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July 1, 2019

Mr. Myrl Lawrence  
Enforcement Coordinator – Water Division  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

RE: City of Bryant  
LIS 16-057, AFIN 63-0005, Permit No. AR0034002  
CIP Update

Dear Myrl:

In accordance with the requirements of the Consent Administrative Order (CAO) LIS No. 16-057 with the Arkansas Department of Environmental Quality dated on July 14, 2016, we submit herewith an update to the Capital Improvement Plan pursuant to your June 11, 2019 request.

Should you have any questions regarding this correspondence plan please don't hesitate to contact Mr. Mark Grimmatt, Public Works Director, at 501.943.0468.

Sincerely,  
Crist Engineers, Inc.

A handwritten signature in blue ink, appearing to read "Craig Johnson", is written over the typed name and title.

Craig Johnson  
Associate

Enclosures: Media Drive  
CIP Update, July 1, 2019  
SECAP Update Future Development Capacity Analysis &  
Improvement Memo – January 2019  
2018 Sanitary Sewer Evaluation Study – June 2019

Cc: Mark Grimmatt, Public Works Director

SUMMARY OF RECOMMENDED CAPITAL IMPROVEMENT PLAN					
PROJECT UPDATE: 7/1/2019					
Reference Number	Basin	Project Name	PHASE I		COMMENT
			2018	2019	
1	MISC	Pump Station Modeling Evaluation and Calibration (BR-XX-01)			This effort is ongoing. The City has purchased 12 pressure recording gauges and evaluating force main pressures to ascertain future pump improvements and needs
2	MISC	Future Conditions Hydraulic Modeling (Masterplan)			Completed and submitted to the City of Bryant on January 21, 2019. A copy is included on the attached media drive
3	BR-04	Basin 04 Pipeline Improvements (BR-04-P1)			Design of the improvements are complete
4	BR-03	Basin 03 Pipeline Improvements (BR-03-P1)			No activity to date
5	MISC	SSES Basins BR-03, BR-06, BR-07 & Unmonitored Area South of BR-03 (SSES 03 07 06 07)			SSES Report completed on June 2019 a copy is included on the media drive attached
6	MISC	Rehab Basins BR-03, BR-06, BR-07 & Unmonitored Area South of BR-03 (SSES 03 07 06 07)			Reviewing SSES for design implementation



# City of Bryant

Notes:

1. The Capital Improvements Plan includes the recommended projects identified in the Sewer Evaluation and Capacity Assurance Plan

2. Basin abbreviations are as follows:

BR - Bryant

Color Key:
Professional Services
Project Construction

Prepared by:



**Crist Engineers, Inc.**

Updated July 1, 2019



January 21, 2019

Mr. Craig A. Johnson, P.E.  
Associate Engineer  
Crist Engineers, Inc.  
205 Executive Court  
Little Rock, AR 72205

Subject: City of Bryant – SECAP update with Future Development Capacity Analysis & Improvement Tech Memo

Dear Mr. Johnson:

RJN is pleased to present the *City of Bryant- SECAP* update Tech Memo to Crist Engineers, Inc. This document provides results from the hydraulic modeling of the City of Bryant sanitary system under future development conditions and present a recommended capital improvement plan to address capacity issues within the city.

As always, it is a pleasure to work with you and your staff on this project. Feel free to contact our office should you have questions or concerns regarding this report.

Respectfully Submitted,

RJN GROUP, INC.

Daniel Jackson, P.E.  
Vice President

Raj Tamrakar, P.E.  
Project Manager

DHJ/RT/18-3329-00  
Enclosure

Sewer Evaluation and Capacity Assurance Plan (SECAP) update with Future Development

Capacity Analysis & Improvement

Technical Memo

City of Bryant



January 2019

I hereby certify that this report was prepared under my direct supervision and that I am a duly registered Professional Engineer under the laws of the State of Arkansas.

\_\_\_\_\_  
Date: \_\_\_\_\_ Registration No.: 13978



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# Technical Memo

To: Craig Johnson, P.E.  
From: Daniel Jackson P.E. / Raj Tamrakar P.E.  
Date: January 21, 2019  
Re: Bryant-SECAP update with Future Development Capacity Analysis & Improvements

## 1. Introduction

This Technical Memo has been prepared to present the impacts of future growth on the capacity analysis improvements recommended in the SECAP (System Evaluation Capacity Assurance Plan) report delivered in September of 2017. Capital improvements recommended in that report have been evaluated for future growth, along with impacts to the entire system.

## 2. Background

RJN Group, Inc. completed the city-wide sanitary sewer hydraulic model development, calibration and SECAP report for the City of Bryant in 2017. At the time of the final SECAP report submission, pump curves were only available for two (2) out of the thirty-eight (38) lift stations within the Bryant sewerage network.

In August 2018, the City of Bryant provided the actual pump curves for twenty-four (24) of the lift stations and requested RJN to update the model, incorporate the future growth flow into the updated model, reassess the impact of the future growth flows on the existing sanitary sewer system and develop a revised SECAP plan.

## 3. Existing System Performance

The capacity analysis of the existing City of Bryant sewerage system under design storm conditions was undertaken and presented in detail in the SECAP report submitted in September 2017.

The revised existing system performance analysis undertaken on the updated model with the additional pump curves has highlighted a number of issues with the pumps currently in service. Table 1 illustrates the comparison of the modeled duty point for each pump versus the name plate duty point. A number of the pumping stations are in manifolded systems with multiple pumps injecting into the same pressure network which could explain the reasoning behind the

selected pump curves. There are a large number of pumps that operate to the right of the manufacturer's pump curve and may be prone to exacerbated impeller wear due to cavitation.

Table 1 Lift Station Updated with Actual Pump Curve			
<i>Lift Station</i>	<i>Nameplate</i>	<i>Model Duty</i>	<i>Observation</i>
LS-01	60 gpm @ 69 ft	57 gpm @ 81 ft	Reasonable
LS-02	202 gpm @ 18 ft	39.5 gpm @ 12 ft	Performing off the pump curve
LS-03	26 gpm @ 28 ft	30 gpm @ 52 ft	Performing lower end of the curve
LS-06	180 gpm @ 152 ft	197 gpm @ 148 ft	Reasonable
LS-08	100 gpm @ 100 ft	95 gpm @ 90 ft	Performing at lower end of curve
LS-11	150 gpm @ 52 ft	175 gpm @ 60 ft	Performing at upper end of curve
LS-14	75 gpm @ 35 ft	30 gpm @ 17 ft	Performing off the pump curve
LS-16	120 gpm @ 70 ft	101 gpm @ 17 ft	Performing at lower end of curve
LS-18	83 gpm @ 37 ft	100 gpm @ 41 ft	Performing at lower end of curve
LS-19		98 gpm @ 66 ft	Performing at lower end of curve
LS-21	80 gpm @ 103 ft	65 gpm @ 89.5 ft	Lower duty points but reasonable
LS-22	250 gpm @ 113 ft	174 gpm @ 161 ft	Performing at upper end of curve
LS-23	80 gpm @ 64 ft	95 gpm @ 76 ft	Performing at lower end of curve
LS-24	48 gpm @ 50 ft	91 gpm @ 86 ft	Performing at lower end of curve
LS-26	140 gpm @ 130 ft	356 gpm @ 119 ft	Performing at lower end of curve
LS-27	128 gpm @ 115 ft	127 gpm @ 115 ft	Ok
LS-28	350 gpm @ 25 ft	97 gpm @ 10 ft	Performing at lower end of curve
LS-29	25 gpm @ 55 ft	71 gpm @ 15 ft	Performing at lower end of curve
LS-31	330 gpm @ 63 ft	120 gpm @ 109 ft	Performing at upper end of curve
LS-32	21 gpm @ 60 ft	39.5 gpm @ 71 ft	Reasonable
LS-33	30 gpm @ 75 ft	54 gpm @ 80 ft	Reasonable
LS-34	90 gpm @ 53 ft	78 gpm @ 61 ft	Reasonable
LS-35	48 gpm @ 57 ft	54 gpm @ 49.5 ft	Reasonable
LS-37	Fixed Pump	35 gpm @ 110 ft	Provided pump curve could not pump against the head

Figure 1 illustrates several pumps that are operating either “off their curve” or at the lower end of their curve. If during normal DWF conditions the pumps are operating at the right-hand end of their pump curve the likelihood of cavitation and wear greatly increases.

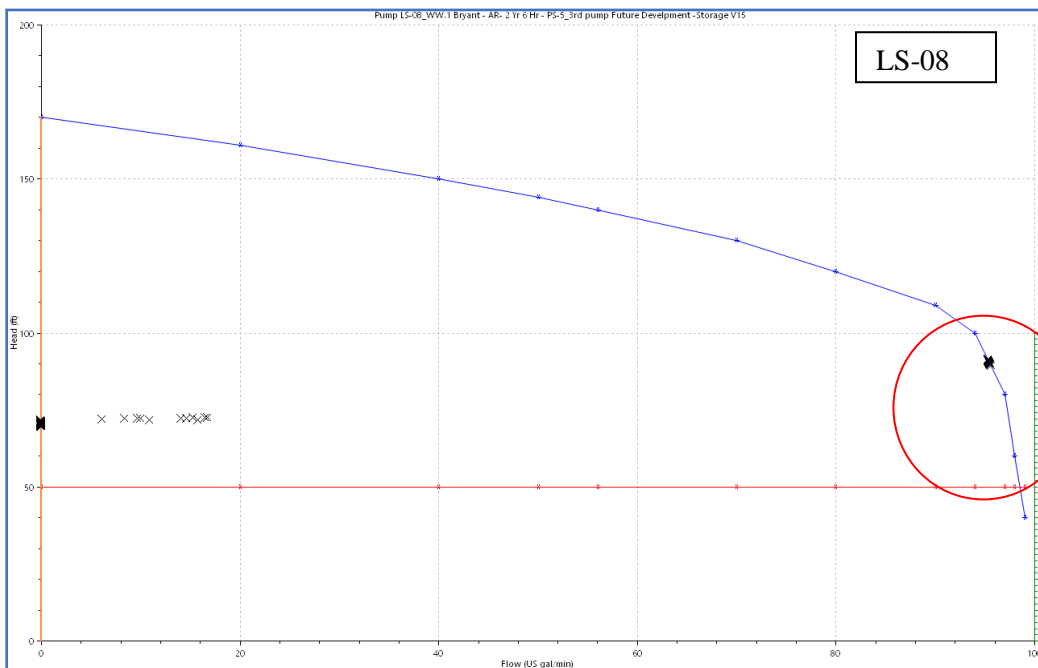
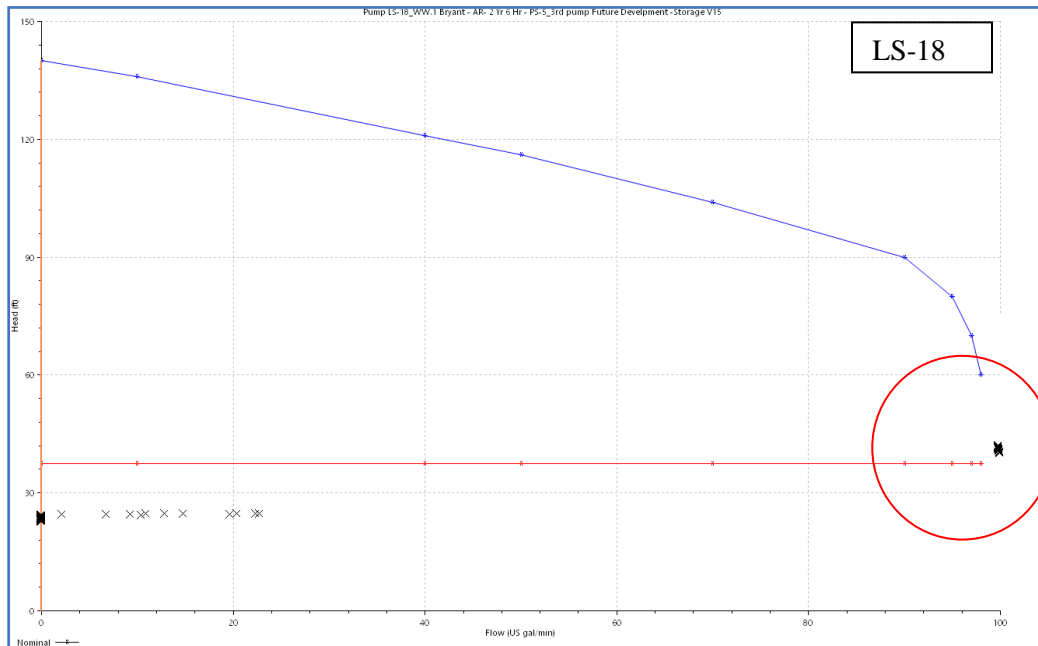


Figure 1. Examples of Pumps Operating at the Right-Hand End of Their Curve

## 4. Development of Future Growth

Future growth is distributed spatially across the system with future flows assigned to discharge into indicative manholes in the system. The future residential growth can be applied as additional population or lots while future flows projections from non-residential areas are generally calculated as a flowrate per acre.

The following methodology has been used to estimate the ultimate build out growth assuming that all the vacant land within the sewerage system service area is developed. Growth has been applied with reference to the City of Bryant Reference Zoning Map and Zoning Code. The Reference Zoning Map is displayed in Figure 2 on page 5.



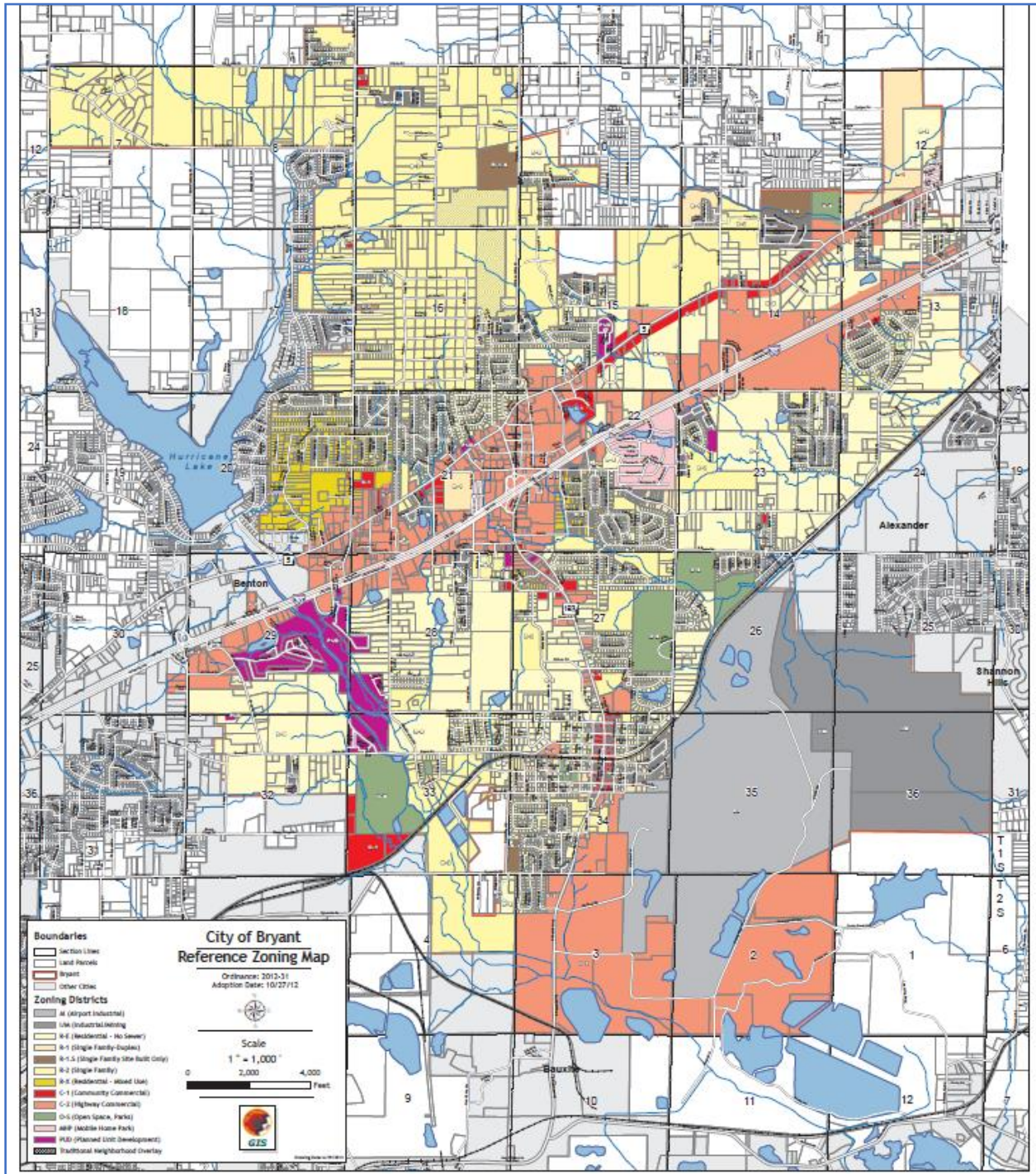


Figure 2. Reference Zoning Map



The City's GIS property parcels were overlaid on to the Reference Zoning Map to determine the zoning district for each vacant/undeveloped parcel. The land use types defined in the Reference Zoning Map and Zoning Code are as follows:

- A/I - Airport/Industrial
- I/M – Industrial/Mining
- R-E – Residential- No Sewer
- R-1 – Single Family-Duplex
- R-1. S – Single Family (Site Built Only)
- R-2 – Single Family
- R-X – Residential-Mixed Use
- C-1 – Community Commercial
- C-2 – Highway Commercial
- O-S – Open Space, Parks
- MHP – Mobile Home Park
- PUD – Planned Unit Development

For purpose of this study, it has been assumed that no significant sewage producing development will occur in zoning district designated as “R-E Residential – No Sewer” and in the areas not currently served by the City’s sewer system.

## 5. Proposed Development Densities

The proposed development densities and sewage discharge rates used in the SECAP update are presented in Table 2 for each zoning district.

Table 2 Proposed Development Densities			
Zoning		Typical Land Use and Development Densities	Sewer Loading Rate
A/I	Airport/Industrial	Zoning district to protect the operation of airport	300 gal/acre/day
I/M	Industrial/Mining	Mini-warehouse, recycling, automobile sales, Manufacturing, Research or Testing)	300 gal/acre/day
R-E	Residential- No Sewer	1 Unit/Acre (Not served by city sewer system)	NA
R-1	Single Family-Duplex	7 Unit/Acre	2.5 per unit @70 gpd
R-1.S	Single Family Site Built Only	7 Unit/Acre	2.5 per unit @70 gpd
R-2	Single Family	4 Unit/Acre	2.5 per unit @70 gpd
R-X	Residential-Mixed Use	Residential-office/Residential-retail	800 gal/acre/day
C-1	Community Commercial	Grocery store, Offices, Restaurant-Cafe (No drive thru), Florist, Drug store, Medical and dental clinics)	300 gal/acre/day
C-2	Highway Commercial	Car Wash, Auto dealership, Retail store, Warehouse, Commercial recreation, Medical clinics, Nursing homes	1000 gal/acre/day
O-S	Open Space, Parks	Parks	NA
MHP	Mobile Home Park	10 Mobile Home/Acre	2 per unit @55 gpd
PUD	Planned Unit Development	Residential, Commercial, Mixed use	800 gal/acre/day

A future residential population density of 2.5 person per lot is proposed based on the census data and a suggested residential per capita flow rate of seventy (70) gallons per person per day.

A wet weather allowance has also been included for rainfall induced inflow and infiltration. This was incorporated into the model at a rate of 1% of precipitation entering the sanitary sewer

system. This will be applied to all future build-out areas assuming properly installed PVC sewer pipes, with strict manhole and private service construction inspection.

The future development locations within the service area of the City’s sewer system along with the existing developments and the areas zoned as open space or no-sewer is shown in Figure 3.

To provide context for the extent of growth being considered, Table 3 presents the existing and build out populations and the non-residential flows with the build out percentage increase over the existing system.

Table 3 Comparison of Existing System and Future Build-Out System			
<i>Description</i>	<i>Existing System</i>	<i>Future Build-Out System</i>	<i>Percentage Increase</i>
<b>Population Served by the City's Sewer System (No.)</b>	15,837	25,256	60%
<b>Non-Residential Flow Served by the City's Sewer System (MGD)</b>	0.277	0.675	144%

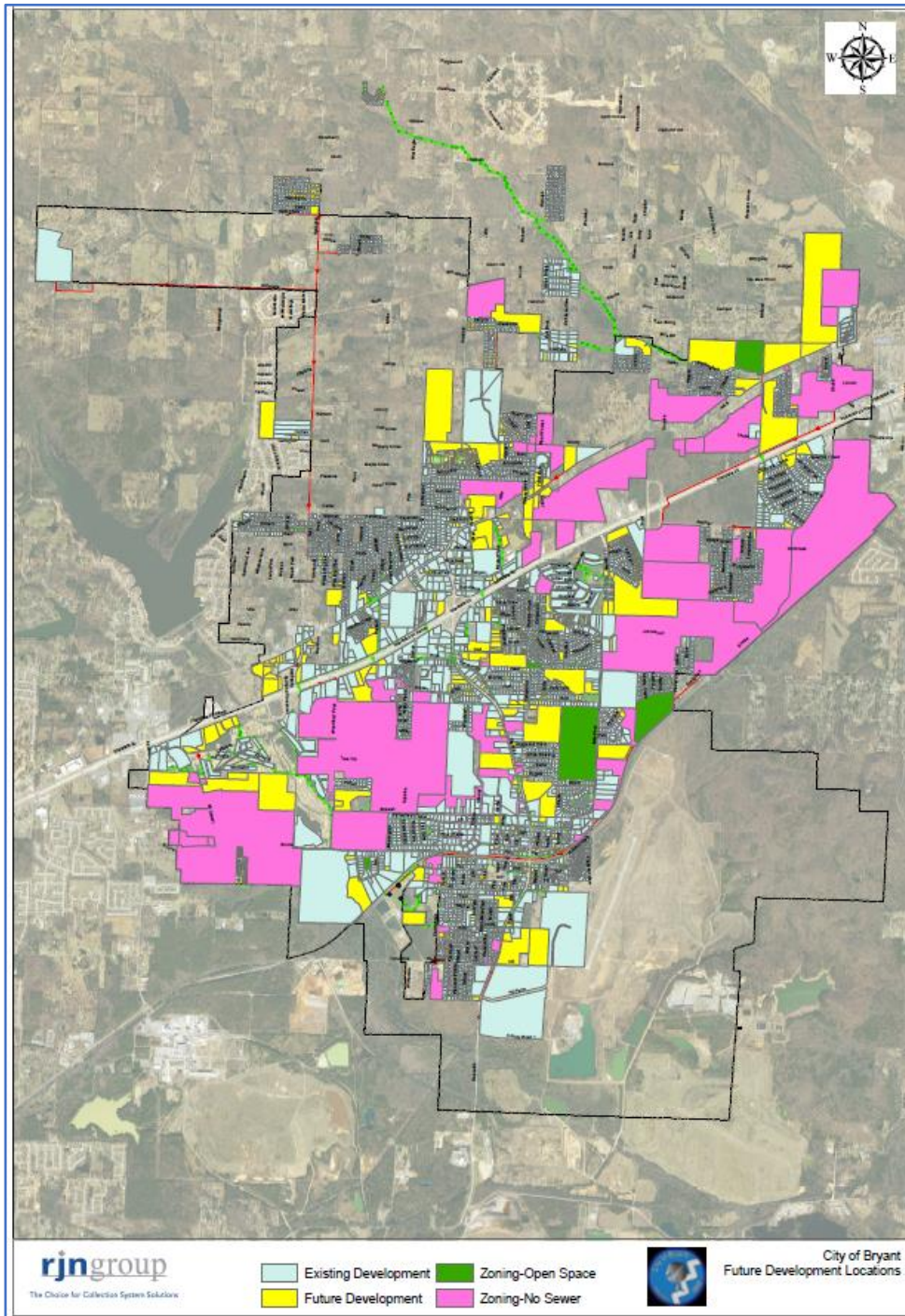


Figure 3. Future Development Locations

## 6. Capacity Analysis

The performance of the 2017 SECAP model, including the future build-out growth projections, was evaluated using a 2-year/6-hour design storm. The 2-year/6-hour storm event has a total rainfall depth of 3.1 inches. The system response to the design storm was assessed to determine the collection system's capacity to transport the peak wet-weather flow.

The capacity analysis highlighted that by including the additional flows from future growth/development, the previous SECAP upgrades were not sufficient to transport all wet weather flow associated with the 2-year/6-hour design storm. The model results showed a total of nine (9) predicted SSOs locations with a total overflow volume of 0.18 MG. A further thirty-six (36) locations experience peak surcharge levels within 3 ft of MH rim. The SSO locations are presented in Table 4 and shown in Figure 4.

Table 4 SSO Locations and Volume			
S.N.	Location	SSO Volume(MG)	Location Details
1	4092	0.11010	Manhole
2	LS-20_WW	0.02570	Wet-Well
3	4019	0.02490	Manhole
4	4354C	0.00640	Manhole
5	LS-37-MH	0.00600	Manhole
6	LS-07_WW	0.00480	Wet-Well
7	4019A	0.00040	Manhole
8	4132	0.00001	Manhole
9	30287	0.00001	Manhole
<b>Total</b>		<b>0.18</b>	



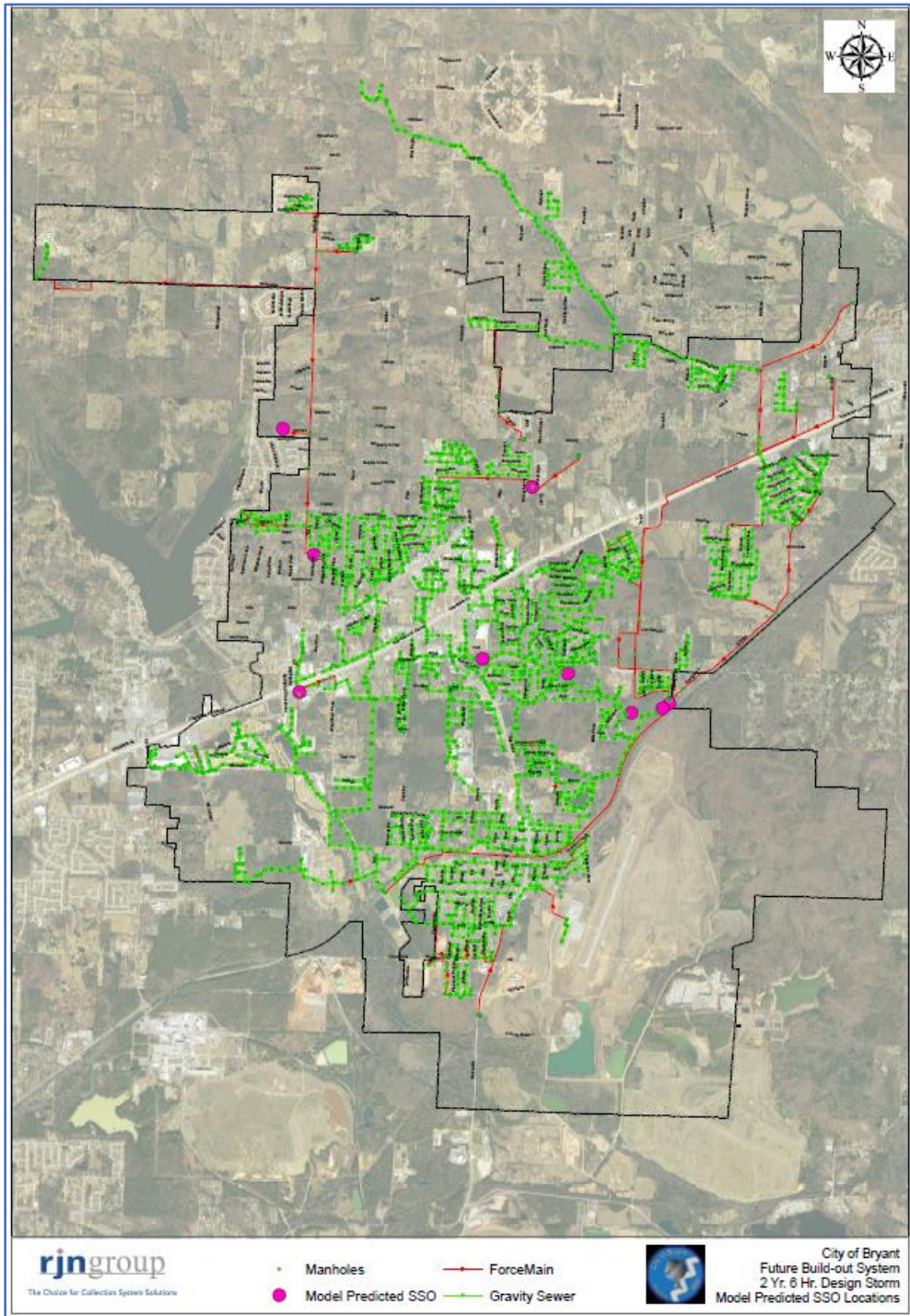


Figure 4. SSO Locations

## 7. Capital Improvement Plan

The following improvements were developed to eliminate the predicted overflows and to reduce the surcharge levels in the sanitary sewer system under future build-out condition.

### Conveyance Option

To resolve a predicted SSO upstream of LS-37 a capacity upgrade to sixty-nine (69) gpm is recommended at this lift station together with upsizing the forcemain to 4" diameter for 1,083ft.

To resolve a predicted SSO upstream of LS-07 a capacity upgrade to one-hundred four (104) gpm recommended.

To resolve a predicted SSO at LS-20, a new 8 ft diameter pumping station is proposed to be sited adjacent to the existing wet well with an 8" cross connection. The new pumping station is proposed to discharge via a new 8-inch forcemain to MH 4458 as shown in Figure 5.

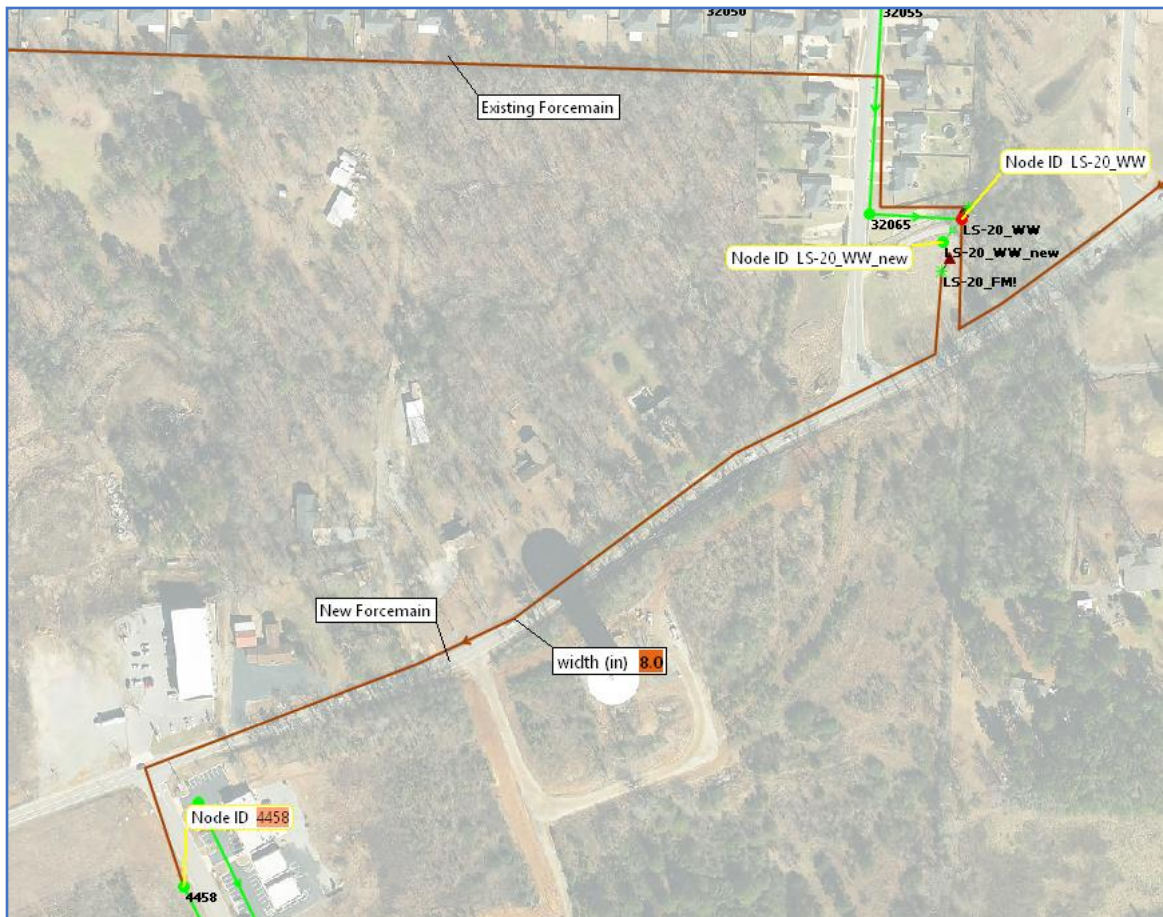


Figure 5. New Wet-Well and Forcemain Arrangement at LS-20



The existing pumping station will convey dry weather flows from the existing wet well via the existing 6-inch forcemain. Once inflows exceed this pump rate excess wet weather flows will discharge into the new wet well and will be pumped via the new 8-inch forcemain. This arrangement will eliminate the otherwise required upgrade of the forcemain and the gravity pipe networks downstream of discharge point of LS-20 forcemain to handle the increased flow and hence use the existing capacity of the system downstream of MH 4458 to transport the pick wet weather flow.

Upsizing of the interceptor from MH 4329 to the wet-well of LS-05 is recommended along with the installation of a 12-inch parallel forcemain from the LS-05 to WWTP to enable additional through put from the lift station and resolve the predicted SSOs upstream of LS-05 and along the interceptor. The recommended improvements are shown in Exhibit TM-A with the summary of works required presented in Table 5.

Table 5 Summary of Conveyance Improvement Option				
Item	Description	Quantity	Unit	Capital Improvement Cost (\$)
1	LS- 37 Improvements			
	a) LS-37 Capacity Upgrade	69	GPM	\$ 38,640
	b) LS-37 Force Main Upgrade to 4"	1,083	LF	\$ 126,711
2	LS-20 Improvement			
	a) New 8' Dia. Pumping Station	208	GPM	\$ 145,600
	b) New 8" Force Main from New Wet-Well to MH 4458	3,751	LF	\$ 536,393
3	LS-07 Capacity Upgrade	104	GPM	\$ 58,240
4	Installation of 12" Parallel Force Main from LS-05 to WWTP	13,786	LF	\$ 2,598,661*
5	Interceptor to LS-05 Improvement			
	a) 12" Dia. Gravity Main Sewer Upgrades from MH 4329 to MH 4319	614	LF	\$ 151,658
	b) 15" Dia. Gravity Main Sewer Upgrades from MH 4319 to MH 4134	1,324	LF	\$ 378,664
	c) 18" Dia. Gravity Main Sewer Upgrades from MH 4134 to LS-05 Wet-Well	5,152	LF	\$ 1,573,936
<b>Total</b>				<b>\$ 5,608,503</b>

\* Cost does not include the permit



## Storage Option

As an alternative to the conveyance option, the proposed construction of a wet-weather storage facility at the LS-05 as shown in Figure 6 could be considered. Constructing a 130,000-gallon storage facility at LS-05 will eliminate the need for the 12-inch forcemain duplication from LS-05 to the WWTP that will need to run parallel to the railway for much of its length. Other required works for the storage option are largely the same as the conveyance option and are detailed in Table 6. The recommended improvements are shown in Exhibit TM-B.

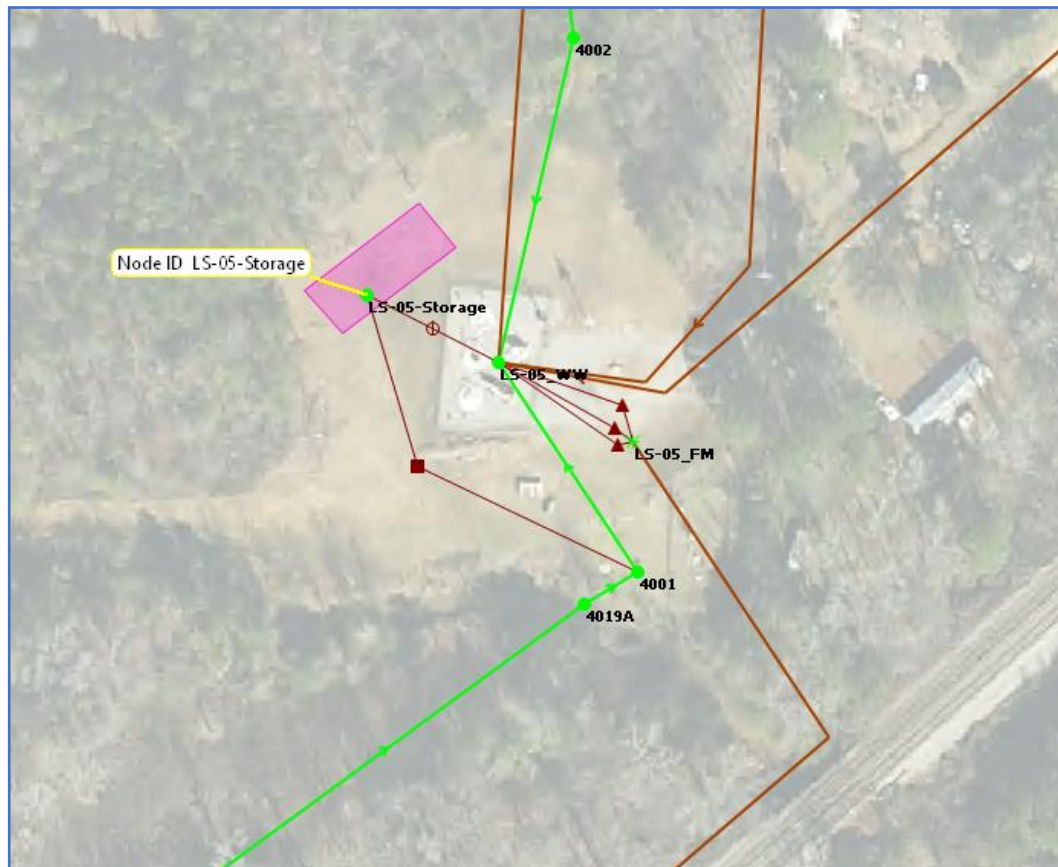


Figure 6. Storage Facility Arrangement at LS-05

Table 6 Summary of Storage Improvement Option

Item	Description	Quantity	Unit	Capital Improvement Cost (\$)
1	LS- 37 Improvements			
	a) LS-37 Capacity Upgrade	69	GPM	\$ 38,640
	b) LS-37 Force Main Upgrade to 4"	1,083	LF	\$ 126,711
2	LS-20 Improvement			
	a) New 8' Dia. Pumping Station	208	GPM	\$ 145,600
	b) New 8" Force Main from New Wet-Well to MH 4458	3,751	LF	\$ 536,393
3	LS-07 Capacity Upgrade	104	GPM	\$ 58,240
4	Installation of Storage Facility at LS-05	130,000	Gal	\$ 211,250
5	Interceptor to LS-05 Improvement			
	a) 12" Dia. Gravity Main Sewer Upgrades from MH 4329 to MH 4319	614	LF	\$ 151,658
	b) 15" Dia. Gravity Main Sewer Upgrades from MH 4319 to MH 4134	1,324	LF	\$ 378,664
	c) 18" Dia. Gravity Main Sewer Upgrades from MH 4134 to LS-05 Wet-Well	5,152	LF	\$ 1,573,936
<b>Total</b>				<b>\$ 3,221,092</b>

After comparing the extent of the improvement works required and the cost associated with the two-option analyzed for the future development improvements, it is recommended to adapt the Storage Option for capital improvement. The storage option is \$2.40 M less expensive and it will eliminate the construction of 12-inch force main along the railway track.

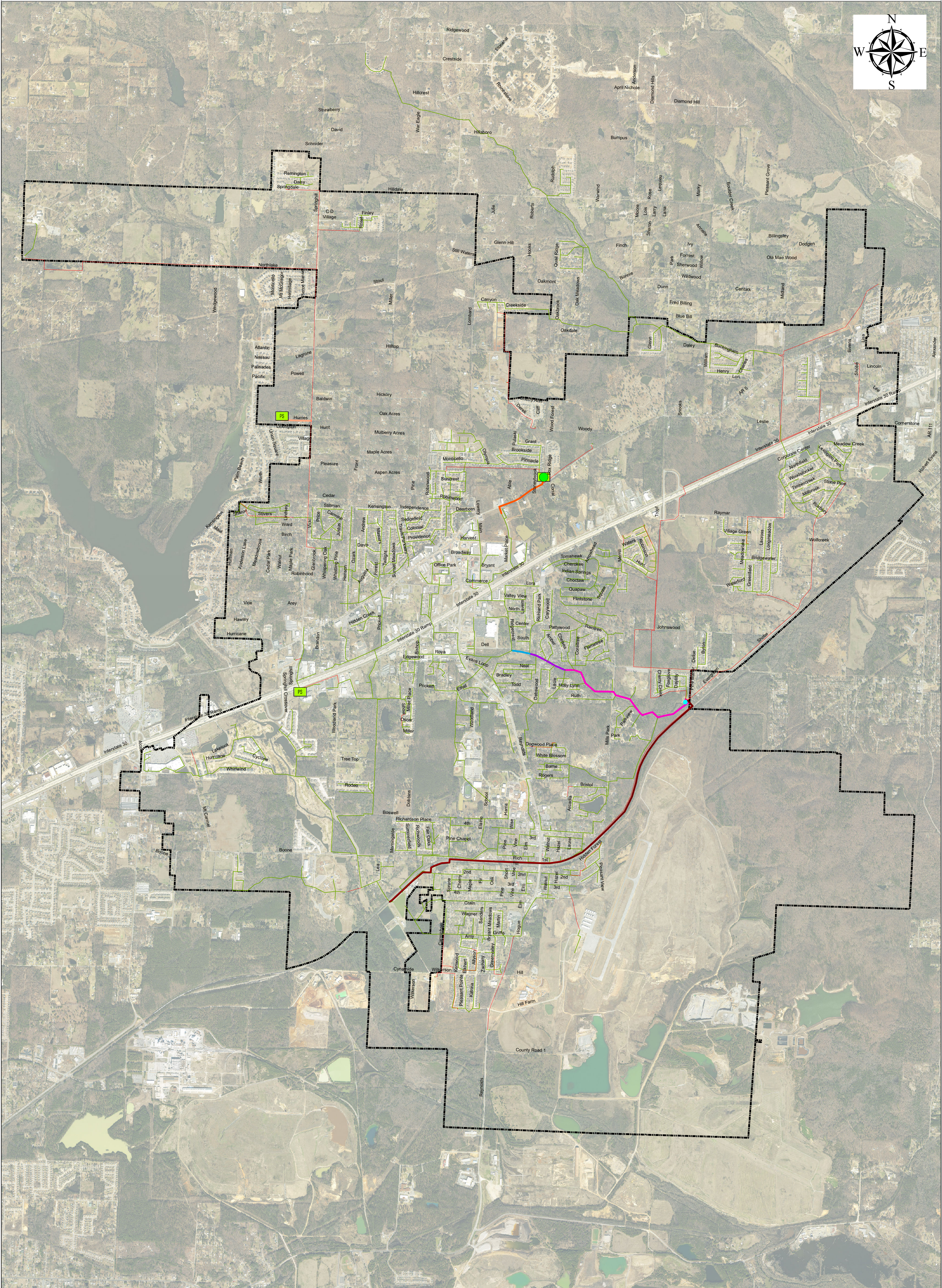
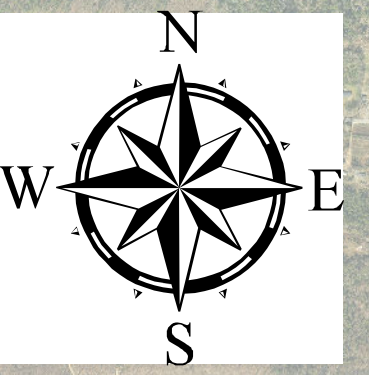
## Appendices

Future Development Improvement- Conveyance Option					
Item	Description	Quantity	Existing Diameter (in)	Unit of Measurement	Construction Cost (\$)
1	<b>LS- 37 Improvements</b>				
	a) LS-37 Capacity Upgrade	69		GPM	\$ 38,640
	b) LS-37 Force Main Upgrade to 4"	1,083	2	LF	\$ 126,711
2	<b>LS-20 Improvement</b>				
	a) New 8' Dia Pumping Station	208		No	\$ 145,600
	b) New 8" Force Main from New Wet-Well to MH 4458	3,751		LF	\$ 536,393
3	<b>LS-07 Capacity Upgrade</b>	104		GPM	\$ 58,240
4	Installation of 12" Parallel Force Main from LS-05 to WWTP	13,786		LF	\$ 2,598,661
5	<b>Interceptor to LS-05 Improvement</b>				
	<b>a) 12" Dia Gravity Main Sewer Upgrades from MH 4329 to MH 4319</b>				
	4329-4328	311	10	LF	\$ 76,817
	4328-4319	303	10	LF	\$ 74,841
	<b>b) 15" Dia Gravity Main Sewer Upgrades from MH 4319 to MH 4134</b>				
	4319-4281	222	10	LF	\$ 63,492
	4281-4276	308	10	LF	\$ 88,088
	4276-4205	122	10	LF	\$ 34,892
	4205-4204	293	10	LF	\$ 83,798
	4204-4134	379	10	LF	\$ 108,394
	<b>c) 18" Dia Gravity Main Sewer Upgrades from MH 4134 to LS-05 Wet-Well</b>				
	4134-4133	313	12	LF	\$ 95,622
	4133-4132	248	12	LF	\$ 75,764
	4132-4131	188	12	LF	\$ 57,434
	4131-4125	210	12	LF	\$ 64,155
	4125-4124	419	12	LF	\$ 128,005
	4124-4123	231	12	LF	\$ 70,571
	4123-4122	211	12	LF	\$ 64,461
	4122-4119	146	12	LF	\$ 44,603
	4119-4118	50	12	LF	\$ 15,275
	4118-4111	137	12	LF	\$ 41,854
	4111-4110	212	12	LF	\$ 64,766
	4110-4109	288	12	LF	\$ 87,984
	4109-4095	339	12	LF	\$ 103,565
	4095-4093	262	12	LF	\$ 80,041
	4093-4093A	90	12	LF	\$ 27,495
	4093A-4092	177	12	LF	\$ 54,074
	4092-4091	177	12	LF	\$ 54,074
	4091-4022	252	12	LF	\$ 76,986
	4022-4021	258	15	LF	\$ 78,819
	4021-4020	276	15	LF	\$ 84,318
	4020-4019	295	15	LF	\$ 90,123
	4019-4019A	298	15	LF	\$ 91,039
	4019A-4001	37	12	LF	\$ 11,304
	4001-LS-05_WW	38	12	LF	\$ 11,609
<b>Total</b>					<b>\$ 5,608,503</b>

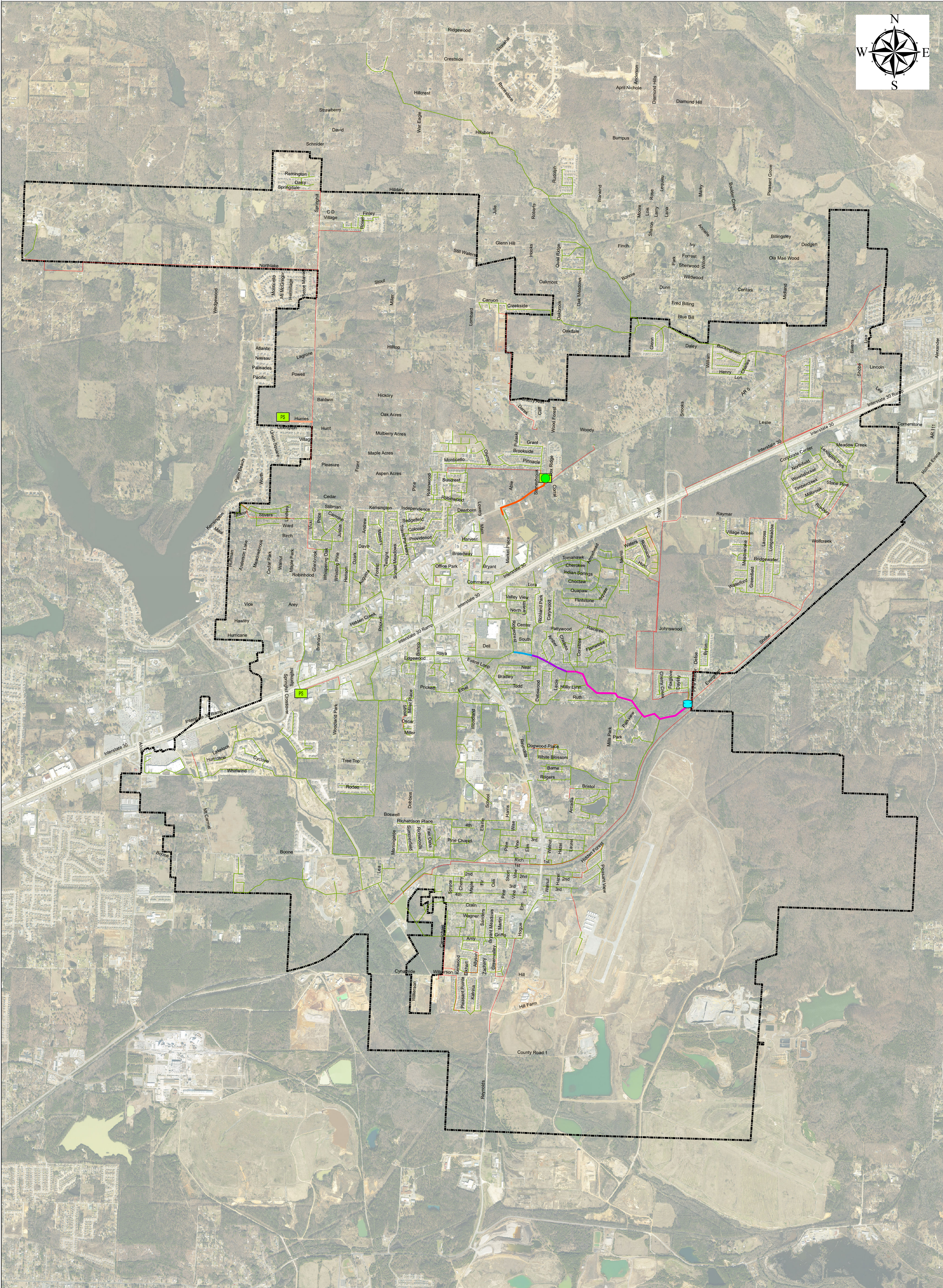
Future Development Improvement- Storage Option					
Item	Description	Quantity	Existing Diameter (in)	Unit of Measurement	Construction Cost (\$)
1	<b>LS- 37 Improvements</b>				
	a) LS-37 Capacity Upgrade	69		GPM	\$ 38,640
	b) LS-37 Force Main Upgrade to 4"	1,083	2	LF	\$ 126,711
2	<b>LS-20 Improvement</b>				
	a) New 8' Dia Pumping Station	208		GPM	\$ 145,600
	b) New 8" Force Main from New Wet-Well to MH 4458	3,751		LF	\$ 536,393
3	<b>LS-07 Capacity Upgrade</b>	104		GPM	\$ 58,240
4	<b>Installation of Storage Facility at LS-05</b>	130,000		Gal	\$ 211,250
5	<b>Interceptor to LS-05 Improvement</b>				
	<b>a) 12" Dia Gravity Main Sewer Upgrades from MH 4329 to MH 4319</b>				
	4329-4328	311	10	LF	\$ 76,817
	4328-4319	303	10	LF	\$ 74,841
	<b>b) 15" Dia Gravity Main Sewer Upgrades from MH 4319 to MH 4134</b>				
	4319-4281	222	10	LF	\$ 63,492
	4281-4276	308	10	LF	\$ 88,088
	4276-4205	122	10	LF	\$ 34,892
	4205-4204	293	10	LF	\$ 83,798
	4204-4134	379	10	LF	\$ 108,394
	<b>c) 18" Dia Gravity Main Sewer Upgrades from MH 4134 to LS-05 Wet-Well</b>				
	4134-4133	313	12	LF	\$ 95,622
	4133-4132	248	12	LF	\$ 75,764
	4132-4131	188	12	LF	\$ 57,434
	4131-4125	210	12	LF	\$ 64,155
	4125-4124	419	12	LF	\$ 128,005
	4124-4123	231	12	LF	\$ 70,571
	4123-4122	211	12	LF	\$ 64,461
	4122-4119	146	12	LF	\$ 44,603
	4119-4118	50	12	LF	\$ 15,275
	4118-4111	137	12	LF	\$ 41,854
	4111-4110	212	12	LF	\$ 64,766
	4110-4109	288	12	LF	\$ 87,984
	4109-4095	339	12	LF	\$ 103,565
	4095-4093	262	12	LF	\$ 80,041
	4093-4093A	90	12	LF	\$ 27,495
	4093A-4092	177	12	LF	\$ 54,074
	4092-4091	177	12	LF	\$ 54,074
	4091-4022	252	12	LF	\$ 76,986
	4022-4021	258	15	LF	\$ 78,819
	4021-4020	276	15	LF	\$ 84,318
	4020-4019	295	15	LF	\$ 90,123
	4019-4019A	298	15	LF	\$ 91,039
	4019A-4001	37	12	LF	\$ 11,304
	4001-LS-05_WW	38	12	LF	\$ 11,609
<b>Total</b>					<b>\$ 3,221,092</b>

## Exhibits









- New Wet Well
- Existing Forcemain
- 12 inch Gravity
- PS Pump Upsize
- 4 inch Forcemain
- 15 inch Gravity
- Storage
- 8 inch Gravity
- 18 inch Gravity
- Existing Sewer
- 8 inch Forcemain



Exhibit TM-B  
 City of Bryant  
 Future System Recommended Improvements  
 Storage Option  
 2-Year 6-Hour Storm



June 2019

# 2018 Sanitary Sewer Evaluation Study

## Draft Report

City of Bryant, AR



**rjngroup**  
*Engineering* infrastructure for tomorrow

RJN Project No. 18-3326-00

June 27, 2019

Mr. Mark Grimmett  
 Public Works Director  
 Bryant Municipal Complex  
 1017 SW 2<sup>nd</sup> Street  
 Bryant AR, 72022

Subject: Bryant 2018 Sanitary Sewer Evaluation Study

Dear Mr. Grimmett:

In accordance with the August 2018 Engineering Agreement, RJN Group, Inc. is pleased to submit this draft report for the above referenced project.

This draft report provides a comprehensive analysis of the data and information collected over multiple projects within Basins BR-03 and BR-06. A summary of recommendations is given in Table 1.

<b>Table 1</b>				
<b>Summary of Recommended Plan</b>				
<b>Item</b>	<b>I/I Reduction</b>		<b>Cost to Benefit Ratio<sup>2/</sup> (mgd/\$Million)</b>	<b>Estimated Capital Cost<sup>2/</sup> (\$Million)</b>
	<b>Inflow<sup>1/</sup> (mgd)</b>	<b>Infiltration (mgd)</b>		
<b><u>Manhole Rehabilitation</u></b>				
Manhole Rehabilitation	0.047	0.038	0.290	\$0.297
<b><u>Sewer Line Rehabilitation</u></b>				
Point Repairs	0.000	0.005	0.069	\$0.072
Complete Rehabilitation	0.000	0.027	0.055	\$0.493
<b><u>Service Line Rehabilitation</u></b>				
Private Sector	<u>0.030</u>	<u>0.000</u>	<u>1.154</u>	<u>\$0.026</u>
<b>Total</b>	<b>0.077</b>	<b>0.070</b>	<b>0.166</b>	<b>\$0.888</b>

1/ Based on projected 1-year/60-minute inflow.

2/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

Mr. Mark Grimmett  
June 27, 2019  
Page Two

The field investigations include defect findings from manhole inspection, smoke testing, dyed water flooding, and television inspection. The following conclusions were based on the current field work:

- The recommended plan includes rehabilitation of 136 manholes, 29 service line sources, 3,609 linear feet of sewer line rehabilitation, and 100 linear feet of point repairs.
- Implementation of the recommended plan would remove approximately 0.077 mgd of 1-year/60-minute inflow and 0.070 mgd of infiltration.
- The estimated Capital Cost to implement the recommended plan is \$0.884 million.

We appreciate the opportunity to work with the City of Bryant and the excellent cooperation from the staff throughout the project. We look forward to working with the City in the future. Should you have any questions, please do not hesitate to call.

Respectfully Submitted,

RJN GROUP, INC.



Mac Compton, P.E.  
Project Manager

MC/18-3326-00

Enclosure

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## CHAPTER 1 – INTRODUCTION

In August, 2018 RJN Group, INC. (RJN) was retained by Crist Engineers to perform an evaluation of the sanitary sewer collection system in Bryant, AR by means of intensive field investigations on select portions of the City. Figure 1.1 depicts the study area from 2018 which consists of two basins referred to as BR-03 and BR-06.

The activities completed during this project closed out the entirety of Basins BR-03 and BR-06. This report focuses exclusively on the findings and remedial measures within these two basins. This includes the following field activities:

- ◆ 13,166 LF of CCTV – City Inspected TV
- ◆ 276 Manhole Inspections – FY18
- ◆ 65,945 LF of Smoke Testing – FY18
- ◆ 5 Dye Tests – FY18

### OVERVIEW

---

A Sanitary Sewer Evaluation Study, or SSES, is a cost-effective evaluation consisting of intensive field procedures and data analysis in order to determine the condition of sanitary sewer lines and access structures. Sewer lines are susceptible to Infiltration and Inflow (I/I) or extraneous flow entering the system which can be excessive, expensive to treat, and contribute to wet-weather overflows.

Infiltration and Inflow may enter the sanitary sewer system during moderate storm events. Infiltration occurs when groundwater enters sewer lines and manholes. Inflow occurs when storm water runoff enters the sanitary sewer system through both public sector and private sector sources. Some inflow sources include cross connections with storm sewers, main line defects, vented manhole covers, defective frame seals, defective cleanouts, and direct connections to the sanitary sewer from downspouts and/or area drains.

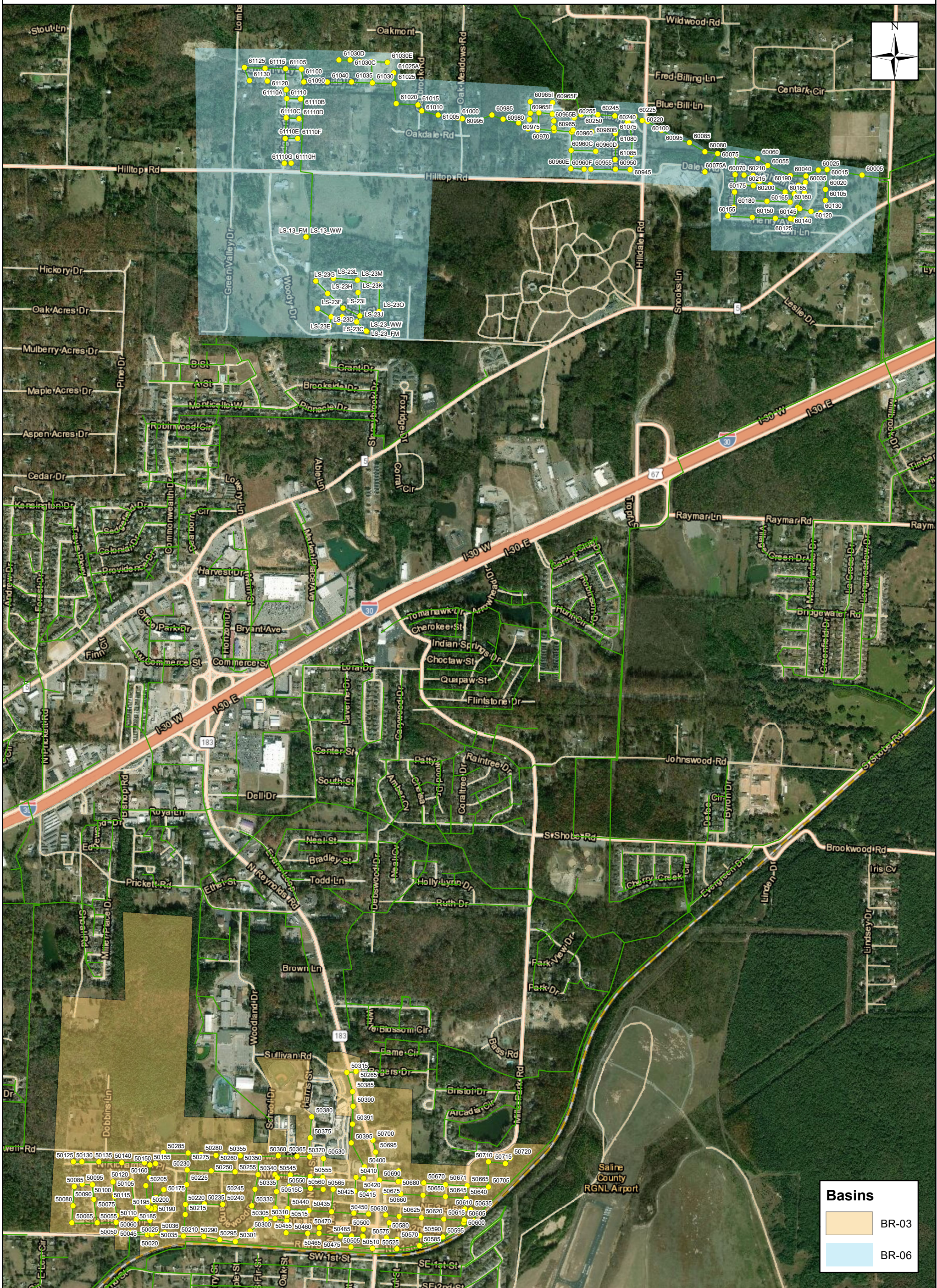
### DESCRIPTION OF THE STUDY AREA

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The study area consists of two basins: BR-06, at the northern part of the city and BR-03, at the south. Bryant is primarily comprised of residential neighborhoods with a small amount of commercial sections and contains 276 manholes and 65,945 linear feet of sewer pipe within these basins.



# Bryant, AR





## PROJECT APPROACH

---

The project approach for the Bryant Sewer System Evaluation included conducting field investigations and followed by developing a recommended plan to reduce I/I and improve efficiency of the wastewater collection system. The project team employed the following approach to maximize efforts and efficiently identify sources of I/I:

### *Field Investigations:*

1. Manhole and Visual Pipe Inspections
2. Smoke Testing
3. Dye Testing
4. Television Inspection (Conducted by the City of Bryant)

### *Data Analysis and Recommendations:*

All collected data is first reviewed by data analysts at RJN to ensure no pertinent information was left behind during field investigations. The quality of the data is also reviewed so that quantifications from rainfall simulation are consistent. The recommended plan was formulated after carefully reviewing the results derived from the field investigations and consists of the following:

1. Recommended I/I Removal
2. Line Replacements and Point Repairs
3. Cost to Implement the Recommended Plan

## DEFINITIONS AND ABBREVIATIONS

---

This section contains definitions and abbreviations commonly used throughout this report.

- (1) Infiltration (as defined by USEPA) - the water entering a sewer system and service connections from the ground through such means as, but not limited to, defective pipes, pipe joints, service connections, service laterals, or manhole walls.
- (2) Inflow (as defined by USEPA) - the water discharged into a sewer system, including service connections, from such sources as roof leaders; cellar, yard, and area drains; foundation drains; cooling water discharges; drains from springs and swampy areas; manhole covers; cross connections from storm sewers, combined sewers, or catch basins; storm waters; surface runoff; or drainage.
- (3) Excessive Infiltration and Inflow (I/I) - the extraneous clean water that enters the sanitary sewer system which can be eliminated on a cost-effective basis.

- (4) Base Flow - wastewater flow exclusive of infiltration or inflow. Generally determined from water records during months when most of the water consumption is returned to the wastewater collection system.
- (5) Permanent Infiltration - extraneous flow that enters the sewer system through the ground during periods of dry weather/low groundwater. Generally determined by subtracting base flow during winter months from the average daily dry-weather monitored flow.
- (6) Peak Infiltration - the maximum extraneous flow that enters the wastewater collection system during high groundwater conditions after the inflow effects of a rain event have ended. Generally determined by subtracting dry-weather/low-groundwater flow (average daily dry-weather monitored flow) from flow recorded during periods of high groundwater.
- (7) Average Daily Dry-Weather Flow - dry-weather/low-groundwater flow exclusive of dry-weather/high-groundwater (peak infiltration) and wet-weather (inflow) flow. Includes base flow and permanent infiltration only.
- (8) Average Daily Dry-Weather Flow Peaking Factor - the ratio between the peak hourly flow rate and the average daily flow.
- (9) 1-Year/60-Minute Storm - a storm event that produces 1.60 inches of rain per hour in the Bryant, Arkansas area and is expected to occur once in any given year.
- (10) 5-Year/60-Minute Storm - a storm event that produces 2.17 inches of rain per hour in the Bryant, Arkansas area and has a 20 percent probability of occurring in a given year.
- (11) Design Storm Event - a storm event selected for purposes of analyzing its effect on the wastewater collection system.
- (12) gpd - gallons per day.
- (13) mgd - million gallons per day.
- (14) idm - inch-diameter-miles. The product of sewer pipe diameter in inches and length of sewer in feet per 5,280 feet.
- (15) gpd/idm - gallons per day per inch-diameter-mile.
- (16) Surcharge Condition – When the sewer flow depth equals or exceeds the diameter of the discharging sewer lines. (WEF Manual of Practice FD-6)
- (17) Infiltration and Inflow (I/I) – A combination of infiltration and inflow wastewater volume in sanitary sewer.

## CHAPTER 2 – FILED INVESTIGATIONS

RJN conducted sanitary sewer investigation activities in Basins BR-03 and BR-06 in Bryant, Arkansas. The objective was to identify sewer maintenance problems, quantify sources of infiltration and inflow (I/I), and recommend a rehabilitation plan to reduce I/I and improve the overall efficiency of the collection system. Field activities included the following:

1. Manhole and Visual Pipe Inspections
2. Rainfall Simulation
  - a. Smoke Testing
    - i. Identification of Public Defects
    - ii. Identification of Private Defects
  - b. Dye Testing
    - i. Potential Mainline/Storm Sewer Connections
    - ii. Manhole Defects
3. Television Inspection (Defects identified from smoke testing and visual pipe) conducted by City of Bryant and reviewed by RJN.

### MAPPING

---

City of Bryant staff provided map data of the wastewater collection system for the study areas at the initiation of the project that included existing access structures. Any manholes or other access structures found during the field investigations that were not shown on existing maps were assigned new numbers and GPS points were collected. During smoke testing, several manholes were discovered in basin BR-06 that were previously unmapped. These manholes and associated gravity main connections were added to the GIS. Updates to the sanitary sewer system will be provided to the City of Bryant with this report.

### FIELD INVESTIGATIONS

---

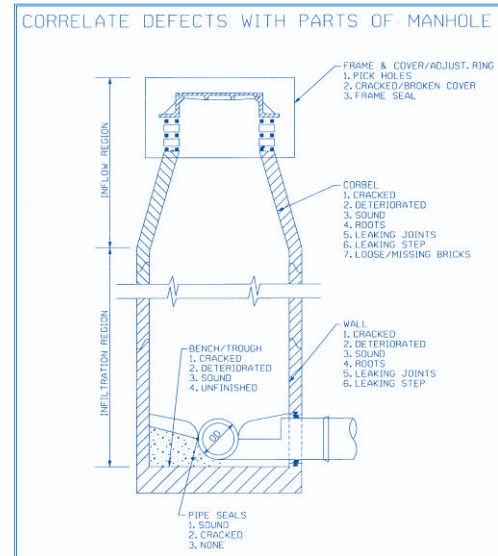
#### *Manhole and Visual Pipe Inspections*

Manhole and visual pipe inspection assess the physical condition of the sewer system. These inspections verify manhole location, pipe size, line segment continuity, and evaluate manhole and connecting pipe condition. A sectional elevation of a typical manhole is shown on page 2-2.

**Manhole Inspections**

The manhole/cleanout inspection procedure included recording the following observations:

1. Location and identification number
2. Potential for ponding or sheeting on manhole cover
3. Cover type, fit, description, distance above or below grade, evidence of inflow
4. Frame adjustment, seal, evidence of inflow
5. Corbel construction, condition, evidence of inflow
6. Wall construction, condition, evidence of infiltration
7. Bench/trough construction, condition, deposition, evidence of infiltration
8. Pipe seal condition, evidence of infiltration
9. Step condition
10. Manhole inside diameter
11. Surcharging or evidence of surcharging
12. Indication of groundwater infiltration



Inspections were performed on 265 of the 276 manholes (96 percent). Every effort was made to locate each structure, however 11 remained uninspected. These manholes consist of 7 unable to locate, and 4 inaccessible due to various reasons. A list of these structures and corresponding status has been provided to the City of Bryant. All manhole inspection information can be found within the report in Appendix A. An access structure inspection summary is given in Table 2.1, and a summary of manhole defects is given in Table 2.2. Map Exhibit A depicts manhole inspection status.



*Defective Chimney  
(BR-03) 50110*

Table 2.1 Access Structure Inspection Summary					
Basin No.	Total Structures	Inspected Structures	Not Found Structures	Buried Structures	Inaccessible Structures
BR-03	146	136	6	0	4
BR-06	<u>130</u>	<u>129</u>	<u>1</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>276</b>	<b>265</b>	<b>7</b>	<b>0</b>	<b>4</b>

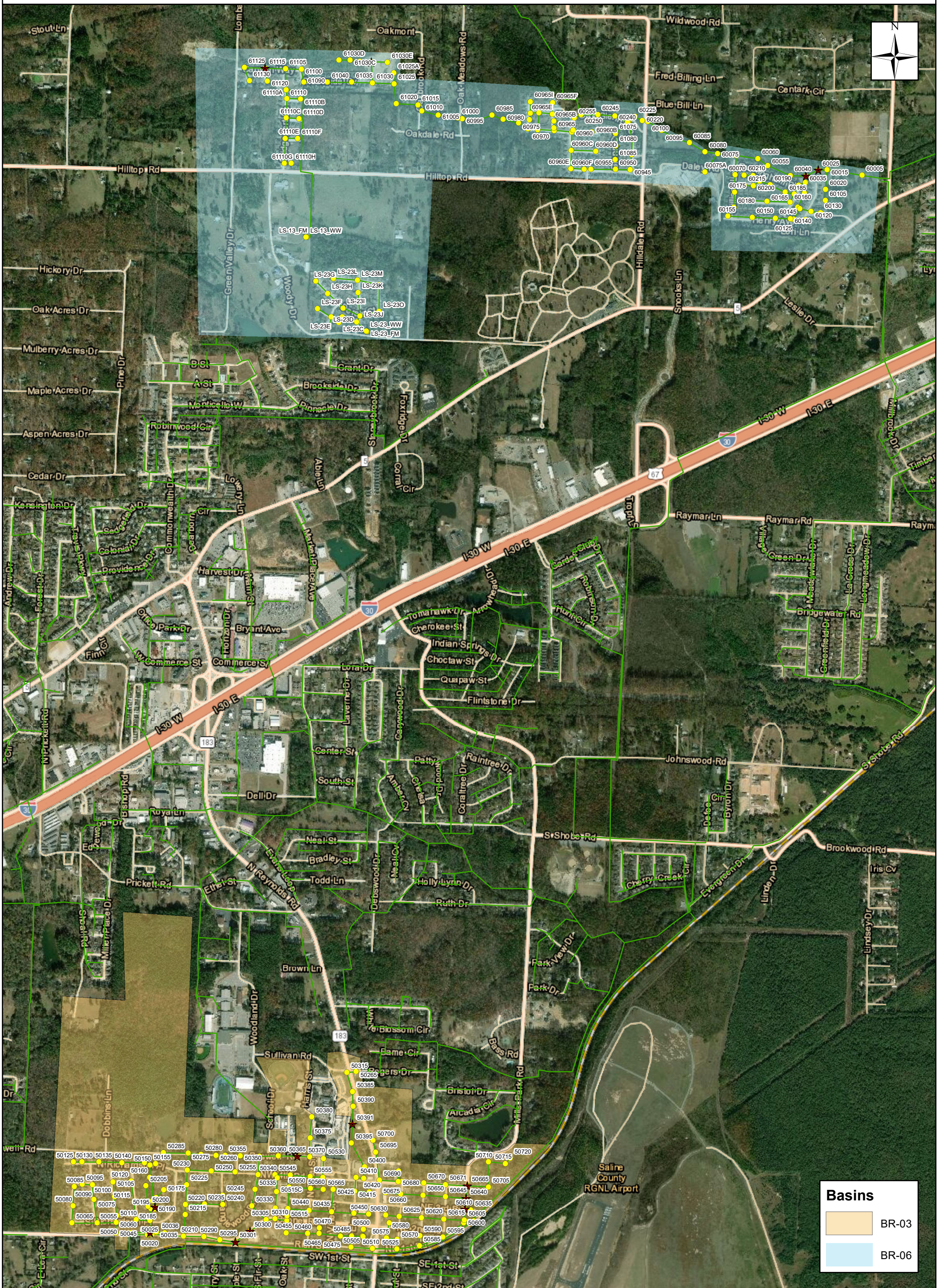
Table 2.2 Summary of Manhole Defects	
Type of Defect	Number of Defects
<b><u>Inflow</u></b>	
Defective Covers	87
Defective Frame Seals	15
Defective Manhole Corbel	12
Broken Frame	<u>3</u>
<i>Subtotal</i>	<i>117</i>
<b><u>Infiltration</u></b>	
Pipe Seals	66
Defective Manhole Walls	<u>9</u>
<i>Subtotal</i>	<i><u>75</u></i>
<b>Total</b>	<b>192</b>

Manhole inspection resulted in the identification of approximately 0.047 mgd of 1-year inflow and 0.038 mgd of infiltration. The largest contributors of inflow for this project were defective covers and defective frame seals. Field investigations identified 15 defective frame seals and 87 defective covers combining to contribute approximately 0.036 mgd of inflow. All the defective covers are due to pick holes or missing bolts. Each defect has been quantified for the inflow that would occur during a one-year storm event.

Defective pipe seals and manhole walls are the main sources of infiltration, totaling 75 defects which contributes approximately 0.038 mgd. A total of 13 manholes located throughout the study area indicated evidence of surcharging. These manholes are shown on Figure 2.1. A detailed manhole inspection report is included in Appendix A



# Bryant, AR



Basins	
<span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span>	BR-03
<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span>	BR-06

- Manholes
- Gravity Main
- ★ Evidence of Surcharge



### ***Visual Pipe Inspections***

Visual pipe inspection is performed as part of the manhole inspection program with the following observations recorded:

1. Manhole identification numbers for connecting sewer lines
2. Flow direction in pipes
3. Pipe diameter and construction material
4. Amount of root growth
5. Amount and type of deposition
6. Structural condition and line/grade of pipe
7. Visible infiltration in pipe and/or from pipe seals
8. Depth from manhole rim to each pipe invert
9. Recommended method of cleaning
10. Depth and velocity of flow



*Collapsed Pipe*

*(BR-03) 50405 N-In*

Visual pipe inspection verifies pipe diameter, continuity, and aids in identifying pipe defects near the collection system access structure. Sewer lines in the study area are primarily constructed of concrete. The visual pipe inspections revealed 67 broken, collapsed, or cracked segments. A digital report listing the findings of the visual pipe inspections is given in Appendix B.

## **RAINFALL SIMULATION**

A major field task in sewer system evaluation studies is locating inflow sources by rainfall simulation. Types of inflow sources identified by rainfall simulation include the following:

1. Roof downspouts, yard, and area drains
2. Defective building sewers, faulty connections, and defective cleanouts
3. Cross connections between sanitary sewers and storm sewers (indirect or direct)
4. Storm sewer sections, stream sections, ditch sections, and ponding areas which may cause infiltration and inflow
5. Structurally damaged sewers and manholes

Rainfall simulation can also be utilized with flow measurements to quantify inflow from identified sources. Rainfall simulation techniques include smoke testing and dyed water flooding.

### **Smoke Testing**

Smoke testing is a quick method for detecting inflow sources in a sanitary sewer system. This method is very effective in detecting sources such as roof downspouts, yard and area drains, defective building sewers, faulty connections, defective cleanouts, and storm sewer cross connections. It can also be utilized during dry weather periods to detect inflow sources in the sewer main. During testing, observations are recorded by line segment as follows:

1. Location of line segment
2. Location of observed smoke leaks recorded at:
  - a. Curb
  - b. Sidewalk
  - c. Cleanout
  - d. Building lateral; front, side or rear yard
  - e. Driveway or area drain
  - f. Downspout
  - g. Building interior (resident must inform inspector)
3. Location of smoke observed from storm water conveyance systems
4. Location of smoke along a main sewer line

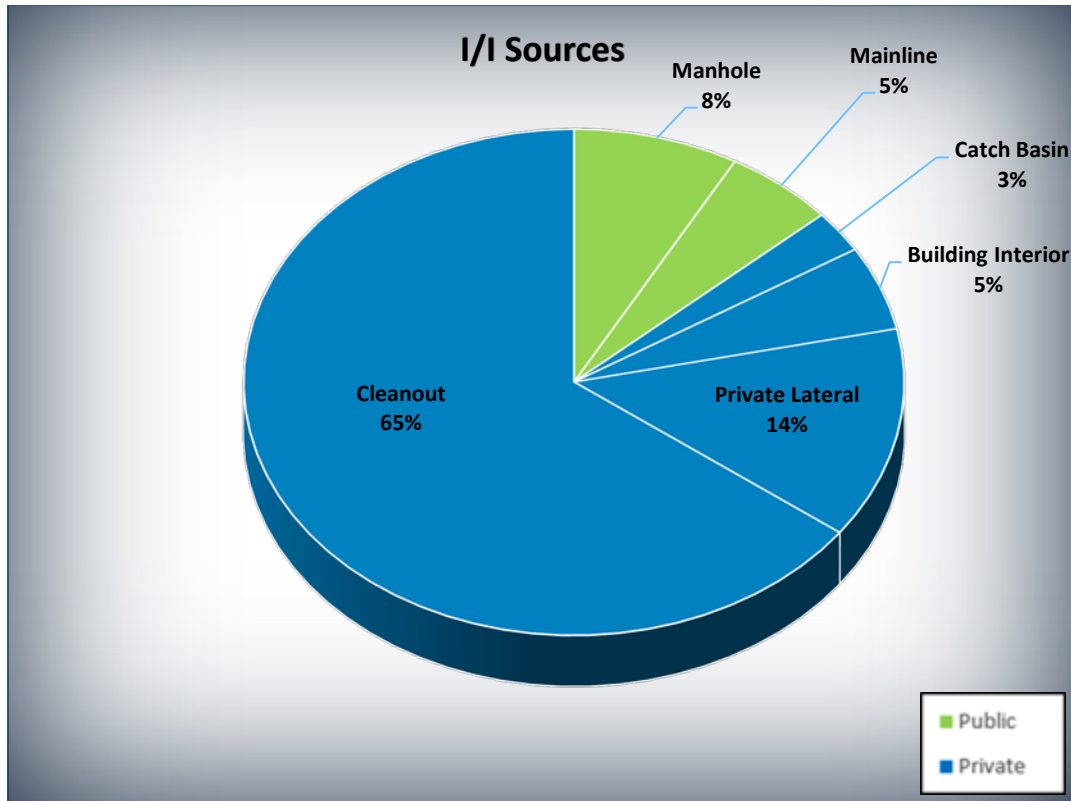
A total of 37 potential sources of I/I were identified from the 65,945 linear feet of sewer lines that were smoke tested; 31 sources identified are from the private sector, while 6 sources are from the public sector. Smoke testing investigations identified 2 possible main line leaks and three manholes as public I/I sources. Private I/I sources included 24 defective cleanouts and 5 building laterals. Private building laterals are defined as any potential building lateral leak off of the main sewer line. These sources are represented in the pie chart on page 2-7 and a summary is given in Table 2.3. Map Exhibit B shows the locations of defects found during smoke testing. A report listing the findings of the smoke testing program is given in Appendix C.



*Lateral Defect*

*(BR-03) 50535:50555*

Table 2.3 Smoke Test Data	
Type of Source	Quantity
<b>Public Sector</b>	
Manhole	3
Mainline	2
Catch Basin	<u>1</u>
<i>Subtotal</i>	6
<b>Private Sector</b>	
Private Cleanout	24
Private Lateral	5
Building Interior	<u>2</u>
<i>Subtotal</i>	<u>31</u>
<b>Total</b>	<b>37</b>



**Dye Water Testing**

Public sector dyed water flooding is used to more accurately identify and quantify public sector inflow sources. It consisted of 5 segments identified during smoke testing as potential mainline, catch basin, or storm ditch defects; resulting in 3 positive tests.

During smoke testing a main line defect was identified on segment (BR-03) 50450:50445. This defect resulted in 0.002 mgd which was the largest contributor of inflow identified during dye testing. Other positive dye tests include a cross connection on segment (BR-03) 50555:50540 and a frame seal on segment (BR-06) 61125:61115, both allowing a significant amount of inflow. These defects are shown in Figure 2.2. Dye testing identified a total of 0.004 mgd of inflow; addressing these defects should make an immediate impact to the system.



*Dye – Positive*  
*(BR-06) 61125:61115*

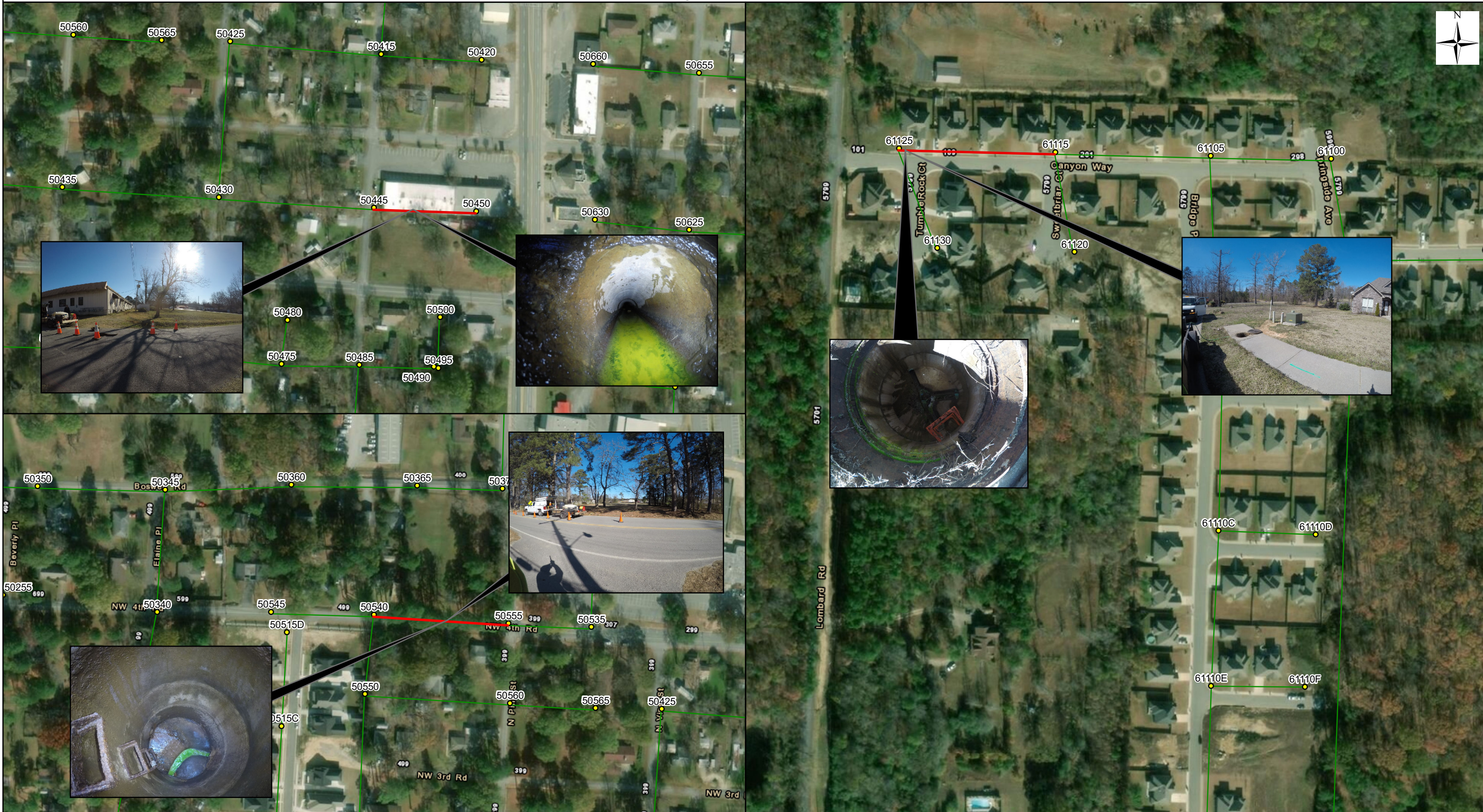


*Dye – Positive*  
*(BR-03) 50450:50445*

Table 2.4 Dyed Water Flooding			
USMH	DSMH	Defect Type	Result
50450	50445	Mainline	Positive
50555	50540	Crossover	Positive
50570	50825	Crossover	Negative
60965E	60965D	Crossover	Negative
61125	61115	Frame Seal	Positive



# Bryant, AR



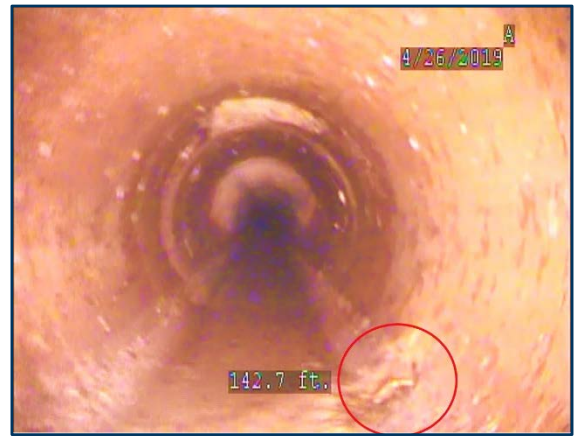


## TELEVISION INSPECTION

A total of 13,903 was attempted with 13,166 successfully televised and submitted to RJN for review. Due to defects or obstacles such as heavy roots, grease, broken or collapsed pipe not all segments were completely surveyed, many segments were inspected enough to make a recommendation. A summary of the line segments reviewed is provided in Appendix E. A total of three segments have voids visible; making the pipe susceptible to collapse and high I/I. A summary of these segments are given in Table 2.5 and shown in Figure 2.3. Two of the segments, 50445:50430 and 50530:50535, are shown in the photos below, and are recommended for immediate repair.



Pipe with hole  
(BR-03) 50445:50430

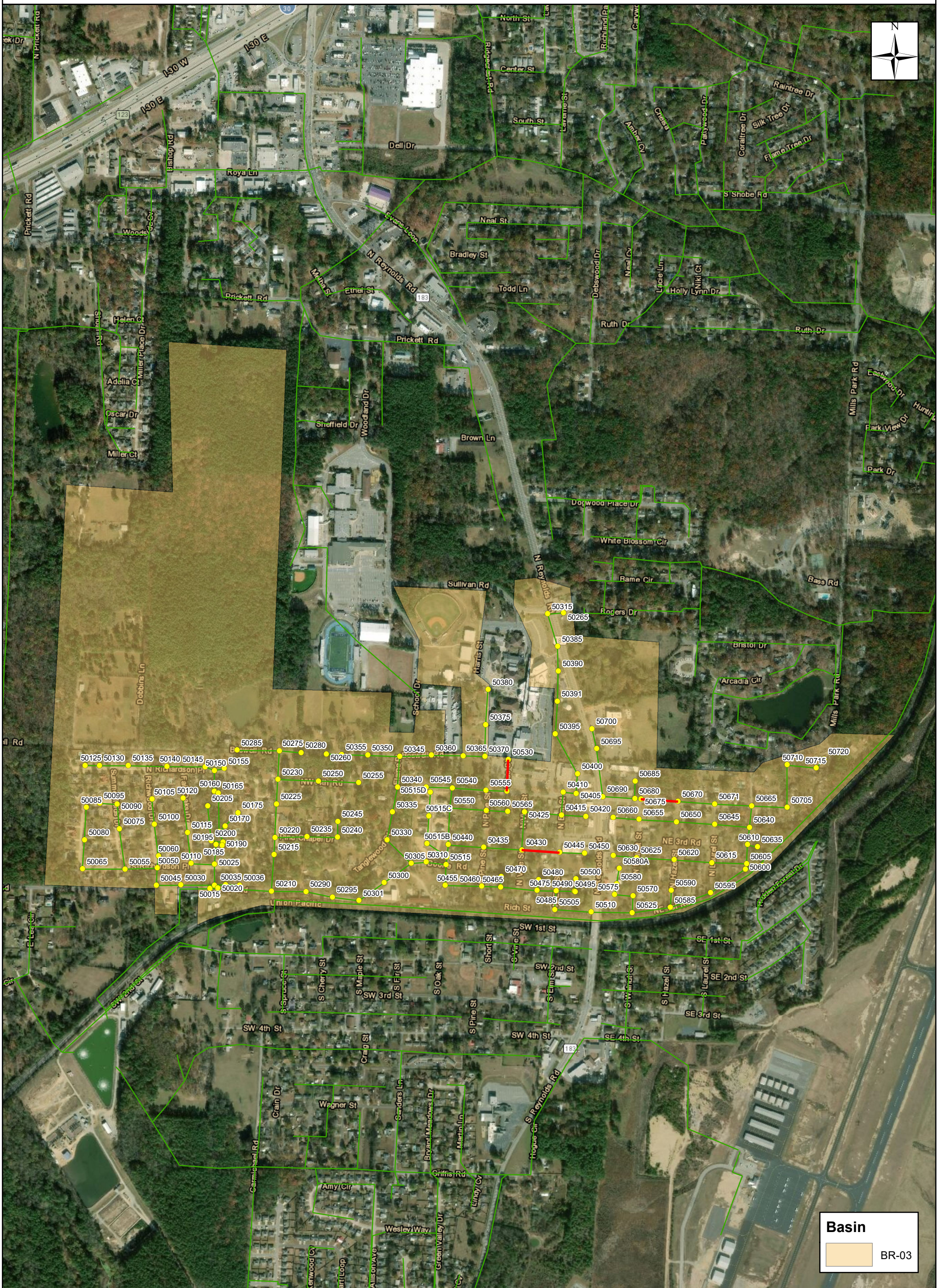


Pipe with hole  
(BR-03) 50530:50535

Table 2.5 Segments with Voids Visible				
USMH	DSMH	Observation	Diameter (in)	Linear Feet (lf)
50445	50430	Hole	6	357
50530	50535	Hole	8	304
50675	50670	Crack	6	<u>353</u>
<b>Total</b>				<b>1,014</b>



# Bryant, AR



**Basin**  
 BR-03

— Segments with Voids Visible    — Gravity Main  
● Manholes



## CHAPTER 3 – I/I SOURCE ANALYSIS

### DETERMINATION OF INFLOW

Inflow in a sanitary sewer system is defined as extraneous flow that is a direct result of storm water runoff. Inflow may enter the sanitary sewer system through directly connected downspouts, area drains, cleanouts, and building sewers. Inflow may also enter the system through direct or indirect connections between the sanitary sewers and storm drains or ditches, sewer line defects, and through defective manhole covers, frame seals, and corbels.

### INFLOW SOURCE QUANTIFICATION

All inflow sources identified during manhole inspections and rainfall simulation were evaluated and quantified. Quantification of individual sources was based on a 1-year/60-minute storm and calculated using the orifice equation and rational formula. These two methods account for drainage area, grading, and surcharge type to produce an inflow rate. The summary of inflow identified by source type is given in Table 3.1 and shown graphically on page 3-3.

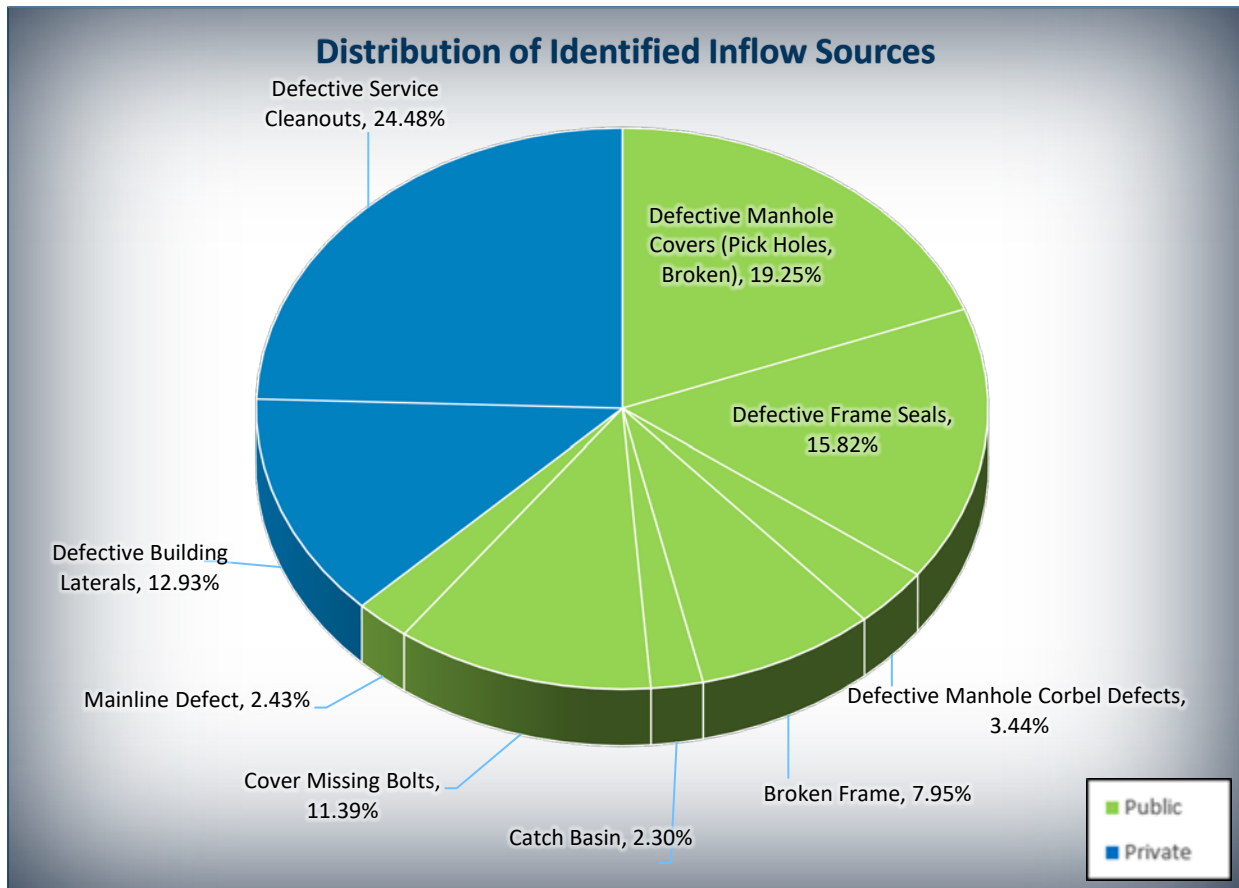
The total quantified inflow from all sources identified through field investigation was estimated to be approximately 0.082 mgd during a 1-year/60-minute design storm. The largest contributor of inflow to the sanitary collection system are defective service cleanouts. Twenty-four percent (24%) of inflow in the study area is attributed to this source type.

<b>Table 3.1</b>			
<b>Distribution of Inflow Sources</b>			
Source	Quantity	1-Year/60 Minute Projected Inflow (gpd)	Percent of Total Inflow
<b><u>Public Sector Inflow</u></b>			
Defective Manhole Covers (Pick Holes, Broken)	80	15,696	19.25%
Defective Frame Seals	15	12,894	15.82%
Cover Missing Bolts	7	9,288	11.39%
Broken Frame	3	6,480	7.95%
Defective Manhole Corbel Defects	12	2,808	3.44%
Mainline Defect	1	1,983	2.43%
Catch Basin	<u>1</u>	<u>1,872</u>	<u>2.30%</u>
<i>Subtotal</i>	<i>119</i>	<i>51,021</i>	<i>62.58%</i>



**Table 3.1**  
**Distribution of Inflow Sources**

Source	Quantity	1-Year/60 Minute Projected Inflow (gpd)	Percent of Total Inflow
<b>Private Sector Inflow</b>			
Defective Service Cleanouts	24	19,958	24.48%
Defective Building Laterals	5	10,541	12.93%
<i>Subtotal</i>	<u>29</u>	<u>30,499</u>	<u>37.41%</u>
<b>Total</b>	<b>148</b>	<b>81,520</b>	<b>100.00%</b>



## DETERMINATION OF INFILTRATION

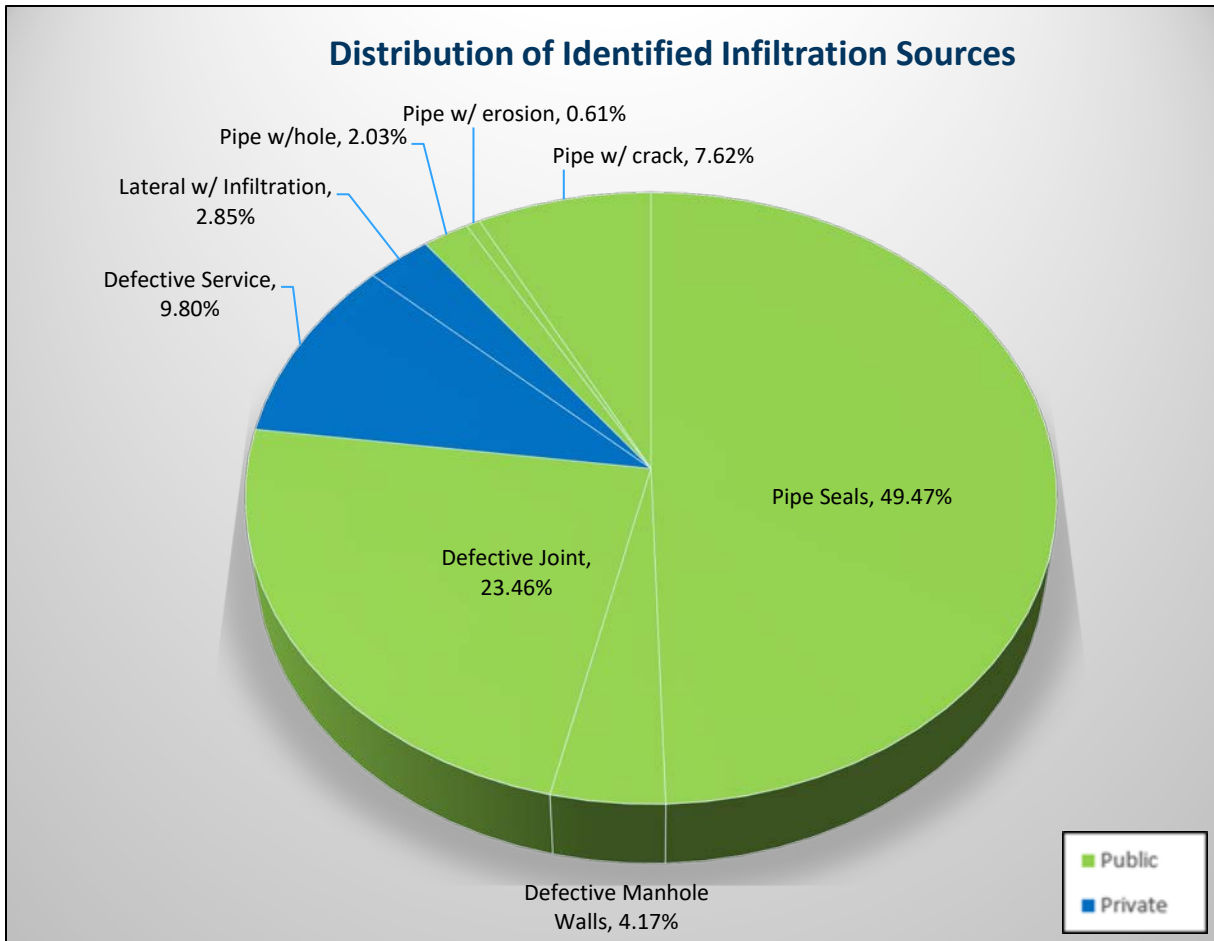
Infiltration in a sanitary sewer system is defined as extraneous flow that enters the system through pipe joints, sewer line defects (including main sewer lines and building sewer lines), and defective manhole walls, benches, and pipe seals. Two types of infiltration can be determined during a study, permanent infiltration and peak infiltration. Permanent infiltration is defined as extraneous flow that enters the system through the ground during periods of dry weather and low groundwater. Peak infiltration is defined as the maximum extraneous flow that enters the sewer system during high groundwater conditions after inflow effects of a rain event have ended.

Analysis of wastewater infiltration were based on I/I source data from field investigations, specifically manhole and visual pipe inspection, rainfall simulation, and internal television inspection of sewer lines.

## INFILTRATION SOURCE QUANTIFICATION

Each of the infiltration sources identified during field investigations was evaluated and quantified in reference to the corresponding sub-basin and line segment. The infiltration rate was estimated based on the severity of the defect. A potential infiltration rate was estimated for each manhole and pipe defect that was observed but not actively leaking. The sum of all observed infiltration sources is referred to as total identified infiltration. Total identified infiltration was quantified to be 0.071 mgd. The total identified infiltration is summarized by source type in Table 3.2.

<b>Table 3.2 Distribution of Identified Infiltration Sources</b>			
<b>Source</b>	<b>Quantity</b>	<b>Estimated Infiltration Rate (gpd)</b>	<b>Percent of Total Infiltration</b>
<b>Manhole Defects</b>			
Pipe Seals	66	35,050	49.47%
Defective Manhole Walls	<u>9</u>	<u>2,952</u>	4.17%
<i>Subtotal</i>	75	38,002	53.64%
<b>Pipeline Defects</b>			
Defective Joint	57	16,618	23.46%
Defective Service	18	6,941	9.80%
Pipe w/ crack	17	5,400	7.62%
Lateral w/ Infiltration	2	2,016	2.85%
Pipe w/hole	2	1,440	2.03%
Pipe w/ erosion	<u>1</u>	<u>432</u>	0.61%
<i>Subtotal</i>	<u>97</u>	<u>32,847</u>	<u>46.36%</u>
<b>Total</b>	<b>172</b>	<b>70,849</b>	<b>100.00%</b>





## CHAPTER 4 – RECOMMENDED REHABILITATION

### RECOMMENDED MANHOLE REHABILITATION

Manhole I/I defects identified during field investigation were analyzed together to obtain recommendations for rehabilitation. Recommendations were based upon total Inflow and Infiltration allowed and associated cost per manhole. Of the 276 manholes studied, a total of 136 (49%) manholes are recommended for rehabilitation. The 136 recommended manholes were divided into a Priority 1 and Priority 2 list. The Priority 1 list consists of manholes with a “Repair Cost to I/I Removed Ratio” less than or equal to 2.4. This list consists of 33 manholes and is included in Appendix F, along with a summary in Table 4.1. The remaining manholes (103) are not the most cost-effective, with a ratio greater than 2.4, and are included in Appendix G. Priority 1 manholes requiring rehabilitation are shown in Map Exhibit C.

**Table 4.1**  
**Recommended Manhole Rehabilitation – Priority 1**

Rehabilitation Description	Number of Manholes	Estimated Inflow (gpd)	Estimated Infiltration (gpd)	Estimated Construction Cost (\$)
Complete Manhole Rehab w/o New Frame and Cover	1	720	648	\$1,971
Grout Lower 18" of Manhole and Repair Bench/Trough	3	1/	8,640	\$3,000
Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	4	4,176	4,536	\$13,200
Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Bolts/Gasket for Bolted Cover	2	3,600	6,048	\$2,140
Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Internal Chimney Seal	3	2,880	864	\$5,200
Install Bolts/Gasket for Bolted Cover	4	4,968	1/	\$400
Repair Corbel	3	648	1/	\$1,500
Replace Cover/Frame/Frame Seal	10	8,424	1/	\$12,100
Replace Cover/Frame/Frame Seal and Adjustment	<u>3</u>	<u>6,912</u>	<u>1/</u>	<u>\$4,500</u>
<b>Total</b>	<b>33</b>	<b>32,328</b>	<b>20,736</b>	<b>\$44,011</b>

1/ Negligible

## SEWER REPLACEMENT/REHABILITATION

Television inspection data was evaluated for repair of specific I/I and maintenance defects. I/I defects are those defects where smoke was visible along a main line and dyed water flooding confirmed the defect. Maintenance defects are those defects that would justify repair or replacement based on their potential to cause future maintenance problems in the sewer system. Maintenance defects include sections of broken or cracked pipe and sections of pipe with sags, root intrusion, or other defects. The maintenance defects may not be large sources of I/I and would not be recommended for repair based on I/I removal alone, but they are recommended for repair to improve system reliability. The television inspection data was evaluated to determine if a sewer segment should be completely rehabilitated or if a point repair should be made. Other considerations used were existing or known problematic areas, diameter of the line, and recommendations for adjacent line segments.

A total of 13,166 linear feet of sewer was televised and reviewed by RJN of an attempted 13,903 linear feet. A summary of the line segments reviewed is listed in Appendix H.

Based on the review of television inspection, point repairs are recommended for approximately 100 linear feet and complete rehabilitation/replacement is recommended for 14-line segments (3,609 linear feet). Table 4.2 summarizes the recommended point repairs and lines for complete rehabilitation. Appendix H through J lists the lines televised, point repairs, and lines requiring complete rehabilitation. Preliminary construction recommendations for complete line rehabilitation have been made based on television review. Based on the desired construction method of cured-in-place pipe (CIPP) by the City of Bryant, RJN utilized CIPP as the primary method wherever possible. Pipe bursting and open cut were also recommended when CIPP was not a viable option. CIPP for 6-inch lines is problematic and could require several point repairs prior to lining. This was considered when making the preliminary construction recommendations and where lining a 6-inch line would cause capacity issues due to liner thickness. Lines requiring rehabilitation are shown on Map Exhibit D.

It should be emphasized that the rehabilitation of the line segments will improve transport performance and system reliability, in addition to the assistance of reducing overflows by reducing I/I.

Table 4.2 Summary of Lines Recommended for Rehabilitation							
	CIPP		Pipe Bursting		Point Repair		Estimated Construction Cost (\$)
	Number of Lines	Length (lf)	Number of Lines	Length (lf)	Number of Lines	Length (lf)	
<b>Total</b>	7	1,633	7	1,976	8	100	\$434,045

## SERVICE LINE RECOMMENDATIONS

Inflow into the wastewater collection system comprised the largest component of extraneous flow during wet-weather periods.

A total of 29 inflow sources identified during the field survey investigations are recommended for removal. The elimination of these sources will provide the greatest I/I reduction in the most cost-effective manner. The indicated sources consist of only private sector sources that will be eliminated through rehabilitation. This will remove 0.030 mgd of 1 year/60-minute inflow at an estimated construction cost of \$19,875. A summary of recommended inflow removal is given in Table 4.3 and a detailed report is included in Appendix K.

Table 4.3 Summary of Recommended Inflow Removal From Service Line Sources			
Source	Quantity	1-Year/60 Minute Projected Peak Inflow (gpd)	Estimated Construction Cost (\$)
<b>Private Sector Inflow</b>			
Cleanout	24	19,958	\$4,875
Sewer Service Defects	<u>5</u>	<u>10,541</u>	<u>\$15,000</u>
<b>Total</b>	<b>29</b>	<b>30,499</b>	<b>\$19,875</b>

## UN-QUANTIFIED DEFECT RECOMMENDATIONS

During manhole investigations, up-pipe photos of all incoming and out-going pipes were taken and reviewed to locate defects. All defects identified during this process were cross referenced with CCTV inspections to ensure that every defect was accounted. Table 4.4 lists defects identified from visual pipe that did not receive I/I quantification due to no CCTV inspections available for the associated pipe segment at the time of this report. The pipe segments in Table 4.4 are recommended for further investigation and rehabilitation.



<b>Table 4.4</b> <b>Un-Quantified Defects Recommended for Further Investigations</b>			
Manhole	Connected Structure	Diameter (in.)	Defect
<b>Mainline</b>			
50245 - S-Out	50240	8	Longitudinal Cracks
50405 - N-In	50400	6	Offset
50505 - N-Out	50485	10	Offset
50550 - E-In	50560	6	Offset
50705 - W-Out	50665	8	Offset
61025 - W-In	61030	8	Offset
50335 - SW-Out	50330	8	Circular Cracks w/ Roots
50370 - W-Out	50365	8	Circular Cracks w/ Roots
50515 - S-In	50455	10	Circular Cracks
<b>Service</b>			
50100 - NE-In	Service	4	Collapsed
50105 - SE-In	Service	4	Offset
50135 - SE-In	Service	4	Circular Cracks
50135 - SE-In	Service	4	Circular Cracks
50140 - NW-In	Service	4	Offset
50155 - NE-In	Service	4	Offset
50370 - W-In	Service	4	Offset
50515C - NW-In	Service	4	Offset
60960C - W-In	Service	4	Offset

## CHAPTER 5 – SUMMARY OF RECOMMENDED PLAN

The recommended rehabilitation plan consists of work to be performed in the public and private sector of the collection system. The plan includes inflow repairs, infiltration repairs, sewer line replacement/rehabilitation, and maintenance repairs. The cost to perform the recommended plan is given in capital cost which includes construction cost plus a 20 percent contingency and 10 percent engineering costs. Cost for right-of-way is not included since the line work is rehabilitation. Costs in this report are in 2018 dollars. Any inflation that occurs between the submission of this report and start of construction is not accounted for. The recommended plan is discussed in the following sections.

### RECOMMENDED MANHOLE REHABILITATION

The recommended manhole rehabilitation plan for manholes includes the rehabilitation of 136 manholes contributing approximately 0.047 mgd of inflow and 0.038 mgd of infiltration. The estimated capital cost would be approximately \$0.297 million. This will eliminate a substantial amount of I/I at a low cost. The sources of inflow and infiltration recommended for removal are presented in Appendix F and G. A summary of the recommended plan for inflow and infiltration removal is given in Table 5.1.

Table 5.1 Summary of Recommended Manhole Rehabilitation Plan				
Rehabilitation Description	Number of Manholes	Estimated Inflow <sup>1/</sup> (gpd)	Estimated Infiltration (gpd)	Estimated Capital Cost <sup>2/</sup> (\$)
Cementitious Coating	1	1/	173	\$1,165
Cementitious Coating and Grout Pipe Seals	1	216	1/	\$1,887
Cementitious Coating and Replace Cover/Frame/Frame Seal	1	72	360	\$2,058
Cementitious Coating, Grout Lower 18" of Manhole, and Repair Bench/Trough	1	216	288	\$1,608
Complete Manhole Rehab w/ New Frame and Cover	1	288	360	\$3,580
Complete Manhole Rehab w/o New Frame and Cover	4	936	2,232	\$7,756
Grout Lower 18" of Manhole and Repair Bench/Trough	26	1/	15,062	\$26,000

<sup>1/</sup> Negligible

<sup>2/</sup> Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

Table 5.1 Summary of Recommended Manhole Rehabilitation Plan				
Rehabilitation Description	Number of Manholes	Estimated Inflow <sup>1/</sup> (gpd)	Estimated Infiltration (gpd)	Estimated Capital Cost <sup>2/</sup> (\$)
Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	30	8,856	12,614	\$99,000
Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Bolts/Gasket for Bolted Cover	2	3,600	6,048	\$2,140
Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Internal Chimney Seal	3	2,880	864	\$5,200
Install Bolts/Gasket for Bolted Cover	4	4,968	1/	\$400
Repair Corbel	3	648	1/	\$1,500
Replace Cover/Frame/Frame Seal	56	17,574	1/	\$72,000
Replace Cover/Frame/Frame Seal and Adjustment	<u>3</u>	<u>6,912</u>	<u>1/</u>	<u>\$4,500</u>
<b>Total</b>	<b>136</b>	<b>47,166</b>	<b>38,001</b>	<b>\$297,432</b>

1/ Negligible

2/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

## RECOMMENDED LINE REHABILITATION

Sewer line rehabilitation is recommended for 14-line segment totaling 3,609 linear feet and sewer line point repairs for 100 linear feet. A detailed discussion of the recommended plan for sewer line repair is included in Chapter 4. A summary of the plan is given in Tables 5.2.



Table 5.2 Summary of Recommended Sewer Rehabilitation <sup>1/</sup>	
Item	Estimated Capital Cost <sup>2/</sup> (\$)
Point Repairs	71,500
Complete Rehabilitation	<u>492,759</u>
<b>Total</b>	<b>564,259</b>

*1/ Lines recommended for complete rehabilitation to correct structural or maintenance defects and are not directly related to any sanitary sewer overflows.*

*2/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.*

## SERVICE LINE RECOMMENDATIONS

The recommended plan for inflow removal includes the repair of all identified sources discovered through field procedures. Each area of rehabilitation is addressed in the following sections.

There are 29 identified private sector sources contributing 0.030 mgd of 1-year/60-minute inflow. The capital cost to remove these private sector sources is approximately \$25,838.

The projected inflow reduction assumes that comprehensive rehabilitation repairs will be completed for the identified I/I sources and that the repairs will effectively eliminate I/I from those identified sources.

A summary of the recommended plan for inflow removal is given in Table 5.3. A computer printout of the inflow sources recommended for repair is given in Appendix K.

Table 5.3 Summary of Recommended Plan For Inflow Removal			
Item	Quantity of Sources	1-Year Inflow Reduction (gpd)	Estimated Capital Cost <sup>1/</sup> (\$)
Service Line Sources	29	30,499	\$25,838

*1/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.*

## SUMMARY OF RECOMMENDED PLAN

The recommended plan includes repairing 29 service line inflow sources, rehabilitation of 136 manholes, 14 sewer line, and point repairs for 100 linear feet. Approximately 0.070 mgd of infiltration will be eliminated by implementation of the recommended plan. The peak 1-year inflow in the basins is projected to be reduced by 0.077 mgd after rehabilitation of the recommended inflow sources. This could be increased to 0.082 mgd if the mainline and catch basin defects from the dye testing are repaired. Recommendations for these segments (50450:50445 and 50555:50540) could not be given due to no available CCTV.

The total capital cost to implement the recommended plan is approximately \$0.888 million. The total capital cost consists of approximately \$26,000 for inflow removal in the private sector, \$0.297 million for manhole rehabilitation, and \$0.565 million for main sewer rehabilitation. A summary of the recommended plan is given in Table 5.4.

Table 5.4 Summary of Recommended Plan				
Item	I/I Reduction		Cost to Benefit Ratio <sup>2/</sup> (mgd/\$Million)	Estimated Capital Cost <sup>2/</sup> (\$Million)
	Inflow <sup>1/</sup> (mgd)	Infiltration (mgd)		
<b><u>Manhole Rehabilitation</u></b>				
Manhole Rehabilitation	0.047	0.038	0.290	\$0.297
<b><u>Sewer Line Rehabilitation</u></b>				
Point Repairs	0.000	0.005	0.069	\$0.072
Complete Rehabilitation	0.000	0.027	0.055	\$0.493
<b><u>Service Line Rehabilitation</u></b>				
Private Sector	<u>0.030</u>	<u>0.000</u>	<u>1.154</u>	<u>\$0.026</u>
<b>Total</b>	<b>0.077</b>	<b>0.070</b>	<b>0.166</b>	<b>\$0.888</b>

1/ Based on projected 1-year/60-minute inflow.

2/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.



# Bryant, AR



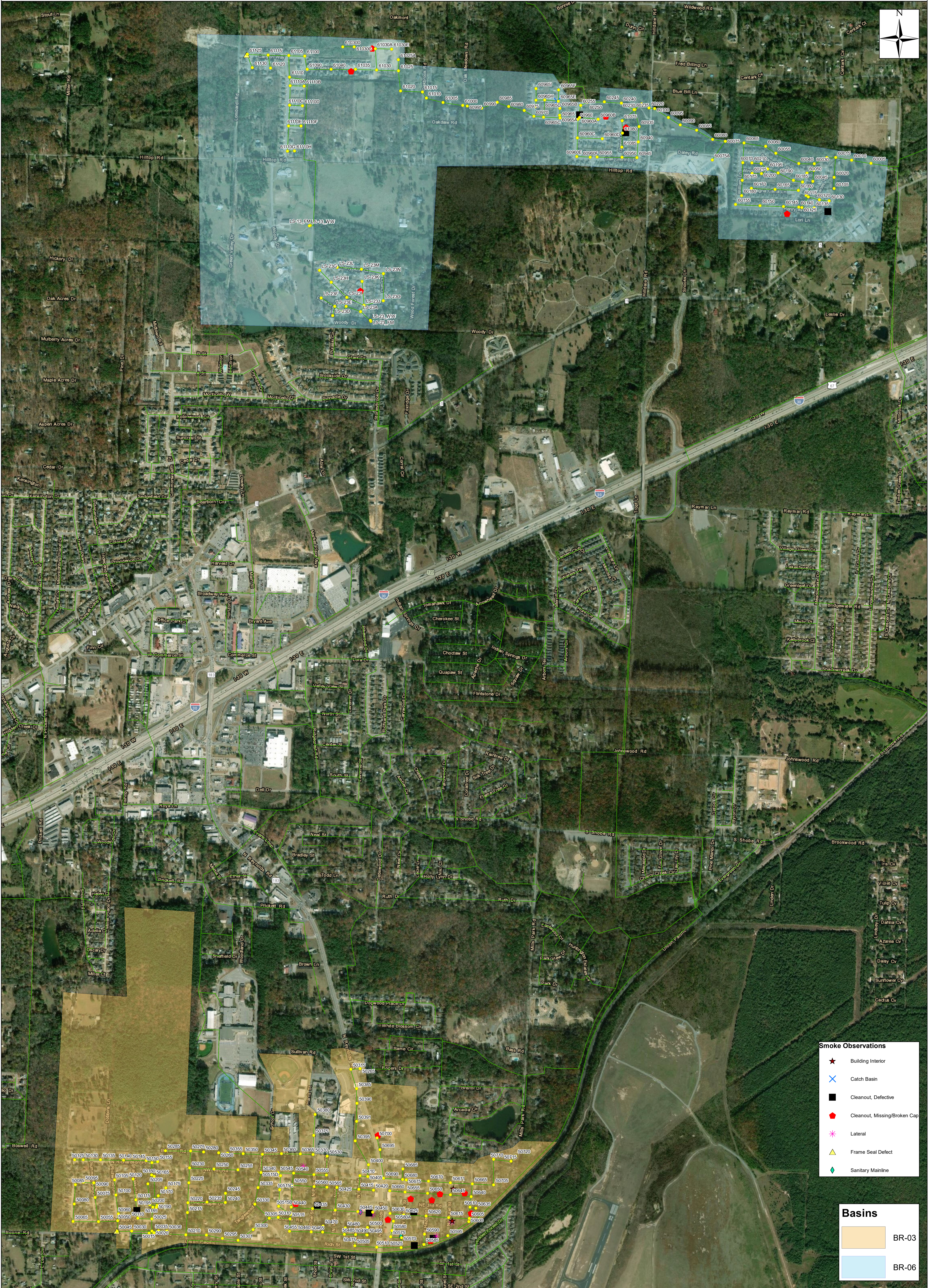
**Basins**

- BR-03
- BR-06

- \* Inspected
- \* Inaccessible
- Gravity Main
- \* Buried
- \* Not Found



# Bryant, AR



**Smoke Observations**

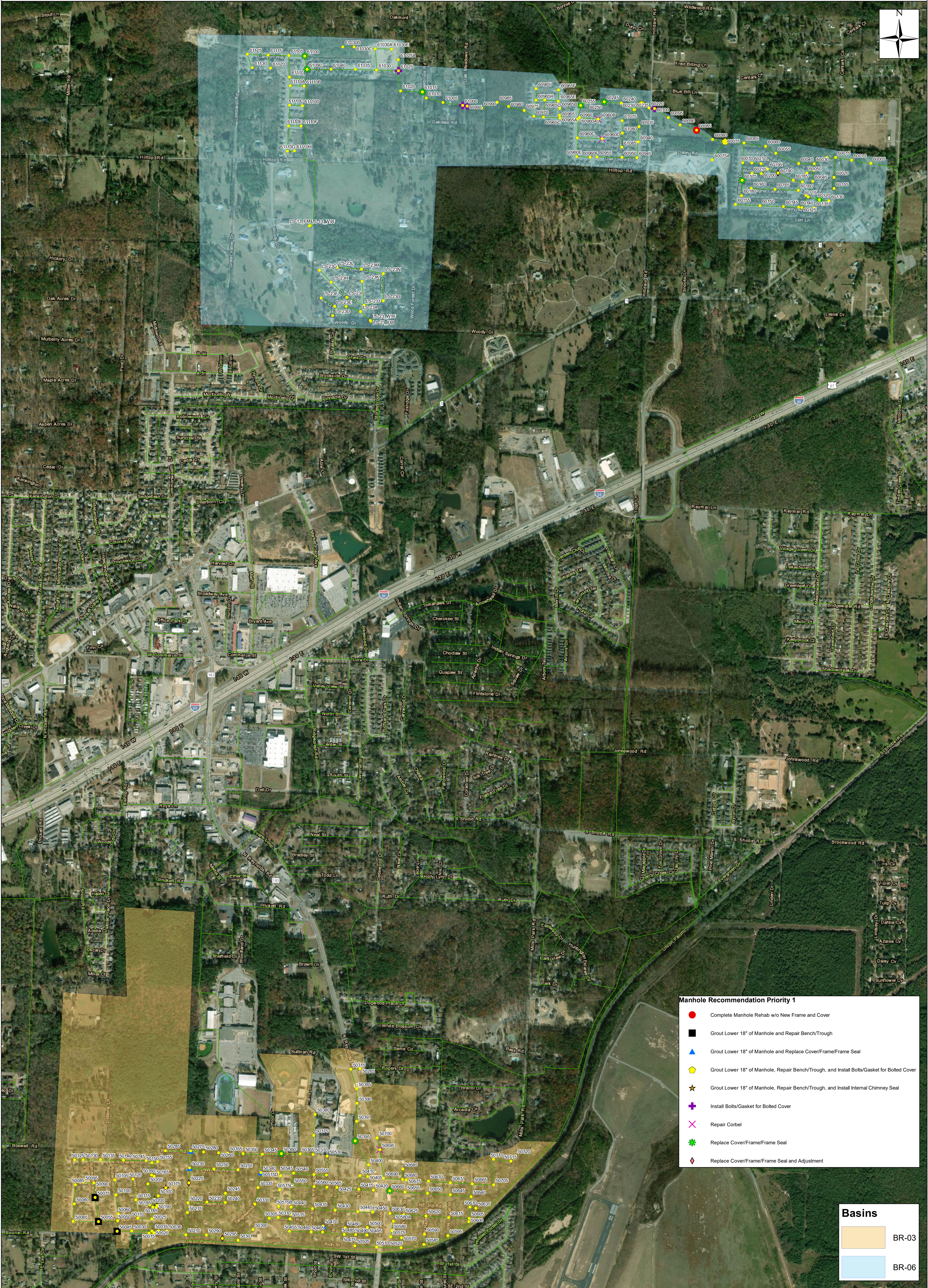
- ★ Building Interior
- ✕ Catch Basin
- Cleanout, Defective
- ⬠ Cleanout, Missing/Broken Cap
- \* Lateral
- ▲ Frame Seal Defect
- ◆ Sanitary Mainline

**Basins**

- BR-03
- BR-06



# Bryant, AR



**Manhole Recommendation Priority 1**

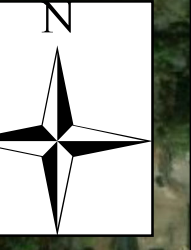
- Complete Manhole Rehab w/o New Frame and Cover
- Grout Lower 18" of Manhole and Repair Bench/Trough
- ▲ Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal
- ◆ Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Bolts/Gasket for Bolted Cover
- ★ Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Internal Chimney Seal
- + Install Bolts/Gasket for Bolted Cover
- ✕ Repair Corbel
- ✱ Replace Cover/Frame/Frame Seal
- ◇ Replace Cover/Frame/Frame Seal and Adjustment

**Basins**

- BR-03
- BR-06



# Bryant, AR



**Line Recommendations**

- CIPP
- PipeBurst
- Point Repair

**Basins**

- BR-03
- BR-06

● Manholes — Gravity Main



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50005	1109 BOONE RD	Center Street	48	10.8	No	Pick	Rehab	Sound	No		72
(BR-03)50010	1103 BOONE RD	Center Street	48	5.2	No	Concealed	Rehab	Sound	No		
(BR-03)50015	1103 BOONE RD	Ditch	48	4.2	No	Concealed	Precast	Leaking Step/Lifting Hole	Yes	288	
(BR-03)50020	1103 BOONE RD	Center Street	48	4.7	No	Concealed	Rehab	Sound	No	288	216
(BR-03)50025	1008 S RICHARDSON PL	Grass Esmt	48	5.9	No	Concealed	Precast	Leaking Step/Lifting Hole	No	288	
(BR-03)50030	1105 S RICHARDSON PL	Grass Esmt	48	7.0	No	Concealed	Poured	Deteriorated	No	288	
(BR-03)50035	1009 S RICHARSON PL	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50036	1001 S RICHARDSON PL	Grass Esmt	48	3.3	No	Concealed	Rehab	Sound	No		
(BR-03)50045	1203 BOONE RD	Grass Esmt	48	3.8	No	Concealed	Rehab	Sound	No	7,200	
(BR-03)50050	1109 S RICHARDSON PL	Grass Esmt	48	7.5	No	Concealed	Poured	Sound	No	288	
(BR-03)50055	1209 S RICHARDSON PL	Grass Esmt	48	7.0	No	Concealed	Poured	Sound	No	720	
(BR-03)50060	200 RICHWOODS DR	Grass Esmt	48	7.0	No	Concealed	Rehab	Deteriorated	No	187	
(BR-03)50065	1300 S RICHARSON PL	Paved Esmt	48	6.7	No	Concealed	Poured	Leaking Step/Lifting Hole	No		
(BR-03)50075	208 SUMMERFIELDS DR	Grass Esmt	48	7.5	No	Concealed	Poured	Deteriorated	No	720	
(BR-03)50080	208 MORNINGSIDE DR	Grass Esmt	48	9.2	No	Concealed	Poured	Deteriorated	No		
(BR-03)50085	304 MORNINGSIDE DR	Grass Esmt	48	5.5	No	Concealed	Poured	Sound	No	288	
(BR-03)50090	304 SUMMERFIELDS DR	Grass Esmt	48	6.9	No	Concealed	Rehab	Sound	No		
(BR-03)50095	304 MORNINGSIDE DR	Grass Esmt	48	6.3	No	Concealed	Rehab	Sound	No	288	
(BR-03)50100	300 RICHWOODS DR	Grass Esmt	48	8.6	No	Concealed	Poured	Sound	No	288	
(BR-03)50105	304 RICHWOODS DR	Grass Esmt	48	6.6	No	Concealed	Rehab	Sound	No		

# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50110	201 FAIR OAKS DR	Center Street	48	4.8	No	Concealed	Rehab	Sound	No		
(BR-03)50115	209 FAIR OAKS DR	Grass Esmt	48	7.0	No	Concealed	Poured	Deteriorated	No		
(BR-03)50120	309 FAIR OAKS DR	Grass Esmt	48	7.0	No	Concealed	Poured	Sound	No		
(BR-03)50125	1310 N RICHARDSON PL	Grass Esmt	48	5.0	No	Concealed	Poured	Sound	No		
(BR-03)50130	1300 N RICHARDSON PL	Grass Esmt	48	6.7	No	Concealed	Poured	Sound	No		
(BR-03)50135	1206 N RICHARDSON PL	Grass Esmt	48	8.1	No	Concealed	Poured	Sound	No	288	
(BR-03)50140	1108 N RICHARSON PL	Grass Esmt	48	6.2	No	Concealed	Poured	Deteriorated	No	360	
(BR-03)50145	1014 N RICHARSON PL	Grass Esmt	48	5.7	No	Concealed	Rehab	Deteriorated	No		
(BR-03)50150	1010 N RICHARDSON PL	Center Street	48	7.4	No	Concealed	Precast	Sound	No	187	
(BR-03)50155	1004 N RICHARDSON PL	Grass Esmt	48	6.6	No	Concealed	Rehab	Sound	No		
(BR-03)50160	1009 N RICHARDSON PL	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50165	1009 N RICHARDON PL	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50170	1003 HAZLEWOOD CV	Grass Esmt	48	5.6	No	Concealed	Precast	Leaking Step/Lifting Hole	No	216	
(BR-03)50175	1003 HAZLEWOOD CV	Paved Esmt	48	6.3	No	Concealed	Precast	Sound	No	288	864
(BR-03)50180	1009 S RICHARDSON PL	Grass Esmt	48	5.7	No		Precast	Sound	No	288	864
(BR-03)50185	205 E RICHARDSON PL	Grass Esmt	48	6.1	No	Concealed	Precast	Leaking Step/Lifting Hole	Yes	288	1,152
(BR-03)50190	1009 S RICHARDSON PL	Grass Esmt	48	5.6	No	Concealed	Precast	Sound	No	288	
(BR-03)50195	1009 S RICHARDSON PL	Grass Esmt	48	5.4	No	Concealed	Precast	Sound	No	288	
(BR-03)50200	204 FAIR OAKS DR	Grass Esmt	48	4.3	No	Concealed	Precast	Sound	No	288	
(BR-03)50205	304 FAIR OAKS DR	Grass Esmt	48	4.4	No	Concealed	Rehab	Sound	No	288	

# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50210	903 BOONE RD	Center Street	48	7.7	No	Pick	Rehab	Sound	No	187	72
(BR-03)50215	11 PINE CHAPLE DR	Grass Esmt	48	10.4	No	Pick	Precast	Cracked	No	547	72
(BR-03)50220	11 PINE CHAPLE DR	Grass Esmt	48	13.3	No	Pick	Precast	Leaking Step/Lifting Hole	No	288	72
(BR-03)50225	811 NW 4TH ST	Grass Esmt	48	15.5	No	Pick	Precast	Sound	No		1,152
(BR-03)50230	902 N RICHARDSON PL	Grass Esmt	48	15.4	No	Pick	Precast	Sound	No	720	720
(BR-03)50235	9 PINE CHAPLE DR	Grass Esmt	48	9.9	No	Pick	Precast	Leaking Joints	No		72
(BR-03)50240	15 TANGLEWOOD DR	Grass Esmt	48	5.6	No	Pick	Precast	Sound	No	288	72
(BR-03)50245	7 TANGLEWOOD DR	Grass Esmt	48	5.8	No	Pick	Precast	Sound	No	360	72
(BR-03)50250	805 NW 4TH ST	Grass Esmt	48	5.1	No	Pick	Precast	Roots	No	360	72
(BR-03)50255	403 BEVERLY PL	Grass Esmt	48	4.9	No	Pick	Rehab	Deteriorated	No		72
(BR-03)50260	711 BOSWELL RD	Grass Esmt	48	3.9	No	Concealed	Precast	Sound	No		
(BR-03)50265	908 N REYNOLDS RD	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50275	902 BOSWELL RD	Center Street	48	12.3	No	Pick	Rehab	Deteriorated	No	2,880	72
(BR-03)50280	805 BOSWELL RD	Center Street	48	7.2	No	Pick	Rehab	Roots	No	648	72
(BR-03)50285	916 BOSWELL RD	Center Street	48	4.2	No	Pick	Rehab	Sound	No		72
(BR-03)50290	802 BOONE RD	Center Street	48	7.6	No	Concealed	Rehab	Sound	No		
(BR-03)50295	803 BOONE RD	Center Street	48	6.6	No	Concealed	Rehab	Sound	No		3,600
(BR-03)50300	501 BOONE RD	Center Street	48	8.7	No	Pick	Rehab	Sound	Yes	288	288
(BR-03)50301	511 BOONE RD	Grass Esmt	48	7.1	No	Pick	Precast	Sound	Yes		288
(BR-03)50305	507 BOONE RD	Center Street	48	9.5	No	Pick	Rehab	Sound	No		288



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50310	507 BOONE RD	Center Street	48	9.9	No	Pick	Rehab	Sound	No		288
(BR-03)50315	801 N REYNOLDS RD	Grass Esmt	48	5.8	No	Concealed	Rehab	Sound	No		
(BR-03)50330	20 TANGLEWOOD DR	Center Street	48	9.0	No	Pick	Precast	Sound	No	288	72
(BR-03)50335	23 TANGLEWOOD DR	Center Street	48	10.0	No	Pick	Precast	Sound	No	288	72
(BR-03)50340	24 TANGLEWOOD DR	Center Street	48	10.4	No	Concealed	Precast	Sound	No	288	2,160
(BR-03)50345	406 ELAINE PL	Center Street	48	11.2	No	Concealed	Rehab	Sound	No		
(BR-03)50350	404 BEVERLY PL	Center Street	48	5.9	No	Pick	Rehab	Sound	No		72
(BR-03)50355	708 BOSWELL RD	Not Found	48	4.4	No	Pick	Rehab	Sound	No	288	288
(BR-03)50360	509 BOSWELL RD	Grass Esmt	48	7.3	No	Pick	Precast	Sound	No		720
(BR-03)50365	411 BOSWELL RD	Grass Esmt	48	9.1	No	Concealed	Rehab	Sound	Yes		
(BR-03)50370	801 N REYNOLDS RD	Grass Esmt	48	10.3	No	Pick	Rehab	Sound	No	288	72
(BR-03)50385	801 N REYNOLDS RD	Grass Esmt	48	6.5	No	Concealed	Rehab	Sound	No		
(BR-03)50390	801 N REYNOLDS RD	Grass Esmt	48	11.9	No	Concealed	Rehab	Sound	No	288	
(BR-03)50391	605 N REYNOLDS RD	Grass Esmt	48	8.3	No	Concealed	Precast	Sound	Yes	288	
(BR-03)50395	503 N REYNOLDS RD	Grass Esmt	48	7.9	No	Pick	Rehab	Deteriorated	No		936
(BR-03)50400	403 N REYNOLDS RD	Grass Esmt	48	8.8	No	Pick	Precast	Sound	No		288
(BR-03)50405	401 N REYNOLDS RD	Grass Esmt	48	10.4	No	Pick	Rehab	Sound	No	288	288
(BR-03)50410	403 N REYNOLDS RD	Grass Esmt	48	9.9	No	Pick	Precast	Sound	No		72
(BR-03)50415	201 NW 4TH ST	Center Street	48	10.9	No	Pick	Precast	Sound	No		72
(BR-03)50420	303 N REYNOLDS RD	Grass Esmt	48	7.6	No	Pick	Rehab	Sound	No	288	288



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50425	211 NW 4TH ST	Center Street	48	9.7	No	Pick	Rehab	Sound	No		288
(BR-03)50430	209 N VINE ST	Center Street	48	6.5	No	Pick	Rehab	Sound	No		288
(BR-03)50435	310 BOONE RD	Center Street	48	6.3	No	Pick	Rehab	Sound	No		72
(BR-03)50440	504 HAYDEN CREEK DR	Grass Esmt	48	6.8	No	Pick	Rehab	Deteriorated	No	288	72
(BR-03)50445	101 NW 3RD ST	Center Street	48	7.6	No	Pick	Rehab	Sound	No	288	72
(BR-03)50450	101 NW 3 RD ST	Grass Esmt	48	7.1	No	Pick	Precast	Sound	No		360
(BR-03)50455	507 BOONE RD	Grass Esmt	48	7.8	No	Pick	Precast	Sound	No		288
(BR-03)50460	107 N PINE ST	Center Street	48	9.5	No	Pick	Precast	Sound	No		72
(BR-03)50465	309 BOONE RD	Grass Esmt	48	9.4	No	Pick	Rehab	Sound	No		72
(BR-03)50470	309 BOONE RD	Grass Esmt	42	4.7	No	Pick	Rehab	Roots	No	648	1,224
(BR-03)50475	211 BOONE RD	Grass Esmt	48	13.4	No	Pick	Rehab	Sound	No		288
(BR-03)50480	211 BOONE RD	Grass Esmt	48	3.8	No	Pick	Rehab	Sound	No		288
(BR-03)50485	108 N ELM ST	Center Street	48	16.0	No	Pick	Precast	Sound	No		288
(BR-03)50490	111 BOONE RD	Grass Esmt	48	4.0	No	Pick	Rehab	Sound	No		72
(BR-03)50495	111 BOONE RD	Grass Esmt	48	4.1	No	Pick	Rehab	Sound	No		72
(BR-03)50500	111 BOONE RD	Grass Esmt	48	4.7	No	Pick	Rehab	Sound	No		72
(BR-03)50505	200 RICH ST	Center Street	48	13.8	No	Pick	Rehab	Sound	No		288
(BR-03)50510	102 N REYNOLDS RD	Center Street	48	16.5	No	Pick	Precast	Sound	No		288
(BR-03)50515	407 BOONE RD	Center Street	48	8.9	No	Pick	Rehab	Sound	No		288
(BR-03)50515A	504 HAYDEN CREEK DR	Grass Esmt	48	6.8	No	Concealed	Poured	Sound	No		



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infiltr. (gpd)	Inflow (gpd)
(BR-03)50515B	513 HAYDEN CREEK DR	Grass Esmt	48	6.9	No	Concealed	Poured	Sound	No		
(BR-03)50515C	525 HAYDEN CREEK DR	Grass Esmt	48	8.8	No	Concealed	Poured	Sound	No		
(BR-03)50515D	533 HAYDEN CREEK DR	Grass Esmt	48	10.6	No	Concealed	Poured	Sound	No		
(BR-03)50525	104 N WALNUT ST	Center Street	48	16.9	No	Pick	Precast	Sound	No		72
(BR-03)50530	801 N REYNOLDS RD	Center Street	48	8.1	No	Pick	Precast	Sound	No		288
(BR-03)50535	403 N REYNOLDS RD	Center Street	48	7.7	No	Pick	Precast	Sound	No		288
(BR-03)50540	410 NW 4TH ST	Center Street	48	8.7	No	Pick	Precast	Sound	No	288	72
(BR-03)50545	504 NW 4 TH ST	Center Street	48	3.8	No	Concealed	None	N/A	No	288	216
(BR-03)50550	528 HAYDEN CREEK DR	Grass Esmt	48	6.7	No	Pick	Rehab	Sound	No	288	72
(BR-03)50555	401 NW 4TH ST	Center Street	48	8.3	No	Pick	Precast	Leaking Step/Lifting Hole	No		288
(BR-03)50560	400 NW 3 RD ST	Center Street	48	6.9	No	Pick	Rehab	Sound	No	288	288
(BR-03)50565	311 NW 4TH ST	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50570	202 NE 2ND ST	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50575	103 N REYNOLDS RD	Grass Esmt	48	4.1	No	Pick	Precast	Sound	No		72
(BR-03)50580	102 NE 2ND ST	Grass Esmt	48	6.3	No	Pick	Rehab	Sound	No	288	72
(BR-03)50580A	107 NE 2ND ST	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50585	107 N HAZEL ST	Center Street	48	18.5	No	Pick	Rehab	Sound	No		288
(BR-03)50590	108 N HAZEL ST	Center Street	48	4.0	No	Pick	Rehab	Sound	No		288
(BR-03)50595	401 NE 1 ST ST	Center Street	48	18.0	No	Pick	Rehab	Sound	No		72
(BR-03)50600	401 NE 1ST ST	Grass Esmt	48	12.2	No	Pick	Precast	Roots	No	360	288



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50600A	401 NE 1 ST ST	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50605	401 NE 1ST ST	Grass Esmt	48	12.2	No	Pick	Rehab	Sound	No	288	72
(BR-03)50610	411 NE 3RD ST	Center Street	48	7.7	No	Pick	Precast	Sound	Yes		72
(BR-03)50615	205 S LAUREL ST	Center Street	48	6.1	No	Pick	Precast	Sound	No		288
(BR-03)50620	211 NE 2ND ST	Center Street	48	7.6	No	Pick	Rehab	Sound	No	288	72
(BR-03)50625	203 NE 2ND ST	Center Street	48	4.2	No	Pick	Rehab	Sound	No		288
(BR-03)50630	210 N REYNOLDS RD	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-03)50635	502 NW 3 RD ST	Center Street	42	2.6	No	Pick	Rehab	Sound	No		288
(BR-03)50640	412 MILLS PARK RD	Grass Esmt	48	4.0	No	Pick	Rehab	Sound	Yes	288	72
(BR-03)50645	402 MILLS PARK RD	Center Street	48	7.4	No	Pick	Rehab	Sound	No	288	288
(BR-03)50650	308 N HAZEL ST	Center Street	48	5.7	No	Pick	Precast	Sound	No		288
(BR-03)50655	108 MILLS PARK RD	Center Street	48	6.3	No	Pick	Rehab	Sound	No	288	936
(BR-03)50660	306 N REYNOLDS RD	Paved Esmt	48	4.0	No	Pick	Rehab	Sound	No		720
(BR-03)50665	411 MILLS PARK RD	Grass Esmt	48	16.6	No	Concealed	Rehab	Sound	Yes		
(BR-03)50670	211 MILLS PARK RD	Grass Esmt	48	4.9	No	Pick	Rehab	Sound	No		72
(BR-03)50671	311 MILLS PARK RD	Paved Esmt	48	5.6	No	Pick	Rehab	Sound	No		72
(BR-03)50675	201 MILLS PARK RD	Paved Esmt	48	9.1	No	Pick	Precast	Sound	No		288
(BR-03)50680	107 MILLS PARK RD	Grass Esmt	48	9.4	No	Pick	Rehab	Sound	No		288
(BR-03)50685	400 N REYNOLDS RD	Grass Esmt	48	7.7	No	Concealed	Brick	Deteriorated	No		216
(BR-03)50690	401 N REYNOLDS RD	Center Street	48	6.3	No	Concealed	Rehab	Sound	No		



# Manhole Inspection Report

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Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-03)50695	508 N REYNOLDS RD	Grass Esmt	48	5.9	No	Concealed	Rehab	Sound	No		216
(BR-03)50700	508 N REYNOLDS RD	Paved Esmt	48	4.8	No	Concealed	Precast	Sound	No	288	
(BR-03)50705	418C MILLS PARK RD	Center Street	48	8.1	No	Pick	Rehab	Sound	No	288	72
(BR-03)50710	514 MILLS PARK RD	Grass Esmt	48	5.8	No	Pick	Rehab	Sound	No		288
(BR-03)50715	418 MILLS PARK RD	Grass Esmt	48	8.3	No	Pick	Rehab	Deteriorated	No	288	720
(BR-03)50720	520 MILLS PARK RD	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		

Totals for Basin BR-03

28,685 29,016

Total Manholes	146
Manholes Inspected	136
Manholes Not Inspected	10
Manholes Buried	0
Manholes Not Found	6
Manholes Inaccessible	4
Location Not Specified	10

Percent:	
Inspected	93.15%
Not Inspected	6.85%
Buried	0.00%
Not Found	4.11%
Inaccessible	2.74%

Evidence of Surcharge	9
Subject to Ponding	0
Subject to Sheeting	108

Surcharge	6.16%
Ponding	0.00%
Sheeting	73.97%



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infiltration (gpd)	Inflow (gpd)
(BR-06)60005	3312 CHARLES CT	Grass Esmt	48	5.3	No	Concealed	Poured	Sound	No		
(BR-06)60010	5312 CHARLES CT	Grass Esmt	48	5.3	No	Concealed	Poured	Sound	No		
(BR-06)60015	5312 CHARLES CT	Grass Esmt	48	7.6	No	Concealed	Poured	Sound	No		
(BR-06)60020	5300 CHARLES CT	Grass Esmt	48	9.1	No	Concealed	Poured	Sound	No		
(BR-06)60025	5312 CHARLES CT	Grass Esmt	48	6.8	No	Concealed	Poured	Sound	Yes		
(BR-06)60030	5318 BUCKINGHAM PL	Grass Esmt	48	8.1	No	Concealed	Poured	Sound	Yes		
(BR-06)60035	5314 BUCKINGHAM PL	Grass Esmt	48	10.1	No	Concealed	Poured	Sound	No		
(BR-06)60040	5326 BUCKINGHAM PL	Grass Esmt	48	9.3	No	Concealed	Poured	Sound	No		
(BR-06)60045	5310 BUCKINGHAM PL	Grass Esmt	48	8.1	No	Concealed	Poured	Sound	No		
(BR-06)60050	5314 BUCKINGHAM PL	Grass Esmt	48	7.4	No	Concealed	Precast	Sound	No		
(BR-06)60051	5306 BUCKINGHAM PL	Grass Esmt	48	7.1	No	Concealed	Precast	Sound	No		
(BR-06)60055	5346 BUCKINGHAM PL	Grass Esmt	48	10.3	No	Concealed	Poured	Sound	No		
(BR-06)60060	5358 BUCKINGHAM PL	Grass Esmt	48	10.2	No	Concealed	Poured	Sound	No	288	
(BR-06)60065	5374 BUCKINGHAM PL	Grass Esmt	48	10.3	No	Concealed	Poured	Sound	No		
(BR-06)60070	2300 WILLIAM LN	Grass Esmt	48	10.1	No	Concealed	Precast	Sound	No		
(BR-06)60075	5445 WILLIAM LN	Grass Esmt	48	8.4	No	Bolts Missing	Precast	Sound	No	5,760	2,880
(BR-06)60075A	1899 DALEY DR	Grass Esmt	48	15.2	No	Concealed	Precast	Sound	No		
(BR-06)60080	5445 WILLIAM LN	Grass Esmt	48	8.1	No	Bolts Missing	Precast	Sound	No		
(BR-06)60085	518 HILLDALE RD	Grass Esmt	48	8.6	No	Bolts Missing	Rehab	Cracked	No	648	720
(BR-06)60090	518 HILLDALE RD	Grass Esmt	48	9.9	No	Bolts Missing	Rehab	Cracked	No	648	



# Manhole Inspection Report

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Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-06)60095	518 HILLDALE RD	Grass Esmt	48	10.3	No	Bolts Missing	Rehab	Cracked	No	648	
(BR-06)60100	518 HILLDALE RD	Grass Esmt	48	9.6	No	Bolts Missing	Precast	Leaking Joints	No		864
(BR-06)60105	5216 CHARLES CT	Grass Esmt	48	6.6	No	Concealed	Precast	Sound	No		
(BR-06)60110	5206 BUCKINGHAM PL	Grass Esmt	48	9.4	No	Concealed	Precast	Sound	No		
(BR-06)60115	2330 CHARLES CT	Grass Esmt	48	8.1	No	Concealed	Precast	Sound	No		
(BR-06)60120	2400 HENRY AVE	Grass Esmt	48	10.5	No	Concealed	Precast	Sound	No		864
(BR-06)60125	2313 HENRY AVE	Grass Esmt	48	7.0	No	Concealed	Precast	Sound	No		
(BR-06)60130	2404 HENRY AVE	Grass Esmt	48	6.2	No	Concealed	Precast	Sound	No		
(BR-06)60135	2401 HENRY AVE	Grass Esmt	48	5.8	No	Concealed	Precast	Sound	No		
(BR-06)60140	2305 HENRY AVE	Grass Esmt	48	6.1	No	Concealed	Precast	Sound	No		
(BR-06)60145	2214 HENRY AVE	Grass Esmt	48	6.1	No	Concealed	Precast	Sound	No		
(BR-06)60150	2102 HENRY AVE	Grass Esmt	48	6.1	No	Concealed	Precast	Sound	No		
(BR-06)60155	5401 HENRY AVE	Paved Esmt	48	4.6	No	Concealed	Precast	Sound	No		
(BR-06)60160	2222 MAGNA CARTA LN	Grass Esmt	48	7.1	No	Concealed	Poured	Sound	No		
(BR-06)60165	2206 MAGNA CARTA LN	Grass Esmt	48	7.9	No	Concealed	Precast	Sound	No		
(BR-06)60170	2112 MAGNA CARTA LN	Grass Esmt	48	6.8	No	Concealed	Precast	Sound	No		
(BR-06)60175	2104 MAGNA CARTA LN	Grass Esmt	48	6.8	No	Concealed	Poured	Sound	No		864
(BR-06)60180	2103 WILLIAM LN	Grass Esmt	48	6.7	No	Concealed	Precast	Sound	No		
(BR-06)60185	5306 BUCKINGHAM PL	Grass Esmt	48	7.5	No	Concealed	Precast	Sound	No		
(BR-06)60190	5306 BUCKINGHAM PL	Grass Esmt	48	5.7	No	Concealed	Precast	Sound	No		2,160



# Manhole Inspection Report

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Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-06)60195	2313 WINDSOR LN	Grass Esmt	48	5.7	No	Concealed	Precast	Sound	No		
(BR-06)60200	2309 WINDSOR CT	Grass Esmt	48	5.7	No	Concealed	Poured	Sound	No		
(BR-06)60205	2306 WINDSOR CV	Grass Esmt	48	5.0	No	Concealed	Precast	Sound	No		
(BR-06)60210	2304 WINDSOR CT	Grass Esmt	48	4.6	No	Concealed	Rehab	Sound	No		
(BR-06)60215	2303 WINDSOR CV	Grass Esmt	48	6.0	No	Concealed	Poured	Sound	No		
(BR-06)60220	518 HILLDALE RD	Grass Esmt	48	9.2	No	Bolts Missing	Precast	Leaking Joints	No		
(BR-06)60225	518 HILLDALE RD	Grass Esmt	48	9.5	No	Bolts Missing	Precast	Sound	No	288	720
(BR-06)60230	518 HILLDALE RD	Grass Esmt	48	7.1	No	Concealed	Poured	Sound	No		
(BR-06)60235	518 HILLDALE RD	Grass Esmt	48	8.6	No	Concealed	Precast	Sound	No		
(BR-06)60240	518 HILLDALE RD	Grass Esmt	48	8.4	No	Concealed	Precast	Sound	No		
(BR-06)60245	1140 OAK GLEN LP	Grass Esmt	48	9.3	No	Concealed	Precast	Sound	No		864
(BR-06)60250	1140 OAK GLEN LP	Center Street	48	11.9	No	Concealed	Precast	Leaking Step/Lifting Hole	No	288	
(BR-06)60255	1142 OAK GLEN LP	Center Street	48	9.1	No	Concealed	Precast	Sound	No		864
(BR-06)60935	1103 OAK GLENN LP	Grass Esmt	48	6.0	No	Concealed	Precast	Sound	No		
(BR-06)60940	1101 OAK GLENN LP	Paved Esmt	48	6.1	No	Concealed	Precast	Sound	No		
(BR-06)60945	1195 OAK GLENN LP	Paved Esmt	48	7.2	No	Concealed	Precast	Sound	No		
(BR-06)60950	5305 OAK GLENN LP	Paved Esmt	48	6.4	No	Concealed	Precast	Sound	No		
(BR-06)60955	1181 OAK GLENN LP	Grass Esmt	48	5.8	Yes	Concealed	Precast	Sound	No		
(BR-06)60960	1401 OAK GLEN CT	Center Street	48	9.5	No	Concealed	Precast	Leaking Joints	No		
(BR-06)60960A	1401 OAK GLENN CT	Paved Esmt	48	8.6	No	Concealed	Precast	Sound	No		



# Manhole Inspection Report

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Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infiltr. (gpd)	Inflow (gpd)
(BR-06)60960B	1411 OAK GLENN CT	Center Street	48	4.3	No	Concealed	Precast	Sound	No		216
(BR-06)60960C	1301 OAK GLENN PL	Grass Esmt	48	6.9	No	Concealed	Poured	Sound	No		
(BR-06)60960D	1311 OAK GLEN PL	Center Street	48	6.9	No	Concealed	Precast	Sound	No		216
(BR-06)60960E	1173 OAK GLENN LP	Center Street	48	4.6	No	Concealed	Poured	Sound	No		
(BR-06)60960F	1177 OAK GLENN LP	Paved Esmt	48	6.6	No	Concealed	Poured	Sound	No		
(BR-06)60965	1316 CROSSING LP	Center Street	48	7.1	No	Concealed	Precast	Sound	No		
(BR-06)60965A	1000 CROSSING LP	Paved Esmt	48	5.8	No	Concealed	Rehab	Sound	No		
(BR-06)60965B	1004 CROSSING LP	Paved Esmt	48	4.9	No	Concealed	Rehab	Sound	No		
(BR-06)60965C	1308 CROSSING LP	Center Street	48	7.3	No	Concealed	Precast	Cracked	No	173	
(BR-06)60965D	1103 COSSING LP	Paved Esmt	48	6.2	No	Concealed	Rehab	Sound	No		
(BR-06)60965E	1101 CROSSING PL	Center Street	48	2.4	No	Concealed	Precast	Sound	No		
(BR-06)60965F	203 CROSSING PL	Center Street	48	2.6	No	Concealed	Precast	Sound	No		
(BR-06)60965G	1205 CROSSING CT	Paved Esmt	48	5.8	No	Concealed	Precast	Sound	No		
(BR-06)60965H	1200 CROSSING CT	Center Street	48	5.8	No	Concealed	Precast	Sound	No		
(BR-06)60965I	305 CROSSING CT	Center Street	48	6.3	No	Concealed	Precast	Sound	No		
(BR-06)60970	1300 CROSSING CT	Center Street	48	9.1	No	Concealed	Precast	Sound	No		
(BR-06)60975	1204 CROSSING CT	Grass Esmt	48	6.8	No	Bolts Missing	Precast	Sound	No		
(BR-06)60980	5525 OAK MEADOWS RD	Grass Esmt	48	6.8	No	Bolts Missing	Precast	Sound	No		
(BR-06)60985	5525 OAK MEADOWS RD	Grass Esmt	48	7.1	No	Bolts Missing	Precast	Sound	No		
(BR-06)60990	5525 OAK MEADOWS RD	Grass Esmt	48	7.2	No	Bolts Missing	Precast	Sound	No		



# Manhole Inspection Report

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Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-06)60995	5525 OAK MEADOWS RD	Grass Esmt	48	6.8	No	Bolts Missing	Precast	Sound	No		2,880
(BR-06)61000	5525 OAK MEADOWS RD	Paved Esmt	48	6.5	No	Bolts Missing	Rehab	Sound	No		1,152
(BR-06)61005	5606 OAKBROOK RD	Grass Esmt	48	7.2	No	Bolts Missing	Precast	Sound	No		
(BR-06)61010	5606 OAKBROOK RD	Grass Esmt	48	8.0	No	Bolts Missing	Precast	Sound	No		
(BR-06)61015	5611 OAKBROOK RD	Grass Esmt	48	8.4	No	Bolts Missing	Precast	Sound	No		864
(Br-06)61020	5563 OAKBROOK RD	Inaccessible	48	11.3	No	Bolts Missing	Rehab	Sound	No		
(BR-06)61025	Lot 31 DAWSON'S POINT AVE	Grass Esmt	48	8.6	No	Bolts Missing	Precast	Sound	No		72
(BR-06)61025A	423-69 CREEK SIDE CV	Grass Esmt	48	7.8	No	Concealed	Precast	Sound	No		
(BR-06)61030	515 CREEK SIDE CV	Inaccessible	48	6.8	No	Concealed	Precast	Sound	No		
(BR-06)61030A	905 DAWSON'S POINT AVE	Grass Esmt	48	11.5	No	Concealed	Precast	Sound	Yes		
(BR-06)61030B	905 DAWSON'S POINT AVE	Grass Esmt	48	10.4	No	Concealed	Precast	Sound	No		
(BR-06)61030C	905 DAWSON'S POINT AVE	Grass Esmt	48	8.6	No	Concealed	Precast	Sound	No		
(BR-06)61030D	905 DAWSON'S POINT AVE	Grass Esmt	48	10.4	No	Concealed	Precast	Sound	No		
(BR-06)61030E	613 DAWSON'S POINT AVE	Grass Esmt	48	9.0	No	Concealed	Precast	Sound	No		
(BR-06)61035	501 CREEK SIDE CV	Grass Esmt	48	10.2	No	Concealed	Precast	Sound	No		
(BR-06)61040	403 CREEK SIDE CV	Paved Esmt	48	7.0	No	Concealed	Precast	Sound	No		
(BR-06)61075	5509 GLENN CIR	Paved Esmt	48	6.8	No	Concealed	Precast	Sound	No		
(BR-06)61080	5413 GLENN CIR	Paved Esmt	48	6.2	No	Concealed	Precast	Sound	No		
(BR-06)61085	5309 GLENN CIR	Paved Esmt	48	4.9	No	Concealed	Precast	Sound	No		
(BR-06)61090	301 CREEK SIDE CV	Paved Esmt	48	10.9	No	Concealed	Precast	Sound	No		864



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-06)611100	5710 SPRING SIDE AVE	Paved Esmt	48	5.9	No	Concealed	Precast	Sound	No		864
(BR-06)611105	214 CANYON WAY	Paved Esmt	48	5.8	No	Concealed	Precast	Sound	No		
(BR-06)611110	215 CANYON WAY	Grass Esmt	48	13.2	No	Concealed	Precast	Sound	No		
(BR-06)611110A	6025 SPRINGWOOD CIR	Grass Esmt	48	12.3	No	Concealed	Precast	Sound	No		
(BR-06)611110B	6017 SPRINGWOOD CIR	Grass Esmt	48	5.6	No	Concealed	Precast	Sound	No	288	
(BR-06)611110C	5000 CLOVER BROOK DR	Grass Esmt	48	10.8	No	Concealed	Rehab	Sound	No		
(BR-06)611110D	5008 CLOVER BROOK DR	Grass Esmt	48	6.3	No	Concealed	Precast	Sound	No		
(BR-06)611110E	4000 SPRINGWOOD CIR	Grass Esmt	48	9.9	No	Concealed	Precast	Sound	No		
(BR-06)611110F	4004 SPRINGWOOD CIR	Grass Esmt	48	7.8	No	Concealed	Precast	Sound	No		
(BR-06)611110G	3001 CYPRESSWOOD CV	Grass Esmt	48	7.3	No	Concealed	Precast	Sound	No		
(BR-06)611110H	3007 CYPRESSWOOD CR	Paved Esmt	48	6.1	No	Concealed	Precast	Sound	No		
(BR-06)611115	202 CANYON WAY	Paved Esmt	48	6.2	No	Concealed	Precast	Sound	Yes		
(BR-06)611120	5702 SWEETBRIAR CT	Grass Esmt	48	4.9	No	Concealed	Precast	Sound	No		
(BR-06)611125	104 CANYON WAY	Paved Esmt	48	5.2	No	Concealed	Precast	Sound	No		222
(BR-06)611130	5704 TUMBLE ROCK CT	Grass Esmt	48	5.0	No	Concealed	Precast	Sound	No		
(BR-06)LS-23A	4505 MEADOW RIDGE LN	Paved Esmt	48	7.8	No	Concealed	Precast	Sound	No		
(BR-06)LS-23B	402 BABS CT	Grass Esmt	48	8.8	No	Concealed	Poured	Sound	No		
(BR-06)LS-23C	402 BABS CT	Grass Esmt	48	6.6	No	Concealed	Poured	Sound	No		
(BR-06)LS-23D	4507 KARIN LN	Grass Esmt	48	5.7	No	Concealed	Poured	Sound	No		
(BR-06)LS-23E	402 BABS CT	Grass Esmt	48	7.1	No	Concealed	Poured	Sound	No		



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Manhole Depth (ft.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
(BR-06)LS-23F	308 LEXIE CV	Grass Esmt	48	5.6	No	Concealed	Poured	Sound	No		
(BR-06)LS-23G	217 DEREK CT	Grass Esmt	48	6.9	No	Concealed	Poured	Sound	No		
(BR-06)LS-23H	319 DEREK CT	Paved Esmt	48	6.5	No	Concealed	Poured	Sound	No		
(BR-06)LS-23I	409 DEREK CT	Not Found	N/A	N/A	No	N/A	N/A	N/A	No		
(BR-06)LS-23J	4511 MEADOW RIDGE LN	Grass Esmt	48	6.3	No	Concealed	Precast	Sound	No		
(BR-06)LS-23K	4705 MEADOW RIDGE LN	Grass Esmt	48	5.7	Yes	Concealed	Precast	Sound	No	288	
(BR-06)LS-23L	319 SHERRY ANN CT	Center Street	48	7.4	No	Concealed	Poured	Sound	No		
(BR-06)LS-23M	421 SHERRY ANN CT	Grass Esmt	48	6.1	No	Concealed	Precast	Sound	No		
(BR-06)LS-23N	4718 CLIFF CT	Center Street	48	9.0	No	Concealed	Precast	Sound	No		
(BR-06)LS-23O	4600 DEREK CT	Center Street	48	10.6	No	Concealed	Precast	Sound	No		

Totals for Basin BR-06

9,317 18,150

Total Manholes	130
Manholes Inspected	129
Manholes Not Inspected	1
Manholes Buried	0
Manholes Not Found	1
Manholes Inaccessible	0
Location Not Specified	1

<b>Percent:</b>	
Inspected	99.23%
Not Inspected	0.77%
Buried	0.00%
Not Found	0.77%
Inaccessible	0.00%

Evidence of Surcharge	4
Subject to Ponding	2
Subject to Sheeting	61

Surcharge	3.08%
Ponding	1.54%
Sheeting	46.92%



# Manhole Inspection Report

Project No. 18-3326-00 Bryant\_2018\_SSES

Manhole Number	Address /Street	Location	Manhole Diam. (in.)	Subj. Pond.	Cover Type	Wall Const.	Wall Condition	Surcharge Evidence	Infilt. (gpd)	Inflow (gpd)
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## Totals for All Basins

Total Manholes	276
Manholes Inspected	265
Manholes Not Inspected	11
Manholes Buried	0
Manholes Not Found	7
Manholes Inaccessible	4
Location Not Specified	11

<b>Percent:</b>	
Inspected	96.01%
Not Inspected	3.99%
Buried	0.00%
Not Found	2.54%
Inaccessible	1.45%

Evidence of Surcharge	13
Subject to Ponding	2
Subject to Sheeting	169

Surcharge	4.71%
Ponding	0.72%
Sheeting	61.23%

Total Infiltration =	38,002
Total Inflow =	47,166



# Visual Pipe Advanced

Project No. 18-3326-00 Bryant\_2018\_SSES

Line Segment	-----PIPE-----			Deposition				Observed					
	Dir.	Diam In	Construction	Root Growth	Type	Depth In	Structural Condition	Line Grade	Visual Infiltr	Depth In	Velocity FPS	Cleaning Method	Drop Conn.
(BR-03) 50005	BR-03 50010	2. E-In 10	Vitrified Clay	No	N/A		Good	N/A		2		N/A	No
	BR-03 50004	1. S-Out 10	Vitrified Clay	No	N/A		Good	N/A		2		N/A	No
(BR-03) 50010	BR-03 50015	2. NE-In 8	PVC	No	N/A		Circular Crac	N/A		1		N/A	No
	BR-03 50020	3. E-In 10	Concrete	No	N/A		Future	N/A		2.5		N/A	No
	BR-03 50005	1. W-Ou 10	Vitrified Clay	No	N/A		Good	N/A		3		N/A	No
(BR-03) 50015	BR-03 50030	2. W-In 8	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50010	1. SW-O 8	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50025	3. N-In 8	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50035	4. E-In 6	PVC	No	N/A		Good	N/A		0		N/A	No
(BR-03) 50020	BR-03 50010	1. W-Ou 10	Vitrified Clay	No	N/A		Circular Crac	N/A		4		N/A	No
	BR-03 50210	2. E-In 10	Vitrified Clay	Yes	N/A		Circular Crac	N/A		4.25		N/A	No
(BR-03) 50025	BR-03 50110	2. W-In 6	PVC	No	N/A		Good	N/A		0.13		N/A	No
	BR-03 SVC	4. NE-In 4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50195	3. N-In 8	PVC	No	N/A		Good	N/A		2		N/A	No
	BR-03 50015	1. S-Out 8	PVC	No	N/A		Good	N/A		2		N/A	No
(BR-03) 50030	BR-03 50045	2. W-In 8	PVC	No	N/A		Good	N/A		0.5		N/A	No
	BR-03 SVC	3. NW-I 4	Concrete	No	N/A		Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50030	BR-03	SVC	4. N-In	4	PVC	No	N/A	Future	N/A	0		N/A	No
	BR-03	50015	1. E-Out	8	PVC	No	N/A	Good	N/A	0.5		N/A	No
(BR-03) 50036	BR-03	50035	1. W-Ou	6	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	SVC	2. NE-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-03) 50045	BR-03	50050	2. N-In	8	PVC	No	N/A	Good	N/A	1.5		N/A	No
	BR-03	SVC	3. NE-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	50030	1. E-Out	8	PVC	No	N/A	Good	N/A	2		N/A	No
(BR-03) 50050	BR-03	50060	1. SW-O	8	PVC	No	N/A	Good	N/A	0.5		N/A	No
	BR-03	50055	2. W-In	8	PVC	No	N/A	Circular Crac	N/A	2		N/A	No
	BR-03	50060	3. NE-In	6	PVC	No	N/A	Good	N/A	0.25		N/A	No
(BR-03) 50055	BR-03	50075	5. NW-I	6	PVC	No	N/A	Good	N/A	0.25		N/A	No
	BR-03	50065	4. W-In	6	PVC	No	N/A	Circular Crac	N/A	0.25		N/A	No
	BR-03	SVC	3. SW-In	4	PVC	No	N/A	Future	N/A	0		N/A	No
	BR-03	SVC	2. SE-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	50050	1. E-Out	8	PVC	No	N/A	Good	N/A	0.75		N/A	No
(BR-03) 50060	BR-03	50100	3. NW-I	6	PVC	No	N/A	Circular Crac	N/A	0.5		N/A	No
	BR-03	SVC	2. NW-I	4	Cast Iron	No	N/A	Good	N/A	0		N/A	No
	BR-03	SVC	4. E-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	50050	1. SW-O	6	PVC	No	N/A	Good	N/A	0.25		N/A	No
(BR-03) 50065	BR-03	SVC	2. E-In	4	PVC	No	N/A	Circular Crac	N/A	0.13		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50065	BR-03	50080	3. N-In 6 PVC	No	N/A	Future	N/A		0.75		N/A	No
	BR-03	50055	1. E-Out 6 PVC	No	N/A	Good	N/A		0.5		N/A	No
(BR-03) 50075	BR-03	SVC	5. SE-In 4 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03	50090	4. NW-I 6 PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03	SVC	3. W-In 4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	2. W-In 4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	50055	1. SE-O 6 PVC	No	N/A	Good	N/A		1		N/A	No
(BR-03) 50080	BR-03	SVC	3. E-In 4 PVC	No	N/A	Circular Crac	N/A		0.13		N/A	No
	BR-03	50085	2. N-In 6 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	50065	1. S-Out 6 PVC	No	N/A	Good	N/A		0.13		N/A	No
(BR-03) 50085	BR-03	SVC	3. NW-I 4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	50080	1. S-Out 6 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	2. NW-I 4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	4. SE-In 4 PVC	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50090	BR-03	SVC	4. E-In 4 PVC	No	N/A	Future	N/A		0		N/A	No
	BR-03	50075	1. SE-O 6 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03	50095	2. W-In 6 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03	SVC	3. N-In 4 PVC	No	N/A	Circular Crac	N/A		0		N/A	No
(BR-03) 50095	BR-03	SVC	5. N-In 4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	4. W-In 4 PVC	No	N/A	Good	N/A		0.13		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>					
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50095	BR-03 SVC	3. W-In	4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 SVC	2. SE-In	4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50090	1. E-Out	6	PVC	No	N/A		Good	N/A		0.13		N/A	No
(BR-03) 50100	BR-03 SVC	4. NE-In	4	PVC	No	N/A	3	Collapsed Pip	N/A		0		N/A	No
	BR-03 SVC	2. W-In	4	PVC	No	N/A		Circular Crac	N/A		0		N/A	No
	BR-03 50060	1. SE-O	6	PVC	No	N/A		Good	N/A		0.13		N/A	No
	BR-03 SVC	5. SE-In	4	PVC	No	N/A		Circular Crac	N/A		0		N/A	No
	BR-03 50105	3. NW-I	6	PVC	No	N/A		Good	N/A		0.13		N/A	No
(BR-03) 50105	BR-03 50100	1. SW-O	6	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 SVC	3. W-In	4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 SVC	2. W-In	4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 SVC	4. N-In	4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 SVC	5. SE-In	4	PVC	No	N/A		Future	N/A		0		N/A	No
(BR-03) 50110	BR-03 50115	3. NW-I	6	PVC	No	N/A		Good	N/A		0.25		N/A	No
	BR-03 50025	1. E-Out	6	PVC	No	N/A		Good	N/A		0.25		N/A	No
	BR-03 SVC	2. NW-I	4	PVC	No	N/A		Good	N/A		0		N/A	No
(BR-03) 50115	BR-03 SVC	2. W-In	4	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50110	1. SE-O	6	PVC	No	N/A		Good	N/A		0.5		N/A	No
	BR-03 50120	3. NW-I	6	PVC	No	N/A		Good	N/A		0.25		N/A	No
(BR-03) 50120	BR-03 SVC	2. SW-In	6	PVC	No	N/A		Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50120	BR-03	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0.5		N/A	No
	BR-03	50115	1. SE-O 6	PVC	No	N/A	Good	N/A		1		N/A	No
(BR-03) 50125	BR-03	50130	1. E-Out 6	PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03	SVC	2. SW-In 4	PVC	No	N/A	Circular Crac	N/A		0.13		N/A	No
	BR-03	SVC	3. NW-I 4	PVC	No	N/A	Circular Crac	N/A		0.13		N/A	No
(BR-03) 50130	BR-03	50135	1. E-Out 6	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03	50125	4. W-In 6	PVC	No	N/A	Circular Crac	N/A		0.13		N/A	No
	BR-03	SVC	5. NW-I 4	PVC	No	N/A	Circular Crac	N/A		0		N/A	No
	BR-03	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	6. NE-In 4	PVC	No	N/A	Circular Crac	N/A		0		N/A	No
	BR-03	SVC	3. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50135	BR-03	SVC	7. NE-In 4	PVC	Yes	N/A	Circular Crac	N/A		2		N/A	No
	BR-03	SVC	2. SE-In 4	PVC	No	N/A	Circular Crac	N/A		0.13		N/A	No
	BR-03	SVC	3. SE-In 4	PVC	Yes	N/A	Circular Crac	N/A		0.13		N/A	No
	BR-03	SVC	4. W-In 4	PVC	No	N/A	0.5 Future	N/A		0		N/A	No
	BR-03	50130	5. W-In 6	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03	SVC	6. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	50140	1. E-Out 6	PVC	No	N/A	Good	N/A		0.5		N/A	No
(BR-03) 50140	BR-03	50145	1. E-Out 6	PVC	No	N/A	Good	N/A		1		N/A	No
	BR-03	SVC	2. S-In 4	PVC	No	N/A	Good	N/A		0.13		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50140	BR-03 SVC	5. NW-I	4 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03 SVC	3. SW-In	4 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03 50135	4. W-In	6 PVC	No	N/A	Circular Crac	N/A		0.25		N/A	No
	BR-03 SVC	6. NW-I	4 PVC	No	N/A	Future	N/A	0	0.13		N/A	No
(BR-03) 50145	BR-03 50150	1. SE-O	6 Cast Iron	No	N/A	Good	N/A		2		N/A	No
	BR-03 SVC	4. N-In	6 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03 SVC	2. S-In	4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03 50140	3. W-In	6 PVC	No	N/A	Good	N/A		1		N/A	No
(BR-03) 50150	BR-03 50160	1. S-Out	8 PVC	No	N/A	Good	N/A		1		N/A	No
	BR-03 SVC	2. SW-In	6 Cast Iron	No	N/A	Good	N/A		0		N/A	No
	BR-03 50145	3. NW-I	6 N/A	No	N/A	Future	N/A		0.25		N/A	No
	BR-03 SVC	4. N-In	4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03 50155	5. NE-In	6 PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-03) 50155	BR-03 50150	1. SW-O	6 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03 SVC	2. NE-In	4 PVC	No	N/A	Future	N/A		0.13		N/A	No
(BR-03) 50170	BR-03 50180	1. SW-O	8 PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03 50175	2. NE-In	8 PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03 SVC	3. SE-In	4 PVC	No	N/A	Good	N/A		0.11		N/A	Yes
(BR-03) 50175	BR-03 SVC	3. NE-In	4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03 50170	1. SW-O	8 PVC	No	N/A	Good	N/A		0.25		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>				
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-03) 50175	BR-03 SVC	4. SE-In	4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-03 SVC	2. NW-I	4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-03) 50180	BR-03 50170	3. NE-In	8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-03 50185	1. SE-O	8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-03 50165	2. NW-I	8	PVC	No	N/A		Good	N/A		0.25	N/A	No
(BR-03) 50185	BR-03 SVC	4. E-In	6	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-03 50180	3. NW-I	8	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-03 SVC	2. NW-I	6	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-03 50190	1. S-Out	8	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-03) 50190	BR-03 50195	1. W-Ou	8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-03 50185	2. NE-In	8	PVC	No	N/A		Good	N/A		0.25	N/A	No
(BR-03) 50195	BR-03 50190	2. E-In	0	PVC	No	N/A	2	Future	N/A		3	N/A	No
	BR-03 50025	1. SW-O	8	PVC	No	N/A	2	Good	N/A		3	N/A	No
(BR-03) 50200	BR-03 50205	5. NW-I	8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-03 SVC	4. NW-I	4	PVC	No	N/A		Future	N/A		0	N/A	No
	BR-03 SVC	3. W-In	4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-03 50185	1. SE-O	8	Concrete	No	N/A		Good	N/A		0.5	N/A	No
	BR-03 SVC	2. SW-In	4	PVC	No	N/A		Future	N/A		0	N/A	No
(BR-03) 50205	BR-03 SVC	3. NW-I	4	PVC	No	N/A		Good	N/A		0.13	N/A	No
	BR-03 50200	1. SE-O	6	PVC	No	N/A		Good	N/A		0.13	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>				<i>Deposition</i>				<i>Observed</i>				
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50205	BR-03	SVC	2. W-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50210	BR-03	50290	3. E-In 10	Vitrified Clay	No	N/A	Good	N/A		4.25		N/A	No
	BR-03	50215	2. N-In 6	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-03	50020	1. W-Ou 10	Vitrified Clay	No	N/A	Circular Crac	N/A		4		N/A	No
(BR-03) 50215	BR-03	50210	1. S-Out 8	PVC	No	N/A	Good	N/A		1.25		N/A	No
	BR-03	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	Yes
	BR-03	50220	3. N-In 8	PVC	No	N/A	Good	N/A		1		N/A	No
(BR-03) 50220	BR-03	50215	1. S-Out 8	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-03	50225	4. N-In 8	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-03	50235	5. E-In 8	PVC	No	N/A	4 Good	N/A		1.5		N/A	No
	BR-03	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	Yes
	BR-03	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	Yes
(BR-03) 50225	BR-03	50220	1. S-Out 8	Cast Iron	No	N/A	Good	N/A		2		N/A	No
	BR-03	SVC	2. W-In 4	PVC	No	N/A	Future	N/A		0		N/A	No
	BR-03	SVC	3. NW-I 4	PVC	No	N/A	Future	N/A		0		N/A	No
	BR-03	50230	4. N-In 8	PVC	No	N/A	Good	N/A		1.25		N/A	No
(BR-03) 50230	BR-03	50225	1. S-Out 10	PVC	No	N/A	Good	N/A		3		N/A	No
	BR-03	50275	2. N-In 10	PVC	No	N/A	Good	N/A		15.41		N/A	No
	BR-03	50250	3. E-In 8	PVC	No	N/A	Good	N/A		0.5		N/A	Yes
(BR-03) 50235	BR-03	50220	1. W-Ou 8	PVC	No	N/A	Good	N/A		0.5		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50235	BR-03	50240	2. E-In 8	PVC	No	N/A	Good	N/A		0.5		N/A	No
(BR-03) 50240	BR-03	50235	1. W-Ou 8	PVC	No	N/A	Good	N/A		0.5		N/A	No
		BR-03	50245	2. N-In 8	Concrete	No	N/A	Good	N/A	0.25		N/A	No
		BR-03	SVC	3. SE-In 4	N/A	Yes	N/A	0.25	Future	N/A		N/A	No
(BR-03) 50245	BR-03	50240	1. S-Out 8	Concrete	No	N/A	Longitudinal C	N/A		1		N/A	No
		BR-03	SVC	2. NW-I 4	N/A	Yes	N/A	Future	N/A	0		N/A	No
		BR-03	SVC	3. N-In 4	PVC	No	N/A	Good	N/A	0.25		N/A	Yes
(BR-03) 50250	BR-03	50250	1. W-Ou 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
		BR-03	50255	2. E-In 8	PVC	No	N/A	Good	N/A	0.13		N/A	No
(BR-03) 50255	BR-03	50250	1. W-Ou 8	PVC	No	N/A	Good	N/A		0		N/A	No
		BR-03	SVC	2. E-In 4	Cast Iron	No	N/A	Good	N/A	0		N/A	No
		BR-03	SVC	3. S-In 4	Cast Iron	No	N/A	Good	N/A	0		N/A	No
(BR-03) 50260	BR-03	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
		BR-03	50355	1. NW-O 6	PVC	No	N/A	Good	N/A	0		N/A	No
		BR-03	SVC	2. NW-I 4	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-03) 50275	BR-03	50230	1. S-Out 8	PVC	No	N/A	Good	N/A		0.5		N/A	No
		BR-03	50280	4. E-In 6	PVC	No	N/A	Good	N/A	0		N/A	Yes
		BR-03	50285	3. W-In 6	PVC	No	N/A	Good	N/A	1		N/A	No
		BR-03	SVC	2. W-In 4	PVC	No	N/A	4	Future	N/A		N/A	No
(BR-03) 50280	BR-03	SVC	2. N-In 4	Concrete	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>				
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-03) 50280	BR-03	50275	1. W-Ou 6 PVC	No	N/A		Good	N/A		0	N/A	No
(BR-03) 50285	BR-03	SVC	2. NW-I 4 Concrete	No	N/A	0.13	Circular Crac	N/A		0	N/A	No
	BR-03	50275	1. SE-O 6 Concrete	No	N/A		Good	N/A		0	N/A	No
(BR-03) 50290	BR-03	50210	1. W-Ou 10 Vitrified Clay	No	N/A		Future	N/A		2	N/A	No
	BR-03	50295	2. SE-In 10 Vitrified Clay	No	N/A		Good	N/A		3.5	N/A	No
(BR-03) 50295	BR-03	50301	2. SE-In 10 Vitrified Clay	No	N/A		Circular Crac	N/A		2	N/A	No
	BR-03	50290	1. NW-O 10 Vitrified Clay	No	N/A		Good	N/A		2	N/A	No
(BR-03) 50300	BR-03	50301	1. SW-O 10 Vitrified Clay	No	N/A		Good	N/A		2	N/A	No
	BR-03	50305	2. NE-In 10 Vitrified Clay	No	N/A		Good	N/A		2	N/A	No
(BR-03) 50301	BR-03	50300	2. NE-In 10 Vitrified Clay	No	N/A		Good	N/A		2	N/A	No
	BR-03	50295	1. NW-O 10 Vitrified Clay	No	N/A		Good	N/A		3	N/A	No
(BR-03) 50305	BR-03	50300	1. SW-O 10 Vitrified Clay	No	N/A		Good	N/A		3	N/A	No
	BR-03	50330	2. NW-I 6 Concrete	No	N/A		Good	N/A		1	N/A	No
	BR-03	50310	3. NE-In 10 Vitrified Clay	No	N/A		Good	N/A		3	N/A	No
	BR-03	EOL	4. SE-In 8 Concrete	Yes	N/A		Circular Crac	N/A		0	N/A	No
(BR-03) 50310	BR-03	50515	2. SE-In 10 Vitrified Clay	No	N/A		Good	N/A		2.5	N/A	No
	BR-03	50305	1. SW-O 10 Vitrified Clay	No	N/A		Circular Crac	N/A		3	N/A	No
(BR-03) 50315	BR-03	50265	4. E-In 6 Concrete	No	N/A		Good	N/A		0	N/A	No
	BR-03	SVC	2. NW-I 4 Concrete	No	N/A	0.25	Circular Crac	N/A		0	N/A	No
	BR-03	SVC	3. N-In 4 Concrete	No	N/A	2	Circular Crac	N/A		0	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50315	BR-03	50385	1. SE-O 6 Concrete	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50330	BR-03	50335	2. NE-In 8 Concrete	No	N/A	Good	N/A		1.5		N/A	No
		BR-03 50305	1. SE-O 8 Concrete	No	N/A	Good	N/A		1.5		N/A	No
(BR-03) 50335	BR-03	50330	1. SW-O 8 Concrete	Yes	N/A	Circular Crac	N/A		1.5		N/A	No
(BR-03) 50340	BR-03	50345	2. NE-In 8 PVC	No	N/A	Future	N/A		8		N/A	No
		BR-03 50335	1. SW-O 8 PVC	No	N/A	Future	N/A		1.5		N/A	No
(BR-03) 50345	BR-03	50360	5. E-In 6 Concrete	No	N/A	Good	N/A		3		N/A	No
		BR-03 50340	1. SW-O 8 Concrete	No	N/A	Future	N/A		7		N/A	No
		BR-03 50350	2. W-In 6 Concrete	No	N/A	Good	N/A		2		N/A	No
		BR-03 SVC	4. NE-In 4 PVC	No	N/A	Future	N/A		0		N/A	No
		BR-03 SVC	3. NW-I 4 PVC	No	N/A	Future	N/A		0		N/A	No
(BR-03) 50350	BR-03	50345	1. E-Out 6 Concrete	No	N/A	Good	N/A		0.5		N/A	No
		BR-03 50355	2. NW-I 6 Concrete	No	N/A	Good	N/A		0.25		N/A	No
(BR-03) 50355	BR-03	50350	1. SE-O 6 Concrete	No	N/A	Good	N/A		0		N/A	No
		BR-03 50260	2. NW-I 6 PVC	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50360	BR-03	50365	2. E-In 6 Concrete	No	N/A	Good	N/A		1.25		N/A	No
		BR-03 50345	1. W-Ou 6 Concrete	No	N/A	Good	N/A		1.5		N/A	No
(BR-03) 50365	BR-03	SVC	2. NW-I 4 PVC	No	N/A	Good	N/A		0		N/A	No
		BR-03 50370	3. E-In 6 Concrete	No	N/A	Good	N/A		1		N/A	No
		BR-03 50360	1. W-Ou 6 Concrete	No	N/A	Good	N/A		1.25		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50370	BR-03	50365	1. W-Ou	8	Concrete	Yes	N/A	Circular Crac	N/A	0.5		N/A	No
	BR-03	SVC	3. W-In	4	Concrete	No	N/A	Future	N/A	0		N/A	No
	BR-03	SVC	4. W-In	4	Concrete	No	N/A	Future	N/A	0		N/A	No
	BR-03	50375	2. N-In	8	Concrete	No	N/A	Good	N/A	0.5		N/A	No
(BR-03) 50385	BR-03	50390	1. S-Out	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No
	BR-03	50315	2. NW-I	6	Concrete	No	N/A	Good	N/A	0.5		N/A	No
(BR-03) 50390	BR-03	SVC	3. SE-In	6	Concrete	No	N/A	0.13	Good	N/A	0		No
	BR-03	50391	1. S-Out	8	PVC	No	N/A	Good	N/A	0.25		N/A	No
	BR-03	50385	2. N-In	6	Vitrified Clay	No	N/A	Good	N/A	0.13		N/A	Yes
(BR-03) 50391	BR-03	SVC	2. W-In	6	Cast Iron	No	N/A	Good	N/A	0		N/A	No
	BR-03	50395	1. S-Out	8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	50390	3. N-In	8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	SVC	4. E-In	4	Cast Iron	No	N/A	Good	N/A	0		N/A	No
(BR-03) 50395	BR-03	50400	1. SE-O	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No
	BR-03	50391	2. N-In	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No
(BR-03) 50400	BR-03	50395	3. NW-I	6	Concrete	No	N/A	Good	N/A	0.5		N/A	No
	BR-03	SVC	2. NW-I	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	50405	1. S-Out	6	Concrete	No	N/A	Good	N/A	0.5		N/A	No
	BR-03	SVC	4. NE-In	4	PVC	No	N/A	Future	N/A	0		N/A	No
(BR-03) 50405	BR-03	50400	2. N-In	6	Concrete	No	N/A	Future	N/A	1		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>							
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>	
(BR-03) 50405	BR-03	SVC	3. E-In	4	Concrete	No	N/A	Good	N/A	0		N/A	No	
	BR-03	50140	1. NW-O	6	Concrete	No	N/A	Good	N/A	1		N/A	No	
(BR-03) 50410	BR-03	50405	2. E-In	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No	
	BR-03	50415	1. S-Out	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No	
(BR-03) 50415	BR-03	50425	1. W-Ou	6	Concrete	No	N/A	0.25	Circular Crac	N/A	0.5		N/A	No
	BR-03	50410	2. N-In	6	Concrete	No	N/A	Good	N/A	0.5		N/A	No	
	BR-03	50420	3. E-In	6	Concrete	No	N/A	Good	N/A	0		N/A	Yes	
(BR-03) 50420	BR-03	SVC	3. SE-In	4	Concrete	No	N/A	Good	N/A	0		N/A	No	
	BR-03	SVC	2. N-In	6	Concrete	No	N/A	Good	N/A	0		N/A	No	
	BR-03	50415	1. W-Ou	6	Concrete	No	N/A	Good	N/A	0		N/A	No	
(BR-03) 50425	BR-03	50430	1. S-Out	6	Concrete	No	N/A	Good	N/A	0.13		N/A	No	
	BR-03	50415	2. E-In	6	Concrete	No	N/A	Good	N/A	0.13		N/A	No	
(BR-03) 50430	BR-03	50445	3. E-In	6	Concrete	No	N/A	Circular Crac	N/A	0.25		N/A	No	
	BR-03	50425	2. N-In	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No	
	BR-03	50435	1. W-Ou	6	PVC	No	N/A	Circular Crac	N/A	0.5		N/A	No	
(BR-03) 50435	BR-03	50440	1. W-Ou	8	Concrete	No	N/A	Good	N/A	1		N/A	No	
	BR-03	50430	2. E-In	8	PVC	No	N/A	Good	N/A	1		N/A	No	
(BR-03) 50440	BR-03	50435	3. E-In	6	Concrete	No	N/A	Good	N/A	0.25		N/A	No	
	BR-03	50515A	1. S-Out	8	Concrete	No	N/A	Good	N/A	0.75		N/A	No	
	BR-03	50550	2. N-In	8	Concrete	No	N/A	Circular Crac	N/A	0.25		N/A	No	



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50445	BR-03	50430	1. W-Ou 6 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	50450	2. E-In 6 Concrete	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50450	BR-03	SVC	2. N-In 4 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	50445	1. W-Ou 6 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	3. S-In 4 Concrete	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50455	BR-03	50515	1. N-Out 10 Concrete	No	N/A	Circular Crac	N/A		3		N/A	No
	BR-03	50460	2. E-In 10 Concrete	No	N/A	Circular Crac	N/A		2		N/A	No
(BR-03) 50460	BR-03	50465	2. E-In 10 Concrete	No	N/A	Good	N/A		1.5		N/A	No
	BR-03	50455	1. W-Ou 10 Concrete	No	N/A	Good	N/A		2		N/A	No
(BR-03) 50465	BR-03	50475	3. E-In 8 Concrete	No	N/A	Circular Crac	N/A		0		N/A	No
	BR-03	50460	1. W-Ou 8 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	50470	2. N-In 8 Concrete	No	N/A	Circular Crac	N/A		0		N/A	Yes
(BR-03) 50470	BR-03	SVC	1. S-Out 8 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	2. NW-I 4 PVC	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	3. NE-In 4 Concrete	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50475	BR-03	50480	2. N-In 6 Concrete	No	N/A	Good	N/A		0		N/A	Yes
	BR-03	50465	1. NW-O 10 Concrete	No	N/A	Good	N/A		1		N/A	No
	BR-03	50485	3. E-In 10 Concrete	No	N/A	Good	N/A		2		N/A	No
(BR-03) 50480	BR-03	50475	1. SW-O 6 Concrete	No	N/A	Good	N/A		0		N/A	No
(BR-03) 50485	BR-03	50475	1. W-Ou 10 Concrete	No	N/A	Circular Crac	N/A		1.5		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50485	BR-03	50490	2. E-In 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
	BR-03	50505	3. S-In 10	Concrete	No	N/A	Good	N/A	1		N/A	No
(BR-03) 50490	BR-03	50485	1. W-Ou 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
	BR-03	50495	2. E-In 6	Concrete	Yes	N/A	Circular Crac	N/A	0.13		N/A	No
(BR-03) 50495	BR-03	50500	2. N-In 6	Concrete	Yes	N/A	Circular Crac	N/A	0		N/A	No
	BR-03	SVC	3. S-In 4	Concrete	No	N/A	Good	N/A	0		N/A	No
	BR-03	50490	1. W-Ou 6	Concrete	No	N/A	Circular Crac	N/A	0		N/A	No
(BR-03) 50500	BR-03	50495	1. S-Out 6	Concrete	No	N/A	Circular Crac	N/A	0		N/A	No
(BR-03) 50505	BR-03	50485	1. N-Out 10	Concrete	No	N/A	Future	N/A	1		N/A	No
	BR-03	50510	2. E-In 10	Concrete	No	N/A	Good	N/A	1		N/A	No
(BR-03) 50510	BR-03	50525	2. E-In 10	Concrete	No	N/A	Good	N/A	0.5		N/A	No
	BR-03	50505	1. W-Ou 10	Concrete	No	N/A	Good	N/A	0.5		N/A	No
(BR-03) 50515	BR-03	50310	1. NW-O 10	Vitrified Clay	No	N/A	Good	N/A	4		N/A	No
	BR-03	50515A	2. N-In 8	Concrete	No	N/A	Future	N/A	2		N/A	No
	BR-03	50455	3. S-In 10	Concrete	No	N/A	Circular Crac	N/A	2		N/A	No
(BR-03) 50515A	BR-03	50515	1. S-Out 8	PVC	No	N/A	Circular Crac	N/A	2		N/A	No
	BR-03	50440	3. N-In 8	Concrete	No	N/A	Circular Crac	N/A	1		N/A	No
	BR-03	50515B	2. NW-I 8	PVC	No	N/A	Good	N/A	2		N/A	No
(BR-03) 50515B	BR-03	50515C	3. N-In 8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-03	50515A	1. SE-O 8	PVC	No	N/A	Good	N/A	0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>				<i>Deposition</i>				<i>Observed</i>			
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-03) 50515B	BR-03	SVC	2. W-In 4	PVC	No	N/A	Good	N/A		0	N/A	No
(BR-03) 50515C	BR-03	SVC	3. NW-I 4	PVC	No	N/A	0.13 Future	N/A		0	N/A	No
	BR-03	SVC	2. W-In 4	PVC	No	N/A	Circular Crac	N/A		0	N/A	No
	BR-03	50515B	1. S-Out 8	PVC	No	N/A	Good	N/A		0	N/A	No
	BR-03	50515D	4. N-In 8	PVC	No	N/A	Good	N/A		0	N/A	No
(BR-03) 50515D	BR-03	SVC	2. NW-I 4	PVC	No	N/A	Circular Crac	N/A		0	N/A	No
	BR-03	50515C	1. S-Out 8	PVC	No	N/A	Good	N/A		0	N/A	No
	BR-03	SVC	3. E-In 4	PVC	No	N/A	Good	N/A		0	N/A	No
(BR-03) 50525	BR-03	50510	1. W-Ou 10	Concrete	No	N/A	Good	N/A		2	N/A	No
	BR-03	50570	2. N-In 6	Concrete	No	N/A	Good	N/A		0	N/A	Yes
	BR-03	50585	3. NE-In 10	Concrete	No	N/A	Good	N/A		1	N/A	No
(BR-03) 50530	BR-03	SVC	3. N-In 6	Concrete	No	N/A	Circular Crac	N/A		1	N/A	No
	BR-03	SVC	2. W-In 8	N/A	No	N/A	Future	N/A		0	N/A	No
	BR-03	50535	1. S-Out 6	Concrete	No	N/A	Circular Crac	N/A		2	N/A	No
	BR-03	SVC	5. SE-In 4	PVC	No	N/A	Good	N/A		0	N/A	No
	BR-03	SVC	4. E-In 6	Concrete	No	N/A	Good	N/A		1	N/A	No
(BR-03) 50535	BR-03	50530	2. N-In 8	Concrete	No	N/A	Good	N/A		1.5	N/A	No
	BR-03	50555	1. W-In 8	Concrete	No	N/A	Good	N/A		2	N/A	No
(BR-03) 50540	BR-03	50545	2. W-In 6	Concrete	No	N/A	Good	N/A		0.5	N/A	No
	BR-03	50550	1. SW-O 8	Concrete	No	N/A	Good	N/A		1	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50540	BR-03	50555	3. E-In 6 Concrete	No	N/A	Good	N/A		0.5		N/A	No
(BR-03) 50545	BR-03	SVC	2. N-In 4 Concrete	No	N/A	Good	N/A		0		N/A	No
		BR-03 50540	1. E-Out 8 Concrete	No	N/A	Future	N/A		0		N/A	No
(BR-03) 50550	BR-03	50440	1. S-Out 8 Concrete	No	N/A	Good	N/A		1		N/A	No
		BR-03 50560	3. E-In 6 Concrete	No	N/A	Future	N/A		0		N/A	No
		BR-03 50540	2. NE-In 6 Concrete	No	N/A	Good	N/A		0.5		N/A	No
(BR-03) 50555	BR-03	50535	2. E-In 8 Concrete	No	N/A	Circular Crac	N/A		0.5		N/A	No
		BR-03 50540	1. W-Ou 8 Concrete	No	N/A	Good	N/A		0.5		N/A	No
(BR-03) 50560	BR-03	50565	2. W-In 6 Concrete	No	N/A	Good	N/A		0.13		N/A	No
		BR-03 50550	1. W-Ou 6 PVC	No	N/A	Good	N/A		0.13		N/A	No
(BR-03) 50575	BR-03	50570	1. E-Out 6 Concrete	No	N/A	Good	N/A		0.25		N/A	No
		BR-03 50580	2. NE-In 6 Concrete	No	N/A	Circular Crac	N/A		0.25		N/A	No
(BR-03) 50580	BR-03	50580A	2. NE-In 6 Concrete	No	N/A	Circular Crac	N/A		0.13		N/A	No
		BR-03 50575	1. SW-O 6 Concrete	No	N/A	Good	N/A		0.25		N/A	No
(BR-03) 50585	BR-03	50595	3. NE-In 10 Concrete	No	N/A	Good	N/A		2		N/A	No
		BR-03 50590	2. N-In 8 Cast Iron	No	N/A	Good	N/A		0		N/A	Yes
		BR-03 50525	1. SE-O 10 Concrete	No	N/A	Good	N/A		2		N/A	No
(BR-03) 50590	BR-03	50585	1. S-Out 6 PVC	No	N/A	Good	N/A		0		N/A	No
		BR-03 SVC	2. NW-I 4 Concrete	No	N/A	Future	N/A		0		N/A	No
(BR-03) 50595	BR-03	SVC	2. SW-In 4 PVC	No	N/A	Future	N/A		0		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>					
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50595	BR-03 SVC	3. SW-In	4	PVC	No	N/A		Future	N/A		0		N/A	No
	BR-03 50585	1. SW-O	10	Concrete	No	N/A		Good	N/A		5		N/A	No
	BR-03 50600	4. NE-In	10	Concrete	No	N/A		Good	N/A		6		N/A	No
(BR-03) 50600	BR-03 50600A	3. NE-In	8	PVC	No	N/A		Good	N/A		0		N/A	No
	BR-03 50605	2. NE-In	10	Concrete	Yes	N/A		Circular Crac	N/A		2		N/A	No
	BR-03 50595	1. SW-O	10	Concrete	Yes	N/A	0.25	Circular Crac	N/A		2		N/A	No
(BR-03) 50605	BR-03 50600	1. SW-O	10	Concrete	No	N/A	0.13	Circular Crac	N/A		2		N/A	No
	BR-03 50615	2. W-In	8	Concrete	No	N/A		Good	N/A		0.5		N/A	No
	BR-03 50610	3. N-In	6	Concrete	No	N/A		Good	N/A		0.5		N/A	Yes
(BR-03) 50610	BR-03 50640	2. N-In	8	Concrete	No	N/A		Good	N/A		4		N/A	No
	BR-03 50605	1. S-Out	8	N/A	No	N/A		Future	N/A		7		N/A	No
	BR-03 50635	3. SE-In	6	N/A	No	N/A		Future	N/A		6		N/A	No
(BR-03) 50615	BR-03 50620	2. W-In	8	Concrete	No	N/A		Circular Crac	N/A		0.13		N/A	No
	BR-03 50605	1. E-Out	8	Concrete	No	N/A		Good	N/A		0.13		N/A	No
(BR-03) 50620	BR-03 50615	1. E-Out	6	Concrete	No	N/A		Good	N/A		0.25		N/A	No
	BR-03 50625	2. W-In	6	Concrete	Yes	N/A		Circular Crac	N/A		0.25		N/A	No
(BR-03) 50625	BR-03 50620	1. E-Out	6	Concrete	No	N/A		Good	N/A		0.13		N/A	No
	BR-03 50630	2. NW-I	6	Concrete	No	N/A		Good	N/A		0.13		N/A	No
(BR-03) 50635	BR-03 50610	1. NW-O	6	Concrete	No	N/A		Good	N/A		0		N/A	No
	BR-03 SVC	2. SE-In	4	Concrete	No	N/A		Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50640	BR-03	50665	3. N-In 6 PVC	No	N/A	Good	N/A		0.5		N/A	No
	BR-03	50645	2. W-In 8 PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03	50610	1. S-Out 10 Concrete	No	N/A	Good	N/A		1		N/A	No
(BR-03) 50645	BR-03	50650	2. W-In 6 Concrete	No	N/A	Good	N/A		2		N/A	No
	BR-03	50640	1. E-Out 8 PVC	No	N/A	Good	N/A		0.13		N/A	No
(BR-03) 50650	BR-03	50655	2. W-In 6 Concrete	No	N/A	Circular Crac	N/A		0.13		N/A	No
	BR-03	50645	1. E-Out 6 Concrete	No	N/A	Good	N/A		0.13		N/A	No
(BR-03) 50655	BR-03	50660	2. W-In 6 Concrete	No	N/A	Circular Crac	N/A		0.25		N/A	No
	BR-03	50650	1. E-Out 6 Concrete	No	N/A	Good	N/A		0.25		N/A	No
(BR-03) 50660	BR-03	SVC	4. N-In 4 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	2. S-In 4 Concrete	No	N/A	Good	N/A		0		N/A	No
	BR-03	SVC	3. W-In 4 N/A	No	N/A	Future	N/A		0		N/A	No
	BR-03	50655	1. E-Out 6 Concrete	No	N/A	Future	N/A		0		N/A	No
(BR-03) 50665	BR-03	50705	4. E-In 8 PVC	No	N/A	Good	N/A		0.13		N/A	No
	BR-03	SVC	3. N-In 4 Concrete	No	N/A	Good	N/A		0.13		N/A	No
	BR-03	50671	2. W-In 6 PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-03	50640	1. S-Out 6 PVC	No	N/A	Good	N/A		1		N/A	No
(BR-03) 50670	BR-03	50671	1. E-Out 6 Concrete	No	N/A	Good	N/A		0.5		N/A	No
	BR-03	50675	2. W-In 6 Concrete	No	N/A	Future	N/A		0.13		N/A	No
(BR-03) 50671	BR-03	50670	2. W-In 6 Concrete	No	N/A	Good	N/A		3		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-03) 50671	BR-03	50665	1. E-Out 6	PVC	No	N/A	Good	N/A	1		N/A	No
(BR-03) 50675	BR-03	50680	2. W-In 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
		BR-03 50670	1. E-Out 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
(BR-03) 50680	BR-03	50675	1. E-Out 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
		BR-03 50690	2. W-In 6	Concrete	No	N/A	Good	N/A	0.25		N/A	No
		BR-03 50685	3. N-In 6	Concrete	No	N/A	Good	N/A	0		N/A	Yes
(BR-03) 50685	BR-03	50680	1. S-Out 6	Concrete	No	N/A	Circular Crac	N/A	0		N/A	No
		BR-03 SVC	3. NE-In 6	Concrete	No	N/A	Good	N/A	0		N/A	No
		BR-03 SVC	2. NW-I 4	Cast Iron	No	N/A	Good	N/A	0		N/A	No
(BR-03) 50690	BR-03	50695	2. NW-I 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
		BR-03 50680	1. E-Out 6	Concrete	No	N/A	Good	N/A	0.13		N/A	No
(BR-03) 50695	BR-03	50700	2. NW-I 6	PVC	No	N/A	Good	N/A	0.5		N/A	No
		BR-03 50690	1. SW-O 6	PVC	No	N/A	Good	N/A	1		N/A	No
(BR-03) 50700	BR-03	50695	1. SE-O 6	PVC	No	N/A	Good	N/A	0.13		N/A	No
		BR-03 SVC	2. NW-I 4	PVC	No	N/A	Good	N/A	0		N/A	No
		BR-03 SVC	3. SE-In 6	PVC	No	N/A	Good	N/A	0.13		N/A	No
(BR-03) 50705	BR-03	SVC	4. E-In 4	Concrete	No	N/A	Good	N/A	2.5		N/A	No
		BR-03 SVC	2. NW-I 4	PVC	No	N/A	Good	N/A	0.13		N/A	No
		BR-03 50710	3. N-In 8	PVC	No	N/A	Good	N/A	0.13		N/A	No
		BR-03 50665	1. W-Ou 8	Concrete	No	N/A	Future	N/A	0.25		N/A	No



<u>Line Segment</u>	<u>-----PIPE-----</u>				<u>Deposition</u>				<u>Observed</u>						
	<u>Dir.</u>	<u>In</u>	<u>Construction</u>	<u>Root Growth</u>	<u>Type</u>	<u>Depth In</u>	<u>Structural Condition</u>	<u>Line Grade</u>	<u>Visual Infiltr</u>	<u>Depth In</u>	<u>Velocity FPS</u>	<u>Cleaning Method</u>	<u>Drop Conn.</u>		
(BR-03) 50710	BR-03	50715	2. SE-In 8	PVC	No	N/A	Good	N/A		0.13		N/A	No		
	BR-03	50705	1. S-Out 8	PVC	No	N/A	Good	N/A		0.13		N/A	No		
(BR-03) 50715	BR-03	SVC	4. SE-In 2	PVC	No	N/A	Good	N/A		0		N/A	No		
	BR-03	50720	3. NE-In 6	N/A	No	N/A	Future	N/A		5.5		N/A	No		
	BR-03	SVC	5. S-In 4	PVC	No	N/A	Good	N/A		0		N/A	No		
	BR-03	SVC	2. E-In 4	PVC	No	N/A	Good	N/A		0		N/A	No		
	BR-03	50710	1. NW-O 6	PVC	No	N/A	Good	N/A		0		N/A	No		
				<u>Structural Condition</u>				<u>Total Length to Clean</u>							
Total Segments	404	Good	298	Long Crack	1	Collapsed	1	Flush	0	Jet	0	Bucket	0	Root Control	0
Total Footage		Broken	0	Circular Crack	60		N/A								
(BR-06) 60005	BR-06	60000	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No		
	BR-06	60010	2. W-In 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No		
(BR-06) 60010	BR-06	60005	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No		
	BR-06	60015	2. W-In 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No		
(BR-06) 60015	BR-06	60020	2. S-In 8	PVC	No	N/A	1	Good	N/A	0	3	N/A	No		
	BR-06	60025	3. W-In 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No		
	BR-06	60010	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No		
(BR-06) 60020	BR-06	60105	2. S-In 8	PVC	No	N/A		Good	N/A		0	N/A	No		
	BR-06	60015	1. N-Out 8	PVC	No	N/A		Good	N/A		0	N/A	No		
	BR-06	SVC	4. NW-I 4	PVC	No	N/A		Good	N/A		0	N/A	No		
	BR-06	SVC	3. SW-In 4	PVC	No	N/A		Good	N/A		0	N/A	No		



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60025	BR-06	60015	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
	BR-06	60030	2. SW-In 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
(BR-06) 60030	BR-06	60040	3. W-In 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
	BR-06	60025	1. NE-O 18	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
	BR-06	60035	2. S-In 8	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
(BR-06) 60035	BR-06	SVC	2. SE-In 4	PVC	No	N/A	0	Good	N/A	0	0.25	N/A	No
	BR-06	60030	1. N-Out 8	PVC	No	N/A	0	Good	N/A	0	1.5	N/A	No
	BR-06	60050	4. SW-In 8	PVC	No	N/A	0	Good	N/A	0	0.25	N/A	No
	BR-06	60045	3. S-In 8	PVC	No	N/A	0	Good	N/A	0	0.5	N/A	No
(BR-06) 60040	BR-06	60030	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	60055	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60045	BR-06	60035	1. N-Out 8	PVC	No	N/A	0	Good	N/A	0	1.5	N/A	No
	BR-06	60110	4. SW-In 8	PVC	No	N/A	0	Good	N/A	0	1.5	N/A	No
	BR-06	SVC	3. SE-In 4	PVC	No	N/A	0	Good	N/A	0	0.13	N/A	No
	BR-06	SVC	5. W-In 4	PVC	No	N/A	0	Good	N/A	0	0	N/A	No
	BR-06	SVC	2. E-In 4	PVC	No	N/A	0	Good	N/A	0	0	N/A	No
(BR-06) 60050	BR-06	60051	2. SW-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	60035	1. NE-O 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
(BR-06) 60051	BR-06	60050	1. NE-O 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	60160	2. SW-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>							
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>	
(BR-06) 60051	BR-06	60185	3. NW-I 8	PVC	No	N/A	Good	N/A		0.25		N/A	No	
(BR-06) 60055	BR-06	60060	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No	
		BR-06	60040	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60060	BR-06	60065	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No	
		BR-06	60055	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60065	BR-06	60060	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No	
		BR-06	60070	2. S-In 8	PVC	No	N/A	0	Good	N/A	0	0.25	N/A	No
		BR-06	60075	3. W-In 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60070	BR-06	60065	1. N-Out 8	PVC	No	N/A		Good	N/A		0.25	N/A	No	
		BR-06	60175	4. S-In 8	PVC	No	N/A		Good	N/A		0.5	N/A	No
		BR-06	SVC	3. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
		BR-06	SVC	2. NE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-06) 60075	BR-06	60065	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No	
		BR-06	60080	3. W-In 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
		BR-06	60075A	2. SW-In 8	PVC	No	N/A	0	Good	N/A	0	0.5	N/A	No
(BR-06) 60075A	BR-06	SVC	4. W-In 4	PVC	No	N/A	0.25	Future	N/A		0	N/A	No	
		BR-06	SVC	2. SE-In 6	PVC	No	N/A		Good	N/A		0	N/A	No
		BR-06	60075	1. NE-O 8	PVC	No	N/A		Good	N/A		1	N/A	No
		BR-06	SVC	3. SW-In 8	PVC	No	N/A		Good	N/A		1.5	N/A	No
(BR-06) 60080	BR-06	60075	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No	



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60080	BR-06	60085	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60085	BR-06	60080	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	60090	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60090	BR-06	60095	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	60085	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60095	BR-06	60090	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	SVC	2. W-In 4	PVC	No	N/A	0	Good	N/A	0	0	N/A	No
	BR-06	60100	3. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60100	BR-06	60220	2. W-In 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
	BR-06	60095	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
(BR-06) 60105	BR-06	SVC	3. NW-I 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60020	1. N-Out 8	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	SVC	2. SW-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-06) 60110	BR-06	60045	1. NE-O 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	60115	2. SE-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	SVC	3. SW-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-06) 60115	BR-06	60120	3. SE-In 8	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60125	5. SW-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	SVC	4. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	SVC	2. NE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>				
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 60115	BR-06	60110	1. NW-O 8 PVC	No	N/A	Good	N/A	0.25		N/A	No
(BR-06) 60120	BR-06	60130	3. SE-In 8 PVC	No	N/A	Good	N/A	0.25		N/A	Yes
	BR-06	SVC	2. NE-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	60115	1. NW-O 8 PVC	No	N/A	Good	N/A	0.25		N/A	No
(BR-06) 60125	BR-06	60115	1. NE-O 8 PVC	No	N/A	Good	N/A	0.25		N/A	No
	BR-06	60135	2. E-In 8 PVC	No	N/A	Good	N/A	0.25		N/A	No
	BR-06	SVC	3. SW-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	60140	4. W-In 8 Cast Iron	No	N/A	Good	N/A	0.25		N/A	No
(BR-06) 60130	BR-06	60120	1. NW-O 8 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	2. NE-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	3. SE-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) 60135	BR-06	SVC	2. NE-In 0 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	4. SE-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	3. SE-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	60125	1. W-Ou 8 PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) 60140	BR-06	SVC	2. SW-In 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	60125	1. E-Out 8 Cast Iron	No	N/A	Good	N/A	0.25		N/A	No
	BR-06	SVC	4. NW-I 4 PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	60145	3. W-In 8 PVC	No	N/A	Good	N/A	0.25		N/A	No
(BR-06) 60145	BR-06	SVC	3. NW-I 4 PVC	No	N/A	Good	N/A	0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60145	BR-06	60150	2. W-In 8	PVC	No	N/A	Good	N/A		0.75		N/A	No
	BR-06	60140	1. E-Out 8	PVC	No	N/A	Good	N/A		0.5		N/A	No
(BR-06) 60150	BR-06	60155	2. W-In 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60145	1. E-Out 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 60155	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60150	1. E-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60160	BR-06	60051	1. NE-O 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60185	2. W-In 8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60165	BR-06	60160	1. E-Out 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06	SVC	4. NW-I 4	Vitrified Clay	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60170	3. W-In 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 60170	BR-06	SVC	2. SW-In 4	Vitrified Clay	No	N/A	Good	N/A		0		N/A	No
	BR-06	60165	1. E-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60175	BR-06	60070	1. N-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60180	2. S-In 8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60180	BR-06	60175	1. N-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 60180	BR-06 SVC	2. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60185	BR-06 SVC	3. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60190	2. NW-I	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 60051	1. SE-O	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 60190	BR-06 SVC	2. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60185	1. SE-O	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 60195	3. NW-I	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 60195	BR-06 SVC	4. NW-I	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60205	3. NW-I	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 60200	2. SW-In	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 SVC	5. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60190	1. SE-O	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 60200	BR-06 60195	1. NE-O	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60215	3. W-In	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	2. S-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60205	BR-06 SVC	4. N-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60210	3. W-In	8	PVC	No	N/A	Good	N/A		0.15		N/A	No
	BR-06 SVC	2. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60195	1. SE-O	8	PVC	No	N/A	Good	N/A		0.12		N/A	No
	BR-06 SVC	5. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60210	BR-06	60205	1. E-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	4. NE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60215	BR-06	60200	1. E-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60220	BR-06	60100	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
	BR-06	60225	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
(BR-06) 60225	BR-06	60235	3. SW-In 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
	BR-06	60220	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	SVC	2. SW-In 8	PVC	No	N/A	0	Good	N/A	0	0.13	N/A	No
(BR-06) 60230	BR-06	60935	2. SE-In 8	PVC	No	N/A	0	Good	N/A	0	0.25	N/A	No
	BR-06	61075	3. SW-In 8	PVC	No	N/A	0	Good	N/A	0	1.5	N/A	No
	BR-06	SVC	4. NW-I 8	PVC	No	N/A	1	Good	N/A	0	0	N/A	No
	BR-06	60225	1. NE-O 8	PVC	No	N/A	0	Good	N/A	0	1	N/A	No
(BR-06) 60235	BR-06	60225	1. NE-O 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
	BR-06	60240	2. NW-I 18	PVC	No	N/A	0	Good	N/A	0	2	N/A	No
(BR-06) 60240	BR-06	60245	2. W-In 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	60235	1. SE-O 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60245	BR-06	60240	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60245	BR-06	60250	2. W-In 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
(BR-06) 60250	BR-06	60245	1. E-Out 18	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	60255	2. SW-In 12	PVC	No	N/A	0	Good	N/A	0	3.5	N/A	No
	BR-06	60265	3. NW-I 15	PVC	No	N/A	0	Good	N/A	0	3.5	N/A	No
(BR-06) 60255	BR-06	60960	2. SW-In 12	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
	BR-06	60250	1. NE-O 0	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
(BR-06) 60935	BR-06	SVC	3. SW-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60230	1. NW-O 8	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60940	2. S-In 8	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	SVC	4. NW-I 4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-06) 60940	BR-06	60935	1. N-Out 8	PVC	No	N/A		Good	N/A		0.2	N/A	No
	BR-06	60945	2. S-In 8	PVC	No	N/A		Good	N/A		0.2	N/A	No
(BR-06) 60945	BR-06	SVC	2. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60940	1. N-Out 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	SVC	4. SW-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60950	5. W-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	SVC	3. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-06) 60950	BR-06	60955	2. W-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	SVC	3. N-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60945	1. E-Out 8	PVC	No	N/A		Good	N/A		0.25	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60955	BR-06	SVC	3. NE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	2. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60950	1. E-Out 8	PVC	No	N/A	Good	N/A		0.18		N/A	No
(BR-06) 60960	BR-06	60255	1. NE-O 12	PVC	No	N/A	0	Good	N/A	0	3	N/A	No
	BR-06	60965	4. W-In 12	PVC	No	N/A	0	Good	N/A	0	2.5	N/A	No
	BR-06	60960A	2. NE-In 8	PVC	No	N/A	0	Good	N/A	0	0.13	N/A	No
	BR-06	60960C	3. S-In 8	PVC	No	N/A	0	Good	N/A	0	1	N/A	No
(BR-06) 60960A	BR-06	SVC	4. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60960B	3. E-In 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
	BR-06	SVC	2. NE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60960	1. SW-O 8	PVC	No	N/A		Good	N/A		0.25	N/A	No
(BR-06) 60960B	BR-06	SVC	5. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	SVC	4. SE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	SVC	3. E-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60960A	1. W-Ou 8	PVC	No	N/A		Good	N/A		0.1	N/A	No
	BR-06	SVC	2. NE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
(BR-06) 60960C	BR-06	SVC	2. NE-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	SVC	6. W-In 4	PVC	No	N/A		Future	N/A		0	N/A	No
	BR-06	SVC	5. W-In 4	PVC	No	N/A		Good	N/A		0	N/A	No
	BR-06	60960E	4. S-In 8	PVC	No	N/A		Good	N/A		0	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 60960C	BR-06	60960	1. N-Out	8	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	60960D	3. E-In	6	PVC	No	N/A	Good	N/A	0	N/A	No
(BR-06) 60960D	BR-06	SVC	5. SE-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	4. SE-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	3. E-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	2. NE-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	60960C	1. W-Ou	8	PVC	No	N/A	Good	N/A	0	N/A	No
(BR-06) 60960E	BR-06	60960F	2. E-In	8	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	60960C	1. N-Out	8	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	5. SW-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	3. S-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	4. SW-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
(BR-06) 60960F	BR-06	SVC	2. N-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	3. NE-In	4	PVC	Yes	N/A	Circular Crac	N/A	0	N/A	No
	BR-06	SVC	4. S-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	60960E	1. W-Ou	8	PVC	No	N/A	Good	N/A	0	N/A	No
(BR-06) 60965	BR-06	60965A	5. NW-I	8	PVC	No	N/A	Good	N/A	0.25	N/A	No
	BR-06	60965C	4. NW-I	12	PVC	No	N/A	Good	N/A	1.25	N/A	No
	BR-06	SVC	3. SW-In	4	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	SVC	2. SE-In	4	PVC	No	N/A	Good	N/A	0	N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60965	BR-06	60960	1. SE-O 12	PVC	No	N/A	Good	N/A		1.25		N/A	No
(BR-06) 60965A	BR-06	60965B	2. N-In 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. E-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965	1. SE-O 8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965B	BR-06	60965A	1. S-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	2. NE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965C	BR-06	60965	1. E-Out 12	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-06	60970	4. W-In 12	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-06	SVC	3. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965D	5. N-In 8	Cast Iron	No	N/A	Good	N/A		0.25		N/A	No
	BR-06	SVC	2. SE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965D	BR-06	60965L	1. S-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965E	5. E-In 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	4. N-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965H	2. W-In 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965E	BR-06	60965F	2. N-In 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965D	1. W-Ou 8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965F	BR-06	SVC	2. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. NE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>						
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) 60965F	BR-06	60965E	1. S-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965G	BR-06	60965H	1. N-Out 8	PVC	No	N/A	Good	N/A		0.15		N/A	No
	BR-06	SVC	2. NE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60965H	BR-06	60965D	1. E-Out 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06	60965G	2. S-In 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06	SVC	3. W-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965I	4. N-In 8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 60965I	BR-06	SVC	5. NE-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	4. N-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60965H	1. S-Out 8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	2. W-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 60970	BR-06	60965C	1. SE-O 12	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	SVC	3. SW-In 4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06	60975	4. NW-I 12	PVC	No	N/A	Good	N/A		1.5		N/A	No
(BR-06) 60975	BR-06	60970	1. SE-O 12	PVC	No	N/A	Good	N/A		1.25		N/A	No
	BR-06	60980	2. NW-I 12	PVC	No	N/A	Good	N/A		1.25		N/A	No
(BR-06) 60980	BR-06	60985	2. NW-I 12	PVC	No	N/A	Good	N/A		1.25		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>			
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 60980	BR-06	60975	1. SE-O 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
(BR-06) 60985	BR-06	60980	1. SE-O 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
	BR-06	60990	2. SW-In 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
(BR-06) 60990	BR-06	60985	1. NE-O 12	PVC	No	N/A	Good	N/A	1.5	N/A	No
	BR-06	60995	2. NW-I 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
(BR-06) 60995	BR-06	60990	1. SE-O 12	PVC	No	N/A	Good	N/A	1.5	N/A	No
	BR-06	61000	2. NW-I 12	PVC	No	N/A	Good	N/A	1.5	N/A	No
(BR-06) 61000	BR-06	60995	1. E-Out 12	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	61005	2. W-In 12	PVC	No	N/A	Good	N/A	0	N/A	No
(BR-06) 61005	BR-06	6100	1. SE-O 12	PVC	No	N/A	Good	N/A	1.5	N/A	No
	BR-06	61010	2. NW-I 12	PVC	No	N/A	Good	N/A	1.5	N/A	No
(BR-06) 61010	BR-06	61015	2. NW-I 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
	BR-06	61005	1. SE-O 12	PVC	No	N/A	Good	N/A	1.5	N/A	No
(BR-06) 61015	BR-06	61010	1. SE-O 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
	BR-06	61020	2. W-In 12	PVC	No	N/A	Good	N/A	1.25	N/A	No
(BR-06) 61020	BR-06	61015	1. E-Out 12	PVC	No	N/A	Good	N/A	0	N/A	No
	BR-06	61025	2. N-In 12	PVC	No	N/A	Good	N/A	0	N/A	No
(BR-06) 61025	BR-06	PLUGGED	2. SW-In 4	N/A	No	N/A	Future	N/A	0	N/A	Yes
	BR-06	61030	3. W-In 8	PVC	No	N/A	Future	N/A	1.75	N/A	No
	BR-06	SVC	4. NW-I 8	PVC	No	N/A	Good	N/A	0.03	N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>		<i>Construction</i>	<i>Root Growth</i>	<i>Deposition</i>			<i>Observed</i>			
		<i>Dir.</i>	<i>In</i>			<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 61025	BR-06 PLUGGED	5. NE-In	8	PVC	No	N/A	Future	N/A	0		N/A	Yes
	BR-06 61020	1. SE-O	12	PVC	No	N/A	Good	N/A	2.5		N/A	No
(BR-06) 61025A	BR-06 61025	1. SW-O	8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06 SVC	2. NW-I	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06 SVC	3. E-In	4	PVC	No	N/A	Future	N/A	0		N/A	No
(BR-06) 61030	BR-06 61035	2. W-In	8	PVC	No	N/A	Good	N/A	1.75		N/A	No
	BR-06 61030A	3. N-In	8	PVC	No	N/A	Good	N/A	1.25		N/A	No
	BR-06 61025	1. E-Out	8	PVC	No	N/A	Good	N/A	2		N/A	No
(BR-06) 61030B	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A	2		N/A	No
	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A	2		N/A	No
	BR-06 61030C	4. W-In	8	PVC	No	N/A	Good	N/A	2		N/A	No
	BR-06 61030A	1. E-Out	8	PVC	No	N/A	Good	N/A	2		N/A	No
(BR-06) 61030C	BR-06 61030B	1. E-Out	8	PVC	No	N/A	Good	N/A	2		N/A	No
	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06 61030D	4. W-In	8	PVC	No	N/A	Good	N/A	2		N/A	No
(BR-06) 61030D	BR-06 61030C	1. E-Out	8	PVC	No	N/A	Good	N/A	2		N/A	No
	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06 EOL	4. NW-I	8	PVC	No	N/A	Future	N/A	0		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>				
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 61030E	BR-06 SVC	4. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61030A	1. W-Ou	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	3. E-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	2. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61035	BR-06 61030	1. E-Out	8	PVC	No	N/A	Good	N/A		2		N/A	No
	BR-06 61040	2. W-In	8	PVC	No	N/A	Good	N/A		2		N/A	No
(BR-06) 61040	BR-06 61035	1. E-Out	8	PVC	No	N/A	Good	N/A		1.75		N/A	No
	BR-06 61090	2. W-In	8	PVC	No	N/A	Good	N/A		1.5		N/A	No
(BR-06) 61075	BR-06 SVC	4. W-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 60230	1. NE-O	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61080	2. S-In	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 61080	BR-06 61085	4. S-In	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 SVC	3. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61075	1. N-Out	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 SVC	2. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61085	BR-06 61080	1. N-Out	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61090	BR-06 61100	5. NW-I	8	PVC	No	N/A	Good	N/A		2		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>				
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 61090	BR-06 SVC	2. S-In	8	PVC	No	N/A	Good	N/A		0.08		N/A	No
	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-06 SVC	4. W-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61040	1. E-Out	8	PVC	No	N/A	Good	N/A		2		N/A	No
(BR-06) 61100	BR-06 SVC	3. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61105	2. W-In	8	PVC	No	N/A	Good	N/A		1		N/A	No
	BR-06 61090	1. SE-O	8	PVC	No	N/A	Good	N/A		1.25		N/A	No
(BR-06) 61105	BR-06 61110	2. S-In	8	PVC	No	N/A	Good	N/A		2.75		N/A	No
	BR-06 61100	1. E-Out	8	PVC	No	N/A	Good	N/A		3		N/A	No
	BR-06 SVC	4. NW-I	4	PVC	No	N/A	Good	N/A		1		N/A	No
	BR-06 61115	3. W-In	8	PVC	No	N/A	Good	N/A		2.5		N/A	No
(BR-06) 61110	BR-06 6110A	3. S-In	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61105	1. N-Out	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	4. W-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61110A	BR-06 61110	1. N-Out	8	PVC	No	N/A	Good	N/A		1.75		N/A	No
	BR-06 61110C	3. S-In	8	PVC	No	N/A	Good	N/A		1.5		N/A	No
	BR-06 61110B	2. E-In	8	PVC	No	N/A	Good	N/A		2		N/A	No
(BR-06) 61110B	BR-06 SVC	4. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	2. NW-I	4	PVC	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>				
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 61110B	BR-06 SVC	3. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 SVC	5. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61110A	1. W-Ou	8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61110C	BR-06 61110D	2. E-In	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61110E	3. S-In	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61110A	1. N-Out	8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61110D	BR-06 EOL	2. E-In	8	PVC	No	N/A	Future	N/A		0		N/A	No
	BR-06 61110C	1. W-Ou	8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61110E	BR-06 61110C	1. N-Out	8	PVC	No	N/A	Good	N/A		1		N/A	No
	BR-06 61110G	3. S-In	8	PVC	No	N/A	Good	N/A		1		N/A	No
	BR-06 61110F	2. E-In	8	PVC	No	N/A	Good	N/A		1		N/A	No
(BR-06) 61110F	BR-06 EOL	3. SE-In	6	PVC	No	N/A	Future	N/A		0		N/A	No
	BR-06 61110E	1. W-Ou	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 EOL	2. E-In	8	PVC	No	N/A	Future	N/A		0		N/A	No
(BR-06) 61110G	BR-06 SVC	4. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61110H	2. NE-In	8	PVC	No	N/A	Good	N/A		0.18		N/A	No
	BR-06 61110E	1. N-Out	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 SVC	3. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61110H	BR-06 61110G	1. SW-O	8	PVC	No	N/A	Future	N/A		0		N/A	No
	BR-06 SVC	2. NE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>		<i>-----PIPE-----</i>			<i>Deposition</i>				<i>Observed</i>				
		<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Type</i>	<i>Depth In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>
(BR-06) 61115	BR-06 SVC	4. NW-I	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61105	1. E-Out	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61125	3. W-In	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61120	2. S-In	8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61120	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61115	1. NW-O	8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) 61125	BR-06 SVC	3. NW-I	4	PVC	No	N/A	Good	N/A		0.18		N/A	No
	BR-06 61115	1. E-Out	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 61130	2. SE-In	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
(BR-06) 61130	BR-06 SVC	2. SE-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 61125	1. NW-O	8	PVC	No	N/A	Good	N/A		0		N/A	No
(BR-06) LS-23A	BR-06 SVC	2. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 LS-23J	4. N-In	8	PVC	No	N/A	Good	N/A		0.25		N/A	No
	BR-06 LS-23B	3. NW-I	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 LS-23_WW	1. SE-O	8	PVC	No	N/A	Good	N/A		0.13		N/A	No
(BR-06) LS-23B	BR-06 LS-23A	1. SE-O	8	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 LS-23C	2. SW-In	8	PVC	No	N/A	Circular Crac	N/A		0		N/A	No
(BR-06) LS-23C	BR-06 SVC	3. SW-In	4	PVC	No	N/A	Good	N/A		0		N/A	No
	BR-06 LS-23E	4. NW-I	8	PVC	No	N/A	Circular Crac	N/A		0		N/A	No
	BR-06 SVC	2. S-In	4	PVC	No	N/A	Good	N/A		0		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>					
	<i>Dir.</i>	<i>Diam In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>
(BR-06) LS-23C	BR-06	LS-23B	1. NE-O 8	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) LS-23D	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	LS-23E	1. NE-O 8	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) LS-23E	BR-06	LS-23C	1. SE-O 8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	LS-23F	3. NW-I 8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	LS-23D	2. SW-In 8	PVC	No	N/A	Circular Crac	N/A	0		N/A	No
(BR-06) LS-23F	BR-06	SVC	3. NW-I 4	PVC	No	N/A	Future	N/A	0		N/A	No
	BR-06	LS-23E	1. SW-O 8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	2. SW-In 4	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) LS-23G	BR-06	LS-23H	1. SE-O 8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	2. NW-I 4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	3. N-In 4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	SVC	4. N-In 4	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) LS-23H	BR-06	LS-23I	1. SE-O 8	PVC	No	N/A	Good	N/A	0.13		N/A	No
	BR-06	SVC	3. NE-In 4	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	LS-23G	2. NW-I 8	PVC	No	N/A	Good	N/A	0		N/A	No
(BR-06) LS-23J	BR-06	LS-23I	2. NW-I 8	PVC	No	N/A	Good	N/A	0.13		N/A	No
	BR-06	LS-23A	1. S-Out 8	PVC	No	N/A	Good	N/A	0.13		N/A	No
	BR-06	LS-23K	3. N-In 8	PVC	No	N/A	Good	N/A	0		N/A	No
	BR-06	LS-23O	4. NE-In 8	PVC	No	N/A	Good	N/A	0.13		N/A	No



<i>Line Segment</i>	<i>-----PIPE-----</i>			<i>Deposition</i>			<i>Observed</i>									
	<i>Dir.</i>	<i>In</i>	<i>Construction</i>	<i>Root Growth</i>	<i>Depth Type</i>	<i>In</i>	<i>Structural Condition</i>	<i>Line Grade</i>	<i>Visual Infiltr</i>	<i>Depth In</i>	<i>Velocity FPS</i>	<i>Cleaning Method</i>	<i>Drop Conn.</i>			
(BR-06) LS-23K	BR-06	LS-23J	1. S-Out	8	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	SVC	2. SW-In	4	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	SVC	3. NW-I	4	PVC	No	N/A	Good	N/A	0		N/A	No			
(BR-06) LS-23L	BR-06	SVC	3. NW-I	4	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	SVC	2. W-In	4	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	LS-23M	1. E-Out	8	PVC	No	N/A	Circular Crac	N/A	0		N/A	No			
(BR-06) LS-23M	BR-06	LS-23N	1. SE-O	8	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	LS-23L	2. E-In	8	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	SVC	3. NW-I	4	PVC	No	N/A	Good	N/A	0		N/A	No			
(BR-06) LS-23N	BR-06	LS-23O	1. S-Out	8	PVC	No	N/A	Good	N/A	0.13		N/A	No			
	BR-06	SVC	4. NE-In	4	PVC	No	N/A	Good	N/A	0		N/A	No			
	BR-06	LS-23M	2. NW-I	8	PVC	No	N/A	Good	N/A	0.25		N/A	No			
	BR-06	SVC	3. N-In	4	PVC	No	N/A	Good	N/A	0		N/A	No			
(BR-06) LS-23O	BR-06	LS-23N	2. N-In	8	PVC	No	N/A	Good	N/A	0.25		N/A	No			
	BR-06	LS-23J	1. SW-O	8	PVC	No	N/A	Good	N/A	0.13		N/A	No			
	BR-06	SVC	3. E-In	4	PVC	No	N/A	Good	N/A	0		N/A	No			
						<u>Structural Condition</u>			<u>Total Length to Clean</u>							
Total Segments	407		Good	390	Long Crack	0	Collapsed	0	Flush	0	Jet	0	Bucket	0	Root Control	0
Total Footage			Broken	0	Circular Crack	5										
						<u>Structural Condition</u>			<u>Total Length to Clean</u>							
Report Totals			Good	688	Long Crack	1	Collapsed	1	Flush	0	Jet	0	Bucket	0	Root Control	0
Total Segments	811		Broken	0	Circular Crack	65										
Total Footage																



# Smoke Test Report

Project Number 18-3326-00 Bryant\_2018\_SSES

<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-03)50010 - (BR-03)50005		BOONE RD	No Defect	No	N/A		264
(BR-03)50015 - (BR-03)50010		BOONE RD	No Defect	No	N/A		75
(BR-03)50015 - (BR-03)50030		BOONE RD	No Defect	No	N/A		324
(BR-03)50020 - (BR-03)50010		BOONE RD	No Defect	No	N/A		70
(BR-03)50025 - (BR-03)50015		S RICHARDSON PL	No Defect	No	N/A		196
(BR-03)50035 - (BR-03)50015		S RICHARDSON PL	No Defect	No	N/A		104
(BR-03)50036 - (BR-03)50035		S RICHARDSON PL	No Defect	No	N/A		133
(BR-03)50045 - (BR-03)50030	1203	BOONE RD	USMH	No	Medium	0	233
	1203	BOONE RD	USMH	No	Light	0	233
(BR-03)50050 - (BR-03)50045		S RICHARDSON PL	No Defect	No	N/A		167
(BR-03)50055 - (BR-03)50050		S RICHARDSON PL	No Defect	No	N/A		308
(BR-03)50060 - (BR-03)50050		RICHWOOD DR	No Defect	No	N/A		113
(BR-03)50065 - (BR-03)50055		S RICHARDON PL	No Defect	No	N/A		390
(BR-03)50075 - (BR-03)50065		SUMMERFIELDS DR	No Defect	No	N/A		380
(BR-03)50080 - (BR-03)50065		MORNINGSIDE DR	No Defect	No	N/A		278
(BR-03)50085 - (BR-03)50080		MORNINGSIDE DR	No Defect	No	N/A		309
(BR-03)50090 - (BR-03)50075		SUMMERFIELDS DR	No Defect	No	N/A		240
(BR-03)50095 - (BR-03)50090		SUMMERFIELDS DR	No Defect	No	N/A		172
(BR-03)50100 - (BR-03)50060		RICHWOOD DR	No Defect	No	N/A		304
(BR-03)50105 - (BR-03)50100		RICHWOOD DR	No Defect	No	N/A		244
(BR-03)50110 - (BR-03)50025		S RICHARDSON PL	No Defect	No	N/A		224
(BR-03)50115 - (BR-03)50110	205	FAIR OAKS DR	Upper Cleanout Defective	No	Light	950	292
(BR-03)50125 - (BR-03)50130		N RICHARDSON PL	No Defect	No	N/A		138
(BR-03)50130 - (BR-03)50135		N RICHARDSON PL	No Defect	No	N/A		275
(BR-03)50135 - (BR-03)50140		N RICHARDSON PL	No Defect	No	N/A		366

1. USMH and DSMH sources are upstream/downstream manhole frame seal defects. Manhole rehabilitation is summarized in Chapter 4 and detailed in the Appendix section of the report.
2. Mainline and Catch Basins sources are quantified in the dyed water flooding report.

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# Smoke Test Report

Project Number 18-3326-00 Bryant\_2018\_SSES

<i>Structure</i>	<i>Address Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-03)50140 - (BR-03)50145	N RICHARDSON PL	No Defect	No	N/A		364
(BR-03)50145 - (BR-03)50150	N RICHARDSON PL	No Defect	No	N/A		90
(BR-03)50150 - (BR-03)50160	N RICHARDON PL	No Defect	No	N/A		198
(BR-03)50155 - (BR-03)50150	N RICHARDSON PL	No Defect	No	N/A		88
(BR-03)50160 - (BR-03)50165	HAZELWOOD CV	No Defect	No	N/A		45
(BR-03)50165 - (BR-03)50170	HAZELWOOD CV	No Defect	No	N/A		364
(BR-03)50170 - (BR-03)50180	HAZELWOOD CV	No Defect	No	N/A		77
(BR-03)50175 - (BR-03)50170	HAZELWOOD CV	No Defect	No	N/A		177
(BR-03)50180 - (BR-03)50185	E RICHARDSON PL	No Defect	No	N/A		109
(BR-03)50185 - (BR-03)50190	E RICHARDSON PL	No Defect	No	N/A		30
(BR-03)50190 - (BR-03)50195	E RICHARDSON PL	No Defect	No	N/A		58
(BR-03)50195 - (BR-03)50025	S RICHARDSON PL	No Defect	No	N/A		189
(BR-03)50200 - (BR-03)50185	FAIR OAKS DR	No Defect	No	N/A		115
(BR-03)50205 - (BR-03)50200	FAIR OAKS DR	No Defect	No	N/A		394
(BR-03)50210 - (BR-03)50020	BOONE RD	No Defect	No	N/A		511
(BR-03)50210 - (BR-03)50115	FAIR OAKS DR	No Defect	No	N/A		334
(BR-03)50215 - (BR-03)50210	BOONE RD	No Defect	No	N/A		354
(BR-03)50220 - (BR-03)50215	PINE CHAPEL DR	No Defect	No	N/A		159
(BR-03)50225 - (BR-03)50220	PINE CHAPEL DR	No Defect	No	N/A		320
(BR-03)50230 - (BR-03)50225	NW 4TH ST	No Defect	No	N/A		236
(BR-03)50235 - (BR-03)50220	PINE CHAPEL DR	No Defect	No	N/A		300
(BR-03)50240 - (BR-03)50235	PINE CHAPEL DR	No Defect	No	N/A		290
(BR-03)50245 - (BR-03)50240	TANGLEWOOD DR	No Defect	No	N/A		148
(BR-03)50250 - (BR-03)50230	NW 4TH ST	No Defect	No	N/A		385
(BR-03)50255 - (BR-03)50250	NW 4TH RD	No Defect	No	N/A		384

1. USMH and DSMH sources are upstream/downstream manhole frame seal defects. Manhole rehabilitation is summarized in Chapter 4 and detailed in the Appendix section of the report.
2. Mainline and Catch Basins sources are quantified in the dyed water flooding report.

Monday, June 10, 2019



# Smoke Test Report

Project Number 18-3326-00 Bryant\_2018\_SSES

<i>Structure</i>	<i>Address Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-03)50260 - (BR-03)50355	BOSWELL RD	No Defect	No	N/A		144
(BR-03)50265 - (BR-03)50315	N REYNOLDS RD	No Defect	No	N/A		150
(BR-03)50275 - (BR-03)50230	BOSWELL RD	No Defect	No	N/A		272
(BR-03)50280 - (BR-03)50275	BOSWELL RD	No Defect	No	N/A		208
(BR-03)50285 - (BR-03)50275	BOSWELL RD	No Defect	No	N/A		401
(BR-03)50290 - (BR-03)50210	BOONE RD	No Defect	No	N/A		329
(BR-03)50295 - (BR-03)50290	BOONE RD	No Defect	No	N/A		259
(BR-03)50300 - (BR-03)50301	BOONE RD	No Defect	No	N/A		295
(BR-03)50301 - (BR-03)50295	BOONE RD	No Defect	No	N/A		253
(BR-03)50305 - (BR-03)50300	BOONE RD	No Defect	No	N/A		317
(BR-03)50310 - (BR-03)50305	BOONE RD	No Defect	No	N/A		143
(BR-03)50315 - (BR-03)50385	N REYNOLDS RD	No Defect	No	N/A		322
(BR-03)50330 - (BR-03)50305	TANGLEWOOD DR	No Defect	No	N/A		321
(BR-03)50335 - (BR-03)50330	TANGLEWOOD DR	No Defect	No	N/A		270
(BR-03)50340 - (BR-03)50335	TANGLEWOOD DR	No Defect	No	N/A		244
(BR-03)50345 - (BR-03)50340	ELAINE PL	No Defect	No	N/A		293
(BR-03)50350 - (BR-03)50345	BOSWELL RD	No Defect	No	N/A		307
(BR-03)50355 - (BR-03)50350	BOSWELL RD	No Defect	No	N/A		249
(BR-03)50360 - (BR-03)50345	BOSWELL RD	No Defect	No	N/A		303
(BR-03)50365 - (BR-03)50360	BOSWELL RD	No Defect	No	N/A		302
(BR-03)50370 - (BR-03)50365	BOSWELL RD	No Defect	No	N/A		205
(BR-03)50375 - (BR-03)50370	HARRIS ST	No Defect	No	N/A		304
(BR-03)50380 - (BR-03)50375	HARRIS ST	No Defect	No	N/A		336
(BR-03)50385 - (BR-03)50390	N REYNOLDS RD	No Defect	No	N/A		326
(BR-03)50390 - (BR-03)50391	N REYNOLDS RD	No Defect	No	N/A		287

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Structure	Address	Street Name	Smoke Source	Recommend Dyed Water Flooding	Smoke Intensity	Inflow Rate (gpd)	Length (ft)
(BR-03)50391 - (BR-03)50395		N REYNOLDS RD	No Defect	No	N/A		312
(BR-03)50395 - (BR-03)50400		N REYNOLDS RD	No Defect	No	N/A		436
(BR-03)50400 - (BR-03)50405		N REYNOLDS RD	No Defect	No	N/A		188
(BR-03)50405 - (BR-03)50410		N REYNOLDS RD	No Defect	No	N/A		123
(BR-03)50410 - (BR-03)50415		N REYNOLDS RD	No Defect	No	N/A		219
(BR-03)50415 - (BR-03)50425		N ELM ST	No Defect	No	N/A		352
(BR-03)50420 - (BR-03)50415		N ELM ST	No Defect	No	N/A		234
(BR-03)50425 - (BR-03)50430		N VINE ST	No Defect	No	N/A		363
(BR-03)50430 - (BR-03)50435	311	NW 3RD ST	Upper Cleanout Defective	No	Heavy	1,440	364
(BR-03)50435 - (BR-03)50440	405	NW 3RD ST	Upper Cleanout Missing Cap	No	Medium	1,195	340
(BR-03)50440 - (BR-03)50515A		NW 3RD ST	No Defect	No	N/A		142
(BR-03)50445 - (BR-03)50430		N ELM ST	No Defect	No	N/A		361
(BR-03)50450 - (BR-03)50445	101	NW 3RD ST	Mainline	No	Medium		238
	101	NW 3RD ST	Upper Cleanout Defective	No	Light	475	238
	101	NW 3RD ST	Upper Sewer Service	No	Light	115	238
	101	NW 3RD ST	Upper Sewer Service	No	Medium	0	238
(BR-03)50460 - (BR-03)50455		N PINE ST	No Defect	No	N/A		347
(BR-03)50465 - (BR-03)50460		N PINE ST	No Defect	No	N/A		182
(BR-03)50470 - (BR-03)50465		BOONE RD	No Defect	No	N/A		0
(BR-03)50475 - (BR-03)50465		N VINE ST	No Defect	No	N/A		350
(BR-03)50480 - (BR-03)50475		BOONE RD	No Defect	No	N/A		103
(BR-03)50485 - (BR-03)50475		N ELM ST	No Defect	No	N/A		181
(BR-03)50490 - (BR-03)50485		N ELM ST	No Defect	No	N/A		174
(BR-03)50495 - (BR-03)50490		BOONE RD	No Defect	No	N/A		10
(BR-03)50500 - (BR-03)50495		BOONE RD	No Defect	No	N/A		118

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<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-03)50505 - (BR-03)50485		N ELM ST	No Defect	No	N/A		178
(BR-03)50510 - (BR-03)50505		RICH ST	No Defect	No	N/A		349
(BR-03)50515 - (BR-03)50455		BOONE RD	No Defect	No	N/A		198
(BR-03)50515A - (BR-03)50515		NW 3RD ST	No Defect	No	N/A		55
(BR-03)50515B - (BR-03)50515A		NW 3RD ST	No Defect	No	N/A		257
(BR-03)50515C - (BR-03)50515B		NW 3RD ST	No Defect	No	N/A		228
(BR-03)50515D - (BR-03)50515C		NW 3RD ST	No Defect	No	N/A		189
(BR-03)50525 - (BR-03)50510		RICH ST	No Defect	No	N/A		392
(BR-03)50530 - (BR-03)50535		WISE ST	No Defect	No	N/A		303
(BR-03)50535 - (BR-03)50555	410	NW 4TH ST	Upper Sewer Service	No	Heavy	7,171	199
(BR-03)50540 - (BR-03)50550		NW 4TH RD	No Defect	No	N/A		191
(BR-03)50545 - (BR-03)50540		NW 4TH RD	No Defect	No	N/A		247
(BR-03)50550 - (BR-03)50440		NW 3RD ST	No Defect	No	N/A		352
(BR-03)50555 - (BR-03)50540		NW 4TH RD	No Defect	No	N/A		323
(BR-03)50560 - (BR-03)50550		N PINE ST	No Defect	No	N/A		349
(BR-03)50565 - (BR-03)50550		N PINE ST	No Defect	No	N/A		206
(BR-03)50570 - (BR-03)50525		N WALNUT ST	No Defect	No	N/A		158
(BR-03)50575 - (BR-03)50570	106	N WALNUT ST	Mainline	No	Light		175
(BR-03)50580 - (BR-03)50575		NE 2ND RD	No Defect	No	N/A		100
(BR-03)50580A - (BR-03)50580	202	N REYNOLDS RD	Upper Cleanout Missing Cap	No	Light	144	150
(BR-03)50585 - (BR-03)50525	209	NE 1ST RD	Upper Cleanout Defective	No	Light	950	367
(BR-03)50590 - (BR-03)50585		N HAZEL ST	No Defect	No	N/A		164
(BR-03)50595 - (BR-03)50585	302	NE 1ST RD	Upper Cleanout Missing Cap	No	Heavy	950	405
	302	NE 1ST RD	Upper Cleanout Defective	No	Light	475	405
	304	NE 1ST RD	Upper Sewer Service	No	Medium	1,670	405

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# Smoke Test Report

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<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-03)50600 - (BR-03)50595		NE 1ST RD	No Defect	No	N/A		400
(BR-03)50600A - (BR-03)50600		NE 1ST RD	No Defect	No	N/A		165
(BR-03)50605 - (BR-03)50600	500	NE 3RD ST	Upper Cleanout Missing Cap	No	Light	144	51
(BR-03)50610 - (BR-03)50605		NE 3RD RD	No Defect	No	N/A		181
(BR-03)50615 - (BR-03)50310		BOONE RD	No Defect	No	N/A		190
(BR-03)50615 - (BR-03)50605	204	N LAUREL ST	Upper Sewer Service	No	Heavy	144	331
(BR-03)50620 - (BR-03)50615		N HAZEL ST	No Defect	No	N/A		360
(BR-03)50625 - (BR-03)50620	210	N WALNUT ST	Upper Cleanout Defective	No	Medium	1,195	359
(BR-03)50630 - (BR-03)50625		N WALNUT ST	No Defect	No	N/A		220
(BR-03)50635 - (BR-03)50610		NE 3RD RD	No Defect	No	N/A		98
(BR-03)50640 - (BR-03)50610		NE 3RD RD	No Defect	No	N/A		168
(BR-03)50645 - (BR-03)50640	408	MILLS PARK RD	Upper Cleanout Missing Cap	No	Medium	475	334
(BR-03)50650 - (BR-03)50645	306	MILLS PARK RD	Upper Cleanout Missing Cap	No	Medium	475	365
	301	NE 3RD RD	Upper Cleanout Missing Cap	No	Medium	144	365
(BR-03)50655 - (BR-03)50650	201	NE 3RD RD	Upper Cleanout Missing Cap	No	Medium	950	359
(BR-03)50660 - (BR-03)50655		N WALNUT ST	No Defect	No	N/A		247
(BR-03)50665 - (BR-03)50640		MILLS PARK RD	No Defect	No	N/A		206
(BR-03)50670 - (BR-03)50671		MILLS PARK RD	No Defect	No	N/A		352
(BR-03)50671 - (BR-03)50665		MILLS PARK RD	No Defect	No	N/A		345
(BR-03)50675 - (BR-03)50670		MILLS PARK RD	No Defect	No	N/A		354
(BR-03)50680 - (BR-03)50675		MILLS PARK RD	No Defect	No	N/A		55
(BR-03)50685 - (BR-03)50680		MILLS PARK RD	No Defect	No	N/A		166
(BR-03)50690 - (BR-03)50680		MILLS PARK RD	No Defect	No	N/A		305
(BR-03)50695 - (BR-03)50690		N REYNOLDS RD	No Defect	No	N/A		458
(BR-03)50700 - (BR-03)50695	508	N REYNOLDS RD	Upper Cleanout Missing Cap	No	Light	2,866	195

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<i>Structure</i>	<i>Address Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-03)50705 - (BR-03)50665	MILLS PARK RD	No Defect	No	N/A		338
(BR-03)50710 - (BR-03)50705	MILLS PARK RD	No Defect	No	N/A		406
(BR-03)50715 - (BR-03)50710	MILLS PARK RD	No Defect	No	N/A		279
(BR-03)50720 - (BR-03)50715	MILLS PARK RD	No Defect	No	N/A		114
(BR-06)60005 - (BR-06)60000	CHARLES CT	No Defect	No	N/A		291
(BR-06)60010 - (BR-06)60005	CHARLES CT	No Defect	No	N/A		311
(BR-06)60015 - (BR-06)60010	CHARLES CT	No Defect	No	N/A		259
(BR-06)60020 - (BR-06)60015	HENRY AVE	No Defect	No	N/A		319
(BR-06)60025 - (BR-06)60015	CHARLES CT	No Defect	No	N/A		143
(BR-06)60030 - (BR-06)60025	CHARLES CT	No Defect	No	N/A		222
(BR-06)60035 - (BR-06)60030	BUCKINGHAM PL	No Defect	No	N/A		103
(BR-06)60040 - (BR-06)60030	BUCKINGHAM PL	No Defect	No	N/A		248
(BR-06)60045 - (BR-06)60035	BUCKINGHAM PL	No Defect	No	N/A		180
(BR-06)60050 - (BR-06)60035	BUCKINGHAM PL	No Defect	No	N/A		119
(BR-06)60051 - (BR-06)60050	BUCKINGHAM PL	No Defect	No	N/A		158
(BR-06)60055 - (BR-06)60040	BUCKINGHAM PL	No Defect	No	N/A		402
(BR-06)60060 - (BR-06)60055	BUCKINGHAM PL	No Defect	No	N/A		197
(BR-06)60065 - (BR-06)60060	BUCKINGHAM PL	No Defect	No	N/A		349
(BR-06)60070 - (BR-06)60065	WILLIAM LN	No Defect	No	N/A		316
(BR-06)60075 - (BR-06)60065	HILLDALE RD	No Defect	No	N/A		303
(BR-06)60075A - (BR-06)60075	DALEY RD	No Defect	No	N/A		361
(BR-06)60080 - (BR-06)60075	HILLDALE RD	No Defect	No	N/A		204
(BR-06)60085 - (BR-06)60080	HILLDALE RD	No Defect	No	N/A		293
(BR-06)60090 - (BR-06)60085	HILLDALE RD	No Defect	No	N/A		275
(BR-06)60095 - (BR-06)60090	HILLDALE RD	No Defect	No	N/A		223

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<i>Structure</i>	<i>Address Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-06)60100 - (BR-06)60095	HILLDALE RD	No Defect	No	N/A		264
(BR-06)60105 - (BR-06)60020	HENRY AVE	No Defect	No	N/A		179
(BR-06)60110 - (BR-06)60045	BUCKINGHAM PL	No Defect	No	N/A		249
(BR-06)60115 - (BR-06)60110	CHARLES CT	No Defect	No	N/A		42
(BR-06)60120 - (BR-06)60115	HENRY AVE	No Defect	No	N/A		184
(BR-06)60125 - (BR-06)60115	HENRY AVE	No Defect	No	N/A		200
(BR-06)60125 - (BR-06)60200	WINDSOR CT	No Defect	No	N/A		0
(BR-06)60130 - (BR-06)60120	2411 HENRY AVE	Upper Cleanout Defective	No	Medium	2,390	156
(BR-06)60135 - (BR-06)60125	HENRY AVE	No Defect	No	N/A		197
(BR-06)60140 - (BR-06)60125	HENRY AVE	No Defect	No	N/A		50
(BR-06)60145 - (BR-06)60140	2113 HENRY AVE	Upper Cleanout Missing Cap	No	Medium	1,440	243
(BR-06)60150 - (BR-06)60145	HENRY AVE	No Defect	No	N/A		375
(BR-06)60155 - (BR-06)60150	HENRY AVE	No Defect	No	N/A		391
(BR-06)60160 - (BR-06)60051	BUCKINGHAM PL	No Defect	No	N/A		145
(BR-06)60165 - (BR-06)60160	MAGNA CARTA LN	No Defect	No	N/A		357
(BR-06)60170 - (BR-06)60165	MAGNA CARTA LN	No Defect	No	N/A		370
(BR-06)60175 - (BR-06)60070	WILLIAM LN	No Defect	No	N/A		283
(BR-06)60180 - (BR-06)60175	WILLIAM LN	No Defect	No	N/A		241
(BR-06)60185 - (BR-06)60051	BUCKINGHAM PL	No Defect	No	N/A		147
(BR-06)60190 - (BR-06)60185	BUCKINGHAM PL	No Defect	No	N/A		271
(BR-06)60195 - (BR-06)60190	WINDSOR CT	No Defect	No	N/A		179
(BR-06)60200 - (BR-06)60195	WINDSOR CT	No Defect	No	N/A		126
(BR-06)60205 - (BR-06)60195	BUCKINGHAM PL	No Defect	No	N/A		136
(BR-06)60210 - (BR-06)60205	BUCKINGHAM PL	No Defect	No	N/A		147
(BR-06)60220 - (BR-06)60100	HILLDALE RD	No Defect	No	N/A		89

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<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-06)60235 - (BR-06)60225		OAK GLENN LP	No Defect	No	N/A		150
(BR-06)60240 - (BR-06)60235		OAK GLENN LP	No Defect	No	N/A		229
(BR-06)60245 - (BR-06)60240		OAK GLENN LP	No Defect	No	N/A		273
(BR-06)60250 - (BR-06)60245		OAK GLENN LP	No Defect	No	N/A		271
(BR-06)60255 - (BR-06)60250		OAK GLENN LP	No Defect	No	N/A		114
(BR-06)60695 - (BR-06)60960		CROSSING PL	No Defect	No	N/A		255
(BR-06)60695A - (BR-06)60695		CROSSING PL	No Defect	No	N/A		55
(BR-06)60695B - (BR-06)60695A		CROSSING PL	No Defect	No	N/A		120
(BR-06)60695C - (BR-06)60695		CROSSING PL	No Defect	No	N/A		254
(BR-06)60695D - (BR-06)60965C		CROSSING LOOP	No Defect	No	N/A		350
(BR-06)60695F - (BR-06)60695E		CROSSING PL	No Defect	No	N/A		193
(BR-06)60696E - (BR-06)60695D	1101	CROSSING LP	Catch Basin	No	Heavy		191
(BR-06)60935 - (BR-06)60235		OAK GLENN LP	No Defect	No	N/A		279
(BR-06)60940 - (BR-06)60935		OAK GLENN LP	No Defect	No	N/A		246
(BR-06)60945 - (BR-06)60940		OAK GLENN LP	No Defect	No	N/A		262
(BR-06)60950 - (BR-06)60945		OAK GLENN LP	No Defect	No	N/A		242
(BR-06)60955 - (BR-06)60950		OAK GLENN LP	No Defect	No	N/A		390
(BR-06)60960 - (BR-06)60255	1401	OAK GLENN CT	Upper Cleanout Defective	No	Medium	144	230
(BR-06)60960A - (BR-06)60960		OAK GLENN CT	No Defect	No	N/A		36
(BR-06)60960B - (BR-06)60960A	1411	OAK GLENN CT	Upper Cleanout Missing Cap	No	Light	144	366
(BR-06)60960C - (BR-06)60960		OAK GLENN LP	No Defect	No	N/A		286
(BR-06)60960D - (BR-06)60960C		OAK GLENN PL	No Defect	No	N/A		400
(BR-06)60960E - (BR-06)60960C		OAK GLENN LP	No Defect	No	N/A		386
(BR-06)60960F - (BR-06)60960E		OAK GLENN LP	No Defect	No	N/A		170
(BR-06)60965G - (BR-06)60965H		CROSSING CT	No Defect	No	N/A		90

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# Smoke Test Report

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<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-06)60965H - (BR-06)60965D		CROSSING LOOP	No Defect	No	N/A		158
(BR-06)60965I - (BR-06)60695H		CROSSING CT	No Defect	No	N/A		184
(BR-06)60970 - (BR-06)60965C		CROSSING LOOP	No Defect	No	N/A		188
(BR-06)60975 - (BR-06)60970		CROSSING CT	No Defect	No	N/A		181
(BR-06)60980 - (BR-06)60975		CROSSING CT	No Defect	No	N/A		257
(BR-06)60985 - (BR-06)60980		OAK GLENN LP	No Defect	No	N/A		200
(BR-06)60990 - (BR-06)60985		OAK MEADOWS RD	No Defect	No	N/A		270
(BR-06)60995 - (BR-06)60990		OAK MEADOWS RD	No Defect	No	N/A		235
(BR-06)61000 - (BR-06)60995		OAK MEADOWS RD	No Defect	No	N/A		80
(BR-06)61005 - (BR-06)61000		OAK MEADOWS RD	No Defect	No	N/A		320
(BR-06)61010 - (BR-06)61005		OAKBROOK RD	No Defect	No	N/A		276
(BR-06)61015 - (BR-06)61010		OAKBROOK RD	No Defect	No	N/A		118
(BR-06)61020 - (BR-06)61015		OAKBROOK RD	No Defect	No	N/A		349
(BR-06)61025 - (BR-06)61020		OAKBROOK RD	No Defect	No	N/A		323
(BR-06)61030 - (BR-06)61025		CREEKSODE DR	No Defect	No	N/A		351
(BR-06)61030B - (BR-06)610130A	905	DAWSON POINT AVE	Upper Cleanout Missing Cap	No	Medium	144	302
(BR-06)61030C - (BR-06)61030B		DAWSON POINT AVE	No Defect	No	N/A		335
(BR-06)61030D - (BR-06)61030C		DAWSON POINT AVE	No Defect	No	N/A		312
(BR-06)61030E - (BR-06)61030A		DAWSON POINT AVE	No Defect	No	N/A		265
(BR-06)61035 - (BR-06)61030		CREEKSIDE DR	No Defect	No	N/A		336
(BR-06)61040 - (BR-06)61035	419	CANYON WAY	Upper Cleanout Missing Cap	No	Medium	245	390
(BR-06)61075 - (BR-06)60235		GLENN CV	No Defect	No	N/A		272
(BR-06)61080 - (BR-06)61075	5413	GLENN CV	Upper Cleanout Defective	No	Light	1,670	198
	5501	GLENN CV	Upper Cleanout Missing Cap	No	Light	475	198
(BR-06)61085 - (BR-06)61080		GLENN CV	No Defect	No	N/A		224

1. USMH and DSMH sources are upstream/downstream manhole frame seal defects. Manhole rehabilitation is summarized in Chapter 4 and detailed in the Appendix section of the report.
2. Mainline and Catch Basins sources are quantified in the dyed water flooding report.

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# Smoke Test Report

Project Number 18-3326-00 Bryant\_2018\_SSES

<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-06)61090 - (BR-06)61040		CANYON WAY	No Defect	No	N/A		382
(BR-06)61100 - (BR-06)61090		CANYON WAY	No Defect	No	N/A		210
(BR-06)61105 - (BR-06)61100		CANYON WAY	No Defect	No	N/A		250
(BR-06)61110 - (BR-06)61105		BRIDGE PORT LN	No Defect	No	N/A		345
(BR-06)61110A - (BR-06)61110		BRIDGE PORT LN	No Defect	No	N/A		224
(BR-06)61110B - (BR-06)61110A		SPRINGWOOD CIR	No Defect	No	N/A		155
(BR-06)61110C - (BR-06)61110A		BRIDGE PORT LN	No Defect	No	N/A		219
(BR-06)61110D - (BR-06)61110C		CLOVER BROOK DR	No Defect	No	N/A		229
(BR-06)61110E - (BR-06)61110C		BRIDGE PORT LN	No Defect	No	N/A		305
(BR-06)61110F - (BR-06)61110E		SPRINGWOOD CIR	No Defect	No	N/A		225
(BR-06)61110G - (BR-06)61110E		BRIDGE PORT LN	No Defect	No	N/A		366
(BR-06)61110H - (BR-06)61110G		CYPRESSWOOD CV	No Defect	No	N/A		118
(BR-06)61120 - (BR-06)61120		CANYON WAY	No Defect	No	N/A		210
(BR-06)61125 - (BR-06)61115	104	CANYON WAY	USMH	No	Light	0	333
(BR-06)61130 - (BR-06)61125		CANYON WAY	No Defect	No	N/A		226
(BR-06)6115 - (BR-06)61105		CANYON WAY	No Defect	No	N/A		330
(BR-06)69225 - (BR-06)60220		HILLDALE RD	No Defect	No	N/A		135
(BR-06)LS-23B - (BR-06)LS-23A		MEADOW RIDGE LN	No Defect	No	N/A		125
(BR-06)LS-23C - (BR-06)LS-23B		BARBARA CT	No Defect	No	N/A		85
(BR-06)LS-23D - (BR-06)LS-23E		KARIN LN	No Defect	No	N/A		127
(BR-06)LS-23E - (BR-06)LS-23C		BARBARA CT	No Defect	No	N/A		145
(BR-06)LS-23F - (BR-06)LS-23E		LEXIE CT	No Defect	No	N/A		150
(BR-06)LS-23G - (BR-06)LS-23H		DEREK CT	No Defect	No	N/A		250
(BR-06)LS-23H - (BR-06)LS-23I		DEREK CT	No Defect	No	N/A		240
(BR-06)LS-23I - (BR-06)LS-23J		DEREK CT	No Defect	No	N/A		185

1. USMH and DSMH sources are upstream/downstream manhole frame seal defects. Manhole rehabilitation is summarized in Chapter 4 and detailed in the Appendix section of the report.
2. Mainline and Catch Basins sources are quantified in the dyed water flooding report.



# Smoke Test Report

Project Number 18-3326-00 Bryant\_2018\_SSES

<i>Structure</i>	<i>Address</i>	<i>Street Name</i>	<i>Smoke Source</i>	<i>Recommend Dyed Water Flooding</i>	<i>Smoke Intensity</i>	<i>Inflow Rate (gpd)</i>	<i>Length (ft)</i>
(BR-06)LS-23J - (BR-06)LS-23A		MEADOW RIDGE LN	No Defect	No	N/A		133
(BR-06)LS-23K - (BR-06)LS-23J	4609	MEADOW RIDGE LN	Upper Cleanout Missing Cap	No	Medium	475	300
(BR-06)LS-23L - (BR-06)LS-23M		SHERRY ANN CT	No Defect	No	N/A		315
(BR-06)LS-23M - (BR-06)LS-23N		SHERRY ANN CT	No Defect	No	N/A		384
(BR-06)LS-23N - (BR-06)LS-23O		CLIFF CT	No Defect	No	N/A		396
(BR-06)LS-23O - (BR-06)LS-23J		CLIFF CT	No Defect	No	N/A		358

**Totals** 30,931 65945

**Source Summary**

Building Interior	2
Catch Basin	1
Mainline	2
Upper Cleanout Defective	9
Upper Cleanout Missing Cap	15
Upper Sewer Service	5
USMH	3
<b>Total Sources</b>	<b>37</b>

1. USMH and DSMH sources are upstream/downstream manhole frame seal defects. Manhole rehabilitation is summarized in Chapter 4 and detailed in the Appendix section of the report.  
 2. Mainline and Catch Basins sources are quantified in the dyed water flooding report.



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# Dyed Water Flooding Report

*Project Number* 18-3326-00 Bryant\_2018\_SSES

<i>Line Segment</i>	<i>Street Name</i>	<i>Location Flooded</i>	<i>Illegal Conditions</i>	<i>Flow Rate</i>	<i>Recommended for TV Inspection</i>
(BR-03)50450 - (BR-03)50445	N Elm St	Deprs Grass Area	Main Line Defect	1.38	No
		Deprs Grass Area	Dyed Water Observed	0.00	No
(BR-03)50555 - (BR-03)50540	NW 4th St	Deprs Grass Area	Cross Connection	0.44	No
		Deprs Grass Area	Dyed Water Observed	0.00	No
(BR-03)50570 - (BR-03)50825	N Walnut St	Storm Ditch	No Sources Found	0.00	No
(BR-06)60696E - (BR-06)60695D		Storm Sewer	No Sources Found	0.00	No
(BR-06)61125 - (BR-06)61115	Canyon Way	Deprs Grass Area	Dyed Water Observed	1.00	No

*Total Line Segments:* 5

*Total Flow (gpm):* 2.82

*Total Recommended for TV:* 0



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		

**(BR-03)50015 - (BR-03)50010**

4/16/2019	Boone Rd							
8"		51.4	51.4					
				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				13.7	Pipe w/ Longitudinal Crack	0.10	Repair	5
				51.4	Upstream Manhole	0.00		0
				51.4	End TV Observation	0.00		0

**(BR-03)50020 - (BR-03)50010**

4/16/2019	Boone Rd							
10"		71.2	71.2					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				37.8	Joint w/ Heavy Roots	0.20	Grout	0
				40.2	Service Connection	0.00		0
				42.9	Joint w/ Infiltration	0.10	Grout	0
				71.2	Downstream Manhole	0.00		0
				71.2	End TV Observation	0.00		0

**(BR-03)50055 - (BR-03)50050**

4/15/2019	S Richardson Pl							
8"		308.5	308.5					
				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				71.1	Service Connection	0.00		0
				157.7	Service Connection	0.00		0
				308.5	Upstream Manhole	0.00		0
				308.5	End TV Observation	0.00		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		
<b>(BR-03)50060 - (BR-03)50050</b>								
4/12/2019	S Richardson Pl							
6 "		109.9	109.9					
				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
			109.9		Upstream Manhole	0.00		0
			109.9		End TV Observation	0.00		0
<b>(BR-03)50065 - (BR-03)50055</b>								
4/12/2019	Morningside Dr							
6 "		407.4	407.4					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
			81.1		Service Connection	0.00		0
			145.9		Service Connection	0.00		0
			302.5		Service Connection	0.00		0
			306		Service Connection	0.00		0
			407.4		Downstream Manhole	0.00		0
			407.4		End TV Observation	0.00		0
<b>(BR-03)50080 - (BR-03)50065</b>								
4/12/2019	S Richardson Pl							
6 "		272.8	272.8					
				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
			94.5		Service Connection	0.00		0
			134		Pipe w/ Longitudinal Crack	0.10	Repair	5
			173.8		Service Connection	0.00		0
			175.5		Service Connection	0.00		0
			196.1		Service Connection	0.00		0
			266		Pipe w/ Longitudinal Crack	0.10	Repair	5
			272.8		Upstream Manhole	0.00		0
			272.8		End TV Observation	0.00		0

1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)

**(BR-03)50100 - (BR-03)50060**

4/12/2019 Richwoods Dr  
6 " 305.7 305.7

5	Upstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
214.4	Service Connection	0.00	0
223.8	Service Connection	0.00	0
305.7	Downstream Manhole	0.00	0
305.7	End TV Observation	0.00	0

**(BR-03)50125 - (BR-03)50130**

4/12/2019 Richardson PI  
6 " 133.5 133.5

5	Downstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
133.5	Upstream Manhole	0.00	0
133.5	End TV Observation	0.00	0

**(BR-03)50130 - (BR-03)50135**

4/12/2019 Richardson PI  
6 " 276.6 276.6

5	Upstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
254.2	Pipe w/ Longitudinal Crack	0.10	Repair 5
276.6	Downstream Manhole	0.00	0
276.6	End TV Observation	0.00	0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		

**(BR-03)50135 - (BR-03)50140**

4/15/2019 N Richardson Pl  
6 " 366 366

5	Upstream Manhole	0.00	0
5	Camera Blocked	0.00	0
5	Begin TV Observation	0.00	0
111.4	Service Connection	0.00	0
112	Service Connection	0.00	0
132	Sag Begins	0.00	0
150.2	Sag Ends	0.00	0
200.5	Service Connection	0.00	0
366	Downstream Manhole	0.00	0
366	End TV Observation	0.00	0

**(BR-03)50140 - (BR-03)50145**

4/15/2019 N Richardson Pl  
6 " 368.4 368.4

5	Downstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
138.9	Service Connection	0.00	0
253.9	Service Connection	0.00	0
353.9	Pipe w/ Longitudinal Crack	0.10	Repair 5
368.4	Upstream Manhole	0.00	0
368.4	End TV Observation	0.00	0

**(BR-03)50145 - (BR-03)50150**

4/15/2019 N Richardson Pl  
6 " 90.2 90.2

6.5	Upstream Manhole	0.00	0
6.5	Begin TV Observation	0.00	0
90.2	Downstream Manhole	0.00	0

Tuesday, June 18, 2019

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)
				90.2	End TV Observation	0.00		0
<b>(BR-03)50190 - (BR-03)50195</b>								
5/6/2019	S Richardson Pl							
8 "		50.6	50.6					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				50.6	Downstream Manhole	0.00		0
				50.6	End TV Observation	0.00		0
<b>(BR-03)50210 - (BR-03)50020</b>								
4/16/2019	Boone Rd							
10 "		318.1	511.4					
				5	Upstream Manhole	0.00		0
				5	Reverse Setup	0.00		0
				5	Begin TV Observation	0.00		0
				5	Begin TV Observation	0.00		0
				5	Camera Submerged	0.00		0
				6.5	Downstream Manhole	0.00		0
				6.5	End TV Observation	0.00		0
				76.6	Service Connection	0.00		0
				95	End TV Observation	0.00		0
				95	Service Connection w/ Break-I	0.15	Repair	5
				132.2	Service Connection	0.00		0
				190.5	Pipe w/ Longitudinal Crack	0.10	Repair	5
				190.9	Joint w/ Light Roots	0.01	Grout	0
<b>(BR-03)50245 - (BR-03)50240</b>								
4/16/2019	Tanglewood Dr							
6 "		149.2	149.2					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)
				7.5	Service Connection w/Defect	0.15	Repair	5
				38	Joint w/ Light Roots	0.10	Grout	0
				83.6	Joint w/ Infiltration	0.30	Grout	0
				116.2	Service Connection w/Defect	0.15	Repair	5
				149.2	Downstream Manhole	0.00		0
				149.2	End TV Observation	0.00		0

**(BR-03)50290 - (BR-03)50210**

4/16/2019 Boone Rd  
10" 331.2 331.2

5	Upstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
8.8	Joint w/ Infiltration	0.25	Grout	0
65.5	Joint w/ Infiltration	0.10	Grout	0
75.9	Joint w/ Infiltration	0.05	Grout	0
86.3	Joint w/ Infiltration	0.10	Grout	0
91.7	Joint w/ Infiltration	0.05	Grout	0
101.8	Joint w/ Infiltration	0.10	Grout	0
112.1	Joint w/ Infiltration	0.10	Grout	0
138	Joint w/ Infiltration	0.10	Grout	0
211.9	Joint w/ Moderate Offset	0.20	Grout	1
215.1	Joint w/ Infiltration	0.20	Grout	0
246.3	Joint w/ Infiltration	0.05	Grout	0
262.1	Joint w/ Moderate Offset	0.15	Grout	1
266.9	Pipe w/ Longitudinal Crack	0.10	Repair	5
331.2	Downstream Manhole	0.00		0
331.2	End TV Observation	0.00		0

**(BR-03)50295 - (BR-03)50290**

4/16/2019 Boone Rd  
10" 255.8 255.8

5	Upstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
16.4	Joint w/ Infiltration	0.05	Grout	0
47.4	Joint w/ Infiltration	0.15	Grout	0
69.7	Joint w/ Infiltration	0.05	Grout	0
82.1	Pipe Material Change	0.00		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----			
Date	Street	Length	Length	Flow	Type	Length	
Dia.		(ft)	(ft)	(gpm)		(ft)	
			100.6	Pipe Material Change	0.00		0
			109.9	Joint w/ Infiltration	0.15	Grout	0
			116.3	Service Connection	0.00		0
			120.2	Joint w/ Infiltration	0.15	Grout	0
			161.6	Joint w/ Infiltration	0.05	Grout	0
			196.4	Service Connection	0.00		0
			255.8	Downstream Manhole	0.00		0
			255.8	End TV Observation	0.00		0

**(BR-03)50301 - (BR-03)50295**

4/16/2019 Boone Rd  
10" 250.4 250.4

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
5	Pipe w/ 51-75 Percent Flow	0.00		0
16.9	Joint w/ Infiltration	0.15	Grout	0
37.6	Pipe w/ Circular Crack	0.10	Repair	5
42.5	Joint w/ Infiltration	0.20	Grout	0
58.5	Joint w/ Infiltration	0.10	Grout	0
213.4	Joint w/ Infiltration	0.10	Grout	0
223.9	Pipe w/ Erosion	0.30		0
250.4	Upstream Manhole	0.00		0
250.4	End TV Observation	0.00		0

**(BR-03)50335 - (BR-03)50330**

5/3/2019 Tanglewood Dr  
8" 265.1 265.1

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
5	Camera Submerged	0.00		0
265.1	Contractor Code Not Found	1.00		
265.1	Upstream Manhole	0.00		0
265.1	End TV Observation	0.00		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)

**(BR-03)50340 - (BR-03)50335**

4/30/2019 Tanglewood Dr  
8 " 239.3 239.3

5	Downstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
19.6	Sag Begins	0.00	0
20.5	Pipe w/ 51-75 Percent Flow	0.00	0
21.8	Camera Submerged	0.00	0
60.6	Sag Ends	0.00	0
75.6	Service Connection	0.00	0
112.8	Service Connection	0.00	0
119.9	Sag Begins	0.00	0
120.5	Pipe w/ 26-50 Percent Flow	0.00	0
140.9	Sag Ends	0.00	0
229.7	Sag Begins	0.00	0
230.2	Pipe w/ 0-25 Percent Flow	0.00	0
237.6	Sag Ends	0.00	0
239.3	Upstream Manhole	0.00	0
239.3	End TV Observation	0.00	0

**(BR-03)50345 - (BR-03)50340**

5/1/2019 Tanglewood Dr  
8 " 8.3 293

5	Downstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
8.3	End TV Observation	0.00	0

**(BR-03)50440 - (BR-03)50515A**

4/26/2019 Boone Rd  
8 " 46.4 142

5	Downstream Manhole	0.00	0
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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)
				5	Begin TV Observation	0.00		0
				46.4	Upstream Manhole	0.00		0
				46.4	End TV Observation	0.00		0

**(BR-03)50445 - (BR-03)50430**

4/25/2019 N Vine St

6 "

356.1

356.1

				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				41.7	Joint w/ Infiltration	0.10	Grout	0
				58.6	Service Connection	0.00		0
				65.5	Intruding > 1 Inch	0.07	Repair	5
				92.5	Joint w/ Light Roots	0.01	Grout	0
				100.4	Service Connection	0.00		0
				116.1	Pipe w/ Hole	0.50	Repair	5
				173.4	Joint w/ Infiltration	0.15	Grout	0
				237.5	Service Connection	0.00		0
				287.1	Service Connection w/Defect	0.15	Repair	5
				292.4	Pipe w/ Longitudinal Crack	0.10	Repair	5
				294.5	Service Connection	0.00		0
				309.4	Joint w/ Infiltration	0.05	Grout	0
				349.2	Joint w/ Infiltration	0.05	Grout	0
				356.1	Upstream Manhole	0.00		0
				356.1	End TV Observation	0.00		0

**(BR-03)50455 - (BR-03)50515**

4/26/2019 Boone Rd

8 "

175.1

175.1

				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				175.1	Upstream Manhole	0.00		0
				175.1	End TV Observation	0.00		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		

**(BR-03)50460 - (BR-03)50455**

4/17/2019 Pine St  
10" 346.6 346.6

5	Upstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
69.5	Service Connection	0.00	0
71.2	Service Connection	0.00	0
82.5	Service Connection	0.00	0
198.8	Service Connection w/Defect	0.75	Repair 5
259.3	Service Connection w/Defect	0.15	Repair 5
283.4	Service Connection w/Defect	0.15	Repair 5
340.6	Roots	0.10	Repair 5
346.6	Downstream Manhole	0.00	0
346.6	End TV Observation	0.00	0

**(BR-03)50495 - (BR-03)50490**

5/3/2019 N Reynolds Rd  
6" 3.1 11.1

0	Upstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
3.1	Downstream Manhole	0.00	0
3.1	End TV Observation	0.00	0

**(BR-03)50500 - (BR-03)50495**

5/3/2019 Jamie's Dog Grooming  
6" 114.9 114.9

5	Upstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
11.2	Service Connection w/Defect	0.75	Repair 5
15.1	Service Connection	0.00	0
34.4	Joint w/ Light Roots	0.35	Grout 0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		
			34.6	Pipe Material Change	0.00		0	
			35.3	Joint w/ Heavy Roots	0.25	Grout	0	
			36.3	Service Connection	0.00		0	
			36.3	Service Connection w/Defect	0.15	Repair	5	
			38.3	Service Connection	0.00		0	
			39.6	Joint w/ Light Roots	0.25	Grout	0	
			39.6	Pipe Material Change	0.00		0	
			60.7	Joint w/ Light Roots	0.01	Grout	0	
			60.7	Service Connection w/Defect	0.25	Repair	5	
			70	Pipe Material Change	0.00		0	
			72.5	Pipe Material Change	0.00		0	
			81.3	Service Connection	0.00		0	
			114	Roots	0.20	Repair	5	
			114.9	Downstream Manhole	0.00		0	
			114.9	End TV Observation	0.00		0	

**(BR-03)50530 - (BR-03)50535**

4/26/2019 NW 4th St  
8 " 303.3 303.3

			5	Downstream Manhole	0.00		0	
			5	Begin TV Observation	0.00		0	
			23.9	Service Connection w/Defect	0.15	Repair	5	
			60.7	Joint w/ Light Roots	0.10	Grout	0	
			80.9	Service Connection	0.00		0	
			142.8	Pipe w/ Hole	0.50	Repair	5	
			143.4	Service Connection	0.00		0	
			154	Joint w/ Infiltration	0.15	Grout	0	
			174.7	Joint w/ Infiltration	0.10	Grout	0	
			189.7	Service Connection	0.00		0	
			303.3	Upstream Manhole	0.00		0	
			303.3	End TV Observation	0.00		0	

**(BR-03)50535 - (BR-03)50555**

4/26/2019 NW 4th St  
8 " 198.2 198.2

			5	Upstream Manhole	0.00		0	
			5	Begin TV Observation	0.00		0	

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Observations	Type	Length	
Dia.		(ft)	(ft)	(gpm)			(ft)	
			158.5	0.00	Service Connection		0	
			198.2	0.00	Downstream Manhole		0	
			198.2	0.00	End TV Observation		0	

**(BR-03)50550 - (BR-03)50440**

4/26/2019 Boone Rd

8 " 148.9 148.9

0	Downstream Manhole	0.00				0
0	Begin TV Observation	0.00				0
3.8	Pipe w/ Circular Crack	0.50		Repair		5
78.8	Service Connection w/Defect	0.25		Repair		5
97.4	Joint w/ Infiltration	0.25		Grout		0
148.9	Upstream Manhole	0.00				0
148.9	End TV Observation	0.00				0

**(BR-03)50560 - (BR-03)50550**

5/3/2019 North Pine St

8 " 339 339

0	Upstream Manhole	0.00				0
0	Begin TV Observation	0.00				0
52.9	Service Connection	0.00				0
269.6	Sag Begins	0.00				0
279.6	Sag Ends	0.00				0
339	Downstream Manhole	0.00				0
339	End TV Observation	0.00				0

**(BR-03)50575 - (BR-03)50570**

4/25/2019 Jordan s bbq

6 " 167.2 167.2

0	Downstream Manhole	0.00				0
0	Begin TV Observation	0.00				0
21.5	Joint w/ Infiltration	0.25		Grout		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



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Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		
			82	Service Connection	0.00		0	
			161.5	Service Connection	0.00		0	
			167.2	End TV Observation	0.00		0	

**(BR-03)50575 - (BR-03)50580**

4/25/2019 Jordan s bbq  
6 "

96.3 96.3

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
10.9	Service Connection w/Defect	0.15	Repair	5
51.1	Service Connection	0.00		0
63.2	Service Connection	0.00		0
67.2	Service Connection	0.00		0
91.2	Service Connection	0.00		0
93.1	Service Connection	0.00		0
96.3	Upstream Manhole	0.00		0
96.3	End TV Observation	0.00		0

**(BR-03)50580A - (BR-03)50580**

5/3/2019 Jordans bbq Parking Lot  
6 "

115.7 115.7

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
113.6	Service Connection	0.00		0
115.7	End TV Observation	0.00		0

**(BR-03)50605 - (BR-03)50600**

4/17/2019 NE 3rd St  
10 "

43.8 43.8

0	Upstream Manhole	0.00		0
0	Begin TV Observation	0.00		0
22.4	Lateral Infiltration	0.75	Repair	5

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1. Refer to the Recommended Line Replacements section of the report for cost details.



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Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)
				43.8	Downstream Manhole	0.00		0
				43.8	End TV Observation	0.00		0
<b>(BR-03)50610 - (BR-03)50605</b>								
4/17/2019	NW 3rd							
10"		177.3	177.3					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				6.6	Roots	0.15	Repair	5
				70	Pipe w/ Circular Crack	0.10	Repair	5
				70	Lateral Infiltration	0.65	Repair	5
				73.6	Service Connection	0.00		0
				118.8	Service Connection	0.00		0
				177.3	Downstream Manhole	0.00		0
				177.3	End TV Observation	0.00		0
<b>(BR-03)50615 - (BR-03)50605</b>								
4/24/2019	N Laurel St							
6"		322	322					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				59.1	Pipe w/ Longitudinal Crack	0.75	Repair	5
				60.1	Service Connection	0.00		0
				94.8	Service Connection	0.00		0
				160.1	Service Connection	0.00		0
				219.9	Service Connection w/Defect	0.35	Repair	5
				258.7	Roots	0.10	Repair	5
				307.6	Joint, Separated	0.70	Repair	5
				327	Downstream Manhole	0.00		0
				327	End TV Observation	0.00		0

1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		
<b>(BR-03)50620 - (BR-03)50615</b>								
4/22/2019	N Hazel St							
6 "		315.9	360					
				0	Upstream Manhole	0.00		0
				0	Begin TV Observation	0.00		0
				91.2	Service Connection	0.00		0
				156.3	Pipe Material Change	0.00		0
				163.5	Pipe Material Change	0.00		0
				171.8	Service Connection w/Defect	0.35	Repair	5
				260.9	Joint w/ Infiltration	0.15	Grout	0
				269.1	Service Connection w/Defect	0.55	Repair	5
				289.1	Service Connection	0.00		0
				315.9	End TV Observation	0.00		0
				315.9	Service Connection w/ Break-I	0.15	Repair	5
<b>(BR-03)50625 - (BR-03)50620</b>								
4/23/2019	Walnut St							
6 "		263	263					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				20.2	Joint w/ Infiltration	0.25	Grout	0
				27.5	Joint w/ Infiltration	0.25	Grout	0
				46.5	Service Connection	0.00		0
				51.5	Service Connection	0.00		0
				66	Joint w/ Light Roots	0.01	Grout	0
				115.6	Service Connection	0.00		0
				136.6	Roots	0.50	Repair	5
				178.7	Joint w/ Infiltration	0.35	Grout	0
				201	Service Connection	0.00		0
				201.6	Joint w/ Infiltration	0.35	Grout	0
				201.6	Roots	0.01	Repair	5
				207	Roots	0.30	Repair	5
				215.5	Roots	0.30	Repair	5
				218.1	Roots	0.30	Repair	5
				235.4	Roots	0.01	Repair	5
				247.7	Roots	0.20	Repair	5
				256.3	Service Connection	0.00		0
				256.3	Roots	0.20	Repair	5
				263	Camera Blocked	0.00		0
				263	Pipe w/ Grease	0.00		0
				263	End TV Observation	0.00		0

1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

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Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		

**(BR-03)50630 - (BR-03)50625**

4/23/2019 Walnut St  
6 " 98.5

98.5

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
23.2	Joint w/ Light Roots	0.25	Grout	0
84.5	Joint w/ Infiltration	0.50	Grout	0
89.3	Service Connection	0.00		0
98.5	End TV Observation	0.00		0

**(BR-03)50635 - (BR-03)50610**

4/17/2019 NE 3rd St  
6 " 94.2

94.2

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
89.4	Pipe w/ Circular Crack	0.10	Repair	5
94.2	Upstream Manhole	0.00		0
94.2	End TV Observation	0.00		0

**(BR-03)50640 - (BR-03)50610**

4/17/2019 NE 3rd St  
10 " 171.2

171.2

5	Downstream Manhole	0.00		0
5	Begin TV Observation	0.00		0
62.7	Service Connection	0.00		0
171.2	Upstream Manhole	0.00		0
171.2	End TV Observation	0.00		0



# TV Inspection Report

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Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)

**(BR-03)50655 - (BR-03)50650**

4/17/2019 Walnut St  
6 " 247.3 358.9

5	Downstream Manhole	0.00				0
5	Begin TV Observation	0.00				0
9.7	Joint w/ Infiltration	0.80		Grout		0
55.6	Joint w/ Infiltration	0.15		Grout		0
65.9	Sag Begins	0.00				0
75.1	Sag Ends	0.00				0
89	Joint w/ Infiltration	0.15		Grout		0
171.8	Service Connection	0.00				0
175.4	Service Connection	0.00				0
186.2	Joint w/ Infiltration	0.05		Grout		0
195.2	Pipe w/ Grease	0.00				0
212.7	Pipe w/ Grease	0.00				0
247.3	Upstream Manhole	0.00				0
247.3	End TV Observation	0.00				0

**(BR-03)50665 - (BR-03)50640**

4/24/2019 Mills Park Rd  
8 " 201.2 201.2

5	Upstream Manhole	0.00				0
5	Begin TV Observation	0.00				0
94.1	Service Connection	0.00				0
116.6	Service Connection	0.00				0
194.2	Sag Begins	0.00				0
199.4	Sag Ends	0.00				0
201.2	Downstream Manhole	0.00				0
201.2	End TV Observation	0.00				0



# TV Inspection Report

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Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)
<b>(BR-03)50671 - (BR-03)50665</b>								
4/22/2019	Mills Park Rd							
6 "		342	342					
				0	Upstream Manhole	0.00		0
				5.2	Begin TV Observation	0.00		0
				5.2	Pipe w/ 0-25 Percent Flow	0.00		0
				14	Pipe w/ Deposits	0.00		0
				17.8	Service Connection	0.00		0
				22.3	Service Connection	0.00		0
				49.7	Joint w/ Infiltration	0.25	Grout	0
				55.3	Sag Begins	0.00		0
				57	Pipe w/ 26-50 Percent Flow	0.00		0
				66.2	Sag Ends	0.00		0
				90.2	Service Connection	0.00		0
				109	Joint w/ Infiltration	0.45	Grout	0
				120.4	Pipe Material Change	0.00		0
				123.2	Service Connection	0.00		0
				124.7	Pipe Material Change	0.00		0
				173	Pipe w/ Longitudinal Crack	0.50	Repair	5
				211.7	Service Connection	0.00		0
				241.8	Pipe w/ Longitudinal Crack	0.50	Repair	5
				245.6	Sag Begins	0.00		0
				247	Pipe w/ 26-50 Percent Flow	0.00		0
				250.5	Sag Ends	0.00		0
				270.1	Sag Begins	0.00		0
				271	Pipe w/ 26-50 Percent Flow	0.00		0
				277.3	Sag Ends	0.00		0
				342	Camera Blocked	0.00		0
				342	End TV Observation	0.00		0

**(BR-03)50675 - (BR-03)50670**

4/22/2019 Mills Park Dr  
6 " 353.2 353.2

				0	Downstream Manhole	0.00		0
				5.3	Begin TV Observation	0.00		0
				139.8	Pipe w/ Open Crack	0.30	Repair	5
				211.6	Joint w/ Infiltration	1.50	Grout	0
				220.6	Pipe w/ Grease	0.00		0
				241.6	Pipe w/ Grease	0.00		0
				253.6	Service Connection	0.00		0
				254.3	Pipe w/ Grease	0.00		0
				269.1	Pipe w/ Grease	0.00		0

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1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

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<i>Line Segment</i>		<i>TV</i>	<i>Segment</i>	<i>-----Repair-----</i>				
<i>Date</i>	<i>Street</i>	<i>Length</i>	<i>Length</i>	<i>Flow</i>	<i>Type</i>	<i>Length</i>		
<i>Dia.</i>		<i>(ft)</i>	<i>(ft)</i>	<i>Footage</i>	<i>Observations</i>	<i>(gpm)</i>		<i>(ft)</i>
				318.5	Service Connection	0.00		0
				353.2	Upstream Manhole	0.00		0
				353.2	End TV Observation	0.00		0
<b>(BR-06)60025 - (BR-06)60015</b>								
5/9/2019	Charles Ct							
18"		131.9	131.9					
				0	Downstream Manhole	0.00		0
				0	Begin TV Observation	0.00		0
				131.9	Upstream Manhole	0.00		0
				131.9	End TV Observation	0.00		0
<b>(BR-06)60030 - (BR-06)60025</b>								
5/9/2019	Charles Ct							
18"		212.1	212.1					
				0	Downstream Manhole	0.00		0
				0	Begin TV Observation	0.00		0
				212.1	Upstream Manhole	0.00		0
				212.1	End TV Observation	0.00		0
<b>(BR-06)60040 - (BR-06)60030</b>								
5/9/2019	Buckingham Pl							
18"		242.7	242.7					
				0	Upstream Manhole	0.00		0
				0	Begin TV Observation	0.00		0
				18.1	Service Connection	0.00		0
				45.9	Service Connection	0.00		0
				242.7	Downstream Manhole	0.00		0
				242.7	End TV Observation	0.00		0

1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

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Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	Footage	Observations	(gpm)		(ft)

**(BR-06)60060 - (BR-06)60055**

5/8/2019 Buckingham Pl  
18" 189.3 189.3

0	Upstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
105	Service Connection	0.00	0
113	Service Connection	0.00	0
189.3	Downstream Manhole	0.00	0
189.3	End TV Observation	0.00	0

**(BR-06)60065 - (BR-06)60060**

5/8/2019 Buckingham Pl  
18" 344.8 344.8

0	Downstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
51.7	Service Connection	0.00	0
59.2	Service Connection	0.00	0
192.6	Service Connection	0.00	0
206	Service Connection	0.00	0
344.8	Upstream Manhole	0.00	0
344.8	End TV Observation	0.00	0

**(BR-06)60075 - (BR-06)60065**

5/8/2019 William Ln  
18" 295.6 295.6

0	Upstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
295.6	Downstream Manhole	0.00	0
295.6	End TV Observation	0.00	0

1. Refer to the Recommended Line Replacements section of the report for cost details.



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Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		

**(BR-06)60080 - (BR-06)60075**

5/8/2019 Daisy Rd  
18" 201.6 201.6

0	Downstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
201.6	Upstream Manhole	0.00	0
201.6	End TV Observation	0.00	0

**(BR-06)60085 - (BR-06)60080**

5/8/2019 Daisy Rd  
18" 283.3 283.3

0	Upstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
283.3	Downstream Manhole	0.00	0
283.3	End TV Observation	0.00	0

**(BR-06)60090 - (BR-06)60085**

5/8/2019 Daisy Rd  
18" 268.6 268.6

0	Downstream Manhole	0.00	0
0	Begin TV Observation	0.00	0
268.6	Upstream Manhole	0.00	0
268.6	End TV Observation	0.00	0

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# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)	Footage	Observations
<b>(BR-06)60095 - (BR-06)60090</b>								
5/7/2019	Daisy Rd							
18"		217.9	217.9					
				0	Upstream Manhole	0.00		0
				0	Begin TV Observation	0.00		0
				217.9	Downstream Manhole	0.00		0
				217.9	End TV Observation	0.00		0
<b>(BR-06)60100 - (BR-06)60095</b>								
5/7/2019	Hilldale Rd							
18"		196.5	196.5					
				0	Upstream Manhole	0.00		0
				0	Begin TV Observation	0.00		0
				196.5	Downstream Manhole	0.00		0
				196.5	End TV Observation	0.00		0
<b>(BR-06)60220 - (BR-06)60100</b>								
5/7/2019	Hilldale Rd							
18"		82.8	82.8					
				5	Downstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				82.8	Upstream Manhole	0.00		0
				82.8	End TV Observation	0.00		0
<b>(BR-06)60225 - (BR-06)60220</b>								
5/10/2019	Hilldale Rd							
18"		133.1	133.1					
				5	Upstream Manhole	0.00		0
				5	Begin TV Observation	0.00		0
				133.1	Downstream Manhole	0.00		0
				133.1	End TV Observation	0.00		0

1. Refer to the Recommended Line Replacements section of the report for cost details.



# TV Inspection Report

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Line Segment		TV	Segment	-----Repair-----				
Date	Street	Length	Length	Flow	Type	Length		
Dia.		(ft)	(ft)	(gpm)		(ft)		

**(BR-06)61030 - (BR-06)61025**

Creekside Cv  
8 " 346.3 346.3

5	Upstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
38.6	Service Connection	0.00	0
53.8	Service Connection	0.00	0
56.1	Pipe w/ Deposits	0.00	0
139.1	Service Connection	0.00	0
140	Service Connection	0.00	0
225.8	Service Connection	0.00	0
231.2	Service Connection	0.00	0
240.4	Service Connection	0.00	0
284.5	Service Connection	0.00	0
293.9	Pipe w/ Longitudinal Crack	0.10	Repair 5
328.5	Service Connection	0.00	0
343.3	Service Connection	0.00	0
344.6	Service Connection	0.00	0
346.3	Upstream Manhole	0.00	0
346.3	End TV Observation	0.00	0

**(BR-06)LS-23C - (BR-06)LS-23B**

4/29/2019 Barbara Ct  
8 " 72.3 72.3

5	Upstream Manhole	0.00	0
5	Begin TV Observation	0.00	0
53.4	Service Connection	0.00	0
72.3	Downstream Manhole	0.00	0
72.3	End TV Observation	0.00	0



# TV Inspection Report

Project Number 18-3326-00 Bryant\_2018\_SSES

<i>Line Segment</i>		<i>TV</i>	<i>Segment</i>	<i>-----Repair-----</i>					
<i>Date</i>	<i>Street</i>	<i>Length</i>	<i>Length</i>	<i>Flow</i>	<i>Type</i>	<i>Length</i>			
<i>Dia.</i>		<i>(ft)</i>	<i>(ft)</i>	<i>(gpm)</i>		<i>(ft)</i>			
<b>(BR-06)LS-23D - (BR-06)LS-23E</b>									
	Karin Ln								
8 "		124.2	124.2						
				5	Upstream Manhole	0.00			0
				5	Begin TV Observation	0.00			0
				66.2	Service Connection	0.00			0
				69.2	Service Connection	0.00			0
				124.2	Downstream Manhole	0.00			0
				124.2	End TV Observation	0.00			0

<b>(BR-06)LS-23E - (BR-06)LS-23C</b>									
4/29/2019	Barbara Ct								
8 "		152.6	152.6						
				5	Upstream Manhole	0.00			0
				5	Begin TV Observation	0.00			0
				55.6	Service Connection	0.00			0
				70.4	Service Connection	0.00			0
				152.6	Downstream Manhole	0.00			0
				152.6	End TV Observation	0.00			0

**Total TV Length (ft)** 13,166

**Total Segment Length (ft)** 13,903



# Manhole Rehabilitation Recommendations Priority One

Project Number 18-3326-00 Bryant\_2018\_SSES

Manhole	Repair Description	Street Address	Construction / MH Type	Surface	Depth	Rating	Grade	Repair Cost	Cumulative Repair Cost	Inflow (GPD)	Infiltration (GPD)	Total Inflow (GPD)	Cumulative Flow (GPD)	Ratio (\$/GPD)	Count
BR-06-60995	Install Bolts/Gasket for Bolted Cover	5525 Oak Meadows Rd	Precast / N/A	Non-Paved	6.76	0.0		\$100	\$100	2,880		2,880	2,880	0.035	1
BR-06-61000	Install Bolts/Gasket for Bolted Cover	5525 Oak Meadows Rd	Rehab / N/A	Paved	6.52	0.0		\$100	\$200	1,152		1,152	4,032	0.087	2
BR-06-60100	Install Bolts/Gasket for Bolted Cover	518 Hilldale Rd	Precast / N/A	Non-Paved	9.65	0.0		\$100	\$300	864		864	4,896	0.116	3
BR-06-60075	Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Bolts/Gasket for Bolted Cover	5445 William Ln	Precast / N/A	Non-Paved	8.39	0.0		\$1,070	\$1,370	2,880	5,760	8,640	13,536	0.124	4
BR-03-50045	Grout Lower 18" of Manhole and Repair Bench/Trough	1203 Boone Rd	Rehab / N/A	Non-Paved	3.80	0.0		\$1,000	\$2,370		7,200	7,200	20,736	0.139	5
BR-03-50295	Replace Cover/Frame/Frame Seal and Adjustment	803 Boone Rd	Rehab / N/A	Paved	6.61	0.0		\$1,500	\$3,870	3,600		3,600	24,336	0.417	6
BR-06-60190	Replace Cover/Frame/Frame Seal and Adjustment	5306 Buckingham Pl	Precast / N/A	Non-Paved	5.67	0.0		\$1,500	\$5,370	2,160		2,160	26,496	0.694	7
BR-06-60225	Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Bolts/Gasket for Bolted Cover	518 Hilldale Rd	Precast / N/A	Non-Paved	9.50	0.0		\$1,070	\$6,440	720	288	1,008	27,504	1.062	8
BR-03-50395	Replace Cover/Frame/Frame Seal	503 N Reynolds Rd	Rehab / N/A	Non-Paved	7.95	0.0		\$1,050	\$7,490	936		936	28,440	1.122	9
BR-03-50185	Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Internal Chimney Seal	205 E Richardson Pl	Precast / N/A	Non-Paved	6.14	0.0		\$1,700	\$9,190	1,152	288	1,440	29,880	1.181	10
BR-03-50275	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	902 Boswell Rd	Rehab / N/A	Paved	12.29	0.0		\$3,500	\$12,690	72	2,880	2,952	32,832	1.186	11
BR-06-60175	Replace Cover/Frame/Frame Seal	2104 Magna Carta Ln	Poured / N/A	Non-Paved	6.82	0.0		\$1,050	\$13,740	864		864	33,696	1.215	12
BR-06-60245	Replace Cover/Frame/Frame Seal	1140 Oak Glen Lp	Precast / N/A	Non-Paved	9.29	0.0		\$1,050	\$14,790	864		864	34,560	1.215	13
BR-06-60120	Replace Cover/Frame/Frame Seal	2400 Henry Ave	Precast / N/A	Non-Paved	10.51	0.0		\$1,050	\$15,840	864		864	35,424	1.215	14
BR-06-61015	Replace Cover/Frame/Frame Seal	5611 Oakbrook Rd	Precast / N/A	Non-Paved	8.36	0.0		\$1,050	\$16,890	864		864	36,288	1.215	15
BR-03-50225	Replace Cover/Frame/Frame Seal and Adjustment	811 NW 4th St	Precast / N/A	Non-Paved	15.50	0.0		\$1,500	\$18,390	1,152		1,152	37,440	1.302	16
BR-06-61025	Install Bolts/Gasket for Bolted Cover	Lot 31 Dawson's Point AVE	Precast / N/A	Non-Paved	8.55	0.0		\$100	\$18,490	72		72	37,512	1.389	17
BR-03-50075	Grout Lower 18" of Manhole and Repair Bench/Trough	208 Summerfields Dr	Poured / N/A	Non-Paved	7.48	0.0		\$1,000	\$19,490		720	720	38,232	1.389	18
BR-03-50055	Grout Lower 18" of Manhole and Repair Bench/Trough	1209 S Richardson Pl	Poured / N/A	Non-Paved	7.00	0.0		\$1,000	\$20,490		720	720	38,952	1.389	19
BR-03-50340	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	24 Tanglewood Dr	Precast / N/A	Paved	10.43	0.0		\$3,500	\$23,990	2,160	288	2,448	41,400	1.430	20
BR-06-60085	Complete Manhole Rehab w/o New Frame and Cover	518 Hilldale Rd	Rehab / N/A	Non-Paved	8.57	0.0		\$1,971	\$25,961	720	648	1,368	42,768	1.441	21
BR-03-50360	Replace Cover/Frame/Frame Seal	509 Boswell Rd	Precast / N/A	Non-Paved	7.35	0.0		\$1,050	\$27,011	720		720	43,488	1.458	22
BR-03-50180	Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Internal Chimney Seal	1009 S Richardson Pl	Precast / N/A	Non-Paved	5.68	0.0		\$1,700	\$28,711	864	288	1,152	44,640	1.476	23
BR-03-50175	Grout Lower 18" of Manhole, Repair Bench/Trough, and Install Internal Chimney Seal	1003 Hazlewood CV	Precast / N/A	Paved	6.35	0.0		\$1,800	\$30,511	864	288	1,152	45,792	1.562	24
BR-03-50470	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	309 Boone Rd	Rehab / N/A	Non-Paved	4.73	0.0		\$3,100	\$33,611	1,224	648	1,872	47,664	1.656	25
BR-06-61100	Replace Cover/Frame/Frame Seal	5710 Spring Side Ave	Precast / N/A	Paved	5.90	0.0		\$1,450	\$35,061	864		864	48,528	1.678	26
BR-06-61090	Replace Cover/Frame/Frame Seal	301 Creek Side CV	Precast / N/A	Paved	10.94	0.0		\$1,450	\$36,511	864		864	49,392	1.678	27
BR-06-60255	Replace Cover/Frame/Frame Seal	1142 Oak Glen Lp	Precast / N/A	Paved	9.13	0.0		\$1,450	\$37,961	864		864	50,256	1.678	28
BR-03-50660	Replace Cover/Frame/Frame Seal	306 N Reynolds Rd	Rehab / N/A	Paved	4.04	0.0		\$1,450	\$39,411	720		720	50,976	2.014	29
BR-03-50230	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	902 N Richardson Pl	Precast / N/A	Non-Paved	15.35	0.0		\$3,100	\$42,511	720	720	1,440	52,416	2.153	30
BR-03-50695	Repair Corbel	508 N Reynolds Rd	Rehab / N/A	Non-Paved	5.95	0.0		\$500	\$43,011	216		216	52,632	2.315	31
BR-06-60960D	Repair Corbel	1311 Oak Glen PL	Precast / N/A	Paved	6.88	0.0		\$500	\$43,511	216		216	52,848	2.315	32
BR-06-60960B	Repair Corbel	1411 Oak Glenn CT	Precast / N/A	Paved	4.34	0.0		\$500	\$44,011	216		216	53,064	2.315	33



<u>Manhole</u>	<u>Repair Description</u>	<u>Street Address</u>	<u>Construction / MH Type</u>	<u>Surface</u>	<u>Depth</u>	<u>Rating</u>	<u>Grade</u>	<u>Repair Cost</u>	<u>Cumulative Repair Cost</u>	<u>Inflow (GPD)</u>	<u>Infiltration (GPD)</u>	<u>Total Inflow (GPD)</u>	<u>Cumulative Flow (GPD)</u>	<u>Ratio (\$/GPD)</u>	<u>Count</u>
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<b>Report Totals:</b>	Total Cost: \$44,011	Total Inflow:	32,328
		Total Infiltration:	20,736
		Total Inflow:	53,064



# Manhole Rehabilitation Recommendations Priority Two

Project Number 18-3326-00 Bryant\_2018\_SSES

Manhole	Repair Description	Street Address	Construction / MH Type	Surface	Depth	Rating	Grade	Repair Cost	Cumulative Repair Cost	Inflow (GPD)	Infiltration (GPD)	Total Inflow (GPD)	Cumulative Flow (GPD)	Ratio (\$/GPD)	Count
BR-03-50020	Complete Manhole Rehab w/o New Frame and Cover	1103 Boone Rd	Rehab / N/A	Paved	4.70	0.0		\$1,352	\$1,352	216	288	504	504	2.683	1
BR-03-50140	Grout Lower 18" of Manhole and Repair Bench/Trough	1108 N Richardson Pl	Poured / N/A	Non-Paved	6.15	0.0		\$1,000	\$2,352		360	360	864	2.778	2
BR-03-50655	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	108 Mills Park Rd	Rehab / N/A	Paved	6.31	0.0		\$3,500	\$5,852	936	288	1,224	2,088	2.859	3
BR-03-50450	Replace Cover/Frame/Frame Seal	101 NW 3 rd St	Precast / N/A	Non-Paved	7.10	0.0		\$1,050	\$6,902	360		360	2,448	2.917	4
BR-03-50715	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	418 Mills Park Rd	Rehab / N/A	Non-Paved	8.34	0.0		\$3,100	\$10,002	720	288	1,008	3,456	3.075	5
BR-03-50545	Cementitious Coating, Grout Lower 18" of Manhole, and Repair Bench/Trough	504 NW 4 th St	None / N/A	Paved	3.80	0.0		\$1,608	\$11,610	216	288	504	3,960	3.190	6
BR-06-60090	Complete Manhole Rehab w/o New Frame and Cover	518 Hilldale Rd	Rehab / N/A	Non-Paved	9.89	0.0		\$2,182	\$13,792		648	648	4,608	3.368	7
BR-06-LS-23K	Grout Lower 18" of Manhole and Repair Bench/Trough	4705 Meadow Ridge Ln	Precast / N/A	Non-Paved	5.65	0.0		\$1,000	\$14,792		288	288	4,896	3.472	8
BR-06-61110B	Grout Lower 18" of Manhole and Repair Bench/Trough	6017 Springwood Cir	Precast / N/A	Non-Paved	5.56	0.0		\$1,000	\$15,792		288	288	5,184	3.472	9
BR-06-60250	Grout Lower 18" of Manhole and Repair Bench/Trough	1140 Oak Glen Lp	Precast / N/A	Paved	11.88	0.0		\$1,000	\$16,792		288	288	5,472	3.472	10
BR-06-60060	Grout Lower 18" of Manhole and Repair Bench/Trough	5358 Buckingham Pl	Poured / N/A	Non-Paved	10.17	0.0		\$1,000	\$17,792		288	288	5,760	3.472	11
BR-03-50700	Grout Lower 18" of Manhole and Repair Bench/Trough	508 N Reynolds Rd	Precast / N/A	Paved	4.84	0.0		\$1,000	\$18,792		288	288	6,048	3.472	12
BR-03-50391	Grout Lower 18" of Manhole and Repair Bench/Trough	605 N Reynolds Rd	Precast / N/A	Non-Paved	8.28	0.0		\$1,000	\$19,792		288	288	6,336	3.472	13
BR-03-50390	Grout Lower 18" of Manhole and Repair Bench/Trough	801 N Reynolds Rd	Rehab / N/A	Non-Paved	11.91	0.0		\$1,000	\$20,792		288	288	6,624	3.472	14
BR-03-50205	Grout Lower 18" of Manhole and Repair Bench/Trough	304 Fair Oaks Dr	Rehab / N/A	Non-Paved	4.44	0.0		\$1,000	\$21,792		288	288	6,912	3.472	15
BR-03-50200	Grout Lower 18" of Manhole and Repair Bench/Trough	204 Fair Oaks Dr	Precast / N/A	Non-Paved	4.28	0.0		\$1,000	\$22,792		288	288	7,200	3.472	16
BR-03-50190	Grout Lower 18" of Manhole and Repair Bench/Trough	1009 S Richardson Pl	Precast / N/A	Non-Paved	5.57	0.0		\$1,000	\$23,792		288	288	7,488	3.472	17
BR-03-50050	Grout Lower 18" of Manhole and Repair Bench/Trough	1109 S Richardson Pl	Poured / N/A	Non-Paved	7.50	0.0		\$1,000	\$24,792		288	288	7,776	3.472	18
BR-03-50135	Grout Lower 18" of Manhole and Repair Bench/Trough	1206 N Richardson Pl	Poured / N/A	Non-Paved	8.08	0.0		\$1,000	\$25,792		288	288	8,064	3.472	19
BR-03-50100	Grout Lower 18" of Manhole and Repair Bench/Trough	300 Richwoods Dr	Poured / N/A	Non-Paved	8.60	0.0		\$1,000	\$26,792		288	288	8,352	3.472	20
BR-03-50095	Grout Lower 18" of Manhole and Repair Bench/Trough	304 Morningside Dr	Rehab / N/A	Non-Paved	6.35	0.0		\$1,000	\$27,792		288	288	8,640	3.472	21
BR-03-50085	Grout Lower 18" of Manhole and Repair Bench/Trough	304 Morningside Dr	Poured / N/A	Non-Paved	5.54	0.0		\$1,000	\$28,792		288	288	8,928	3.472	22
BR-03-50030	Grout Lower 18" of Manhole and Repair Bench/Trough	1105 S Richardson Pl	Poured / N/A	Non-Paved	7.00	0.0		\$1,000	\$29,792		288	288	9,216	3.472	23
BR-03-50025	Grout Lower 18" of Manhole and Repair Bench/Trough	1008 S Richardson Pl	Precast / N/A	Non-Paved	5.90	0.0		\$1,000	\$30,792		288	288	9,504	3.472	24
BR-03-50015	Grout Lower 18" of Manhole and Repair Bench/Trough	1103 Boone Rd	Precast / N/A	Non-Paved	4.24	0.0		\$1,000	\$31,792		288	288	9,792	3.472	25
BR-03-50195	Grout Lower 18" of Manhole and Repair Bench/Trough	1009 S Richardson PL	Precast / N/A	Non-Paved	5.40	0.0		\$1,000	\$32,792		288	288	10,080	3.472	26
BR-06-60095	Complete Manhole Rehab w/o New Frame and Cover	518 Hilldale Rd	Rehab / N/A	Non-Paved	10.32	0.0		\$2,251	\$35,044		648	648	10,728	3.474	27
BR-03-50710	Replace Cover/Frame/Frame Seal	514 Mills Park Rd	Rehab / N/A	Non-Paved	5.78	0.0		\$1,050	\$36,094	288		288	11,016	3.646	28
BR-03-50480	Replace Cover/Frame/Frame Seal	211 Boone Rd	Rehab / N/A	Non-Paved	3.81	0.0		\$1,050	\$37,144	288		288	11,304	3.646	29
BR-03-50475	Replace Cover/Frame/Frame Seal	211 Boone Rd	Rehab / N/A	Non-Paved	13.40	0.0		\$1,050	\$38,194	288		288	11,592	3.646	30
BR-03-50455	Replace Cover/Frame/Frame Seal	507 Boone Rd	Precast / N/A	Non-Paved	7.77	0.0		\$1,050	\$39,244	288		288	11,880	3.646	31
BR-03-50400	Replace Cover/Frame/Frame Seal	403 N Reynolds Rd	Precast / N/A	Non-Paved	8.79	0.0		\$1,050	\$40,294	288		288	12,168	3.646	32
BR-03-50680	Replace Cover/Frame/Frame Seal	107 Mills Park Rd	Rehab / N/A	Non-Paved	9.35	0.0		\$1,050	\$41,344	288		288	12,456	3.646	33
BR-03-50301	Replace Cover/Frame/Frame Seal	511 Boone Rd	Precast / N/A	Non-Paved	7.11	0.0		\$1,050	\$42,394	288		288	12,744	3.646	34
BR-03-50170	Grout Lower 18" of Manhole and Repair Bench/Trough	1003 Hazlewood CV	Precast / N/A	Non-Paved	5.58	0.0		\$1,000	\$43,394		216	216	12,960	4.630	35
BR-03-50250	Cementitious Coating and Replace Cover/Frame/Frame Seal	805 NW 4th St	Precast / N/A	Non-Paved	5.05	0.0		\$2,058	\$45,452	72	360	432	13,392	4.764	36



Manhole	Repair Description	Street Address	Construction / MH Type	Surface	Depth	Rating	Grade	Repair Cost	Cumulative Repair Cost	Inflow (GPD)	Infiltration (GPD)	Total Inflow (GPD)	Cumulative Flow (GPD)	Ratio (\$/GPD)	Count
BR-03-50280	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	805 Boswell Rd	Rehab / N/A	Paved	7.21	0.0		\$3,500	\$48,952	72	648	720	14,112	4.861	37
BR-03-50215	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	11 Pine Chaple Dr	Precast / N/A	Non-Paved	10.40	0.0		\$3,100	\$52,052	72	547	619	14,731	5.006	38
BR-03-50485	Replace Cover/Frame/Frame Seal	108 N Elm St	Precast / N/A	Paved	16.02	0.0		\$1,450	\$53,502	288		288	15,019	5.035	39
BR-03-50675	Replace Cover/Frame/Frame Seal	201 Mills Park Rd	Precast / N/A	Paved	9.10	0.0		\$1,450	\$54,952	288		288	15,307	5.035	40
BR-03-50555	Replace Cover/Frame/Frame Seal	401 NW 4th St	Precast / N/A	Paved	8.30	0.0		\$1,450	\$56,402	288		288	15,595	5.035	41
BR-03-50615	Replace Cover/Frame/Frame Seal	205 S Laurel St	Precast / N/A	Paved	6.11	0.0		\$1,450	\$57,852	288		288	15,883	5.035	42
BR-03-50590	Replace Cover/Frame/Frame Seal	108 N Hazel St	Rehab / N/A	Paved	4.03	0.0		\$1,450	\$59,302	288		288	16,171	5.035	43
BR-03-50585	Replace Cover/Frame/Frame Seal	107 N Hazel St	Rehab / N/A	Paved	18.50	0.0		\$1,450	\$60,752	288		288	16,459	5.035	44
BR-03-50635	Replace Cover/Frame/Frame Seal	502 NW 3 rd St	Rehab / N/A	Paved	2.60	0.0		\$1,450	\$62,202	288		288	16,747	5.035	45
BR-03-50535	Replace Cover/Frame/Frame Seal	403 N Reynolds Rd	Precast / N/A	Paved	7.71	0.0		\$1,450	\$63,652	288		288	17,035	5.035	46
BR-03-50530	Replace Cover/Frame/Frame Seal	801 N Reynolds Rd	Precast / N/A	Paved	8.05	0.0		\$1,450	\$65,102	288		288	17,323	5.035	47
BR-03-50515	Replace Cover/Frame/Frame Seal	407 Boone Rd	Rehab / N/A	Paved	8.85	0.0		\$1,450	\$66,552	288		288	17,611	5.035	48
BR-03-50505	Replace Cover/Frame/Frame Seal	200 Rich St	Rehab / N/A	Paved	13.80	0.0		\$1,450	\$68,002	288		288	17,899	5.035	49
BR-03-50650	Replace Cover/Frame/Frame Seal	308 N Hazel St	Precast / N/A	Paved	5.68	0.0		\$1,450	\$69,452	288		288	18,187	5.035	50
BR-03-50430	Replace Cover/Frame/Frame Seal	209 N Vine St	Rehab / N/A	Paved	6.50	0.0		\$1,450	\$70,902	288		288	18,475	5.035	51
BR-03-50425	Replace Cover/Frame/Frame Seal	211 NW 4th St	Rehab / N/A	Paved	9.73	0.0		\$1,450	\$72,352	288		288	18,763	5.035	52
BR-03-50310	Replace Cover/Frame/Frame Seal	507 Boone Rd	Rehab / N/A	Paved	9.89	0.0		\$1,450	\$73,802	288		288	19,051	5.035	53
BR-03-50305	Replace Cover/Frame/Frame Seal	507 Boone Rd	Rehab / N/A	Paved	9.50	0.0		\$1,450	\$75,252	288		288	19,339	5.035	54
BR-03-50510	Replace Cover/Frame/Frame Seal	102 N Reynolds Rd	Precast / N/A	Paved	16.50	0.0		\$1,450	\$76,702	288		288	19,627	5.035	55
BR-03-50625	Replace Cover/Frame/Frame Seal	203 NE 2nd St	Rehab / N/A	Paved	4.22	0.0		\$1,450	\$78,152	288		288	19,915	5.035	56
BR-03-50150	Grout Lower 18" of Manhole and Repair Bench/Trough	1010 N Richardson Pl	Precast / N/A	Paved	7.38	0.0		\$1,000	\$79,152		187	187	20,102	5.342	57
BR-03-50060	Grout Lower 18" of Manhole and Repair Bench/Trough	200 Richwoods Dr	Rehab / N/A	Non-Paved	6.98	0.0		\$1,000	\$80,152		187	187	20,290	5.342	58
BR-03-50405	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	401 N Reynolds Rd	Rehab / N/A	Non-Paved	10.40	0.0		\$3,100	\$83,252	288	288	576	20,866	5.382	59
BR-03-50420	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	303 N Reynolds Rd	Rehab / N/A	Non-Paved	7.64	0.0		\$3,100	\$86,352	288	288	576	21,442	5.382	60
BR-03-50600	Compete Manhole Rehab w/ New Frame and Cover	401 NE 1st St	Precast / N/A	Non-Paved	12.22	0.0		\$3,580	\$89,932	288	360	648	22,090	5.525	61
BR-03-50300	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	501 Boone Rd	Rehab / N/A	Paved	8.70	0.0		\$3,500	\$93,432	288	288	576	22,666	6.076	62
BR-03-50355	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	708 Boswell Rd	Rehab / N/A	Paved	4.41	0.0		\$3,500	\$96,932	288	288	576	23,242	6.076	63
BR-03-50560	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	400 NW 3 rd St	Rehab / N/A	Paved	6.90	0.0		\$3,500	\$100,432	288	288	576	23,818	6.076	64
BR-03-50645	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	402 Mills Park Rd	Rehab / N/A	Paved	7.44	0.0		\$3,500	\$103,932	288	288	576	24,394	6.076	65
BR-06-61125	Replace Cover/Frame/Frame Seal	104 Canyon Way	Precast / N/A	Paved	5.19	0.0		\$1,450	\$105,382	222		222	24,615	6.539	66
BR-06-60965C	Cementitious Coating	1308 Crossing LP	Precast / N/A	Paved	7.28	0.0		\$1,165	\$106,547		173	173	24,788	6.741	67
BR-03-50245	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	7 Tanglewood Dr	Precast / N/A	Non-Paved	5.76	0.0		\$3,100	\$109,647	72	360	432	25,220	7.176	68
BR-03-50640	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	412 Mills Park Rd	Rehab / N/A	Non-Paved	3.98	0.0		\$3,100	\$112,747	72	288	360	25,580	8.611	69
BR-03-50240	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	15 Tanglewood Dr	Precast / N/A	Non-Paved	5.56	0.0		\$3,100	\$115,847	72	288	360	25,940	8.611	70
BR-03-50605	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	401 NE 1st St	Rehab / N/A	Non-Paved	12.23	0.0		\$3,100	\$118,947	72	288	360	26,300	8.611	71
BR-03-50220	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	11 Pine Chaple Dr	Precast / N/A	Non-Paved	13.27	0.0		\$3,100	\$122,047	72	288	360	26,660	8.611	72
BR-03-50440	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	504 Hayden Creek Dr	Rehab / N/A	Non-Paved	6.78	0.0		\$3,100	\$125,147	72	288	360	27,020	8.611	73
BR-03-50370	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	801 N Reynolds Rd	Rehab / N/A	Non-Paved	10.30	0.0		\$3,100	\$128,247	72	288	360	27,380	8.611	74



Manhole	Repair Description	Street Address	Construction / MH Type	Surface	Depth	Rating	Grade	Repair Cost	Cumulative Repair Cost	Inflow (GPD)	Infiltration (GPD)	Total Inflow (GPD)	Cumulative Flow (GPD)	Ratio (\$/GPD)	Count
BR-03-50550	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	528 Hayden Creek Dr	Rehab / N/A	Non-Paved	6.65	0.0		\$3,100	\$131,347	72	288	360	27,740	8.611	75
BR-03-50580	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	102 NE 2nd St	Rehab / N/A	Non-Paved	6.29	0.0		\$3,100	\$134,447	72	288	360	28,100	8.611	76
BR-03-50685	Cementitious Coating and Grout Pipe Seals	400 N Reynolds Rd	Brick / N/A	Non-Paved	7.73	0.0		\$1,887	\$136,333	216		216	28,316	8.735	77
BR-03-50705	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	418C Mills Park Rd	Rehab / N/A	Paved	8.14	0.0		\$3,500	\$139,833	72	288	360	28,676	9.722	78
BR-03-50335	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	23 Tanglewood Dr	Precast / N/A	Paved	10.02	0.0		\$3,500	\$143,333	72	288	360	29,036	9.722	79
BR-03-50330	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	20 Tanglewood Dr	Precast / N/A	Paved	9.00	0.0		\$3,500	\$146,833	72	288	360	29,396	9.722	80
BR-03-50445	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	101 NW 3rd St	Rehab / N/A	Paved	7.61	0.0		\$3,500	\$150,333	72	288	360	29,756	9.722	81
BR-03-50540	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	410 NW 4th St	Precast / N/A	Paved	8.70	0.0		\$3,500	\$153,833	72	288	360	30,116	9.722	82
BR-03-50620	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	211 NE 2nd St	Rehab / N/A	Paved	7.58	0.0		\$3,500	\$157,333	72	288	360	30,476	9.722	83
BR-03-50210	Grout Lower 18" of Manhole and Replace Cover/Frame/Frame Seal	903 Boone Rd	Rehab / N/A	Paved	7.70	0.0		\$3,500	\$160,833	72	187	259	30,735	13.503	84
BR-03-50235	Replace Cover/Frame/Frame Seal	9 Pine Chaple Dr	Precast / N/A	Non-Paved	9.88	0.0		\$1,050	\$161,883	72		72	30,807	14.583	85
BR-03-50255	Replace Cover/Frame/Frame Seal	403 Beverly Pl	Rehab / N/A	Non-Paved	4.88	0.0		\$1,050	\$162,933	72		72	30,879	14.583	86
BR-03-50410	Replace Cover/Frame/Frame Seal	403 N Reynolds Rd	Precast / N/A	Non-Paved	9.90	0.0		\$1,050	\$163,983	72		72	30,951	14.583	87
BR-03-50575	Replace Cover/Frame/Frame Seal	103 N Reynolds Rd	Precast / N/A	Non-Paved	4.10	0.0		\$1,050	\$165,033	72		72	31,023	14.583	88
BR-03-50465	Replace Cover/Frame/Frame Seal	309 Boone Rd	Rehab / N/A	Non-Paved	9.45	0.0		\$1,050	\$166,083	72		72	31,095	14.583	89
BR-03-50490	Replace Cover/Frame/Frame Seal	111 Boone Rd	Rehab / N/A	Non-Paved	4.03	0.0		\$1,050	\$167,133	72		72	31,167	14.583	90
BR-03-50500	Replace Cover/Frame/Frame Seal	111 Boone Rd	Rehab / N/A	Non-Paved	4.66	0.0		\$1,050	\$168,183	72		72	31,239	14.583	91
BR-03-50670	Replace Cover/Frame/Frame Seal	211 Mills Park Rd	Rehab / N/A	Non-Paved	4.87	0.0		\$1,050	\$169,233	72		72	31,311	14.583	92
BR-03-50495	Replace Cover/Frame/Frame Seal	111 Boone Rd	Rehab / N/A	Non-Paved	4.10	0.0		\$1,050	\$170,283	72		72	31,383	14.583	93
BR-03-50005	Replace Cover/Frame/Frame Seal	1109 BOONE RD	Rehab / N/A	Paved	10.80	0.0		\$1,450	\$171,733	72		72	31,455	20.139	94
BR-03-50671	Replace Cover/Frame/Frame Seal	311 Mills Park Rd	Rehab / N/A	Paved	5.59	0.0		\$1,450	\$173,183	72		72	31,527	20.139	95
BR-03-50285	Replace Cover/Frame/Frame Seal	916 Boswell Rd	Rehab / N/A	Paved	4.20	0.0		\$1,450	\$174,633	72		72	31,599	20.139	96
BR-03-50610	Replace Cover/Frame/Frame Seal	411 NE 3rd St	Precast / N/A	Paved	7.74	0.0		\$1,450	\$176,083	72		72	31,671	20.139	97
BR-03-50350	Replace Cover/Frame/Frame Seal	404 Beverly Pl	Rehab / N/A	Paved	5.90	0.0		\$1,450	\$177,533	72		72	31,743	20.139	98
BR-03-50460	Replace Cover/Frame/Frame Seal	107 N Pine St	Precast / N/A	Paved	9.54	0.0		\$1,450	\$178,983	72		72	31,815	20.139	99
BR-03-50525	Replace Cover/Frame/Frame Seal	104 N Walnut St	Precast / N/A	Paved	16.94	0.0		\$1,450	\$180,433	72		72	31,887	20.139	100
BR-03-50415	Replace Cover/Frame/Frame Seal	201 NW 4th St	Precast / N/A	Paved	10.94	0.0		\$1,450	\$181,883	72		72	31,959	20.139	101
BR-03-50435	Replace Cover/Frame/Frame Seal	310 Boone Rd	Rehab / N/A	Paved	6.26	0.0		\$1,450	\$183,333	72		72	32,031	20.139	102
BR-03-50595	Replace Cover/Frame/Frame Seal	401 NE 1 st St	Rehab / N/A	Paved	18.03	0.0		\$1,450	\$184,783	72		72	32,103	20.139	103

<b>Report Totals:</b>	Total Cost: \$184,783	Total Inflow:	14,838
		Total Infiltration:	17,265
		Total Inflow:	32,103



*Appendix H*  
*List of Lines Televised*



Basin	USMH	DSMH	Pipe Diameter (IN)	Segment Length (FT)	Actual Televised (FT)	Inflow (GPD)	Infiltration (GPD)
<b>BR-03</b>							
BR-03	50015	50010	8	51.4	51.4	-	144.0
BR-03	50020	50010	10	71.2	71.2	-	14.4
BR-03	50055	50050	8	308.5	308.5	-	-
BR-03	50060	50050	6	109.9	109.9	-	-
BR-03	50065	50055	6	407.4	407.4	-	-
BR-03	50080	50065	6	272.8	272.8	-	288.0
BR-03	50100	50060	6	305.7	305.7	-	-
BR-03	50125	50130	6	133.5	133.5	-	-
BR-03	50130	50135	6	276.6	276.6	-	144.0
BR-03	50135	50140	6	366	366	-	-
BR-03	50140	50145	6	368.4	368.4	-	144.0
BR-03	50145	50150	6	90.2	90.2	-	-
BR-03	50190	50195	8	50.6	50.6	-	-
BR-03	50210	50020	10	511.4	318.1	-	374.4
BR-03	50245	50240	6	149.2	149.2	-	86.4
BR-03	50290	50210	10	331.2	331.2	-	360.0
BR-03	50295	50290	10	255.8	255.8	-	432.0
BR-03	50301	50295	10	250.4	250.4	-	72.0
BR-03	50335	50330	8	265.1	265.1	-	-
BR-03	50340	50335	8	239.3	239.3	-	-
BR-03	50345	50340	8	293.0	8.3	-	-
BR-03	50440	50515A	8	142	46.4	-	-
BR-03	50445	50430	6	356.1	356.1	-	244.8



*Appendix H  
List of Lines Televised*

<b>Basin</b>	<b>USMH</b>	<b>DSMH</b>	<b>Pipe Diameter (IN)</b>	<b>Segment Length (FT)</b>	<b>Actual Televised (FT)</b>	<b>Inflow (GPD)</b>	<b>Infiltration (GPD)</b>
BR-03	50455	50515	10	175.1	175.1	-	-
BR-03	50460	50455	10	346.6	346.6	-	-
BR-03	50495	50490	6	11.1	3.1	-	-
BR-03	50500	50495	6	114.9	114.9	-	273.6
BR-03	50530	50535	6	303.3	303.3	-	-
BR-03	50535	50555	8	198.2	198.2	-	-
BR-03	50550	50440	8	148.9	148.9	-	216.0
BR-03	50560	50550	6	339	339	-	-
BR-03	50575	50570	6	167.2	167.2	-	72.0
BR-03	50580	50575	6	96.3	96.3	-	216.0
BR-03	50580A	50580	6	115.7	115.7	-	-
BR-03	50605	50600	10	43.8	43.8	-	216.0
BR-03	50610	50605	10	177.3	177.3	-	374.4
BR-03	50615	50605	8	322	322	-	1,166.4
BR-03	50620	50615	6	360	315.9	-	648.0
BR-03	50625	50620	6	263	263	-	187.2
BR-03	50630	50625	6	98.5	98.5	-	14.4
BR-03	50635	50610	6	94.2	94.2	-	144.0
BR-03	50640	50610	10	171.2	171.2	-	-
BR-03	50655	50650	6	358.9	247.3	-	72.0
BR-03	50665	50640	8	201.2	201.2	-	-
BR-03	50671	50665	6	342	342	-	432.0
BR-03	50675	50670	6	353.2	353.2	-	72.0
<i>Subtotal</i>				<b>10,407.3</b>	<b>9,670.0</b>	-	<b>6,408.0</b>



*Appendix H  
List of Lines Televised*



Basin	USMH	DSMH	Pipe Diameter (IN)	Segment Length (FT)	Actual Televised (FT)	Inflow (GPD)	Infiltration (GPD)
<b>BR-06</b>							
BR-06	60025	60015	18	131.9	131.9	-	-
BR-06	60030	60025	18	212.1	212.1	-	-
BR-06	60040	60030	18	242.7	242.7	-	-
BR-06	60060	60055	18	189.3	189.3	-	-
BR-06	60065	60060	18	344.8	344.8	-	-
BR-06	60075	60065	18	295.6	295.6	-	-
BR-06	60080	60075	18	201.6	201.6	-	-
BR-06	60085	60080	18	283.3	283.3	-	-
BR-06	60090	60085	18	268.6	268.6	-	-
BR-06	60095	60090	18	217.9	217.9	-	-
BR-06	60100	60095	18	196.5	196.5	-	-
BR-06	60220	60100	18	82.8	82.8	-	-
BR-06	60225	60220	18	133.1	133.1	-	-
BR-06	61030	61025	8	346.3	346.3	-	144.0
BR-06	LS-23C	LS-23B	8	72.3	72.3	-	-
BR-06	LS-23D	LS-23E	8	124.2	124.2	-	-
BR-06	LS-23E	LS-23C	8	<u>152.6</u>	<u>152.6</u>	-	-
<i>Subtotal</i>				<u>3,495.6</u>	<u>3,495.6</u>	-	<u>144.0</u>
<b>Grand Total</b>				<b>13,902.9</b>	<b>13,165.6</b>	-	<b>6,552.0</b>



*Appendix I*  
*Lines Recommended for Point Repairs*

Line Segment			Existing Diameter	Station	Repair Length	Direction <sup>1/</sup>	Infiltration Rate	Construction Cost	Estimated Capital Cost <sup>2/</sup>
Basin	USMH	DSMH	(IN)		(FT)		(GPD)	(\$)	(\$)
<b>BR-03</b>									
BR-03	50015	50010	8	0+8 - 0+18	10	DSMH	144	\$5,500	\$7,150
BR-03	50130	50135	6	2+49 - 2+59	10	USMH	144	\$5,500	\$7,150
BR-03	50140	50145	6	3+49 - 3+59	10	DSMH	144	\$5,500	\$7,150
BR-03	50210	50020	10	0+91 - 1+01 1+22 - 1+32	20	USMH	374	\$11,000	\$14,300
BR-03	50575	50570	6	0+17 - 0+27	10	DSMH	360	\$5,500	\$7,150
BR-03	50605	50600	10	0+17 - 0+27	10	USMH	1,080	\$5,500	\$7,150
BR-03	50635	50610	6	0+84 - 0+94	10	DSMH	144	\$5,500	\$7,150
BR-03	50675	50670	6	1+35 - 1+45 2+06 - 2+16	<u>20</u>	DSMH	<u>2,592</u>	<u>\$11,000</u>	<u>\$14,300</u>
<b>GrandTotal</b>					<b>100</b>		<b>4,982</b>	<b>\$55,000</b>	<b>\$71,500</b>

1/ 'USMH' = distance from the USMH, 'DSMH' = distance from DSMH

2/ Estimated construction cost plus a 30% engineering service and contingency fees



*Appendix J*  
*Lines Recommended for Complete Rehabilitation*



		Existing Diameter	Recommended Diameter	Segment Length	Rehab Method	Inflow Rate	Infiltration Rate	Estimated Construction Cost	Estimated Capital Cost <sup>1/</sup>
USMH	DSMH	(IN)	(IN)	(FT)		(GPD)	(GPD)	(\$)	(\$)
<b>BR-03</b>									
50020	50010	10	10	72	CIPP	-	432	\$5,400	\$7,020
50290	50210	10	10	332	CIPP	-	2,232	\$24,900	\$32,370
50295	50290	10	10	256	Pipe Burst	-	864	\$38,370	\$49,881
50301	50295	10	10	251	CIPP	-	1,368	\$18,825	\$24,473
50445	50430	6	8	357	PipeBurst	-	1,685	\$46,410	\$60,333
50460	50455	10	10	347	CIPP	-	1,656	\$26,025	\$33,833
50500	50495	6	8	115	Pipe Burst	-	3,182	\$14,950	\$19,435
50530	50535	8	8	304	CIPP	-	1,440	\$22,800	\$29,640
50550	50440	8	8	149	CIPP	-	1,440	\$11,175	\$14,528
50610	50605	10	10	178	CIPP	-	1,296	\$13,350	\$17,355
50615	50605	6	8	327	Pipe Burst	-	2,736	\$42,510	\$55,263
50620	50615	6	8	316	Pipe Burst	-	1,728	\$41,080	\$53,404
50625	50620	6	8	263	Pipe Burst	-	4,363	\$34,190	\$44,447
50671	50665	6	8	<u>342</u>	Pipe Burst	-	<u>2,448</u>	<u>\$44,460</u>	<u>\$57,798</u>
<b>Grand Total</b>				<b>3,609</b>		-	<b>26,871</b>	<b>\$379,045</b>	<b>\$492,759</b>

1/ Includes estimated construction cost plus a 30 percent engineering service and contingency fees.



# Recommended Service Line Inflow Removal

Project Number

18-3326-00

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<i>Basin/Structure</i>	<i>Street Address</i>	<i>Type Source</i>	<i>Rehabilitation Work</i>	<i>Flow (GPD)</i>	<i>Repair Cost (\$)</i>	<i>Ratio (\$/GPD)</i>	<i>Cumulative Flow (GPD)</i>	<i>Cumulative Cost (\$)</i>	
BR-03 50115	BR-03 50110	205 Fair Oaks Dr	Inflow Cleanout	Repair Broken Cleanout	950	\$375	0.395	950	\$375
BR-03 50430	BR-03 50435	311 NW 3rd St	Inflow Cleanout	Repair Broken Cleanout	1,440	\$375	0.260	2,390	\$750
BR-03 50435	BR-03 50440	405 NW 3rd St	Inflow Cleanout	Replace Cleanout Cap	1,195	\$100	0.084	3,586	\$850
BR-03 50450	BR-03 50445	101 NW 3rd St	Inflow Cleanout	Repair Broken Cleanout	475	\$375	0.789	4,061	\$1,225
BR-03 50450	BR-03 50445	101 NW 3rd St	Inflow Sewer Service Defects	Replace Service Line	1,440	\$3,000	2.083	5,501	\$4,225
BR-03 50450	BR-03 50445	101 NW 3rd St	Inflow Sewer Service Defects	Replace Service Line	115	\$3,000	26.042	5,616	\$7,225
BR-03 50535	BR-03 50555	410 NW 4th St	Inflow Sewer Service Defects	Replace Service Line	7,171	\$3,000	0.418	12,787	\$10,225
BR-03 50580A	BR-03 50580	202 N Reynolds Rd	Inflow Cleanout	Replace Cleanout Cap	144	\$100	0.694	12,931	\$10,325
BR-03 50585	BR-03 50525	209 NE 1st Rd	Inflow Cleanout	Repair Broken Cleanout	950	\$375	0.395	13,882	\$10,700
BR-03 50595	BR-03 50585	302 NE 1st Rd	Inflow Cleanout	Repair Broken Cleanout	475	\$375	0.789	14,357	\$11,075
BR-03 50595	BR-03 50585	302 NE 1st Rd	Inflow Cleanout	Replace Cleanout Cap	950	\$100	0.105	15,307	\$11,175
BR-03 50595	BR-03 50585	304 NE 1st Rd	Inflow Sewer Service Defects	Replace Service Line	1,670	\$3,000	1.796	16,978	\$14,175
BR-03 50605	BR-03 50600	500 NE 3rd St	Inflow Cleanout	Replace Cleanout Cap	144	\$100	0.694	17,122	\$14,275
BR-03 50615	BR-03 50605	204 N Laurel St	Inflow Sewer Service Defects	Replace Service Line	144	\$3,000	20.833	17,266	\$17,275
BR-03 50625	BR-03 50620	210 N Walnut St	Inflow Cleanout	Repair Broken Cleanout	1,195	\$375	0.314	18,461	\$17,650
BR-03 50645	BR-03 50640	408 Mills Park Rd	Inflow Cleanout	Replace Cleanout Cap	475	\$100	0.210	18,936	\$17,750
BR-03 50650	BR-03 50645	306 Mills Park Rd	Inflow Cleanout	Replace Cleanout Cap	475	\$100	0.210	19,411	\$17,850
BR-03 50650	BR-03 50645	301 NE 3rd Rd	Inflow Cleanout	Replace Cleanout Cap	144	\$100	0.694	19,555	\$17,950
BR-03 50655	BR-03 50650	201 NE 3rd Rd	Inflow Cleanout	Replace Cleanout Cap	950	\$100	0.105	20,506	\$18,050
BR-03 50700	BR-03 50695	508 N Reynolds Rd	Inflow Cleanout	Replace Cleanout Cap	2,866	\$100	0.035	23,371	\$18,150
BR-06 60130	BR-06 60120	2411 Henry Ave	Inflow Cleanout	Repair Broken Cleanout	2,390	\$375	0.157	25,762	\$18,525
BR-06 60145	BR-06 60140	2113 Henry Ave	Inflow Cleanout	Replace Cleanout Cap	1,440	\$100	0.069	27,202	\$18,625
BR-06 60960	BR-06 60255	1401 Oak Glenn Ct	Inflow Cleanout	Repair Broken Cleanout	144	\$375	2.604	27,346	\$19,000
BR-06 60960B	BR-06 60960A	1411 Oak Glenn Ct	Inflow Cleanout	Replace Cleanout Cap	144	\$100	0.694	27,490	\$19,100
BR-06 61030B	BR-06 610130A	905 Dawson Point Ave	Inflow Cleanout	Replace Cleanout Cap	144	\$100	0.694	27,634	\$19,200
BR-06 61040	BR-06 61035	419 Canyon Way	Inflow Cleanout	Replace Cleanout Cap	245	\$100	0.408	27,878	\$19,300
BR-06 61080	BR-06 61075	5501 Glenn Cv	Inflow Cleanout	Replace Cleanout Cap	475	\$100	0.210	28,354	\$19,400
BR-06 61080	BR-06 61075	5413 Glenn Cv	Inflow Cleanout	Repair Broken Cleanout	1,670	\$375	0.224	30,024	\$19,775
BR-06 LS-23K	BR-06 LS-23J	4609 Meadow Ridge Ln	Inflow Cleanout	Replace Cleanout Cap	475	\$100	0.210	30,499	\$19,875



*Project Number*      18-3326-00      Bryant\_2018\_SSES

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<i>Basin/Structure</i>	<i>Street Address</i>	<i>Type Source</i>	<i>Rehabilitation Work</i>	<i>Flow</i> <i>(GPD)</i>	<i>Repair</i> <i>Cost</i> <i>(\$)</i>	<i>Ratio</i> <i>(\$/GPD)</i>	<i>Cumulative</i> <i>Flow</i> <i>(GPD)</i>	<i>Cumulative</i> <i>Cost</i> <i>(\$)</i>
<i>Total Flow (gpd):</i>	30,499							
<i>Total Cost:</i>	\$19,875							
<i>Total Sources:</i>	29							





**rjn**group  
*Engineering* infrastructure for tomorrow