67.80	58.45	0.00	58.70	0.25	9.10	0.00
SANMH 49	51.21	66.66	56.21	0.00	57.37	1.16	9.29	0.00
SANMH 48	50.48	66.23	55.48	0.00	56.44	0.96	9.79	0.00
SANMH 47	48.92	64.87	53.92	1.50	54.67	0.75	10.20	0.00
SANMH 46	47.90	63.50	52.90	0.00	53.21	0.31	10.29	0.00
SANMH 45	46.51	62.73	51.51	0.00	51.72	0.21	11.01	0.00
SANMH 44	45.49	61.19	50.49	0.00	50.18	0.00	11.01	0.00
SANMH 43	43.73	59.72	48.73	0.00	48.39	0.00	11.33	0.00
SANMH 42	42.55	59.15	47.55	0.00	47.20	0.00	11.95	0.00
SANMH 41	41.24	59.82	46.24	0.95	45.60	0.00	14.23	0.00
SANMH 40	39.58	57.05	44.58	0.00	43.94	0.00	13.12	0.00

Appendix G: Alternative Alignments

APPENDIX G: ALTERNATIVE ALIGNMENTS

Feb 12, 2008 - 8:39am User: jonathan.meyers
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LEGEND

- EX. MATTAWOMAN INTERCEPTOR
- ALTERNATE 1
- ALTERNATES 2 & 3

NOTE:
THIS PLAN SHEET IS SCHEMATIC. REFER TO SUBSEQUENT
PLAN SHEETS FOR LOCATIONS OF PROPOSED SEWER
RELATIVE TO EXISTING SEWER, FOR ALL ALIGNMENTS.

ALTERNATIVE SEWER ALIGNMENTS
SCALE: NONE

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DRN: JBM
CHK: JRK
DATE: Feb, 2008

**ALTERNATIVE SEWER
ALIGNMENTS**

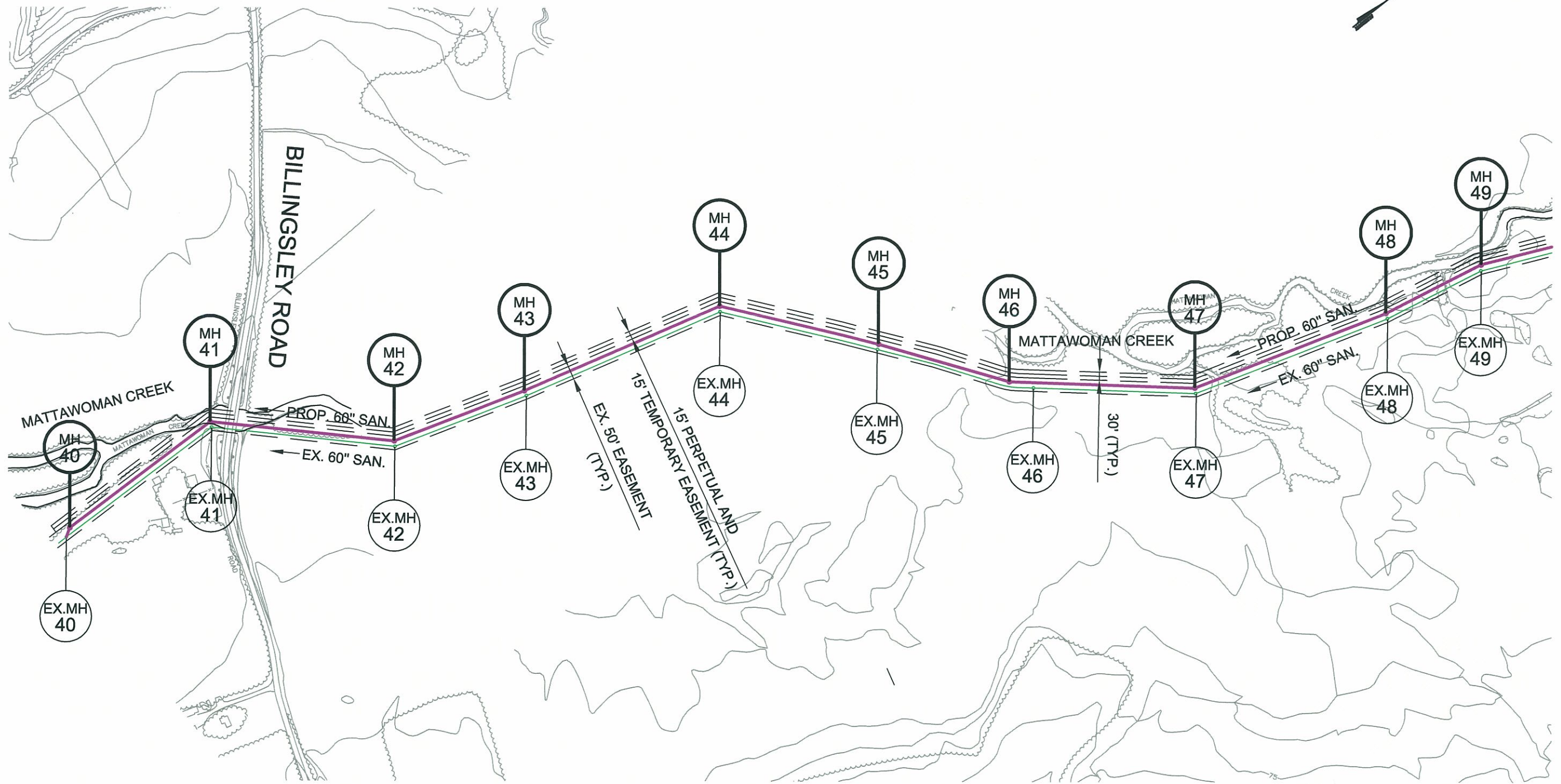
SCALE: AS NOTED

MATTAWOMAN INTERCEPTOR
PHASE I & II CAPACITY STUDY
PGM# VCI 06-0082

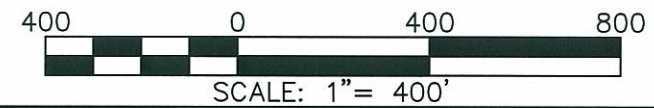
6TH ELECTION DISTRICT

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1 OF 17



PLAN
SCALE: 1" = 400'



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ALTERNATIVE 1 - MH 40 TO MH 49

SCALE: AS NOTED

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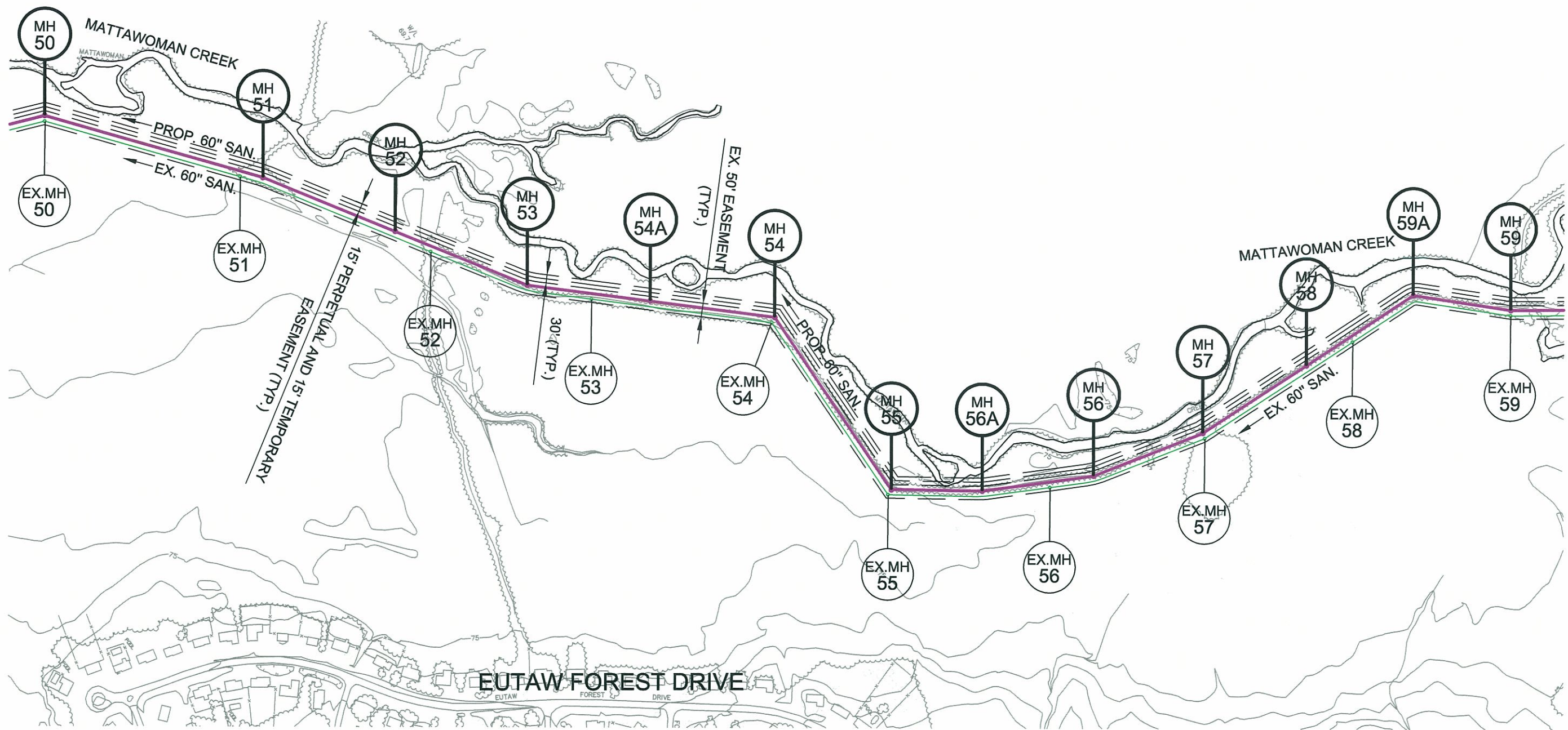
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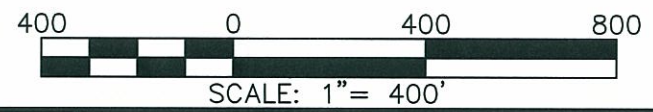
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ALTERNATIVE 1 - MH 50 TO MH 59

SCALE: AS NOTED

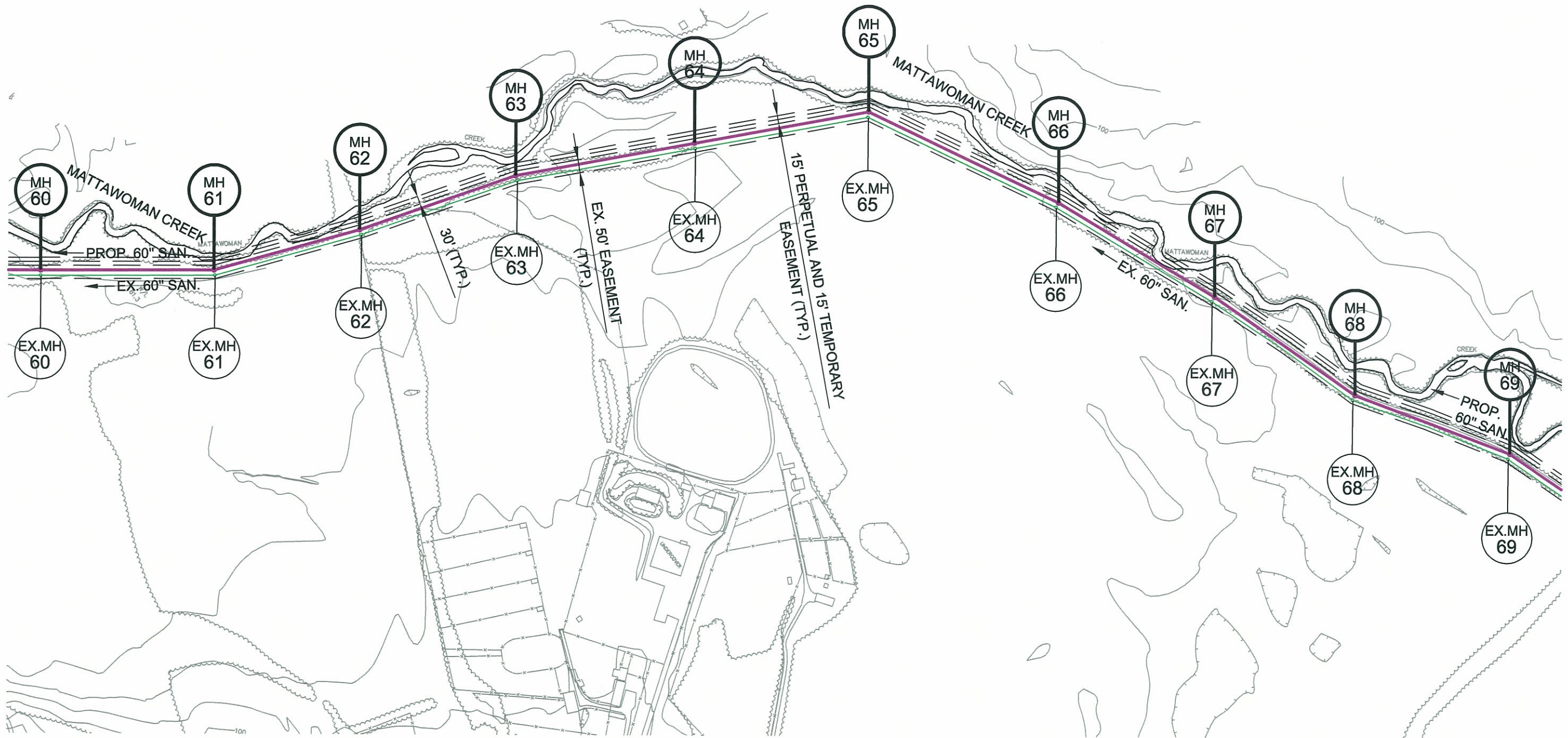
MATTAWOMAN INTERCEPTOR
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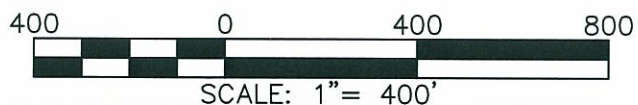
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3 OF 17

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ALTERNATIVE 1 - MH 60 TO MH 69

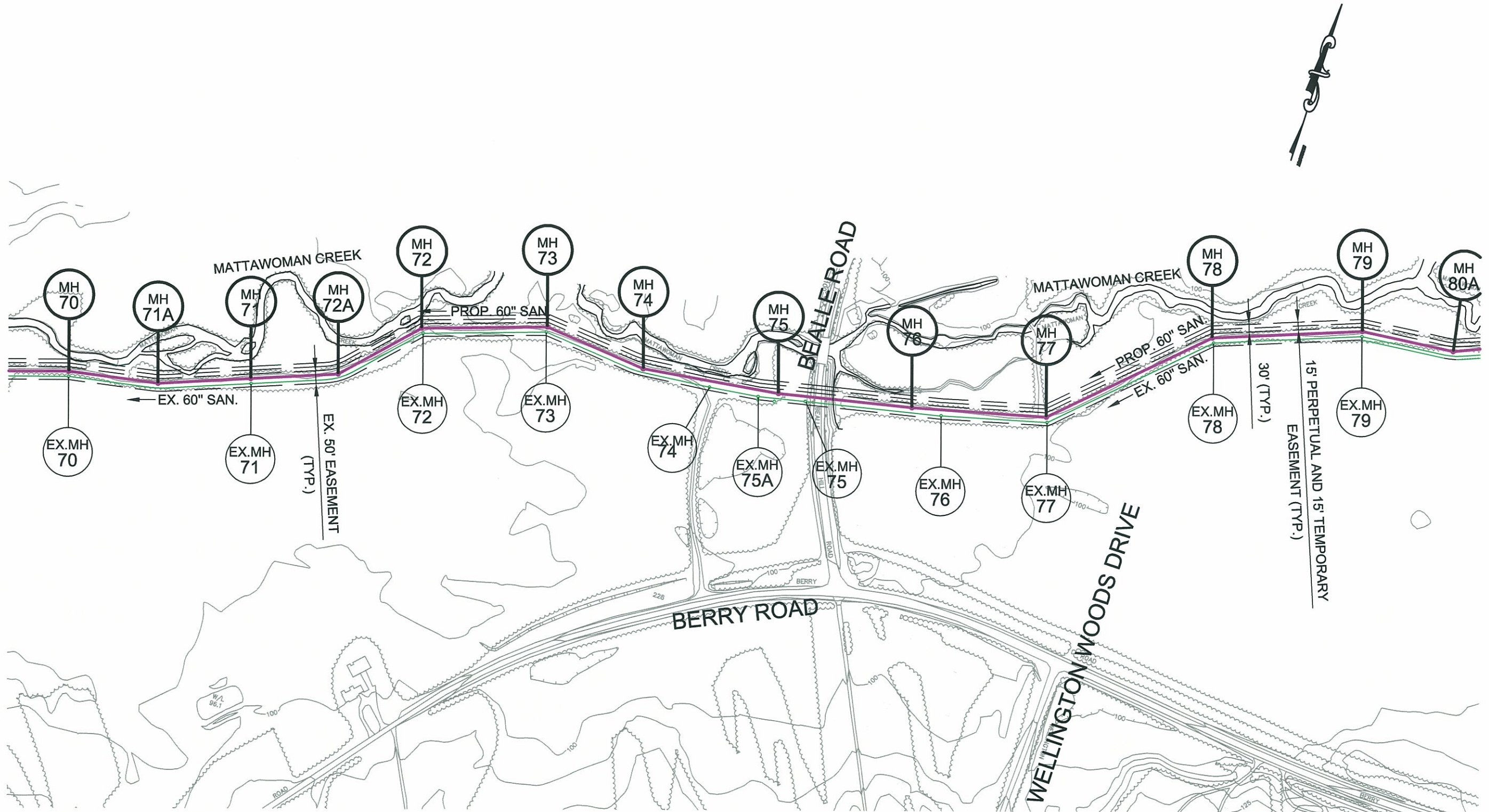
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MATTAWOMAN INTERCEPTOR
PHASE I & II CAPACITY STUDY
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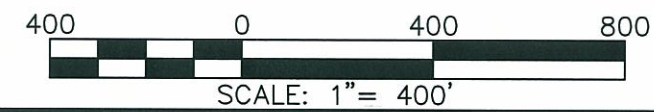
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4 OF 17

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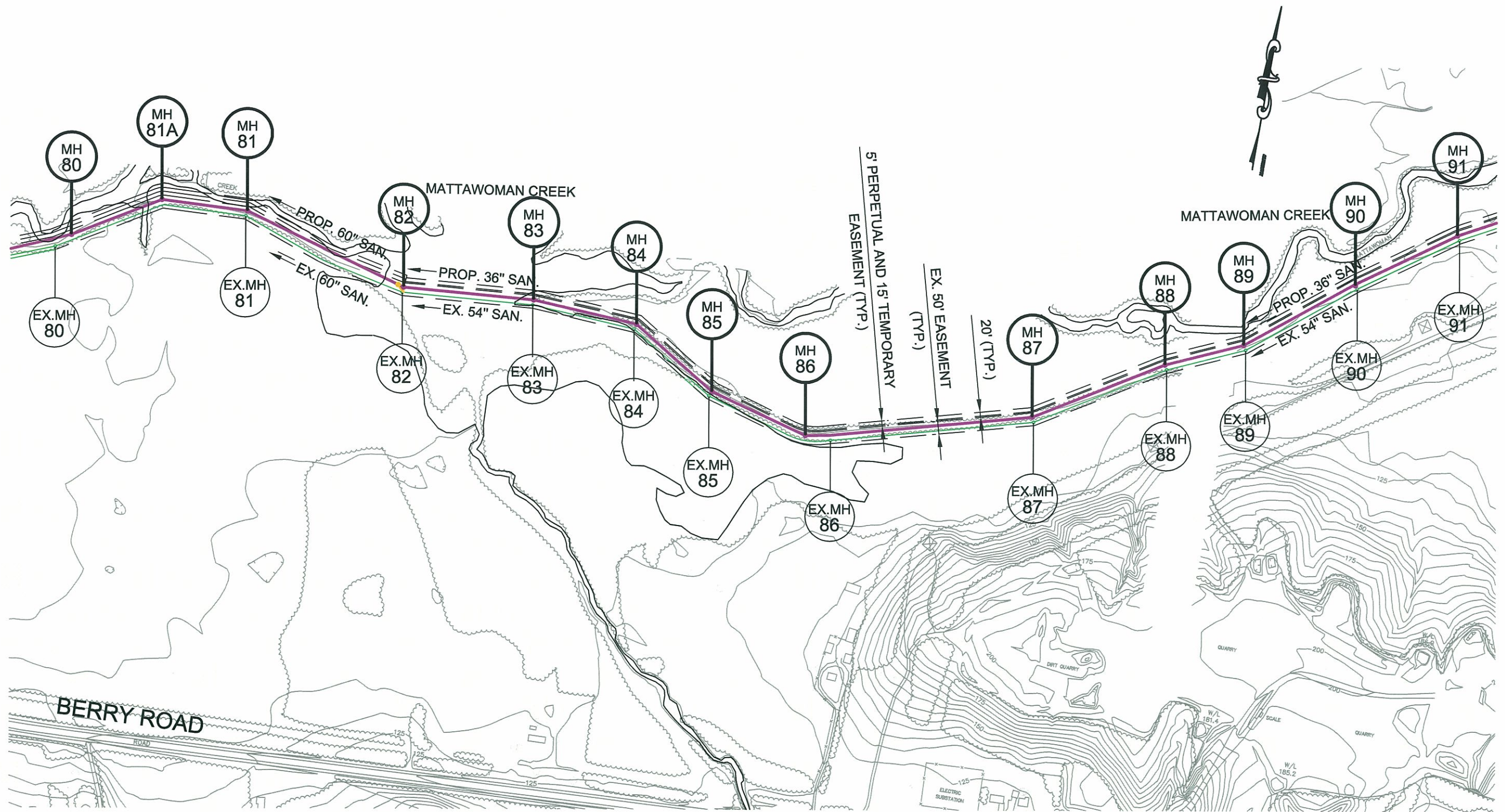
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CHK: JRK
DATE: Feb, 2008

ALTERNATIVE 1 - MH 70 TO MH 79
SCALE: AS NOTED

MATTAWOMAN INTERCEPTOR
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PGM# VCI 06-0082

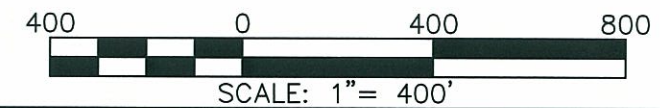
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ALTERNATIVE 1 - MH 80 TO MH 91

SCALE: AS NOTED

MATTAWOMAN INTERCEPTOR
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 PGM# VCI 06-0082

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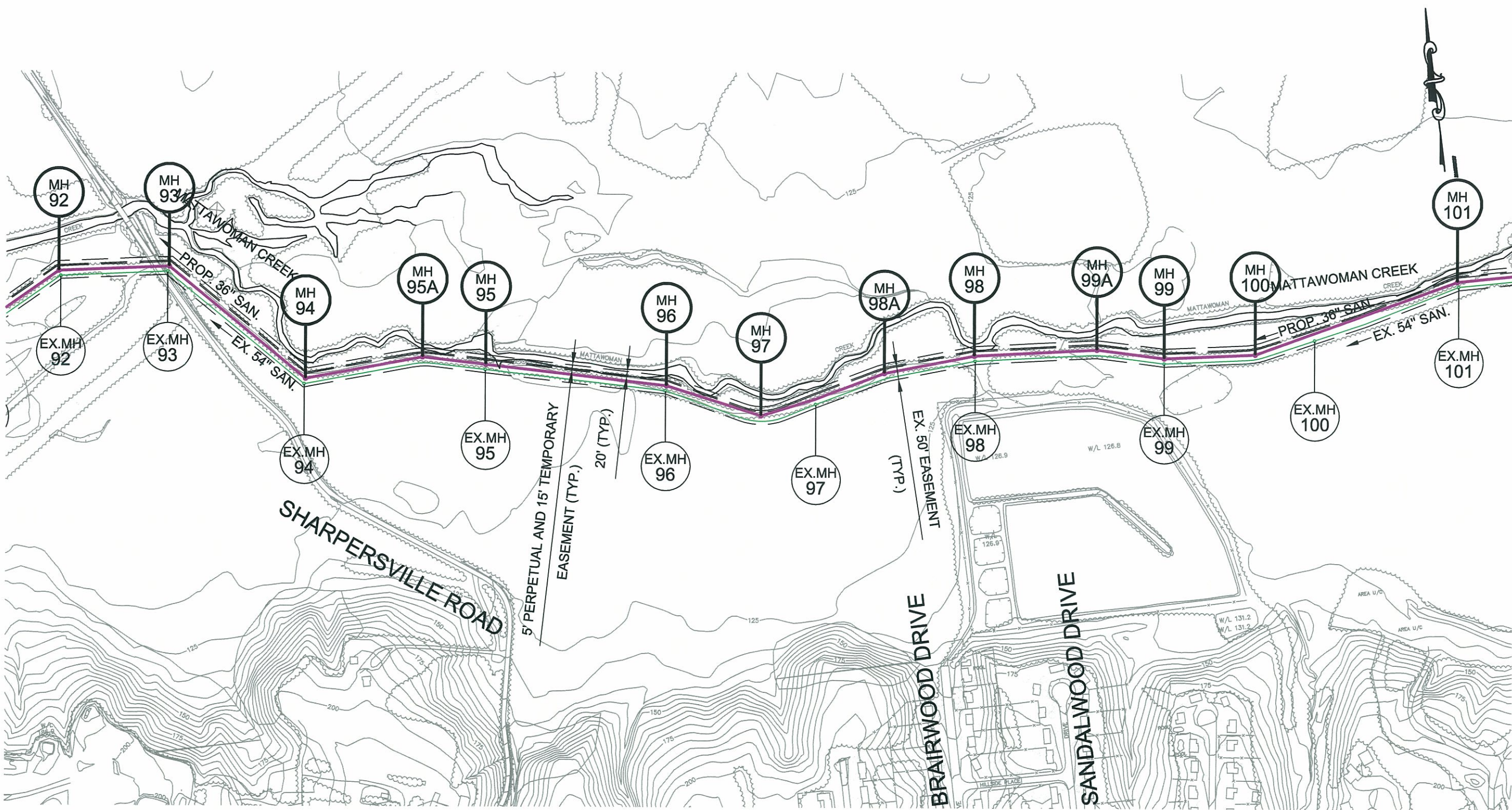
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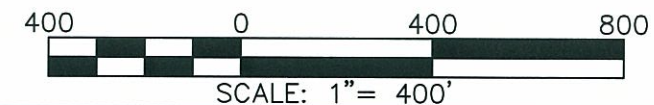
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DES: KAK
DRN: JBM
CHK: JRK
DATE: Feb, 2008

ALTERNATIVE 1 - MH 92 TO MH 101
SCALE: AS NOTED

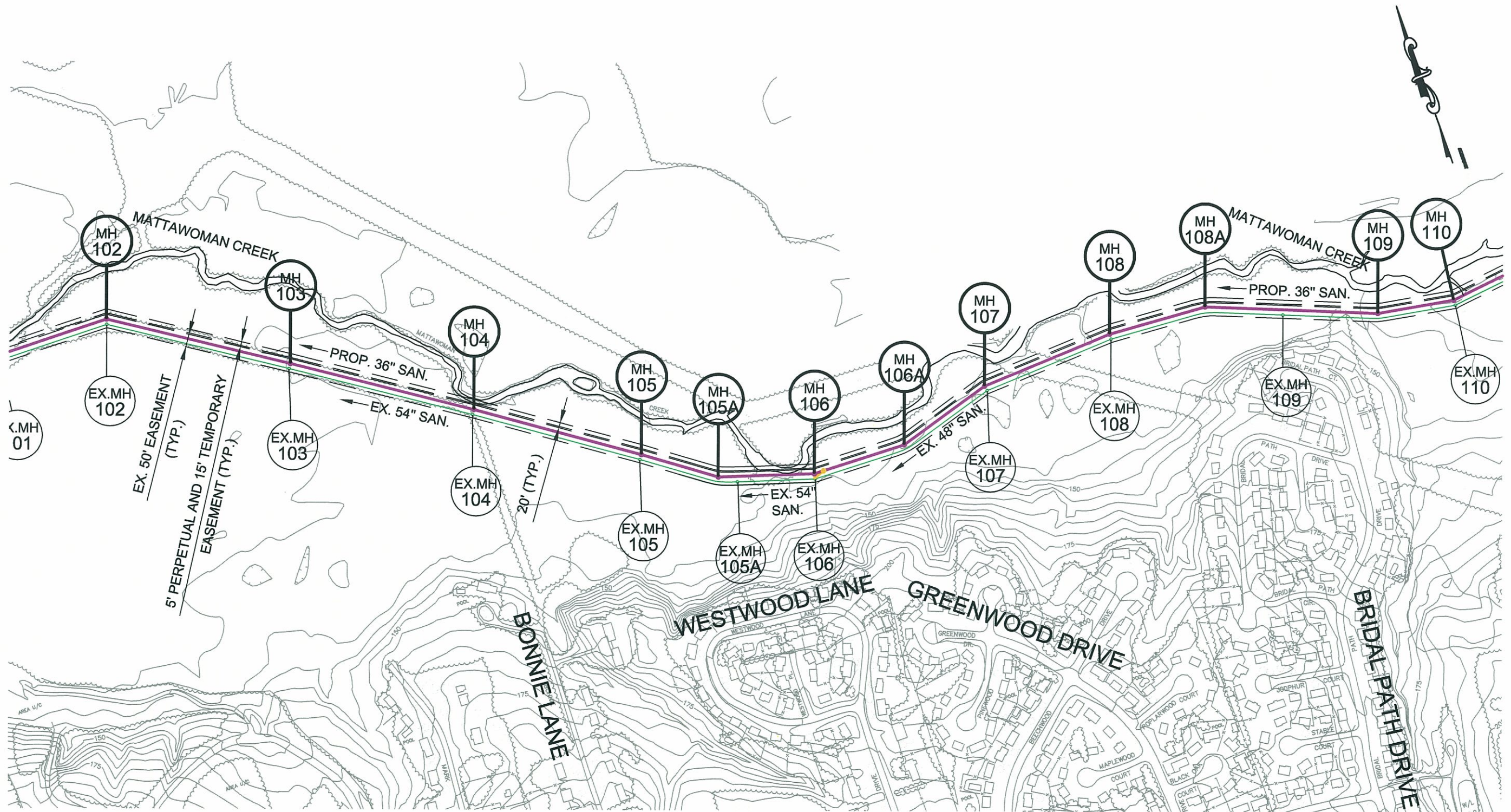
MATTAWOMAN INTERCEPTOR
PHASE I & II CAPACITY STUDY
PGM# VCI 06-0082

6TH ELECTION DISTRICT

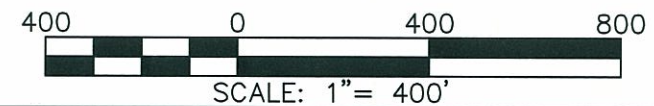
CHARLES COUNTY, MARYLAND

SHEET
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Z OF 17

Feb 12, 2008 - 8:42am User: jonathan.meyers
M: \\2006\\01065913\\Drawings\\Study_C-08.dwg



PLAN
SCALE: 1" = 400'



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ALTERNATIVE 1 - MH 102 TO MH 110
SCALE: AS NOTED

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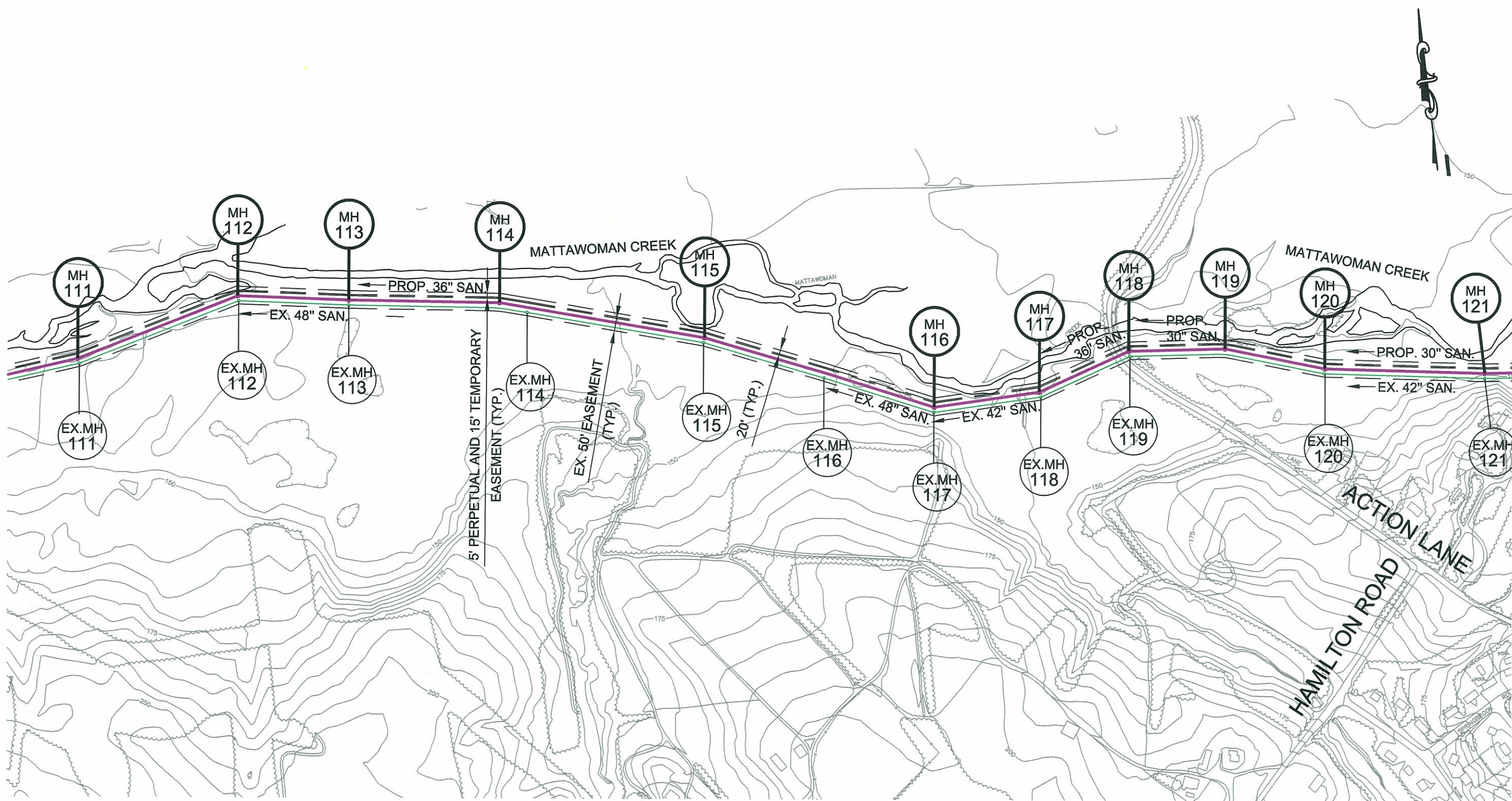
CHARLES COUNTY, MARYLAND

SHEET

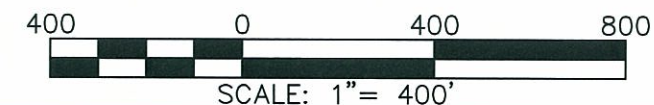
C-08

8 OF 17

Feb 12, 2008 - 8:43am User: jonathan.meyers
M: \\2006\01065913\Drawings\Study_C-09.dwg



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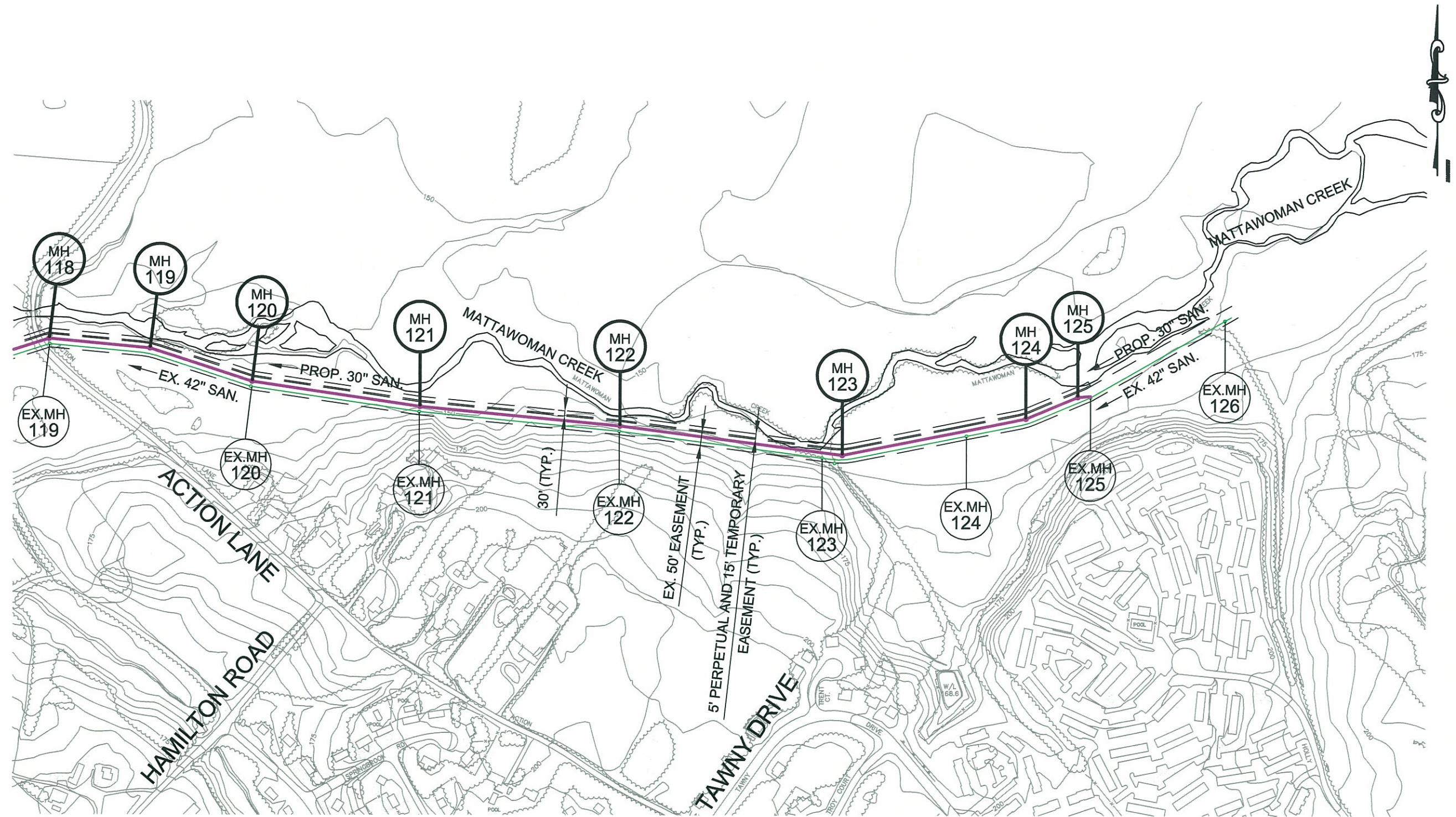
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SCALE: AS NOTED

MATTAWOMAN INTERCEPTOR
PHASE I & II CAPACITY STUDY
PGM# VCI 06-0082

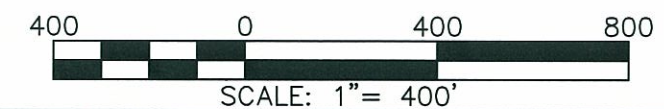
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C-09
9 OF 17



PLAN
SCALE: 1" = 400'



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CHK: JRK
DATE: Feb, 2008

ALTERNATIVE 1 - MH 121 TO MH 126
SCALE: AS NOTED

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PGM# VCI 06-0082

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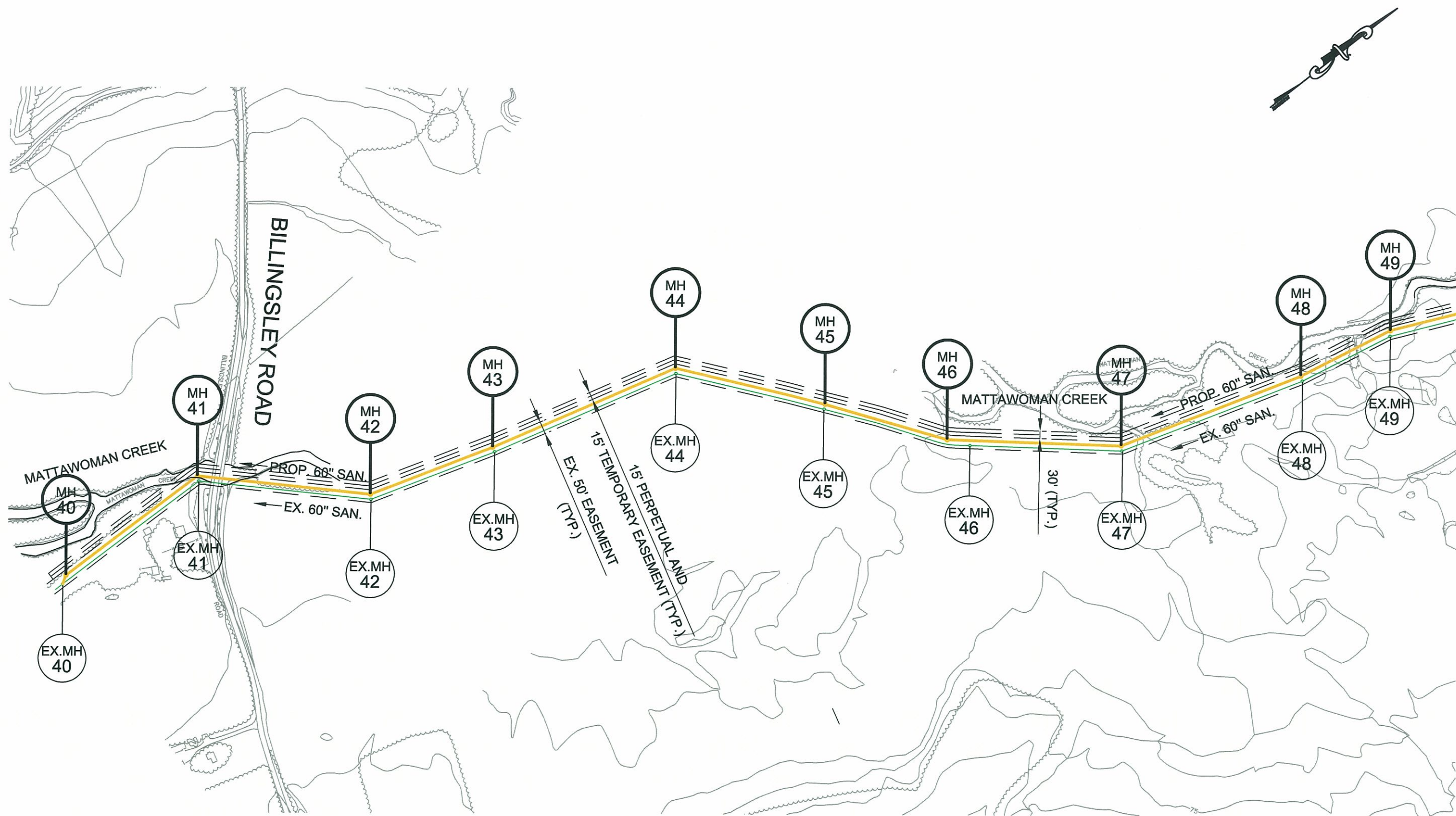
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SHEET

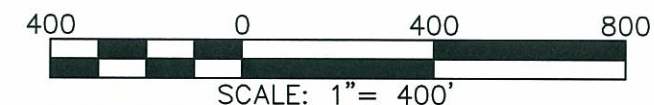
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10 OF 17

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DES: KAK
DRN: JBM
CHK: JRK
DATE: Feb, 2008

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SCALE: AS NOTED

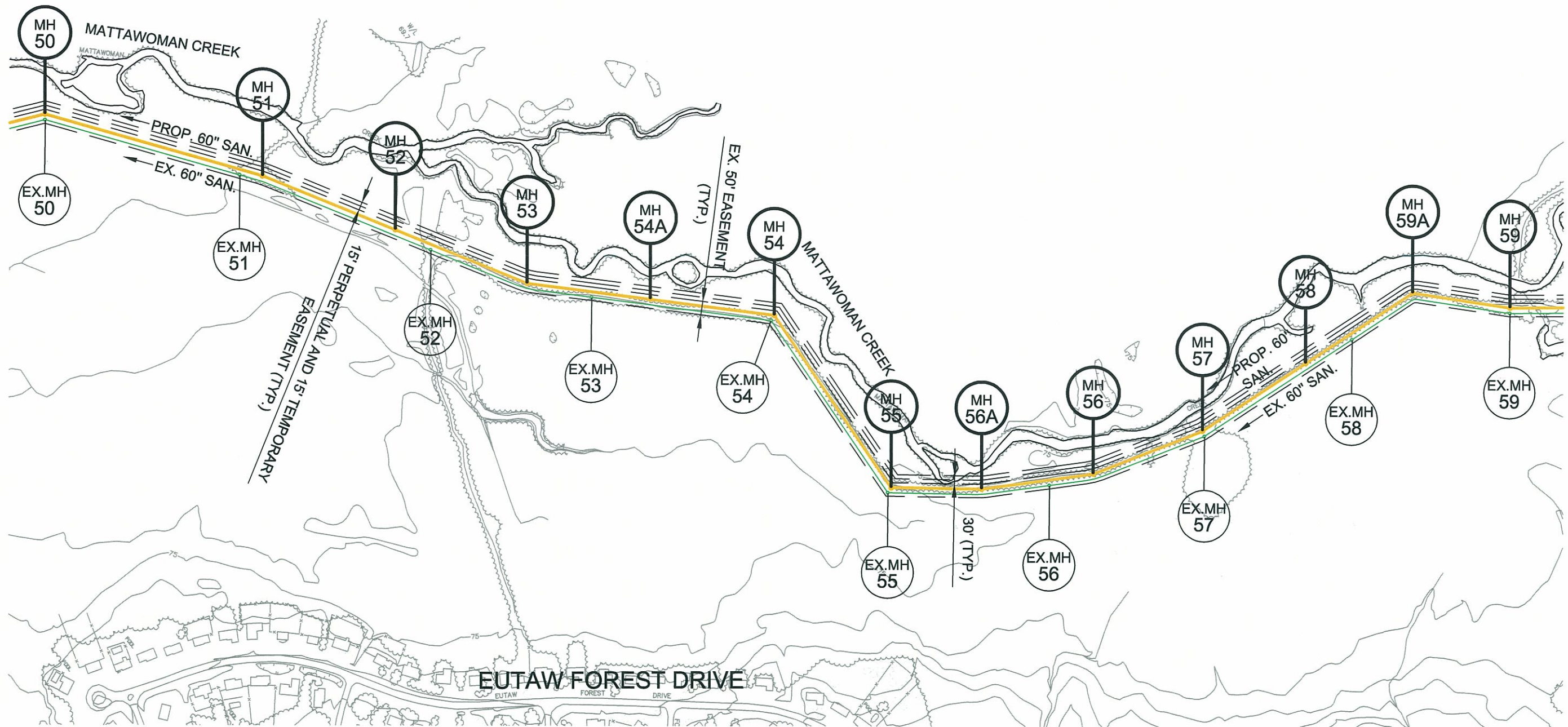
MATTAWOMAN INTERCEPTOR
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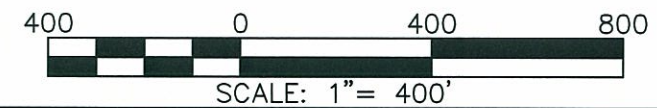
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11 OF 17

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PLAN

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DATE: Feb, 2008

ALTERNATIVE 2 - MH 50 TO MH 59

SCALE: AS NOTED

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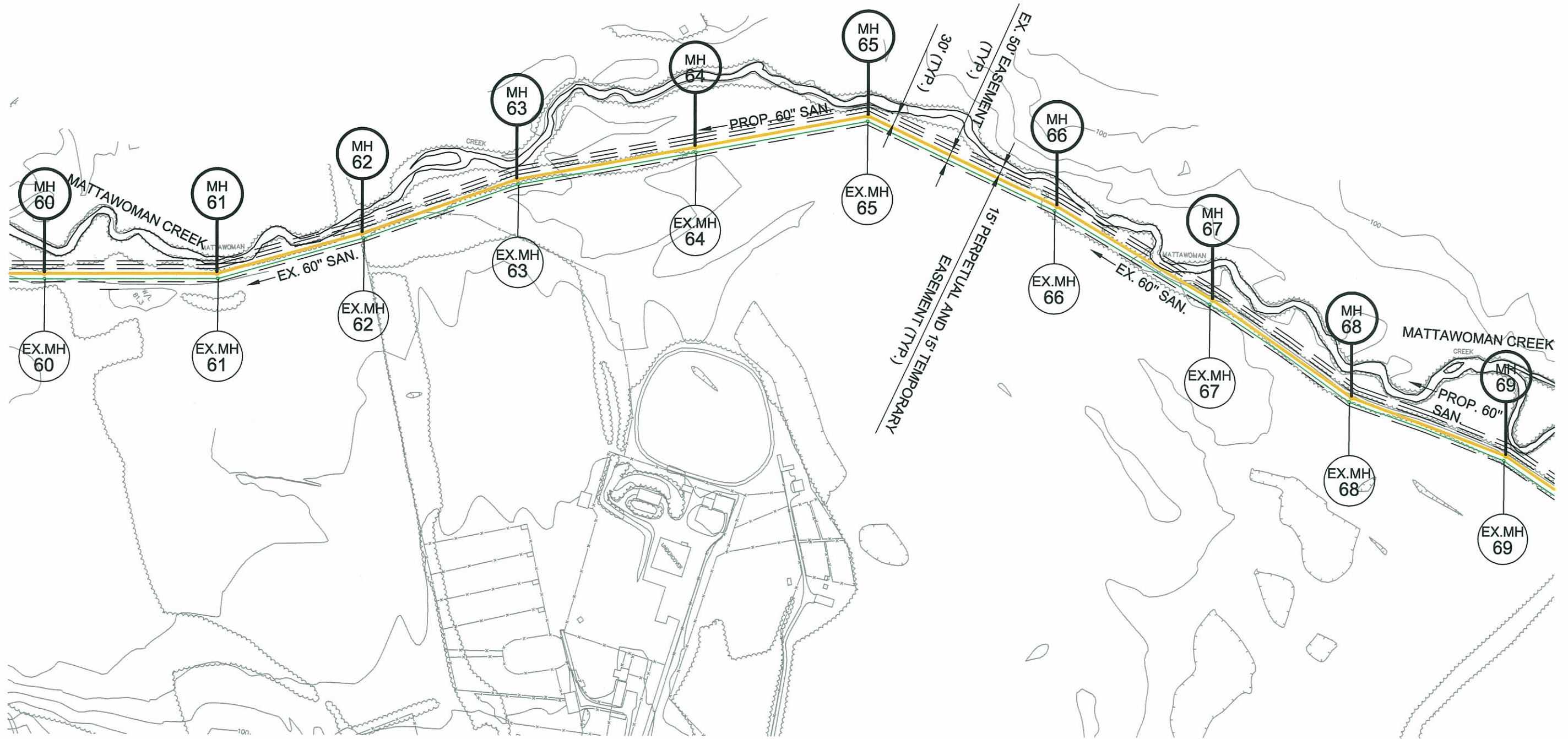
CHARLES COUNTY, MARYLAND

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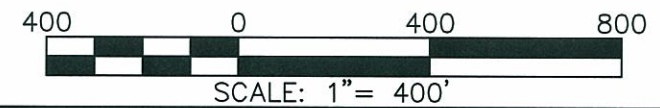
C-12

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M: \\2006\\01065913\\Drawings\\Study_C-13.dwg



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ALTERNATIVE 2 - MH 60 TO MH 69

SCALE: AS NOTED

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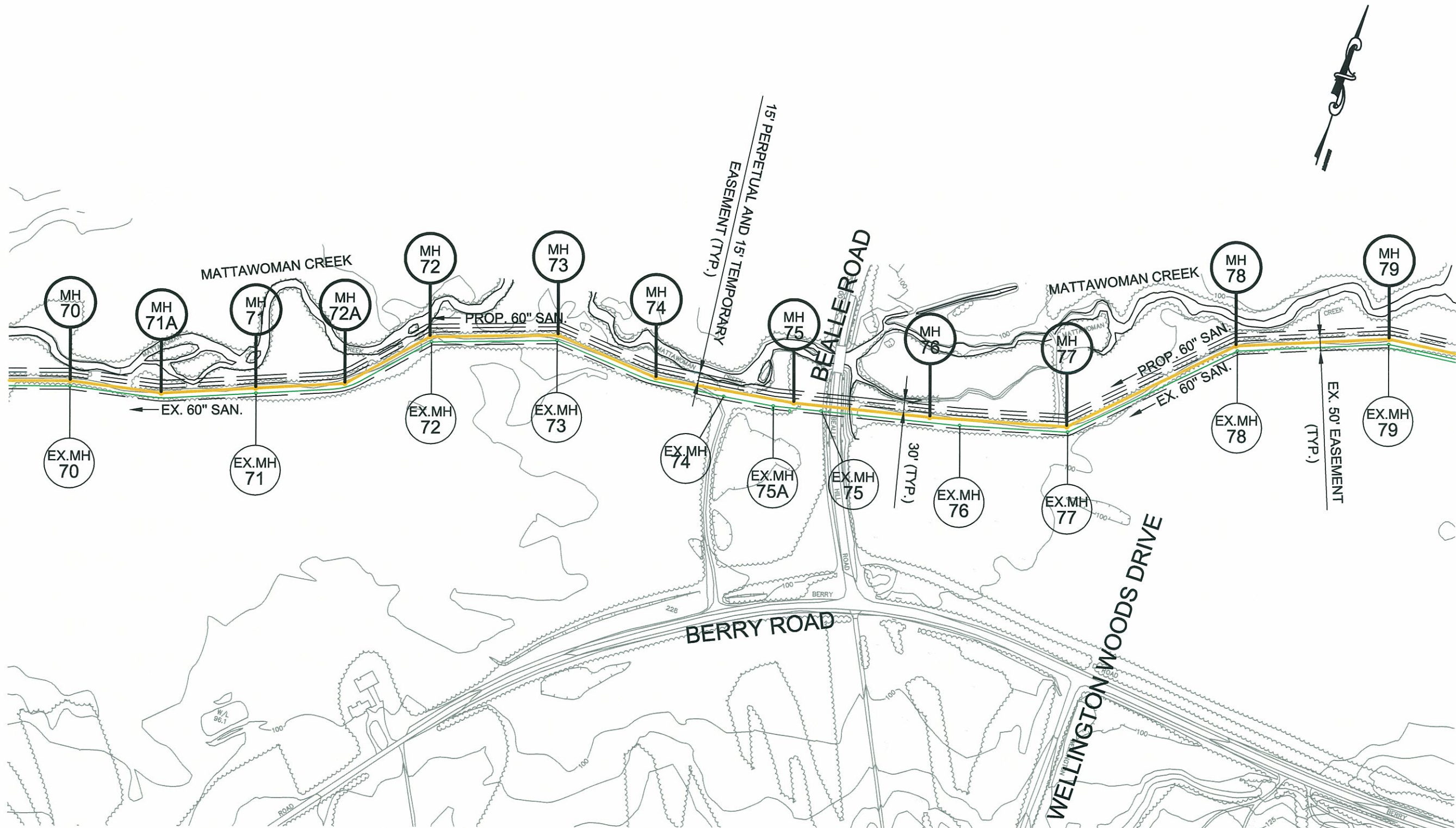
CHARLES COUNTY, MARYLAND

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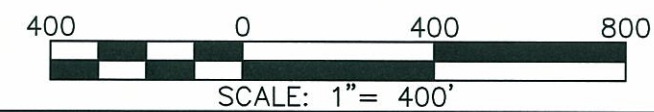
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M: \\2006\\01065913\\Drawings\\Study_C-14.dwg



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DES: KAK
DRN: JBM
CHK: JRK
DATE: Feb, 2008

ALTERNATIVE 2 - MH 70 TO MH 82

SCALE: AS NOTED

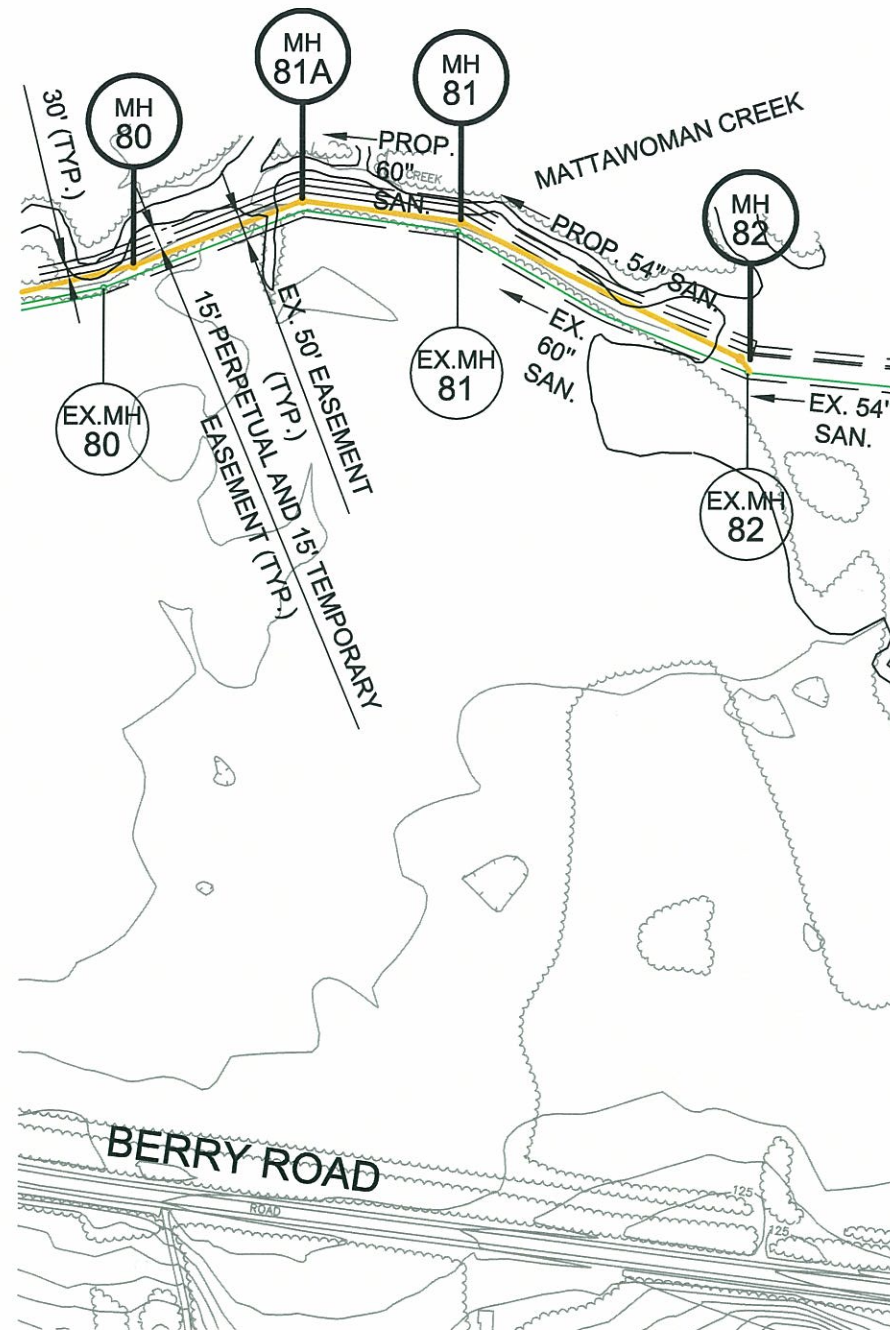
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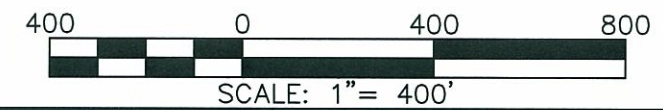
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14 OF 17

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CHK: JRK
DATE: Feb, 2008

ALTERNATIVE 2 - MH 80 TO MH 82

SCALE: AS NOTED

MATTAWOMAN INTERCEPTOR
PHASE I & II CAPACITY STUDY
PGM# VCI 06-0082

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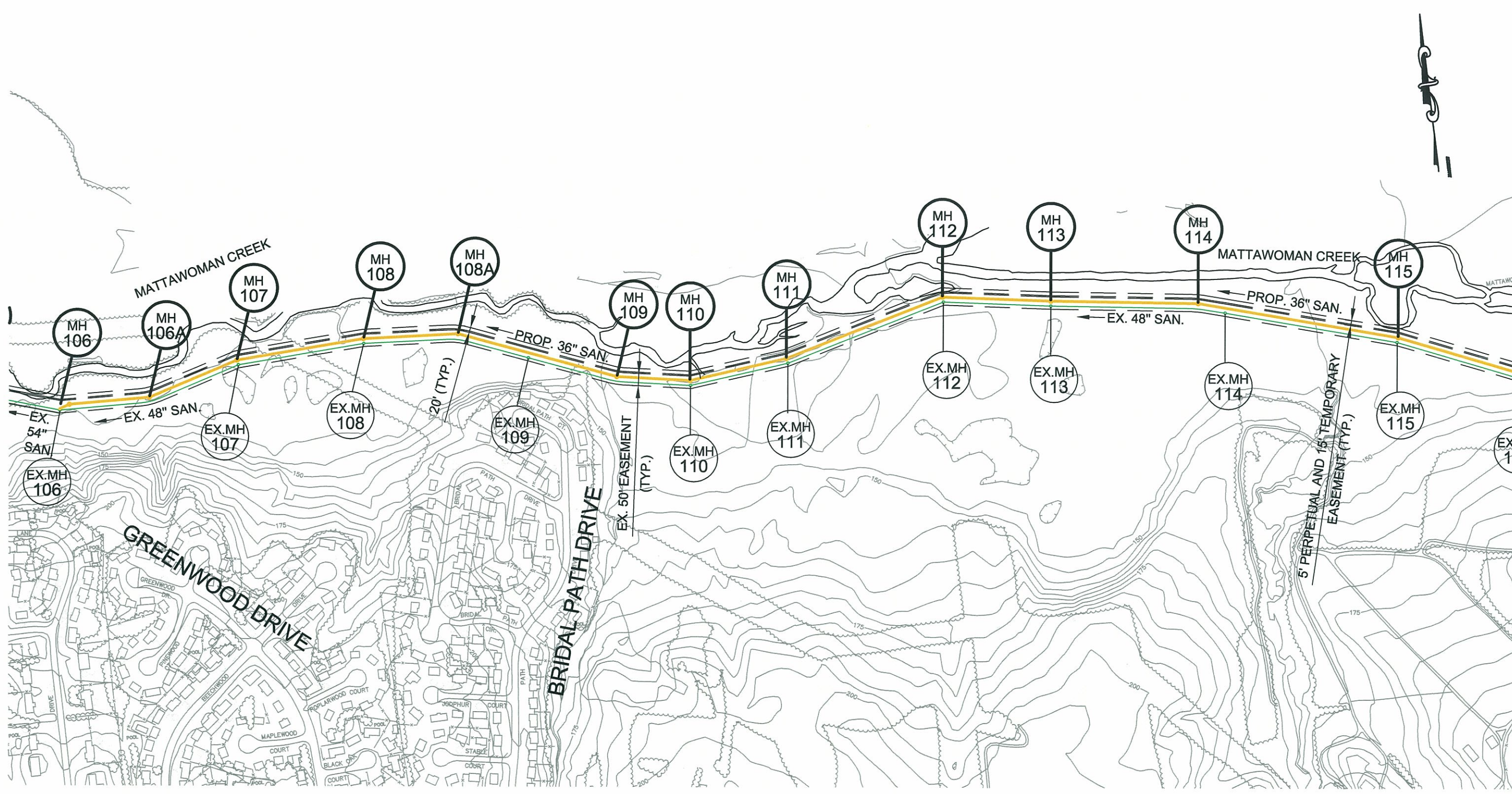
CHARLES COUNTY, MARYLAND

SHEET

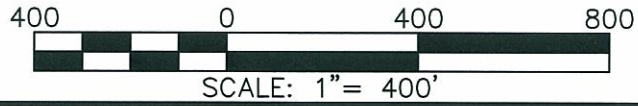
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15 OF 17

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PLAN
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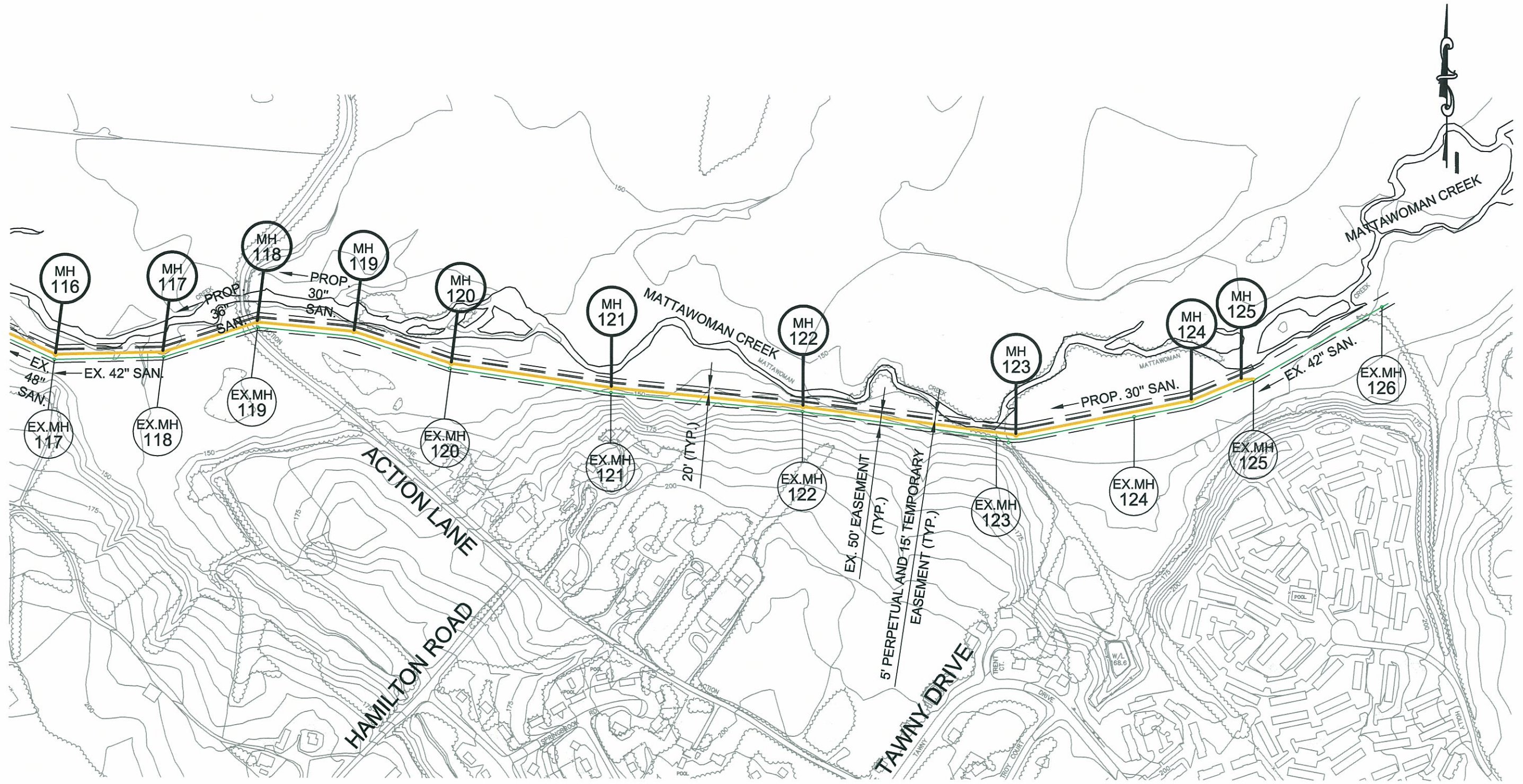
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FAX: (410) 316-7817
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DES: KAK
DRN: JBM
CHK: JRK
DATE: Feb, 2008

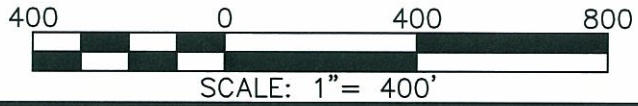
ALTERNATIVE 2 - MH 106 TO MH 116
SCALE: AS NOTED

MATTAWOMAN INTERCEPTOR
PHASE I & II CAPACITY STUDY
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CHK: JRK
DATE: Feb, 2008

ALTERNATIVE 2 - MH 117 TO MH 126
SCALE: AS NOTED

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PHASE I & II CAPACITY STUDY
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APPENDIX H: ALTERNATIVE MODEL RESULTS

**Alternative I:
Parallel Interceptor MH 125- MH 40**

ALTERNATIVE I (Constant n)

CONDUIT SUMMARY: EXISTING LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	148.08	143.15	582.50	42.00	26.77	51.86	40.65	0.66
125	143.15	142.12	492.90	42.00	17.78	25.77	20.20	0.88
124	142.12	140.90	551.20	42.00	17.70	26.52	20.79	0.85
123	140.90	139.10	769.90	42.00	18.47	27.25	21.37	0.86
122	139.10	137.72	757.50	42.00	18.47	24.06	18.86	0.98
121	137.72	136.19	640.20	42.00	18.47	27.56	21.60	0.85
120	136.19	134.45	778.00	42.00	18.47	26.66	20.90	0.88
119	134.45	133.71	388.30	42.00	18.47	24.60	19.29	0.96
118	133.71	133.04	428.40	42.00	18.47	22.29	17.47	1.06
117	133.04	131.56	456.20	48.00	23.43	45.84	35.94	0.65
116	131.56	130.59	498.60	48.00	23.43	35.49	27.83	0.84
115	130.59	129.44	708.10	48.00	23.43	32.43	25.43	0.92
114	129.44	128.30	710.70	48.00	23.96	32.23	25.27	0.95
113	128.30	127.65	436.00	48.00	23.96	31.07	24.36	0.98
112	127.65	126.42	677.00	48.00	23.96	34.30	26.89	0.89
111	126.42	125.68	404.30	48.00	23.96	34.43	26.99	0.89
110	125.68	124.47	666.20	48.00	25.38	34.30	26.89	0.94
109	124.47	123.26	669.30	48.00	25.49	34.21	26.82	0.95
108	123.26	122.57	516.30	48.00	25.49	29.42	23.06	1.11
107	122.57	120.49	744.20	48.00	25.49	42.54	33.35	0.76
106	120.49	120.17	300.80	54.00	25.49	35.93	28.17	0.90
105A	120.17	119.54	385.10	54.00	25.55	44.56	34.93	0.73
105	119.54	118.42	661.90	54.00	25.55	45.32	35.53	0.72
104	118.42	116.91	727.00	54.00	25.55	50.21	39.36	0.65
103	116.91	115.15	722.30	54.00	25.55	54.38	42.64	0.60
102	115.15	114.37	432.50	54.00	25.55	46.79	36.68	0.70
101	114.37	113.40	603.60	54.00	25.55	44.16	34.62	0.74
100	113.40	112.43	602.40	54.00	25.55	44.21	34.66	0.74
99	112.43	111.06	742.50	54.00	25.55	47.32	37.10	0.69
98	111.06	109.87	648.80	54.00	25.91	47.18	36.99	0.70
97	109.87	108.82	621.80	54.00	25.91	45.27	35.49	0.73
96	108.82	107.63	709.10	54.00	25.91	45.13	35.38	0.73
95	107.63	106.05	718.70	54.00	25.91	51.65	40.50	0.64
94	106.05	104.63	694.20	54.00	25.91	49.83	39.06	0.66
93	104.63	103.64	419.00	54.00	26.14	53.55	41.98	0.62
92	103.64	102.60	467.10	54.00	26.14	51.98	40.76	0.64
91	102.60	101.80	440.30	54.00	26.14	46.96	36.82	0.71
90	101.80	100.88	492.10	54.00	26.14	47.63	37.35	0.70
89	100.88	100.29	316.80	54.00	26.14	47.54	37.27	0.70
88	100.29	99.13	553.90	54.00	26.14	50.41	39.52	0.66
87	99.13	97.48	788.70	54.00	26.14	50.39	39.50	0.66
86	97.48	96.52	507.80	54.00	26.14	47.90	37.55	0.70

ALTERNATIVE I (Constant n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
85	96.52	95.81	390.70	54.00	26.14	46.96	36.82	0.71
84	95.81	94.50	401.60	54.00	26.14	62.92	49.33	0.53
83	94.50	93.47	508.50	54.00	26.14	49.58	38.87	0.67
82	93.47	91.74	674.50	60.00	35.51	73.89	57.93	0.61
81	91.74	90.12	775.50	60.00	35.51	66.68	52.28	0.68
80	90.12	88.88	676.40	60.00	35.51	62.47	48.98	0.73
79	88.88	87.68	581.50	60.00	35.51	66.28	51.97	0.68
78	87.68	86.41	721.50	60.00	35.51	61.22	47.99	0.74
77	86.41	85.68	414.10	60.00	35.51	61.26	48.03	0.74
76	85.68	84.71	538.70	60.00	35.51	61.91	48.54	0.73
075A	84.40	84.00	194.00	60.00	36.89	66.25	51.94	0.71
75	84.71	84.40	184.50	60.00	35.51	59.81	46.89	0.76
74	84.00	82.61	676.90	60.00	36.89	66.12	51.83	0.71
73	82.61	81.67	481.80	60.00	36.89	64.45	50.53	0.73
72	81.67	80.25	716.60	60.00	36.89	64.95	50.92	0.72
71	80.25	78.90	716.20	60.00	36.89	63.35	49.67	0.74
70	78.90	77.36	728.80	60.00	36.89	67.07	52.58	0.70
69	77.36	76.15	628.50	60.00	38.25	64.02	50.19	0.76
68	76.15	74.91	645.40	60.00	38.25	63.96	50.14	0.76
67	74.91	73.59	685.40	60.00	38.25	64.03	50.20	0.76
66	73.59	72.23	787.60	60.00	38.25	60.63	47.54	0.80
65	72.23	71.10	659.00	60.00	38.25	60.42	47.37	0.81
64	71.10	69.84	680.30	60.00	38.25	62.79	49.23	0.78
63	69.84	68.40	620.80	60.00	38.25	70.27	55.09	0.69
62	68.40	67.08	572.60	60.00	38.78	70.05	54.92	0.71
61	67.08	65.84	655.60	60.00	38.78	63.45	49.75	0.78
60	65.84	64.70	600.00	60.00	38.78	63.60	49.86	0.78
59	64.70	63.41	634.40	60.00	39.94	65.79	51.58	0.77
58	63.41	62.22	653.60	60.00	39.94	62.26	48.81	0.82
57	62.22	61.12	604.40	60.00	39.94	62.24	48.80	0.82
56	61.12	59.45	600.00	60.00	41.38	76.97	60.35	0.69
55	59.45	57.86	770.60	60.00	41.38	66.28	51.96	0.80
54	57.86	56.55	671.40	60.00	41.38	64.45	50.53	0.82
53	56.55	55.26	624.70	60.00	41.38	66.30	51.98	0.80
52	55.26	53.88	758.90	60.00	41.38	62.22	48.78	0.85
51	53.88	53.45	749.40	60.00	41.38	34.95	27.40	1.51
50	53.45	51.21	567.70	60.00	41.38	91.65	71.85	0.58
49	51.21	50.48	392.60	60.00	41.38	62.92	49.33	0.84
48	50.48	48.92	768.40	60.00	41.38	65.74	51.54	0.80
47	48.92	47.90	605.00	60.00	42.88	59.91	46.97	0.91
46	47.90	46.51	598.90	60.00	42.88	70.29	55.11	0.78
45	46.51	45.49	605.00	60.00	42.88	59.91	46.97	0.91
44	45.49	43.73	785.80	60.00	42.88	69.05	54.14	0.79
43	43.73	42.55	525.30	60.00	42.88	69.15	54.22	0.79
42	42.55	41.24	687.30	60.00	42.88	63.70	49.94	0.86
41	41.24	39.58	678.50	60.00	43.83	72.17	56.58	0.77

ALTERNATIVE I (Constant n)

CONDUIT SUMMARY: PARALLEL LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 125A	143.70	143.60	20.00	30.00	8.80	16.25	12.74	0.69
FUT 125	143.60	142.36	493.00	30.00	8.80	11.53	9.04	0.97
FUT 124	142.36	140.98	551.00	30.00	8.80	11.50	9.02	0.98
FUT 123	141.00	139.07	770.00	30.00	8.88	11.51	9.02	0.98
FUT 122	139.07	137.18	757.00	30.00	8.86	11.48	9.00	0.98
FUT 121	137.18	135.58	640.00	30.00	8.84	11.49	9.01	0.98
FUT 120	135.58	133.63	778.00	30.00	8.84	11.51	9.02	0.98
FUT 119	133.63	132.66	388.00	30.00	8.82	11.49	9.01	0.98
FUT 118	132.66	131.85	428.00	36.00	8.81	16.26	12.75	0.69
FUT 117	131.85	130.90	456.00	36.00	8.80	17.05	13.37	0.66
FUT 116	130.90	129.95	499.00	36.00	8.80	16.30	12.78	0.69
FUT 115	129.95	128.81	708.00	36.00	8.80	15.00	11.76	0.75
FUT 114	128.81	127.85	711.00	36.00	8.80	13.73	10.76	0.82
FUT 113	127.85	127.35	436.00	36.00	8.80	12.66	9.92	0.89
FUT 112	127.35	126.42	677.00	36.00	8.80	13.85	10.86	0.81
FUT 111	126.42	125.68	404.00	36.00	8.80	15.99	12.54	0.70
FUT 110	125.68	124.47	666.00	36.00	8.80	15.93	12.49	0.70
FUT 109	124.47	123.26	669.00	36.00	8.80	15.89	12.46	0.71
FUT 108	123.26	122.57	516.00	36.00	8.80	13.67	10.71	0.82
FUT 107	122.57	120.49	744.00	36.00	8.80	19.75	15.49	0.57
FUT 106	120.49	120.17	300.80	36.00	8.80	12.18	9.55	0.92
FUT 105A	120.17	119.54	385.10	36.00	8.80	15.11	11.85	0.74
FUT 105	119.54	118.42	661.90	36.00	8.80	15.37	12.05	0.73
FUT 104	118.42	116.91	727.00	36.00	8.80	17.03	13.35	0.66
FUT 103	116.91	115.15	722.30	36.00	8.80	18.44	14.46	0.61
FUT 102	115.15	114.37	432.50	36.00	8.80	15.87	12.44	0.71
FUT 101	114.37	113.40	603.60	36.00	8.80	14.98	11.74	0.75
FUT 100	113.40	112.43	602.40	36.00	8.80	15.00	11.76	0.75
FUT 99	112.43	111.06	742.50	36.00	8.80	16.05	12.58	0.70
FUT 98	111.06	109.87	648.80	36.00	8.80	16.01	12.55	0.70
FUT 97	109.87	108.82	621.80	36.00	8.80	15.35	12.04	0.73
FUT 96	108.82	107.63	709.10	36.00	8.80	15.31	12.00	0.73
FUT 95	107.63	106.05	718.70	36.00	8.80	17.52	13.73	0.64
FUT 94	106.05	104.63	694.20	36.00	8.80	16.90	13.25	0.66
FUT 93	104.63	103.64	419.00	36.00	8.80	18.16	14.24	0.62
FUT 92	103.64	102.60	467.10	36.00	8.80	17.63	13.83	0.64
FUT 91	102.60	101.80	440.30	36.00	8.80	15.93	12.49	0.70
FUT 90	101.80	100.88	492.10	36.00	8.80	16.15	12.66	0.69
FUT 89	100.88	100.29	316.80	36.00	8.80	16.13	12.64	0.70
FUT 88	100.29	99.13	553.90	36.00	8.80	17.10	13.40	0.66
FUT 87	99.13	97.48	788.70	36.00	8.80	17.09	13.40	0.66
FUT 86	97.48	96.52	507.80	36.00	8.80	16.24	12.74	0.69
FUT 85	96.52	95.81	390.70	36.00	8.80	15.93	12.49	0.70
FUT 84	95.81	94.50	401.60	36.00	8.80	21.34	16.73	0.53
FUT 83	94.50	93.47	508.50	36.00	8.80	16.82	13.19	0.67

ALTERNATIVE I (Constant n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT82A	93.47	93.40	20.00	60.00	36.01	86.32	67.68	0.53
FUT 82	93.00	91.74	674.00	60.00	40.76	63.08	49.46	0.82
FUT 81	91.74	90.12	776.00	60.00	40.76	66.66	52.26	0.78
FUT 80	90.12	88.88	676.00	60.00	40.76	62.49	48.99	0.83
FUT 79	88.88	87.68	581.00	60.00	40.76	66.31	51.99	0.78
FUT 78	87.68	86.41	721.00	60.00	40.76	61.23	48.01	0.85
FUT 77	86.41	85.68	414.00	60.00	40.76	61.27	48.03	0.85
FUT 76	85.68	84.71	539.00	60.00	40.76	61.89	48.52	0.84
FUT 75A	84.40	84.00	194.00	60.00	40.76	66.25	51.94	0.78
FUT 75	84.71	84.40	184.00	60.00	40.76	59.89	46.95	0.87
FUT 74	84.00	82.61	677.00	60.00	40.76	66.12	51.83	0.79
FUT 73	82.61	81.67	482.00	60.00	40.76	64.43	50.52	0.81
FUT 72	81.67	80.25	717.00	60.00	40.76	64.93	50.91	0.80
FUT 71	80.25	78.90	716.00	60.00	40.76	63.35	49.67	0.82
FUT 70	78.90	77.36	729.00	60.00	40.76	67.06	52.57	0.78
FUT 69	77.36	76.15	628.00	60.00	40.76	64.05	50.21	0.81
FUT 68	76.15	74.91	645.00	60.00	40.76	63.98	50.16	0.81
FUT 67	74.91	73.59	685.00	60.00	40.76	64.05	50.21	0.81
FUT 66	73.59	72.23	788.00	60.00	40.76	60.61	47.52	0.86
FUT 65	72.23	71.10	659.00	60.00	40.76	60.42	47.37	0.86
FUT 64	71.10	69.84	680.00	60.00	40.76	62.81	49.24	0.83
FUT 63	69.84	68.40	621.00	60.00	40.76	70.26	55.08	0.74
FUT 62	68.40	67.08	573.00	60.00	40.76	70.03	54.91	0.74
FUT 61	67.08	65.84	656.00	60.00	40.76	63.43	49.73	0.82
FUT 60	65.84	64.70	600.00	60.00	40.76	63.60	49.86	0.82
FUT 59	64.70	63.41	634.00	60.00	40.76	65.82	51.60	0.79
FUT 58	63.41	62.22	654.00	60.00	40.76	62.24	48.79	0.84
FUT 57	62.22	61.12	604.00	60.00	40.76	62.27	48.82	0.83
FUT 56	61.12	59.45	600.00	60.00	40.76	76.97	60.35	0.68
FUT 55	59.45	57.86	771.00	60.00	40.76	66.26	51.95	0.78
FUT 54	57.86	56.55	671.00	60.00	40.76	64.47	50.54	0.81
FUT 53	56.55	55.26	625.00	60.00	40.76	66.29	51.97	0.78
FUT 52	55.26	53.88	759.00	60.00	40.76	62.22	48.78	0.84
FUT 51	53.88	53.45	749.00	60.00	40.76	65.29	51.19	0.80
FUT 50	53.45	51.21	568.00	60.00	40.76	66.22	51.92	0.79
FUT 49	51.21	50.48	393.00	60.00	40.76	62.88	49.30	0.83
FUT 48	50.48	48.92	768.00	60.00	40.76	65.76	51.56	0.79
FUT 47	48.92	47.90	605.00	60.00	40.76	59.91	46.97	0.87
FUT 46	47.90	46.51	599.00	60.00	40.76	70.28	55.10	0.74
FUT 45	46.51	45.49	605.00	60.00	40.76	59.91	46.97	0.87
FUT 44	45.49	43.73	786.00	60.00	40.76	69.04	54.13	0.75
FUT 43	43.73	42.55	525.00	60.00	40.76	69.17	54.23	0.75
FUT 42	42.55	41.24	687.00	60.00	40.76	63.71	49.95	0.82
FUT 41	41.24	39.58	679.00	60.00	40.76	72.14	56.56	0.72

Note: When ratio of computed to design flow > 1, then the pipe has exceeded design capacity. Even when the ratio of computed flow to design flow is greater than 1, the model still shows them within the design capacity. This is due to the slope of hydraulic line being greater than the slope of the pipe in that particular pipe segment.

ALTERNATIVE I (Constant n)

JUNCTION SUMMARY: EXISTING LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	26.50	149.91	0.00	8.69	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.28	0.00	10.27	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.23	0.00	5.08	0.00
SANMH 123	140.90	154.05	144.40	0.77	143.04	0.00	11.01	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.39	0.00	20.52	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.83	0.00	11.32	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.36	0.00	10.78	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.74	0.00	12.35	0.00
SANMH 118	133.71	147.92	137.21	0.00	136.02	0.00	11.90	0.00
SANMH 117	133.04	148.12	137.04	4.96	135.14	0.00	12.98	0.00
SANMH 116	131.56	147.80	135.56	0.00	133.99	0.00	13.81	0.00
SANMH 115	130.59	145.49	134.59	0.00	133.13	0.00	12.36	0.00
SANMH 114	129.44	144.68	133.44	0.53	132.01	0.00	12.67	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.87	0.00	11.45	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.13	0.00	11.71	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.93	0.00	10.54	0.00
SANMH 110	125.68	139.67	129.68	1.42	128.26	0.00	11.42	0.00
SANMH 109	124.47	138.07	128.47	0.10	127.07	0.00	11.00	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.91	0.00	10.90	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.85	0.00	10.27	0.00
SANMH 106	120.49	133.54	124.99	0.00	123.07	0.00	10.47	0.00
SANMH 105A	120.17	135.19	124.67	0.06	122.60	0.00	12.59	0.00
SANMH 105	119.54	133.09	124.04	0.00	121.94	0.00	11.15	0.00
SANMH 104	118.42	132.62	122.92	0.00	120.70	0.00	11.92	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.12	0.00	11.20	0.00
SANMH 102	115.15	129.75	119.65	0.00	117.55	0.00	12.20	0.00
SANMH 101	114.37	128.97	118.87	0.00	116.82	0.00	12.15	0.00
SANMH 100	113.40	125.65	117.90	0.00	115.84	0.00	9.81	0.00
SANMH 99	112.43	125.43	116.93	0.00	114.80	0.00	10.63	0.00
SANMH 98	111.06	127.00	115.56	0.36	113.46	0.00	13.54	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.31	0.00	11.48	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.25	0.00	9.97	0.00
SANMH 95	107.63	120.31	112.13	0.00	109.89	0.00	10.42	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.35	0.00	12.42	0.00
SANMH 93	104.63	117.88	109.13	0.23	106.87	0.00	11.01	0.00
SANMH 92	103.64	116.31	108.14	0.00	105.94	0.00	10.37	0.00
SANMH 91	102.60	115.70	107.10	0.00	104.99	0.00	10.71	0.00
SANMH 90	101.80	114.40	106.30	0.00	104.18	0.00	10.23	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.24	0.00	10.43	0.00
SANMH 88	100.29	113.09	104.79	0.00	102.59	0.00	10.50	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.44	0.00	10.85	0.00

ALTERNATIVE I (Constant n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 86	97.48	109.88	101.98	0.00	99.84	0.00	10.04	0.00
SANMH 85	96.52	108.97	101.02	0.00	98.85	0.00	10.12	0.00
SANMH 84	95.81	109.11	100.31	0.00	97.90	0.00	11.21	0.00
SANMH 83	94.50	108.44	99.00	0.00	96.87	0.00	11.57	0.00
SANMH 82	93.47	106.10	98.47	41.34	95.94	0.00	10.16	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.36	0.00	11.20	0.00
SANMH 80	90.12	103.87	95.12	0.00	92.81	0.00	11.06	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.52	0.00	9.82	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.41	0.00	9.82	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.14	0.00	9.39	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.40	0.00	9.61	0.00
SANMH 75	84.71	101.02	89.71	0.00	87.42	0.00	13.60	0.00
SANMH 75A	84.40	98.30	89.40	1.38	87.08	0.00	11.23	0.00
SANMH 74	84.00	95.82	89.00	0.00	86.68	0.00	9.14	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.32	0.00	9.34	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.38	0.00	8.80	0.00
SANMH 71	80.25	91.95	85.25	0.00	82.99	0.00	8.96	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.58	0.00	10.13	0.00
SANMH 69	77.36	89.38	82.36	1.36	80.15	0.00	9.23	0.00
SANMH 68	76.15	87.87	81.15	0.00	78.94	0.00	8.93	0.00
SANMH 67	74.91	86.88	79.91	0.00	77.72	0.00	9.16	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.47	0.00	9.22	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.10	0.00	8.80	0.00
SANMH 64	71.10	82.30	76.10	0.00	73.90	0.00	8.40	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.49	0.00	9.41	0.00
SANMH 62	68.40	82.75	73.40	0.54	71.10	0.00	11.65	0.00
SANMH 61	67.08	80.48	72.08	0.00	69.91	0.00	10.58	0.00
SANMH 60	65.84	78.87	70.84	0.00	68.67	0.00	10.20	0.00
SANMH 59	64.70	78.08	69.70	1.15	67.54	0.00	10.54	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.31	0.00	11.45	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.09	0.00	10.34	0.00
SANMH 56	61.12	74.90	66.12	1.45	63.79	0.00	11.12	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.33	0.00	11.52	0.00
SANMH 54	57.86	72.54	62.86	0.00	60.79	0.00	11.75	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.50	0.00	11.72	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.39	0.00	12.97	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.29	0.00	11.39	0.00
SANMH 50	53.45	67.80	58.45	0.00	55.87	0.00	11.93	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.16	0.00	12.50	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.41	0.00	12.82	0.00
SANMH 47	48.92	64.87	53.92	1.50	51.99	0.00	12.89	0.00
SANMH 46	47.90	63.50	52.90	0.00	50.79	0.00	12.71	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.57	0.00	13.16	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.35	0.00	12.84	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.62	0.00	13.10	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.53	0.00	13.62	0.00

ALTERNATIVE I (Constant n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 41	41.24	59.82	46.24	0.95	44.05	0.00	15.77	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.39	0.00	14.66	0.00

JUNCTION SUMMARY: PARALLEL LINE

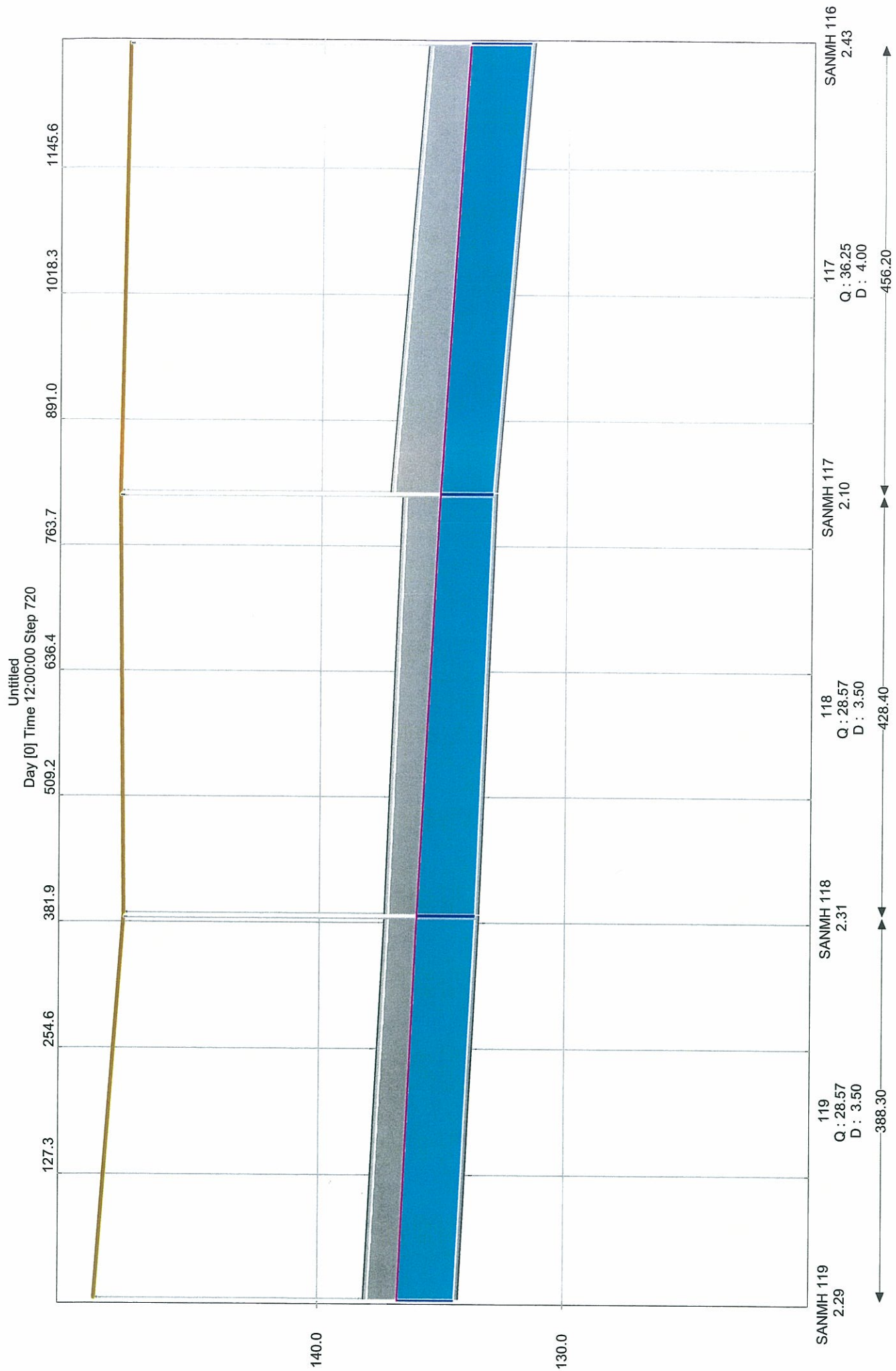
Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH125	143.60	155.55	146.10	0.00	145.24	0.00	10.31	0.00
FUT MH124	142.36	149.30	144.86	0.00	144.01	0.00	5.30	0.00
FUT MH123	140.98	154.05	143.50	0.00	142.66	0.00	11.41	0.00
FUT MH122	139.07	161.90	141.57	0.00	140.72	0.00	21.19	0.00
FUT MH121	137.18	151.15	139.68	0.00	138.83	0.00	12.33	0.00
FUT MH120	135.58	149.14	138.08	0.00	137.23	0.00	11.92	0.00
FUT MH119	133.63	149.09	136.13	0.00	135.27	0.00	13.83	0.00
FUT MH118	132.66	147.92	135.66	0.00	134.23	0.00	13.69	0.00
FUT MH117	131.85	148.12	134.85	0.00	133.39	0.00	14.73	0.00
FUT MH116	130.90	147.80	133.90	0.00	132.50	0.00	15.31	0.00
FUT MH115	129.95	145.49	132.95	0.00	131.63	0.00	13.86	0.00
FUT MH114	128.81	144.68	131.81	0.00	130.57	0.00	14.11	0.00
FUT MH113	127.85	142.32	130.85	0.00	129.65	0.00	12.67	0.00
FUT MH112	127.35	141.84	130.35	0.00	129.07	0.00	12.77	0.00
FUT MH111	126.42	139.47	129.42	0.00	128.01	0.00	11.46	0.00
FUT MH110	125.68	139.67	128.68	0.00	127.28	0.00	12.39	0.00
FUT MH109	124.47	138.07	127.47	0.00	126.08	0.00	11.99	0.00
FUT MH108	123.26	136.81	126.26	0.00	124.96	0.00	11.85	0.00
FUT MH107	122.57	135.12	125.57	0.00	123.99	0.00	11.13	0.00
FUT MH106	120.49	133.54	123.49	0.00	122.26	0.00	11.28	0.00
FUT MH105A	120.17	135.19	123.17	0.00	121.81	0.00	13.38	0.00
FUT MH105	119.54	133.09	122.54	0.00	121.17	0.00	11.92	0.00
FUT MH104	118.42	132.62	121.42	0.00	119.96	0.00	12.66	0.00
FUT MH103	116.91	130.31	119.91	0.00	118.38	0.00	11.93	0.00
FUT MH102	115.15	129.75	118.15	0.00	116.76	0.00	12.99	0.00
FUT MH101	114.37	128.97	117.37	0.00	116.02	0.00	12.95	0.00
FUT MH100	113.40	125.65	116.40	0.00	115.05	0.00	10.60	0.00
FUT MH99	112.43	125.43	115.43	0.00	114.02	0.00	11.41	0.00
FUT MH98	111.06	127.00	114.06	0.00	112.66	0.00	14.34	0.00
FUT MH97	109.87	123.79	112.87	0.00	111.50	0.00	12.29	0.00
FUT MH96	108.82	121.22	111.82	0.00	110.46	0.00	10.76	0.00
FUT MH95	107.63	120.31	110.63	0.00	109.14	0.00	11.17	0.00
FUT MH94	106.05	120.77	109.05	0.00	107.59	0.00	13.18	0.00
FUT MH93	104.63	117.88	107.63	0.00	106.11	0.00	11.77	0.00
FUT MH92	103.64	116.31	106.64	0.00	105.16	0.00	11.15	0.00

ALTERNATIVE I (Constant n)

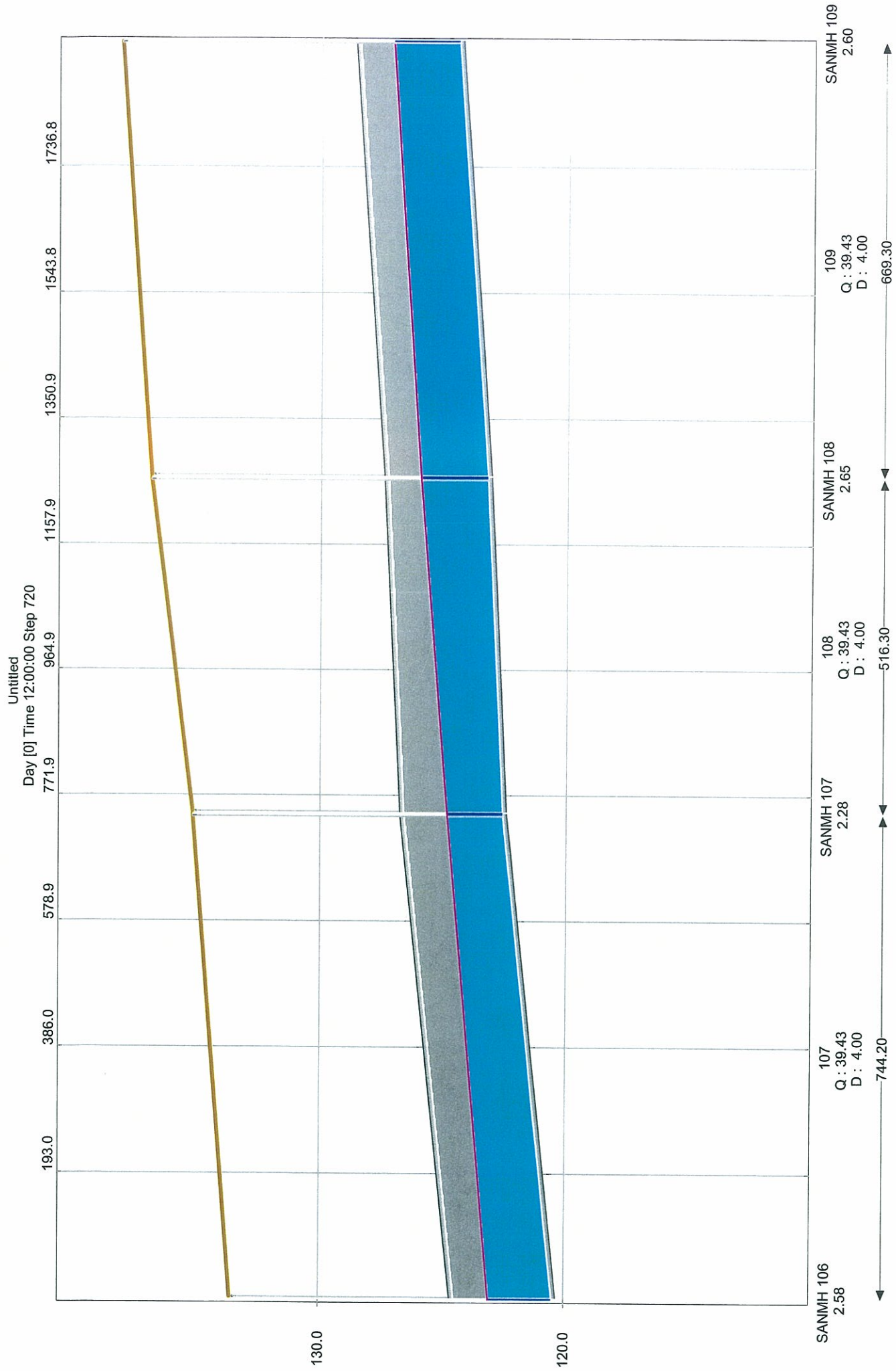
Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
FUT MH91	102.60	115.70	105.60	0.00	104.19	0.00	11.51	0.00
FUT MH90	101.80	114.40	104.80	0.00	103.38	0.00	11.02	0.00
FUT MH89	100.88	113.66	103.88	0.00	102.45	0.00	11.21	0.00
FUT MH88	100.29	113.09	103.29	0.00	101.82	0.00	11.27	0.00
FUT MH87	99.13	112.29	102.13	0.00	100.66	0.00	11.63	0.00
FUT MH86	97.48	109.88	100.48	0.00	99.05	0.00	10.83	0.00
FUT MH85	96.52	108.97	99.52	0.00	98.09	0.00	10.88	0.00
FUT MH84	95.81	109.11	98.81	0.00	97.22	0.00	11.89	0.00
FUT MH83	94.50	108.44	97.50	0.00	96.37	0.00	12.07	0.00
FUT MH82	93.00	106.10	98.40	0.00	95.91	0.00	10.19	0.00
FUT MH81	91.74	105.56	96.74	0.00	94.59	0.00	10.97	0.00
FUT MH80	90.12	103.87	95.12	0.00	93.05	0.00	10.82	0.00
FUT MH79	88.88	101.34	93.88	0.00	91.76	0.00	9.58	0.00
FUT MH78	87.68	100.23	92.68	0.00	90.66	0.00	9.57	0.00
FUT MH77	86.41	98.53	91.41	0.00	89.38	0.00	9.15	0.00
FUT MH76	85.68	98.01	90.68	0.00	88.63	0.00	9.38	0.00
FUT MH75	84.71	101.02	89.71	0.00	87.62	0.00	13.40	0.00
FUT MH75A	84.40	98.30	89.40	0.00	87.25	0.00	11.05	0.00
FUT MH74	84.00	95.82	89.00	0.00	86.85	0.00	8.97	0.00
FUT MH73	82.61	94.66	87.61	0.00	85.50	0.00	9.16	0.00
FUT MH72	81.67	93.18	86.67	0.00	84.55	0.00	8.63	0.00
FUT MH71	80.25	91.95	85.25	0.00	83.16	0.00	8.79	0.00
FUT MH70	78.90	91.71	83.90	0.00	81.74	0.00	9.97	0.00
FUT MH69	77.36	89.38	82.36	0.00	80.26	0.00	9.12	0.00
FUT MH68	76.15	87.87	81.15	0.00	79.06	0.00	8.81	0.00
FUT MH67	74.91	86.88	79.91	0.00	77.84	0.00	9.04	0.00
FUT MH66	73.59	85.69	78.59	0.00	76.59	0.00	9.10	0.00
FUT MH65	72.23	83.90	77.23	0.00	75.22	0.00	8.68	0.00
FUT MH64	71.10	82.30	76.10	0.00	74.01	0.00	8.29	0.00
FUT MH63	69.84	81.90	74.84	0.00	72.59	0.00	9.31	0.00
FUT MH62	68.40	82.75	73.40	0.00	71.19	0.00	11.56	0.00
FUT MH61	67.08	80.48	72.08	0.00	69.99	0.00	10.49	0.00
FUT MH60	65.84	78.87	70.84	0.00	68.74	0.00	10.13	0.00
FUT MH59	64.70	78.08	69.70	0.00	67.58	0.00	10.50	0.00
FUT MH58	63.41	77.76	68.41	0.00	66.35	0.00	11.41	0.00
FUT MH57	62.22	75.43	67.22	0.00	65.11	0.00	10.32	0.00
FUT MH56	61.12	74.90	66.12	0.00	63.76	0.00	11.14	0.00
FUT MH55	59.45	73.85	64.45	0.00	62.30	0.00	11.55	0.00
FUT MH54	57.86	72.54	62.86	0.00	60.74	0.00	11.80	0.00
FUT MH53	56.55	71.22	61.55	0.00	59.42	0.00	11.80	0.00
FUT MH52	55.26	71.36	60.26	0.00	58.20	0.00	13.16	0.00
FUT MH51	53.88	68.68	58.88	0.00	56.74	0.00	11.94	0.00
FUT MH50	52.38	67.80	57.38	0.00	55.24	0.00	12.56	0.00
FUT MH49	51.21	66.66	56.21	0.00	54.12	0.00	12.54	0.00
FUT MH48	50.48	66.23	55.48	0.00	53.36	0.00	12.87	0.00
FUT MH47	48.92	64.87	53.92	0.00	51.89	0.00	12.98	0.00

ALTERNATIVE I (Constant n)

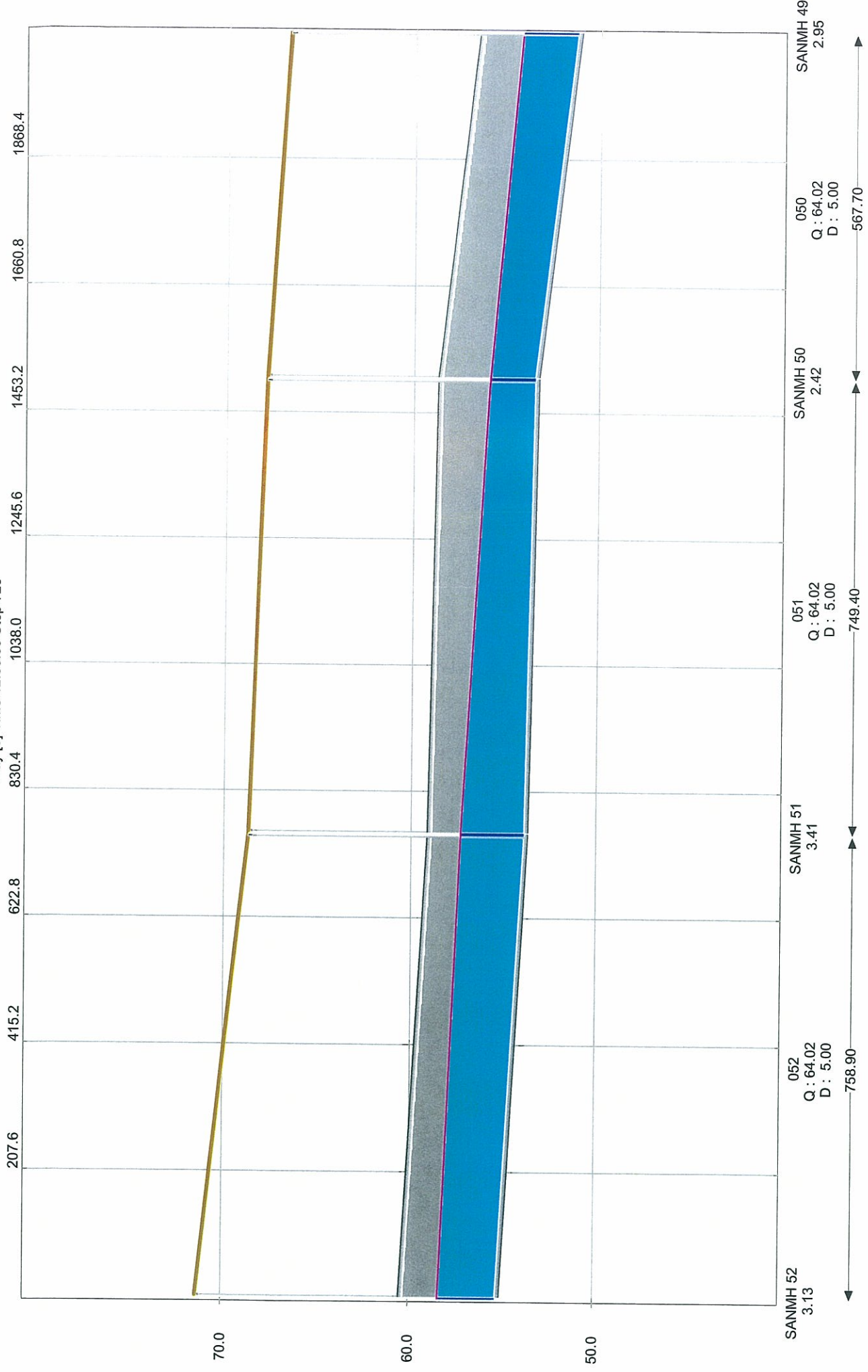
Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
FUT MH46	47.90	63.50	52.90	0.00	50.70	0.00	12.80	0.00
FUT MH45	46.51	62.73	51.51	0.00	49.47	0.00	13.26	0.00
FUT MH44	45.49	61.19	50.49	0.00	48.26	0.00	12.93	0.00
FUT MH43	43.73	59.72	48.73	0.00	46.53	0.00	13.19	0.00
FUT MH42	42.55	59.15	47.55	0.00	45.43	0.00	13.72	0.00
FUT MH41	41.24	59.82	46.24	0.00	43.96	0.00	15.86	0.00



Alternative I



Untitled
Day [0] Time 12:00:00 Step 720



Alternative I

**Alternative II:
Parallel Interceptor MH 125-105A & MH 82- MH 40**

ALTERNATIVE II (Constant n)

CONDUIT SUMMARY: EXISTING LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	148.08	143.15	582.50	42.00	26.77	51.86	40.65	0.66
125	143.15	142.12	492.90	42.00	17.78	25.77	20.20	0.88
124	142.12	140.90	551.20	42.00	17.70	26.52	20.79	0.85
123	140.90	139.10	769.90	42.00	18.47	27.25	21.37	0.86
122	139.10	137.72	757.50	42.00	18.47	24.06	18.86	0.98
121	137.72	136.19	640.20	42.00	18.47	27.56	21.60	0.85
120	136.19	134.45	778.00	42.00	18.47	26.66	20.90	0.88
119	134.45	133.71	388.30	42.00	18.47	24.60	19.29	0.96
118	133.71	133.04	428.40	42.00	18.47	22.29	17.47	1.06
117	133.04	131.56	456.20	48.00	23.43	45.84	35.94	0.65
116	131.56	130.59	498.60	48.00	23.43	35.49	27.83	0.84
115	130.59	129.44	708.10	48.00	23.43	32.43	25.43	0.92
114	129.44	128.30	710.70	48.00	23.96	32.23	25.27	0.95
113	128.30	127.65	436.00	48.00	23.96	31.07	24.36	0.98
112	127.65	126.42	677.00	48.00	23.96	34.30	26.89	0.89
111	126.42	125.68	404.30	48.00	23.96	34.43	26.99	0.89
110	125.68	124.47	666.20	48.00	25.38	34.30	26.89	0.94
109	124.47	123.26	669.30	48.00	25.49	34.21	26.82	0.95
108	123.26	122.57	516.30	48.00	25.49	29.42	23.06	1.11
107	122.57	120.49	744.20	48.00	25.49	42.54	33.35	0.76
106	120.49	120.17	300.80	54.00	25.49	35.93	28.17	0.90
105A	120.17	119.54	385.10	54.00	34.35	44.56	34.93	0.98
105	119.54	118.42	661.90	54.00	34.35	45.32	35.53	0.97
104	118.42	116.91	727.00	54.00	34.35	50.21	39.36	0.87
103	116.91	115.15	722.30	54.00	34.35	54.38	42.64	0.81
102	115.15	114.37	432.50	54.00	34.35	46.79	36.68	0.94
101	114.37	113.40	603.60	54.00	34.35	44.16	34.62	0.99
100	113.40	112.43	602.40	54.00	34.35	44.21	34.66	0.99
99	112.43	111.06	742.50	54.00	34.35	47.32	37.10	0.93
98	111.06	109.87	648.80	54.00	34.71	47.18	36.99	0.94
97	109.87	108.82	621.80	54.00	34.71	45.27	35.49	0.98
96	108.82	107.63	709.10	54.00	34.71	45.13	35.38	0.98
95	107.63	106.05	718.70	54.00	34.71	51.65	40.50	0.86
94	106.05	104.63	694.20	54.00	34.71	49.83	39.06	0.89
93	104.63	103.64	419.00	54.00	34.94	53.55	41.98	0.83
92	103.64	102.60	467.10	54.00	34.94	51.98	40.76	0.86
91	102.60	101.80	440.30	54.00	34.94	46.96	36.82	0.95
90	101.80	100.88	492.10	54.00	34.94	47.63	37.35	0.94
89	100.88	100.29	316.80	54.00	34.94	47.54	37.27	0.94
88	100.29	99.13	553.90	54.00	34.94	50.41	39.52	0.88
87	99.13	97.48	788.70	54.00	34.94	50.39	39.50	0.88
86	97.48	96.52	507.80	54.00	34.94	47.90	37.55	0.93

ALTERNATIVE II (Constant n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
85	96.52	95.81	390.70	54.00	34.94	46.96	36.82	0.95
84	95.81	94.50	401.60	54.00	34.94	62.92	49.33	0.71
83	94.50	93.47	508.50	54.00	34.94	49.58	38.87	0.90
82	93.47	91.74	674.50	60.00	36.10	73.89	57.93	0.62
81	91.74	90.12	775.50	60.00	36.10	66.68	52.28	0.69
80	90.12	88.88	676.40	60.00	36.10	62.47	48.98	0.74
79	88.88	87.68	581.50	60.00	36.10	66.28	51.97	0.69
78	87.68	86.41	721.50	60.00	36.10	61.22	47.99	0.75
77	86.41	85.68	414.10	60.00	36.10	61.26	48.03	0.75
76	85.68	84.71	538.70	60.00	36.10	61.91	48.54	0.74
075A	84.40	84.00	194.00	60.00	37.47	66.25	51.94	0.72
75	84.71	84.40	184.50	60.00	36.10	59.81	46.89	0.77
74	84.00	82.61	676.90	60.00	37.47	66.12	51.83	0.72
73	82.61	81.67	481.80	60.00	37.47	64.45	50.53	0.74
72	81.67	80.25	716.60	60.00	37.47	64.95	50.92	0.74
71	80.25	78.90	716.20	60.00	37.47	63.35	49.67	0.75
70	78.90	77.36	728.80	60.00	37.47	67.07	52.58	0.71
69	77.36	76.15	628.50	60.00	38.83	64.02	50.19	0.77
68	76.15	74.91	645.40	60.00	38.83	63.96	50.14	0.77
67	74.91	73.59	685.40	60.00	38.83	64.03	50.20	0.77
66	73.59	72.23	787.60	60.00	38.83	60.63	47.54	0.82
65	72.23	71.10	659.00	60.00	38.83	60.42	47.37	0.82
64	71.10	69.84	680.30	60.00	38.83	62.79	49.23	0.79
63	69.84	68.40	620.80	60.00	38.83	70.27	55.09	0.70
62	68.40	67.08	572.60	60.00	39.37	70.05	54.92	0.72
61	67.08	65.84	655.60	60.00	39.37	63.45	49.75	0.79
60	65.84	64.70	600.00	60.00	39.37	63.60	49.86	0.79
59	64.70	63.41	634.40	60.00	40.52	65.79	51.58	0.79
58	63.41	62.22	653.60	60.00	40.52	62.26	48.81	0.83
57	62.22	61.12	604.40	60.00	40.52	62.24	48.80	0.83
56	61.12	59.45	600.00	60.00	41.97	76.97	60.35	0.70
55	59.45	57.86	770.60	60.00	41.97	66.28	51.96	0.81
54	57.86	56.55	671.40	60.00	41.97	64.45	50.53	0.83
53	56.55	55.26	624.70	60.00	41.97	66.30	51.98	0.81
52	55.26	53.88	758.90	60.00	41.97	62.22	48.78	0.86
51	53.88	53.45	749.40	60.00	41.97	34.95	27.40	1.53
50	53.45	51.21	567.70	60.00	41.97	91.65	71.85	0.58
49	51.21	50.48	392.60	60.00	41.97	62.92	49.33	0.85
48	50.48	48.92	768.40	60.00	41.97	65.74	51.54	0.81
47	48.92	47.90	605.00	60.00	43.46	59.91	46.97	0.93
46	47.90	46.51	598.90	60.00	43.46	70.29	55.11	0.79
45	46.51	45.49	605.00	60.00	43.46	59.91	46.97	0.93
44	45.49	43.73	785.80	60.00	43.46	69.05	54.14	0.80
43	43.73	42.55	525.30	60.00	43.46	69.15	54.22	0.80
42	42.55	41.24	687.30	60.00	43.46	63.70	49.94	0.87
41	41.24	39.58	678.50	60.00	44.41	72.17	56.58	0.78

ALTERNATIVE II (Constant n)

CONDUIT SUMMARY: PARALLEL LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 125A	143.70	143.60	20.00	30.00	8.80	16.25	12.74	0.69
FUT 125	143.60	142.36	493.00	30.00	8.80	11.53	9.04	0.97
FUT 124	142.36	140.98	551.00	30.00	8.80	11.50	9.02	0.98
FUT 123	141.00	139.07	770.00	30.00	8.88	11.51	9.02	0.98
FUT 122	139.07	137.18	757.00	30.00	8.86	11.48	9.00	0.98
FUT 121	137.18	135.58	640.00	30.00	8.84	11.49	9.01	0.98
FUT 120	135.58	133.63	778.00	30.00	8.84	11.51	9.02	0.98
FUT 119	133.63	132.66	388.00	30.00	8.82	11.49	9.01	0.98
FUT 118	132.66	131.85	428.00	36.00	8.81	16.26	12.75	0.69
FUT 117	131.85	130.90	456.00	36.00	8.80	17.05	13.37	0.66
FUT 116	130.90	129.95	499.00	36.00	8.80	16.30	12.78	0.69
FUT 115	129.95	128.81	708.00	36.00	8.80	15.00	11.76	0.75
FUT 114	128.81	127.85	711.00	36.00	8.80	13.73	10.76	0.82
FUT 113	127.85	127.35	436.00	36.00	8.80	12.66	9.92	0.89
FUT 112	127.35	126.42	677.00	36.00	8.80	13.85	10.86	0.81
FUT 111	126.42	125.68	404.00	36.00	8.80	15.99	12.54	0.70
FUT 110	125.68	124.47	666.00	36.00	8.80	15.93	12.49	0.70
FUT 109	124.47	123.26	669.00	36.00	8.80	15.89	12.46	0.71
FUT 108	123.26	122.57	516.00	36.00	8.80	13.67	10.71	0.82
FUT 107	122.57	120.49	744.00	36.00	8.80	19.75	15.49	0.57
FUT 106	120.49	120.17	301.00	36.00	8.80	12.18	9.55	0.92
FUT 82A	93.47	93.40	20.00	54.00	40.18	65.18	51.10	0.79
FUT 82	93.00	91.74	674.00	60.00	40.18	63.08	49.46	0.81
FUT 81	91.74	90.12	776.00	60.00	40.18	66.66	52.26	0.77
FUT 80	90.12	88.88	676.00	60.00	40.18	62.49	48.99	0.82
FUT 79	88.88	87.68	581.00	60.00	40.18	66.31	51.99	0.77
FUT 78	87.68	86.41	721.00	60.00	40.18	61.23	48.01	0.84
FUT 77	86.41	85.68	414.00	60.00	40.18	61.27	48.03	0.84
FUT 76	85.68	84.71	539.00	60.00	40.18	61.89	48.52	0.83
FUT 75A	84.40	84.00	194.00	60.00	40.18	66.25	51.94	0.77
FUT 75	84.71	84.40	184.00	60.00	40.18	59.89	46.95	0.86
FUT 74	84.00	82.61	677.00	60.00	40.18	66.12	51.83	0.78
FUT 73	82.61	81.67	482.00	60.00	40.18	64.43	50.52	0.80
FUT 72	81.67	80.25	717.00	60.00	40.18	64.93	50.91	0.79
FUT 71	80.25	78.90	716.00	60.00	40.18	63.35	49.67	0.81
FUT 70	78.90	77.36	729.00	60.00	40.18	67.06	52.57	0.76
FUT 69	77.36	76.15	628.00	60.00	40.18	64.05	50.21	0.80
FUT 68	76.15	74.91	645.00	60.00	40.18	63.98	50.16	0.80
FUT 67	74.91	73.59	685.00	60.00	40.18	64.05	50.21	0.80
FUT 66	73.59	72.23	788.00	60.00	40.18	60.61	47.52	0.85
FUT 65	72.23	71.10	659.00	60.00	40.18	60.42	47.37	0.85
FUT 64	71.10	69.84	680.00	60.00	40.18	62.81	49.24	0.82
FUT 63	69.84	68.40	621.00	60.00	40.18	70.26	55.08	0.73
FUT 62	68.40	67.08	573.00	60.00	40.18	70.03	54.91	0.73
FUT 61	67.08	65.84	656.00	60.00	40.18	63.43	49.73	0.81

ALTERNATIVE II (Constant n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 60	65.84	64.70	600.00	60.00	40.18	63.60	49.86	0.81
FUT 59	64.70	63.41	634.00	60.00	40.18	65.82	51.60	0.78
FUT 58	63.41	62.22	654.00	60.00	40.18	62.24	48.79	0.82
FUT 57	62.22	61.12	604.00	60.00	40.18	62.27	48.82	0.82
FUT 56	61.12	59.45	600.00	60.00	40.18	76.97	60.35	0.67
FUT 55	59.45	57.86	771.00	60.00	40.18	66.26	51.95	0.77
FUT 54	57.86	56.55	671.00	60.00	40.18	64.47	50.54	0.80
FUT 53	56.55	55.26	625.00	60.00	40.18	66.29	51.97	0.77
FUT 52	55.26	53.88	759.00	60.00	40.18	62.22	48.78	0.82
FUT 51	53.88	52.38	749.00	60.00	40.18	65.29	51.19	0.78
FUT 50	52.38	51.21	568.00	60.00	40.18	66.22	51.92	0.77
FUT 49	51.21	50.48	393.00	60.00	40.18	62.88	49.30	0.82
FUT 48	50.48	48.92	768.00	60.00	40.18	65.76	51.56	0.78
FUT 47	48.92	47.90	605.00	60.00	40.18	59.91	46.97	0.86
FUT 46	47.90	46.51	599.00	60.00	40.18	70.28	55.10	0.73
FUT 45	46.51	45.49	605.00	60.00	40.18	59.91	46.97	0.86
FUT 44	45.49	43.73	786.00	60.00	40.18	69.04	54.13	0.74
FUT 43	43.73	42.55	525.00	60.00	40.18	69.17	54.23	0.74
FUT 42	42.55	41.24	687.00	60.00	40.18	63.71	49.95	0.80
FUT 41	41.24	39.58	679.00	60.00	40.18	72.14	56.56	0.71

Note: When ratio of computed to design flow > 1, then the pipe has exceeded design capacity. Even when the ratio of computed flow to design flow is greater than 1, the model still shows them within the design capacity. This is due to the slope of hydraulic line being greater than the slope of the pipe in that particular pipe segment.

ALTERNATIVE II (Constant n)

JUNCTION SUMMARY: EXISTING LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	26.50	149.91	0.00	8.69	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.28	0.00	10.27	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.23	0.00	5.08	0.00
SANMH 123	140.90	154.05	144.40	0.77	143.04	0.00	11.01	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.39	0.00	20.52	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.83	0.00	11.32	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.36	0.00	10.78	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.74	0.00	12.35	0.00
SANMH 118	133.71	147.92	137.21	0.00	136.02	0.00	11.90	0.00
SANMH 117	133.04	148.12	137.04	4.96	135.14	0.00	12.98	0.00
SANMH 116	131.56	147.80	135.56	0.00	133.99	0.00	13.81	0.00
SANMH 115	130.59	145.49	134.59	0.00	133.13	0.00	12.36	0.00
SANMH 114	129.44	144.68	133.44	0.53	132.01	0.00	12.67	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.87	0.00	11.45	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.13	0.00	11.71	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.93	0.00	10.54	0.00
SANMH 110	125.68	139.67	129.68	1.42	128.26	0.00	11.41	0.00
SANMH 109	124.47	138.07	128.47	0.10	127.08	0.00	10.99	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.93	0.00	10.88	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.91	0.00	10.21	0.00
SANMH 106	120.49	133.54	124.99	0.00	123.38	0.00	10.16	0.00
SANMH 105A	120.17	135.19	124.67	0.06	123.10	0.00	12.09	0.00
SANMH 105	119.54	133.09	124.04	0.00	122.42	0.00	10.67	0.00
SANMH 104	118.42	132.62	122.92	0.00	121.15	0.00	11.47	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.58	0.00	10.73	0.00
SANMH 102	115.15	129.75	119.65	0.00	118.07	0.00	11.68	0.00
SANMH 101	114.37	128.97	118.87	0.00	117.34	0.00	11.63	0.00
SANMH 100	113.40	125.65	117.90	0.00	116.34	0.00	9.31	0.00
SANMH 99	112.43	125.43	116.93	0.00	115.29	0.00	10.14	0.00
SANMH 98	111.06	127.00	115.56	0.36	113.96	0.00	13.04	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.81	0.00	10.98	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.73	0.00	9.49	0.00
SANMH 95	107.63	120.31	112.13	0.00	110.35	0.00	9.96	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.81	0.00	11.96	0.00
SANMH 93	104.63	117.88	109.13	0.23	107.32	0.00	10.56	0.00
SANMH 92	103.64	116.31	108.14	0.00	106.41	0.00	9.90	0.00
SANMH 91	102.60	115.70	107.10	0.00	105.48	0.00	10.22	0.00
SANMH 90	101.80	114.40	106.30	0.00	104.65	0.00	9.75	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.70	0.00	9.96	0.00
SANMH 88	100.29	113.09	104.79	0.00	103.05	0.00	10.04	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.91	0.00	10.39	0.00

ALTERNATIVE II (Constant n)

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 86	97.48	109.88	101.98	0.00	100.31	0.00	9.58	0.00
SANMH 85	96.52	108.97	101.02	0.00	99.27	0.00	9.70	0.00
SANMH 84	95.81	109.11	100.31	0.00	98.29	0.00	10.82	0.00
SANMH 83	94.50	108.44	99.00	0.00	97.23	0.00	11.21	0.00
SANMH 82	93.47	106.10	98.47	41.34	95.97	0.00	10.13	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.38	0.00	11.18	0.00
SANMH 80	90.12	103.87	95.12	0.00	92.84	0.00	11.03	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.55	0.00	9.79	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.44	0.00	9.79	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.17	0.00	9.37	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.42	0.00	9.59	0.00
SANMH 75	84.40	98.30	89.40	1.38	87.10	0.00	11.20	0.00
SANMH 75A	84.71	101.02	89.71	0.00	87.45	0.00	13.57	0.00
SANMH 74	84.00	95.82	89.00	0.00	86.71	0.00	9.11	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.35	0.00	9.31	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.41	0.00	8.78	0.00
SANMH 71	80.25	91.95	85.25	0.00	83.01	0.00	8.94	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.61	0.00	10.10	0.00
SANMH 69	77.36	89.38	82.36	1.36	80.17	0.00	9.21	0.00
SANMH 68	76.15	87.87	81.15	0.00	78.97	0.00	8.90	0.00
SANMH 67	74.91	86.88	79.91	0.00	77.75	0.00	9.13	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.50	0.00	9.19	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.13	0.00	8.77	0.00
SANMH 64	71.10	82.30	76.10	0.00	73.92	0.00	8.38	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.51	0.00	9.39	0.00
SANMH 62	68.40	82.75	73.40	0.54	71.13	0.00	11.62	0.00
SANMH 61	67.08	80.48	72.08	0.00	69.93	0.00	10.55	0.00
SANMH 60	65.84	78.87	70.84	0.00	68.69	0.00	10.18	0.00
SANMH 59	64.70	78.08	69.70	1.15	67.57	0.00	10.51	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.34	0.00	11.42	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.11	0.00	10.32	0.00
SANMH 56	61.12	74.90	66.12	1.45	63.81	0.00	11.09	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.36	0.00	11.50	0.00
SANMH 54	57.86	72.54	62.86	0.00	60.81	0.00	11.73	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.53	0.00	11.69	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.42	0.00	12.94	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.32	0.00	11.36	0.00
SANMH 50	53.45	67.80	58.45	0.00	55.89	0.00	11.91	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.19	0.00	12.48	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.44	0.00	12.80	0.00
SANMH 47	48.92	64.87	53.92	1.50	52.01	0.00	12.86	0.00
SANMH 46	47.90	63.50	52.90	0.00	50.82	0.00	12.68	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.59	0.00	13.14	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.38	0.00	12.81	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.65	0.00	13.07	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.55	0.00	13.60	0.00

ALTERNATIVE II (Constant n)

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 41	41.24	59.82	46.24	0.95	44.08	0.00	15.74	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.42	0.00	14.63	0.00

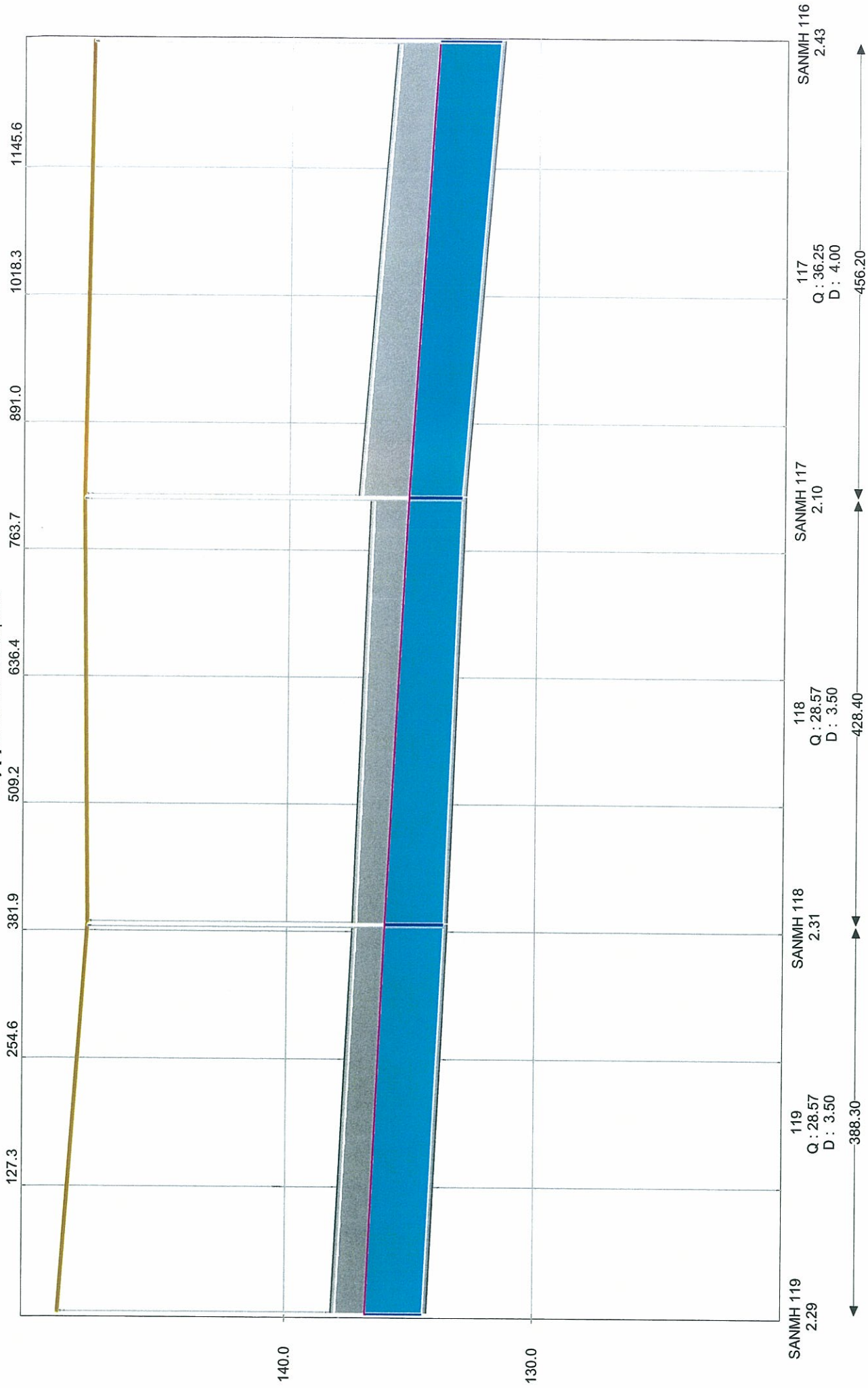
JUNCTION SUMMARY: PARALLEL LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
FUT MH125	143.60	155.55	146.10	0.00	145.24	0.00	10.31	0.00
FUT MH124	142.36	149.30	144.86	0.00	144.01	0.00	5.30	0.00
FUT MH123	140.98	154.05	143.50	0.00	142.66	0.00	11.41	0.00
FUT MH122	139.07	161.90	141.57	0.00	140.72	0.00	21.19	0.00
FUT MH121	137.18	151.15	139.68	0.00	138.83	0.00	12.33	0.00
FUT MH120	135.58	149.14	138.08	0.00	137.23	0.00	11.92	0.00
FUT MH119	133.63	149.09	136.13	0.00	135.27	0.00	13.83	0.00
FUT MH118	132.66	147.92	135.66	0.00	134.23	0.00	13.69	0.00
FUT MH117	131.85	148.12	134.85	0.00	133.39	0.00	14.73	0.00
FUT MH116	130.90	147.80	133.90	0.00	132.50	0.00	15.31	0.00
FUT MH115	129.95	145.49	132.95	0.00	131.63	0.00	13.86	0.00
FUT MH114	128.81	144.68	131.81	0.00	130.57	0.00	14.11	0.00
FUT MH113	127.85	142.32	130.85	0.00	129.65	0.00	12.67	0.00
FUT MH112	127.35	141.84	130.35	0.00	129.07	0.00	12.77	0.00
FUT MH111	126.42	139.47	129.42	0.00	128.01	0.00	11.46	0.00
FUT MH110	125.68	139.67	128.68	0.00	127.28	0.00	12.39	0.00
FUT MH109	124.47	138.07	127.47	0.00	126.09	0.00	11.98	0.00
FUT MH108	123.26	136.81	126.26	0.00	124.98	0.00	11.83	0.00
FUT MH107	122.57	135.12	125.57	0.00	124.17	0.00	10.95	0.00
FUT MH106	120.49	133.54	123.49	0.00	123.24	0.00	10.30	0.00
FUT MH82	93.00	106.10	98.00	0.00	95.89	0.00	10.21	0.00
FUT MH81	91.74	105.56	96.74	0.00	94.57	0.00	10.99	0.00
FUT MH80	90.12	103.87	95.12	0.00	93.03	0.00	10.84	0.00
FUT MH79	88.88	101.34	93.88	0.00	91.74	0.00	9.60	0.00
FUT MH78	87.68	100.23	92.68	0.00	90.63	0.00	9.60	0.00
FUT MH77	86.41	98.53	91.41	0.00	89.35	0.00	9.18	0.00
FUT MH76	85.68	98.01	90.68	0.00	88.60	0.00	9.41	0.00
FUT MH75	84.40	98.30	89.40	0.00	87.22	0.00	11.08	0.00
FUT MH75A	84.71	101.02	89.71	0.00	87.60	0.00	13.43	0.00
FUT MH74	84.00	95.82	89.00	0.00	86.83	0.00	8.99	0.00
FUT MH73	82.61	94.66	87.61	0.00	85.47	0.00	9.19	0.00
FUT MH72	81.67	93.18	86.67	0.00	84.53	0.00	8.65	0.00
FUT MH71	80.25	91.95	85.25	0.00	83.13	0.00	8.82	0.00
FUT MH70	78.90	91.71	83.90	0.00	81.71	0.00	10.00	0.00
FUT MH69	77.36	89.38	82.36	0.00	80.24	0.00	9.14	0.00

ALTERNATIVE II (Constant n)

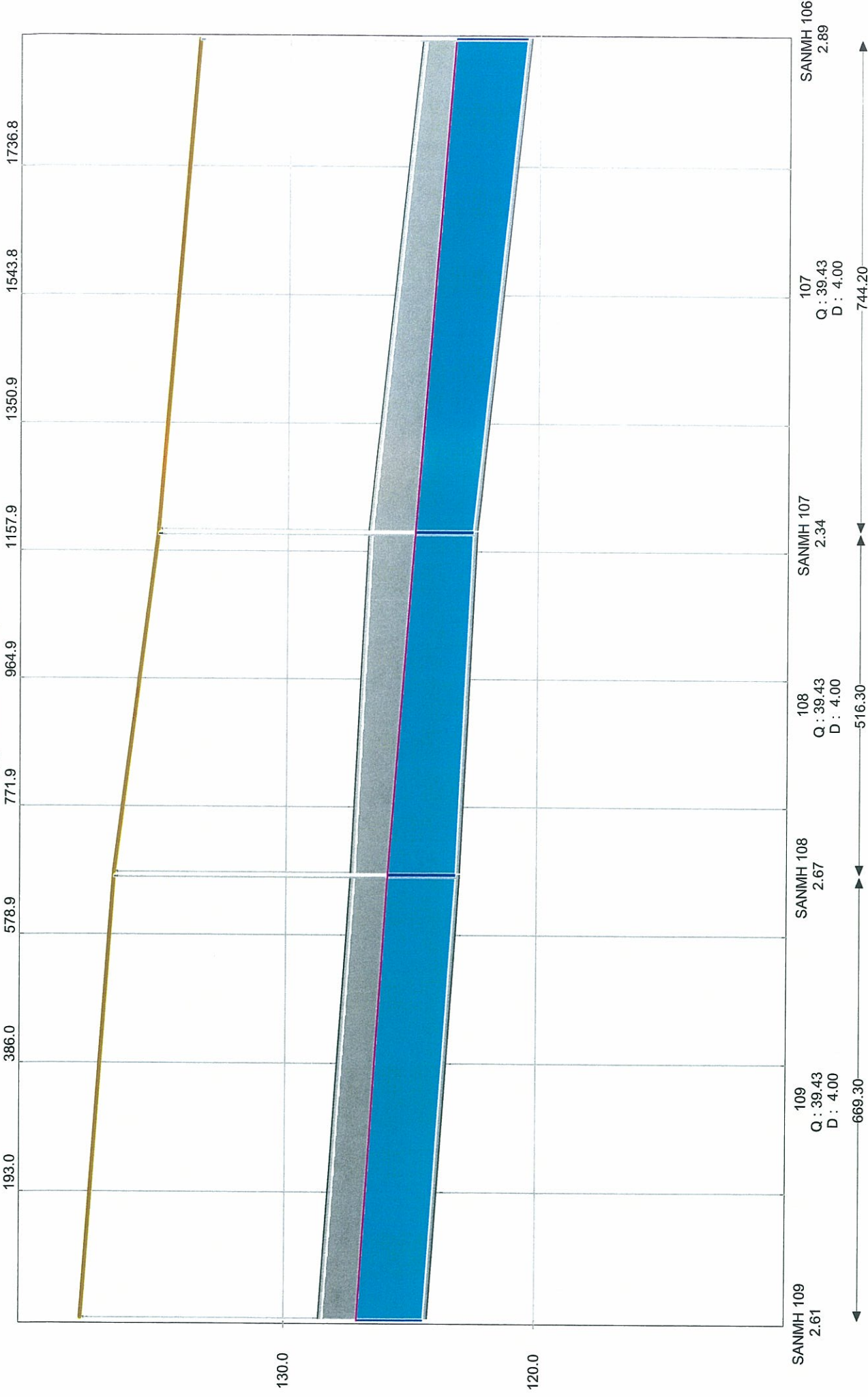
Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH68	76.15	87.87	81.15	0.00	79.03	0.00	8.84	0.00
FUT MH67	74.91	86.88	79.91	0.00	77.81	0.00	9.07	0.00
FUT MH66	73.59	85.69	78.59	0.00	76.56	0.00	9.13	0.00
FUT MH65	72.23	83.90	77.23	0.00	75.19	0.00	8.71	0.00
FUT MH64	71.10	82.30	76.10	0.00	73.98	0.00	8.32	0.00
FUT MH63	69.84	81.90	74.84	0.00	72.56	0.00	9.34	0.00
FUT MH62	68.40	82.75	73.40	0.00	71.16	0.00	11.59	0.00
FUT MH61	67.08	80.48	72.08	0.00	69.97	0.00	10.51	0.00
FUT MH60	65.84	78.87	70.84	0.00	68.72	0.00	10.15	0.00
FUT MH59	64.70	78.08	69.70	0.00	67.55	0.00	10.53	0.00
FUT MH58	63.41	77.76	68.41	0.00	66.32	0.00	11.44	0.00
FUT MH57	62.22	75.43	67.22	0.00	65.09	0.00	10.34	0.00
FUT MH56	61.12	74.90	66.12	0.00	63.74	0.00	11.17	0.00
FUT MH55	59.45	73.85	64.45	0.00	62.27	0.00	11.58	0.00
FUT MH54	57.86	72.54	62.86	0.00	60.72	0.00	11.82	0.00
FUT MH53	56.55	71.22	61.55	0.00	59.39	0.00	11.83	0.00
FUT MH52	55.26	71.36	60.26	0.00	58.17	0.00	13.19	0.00
FUT MH51	53.88	68.68	58.88	0.00	56.72	0.00	11.96	0.00
FUT MH50	52.38	67.80	57.38	0.00	55.22	0.00	12.58	0.00
FUT MH49	51.21	66.66	56.21	0.00	54.10	0.00	12.56	0.00
FUT MH48	50.48	66.23	55.48	0.00	53.34	0.00	12.90	0.00
FUT MH47	48.92	64.87	53.92	0.00	51.86	0.00	13.01	0.00
FUT MH46	47.90	63.50	52.90	0.00	50.67	0.00	12.83	0.00
FUT MH45	46.51	62.73	51.51	0.00	49.45	0.00	13.28	0.00
FUT MH44	45.49	61.19	50.49	0.00	48.24	0.00	12.95	0.00
FUT MH43	43.73	59.72	48.73	0.00	46.50	0.00	13.22	0.00
FUT MH42	42.55	59.15	47.55	0.00	45.41	0.00	13.74	0.00
FUT MH41	41.24	59.82	46.24	0.00	43.94	0.00	15.88	0.00

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Day [0] Time 12:00:00 Step 720



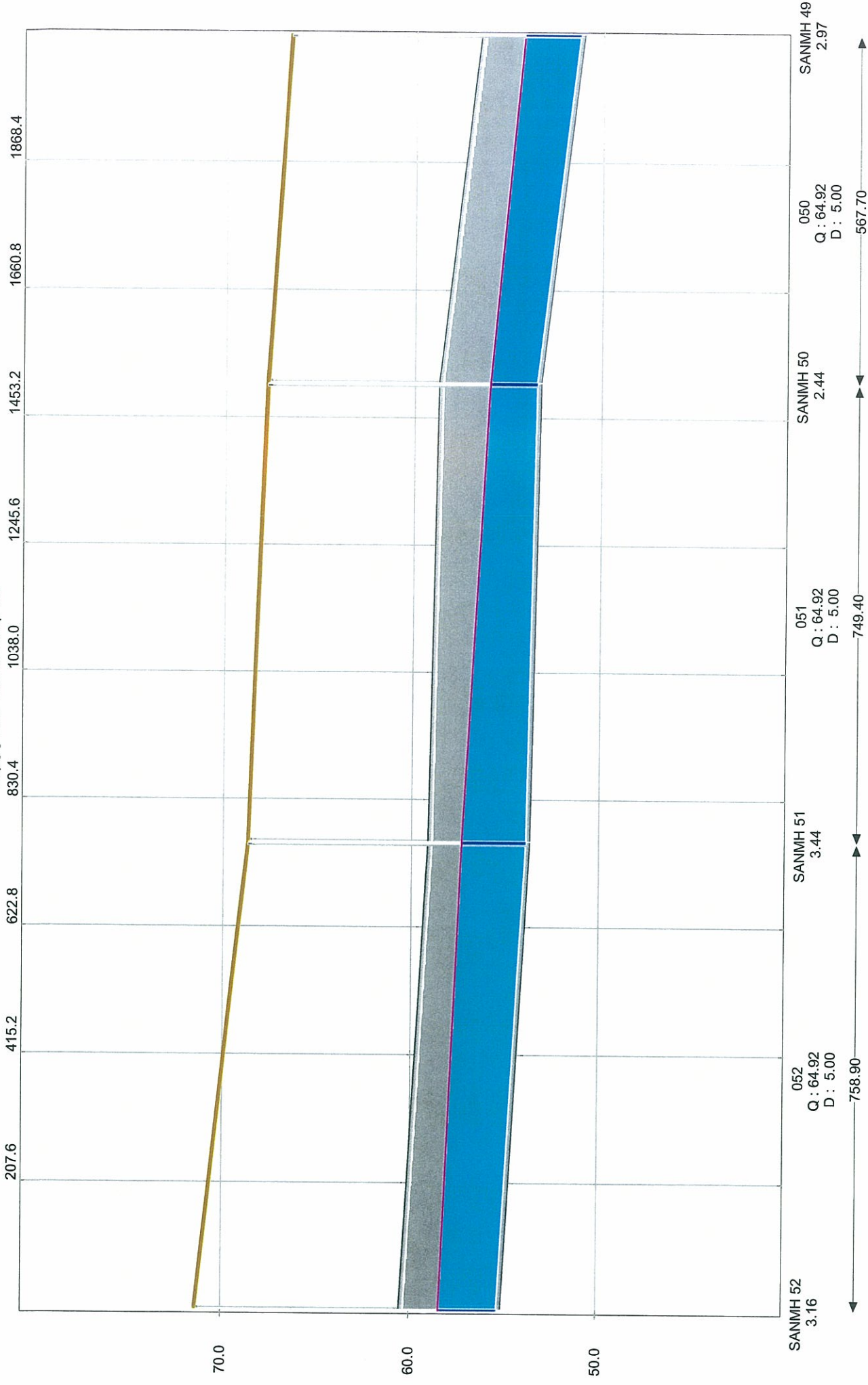
Alternative II

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Day [0] Time 12:00:00 Step 720



Alternative II

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Day [0] Time 12:00:00 Step 720



Alternative II

**Alternative III:
Parallel Interceptor MH 125-105A & MH 82- MH 40,
Residential Density 20% Increase**

ALTERNATIVE III (Constant n)

CONDUIT SUMMARY: EXISTING LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	148.08	143.15	582.50	42.00	27.14	51.86	40.65	0.67
125	143.15	142.12	492.90	42.00	17.98	25.77	20.20	0.89
124	142.12	140.90	551.20	42.00	17.91	26.52	20.79	0.86
123	140.90	139.10	769.90	42.00	18.75	27.25	21.37	0.88
122	139.10	137.72	757.50	42.00	18.75	24.06	18.86	0.99
121	137.72	136.19	640.20	42.00	18.75	27.56	21.60	0.87
120	136.19	134.45	778.00	42.00	18.75	26.66	20.90	0.90
119	134.45	133.71	388.30	42.00	18.75	24.60	19.29	0.97
118	133.71	133.04	428.40	42.00	18.75	22.29	17.47	1.07
117	133.04	131.56	456.20	48.00	23.78	45.84	35.94	0.66
116	131.56	130.59	498.60	48.00	23.78	35.49	27.83	0.85
115	130.59	129.44	708.10	48.00	23.78	32.43	25.43	0.94
114	129.44	128.30	710.70	48.00	24.36	32.23	25.27	0.96
113	128.30	127.65	436.00	48.00	24.36	31.07	24.36	1.00
112	127.65	126.42	677.00	48.00	24.36	34.30	26.89	0.91
111	126.42	125.68	404.30	48.00	24.36	34.43	26.99	0.90
110	125.68	124.47	666.20	48.00	25.79	34.30	26.89	0.96
109	124.47	123.26	669.30	48.00	25.91	34.21	26.82	0.97
108	123.26	122.57	516.30	48.00	25.91	29.42	23.06	1.12
107	122.57	120.49	744.20	48.00	25.91	42.54	33.35	0.78
106	120.49	120.17	300.80	54.00	25.91	35.93	28.17	0.92
105A	120.17	119.54	385.10	54.00	34.91	44.56	34.93	1.00
105	119.54	118.42	661.90	54.00	34.91	45.32	35.53	0.98
104	118.42	116.91	727.00	54.00	34.91	50.21	39.36	0.89
103	116.91	115.15	722.30	54.00	34.91	54.38	42.64	0.82
102	115.15	114.37	432.50	54.00	34.91	46.79	36.68	0.95
101	114.37	113.40	603.60	54.00	34.91	44.16	34.62	1.01
100	113.40	112.43	602.40	54.00	34.91	44.21	34.66	1.01
99	112.43	111.06	742.50	54.00	34.91	47.32	37.10	0.94
98	111.06	109.87	648.80	54.00	35.31	47.18	36.99	0.95
97	109.87	108.82	621.80	54.00	35.31	45.27	35.49	0.99
96	108.82	107.63	709.10	54.00	35.31	45.13	35.38	1.00
95	107.63	106.05	718.70	54.00	35.31	51.65	40.50	0.87
94	106.05	104.63	694.20	54.00	35.31	49.83	39.06	0.90
93	104.63	103.64	419.00	54.00	35.55	53.55	41.98	0.85
92	103.64	102.60	467.10	54.00	35.55	51.98	40.76	0.87
91	102.60	101.80	440.30	54.00	35.55	46.96	36.82	0.97
90	101.80	100.88	492.10	54.00	35.55	47.63	37.35	0.95
89	100.88	100.29	316.80	54.00	35.55	47.54	37.27	0.95
88	100.29	99.13	553.90	54.00	35.55	50.41	39.52	0.90
87	99.13	97.48	788.70	54.00	35.55	50.39	39.50	0.90
86	97.48	96.52	507.80	54.00	35.55	47.90	37.55	0.95

ALTERNATIVE III (Constant n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
85	96.52	95.81	390.70	54.00	35.55	46.96	36.82	0.97
84	95.81	94.50	401.60	54.00	35.55	62.92	49.33	0.72
83	94.50	93.47	508.50	54.00	35.55	49.58	38.87	0.91
82	93.47	91.74	674.50	60.00	36.98	73.89	57.93	0.64
81	91.74	90.12	775.50	60.00	36.98	66.68	52.28	0.71
80	90.12	88.88	676.40	60.00	36.98	62.47	48.98	0.76
79	88.88	87.68	581.50	60.00	36.98	66.28	51.97	0.71
78	87.68	86.41	721.50	60.00	36.98	61.22	47.99	0.77
77	86.41	85.68	414.10	60.00	36.98	61.26	48.03	0.77
76	85.68	84.71	538.70	60.00	36.98	61.91	48.54	0.76
075A	84.40	84.00	194.00	60.00	38.36	66.25	51.94	0.74
75	84.71	84.40	184.50	60.00	36.98	59.81	46.89	0.79
74	84.00	82.61	676.90	60.00	38.36	66.12	51.83	0.74
73	82.61	81.67	481.80	60.00	38.36	64.45	50.53	0.76
72	81.67	80.25	716.60	60.00	38.36	64.95	50.92	0.75
71	80.25	78.90	716.20	60.00	38.36	63.35	49.67	0.77
70	78.90	77.36	728.80	60.00	38.36	67.07	52.58	0.73
69	77.36	76.15	628.50	60.00	39.76	64.02	50.19	0.79
68	76.15	74.91	645.40	60.00	39.76	63.96	50.14	0.79
67	74.91	73.59	685.40	60.00	39.76	64.03	50.20	0.79
66	73.59	72.23	787.60	60.00	39.76	60.63	47.54	0.84
65	72.23	71.10	659.00	60.00	39.76	60.42	47.37	0.84
64	71.10	69.84	680.30	60.00	39.76	62.79	49.23	0.81
63	69.84	68.40	620.80	60.00	39.76	70.27	55.09	0.72
62	68.40	67.08	572.60	60.00	40.36	70.05	54.92	0.73
61	67.08	65.84	655.60	60.00	40.36	63.45	49.75	0.81
60	65.84	64.70	600.00	60.00	40.36	63.60	49.86	0.81
59	64.70	63.41	634.40	60.00	41.53	65.79	51.58	0.81
58	63.41	62.22	653.60	60.00	41.53	62.26	48.81	0.85
57	62.22	61.12	604.40	60.00	41.53	62.24	48.80	0.85
56	61.12	59.45	600.00	60.00	43.04	76.97	60.35	0.71
55	59.45	57.86	770.60	60.00	43.04	66.28	51.96	0.83
54	57.86	56.55	671.40	60.00	43.04	64.45	50.53	0.85
53	56.55	55.26	624.70	60.00	43.04	66.30	51.98	0.83
52	55.26	53.88	758.90	60.00	43.04	62.22	48.78	0.88
51	53.88	53.45	749.40	60.00	43.04	34.95	27.40	1.57
50	53.45	51.21	567.70	60.00	43.04	91.65	71.85	0.60
49	51.21	50.48	392.60	60.00	43.04	62.92	49.33	0.87
48	50.48	48.92	768.40	60.00	43.04	65.74	51.54	0.84
47	48.92	47.90	605.00	60.00	44.74	59.91	46.97	0.95
46	47.90	46.51	598.90	60.00	44.74	70.29	55.11	0.81
45	46.51	45.49	605.00	60.00	44.74	59.91	46.97	0.95
44	45.49	43.73	785.80	60.00	44.74	69.05	54.14	0.83
43	43.73	42.55	525.30	60.00	44.74	69.15	54.22	0.83
42	42.55	41.24	687.30	60.00	44.74	63.70	49.94	0.90
41	41.24	39.58	678.50	60.00	45.79	72.17	56.58	0.81

ALTERNATIVE III (Constant n)

CONDUIT SUMMARY: PARALLEL LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 125A	143.70	143.60	20.00	30.00	8.93	16.25	12.74	0.70
FUT 125	143.60	142.36	493.00	30.00	8.93	11.53	9.04	0.99
FUT 124	142.36	140.98	551.00	30.00	8.93	11.50	9.02	0.99
FUT 123	141.00	139.07	770.00	30.00	9.00	11.51	9.02	1.00
FUT 122	139.07	137.18	757.00	30.00	8.97	11.48	9.00	1.00
FUT 121	137.18	135.58	640.00	30.00	8.95	11.49	9.01	0.99
FUT 120	135.58	133.63	778.00	30.00	8.96	11.51	9.02	0.99
FUT 119	133.63	132.66	388.00	30.00	8.94	11.49	9.01	0.99
FUT 118	132.66	131.85	428.00	36.00	8.93	16.26	12.75	0.70
FUT 117	131.85	130.90	456.00	36.00	8.93	17.05	13.37	0.67
FUT 116	130.90	129.95	499.00	36.00	8.93	16.30	12.78	0.70
FUT 115	129.95	128.81	708.00	36.00	8.93	15.00	11.76	0.76
FUT 114	128.81	127.85	711.00	36.00	8.93	13.73	10.76	0.83
FUT 113	127.85	127.35	436.00	36.00	8.93	12.66	9.92	0.90
FUT 112	127.35	126.42	677.00	36.00	8.93	13.85	10.86	0.82
FUT 111	126.42	125.68	404.00	36.00	8.93	15.99	12.54	0.71
FUT 110	125.68	124.47	666.00	36.00	8.93	15.93	12.49	0.71
FUT 109	124.47	123.26	669.00	36.00	8.93	15.89	12.46	0.72
FUT 108	123.26	122.57	516.00	36.00	8.93	13.67	10.71	0.83
FUT 107	122.57	120.49	744.00	36.00	8.93	19.75	15.49	0.58
FUT 106	120.49	120.17	301.00	36.00	8.93	12.18	9.55	0.93
FUT 82A	93.47	93.40	20.00	54.00	41.01	65.18	51.10	0.80
FUT 82	93.00	91.74	674.00	60.00	41.01	63.08	49.46	0.83
FUT 81	91.74	90.12	776.00	60.00	41.01	66.66	52.26	0.78
FUT 80	90.12	88.88	676.00	60.00	41.01	62.49	48.99	0.84
FUT 79	88.88	87.68	581.00	60.00	41.01	66.31	51.99	0.79
FUT 78	87.68	86.41	721.00	60.00	41.01	61.23	48.01	0.85
FUT 77	86.41	85.68	414.00	60.00	41.01	61.27	48.03	0.85
FUT 76	85.68	84.71	539.00	60.00	41.01	61.89	48.52	0.85
FUT 75A	84.40	84.00	194.00	60.00	41.01	66.25	51.94	0.79
FUT 75	84.71	84.40	184.00	60.00	41.01	59.89	46.95	0.87
FUT 74	84.00	82.61	677.00	60.00	41.01	66.12	51.83	0.79
FUT 73	82.61	81.67	482.00	60.00	41.01	64.43	50.52	0.81
FUT 72	81.67	80.25	717.00	60.00	41.01	64.93	50.91	0.81
FUT 71	80.25	78.90	716.00	60.00	41.01	63.35	49.67	0.83
FUT 70	78.90	77.36	729.00	60.00	41.01	67.06	52.57	0.78
FUT 69	77.36	76.15	628.00	60.00	41.01	64.05	50.21	0.82
FUT 68	76.15	74.91	645.00	60.00	41.01	63.98	50.16	0.82
FUT 67	74.91	73.59	685.00	60.00	41.01	64.05	50.21	0.82
FUT 66	73.59	72.23	788.00	60.00	41.01	60.61	47.52	0.86
FUT 65	72.23	71.10	659.00	60.00	41.01	60.42	47.37	0.87
FUT 64	71.10	69.84	680.00	60.00	41.01	62.81	49.24	0.83
FUT 63	69.84	68.40	621.00	60.00	41.01	70.26	55.08	0.74
FUT 62	68.40	67.08	573.00	60.00	41.01	70.03	54.91	0.75
FUT 61	67.08	65.84	656.00	60.00	41.01	63.43	49.73	0.82

ALTERNATIVE III (Constant n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Ratio of Computed to Design flow
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 60	65.84	64.70	600.00	60.00	41.01	63.60	49.86	0.82
FUT 59	64.70	63.41	634.00	60.00	41.01	65.82	51.60	0.79
FUT 58	63.41	62.22	654.00	60.00	41.01	62.24	48.79	0.84
FUT 57	62.22	61.12	604.00	60.00	41.01	62.27	48.82	0.84
FUT 56	61.12	59.45	600.00	60.00	41.01	76.97	60.35	0.68
FUT 55	59.45	57.86	771.00	60.00	41.01	66.26	51.95	0.79
FUT 54	57.86	56.55	671.00	60.00	41.01	64.47	50.54	0.81
FUT 53	56.55	55.26	625.00	60.00	41.01	66.29	51.97	0.79
FUT 52	55.26	53.88	759.00	60.00	41.01	62.22	48.78	0.84
FUT 51	53.88	52.38	749.00	60.00	41.01	65.29	51.19	0.80
FUT 50	52.38	51.21	568.00	60.00	41.01	66.22	51.92	0.79
FUT 49	51.21	50.48	393.00	60.00	41.01	62.88	49.30	0.83
FUT 48	50.48	48.92	768.00	60.00	41.01	65.76	51.56	0.80
FUT 47	48.92	47.90	605.00	60.00	41.01	59.91	46.97	0.87
FUT 46	47.90	46.51	599.00	60.00	41.01	70.28	55.10	0.74
FUT 45	46.51	45.49	605.00	60.00	41.01	59.91	46.97	0.87
FUT 44	45.49	43.73	786.00	60.00	41.01	69.04	54.13	0.76
FUT 43	43.73	42.55	525.00	60.00	41.01	69.17	54.23	0.76
FUT 42	42.55	41.24	687.00	60.00	41.01	63.71	49.95	0.82
FUT 41	41.24	39.58	679.00	60.00	41.01	72.14	56.56	0.73

Note: When ratio of computed to design flow > 1, then the pipe has exceeded design capacity. Even when the ratio of computed flow to design flow is greater than 1, the model still shows them within the design capacity. This is due to the slope of hydraulic line being greater than the slope of the pipe in that particular pipe segment.

ALTERNATIVE III (Constant n)

JUNCTION SUMMARY: EXISTING LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	26.83	149.93	0.00	8.68	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.30	0.00	10.26	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.24	0.00	5.06	0.00
SANMH 123	140.90	154.05	144.40	0.84	143.07	0.00	10.99	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.41	0.00	20.49	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.85	0.00	11.30	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.38	0.00	10.76	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.76	0.00	12.33	0.00
SANMH 118	133.71	147.92	137.21	0.00	136.05	0.00	11.87	0.00
SANMH 117	133.04	148.12	137.04	5.03	135.16	0.00	12.96	0.00
SANMH 116	131.56	147.80	135.56	0.00	134.02	0.00	13.78	0.00
SANMH 115	130.59	145.49	134.59	0.00	133.16	0.00	12.34	0.00
SANMH 114	129.44	144.68	133.44	0.58	132.04	0.00	12.64	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.90	0.00	11.42	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.16	0.00	11.68	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.96	0.00	10.51	0.00
SANMH 110	125.68	139.67	129.68	1.44	128.29	0.00	11.38	0.00
SANMH 109	124.47	138.07	128.47	0.12	127.11	0.00	10.96	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.96	0.00	10.85	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.94	0.00	10.18	0.00
SANMH 106	120.49	133.54	124.99	0.00	123.41	0.00	10.13	0.00
SANMH 105A	120.17	135.19	124.67	0.07	123.13	0.00	12.06	0.00
SANMH 105	119.54	133.09	124.04	0.00	122.45	0.00	10.64	0.00
SANMH 104	118.42	132.62	122.92	0.00	121.18	0.00	11.44	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.61	0.00	10.70	0.00
SANMH 102	115.15	129.75	119.65	0.00	118.10	0.00	11.65	0.00
SANMH 101	114.37	128.97	118.87	0.00	117.37	0.00	11.60	0.00
SANMH 100	113.40	125.65	117.90	0.00	116.38	0.00	9.27	0.00
SANMH 99	112.43	125.43	116.93	0.00	115.32	0.00	10.11	0.00
SANMH 98	111.06	127.00	115.56	0.40	113.99	0.00	13.01	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.85	0.00	10.95	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.76	0.00	9.46	0.00
SANMH 95	107.63	120.31	112.13	0.00	110.38	0.00	9.93	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.84	0.00	11.93	0.00
SANMH 93	104.63	117.88	109.13	0.25	107.36	0.00	10.53	0.00
SANMH 92	103.64	116.31	108.14	0.00	106.44	0.00	9.87	0.00
SANMH 91	102.60	115.70	107.10	0.00	105.51	0.00	10.19	0.00
SANMH 90	101.80	114.40	106.30	0.00	104.68	0.00	9.72	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.73	0.00	9.93	0.00
SANMH 88	100.29	113.09	104.79	0.00	103.09	0.00	10.00	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.94	0.00	10.35	0.00

ALTERNATIVE III (Constant n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 86	97.48	109.88	101.98	0.00	100.34	0.00	9.54	0.00
SANMH 85	96.52	108.97	101.02	0.00	99.30	0.00	9.67	0.00
SANMH 84	95.81	109.11	100.31	0.00	98.32	0.00	10.79	0.00
SANMH 83	94.50	108.44	99.00	0.00	97.26	0.00	11.18	0.00
SANMH 82	93.47	106.10	98.47	42.44	96.00	0.00	10.10	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.42	0.00	11.14	0.00
SANMH 80	90.12	103.87	95.12	0.00	92.88	0.00	10.99	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.59	0.00	9.75	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.48	0.00	9.75	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.21	0.00	9.33	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.46	0.00	9.55	0.00
SANMH 75	84.71	101.02	89.71	0.00	87.49	0.00	13.53	0.00
SANMH 75A	84.40	98.30	89.40	1.38	87.14	0.00	11.16	0.00
SANMH 74	84.00	95.82	89.00	0.00	86.75	0.00	9.07	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.39	0.00	9.27	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.44	0.00	8.74	0.00
SANMH 71	80.25	91.95	85.25	0.00	83.05	0.00	8.90	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.65	0.00	10.06	0.00
SANMH 69	77.36	89.38	82.36	1.40	80.22	0.00	9.16	0.00
SANMH 68	76.15	87.87	81.15	0.00	79.01	0.00	8.86	0.00
SANMH 67	74.91	86.88	79.91	0.00	77.79	0.00	9.09	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.54	0.00	9.15	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.17	0.00	8.73	0.00
SANMH 64	71.10	82.30	76.10	0.00	73.96	0.00	8.34	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.55	0.00	9.35	0.00
SANMH 62	68.40	82.75	73.40	0.60	71.17	0.00	11.58	0.00
SANMH 61	67.08	80.48	72.08	0.00	69.98	0.00	10.50	0.00
SANMH 60	65.84	78.87	70.84	0.00	68.74	0.00	10.13	0.00
SANMH 59	64.70	78.08	69.70	1.17	67.61	0.00	10.47	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.39	0.00	11.37	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.16	0.00	10.27	0.00
SANMH 56	61.12	74.90	66.12	1.51	63.85	0.00	11.05	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.40	0.00	11.45	0.00
SANMH 54	57.86	72.54	62.86	0.00	60.86	0.00	11.68	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.58	0.00	11.64	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.48	0.00	12.88	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.37	0.00	11.31	0.00
SANMH 50	53.45	67.80	58.45	0.00	55.93	0.00	11.87	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.24	0.00	12.43	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.49	0.00	12.74	0.00
SANMH 47	48.92	64.87	53.92	1.70	52.07	0.00	12.80	0.00
SANMH 46	47.90	63.50	52.90	0.00	50.87	0.00	12.63	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.65	0.00	13.08	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.43	0.00	12.76	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.70	0.00	13.02	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.61	0.00	13.54	0.00

ALTERNATIVE III (Constant n)

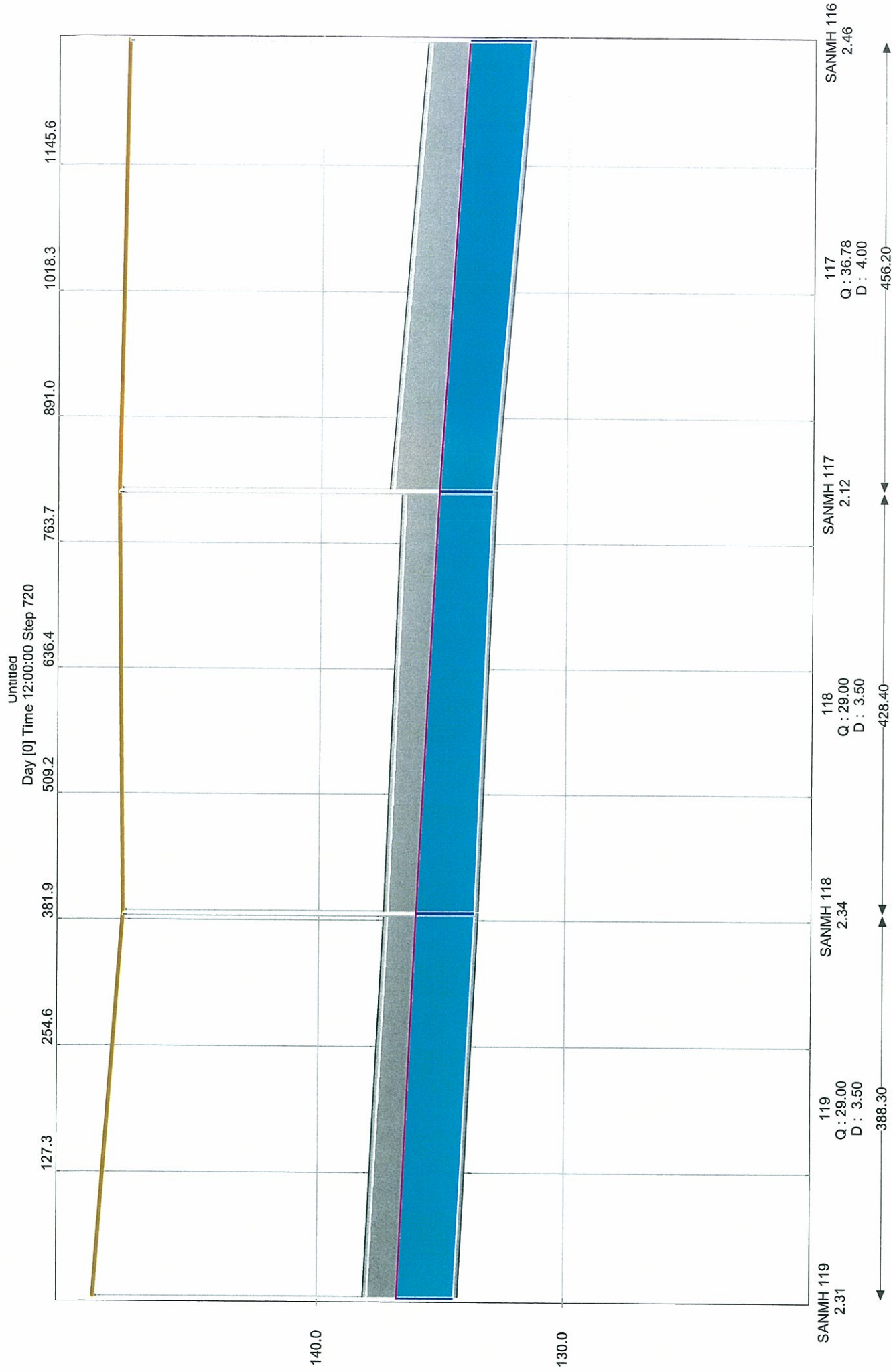
Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 41	41.24	59.82	46.24	1.05	44.13	0.00	15.69	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.47	0.00	14.58	0.00

JUNCTION SUMMARY: PARALLEL LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
FUT MH125	143.60	155.55	146.10	0.00	145.26	0.00	10.30	0.00
FUT MH124	142.36	149.30	144.86	0.00	144.02	0.00	5.28	0.00
FUT MH123	140.98	154.05	143.50	0.00	142.68	0.00	11.39	0.00
FUT MH122	139.07	161.90	141.57	0.00	140.74	0.00	21.17	0.00
FUT MH121	137.18	151.15	139.68	0.00	138.84	0.00	12.31	0.00
FUT MH120	135.58	149.14	138.08	0.00	137.24	0.00	11.90	0.00
FUT MH119	133.63	149.09	136.13	0.00	135.28	0.00	13.81	0.00
FUT MH118	132.66	147.92	135.66	0.00	134.25	0.00	13.68	0.00
FUT MH117	131.85	148.12	134.85	0.00	133.41	0.00	14.71	0.00
FUT MH116	130.90	147.80	133.90	0.00	132.51	0.00	15.29	0.00
FUT MH115	129.95	145.49	132.95	0.00	131.64	0.00	13.85	0.00
FUT MH114	128.81	144.68	131.81	0.00	130.59	0.00	14.09	0.00
FUT MH113	127.85	142.32	130.85	0.00	129.66	0.00	12.66	0.00
FUT MH112	127.35	141.84	130.35	0.00	129.09	0.00	12.75	0.00
FUT MH111	126.42	139.47	129.42	0.00	128.03	0.00	11.45	0.00
FUT MH110	125.68	139.67	128.68	0.00	127.29	0.00	12.38	0.00
FUT MH109	124.47	138.07	127.47	0.00	126.10	0.00	11.97	0.00
FUT MH108	123.26	136.81	126.26	0.00	125.00	0.00	11.81	0.00
FUT MH107	122.57	135.12	125.57	0.00	124.20	0.00	10.93	0.00
FUT MH106	120.49	133.54	123.49	0.00	123.28	0.00	10.26	0.00
FUT MH82	93.00	106.10	98.00	0.00	95.93	0.00	10.17	0.00
FUT MH81	91.74	105.56	96.74	0.00	94.60	0.00	10.96	0.00
FUT MH80	90.12	103.87	95.12	0.00	93.07	0.00	10.81	0.00
FUT MH79	88.88	101.34	93.88	0.00	91.78	0.00	9.57	0.00
FUT MH78	87.68	100.23	92.68	0.00	90.67	0.00	9.56	0.00
FUT MH77	86.41	98.53	91.41	0.00	89.39	0.00	9.14	0.00
FUT MH76	85.68	98.01	90.68	0.00	88.64	0.00	9.37	0.00
FUT MH75	84.71	101.02	89.71	0.00	87.63	0.00	13.39	0.00
FUT MH75A	84.40	98.30	89.40	0.00	87.26	0.00	11.04	0.00
FUT MH74	84.00	95.82	89.00	0.00	86.87	0.00	8.96	0.00
FUT MH73	82.61	94.66	87.61	0.00	85.51	0.00	9.15	0.00
FUT MH72	81.67	93.18	86.67	0.00	84.56	0.00	8.62	0.00
FUT MH71	80.25	91.95	85.25	0.00	83.17	0.00	8.78	0.00
FUT MH70	78.90	91.71	83.90	0.00	81.75	0.00	9.96	0.00
FUT MH69	77.36	89.38	82.36	0.00	80.27	0.00	9.11	0.00

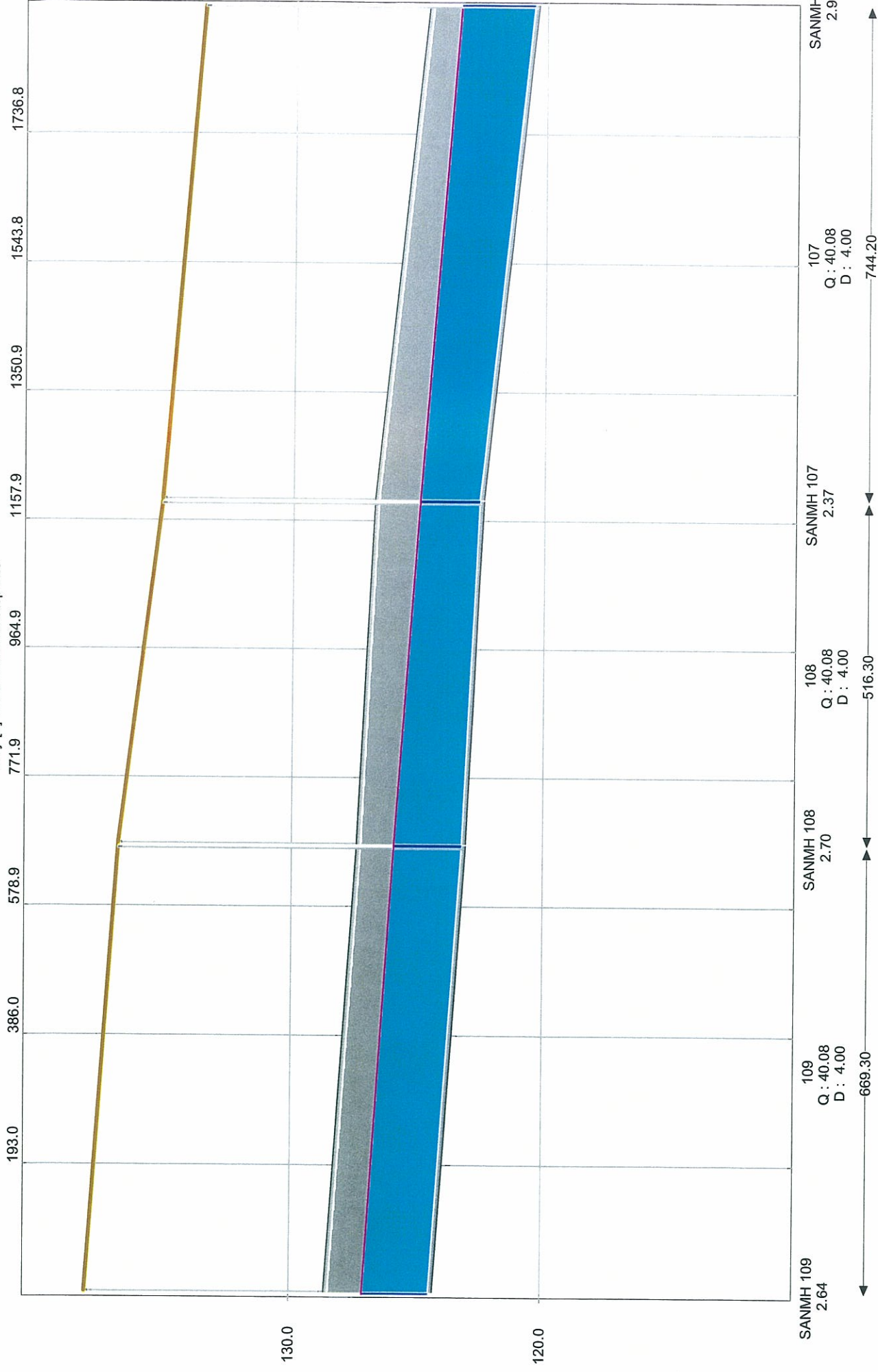
ALTERNATIVE III (Constant n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH68	76.15	87.87	81.15	0.00	79.07	0.00	8.80	0.00
FUT MH67	74.91	86.88	79.91	0.00	77.85	0.00	9.03	0.00
FUT MH66	73.59	85.69	78.59	0.00	76.60	0.00	9.09	0.00
FUT MH65	72.23	83.90	77.23	0.00	75.23	0.00	8.67	0.00
FUT MH64	71.10	82.30	76.10	0.00	74.02	0.00	8.28	0.00
FUT MH63	69.84	81.90	74.84	0.00	72.60	0.00	9.30	0.00
FUT MH62	68.40	82.75	73.40	0.00	71.20	0.00	11.55	0.00
FUT MH61	67.08	80.48	72.08	0.00	70.01	0.00	10.47	0.00
FUT MH60	65.84	78.87	70.84	0.00	68.76	0.00	10.11	0.00
FUT MH59	64.70	78.08	69.70	0.00	67.59	0.00	10.49	0.00
FUT MH58	63.41	77.76	68.41	0.00	66.36	0.00	11.40	0.00
FUT MH57	62.22	75.43	67.22	0.00	65.12	0.00	10.31	0.00
FUT MH56	61.12	74.90	66.12	0.00	63.77	0.00	11.13	0.00
FUT MH55	59.45	73.85	64.45	0.00	62.31	0.00	11.54	0.00
FUT MH54	57.86	72.54	62.86	0.00	60.76	0.00	11.79	0.00
FUT MH53	56.55	71.22	61.55	0.00	59.43	0.00	11.79	0.00
FUT MH52	55.26	71.36	60.26	0.00	58.21	0.00	13.15	0.00
FUT MH51	53.88	68.68	58.88	0.00	56.75	0.00	11.93	0.00
FUT MH50	52.38	67.80	57.38	0.00	55.25	0.00	12.55	0.00
FUT MH49	51.21	66.66	56.21	0.00	54.14	0.00	12.53	0.00
FUT MH48	50.48	66.23	55.48	0.00	53.37	0.00	12.86	0.00
FUT MH47	48.92	64.87	53.92	0.00	51.90	0.00	12.97	0.00
FUT MH46	47.90	63.50	52.90	0.00	50.71	0.00	12.79	0.00
FUT MH45	46.51	62.73	51.51	0.00	49.49	0.00	13.25	0.00
FUT MH44	45.49	61.19	50.49	0.00	48.27	0.00	12.92	0.00
FUT MH43	43.73	59.72	48.73	0.00	46.54	0.00	13.18	0.00
FUT MH42	42.55	59.15	47.55	0.00	45.45	0.00	13.70	0.00
FUT MH41	41.24	59.82	46.24	0.00	43.98	0.00	15.84	0.00

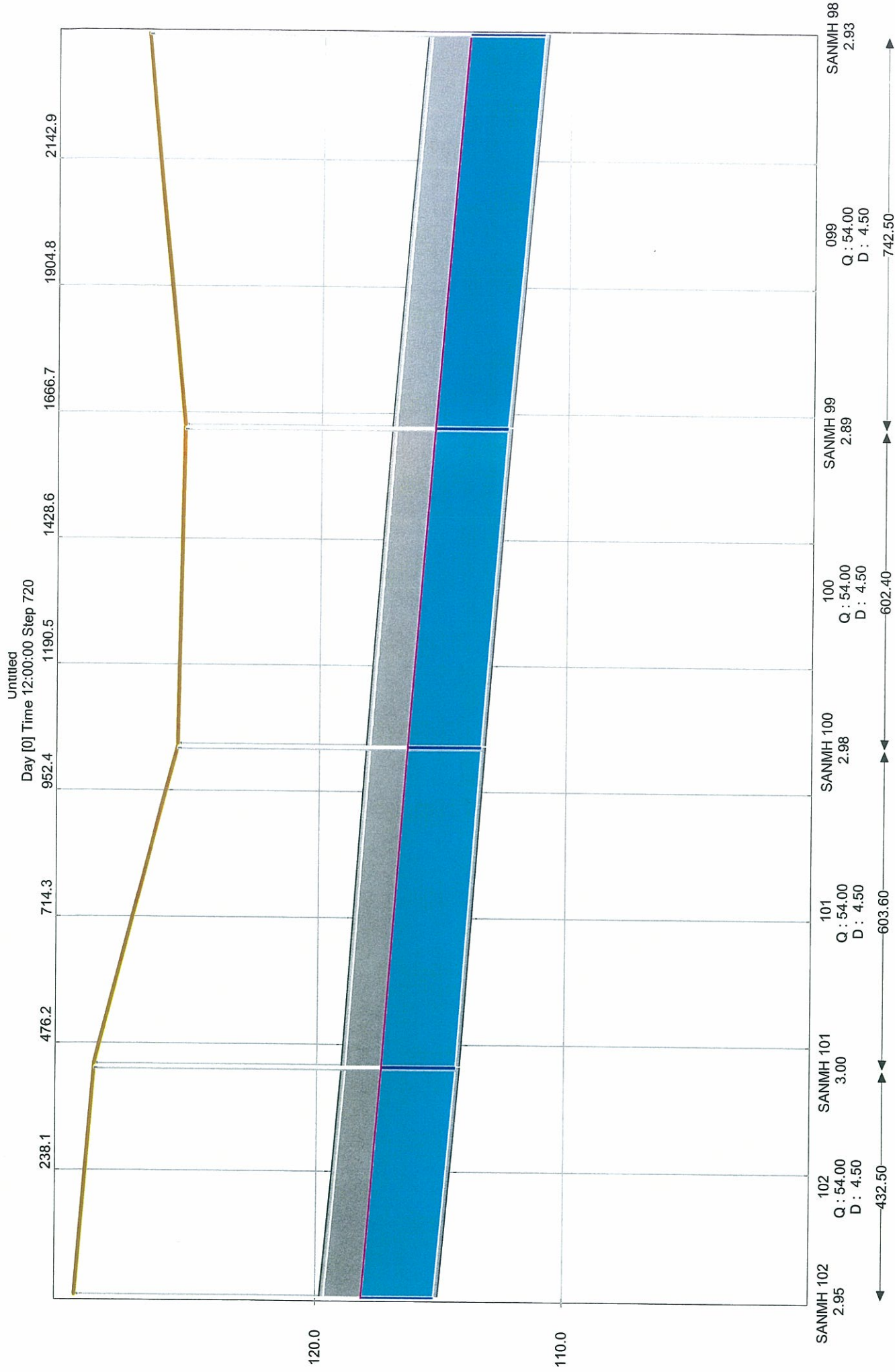


Alternative III

Untitled
Day [0] Time 12:00:00 Step 720

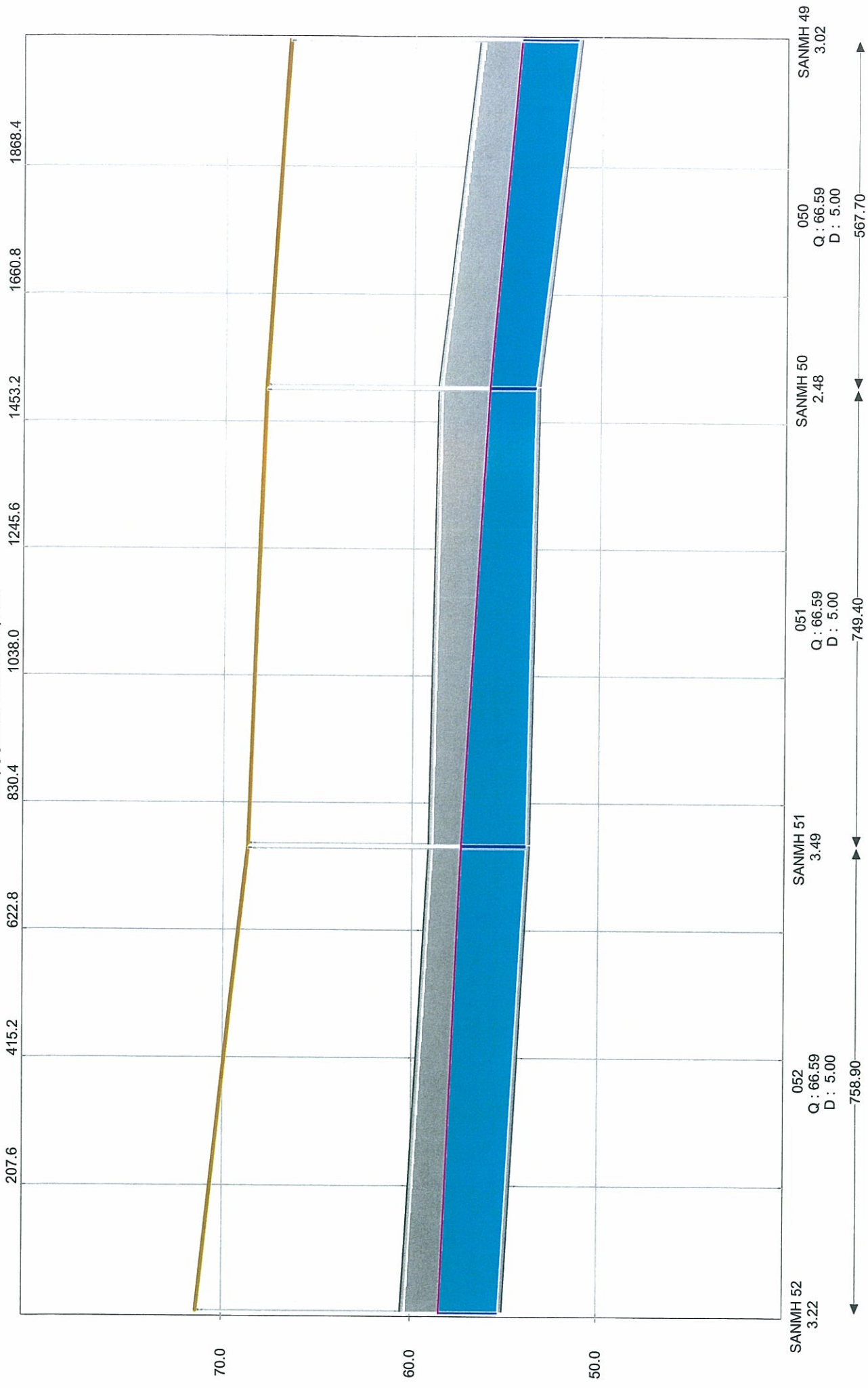


Alternative III



Alternative III

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Day [0] Time 12:00:00 Step 720



Alternative III

APPENDIX H1: MODEL RESULTS WITH VARYING n

ALTERNATIVE I (Varying n)

CONDUIT SUMMARY: EXISTING LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	148.08	143.15	582.50	42.00	26.77	61.24	39.81	No
125	143.15	142.12	492.90	42.00	17.78	30.43	19.78	No
124	142.12	140.90	551.20	42.00	17.70	31.32	20.36	No
123	140.90	139.10	769.90	42.00	18.47	32.19	20.92	No
122	139.10	137.72	757.50	42.00	18.47	28.42	18.47	No
121	137.72	136.19	640.20	42.00	18.47	32.55	21.16	No
120	136.19	134.45	778.00	42.00	18.47	31.48	20.46	No
119	134.45	133.71	388.30	42.00	18.47	29.06	18.89	No
118	133.71	133.04	428.40	42.00	18.47	26.33	17.11	No
117	133.04	131.56	456.20	48.00	23.43	54.14	35.19	No
116	131.56	130.59	498.60	48.00	23.43	41.92	27.25	No
115	130.59	129.44	708.10	48.00	23.43	38.31	24.90	No
114	129.44	128.30	710.70	48.00	23.96	38.07	24.74	No
113	128.30	127.65	436.00	48.00	23.96	36.70	23.85	No
112	127.65	126.42	677.00	48.00	23.96	40.51	26.33	No
111	126.42	125.68	404.30	48.00	23.96	40.67	26.43	No
110	125.68	124.47	666.20	48.00	25.38	40.50	26.33	No
109	124.47	123.26	669.30	48.00	25.49	40.41	26.27	No
108	123.26	122.57	516.30	48.00	25.49	34.74	22.58	No
107	122.57	120.49	744.20	48.00	25.49	50.25	32.66	No
106	120.49	120.17	300.80	54.00	25.49	42.44	27.58	No
105A	120.17	119.54	385.10	54.00	25.55	52.63	34.21	No
105	119.54	118.42	661.90	54.00	25.55	53.52	34.79	No
104	118.42	116.91	727.00	54.00	25.55	59.30	38.55	No
103	116.91	115.15	722.30	54.00	25.55	64.23	41.75	No
102	115.15	114.37	432.50	54.00	25.55	55.26	35.92	No
101	114.37	113.40	603.60	54.00	25.55	52.16	33.90	No
100	113.40	112.43	602.40	54.00	25.55	52.21	33.94	No
99	112.43	111.06	742.50	54.00	25.55	55.90	36.33	No
98	111.06	109.87	648.80	54.00	25.91	55.73	36.22	No
97	109.87	108.82	621.80	54.00	25.91	53.47	34.76	No
96	108.82	107.63	709.10	54.00	25.91	53.30	34.65	No
95	107.63	106.05	718.70	54.00	25.91	61.01	39.66	No
94	106.05	104.63	694.20	54.00	25.91	58.85	38.25	No
93	104.63	103.64	419.00	54.00	26.14	63.25	41.11	No
92	103.64	102.60	467.10	54.00	26.14	61.40	39.91	No
91	102.60	101.80	440.30	54.00	26.14	55.46	36.05	No
90	101.80	100.88	492.10	54.00	26.14	56.26	36.57	No
89	100.88	100.29	316.80	54.00	26.14	56.15	36.50	No
88	100.29	99.13	553.90	54.00	26.14	59.55	38.71	No
87	99.13	97.48	788.70	54.00	26.14	59.52	38.68	No
86	97.48	96.52	507.80	54.00	26.14	56.57	36.77	No
85	96.52	95.81	390.70	54.00	26.14	55.47	36.05	No
84	95.81	94.50	401.60	54.00	26.14	74.32	48.31	No
83	94.50	93.47	508.50	54.00	26.14	58.56	38.07	No

ALTERNATIVE I (Varying n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
82	93.47	91.74	674.50	60.00	35.51	87.28	56.73	No
81	91.74	90.12	775.50	60.00	35.51	78.77	51.20	No
80	90.12	88.88	676.40	60.00	35.51	73.79	47.96	No
79	88.88	87.68	581.50	60.00	35.51	78.29	50.89	No
78	87.68	86.41	721.50	60.00	35.51	72.30	47.00	No
77	86.41	85.68	414.10	60.00	35.51	72.35	47.03	No
76	85.68	84.71	538.70	60.00	35.51	73.13	47.53	No
075A	84.40	84.00	194.00	60.00	36.89	78.25	50.86	No
75	84.71	84.40	184.50	60.00	35.51	70.64	45.92	No
74	84.00	82.61	676.90	60.00	36.89	78.09	50.76	No
73	82.61	81.67	481.80	60.00	36.89	76.12	49.48	No
72	81.67	80.25	716.60	60.00	36.89	76.71	49.86	No
71	80.25	78.90	716.20	60.00	36.89	74.82	48.63	No
70	78.90	77.36	728.80	60.00	36.89	79.22	51.49	No
69	77.36	76.15	628.50	60.00	38.25	75.61	49.15	No
68	76.15	74.91	645.40	60.00	38.25	75.54	49.10	No
67	74.91	73.59	685.40	60.00	38.25	75.62	49.16	No
66	73.59	72.23	787.60	60.00	38.25	71.61	46.55	No
65	72.23	71.10	659.00	60.00	38.25	71.36	46.38	No
64	71.10	69.84	680.30	60.00	38.25	74.16	48.21	No
63	69.84	68.40	620.80	60.00	38.25	83.00	53.95	No
62	68.40	67.08	572.60	60.00	38.78	82.74	53.78	No
61	67.08	65.84	655.60	60.00	38.78	74.95	48.71	No
60	65.84	64.70	600.00	60.00	38.78	75.12	48.83	No
59	64.70	63.41	634.40	60.00	39.94	77.71	50.51	No
58	63.41	62.22	653.60	60.00	39.94	73.53	47.79	No
57	62.22	61.12	604.40	60.00	39.94	73.52	47.79	No
56	61.12	59.45	600.00	60.00	41.38	90.92	59.10	No
55	59.45	57.86	770.60	60.00	41.38	78.28	50.88	No
54	57.86	56.55	671.40	60.00	41.38	76.12	49.48	No
53	56.55	55.26	624.70	60.00	41.38	78.31	50.90	No
52	55.26	53.88	758.90	60.00	41.38	73.48	47.76	No
51	53.88	53.45	749.40	60.00	41.38	41.28	26.83	No
50	53.45	51.21	567.70	60.00	41.38	108.25	70.36	No
49	51.21	50.48	392.60	60.00	41.38	74.31	48.30	No
48	50.48	48.92	768.40	60.00	41.38	77.65	50.47	No
47	48.92	47.90	605.00	60.00	42.88	70.76	45.99	No
46	47.90	46.51	598.90	60.00	42.88	83.02	53.96	No
45	46.51	45.49	605.00	60.00	42.88	70.76	45.99	No
44	45.49	43.73	785.80	60.00	42.88	81.56	53.01	No
43	43.73	42.55	525.30	60.00	42.88	81.67	53.09	No
42	42.55	41.24	687.30	60.00	42.88	75.24	48.90	No
41	41.24	39.58	678.50	60.00	43.83	85.24	55.41	No

ALTERNATIVE I (Varying n)

CONDUIT SUMMARY: PARALLEL LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 125A	143.70	143.60	20.00	30.00	8.80	19.19	12.47	No
FUT 125	143.60	142.36	493.00	30.00	8.80	13.61	8.85	No
FUT 124	142.36	140.98	551.00	30.00	8.80	13.58	8.83	No
FUT 123	141.00	139.07	770.00	30.00	8.88	13.59	8.83	No
FUT 122	139.07	137.18	757.00	30.00	8.86	13.56	8.82	No
FUT 121	137.18	135.58	640.00	30.00	8.84	13.57	8.82	No
FUT 120	135.58	133.63	778.00	30.00	8.84	13.59	8.83	No
FUT 119	133.63	132.66	388.00	30.00	8.82	13.57	8.82	No
FUT 118	132.66	131.85	428.00	36.00	8.81	19.20	12.48	No
FUT 117	131.85	130.90	456.00	36.00	8.80	20.14	13.09	No
FUT 116	130.90	129.95	499.00	36.00	8.80	19.26	12.52	No
FUT 115	129.95	128.81	708.00	36.00	8.80	17.71	11.51	No
FUT 114	128.81	127.85	711.00	36.00	8.80	16.22	10.54	No
FUT 113	127.85	127.35	436.00	36.00	8.80	14.95	9.71	No
FUT 112	127.35	126.42	677.00	36.00	8.80	16.35	10.63	No
FUT 111	126.42	125.68	404.00	36.00	8.80	18.89	12.28	No
FUT 110	125.68	124.47	666.00	36.00	8.80	18.81	12.23	No
FUT 109	124.47	123.26	669.00	36.00	8.80	18.77	12.20	No
FUT 108	123.26	122.57	516.00	36.00	8.80	16.14	10.49	No
FUT 107	122.57	120.49	744.00	36.00	8.80	23.34	15.17	No
FUT 106	120.49	120.17	300.80	36.00	8.80	14.40	9.36	No
FUT 105A	120.17	119.54	385.10	36.00	8.80	17.85	11.60	No
FUT 105	119.54	118.42	661.90	36.00	8.80	18.15	11.80	No
FUT 104	118.42	116.91	727.00	36.00	8.80	20.12	13.08	No
FUT 103	116.91	115.15	722.30	36.00	8.80	21.78	14.16	No
FUT 102	115.15	114.37	432.50	36.00	8.80	18.74	12.18	No
FUT 101	114.37	113.40	603.60	36.00	8.80	17.69	11.50	No
FUT 100	113.40	112.43	602.40	36.00	8.80	17.71	11.51	No
FUT 99	112.43	111.06	742.50	36.00	8.80	18.96	12.32	No
FUT 98	111.06	109.87	648.80	36.00	8.80	18.90	12.29	No
FUT 97	109.87	108.82	621.80	36.00	8.80	18.14	11.79	No
FUT 96	108.82	107.63	709.10	36.00	8.80	18.08	11.75	No
FUT 95	107.63	106.05	718.70	36.00	8.80	20.69	13.45	No
FUT 94	106.05	104.63	694.20	36.00	8.80	19.96	12.97	No
FUT 93	104.63	103.64	419.00	36.00	8.80	21.45	13.95	No
FUT 92	103.64	102.60	467.10	36.00	8.80	20.83	13.54	No
FUT 91	102.60	101.80	440.30	36.00	8.80	18.81	12.23	No
FUT 90	101.80	100.88	492.10	36.00	8.80	19.08	12.40	No
FUT 89	100.88	100.29	316.80	36.00	8.80	19.04	12.38	No
FUT 88	100.29	99.13	553.90	36.00	8.80	20.19	13.13	No
FUT 87	99.13	97.48	788.70	36.00	8.80	20.19	13.12	No
FUT 86	97.48	96.52	507.80	36.00	8.80	19.19	12.47	No
FUT 85	96.52	95.81	390.70	36.00	8.80	18.81	12.23	No
FUT 84	95.81	94.50	401.60	36.00	8.80	25.20	16.38	No
FUT 83	94.50	93.47	508.50	36.00	8.80	19.86	12.91	No

ALTERNATIVE I (Varying n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT82A	93.47	93.40	20.00	60.00	36.01	101.95	66.27	No
FUT 82	93.00	91.74	674.00	60.00	40.76	74.51	48.43	No
FUT 81	91.74	90.12	776.00	60.00	40.76	78.74	51.18	No
FUT 80	90.12	88.88	676.00	60.00	40.76	73.81	47.97	No
FUT 79	88.88	87.68	581.00	60.00	40.76	78.32	50.91	No
FUT 78	87.68	86.41	721.00	60.00	40.76	72.33	47.01	No
FUT 77	86.41	85.68	414.00	60.00	40.76	72.37	47.04	No
FUT 76	85.68	84.71	539.00	60.00	40.76	73.10	47.52	No
FUT 75A	84.40	84.00	194.00	60.00	40.76	78.25	50.86	No
FUT 75	84.71	84.40	184.00	60.00	40.76	70.74	45.98	No
FUT 74	84.00	82.61	677.00	60.00	40.76	78.09	50.76	No
FUT 73	82.61	81.67	482.00	60.00	40.76	76.10	49.47	No
FUT 72	81.67	80.25	717.00	60.00	40.76	76.69	49.85	No
FUT 71	80.25	78.90	716.00	60.00	40.76	74.83	48.64	No
FUT 70	78.90	77.36	729.00	60.00	40.76	79.20	51.48	No
FUT 69	77.36	76.15	628.00	60.00	40.76	75.64	49.17	No
FUT 68	76.15	74.91	645.00	60.00	40.76	75.56	49.11	No
FUT 67	74.91	73.59	685.00	60.00	40.76	75.65	49.17	No
FUT 66	73.59	72.23	788.00	60.00	40.76	71.59	46.53	No
FUT 65	72.23	71.10	659.00	60.00	40.76	71.36	46.38	No
FUT 64	71.10	69.84	680.00	60.00	40.76	74.18	48.22	No
FUT 63	69.84	68.40	621.00	60.00	40.76	82.99	53.94	No
FUT 62	68.40	67.08	573.00	60.00	40.76	82.71	53.76	No
FUT 61	67.08	65.84	656.00	60.00	40.76	74.93	48.70	No
FUT 60	65.84	64.70	600.00	60.00	40.76	75.12	48.83	No
FUT 59	64.70	63.41	634.00	60.00	40.76	77.73	50.53	No
FUT 58	63.41	62.22	654.00	60.00	40.76	73.51	47.78	No
FUT 57	62.22	61.12	604.00	60.00	40.76	73.54	47.80	No
FUT 56	61.12	59.45	600.00	60.00	40.76	90.92	59.10	No
FUT 55	59.45	57.86	771.00	60.00	40.76	78.26	50.87	No
FUT 54	57.86	56.55	671.00	60.00	40.76	76.14	49.49	No
FUT 53	56.55	55.26	625.00	60.00	40.76	78.29	50.89	No
FUT 52	55.26	53.88	759.00	60.00	40.76	73.48	47.76	No
FUT 51	53.88	53.45	749.00	60.00	40.76	77.12	50.13	No
FUT 50	53.45	51.21	568.00	60.00	40.76	78.22	50.84	No
FUT 49	51.21	50.48	393.00	60.00	40.76	74.27	48.28	No
FUT 48	50.48	48.92	768.00	60.00	40.76	77.67	50.48	No
FUT 47	48.92	47.90	605.00	60.00	40.76	70.76	45.99	No
FUT 46	47.90	46.51	599.00	60.00	40.76	83.01	53.96	No
FUT 45	46.51	45.49	605.00	60.00	40.76	70.76	45.99	No
FUT 44	45.49	43.73	786.00	60.00	40.76	81.54	53.00	No
FUT 43	43.73	42.55	525.00	60.00	40.76	81.70	53.11	No
FUT 42	42.55	41.24	687.00	60.00	40.76	75.25	48.91	No
FUT 41	41.24	39.58	679.00	60.00	40.76	85.21	55.39	No

ALTERNATIVE I (Varying n)

JUNCTION SUMMARY: EXISTING LINE

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 126	148.08	158.55	151.58	26.50	149.91	0.00	8.69	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.28	0.00	10.27	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.23	0.00	5.08	0.00
SANMH 123	140.90	154.05	144.40	0.77	143.04	0.00	11.01	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.39	0.00	20.52	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.83	0.00	11.32	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.36	0.00	10.78	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.74	0.00	12.35	0.00
SANMH 118	133.71	147.92	137.21	0.00	136.02	0.00	11.90	0.00
SANMH 117	133.04	148.12	137.04	4.96	135.14	0.00	12.98	0.00
SANMH 116	131.56	147.80	135.56	0.00	133.99	0.00	13.81	0.00
SANMH 115	130.59	145.49	134.59	0.00	133.13	0.00	12.36	0.00
SANMH 114	129.44	144.68	133.44	0.53	132.01	0.00	12.67	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.87	0.00	11.45	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.13	0.00	11.71	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.93	0.00	10.54	0.00
SANMH 110	125.68	139.67	129.68	1.42	128.26	0.00	11.42	0.00
SANMH 109	124.47	138.07	128.47	0.10	127.07	0.00	11.00	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.91	0.00	10.90	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.85	0.00	10.27	0.00
SANMH 106	120.49	133.54	124.99	0.00	123.07	0.00	10.47	0.00
SANMH 105A	120.17	135.19	124.67	0.06	122.60	0.00	12.59	0.00
SANMH 105	119.54	133.09	124.04	0.00	121.94	0.00	11.15	0.00
SANMH 104	118.42	132.62	122.92	0.00	120.70	0.00	11.92	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.12	0.00	11.20	0.00
SANMH 102	115.15	129.75	119.65	0.00	117.55	0.00	12.20	0.00
SANMH 101	114.37	128.97	118.87	0.00	116.82	0.00	12.15	0.00
SANMH 100	113.40	125.65	117.90	0.00	115.84	0.00	9.81	0.00
SANMH 99	112.43	125.43	116.93	0.00	114.80	0.00	10.63	0.00
SANMH 98	111.06	127.00	115.56	0.36	113.46	0.00	13.54	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.31	0.00	11.48	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.25	0.00	9.97	0.00
SANMH 95	107.63	120.31	112.13	0.00	109.89	0.00	10.42	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.35	0.00	12.42	0.00
SANMH 93	104.63	117.88	109.13	0.23	106.87	0.00	11.01	0.00
SANMH 92	103.64	116.31	108.14	0.00	105.94	0.00	10.37	0.00
SANMH 91	102.60	115.70	107.10	0.00	104.99	0.00	10.71	0.00
SANMH 90	101.80	114.40	106.30	0.00	104.18	0.00	10.23	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.24	0.00	10.43	0.00
SANMH 88	100.29	113.09	104.79	0.00	102.59	0.00	10.50	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.44	0.00	10.85	0.00

ALTERNATIVE I (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 86	97.48	109.88	101.98	0.00	99.84	0.00	10.04	0.00
SANMH 85	96.52	108.97	101.02	0.00	98.85	0.00	10.12	0.00
SANMH 84	95.81	109.11	100.31	0.00	97.90	0.00	11.21	0.00
SANMH 83	94.50	108.44	99.00	0.00	96.87	0.00	11.57	0.00
SANMH 82	93.47	106.10	98.47	41.34	95.94	0.00	10.16	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.36	0.00	11.20	0.00
SANMH 80	90.12	103.87	95.12	0.00	92.81	0.00	11.06	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.52	0.00	9.82	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.41	0.00	9.82	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.14	0.00	9.39	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.40	0.00	9.61	0.00
SANMH 75	84.71	101.02	89.71	0.00	87.42	0.00	13.60	0.00
SANMH 75A	84.40	98.30	89.40	1.38	87.08	0.00	11.23	0.00
SANMH 74	84.00	95.82	89.00	0.00	86.68	0.00	9.14	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.32	0.00	9.34	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.38	0.00	8.80	0.00
SANMH 71	80.25	91.95	85.25	0.00	82.99	0.00	8.96	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.58	0.00	10.13	0.00
SANMH 69	77.36	89.38	82.36	1.36	80.15	0.00	9.23	0.00
SANMH 68	76.15	87.87	81.15	0.00	78.94	0.00	8.93	0.00
SANMH 67	74.91	86.88	79.91	0.00	77.72	0.00	9.16	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.47	0.00	9.22	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.10	0.00	8.80	0.00
SANMH 64	71.10	82.30	76.10	0.00	73.90	0.00	8.40	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.49	0.00	9.41	0.00
SANMH 62	68.40	82.75	73.40	0.54	71.10	0.00	11.65	0.00
SANMH 61	67.08	80.48	72.08	0.00	69.91	0.00	10.58	0.00
SANMH 60	65.84	78.87	70.84	0.00	68.67	0.00	10.20	0.00
SANMH 59	64.70	78.08	69.70	1.15	67.54	0.00	10.54	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.31	0.00	11.45	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.09	0.00	10.34	0.00
SANMH 56	61.12	74.90	66.12	1.45	63.79	0.00	11.12	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.33	0.00	11.52	0.00
SANMH 54	57.86	72.54	62.86	0.00	60.79	0.00	11.75	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.50	0.00	11.72	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.39	0.00	12.97	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.29	0.00	11.39	0.00
SANMH 50	53.45	67.80	58.45	0.00	55.87	0.00	11.93	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.16	0.00	12.50	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.41	0.00	12.82	0.00
SANMH 47	48.92	64.87	53.92	1.50	51.99	0.00	12.89	0.00
SANMH 46	47.90	63.50	52.90	0.00	50.79	0.00	12.71	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.57	0.00	13.16	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.35	0.00	12.84	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.62	0.00	13.10	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.53	0.00	13.62	0.00

ALTERNATIVE I (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 41	41.24	59.82	46.24	0.95	44.05	0.00	15.77	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.39	0.00	14.66	0.00

JUNCTION SUMMARY: PARALLEL LINE

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH125	143.60	155.55	146.10	0.00	145.24	0.00	10.31	0.00
FUT MH124	142.36	149.30	144.86	0.00	144.01	0.00	5.30	0.00
FUT MH123	140.98	154.05	143.50	0.00	142.66	0.00	11.41	0.00
FUT MH122	139.07	161.90	141.57	0.00	140.72	0.00	21.19	0.00
FUT MH121	137.18	151.15	139.68	0.00	138.83	0.00	12.33	0.00
FUT MH120	135.58	149.14	138.08	0.00	137.23	0.00	11.92	0.00
FUT MH119	133.63	149.09	136.13	0.00	135.27	0.00	13.83	0.00
FUT MH118	132.66	147.92	135.66	0.00	134.23	0.00	13.69	0.00
FUT MH117	131.85	148.12	134.85	0.00	133.39	0.00	14.73	0.00
FUT MH116	130.90	147.80	133.90	0.00	132.50	0.00	15.31	0.00
FUT MH115	129.95	145.49	132.95	0.00	131.63	0.00	13.86	0.00
FUT MH114	128.81	144.68	131.81	0.00	130.57	0.00	14.11	0.00
FUT MH113	127.85	142.32	130.85	0.00	129.65	0.00	12.67	0.00
FUT MH112	127.35	141.84	130.35	0.00	129.07	0.00	12.77	0.00
FUT MH111	126.42	139.47	129.42	0.00	128.01	0.00	11.46	0.00
FUT MH110	125.68	139.67	128.68	0.00	127.28	0.00	12.39	0.00
FUT MH109	124.47	138.07	127.47	0.00	126.08	0.00	11.99	0.00
FUT MH108	123.26	136.81	126.26	0.00	124.96	0.00	11.85	0.00
FUT MH107	122.57	135.12	125.57	0.00	123.99	0.00	11.13	0.00
FUT MH106	120.49	133.54	123.49	0.00	122.26	0.00	11.28	0.00
FUT MH105A	120.17	135.19	123.17	0.00	121.81	0.00	13.38	0.00
FUT MH105	119.54	133.09	122.54	0.00	121.17	0.00	11.92	0.00
FUT MH104	118.42	132.62	121.42	0.00	119.96	0.00	12.66	0.00
FUT MH103	116.91	130.31	119.91	0.00	118.38	0.00	11.93	0.00
FUT MH102	115.15	129.75	118.15	0.00	116.76	0.00	12.99	0.00
FUT MH101	114.37	128.97	117.37	0.00	116.02	0.00	12.95	0.00
FUT MH100	113.40	125.65	116.40	0.00	115.05	0.00	10.60	0.00
FUT MH99	112.43	125.43	115.43	0.00	114.02	0.00	11.41	0.00
FUT MH98	111.06	127.00	114.06	0.00	112.66	0.00	14.34	0.00
FUT MH97	109.87	123.79	112.87	0.00	111.50	0.00	12.29	0.00
FUT MH96	108.82	121.22	111.82	0.00	110.46	0.00	10.76	0.00
FUT MH95	107.63	120.31	110.63	0.00	109.14	0.00	11.17	0.00
FUT MH94	106.05	120.77	109.05	0.00	107.59	0.00	13.18	0.00
FUT MH93	104.63	117.88	107.63	0.00	106.11	0.00	11.77	0.00
FUT MH92	103.64	116.31	106.64	0.00	105.16	0.00	11.15	0.00

ALTERNATIVE I (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH91	102.60	115.70	105.60	0.00	104.19	0.00	11.51	0.00
FUT MH90	101.80	114.40	104.80	0.00	103.38	0.00	11.02	0.00
FUT MH89	100.88	113.66	103.88	0.00	102.45	0.00	11.21	0.00
FUT MH88	100.29	113.09	103.29	0.00	101.82	0.00	11.27	0.00
FUT MH87	99.13	112.29	102.13	0.00	100.66	0.00	11.63	0.00
FUT MH86	97.48	109.88	100.48	0.00	99.05	0.00	10.83	0.00
FUT MH85	96.52	108.97	99.52	0.00	98.09	0.00	10.88	0.00
FUT MH84	95.81	109.11	98.81	0.00	97.22	0.00	11.89	0.00
FUT MH83	94.50	108.44	97.50	0.00	96.37	0.00	12.07	0.00
FUT MH82	93.00	106.10	98.40	0.00	95.91	0.00	10.19	0.00
FUT MH81	91.74	105.56	96.74	0.00	94.59	0.00	10.97	0.00
FUT MH80	90.12	103.87	95.12	0.00	93.05	0.00	10.82	0.00
FUT MH79	88.88	101.34	93.88	0.00	91.76	0.00	9.58	0.00
FUT MH78	87.68	100.23	92.68	0.00	90.66	0.00	9.57	0.00
FUT MH77	86.41	98.53	91.41	0.00	89.38	0.00	9.15	0.00
FUT MH76	85.68	98.01	90.68	0.00	88.63	0.00	9.38	0.00
FUT MH75	84.71	101.02	89.71	0.00	87.62	0.00	13.40	0.00
FUT MH75A	84.40	98.30	89.40	0.00	87.25	0.00	11.05	0.00
FUT MH74	84.00	95.82	89.00	0.00	86.85	0.00	8.97	0.00
FUT MH73	82.61	94.66	87.61	0.00	85.50	0.00	9.16	0.00
FUT MH72	81.67	93.18	86.67	0.00	84.55	0.00	8.63	0.00
FUT MH71	80.25	91.95	85.25	0.00	83.16	0.00	8.79	0.00
FUT MH70	78.90	91.71	83.90	0.00	81.74	0.00	9.97	0.00
FUT MH69	77.36	89.38	82.36	0.00	80.26	0.00	9.12	0.00
FUT MH68	76.15	87.87	81.15	0.00	79.06	0.00	8.81	0.00
FUT MH67	74.91	86.88	79.91	0.00	77.84	0.00	9.04	0.00
FUT MH66	73.59	85.69	78.59	0.00	76.59	0.00	9.10	0.00
FUT MH65	72.23	83.90	77.23	0.00	75.22	0.00	8.68	0.00
FUT MH64	71.10	82.30	76.10	0.00	74.01	0.00	8.29	0.00
FUT MH63	69.84	81.90	74.84	0.00	72.59	0.00	9.31	0.00
FUT MH62	68.40	82.75	73.40	0.00	71.19	0.00	11.56	0.00
FUT MH61	67.08	80.48	72.08	0.00	69.99	0.00	10.49	0.00
FUT MH60	65.84	78.87	70.84	0.00	68.74	0.00	10.13	0.00
FUT MH59	64.70	78.08	69.70	0.00	67.58	0.00	10.50	0.00
FUT MH58	63.41	77.76	68.41	0.00	66.35	0.00	11.41	0.00
FUT MH57	62.22	75.43	67.22	0.00	65.11	0.00	10.32	0.00
FUT MH56	61.12	74.90	66.12	0.00	63.76	0.00	11.14	0.00
FUT MH55	59.45	73.85	64.45	0.00	62.30	0.00	11.55	0.00
FUT MH54	57.86	72.54	62.86	0.00	60.74	0.00	11.80	0.00
FUT MH53	56.55	71.22	61.55	0.00	59.42	0.00	11.80	0.00
FUT MH52	55.26	71.36	60.26	0.00	58.20	0.00	13.16	0.00
FUT MH51	53.88	68.68	58.88	0.00	56.74	0.00	11.94	0.00
FUT MH50	52.38	67.80	57.38	0.00	55.24	0.00	12.56	0.00
FUT MH49	51.21	66.66	56.21	0.00	54.12	0.00	12.54	0.00
FUT MH48	50.48	66.23	55.48	0.00	53.36	0.00	12.87	0.00
FUT MH47	48.92	64.87	53.92	0.00	51.89	0.00	12.98	0.00

ALTERNATIVE I (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft³
FUT MH46	47.90	63.50	52.90	0.00	50.70	0.00	12.80	0.00
FUT MH45	46.51	62.73	51.51	0.00	49.47	0.00	13.26	0.00
FUT MH44	45.49	61.19	50.49	0.00	48.26	0.00	12.93	0.00
FUT MH43	43.73	59.72	48.73	0.00	46.53	0.00	13.19	0.00
FUT MH42	42.55	59.15	47.55	0.00	45.43	0.00	13.72	0.00
FUT MH41	41.24	59.82	46.24	0.00	43.96	0.00	15.86	0.00

ALTERNATIVE II (Varying n)

CONDUIT SUMMARY: EXISTING LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	148.08	143.15	582.50	42.00	26.77	61.24	39.81	No
125	143.15	142.12	492.90	42.00	17.78	30.43	19.78	No
124	142.12	140.90	551.20	42.00	17.70	31.32	20.36	No
123	140.90	139.10	769.90	42.00	18.47	32.19	20.92	No
122	139.10	137.72	757.50	42.00	18.47	28.42	18.47	No
121	137.72	136.19	640.20	42.00	18.47	32.55	21.16	No
120	136.19	134.45	778.00	42.00	18.47	31.48	20.46	No
119	134.45	133.71	388.30	42.00	18.47	29.06	18.89	No
118	133.71	133.04	428.40	42.00	18.47	26.33	17.11	No
117	133.04	131.56	456.20	48.00	23.43	54.14	35.19	No
116	131.56	130.59	498.60	48.00	23.43	41.92	27.25	No
115	130.59	129.44	708.10	48.00	23.43	38.31	24.90	No
114	129.44	128.30	710.70	48.00	23.96	38.07	24.74	No
113	128.30	127.65	436.00	48.00	23.96	36.70	23.85	No
112	127.65	126.42	677.00	48.00	23.96	40.51	26.33	No
111	126.42	125.68	404.30	48.00	23.96	40.67	26.43	No
110	125.68	124.47	666.20	48.00	25.38	40.50	26.33	No
109	124.47	123.26	669.30	48.00	25.49	40.41	26.27	No
108	123.26	122.57	516.30	48.00	25.49	34.74	22.58	No
107	122.57	120.49	744.20	48.00	25.49	50.25	32.66	No
106	120.49	120.17	300.80	54.00	25.49	42.44	27.58	No
105A	120.17	119.54	385.10	54.00	34.35	52.63	34.21	No
105	119.54	118.42	661.90	54.00	34.35	53.52	34.79	No
104	118.42	116.91	727.00	54.00	34.35	59.30	38.55	No
103	116.91	115.15	722.30	54.00	34.35	64.23	41.75	No
102	115.15	114.37	432.50	54.00	34.35	55.26	35.92	No
101	114.37	113.40	603.60	54.00	34.35	52.16	33.90	No
100	113.40	112.43	602.40	54.00	34.35	52.21	33.94	No
99	112.43	111.06	742.50	54.00	34.35	55.90	36.33	No
98	111.06	109.87	648.80	54.00	34.71	55.73	36.22	No
97	109.87	108.82	621.80	54.00	34.71	53.47	34.76	No
96	108.82	107.63	709.10	54.00	34.71	53.30	34.65	No
95	107.63	106.05	718.70	54.00	34.71	61.01	39.66	No
94	106.05	104.63	694.20	54.00	34.71	58.85	38.25	No
93	104.63	103.64	419.00	54.00	34.94	63.25	41.11	No
92	103.64	102.60	467.10	54.00	34.94	61.40	39.91	No
91	102.60	101.80	440.30	54.00	34.94	55.46	36.05	No
90	101.80	100.88	492.10	54.00	34.94	56.26	36.57	No
89	100.88	100.29	316.80	54.00	34.94	56.15	36.50	No
88	100.29	99.13	553.90	54.00	34.94	59.55	38.71	No
87	99.13	97.48	788.70	54.00	34.94	59.52	38.68	No
86	97.48	96.52	507.80	54.00	34.94	56.57	36.77	No
85	96.52	95.81	390.70	54.00	34.94	55.47	36.05	No
84	95.81	94.50	401.60	54.00	34.94	74.32	48.31	No
83	94.50	93.47	508.50	54.00	34.94	58.56	38.07	No

ALTERNATIVE II (Varying n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
82	93.47	91.74	674.50	60.00	36.10	87.28	56.73	No
81	91.74	90.12	775.50	60.00	36.10	78.77	51.20	No
80	90.12	88.88	676.40	60.00	36.10	73.79	47.96	No
79	88.88	87.68	581.50	60.00	36.10	78.29	50.89	No
78	87.68	86.41	721.50	60.00	36.10	72.30	47.00	No
77	86.41	85.68	414.10	60.00	36.10	72.35	47.03	No
76	85.68	84.71	538.70	60.00	36.10	73.13	47.53	No
075A	84.40	84.00	194.00	60.00	37.47	78.25	50.86	No
75	84.71	84.40	184.50	60.00	36.10	70.64	45.92	No
74	84.00	82.61	676.90	60.00	37.47	78.09	50.76	No
73	82.61	81.67	481.80	60.00	37.47	76.12	49.48	No
72	81.67	80.25	716.60	60.00	37.47	76.71	49.86	No
71	80.25	78.90	716.20	60.00	37.47	74.82	48.63	No
70	78.90	77.36	728.80	60.00	37.47	79.22	51.49	No
69	77.36	76.15	628.50	60.00	38.83	75.61	49.15	No
68	76.15	74.91	645.40	60.00	38.83	75.54	49.10	No
67	74.91	73.59	685.40	60.00	38.83	75.62	49.16	No
66	73.59	72.23	787.60	60.00	38.83	71.61	46.55	No
65	72.23	71.10	659.00	60.00	38.83	71.36	46.38	No
64	71.10	69.84	680.30	60.00	38.83	74.16	48.21	No
63	69.84	68.40	620.80	60.00	38.83	83.00	53.95	No
62	68.40	67.08	572.60	60.00	39.37	82.74	53.78	No
61	67.08	65.84	655.60	60.00	39.37	74.95	48.71	No
60	65.84	64.70	600.00	60.00	39.37	75.12	48.83	No
59	64.70	63.41	634.40	60.00	40.52	77.71	50.51	No
58	63.41	62.22	653.60	60.00	40.52	73.53	47.79	No
57	62.22	61.12	604.40	60.00	40.52	73.52	47.79	No
56	61.12	59.45	600.00	60.00	41.97	90.92	59.10	No
55	59.45	57.86	770.60	60.00	41.97	78.28	50.88	No
54	57.86	56.55	671.40	60.00	41.97	76.12	49.48	No
53	56.55	55.26	624.70	60.00	41.97	78.31	50.90	No
52	55.26	53.88	758.90	60.00	41.97	73.48	47.76	No
51	53.88	53.45	749.40	60.00	41.97	41.28	26.83	No
50	53.45	51.21	567.70	60.00	41.97	108.25	70.36	No
49	51.21	50.48	392.60	60.00	41.97	74.31	48.30	No
48	50.48	48.92	768.40	60.00	41.97	77.65	50.47	No
47	48.92	47.90	605.00	60.00	43.46	70.76	45.99	No
46	47.90	46.51	598.90	60.00	43.46	83.02	53.96	No
45	46.51	45.49	605.00	60.00	43.46	70.76	45.99	No
44	45.49	43.73	785.80	60.00	43.46	81.56	53.01	No
43	43.73	42.55	525.30	60.00	43.46	81.67	53.09	No
42	42.55	41.24	687.30	60.00	43.46	75.24	48.90	No
41	41.24	39.58	678.50	60.00	44.41	85.24	55.41	No

ALTERNATIVE II (Varying n)

CONDUIT SUMMARY: PARALLEL LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 125A	143.70	143.60	20.00	30.00	8.80	19.19	12.47	No
FUT 125	143.60	142.36	493.00	30.00	8.80	13.61	8.85	No
FUT 124	142.36	140.98	551.00	30.00	8.80	13.58	8.83	No
FUT 123	141.00	139.07	770.00	30.00	8.88	13.59	8.83	No
FUT 122	139.07	137.18	757.00	30.00	8.86	13.56	8.82	No
FUT 121	137.18	135.58	640.00	30.00	8.84	13.57	8.82	No
FUT 120	135.58	133.63	778.00	30.00	8.84	13.59	8.83	No
FUT 119	133.63	132.66	388.00	30.00	8.82	13.57	8.82	No
FUT 118	132.66	131.85	428.00	36.00	8.81	19.20	12.48	No
FUT 117	131.85	130.90	456.00	36.00	8.80	20.14	13.09	No
FUT 116	130.90	129.95	499.00	36.00	8.80	19.26	12.52	No
FUT 115	129.95	128.81	708.00	36.00	8.80	17.71	11.51	No
FUT 114	128.81	127.85	711.00	36.00	8.80	16.22	10.54	No
FUT 113	127.85	127.35	436.00	36.00	8.80	14.95	9.71	No
FUT 112	127.35	126.42	677.00	36.00	8.80	16.35	10.63	No
FUT 111	126.42	125.68	404.00	36.00	8.80	18.89	12.28	No
FUT 110	125.68	124.47	666.00	36.00	8.80	18.81	12.23	No
FUT 109	124.47	123.26	669.00	36.00	8.80	18.77	12.20	No
FUT 108	123.26	122.57	516.00	36.00	8.80	16.14	10.49	No
FUT 107	122.57	120.49	744.00	36.00	8.80	23.34	15.17	No
FUT 106	120.49	120.17	301.00	36.00	8.80	14.39	9.35	No
FUT 82A	93.47	93.40	20.00	54.00	40.18	76.98	50.04	No
FUT 82	93.00	91.74	674.00	60.00	40.18	74.51	48.43	No
FUT 81	91.74	90.12	776.00	60.00	40.18	78.74	51.18	No
FUT 80	90.12	88.88	676.00	60.00	40.18	73.81	47.97	No
FUT 79	88.88	87.68	581.00	60.00	40.18	78.32	50.91	No
FUT 78	87.68	86.41	721.00	60.00	40.18	72.33	47.01	No
FUT 77	86.41	85.68	414.00	60.00	40.18	72.37	47.04	No
FUT 76	85.68	84.71	539.00	60.00	40.18	73.10	47.52	No
FUT 75A	84.40	84.00	194.00	60.00	40.18	78.25	50.86	No
FUT 75	84.71	84.40	184.00	60.00	40.18	70.74	45.98	No
FUT 74	84.00	82.61	677.00	60.00	40.18	78.09	50.76	No
FUT 73	82.61	81.67	482.00	60.00	40.18	76.10	49.47	No
FUT 72	81.67	80.25	717.00	60.00	40.18	76.69	49.85	No
FUT 71	80.25	78.90	716.00	60.00	40.18	74.83	48.64	No
FUT 70	78.90	77.36	729.00	60.00	40.18	79.20	51.48	No
FUT 69	77.36	76.15	628.00	60.00	40.18	75.64	49.17	No
FUT 68	76.15	74.91	645.00	60.00	40.18	75.56	49.11	No
FUT 67	74.91	73.59	685.00	60.00	40.18	75.65	49.17	No
FUT 66	73.59	72.23	788.00	60.00	40.18	71.59	46.53	No
FUT 65	72.23	71.10	659.00	60.00	40.18	71.36	46.38	No
FUT 64	71.10	69.84	680.00	60.00	40.18	74.18	48.22	No
FUT 63	69.84	68.40	621.00	60.00	40.18	82.99	53.94	No
FUT 62	68.40	67.08	573.00	60.00	40.18	82.71	53.76	No
FUT 61	67.08	65.84	656.00	60.00	40.18	74.93	48.70	No

ALTERNATIVE II (Varying n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 60	65.84	64.70	600.00	60.00	40.18	75.12	48.83	No
FUT 59	64.70	63.41	634.00	60.00	40.18	77.73	50.53	No
FUT 58	63.41	62.22	654.00	60.00	40.18	73.51	47.78	No
FUT 57	62.22	61.12	604.00	60.00	40.18	73.54	47.80	No
FUT 56	61.12	59.45	600.00	60.00	40.18	90.92	59.10	No
FUT 55	59.45	57.86	771.00	60.00	40.18	78.26	50.87	No
FUT 54	57.86	56.55	671.00	60.00	40.18	76.14	49.49	No
FUT 53	56.55	55.26	625.00	60.00	40.18	78.29	50.89	No
FUT 52	55.26	53.88	759.00	60.00	40.18	73.48	47.76	No
FUT 51	53.88	52.38	749.00	60.00	40.18	77.12	50.13	No
FUT 50	52.38	51.21	568.00	60.00	40.18	78.22	50.84	No
FUT 49	51.21	50.48	393.00	60.00	40.18	74.27	48.28	No
FUT 48	50.48	48.92	768.00	60.00	40.18	77.67	50.48	No
FUT 47	48.92	47.90	605.00	60.00	40.18	70.76	45.99	No
FUT 46	47.90	46.51	599.00	60.00	40.18	83.01	53.96	No
FUT 45	46.51	45.49	605.00	60.00	40.18	70.76	45.99	No
FUT 44	45.49	43.73	786.00	60.00	40.18	81.54	53.00	No
FUT 43	43.73	42.55	525.00	60.00	40.18	81.70	53.11	No
FUT 42	42.55	41.24	687.00	60.00	40.18	75.25	48.91	No
FUT 41	41.24	39.58	679.00	60.00	40.18	85.21	55.39	No

ALTERNATIVE II (Varying n)

JUNCTION SUMMARY: EXISTING LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	26.50	149.91	0.00	8.69	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.28	0.00	10.27	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.23	0.00	5.08	0.00
SANMH 123	140.90	154.05	144.40	0.77	143.04	0.00	11.01	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.39	0.00	20.52	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.83	0.00	11.32	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.36	0.00	10.78	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.74	0.00	12.35	0.00
SANMH 118	133.71	147.92	137.21	0.00	136.02	0.00	11.90	0.00
SANMH 117	133.04	148.12	137.04	4.96	135.14	0.00	12.98	0.00
SANMH 116	131.56	147.80	135.56	0.00	133.99	0.00	13.81	0.00
SANMH 115	130.59	145.49	134.59	0.00	133.13	0.00	12.36	0.00
SANMH 114	129.44	144.68	133.44	0.53	132.01	0.00	12.67	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.87	0.00	11.45	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.13	0.00	11.71	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.93	0.00	10.54	0.00
SANMH 110	125.68	139.67	129.68	1.42	128.26	0.00	11.41	0.00
SANMH 109	124.47	138.07	128.47	0.10	127.08	0.00	10.99	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.93	0.00	10.88	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.91	0.00	10.21	0.00
SANMH 106	120.49	133.54	124.99	0.00	123.38	0.00	10.16	0.00
SANMH 105A	120.17	135.19	124.67	0.06	123.10	0.00	12.09	0.00
SANMH 105	119.54	133.09	124.04	0.00	122.42	0.00	10.67	0.00
SANMH 104	118.42	132.62	122.92	0.00	121.15	0.00	11.47	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.58	0.00	10.73	0.00
SANMH 102	115.15	129.75	119.65	0.00	118.07	0.00	11.68	0.00
SANMH 101	114.37	128.97	118.87	0.00	117.34	0.00	11.63	0.00
SANMH 100	113.40	125.65	117.90	0.00	116.34	0.00	9.31	0.00
SANMH 99	112.43	125.43	116.93	0.00	115.29	0.00	10.14	0.00
SANMH 98	111.06	127.00	115.56	0.36	113.96	0.00	13.04	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.81	0.00	10.98	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.73	0.00	9.49	0.00
SANMH 95	107.63	120.31	112.13	0.00	110.35	0.00	9.96	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.81	0.00	11.96	0.00
SANMH 93	104.63	117.88	109.13	0.23	107.32	0.00	10.56	0.00
SANMH 92	103.64	116.31	108.14	0.00	106.41	0.00	9.90	0.00
SANMH 91	102.60	115.70	107.10	0.00	105.48	0.00	10.22	0.00
SANMH 90	101.80	114.40	106.30	0.00	104.65	0.00	9.75	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.70	0.00	9.96	0.00
SANMH 88	100.29	113.09	104.79	0.00	103.05	0.00	10.04	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.91	0.00	10.39	0.00

ALTERNATIVE II (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 86	97.48	109.88	101.98	0.00	100.31	0.00	9.58	0.00
SANMH 85	96.52	108.97	101.02	0.00	99.27	0.00	9.70	0.00
SANMH 84	95.81	109.11	100.31	0.00	98.29	0.00	10.82	0.00
SANMH 83	94.50	108.44	99.00	0.00	97.23	0.00	11.21	0.00
SANMH 82	93.47	106.10	98.47	41.34	95.97	0.00	10.13	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.38	0.00	11.18	0.00
SANMH 80	90.12	103.87	95.12	0.00	92.84	0.00	11.03	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.55	0.00	9.79	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.44	0.00	9.79	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.17	0.00	9.37	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.42	0.00	9.59	0.00
SANMH 75	84.40	98.30	89.40	1.38	87.10	0.00	11.20	0.00
SANMH 75A	84.71	101.02	89.71	0.00	87.45	0.00	13.57	0.00
SANMH 74	84.00	95.82	89.00	0.00	86.71	0.00	9.11	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.35	0.00	9.31	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.41	0.00	8.78	0.00
SANMH 71	80.25	91.95	85.25	0.00	83.01	0.00	8.94	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.61	0.00	10.10	0.00
SANMH 69	77.36	89.38	82.36	1.36	80.17	0.00	9.21	0.00
SANMH 68	76.15	87.87	81.15	0.00	78.97	0.00	8.90	0.00
SANMH 67	74.91	86.88	79.91	0.00	77.75	0.00	9.13	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.50	0.00	9.19	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.13	0.00	8.77	0.00
SANMH 64	71.10	82.30	76.10	0.00	73.92	0.00	8.38	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.51	0.00	9.39	0.00
SANMH 62	68.40	82.75	73.40	0.54	71.13	0.00	11.62	0.00
SANMH 61	67.08	80.48	72.08	0.00	69.93	0.00	10.55	0.00
SANMH 60	65.84	78.87	70.84	0.00	68.69	0.00	10.18	0.00
SANMH 59	64.70	78.08	69.70	1.15	67.57	0.00	10.51	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.34	0.00	11.42	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.11	0.00	10.32	0.00
SANMH 56	61.12	74.90	66.12	1.45	63.81	0.00	11.09	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.36	0.00	11.50	0.00
SANMH 54	57.86	72.54	62.86	0.00	60.81	0.00	11.73	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.53	0.00	11.69	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.42	0.00	12.94	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.32	0.00	11.36	0.00
SANMH 50	53.45	67.80	58.45	0.00	55.89	0.00	11.91	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.19	0.00	12.48	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.44	0.00	12.80	0.00
SANMH 47	48.92	64.87	53.92	1.50	52.01	0.00	12.86	0.00
SANMH 46	47.90	63.50	52.90	0.00	50.82	0.00	12.68	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.59	0.00	13.14	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.38	0.00	12.81	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.65	0.00	13.07	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.55	0.00	13.60	0.00

ALTERNATIVE II (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 41	41.24	59.82	46.24	0.95	44.08	0.00	15.74	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.42	0.00	14.63	0.00

JUNCTION SUMMARY: PARALLEL LINE

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH125	143.60	155.55	146.10	0.00	145.24	0.00	10.31	0.00
FUT MH124	142.36	149.30	144.86	0.00	144.01	0.00	5.30	0.00
FUT MH123	140.98	154.05	143.50	0.00	142.66	0.00	11.41	0.00
FUT MH122	139.07	161.90	141.57	0.00	140.72	0.00	21.19	0.00
FUT MH121	137.18	151.15	139.68	0.00	138.83	0.00	12.33	0.00
FUT MH120	135.58	149.14	138.08	0.00	137.23	0.00	11.92	0.00
FUT MH119	133.63	149.09	136.13	0.00	135.27	0.00	13.83	0.00
FUT MH118	132.66	147.92	135.66	0.00	134.23	0.00	13.69	0.00
FUT MH117	131.85	148.12	134.85	0.00	133.39	0.00	14.73	0.00
FUT MH116	130.90	147.80	133.90	0.00	132.50	0.00	15.31	0.00
FUT MH115	129.95	145.49	132.95	0.00	131.63	0.00	13.86	0.00
FUT MH114	128.81	144.68	131.81	0.00	130.57	0.00	14.11	0.00
FUT MH113	127.85	142.32	130.85	0.00	129.65	0.00	12.67	0.00
FUT MH112	127.35	141.84	130.35	0.00	129.07	0.00	12.77	0.00
FUT MH111	126.42	139.47	129.42	0.00	128.01	0.00	11.46	0.00
FUT MH110	125.68	139.67	128.68	0.00	127.28	0.00	12.39	0.00
FUT MH109	124.47	138.07	127.47	0.00	126.09	0.00	11.98	0.00
FUT MH108	123.26	136.81	126.26	0.00	124.98	0.00	11.83	0.00
FUT MH107	122.57	135.12	125.57	0.00	124.17	0.00	10.95	0.00
FUT MH106	120.49	133.54	123.49	0.00	123.24	0.00	10.30	0.00
FUT MH82	93.00	106.10	98.00	0.00	95.89	0.00	10.21	0.00
FUT MH81	91.74	105.56	96.74	0.00	94.57	0.00	10.99	0.00
FUT MH80	90.12	103.87	95.12	0.00	93.03	0.00	10.84	0.00
FUT MH79	88.88	101.34	93.88	0.00	91.74	0.00	9.60	0.00
FUT MH78	87.68	100.23	92.68	0.00	90.63	0.00	9.60	0.00
FUT MH77	86.41	98.53	91.41	0.00	89.35	0.00	9.18	0.00
FUT MH76	85.68	98.01	90.68	0.00	88.60	0.00	9.41	0.00
FUT MH75	84.40	98.30	89.40	0.00	87.22	0.00	11.08	0.00
FUT MH75A	84.71	101.02	89.71	0.00	87.60	0.00	13.43	0.00
FUT MH74	84.00	95.82	89.00	0.00	86.83	0.00	8.99	0.00
FUT MH73	82.61	94.66	87.61	0.00	85.47	0.00	9.19	0.00
FUT MH72	81.67	93.18	86.67	0.00	84.53	0.00	8.65	0.00
FUT MH71	80.25	91.95	85.25	0.00	83.13	0.00	8.82	0.00
FUT MH70	78.90	91.71	83.90	0.00	81.71	0.00	10.00	0.00
FUT MH69	77.36	89.38	82.36	0.00	80.24	0.00	9.14	0.00

ALTERNATIVE II (Varying n)

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
FUT MH68	76.15	87.87	81.15	0.00	79.03	0.00	8.84	0.00
FUT MH67	74.91	86.88	79.91	0.00	77.81	0.00	9.07	0.00
FUT MH66	73.59	85.69	78.59	0.00	76.56	0.00	9.13	0.00
FUT MH65	72.23	83.90	77.23	0.00	75.19	0.00	8.71	0.00
FUT MH64	71.10	82.30	76.10	0.00	73.98	0.00	8.32	0.00
FUT MH63	69.84	81.90	74.84	0.00	72.56	0.00	9.34	0.00
FUT MH62	68.40	82.75	73.40	0.00	71.16	0.00	11.59	0.00
FUT MH61	67.08	80.48	72.08	0.00	69.97	0.00	10.51	0.00
FUT MH60	65.84	78.87	70.84	0.00	68.72	0.00	10.15	0.00
FUT MH59	64.70	78.08	69.70	0.00	67.55	0.00	10.53	0.00
FUT MH58	63.41	77.76	68.41	0.00	66.32	0.00	11.44	0.00
FUT MH57	62.22	75.43	67.22	0.00	65.09	0.00	10.34	0.00
FUT MH56	61.12	74.90	66.12	0.00	63.74	0.00	11.17	0.00
FUT MH55	59.45	73.85	64.45	0.00	62.27	0.00	11.58	0.00
FUT MH54	57.86	72.54	62.86	0.00	60.72	0.00	11.82	0.00
FUT MH53	56.55	71.22	61.55	0.00	59.39	0.00	11.83	0.00
FUT MH52	55.26	71.36	60.26	0.00	58.17	0.00	13.19	0.00
FUT MH51	53.88	68.68	58.88	0.00	56.72	0.00	11.96	0.00
FUT MH50	52.38	67.80	57.38	0.00	55.22	0.00	12.58	0.00
FUT MH49	51.21	66.66	56.21	0.00	54.10	0.00	12.56	0.00
FUT MH48	50.48	66.23	55.48	0.00	53.34	0.00	12.90	0.00
FUT MH47	48.92	64.87	53.92	0.00	51.86	0.00	13.01	0.00
FUT MH46	47.90	63.50	52.90	0.00	50.67	0.00	12.83	0.00
FUT MH45	46.51	62.73	51.51	0.00	49.45	0.00	13.28	0.00
FUT MH44	45.49	61.19	50.49	0.00	48.24	0.00	12.95	0.00
FUT MH43	43.73	59.72	48.73	0.00	46.50	0.00	13.22	0.00
FUT MH42	42.55	59.15	47.55	0.00	45.41	0.00	13.74	0.00
FUT MH41	41.24	59.82	46.24	0.00	43.94	0.00	15.88	0.00

ALTERNATIVE III (Varying n)

CONDUIT SUMMARY: EXISTING LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
126	148.08	143.15	582.50	42.00	27.14	61.24	39.81	No
125	143.15	142.12	492.90	42.00	17.98	30.43	19.78	No
124	142.12	140.90	551.20	42.00	17.91	31.32	20.36	No
123	140.90	139.10	769.90	42.00	18.75	32.19	20.92	No
122	139.10	137.72	757.50	42.00	18.75	28.42	18.47	No
121	137.72	136.19	640.20	42.00	18.75	32.55	21.16	No
120	136.19	134.45	778.00	42.00	18.75	31.48	20.46	No
119	134.45	133.71	388.30	42.00	18.75	29.06	18.89	No
118	133.71	133.04	428.40	42.00	18.75	26.33	17.11	No
117	133.04	131.56	456.20	48.00	23.78	54.14	35.19	No
116	131.56	130.59	498.60	48.00	23.78	41.92	27.25	No
115	130.59	129.44	708.10	48.00	23.78	38.31	24.90	No
114	129.44	128.30	710.70	48.00	24.36	38.07	24.74	No
113	128.30	127.65	436.00	48.00	24.36	36.70	23.85	No
112	127.65	126.42	677.00	48.00	24.36	40.51	26.33	No
111	126.42	125.68	404.30	48.00	24.36	40.67	26.43	No
110	125.68	124.47	666.20	48.00	25.79	40.50	26.33	No
109	124.47	123.26	669.30	48.00	25.91	40.41	26.27	No
108	123.26	122.57	516.30	48.00	25.91	34.74	22.58	No
107	122.57	120.49	744.20	48.00	25.91	50.25	32.66	No
106	120.49	120.17	300.80	54.00	25.91	42.44	27.58	No
105A	120.17	119.54	385.10	54.00	34.91	52.63	34.21	No
105	119.54	118.42	661.90	54.00	34.91	53.52	34.79	No
104	118.42	116.91	727.00	54.00	34.91	59.30	38.55	No
103	116.91	115.15	722.30	54.00	34.91	64.23	41.75	No
102	115.15	114.37	432.50	54.00	34.91	55.26	35.92	No
101	114.37	113.40	603.60	54.00	34.91	52.16	33.90	No
100	113.40	112.43	602.40	54.00	34.91	52.21	33.94	No
99	112.43	111.06	742.50	54.00	34.91	55.90	36.33	No
98	111.06	109.87	648.80	54.00	35.31	55.73	36.22	No
97	109.87	108.82	621.80	54.00	35.31	53.47	34.76	No
96	108.82	107.63	709.10	54.00	35.31	53.30	34.65	No
95	107.63	106.05	718.70	54.00	35.31	61.01	39.66	No
94	106.05	104.63	694.20	54.00	35.31	58.85	38.25	No
93	104.63	103.64	419.00	54.00	35.55	63.25	41.11	No
92	103.64	102.60	467.10	54.00	35.55	61.40	39.91	No
91	102.60	101.80	440.30	54.00	35.55	55.46	36.05	No
90	101.80	100.88	492.10	54.00	35.55	56.26	36.57	No
89	100.88	100.29	316.80	54.00	35.55	56.15	36.50	No
88	100.29	99.13	553.90	54.00	35.55	59.55	38.71	No
87	99.13	97.48	788.70	54.00	35.55	59.52	38.68	No
86	97.48	96.52	507.80	54.00	35.55	56.57	36.77	No
85	96.52	95.81	390.70	54.00	35.55	55.47	36.05	No
84	95.81	94.50	401.60	54.00	35.55	74.32	48.31	No
83	94.50	93.47	508.50	54.00	35.55	58.56	38.07	No

ALTERNATIVE III (Varying n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
82	93.47	91.74	674.50	60.00	36.98	87.28	56.73	No
81	91.74	90.12	775.50	60.00	36.98	78.77	51.20	No
80	90.12	88.88	676.40	60.00	36.98	73.79	47.96	No
79	88.88	87.68	581.50	60.00	36.98	78.29	50.89	No
78	87.68	86.41	721.50	60.00	36.98	72.30	47.00	No
77	86.41	85.68	414.10	60.00	36.98	72.35	47.03	No
76	85.68	84.71	538.70	60.00	36.98	73.13	47.53	No
075A	84.40	84.00	194.00	60.00	38.36	78.25	50.86	No
75	84.71	84.40	184.50	60.00	36.98	70.64	45.92	No
74	84.00	82.61	676.90	60.00	38.36	78.09	50.76	No
73	82.61	81.67	481.80	60.00	38.36	76.12	49.48	No
72	81.67	80.25	716.60	60.00	38.36	76.71	49.86	No
71	80.25	78.90	716.20	60.00	38.36	74.82	48.63	No
70	78.90	77.36	728.80	60.00	38.36	79.22	51.49	No
69	77.36	76.15	628.50	60.00	39.76	75.61	49.15	No
68	76.15	74.91	645.40	60.00	39.76	75.54	49.10	No
67	74.91	73.59	685.40	60.00	39.76	75.62	49.16	No
66	73.59	72.23	787.60	60.00	39.76	71.61	46.55	No
65	72.23	71.10	659.00	60.00	39.76	71.36	46.38	No
64	71.10	69.84	680.30	60.00	39.76	74.16	48.21	No
63	69.84	68.40	620.80	60.00	39.76	83.00	53.95	No
62	68.40	67.08	572.60	60.00	40.36	82.74	53.78	No
61	67.08	65.84	655.60	60.00	40.36	74.95	48.71	No
60	65.84	64.70	600.00	60.00	40.36	75.12	48.83	No
59	64.70	63.41	634.40	60.00	41.53	77.71	50.51	No
58	63.41	62.22	653.60	60.00	41.53	73.53	47.79	No
57	62.22	61.12	604.40	60.00	41.53	73.52	47.79	No
56	61.12	59.45	600.00	60.00	43.04	90.92	59.10	No
55	59.45	57.86	770.60	60.00	43.04	78.28	50.88	No
54	57.86	56.55	671.40	60.00	43.04	76.12	49.48	No
53	56.55	55.26	624.70	60.00	43.04	78.31	50.90	No
52	55.26	53.88	758.90	60.00	43.04	73.48	47.76	No
51	53.88	53.45	749.40	60.00	43.04	41.28	26.83	No
50	53.45	51.21	567.70	60.00	43.04	108.25	70.36	No
49	51.21	50.48	392.60	60.00	43.04	74.31	48.30	No
48	50.48	48.92	768.40	60.00	43.04	77.65	50.47	No
47	48.92	47.90	605.00	60.00	44.74	70.76	45.99	No
46	47.90	46.51	598.90	60.00	44.74	83.02	53.96	No
45	46.51	45.49	605.00	60.00	44.74	70.76	45.99	No
44	45.49	43.73	785.80	60.00	44.74	81.56	53.01	No
43	43.73	42.55	525.30	60.00	44.74	81.67	53.09	No
42	42.55	41.24	687.30	60.00	44.74	75.24	48.90	No
41	41.24	39.58	678.50	60.00	45.79	85.24	55.41	No

ALTERNATIVE III (Varying n)

CONDUIT SUMMARY: PARALLEL LINE

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 125A	143.70	143.60	20.00	30.00	8.93	19.19	12.47	No
FUT 125	143.60	142.36	493.00	30.00	8.93	13.61	8.85	No
FUT 124	142.36	140.98	551.00	30.00	8.93	13.58	8.83	No
FUT 123	141.00	139.07	770.00	30.00	9.00	13.59	8.83	No
FUT 122	139.07	137.18	757.00	30.00	8.97	13.56	8.82	No
FUT 121	137.18	135.58	640.00	30.00	8.95	13.57	8.82	No
FUT 120	135.58	133.63	778.00	30.00	8.96	13.59	8.83	No
FUT 119	133.63	132.66	388.00	30.00	8.94	13.57	8.82	No
FUT 118	132.66	131.85	428.00	36.00	8.93	19.20	12.48	No
FUT 117	131.85	130.90	456.00	36.00	8.93	20.14	13.09	No
FUT 116	130.90	129.95	499.00	36.00	8.93	19.26	12.52	No
FUT 115	129.95	128.81	708.00	36.00	8.93	17.71	11.51	No
FUT 114	128.81	127.85	711.00	36.00	8.93	16.22	10.54	No
FUT 113	127.85	127.35	436.00	36.00	8.93	14.95	9.71	No
FUT 112	127.35	126.42	677.00	36.00	8.93	16.35	10.63	No
FUT 111	126.42	125.68	404.00	36.00	8.93	18.89	12.28	No
FUT 110	125.68	124.47	666.00	36.00	8.93	18.81	12.23	No
FUT 109	124.47	123.26	669.00	36.00	8.93	18.77	12.20	No
FUT 108	123.26	122.57	516.00	36.00	8.93	16.14	10.49	No
FUT 107	122.57	120.49	744.00	36.00	8.93	23.34	15.17	No
FUT 106	120.49	120.17	301.00	36.00	8.93	14.39	9.35	No
FUT 82A	93.47	93.40	20.00	54.00	41.01	76.98	50.04	No
FUT 82	93.00	91.74	674.00	60.00	41.01	74.51	48.43	No
FUT 81	91.74	90.12	776.00	60.00	41.01	78.74	51.18	No
FUT 80	90.12	88.88	676.00	60.00	41.01	73.81	47.97	No
FUT 79	88.88	87.68	581.00	60.00	41.01	78.32	50.91	No
FUT 78	87.68	86.41	721.00	60.00	41.01	72.33	47.01	No
FUT 77	86.41	85.68	414.00	60.00	41.01	72.37	47.04	No
FUT 76	85.68	84.71	539.00	60.00	41.01	73.10	47.52	No
FUT 75A	84.40	84.00	194.00	60.00	41.01	78.25	50.86	No
FUT 75	84.71	84.40	184.00	60.00	41.01	70.74	45.98	No
FUT 74	84.00	82.61	677.00	60.00	41.01	78.09	50.76	No
FUT 73	82.61	81.67	482.00	60.00	41.01	76.10	49.47	No
FUT 72	81.67	80.25	717.00	60.00	41.01	76.69	49.85	No
FUT 71	80.25	78.90	716.00	60.00	41.01	74.83	48.64	No
FUT 70	78.90	77.36	729.00	60.00	41.01	79.20	51.48	No
FUT 69	77.36	76.15	628.00	60.00	41.01	75.64	49.17	No
FUT 68	76.15	74.91	645.00	60.00	41.01	75.56	49.11	No
FUT 67	74.91	73.59	685.00	60.00	41.01	75.65	49.17	No
FUT 66	73.59	72.23	788.00	60.00	41.01	71.59	46.53	No
FUT 65	72.23	71.10	659.00	60.00	41.01	71.36	46.38	No
FUT 64	71.10	69.84	680.00	60.00	41.01	74.18	48.22	No
FUT 63	69.84	68.40	621.00	60.00	41.01	82.99	53.94	No
FUT 62	68.40	67.08	573.00	60.00	41.01	82.71	53.76	No
FUT 61	67.08	65.84	656.00	60.00	41.01	74.93	48.70	No

ALTERNATIVE III (Varying n)

Link Name	Invert Elevations		Length ft	Diameter in	Flow			Computed> Design Flow (Yes/No)
	Upstream ft	Downstream ft			Computed mgd	Full mgd	Design mgd	
FUT 60	65.84	64.70	600.00	60.00	41.01	75.12	48.83	No
FUT 59	64.70	63.41	634.00	60.00	41.01	77.73	50.53	No
FUT 58	63.41	62.22	654.00	60.00	41.01	73.51	47.78	No
FUT 57	62.22	61.12	604.00	60.00	41.01	73.54	47.80	No
FUT 56	61.12	59.45	600.00	60.00	41.01	90.92	59.10	No
FUT 55	59.45	57.86	771.00	60.00	41.01	78.26	50.87	No
FUT 54	57.86	56.55	671.00	60.00	41.01	76.14	49.49	No
FUT 53	56.55	55.26	625.00	60.00	41.01	78.29	50.89	No
FUT 52	55.26	53.88	759.00	60.00	41.01	73.48	47.76	No
FUT 51	53.88	52.38	749.00	60.00	41.01	77.12	50.13	No
FUT 50	52.38	51.21	568.00	60.00	41.01	78.22	50.84	No
FUT 49	51.21	50.48	393.00	60.00	41.01	74.27	48.28	No
FUT 48	50.48	48.92	768.00	60.00	41.01	77.67	50.48	No
FUT 47	48.92	47.90	605.00	60.00	41.01	70.76	45.99	No
FUT 46	47.90	46.51	599.00	60.00	41.01	83.01	53.96	No
FUT 45	46.51	45.49	605.00	60.00	41.01	70.76	45.99	No
FUT 44	45.49	43.73	786.00	60.00	41.01	81.54	53.00	No
FUT 43	43.73	42.55	525.00	60.00	41.01	81.70	53.11	No
FUT 42	42.55	41.24	687.00	60.00	41.01	75.25	48.91	No
FUT 41	41.24	39.58	679.00	60.00	41.01	85.21	55.39	No

ALTERNATIVE III (Varying n)

JUNCTION SUMMARY: EXISTING LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 126	148.08	158.55	151.58	26.83	149.93	0.00	8.68	0.00
SANMH 125	143.15	155.55	146.65	0.00	145.30	0.00	10.26	0.00
SANMH 124	142.12	149.30	145.62	0.00	144.24	0.00	5.06	0.00
SANMH 123	140.90	154.05	144.40	0.84	143.07	0.00	10.99	0.00
SANMH 122	139.10	161.90	142.60	0.00	141.41	0.00	20.49	0.00
SANMH 121	137.72	151.15	141.22	0.00	139.85	0.00	11.30	0.00
SANMH 120	136.19	149.14	139.69	0.00	138.38	0.00	10.76	0.00
SANMH 119	134.45	149.09	137.95	0.00	136.76	0.00	12.33	0.00
SANMH 118	133.71	147.92	137.21	0.00	136.05	0.00	11.87	0.00
SANMH 117	133.04	148.12	137.04	5.03	135.16	0.00	12.96	0.00
SANMH 116	131.56	147.80	135.56	0.00	134.02	0.00	13.78	0.00
SANMH 115	130.59	145.49	134.59	0.00	133.16	0.00	12.34	0.00
SANMH 114	129.44	144.68	133.44	0.58	132.04	0.00	12.64	0.00
SANMH 113	128.30	142.32	132.30	0.00	130.90	0.00	11.42	0.00
SANMH 112	127.65	141.84	131.65	0.00	130.16	0.00	11.68	0.00
SANMH 111	126.42	139.47	130.42	0.00	128.96	0.00	10.51	0.00
SANMH 110	125.68	139.67	129.68	1.44	128.29	0.00	11.38	0.00
SANMH 109	124.47	138.07	128.47	0.12	127.11	0.00	10.96	0.00
SANMH 108	123.26	136.81	127.26	0.00	125.96	0.00	10.85	0.00
SANMH 107	122.57	135.12	126.57	0.00	124.94	0.00	10.18	0.00
SANMH 106	120.49	133.54	124.99	0.00	123.41	0.00	10.13	0.00
SANMH 105A	120.17	135.19	124.67	0.07	123.13	0.00	12.06	0.00
SANMH 105	119.54	133.09	124.04	0.00	122.45	0.00	10.64	0.00
SANMH 104	118.42	132.62	122.92	0.00	121.18	0.00	11.44	0.00
SANMH 103	116.91	130.31	121.41	0.00	119.61	0.00	10.70	0.00
SANMH 102	115.15	129.75	119.65	0.00	118.10	0.00	11.65	0.00
SANMH 101	114.37	128.97	118.87	0.00	117.37	0.00	11.60	0.00
SANMH 100	113.40	125.65	117.90	0.00	116.38	0.00	9.27	0.00
SANMH 99	112.43	125.43	116.93	0.00	115.32	0.00	10.11	0.00
SANMH 98	111.06	127.00	115.56	0.40	113.99	0.00	13.01	0.00
SANMH 97	109.87	123.79	114.37	0.00	112.85	0.00	10.95	0.00
SANMH 96	108.82	121.22	113.32	0.00	111.76	0.00	9.46	0.00
SANMH 95	107.63	120.31	112.13	0.00	110.38	0.00	9.93	0.00
SANMH 94	106.05	120.77	110.55	0.00	108.84	0.00	11.93	0.00
SANMH 93	104.63	117.88	109.13	0.25	107.36	0.00	10.53	0.00
SANMH 92	103.64	116.31	108.14	0.00	106.44	0.00	9.87	0.00
SANMH 91	102.60	115.70	107.10	0.00	105.51	0.00	10.19	0.00
SANMH 90	101.80	114.40	106.30	0.00	104.68	0.00	9.72	0.00
SANMH 89	100.88	113.66	105.38	0.00	103.73	0.00	9.93	0.00
SANMH 88	100.29	113.09	104.79	0.00	103.09	0.00	10.00	0.00
SANMH 87	99.13	112.29	103.63	0.00	101.94	0.00	10.35	0.00

ALTERNATIVE III (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
SANMH 86	97.48	109.88	101.98	0.00	100.34	0.00	9.54	0.00
SANMH 85	96.52	108.97	101.02	0.00	99.30	0.00	9.67	0.00
SANMH 84	95.81	109.11	100.31	0.00	98.32	0.00	10.79	0.00
SANMH 83	94.50	108.44	99.00	0.00	97.26	0.00	11.18	0.00
SANMH 82	93.47	106.10	98.47	42.44	96.00	0.00	10.10	0.00
SANMH 81	91.74	105.56	96.74	0.00	94.42	0.00	11.14	0.00
SANMH 80	90.12	103.87	95.12	0.00	92.88	0.00	10.99	0.00
SANMH 79	88.88	101.34	93.88	0.00	91.59	0.00	9.75	0.00
SANMH 78	87.68	100.23	92.68	0.00	90.48	0.00	9.75	0.00
SANMH 77	86.41	98.53	91.41	0.00	89.21	0.00	9.33	0.00
SANMH 76	85.68	98.01	90.68	0.00	88.46	0.00	9.55	0.00
SANMH 75	84.71	101.02	89.71	0.00	87.49	0.00	13.53	0.00
SANMH 75A	84.40	98.30	89.40	1.38	87.14	0.00	11.16	0.00
SANMH 74	84.00	95.82	89.00	0.00	86.75	0.00	9.07	0.00
SANMH 73	82.61	94.66	87.61	0.00	85.39	0.00	9.27	0.00
SANMH 72	81.67	93.18	86.67	0.00	84.44	0.00	8.74	0.00
SANMH 71	80.25	91.95	85.25	0.00	83.05	0.00	8.90	0.00
SANMH 70	78.90	91.71	83.90	0.00	81.65	0.00	10.06	0.00
SANMH 69	77.36	89.38	82.36	1.40	80.22	0.00	9.16	0.00
SANMH 68	76.15	87.87	81.15	0.00	79.01	0.00	8.86	0.00
SANMH 67	74.91	86.88	79.91	0.00	77.79	0.00	9.09	0.00
SANMH 66	73.59	85.69	78.59	0.00	76.54	0.00	9.15	0.00
SANMH 65	72.23	83.90	77.23	0.00	75.17	0.00	8.73	0.00
SANMH 64	71.10	82.30	76.10	0.00	73.96	0.00	8.34	0.00
SANMH 63	69.84	81.90	74.84	0.00	72.55	0.00	9.35	0.00
SANMH 62	68.40	82.75	73.40	0.60	71.17	0.00	11.58	0.00
SANMH 61	67.08	80.48	72.08	0.00	69.98	0.00	10.50	0.00
SANMH 60	65.84	78.87	70.84	0.00	68.74	0.00	10.13	0.00
SANMH 59	64.70	78.08	69.70	1.17	67.61	0.00	10.47	0.00
SANMH 58	63.41	77.76	68.41	0.00	66.39	0.00	11.37	0.00
SANMH 57	62.22	75.43	67.22	0.00	65.16	0.00	10.27	0.00
SANMH 56	61.12	74.90	66.12	1.51	63.85	0.00	11.05	0.00
SANMH 55	59.45	73.85	64.45	0.00	62.40	0.00	11.45	0.00
SANMH 54	57.86	72.54	62.86	0.00	60.86	0.00	11.68	0.00
SANMH 53	56.55	71.22	61.55	0.00	59.58	0.00	11.64	0.00
SANMH 52	55.26	71.36	60.26	0.00	58.48	0.00	12.88	0.00
SANMH 51	53.88	68.68	58.88	0.00	57.37	0.00	11.31	0.00
SANMH 50	53.45	67.80	58.45	0.00	55.93	0.00	11.87	0.00
SANMH 49	51.21	66.66	56.21	0.00	54.24	0.00	12.43	0.00
SANMH 48	50.48	66.23	55.48	0.00	53.49	0.00	12.74	0.00
SANMH 47	48.92	64.87	53.92	1.70	52.07	0.00	12.80	0.00
SANMH 46	47.90	63.50	52.90	0.00	50.87	0.00	12.63	0.00
SANMH 45	46.51	62.73	51.51	0.00	49.65	0.00	13.08	0.00
SANMH 44	45.49	61.19	50.49	0.00	48.43	0.00	12.76	0.00
SANMH 43	43.73	59.72	48.73	0.00	46.70	0.00	13.02	0.00
SANMH 42	42.55	59.15	47.55	0.00	45.61	0.00	13.54	0.00

ALTERNATIVE III (Varying n)

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
SANMH 41	41.24	59.82	46.24	1.05	44.13	0.00	15.69	0.00
SANMH 40	39.58	57.05	44.58	0.00	42.47	0.00	14.58	0.00

JUNCTION SUMMARY: PARALLEL LINE

Junction Name	Invert Elevation ft	Ground Elevation ft	Uppermost Pipe Crown Elevation ft	Constant Inflow mgd	Maximum Junction Elevation ft	Surcharge at Maximum Elevation ft	Freeboard of node ft	Flooded Volume ft ³
FUT MH125	143.60	155.55	146.10	0.00	145.26	0.00	10.30	0.00
FUT MH124	142.36	149.30	144.86	0.00	144.02	0.00	5.28	0.00
FUT MH123	140.98	154.05	143.50	0.00	142.68	0.00	11.39	0.00
FUT MH122	139.07	161.90	141.57	0.00	140.74	0.00	21.17	0.00
FUT MH121	137.18	151.15	139.68	0.00	138.84	0.00	12.31	0.00
FUT MH120	135.58	149.14	138.08	0.00	137.24	0.00	11.90	0.00
FUT MH119	133.63	149.09	136.13	0.00	135.28	0.00	13.81	0.00
FUT MH118	132.66	147.92	135.66	0.00	134.25	0.00	13.68	0.00
FUT MH117	131.85	148.12	134.85	0.00	133.41	0.00	14.71	0.00
FUT MH116	130.90	147.80	133.90	0.00	132.51	0.00	15.29	0.00
FUT MH115	129.95	145.49	132.95	0.00	131.64	0.00	13.85	0.00
FUT MH114	128.81	144.68	131.81	0.00	130.59	0.00	14.09	0.00
FUT MH113	127.85	142.32	130.85	0.00	129.66	0.00	12.66	0.00
FUT MH112	127.35	141.84	130.35	0.00	129.09	0.00	12.75	0.00
FUT MH111	126.42	139.47	129.42	0.00	128.03	0.00	11.45	0.00
FUT MH110	125.68	139.67	128.68	0.00	127.29	0.00	12.38	0.00
FUT MH109	124.47	138.07	127.47	0.00	126.10	0.00	11.97	0.00
FUT MH108	123.26	136.81	126.26	0.00	125.00	0.00	11.81	0.00
FUT MH107	122.57	135.12	125.57	0.00	124.20	0.00	10.93	0.00
FUT MH106	120.49	133.54	123.49	0.00	123.28	0.00	10.26	0.00
FUT MH82	93.00	106.10	98.00	0.00	95.93	0.00	10.17	0.00
FUT MH81	91.74	105.56	96.74	0.00	94.60	0.00	10.96	0.00
FUT MH80	90.12	103.87	95.12	0.00	93.07	0.00	10.81	0.00
FUT MH79	88.88	101.34	93.88	0.00	91.78	0.00	9.57	0.00
FUT MH78	87.68	100.23	92.68	0.00	90.67	0.00	9.56	0.00
FUT MH77	86.41	98.53	91.41	0.00	89.39	0.00	9.14	0.00
FUT MH76	85.68	98.01	90.68	0.00	88.64	0.00	9.37	0.00
FUT MH75	84.71	101.02	89.71	0.00	87.63	0.00	13.39	0.00
FUT MH75A	84.40	98.30	89.40	0.00	87.26	0.00	11.04	0.00
FUT MH74	84.00	95.82	89.00	0.00	86.87	0.00	8.96	0.00
FUT MH73	82.61	94.66	87.61	0.00	85.51	0.00	9.15	0.00
FUT MH72	81.67	93.18	86.67	0.00	84.56	0.00	8.62	0.00
FUT MH71	80.25	91.95	85.25	0.00	83.17	0.00	8.78	0.00
FUT MH70	78.90	91.71	83.90	0.00	81.75	0.00	9.96	0.00
FUT MH69	77.36	89.38	82.36	0.00	80.27	0.00	9.11	0.00

ALTERNATIVE III (Varying n)

Junction Name	Invert Elevation	Ground Elevation	Uppermost Pipe Crown Elevation	Constant Inflow	Maximum Junction Elevation	Surcharge at Maximum Elevation	Freeboard of node	Flooded Volume
	ft	ft	ft	mgd	ft	ft	ft	ft ³
FUT MH68	76.15	87.87	81.15	0.00	79.07	0.00	8.80	0.00
FUT MH67	74.91	86.88	79.91	0.00	77.85	0.00	9.03	0.00
FUT MH66	73.59	85.69	78.59	0.00	76.60	0.00	9.09	0.00
FUT MH65	72.23	83.90	77.23	0.00	75.23	0.00	8.67	0.00
FUT MH64	71.10	82.30	76.10	0.00	74.02	0.00	8.28	0.00
FUT MH63	69.84	81.90	74.84	0.00	72.60	0.00	9.30	0.00
FUT MH62	68.40	82.75	73.40	0.00	71.20	0.00	11.55	0.00
FUT MH61	67.08	80.48	72.08	0.00	70.01	0.00	10.47	0.00
FUT MH60	65.84	78.87	70.84	0.00	68.76	0.00	10.11	0.00
FUT MH59	64.70	78.08	69.70	0.00	67.59	0.00	10.49	0.00
FUT MH58	63.41	77.76	68.41	0.00	66.36	0.00	11.40	0.00
FUT MH57	62.22	75.43	67.22	0.00	65.12	0.00	10.31	0.00
FUT MH56	61.12	74.90	66.12	0.00	63.77	0.00	11.13	0.00
FUT MH55	59.45	73.85	64.45	0.00	62.31	0.00	11.54	0.00
FUT MH54	57.86	72.54	62.86	0.00	60.76	0.00	11.79	0.00
FUT MH53	56.55	71.22	61.55	0.00	59.43	0.00	11.79	0.00
FUT MH52	55.26	71.36	60.26	0.00	58.21	0.00	13.15	0.00
FUT MH51	53.88	68.68	58.88	0.00	56.75	0.00	11.93	0.00
FUT MH50	52.38	67.80	57.38	0.00	55.25	0.00	12.55	0.00
FUT MH49	51.21	66.66	56.21	0.00	54.14	0.00	12.53	0.00
FUT MH48	50.48	66.23	55.48	0.00	53.37	0.00	12.86	0.00
FUT MH47	48.92	64.87	53.92	0.00	51.90	0.00	12.97	0.00
FUT MH46	47.90	63.50	52.90	0.00	50.71	0.00	12.79	0.00
FUT MH45	46.51	62.73	51.51	0.00	49.49	0.00	13.25	0.00
FUT MH44	45.49	61.19	50.49	0.00	48.27	0.00	12.92	0.00
FUT MH43	43.73	59.72	48.73	0.00	46.54	0.00	13.18	0.00
FUT MH42	42.55	59.15	47.55	0.00	45.45	0.00	13.70	0.00
FUT MH41	41.24	59.82	46.24	0.00	43.98	0.00	15.84	0.00

APPENDIX I: COST ESTIMATE

TYPE OF ESTIMATE: 90%- ALTERNATIVE I, MATTAWOMAN PARALLEL INTERCEPTOR

DATE: JUNE 2007

TYPE OF CONSTRUCTION: UTILITY - SEWER

PROJECT: MATTAWOMAN INTERCEPTOR PHASE 1 & 2 CAPACITY STUDY

PREPARED BY: KCI TECHNOLOGIES, INC.

May 2006 ENR Construction Cost Index= 7942

ITEM	DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL COST
1	MOBILIZATION	LS	\$2,500.00	1	\$2,500
2	SURVEY & FIELD ENGINEERING	LS	\$50,000.00	1	\$50,000
3	BITUMINOUS CONCRETE PAVEMENT RESTORATION	SY	\$60.00	178	\$10,667
4	SEED, MULCH & FERTILIZER	SY	\$0.60	9,728	\$5,837
5	MAINTENANCE OF TRAFFIC	DAY	\$2,020.00	20	\$40,400
6	FENCING/SCREENING	LF	\$16.00	5,209	\$83,336
7	CLEAR & GRUB & REFORESTATION	AC	\$6,200.00	46	\$283,960
8	SILT FENCE	LF	\$3.70	5,209	\$19,271
9	STABILIZED CONSTRUCTION ENTRANCE	EA	\$1,000.00	9	\$9,000
10	RESTORE WETLANDS & MITIGATION	SF	\$2.25	1,912,284	\$4,302,639
11	30" MICROTUNNELING	LF	\$875	1,190	\$1,040,793
12	36" MICROTUNNELING	LF	\$1,118	560	\$625,836
13	60" MICROTUNNELING	LF	\$1,591	80	\$127,305
14	MICROTUNNELING PITS	EA	\$8,100.00	20	\$162,000
15	5' PERPETUAL EASEMENTS	SF	\$2.00	125,840	\$251,680
16	15' PERPETUAL EASEMENTS	SF	\$2.00	403,755	\$807,510
17	15' TEMPORARY EASEMENTS	SF	\$0.40	781,275	\$312,510
18	30" SANITARY SEWER	LF	\$250.00	4,397	\$1,099,250
19	36" SANITARY SEWER	LF	\$250.00	20,771	\$5,192,750
20	60" SANITARY SEWER	LF	\$300.00	26,917	\$8,075,100
21	MANHOLES	EA	\$5,000.00	86	\$430,000
SUBTOTAL					\$22,932,345
CONTINGENCY (20%)					\$4,586,469
SUBTOTAL					\$27,518,814
ENGINEERING & ADMINISTRATION (25%)					\$6,928,683
TOTAL ALTERNATIVE I- PINEY BRANCH PARALLEL INTERCEPTOR COST					\$34,447,497

TYPE OF ESTIMATE: 90%- ALTERNATIVE II, MATTAWOMAN PARALLEL INTERCEPTOR MH 40-80 AND 105A-125

DATE: JUNE 2007

TYPE OF CONSTRUCTION: UTILITY - SEWER

PROJECT: MATTAWOMAN INTERCEPTOR PHASE 1 & 2 CAPACITY STUDY

PREPARED BY: KCI TECHNOLOGIES, INC.

May 2006 ENR Construction Cost Index= 7942

ITEM	DESCRIPTION	UNIT	UNIT PRICE	TOTAL QUANTITY	TOTAL COST
1	MOBILIZATION	LS	\$2,500.00	1	\$2,500
2	SURVEY & FIELD ENGINEERING	LS	\$50,000.00	1	\$50,000
3	BITUMINOUS CONCRETE PAVEMENT RESTORATION	SY	\$60.00	133	\$8,000
4	SEED, MULCH & FERTILIZER	SY	\$0.60	7,296	\$4,378
5	MAINTENANCE OF TRAFFIC	DAY	\$2,020.00	15	\$30,300
6	FENCING/SCREENING	LF	\$16.00	2,890	\$46,235
7	CLEAR & GRUB & REFORESTATION	AC	\$6,200.00	34	\$212,970
8	SILT FENCE	LF	\$3.70	2,890	\$10,692
9	STABILIZED CONSTRUCTION ENTRANCE	EA	\$1,000.00	9	\$9,000
10	RESTORE WETLANDS & MITIGATION	SF	\$2.25	1,542,024	\$3,469,554
11	30" MICROTUNNELING	LF	\$875	893	\$780,595
12	36" MICROTUNNELING	LF	\$1,118	398	\$444,232
13	60" MICROTUNNELING	LF	\$1,591	80	\$127,305
14	MICROTUNNELING PITS	EA	\$8,100.00	15	\$121,500
15	5' PERPETUAL EASEMENTS	SF	\$2.00	63,300	\$126,600
16	15' PERPETUAL EASEMENTS	SF	\$2.00	403,755	\$807,510
17	15' TEMPORARY EASEMENTS	SF	\$0.40	593,655	\$237,462
18	30" SANITARY SEWER	LF	\$250.00	4,397	\$1,099,250
19	36" SANITARY SEWER	LF	\$250.00	7,215	\$1,803,750
20	54" SANITARY SEWER	LF	\$300.00	20	\$6,000
21	60" SANITARY SEWER	LF	\$300.00	26,897	\$8,069,100
22	MANHOLES	EA	\$5,000.00	65	\$322,500
SUBTOTAL					\$17,789,433
CONTINGENCY (20%)					\$3,557,887
SUBTOTAL					\$21,347,319
ENGINEERING & ADMINISTRATION (25%)					\$6,928,683
TOTAL ALTERNATIVE I- PINEY BRANCH PARALLEL INTERCEPTOR COST					\$28,276,002

APPENDIX J: ENVIRONMENTAL IMPACTS

Environmental Impacts

Existing Mattawoman Interceptor
40' Width of Impact

Environmental Feature	<u>Acres</u>
Forest Conservation	0.4
Protected Lands	0.0
100-yr flood	43.6
500-yr flood	0.1
Ag Easement	0.0
Greenways	0.0
Natural Heritage Areas	0.0
Historic Easements	0.0
NWI Wetlands	43.9

Environmental Impacts

Alternative I

Parallel Mattawoman Interceptor

40' Width of Impact

Environmental Feature	Acres
Forest Conservation	0.4
Protected Lands	0.0
100-yr flood	43.6
500-yr flood	0.1
Ag Easement	0.0
Greenways	0.0
Natural Heritage Areas	0.0
Historic Easements	0.0
NWI Wetlands	43.9

Total Impact Area

193,229 Sq Meters

47.7 Acres

Environmental Impacts

Alternative II

Partial Parallel Mattawoman Interceptor
40' Width of Impact

Environmental Feature	<u>Acres</u>
Forest Conservation	0.4
Protected Lands	0.0
100-yr flood	32.1
500-yr flood	0.1
Ag Easement	0.0
Greenways	0.0
Natural Heritage Areas	0.0
Historic Easements	0.0
NWI Wetlands	35.4
Sensitive Species	4.9

Total Impact Area

144,922 Sq Meters
35.8 Acres

Environmental Impacts

Alternative III

Partial Parallel Mattawoman Interceptor

40' Width of Impact

Environmental Feature	<u>Acres</u>
Forest Conservation	0.4
Protected Lands	0.0
100-yr flood	32.1
500-yr flood	0.1
Ag Easement	0.0
Greenways	0.0
Natural Heritage Areas	0.0
Historic Easements	0.0
NWI Wetlands	35.4
Sensitive Species	4.9

Total Impact Area

144,922 Sq Meters

35.8 Acres

APPENDIX K: ENVIRONMENTAL FEATURES MAP

