

Auburn Hills Beverly Hills

Bingham Farms Birmingham

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Bloomfield Twp.

Canton Twp.

Commerce Twp.

Dearborn Heights

Farmington

Farmington Hills

Franklin Garden City

Henry Ford College

Inkster

Lathrup Village

Livonia Melvindale Northville

Northville Twp.

Novi

Oak Park
Oakland County

Orchard Lake

Plymouth

Plymouth Twp.

Redford Twp.

Rochester Hills

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Schoolcraft College

Southfield

Troy

University of

Michigan-Dearborn

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Walled Lake

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Wayne

Wayne County

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Cooperating Partners:

Cranbrook Institute of Science
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Rouge River Advisory Council
SEMCOG

accordance with a accordance with a accordance with a sampling efforts.

Southeastern Oakland County Water Authority TO: Karen Mondora, ARC Technical Committee Chair

FROM: Emily Levine, Technical Committee Coordinator

DATE: February 15, 2023

SUBJECT: 2022 IDEP Investigation Summary

In 2022, ARC staff continued to work on an ongoing illicit discharge investigation in Oakland County and assisted Wayne County with investigations in Livonia and Inkster. These investigations were in accordance with the Rouge River Collaborative Illicit Discharge Elimination Plan. These investigations were prompted by the outfall screening efforts conducted in 2018 and 2019, as well as additional sampling conducted by Wayne County in 2020.

The results of the investigations are summarized in Table 1. More detail can be found in the investigation reports which were sent to the communities (Attachment A).

Table 1. Status and Results of Illicit Discharge Investigations

Permittee	Outfall ID	Status	Result
Beverly Hills	BV51	Ongoing	Further investigation required
Livonia	U2008221	Ongoing	An illicit connection was identified and corrected. Follow-up investigation revealed that an additional pollutant source may be present, resulting in further investigation required
Livonia	L1619	Ongoing	Further investigation required
Inkster	Perrin Drain	Ongoing	Tap identified, further investigation required

In addition, ARC staff conducted sampling in accordance with the ARC's Collaborative Total Maximum Daily Load (TMDL) Implementation Plan requirements. This included completing DO monitoring in Johnson Creek for two months, screening 83 outfalls for *E. coli*, and sampling 28 instream sites for suspended sediment. More information about this can be found in the 2022 Rouge River Water Quality Assessment Report.

In 2023, ARC staff will continue source investigations on the outstanding issues in accordance with the Plan and as directed by the Technical Committee. This will also include additional investigations that are in response to results from the 2022 TMDL sampling efforts.

P:\Alliance of Rouge Communities\2023 Alliance of Rouge Communities\Tech Committee\Facilitation\Feb 2023\2022 OC IDEP Summary.docx

Attachment A Community-specific Investigation Reports

Auburn Hills Beverly Hills Bingham Farms

Birmingham

Bloomfield Hills Bloomfield Twp.

Canton Twp.

Commerce Twp.

Dearborn Heights

Farmington

Farmington Hills

Franklin Garden City

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Livonia

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Redford Twp.

Rochester Hills

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Walled Lake

Washtenaw County

Wayne

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Southeastern Oakland County Water Authority



TO: Neil Johnson, Village of Beverly Hills Director of Public Services

FROM: Emily Levine, ARC Staff

DATE: November 7, 2022

SUBJECT: IDEP Investigation Results: Outfall BV51 (Sleepy Hollow Lane)

ARC staff continued illicit discharge investigation on storm drain outfall BV51 in response to findings from the 2018 outfall screening and 2019 and 2020 investigations. Our investigations did not reveal the source of *E. coli* entering the drain and no illicit connection has been identified.

Background

Outfall BV51 was investigated due to the high *E. coli* concentrations found during the outfall survey conducted in 2018. At that time, the *E. coli* concentration was 3,076 MPN/100 ml which can be indicative of an illicit discharge containing sanitary sewage. ARC staff reinspected the outfall in 2019 and found *E. coli* concentrations at 201 and >24,196 MPN/100 ml respectively.

ARC staff reinspected the outfall on August 19, September 15, and November 17, 2020. As was the case in 2019, the results varied greatly in 2020, with *E. coli* concentrations of 573, >24,196, and 1,081 MPN/100 ml respectively (See Table 1). The results from the September and November sampling events showed Human *Bacteroides* concentrations of 72,000 and <354 gene copies/100 ml respectively. There were no physical signs (ex: odor, staining, debris, organic growth) of a sewage discharge to the storm drain in the outfall or any of the manholes. Likewise, there were no obvious signs of animal fecal impacts to the drain.

The outfall drains a portion of Sleepy Hollow Lane, Fiddlers Cove Road, and Metamora Lane. The receiving water is an unnamed tributary of the Rouge River (Figure 1).

Results

Based on sampling results from previous inspections, ARC staff coordinated with the Oakland County Water Resource Commissioner (OCWRC) to televise the drain west of Outfall BV51 on May 19, 2021. Only the west line was televised because flow had not been observed coming from the north and south during dry weather. A tap was identified in the storm drain that was believed to be a possible illicit connection, although no staining or evidence of sewage was observed (Figure 2). Based on the pipe's location and direction, it appeared to be coming from the house at 31349 Sleepy Hollow Lane. On July 23, 2021, ARC staff coordinated with the Village of Beverly Hills to dye test 31349 Sleepy Hollow Lane. The dye testing revealed that all three bathrooms in the house were correctly connected to the sanitary drain and no dye was observed entering the storm drain.

ARC staff coordinated with the Village of Beverly Hills and OCWRC to televise the remainder of the storm drain on July 26, 2022. The drains from BV51-1 to BV51-2, and the drain from BV51-3 to BV51-2 were televised. BV51-2 is buried. No possible illicit connection was identified.

Table 1. Sampling Results (E. coli in MPN/100 mL and Human Bacteroides in gene copies/100 ml)

	E. coli	Human Bacteroides	E. coli	Human Bacteroides				
	7/9/18	8/15/19	9/19/19	8/19/20	9/15/20	9/15/20	11/17/20	11/17/20
BV51-0	3,076	201	>24,196	573	>24,196	72,000	1,081	<354

Conclusions and Recommendations

Work to date indicates that no illicit connection has been identified upstream of BV51. The manhole at BV51-2 is buried. We recommend digging up BV51-2 to be able to further investigate it and sample the manhole.

This work is being completed as outlined in the Rouge River Collaborative IDEP Plan in compliance with the Village's MS4 permit and as a result of your ARC membership. If you have any questions, I can be reached at 313-963-6600 or elevine@ectinc.com.

X:\Alliance of Rouge Communities\2021 Alliance of Rouge Communities\Tech Com\OC IDEP\BV51 2021 IDEP close-out Summary.docx

Figure 1. Storm Drain and Sampling Locations 22599 Metamora Ln BV51-1 BV51-0 Tap identified 31349 BV51-3 BV51-2 Fiddlers Cove Rd Legend Manholes Storm Sewers <all other values> 110 Feet 55 0 110 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



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County Water Authority



Doug Moore, City of Livonia

FROM: Emily Levine, ARC Staff

DATE: January 6, 2023

SUBJECT: IDEP Investigation Results: Outfall L1619

ARC staff continued the illicit discharge investigation on storm drain outfall L1619 in response to findings from the 2018 outfall screening and subsequent investigations conducted by Wayne County. Our investigations have not identified an illicit connection and further investigation is recommended.

Background

TO:

Outfall L1619 was investigated due to the high *E. coli* concentrations found during the outfall survey conducted in 2018. At that time, the *E. coli* concentration was 15,531 MPN/100 ml which is indicative of an illicit discharge containing sanitary sewage. Wayne County conducted follow-up investigations, which narrowed down the source to being upstream of a manhole located in the grass along the north side of Seven Mile Road, near a Chicken Shack restaurant (Figure 1). *E. coli* and Human *Bacteroides* levels at this manhole have been found to be elevated (Table 1).

The drainage area of the manhole in front of the Chicken Shack was unclear, as the storm drain map provided by the City of Livonia appears to be incomplete. Therefore, televising was recommended to determine the extent of the storm drain and search for any illicit connections.

Results

ECT worked with a televising crew on December 21, 2022 to televise the line starting at the manhole by the Chicken Shack along Seven Mile Road and ending at Middlebelt Road (Figure 2). Eight manholes were encountered along this section of pipe. No taps were found between manholes and the line ended at a 12" pipe that was bulkheaded. Inlets in the manholes appear to connect to catch basins along Seven Mile Road and to the parking areas of the businesses to the north of the storm drain. The CCTV report is included as Attachment A.

Doug Moore, City of Livonia
IDEP Investigation Results: Outfall L1619

Page 2

Table 1. Sampling Results (E. coli in MPN/100 mL and Human Bacteroides in gene copies/100 ml)

	E. coli	E. coli	E. coli	E. coli	Human Bacteroides
	7/16/18	12/9/20	12/16/20	11/10/21	11/10/21
L1619	15,531	630		3,076	95
29050 Dardanella		<100			
Seven Mile WC MS4 East			61		
Chicken Shack			2,000	1,616	1,541,053

Conclusions and Recommendations

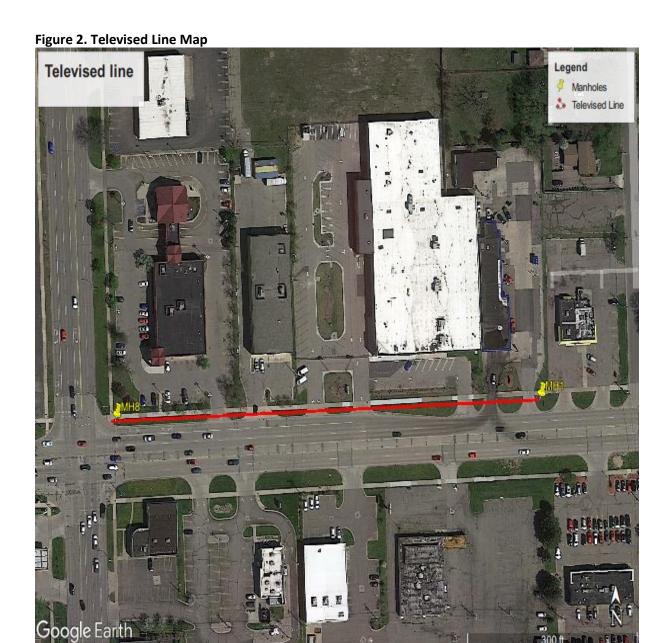
The source of the elevated *E. coli* at this outfall remains unclear. Additional inspections of catch basins and their connections along Seven Mile Road, upstream of the Chicken Shack are recommended.

This work is being completed as outlined in the Rouge River Collaborative IDEP Plan in compliance with the City's MS4 permit and as a result of your ARC membership. If you have any questions, you can reach me at 248-763-1407 or elevine@ectinc.com.

 $X:\Alliance of Rouge Communities \end{Communities} Tech Committee \end{Communities} IDEP investigations \end{Livenia} Livenia \end{Communities} DEP Summary. docx$

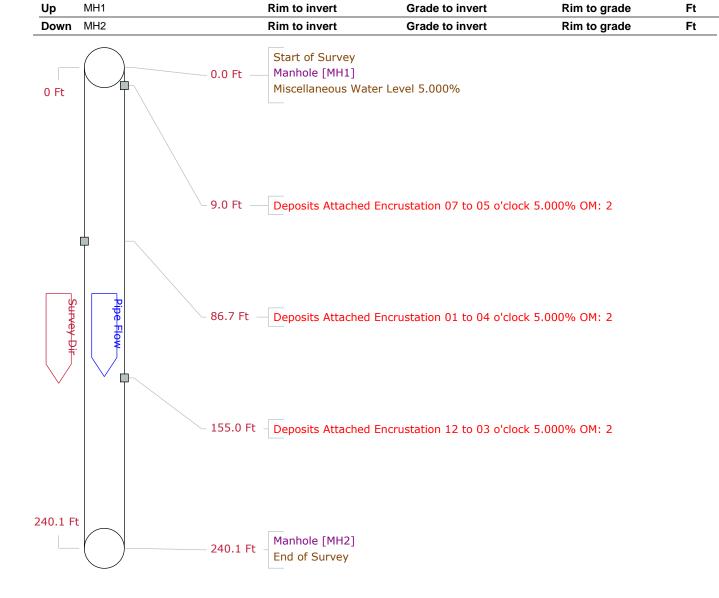
Figure 1. Storm Drain and Sampling Location



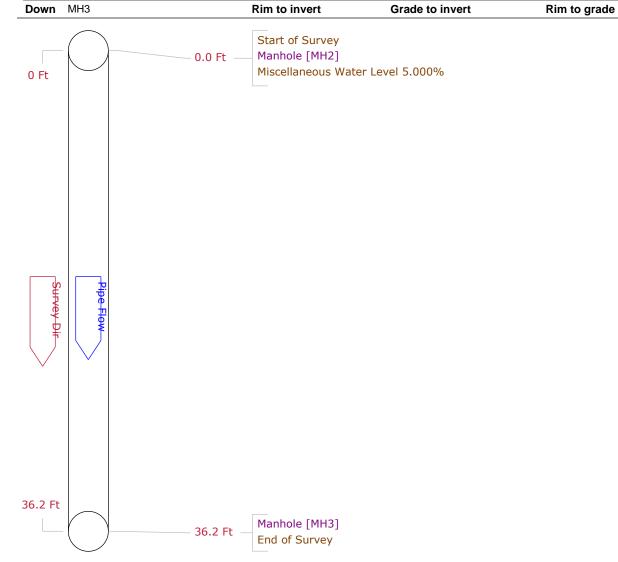


Attachment A. CCTV Inspection Reports

ipe Grapino	Report of Lit III			101			
Setup 1	Surveyed By PIPE	TEK-RD	Certifica	te # P003892	23-082022	Owner LIVONIA	
Reviewed By		Reviewer #			Work Order		
Customer	ETC				P/O	#	
Media Label	MH1A	Project ETC_STO	RM_TV_RD	_12-21-2022			
Date 2022/12/	21 Time 8:49	Weath	er	Pre	e-Cleaning N	Date Clea	ined
Flow control	Not Controlled	Survey Purpos	e Routine A	ssessment		Direction Do	ownstream
Street 7 MILE			City	LIVONIA		Drainage area	
Location Code					Pipe Use	Stormwater Pipe	
Location detail	s CHICKEN SHACK				Height 18	Width ins	
Shape Circular		Material Re	inforced Cor	ncrete Pipe	Lining		
Coating		Pipe Join	t length	Ft Total	length	Ft Structural	O & M
Length Survey	ed 240.10 Ft	Year Constructe	d Yo	ear Renewed		Miscellaneous	Constructional
Additional info							
					_		



.pc C	apino	ricport	O1 1 E11		127			_0.			
Setup	2	Surve	eyed By F	PIPE	TEK-RD C	ertific	ate # P003892	3-082022	Owner l	LIVONIA	
Revie	wed By				Reviewer #			Work Order			
Custor	mer	ETC						P/O	#		
Media	Label	MH2A			Project ETC_STORM	_TV_R[D_12-21-2022				
Date	2022/12	/21	Time 9:	11	Weather		Pre	-Cleaning N	1	Date Clear	ned
Flow c	ontrol	Not Con	trolled		Survey Purpose R	outine /	Assessment		Dir	ection Do	wnstream
Street	7 MILE					City	LIVONIA		Drainage	area	
Location	on Code	•						Pipe Use	Stormwa	ater Pipe	
Location	on detai	ils						Height 18	Width	ins	
Shape	Circula	r			Material Reinfo	rced Cc	oncrete Pipe	Lining			
Coatin	g				Pipe Joint le	ngth	Ft Total	length	Ft Struc	ctural	O & M
Length	Survey	/ed	36.20	Ft	Year Constructed	Y	ear Renewed		Misc	ellaneous	Constructiona
Additio	onal info)									
Up	MH2				Rim to invert		Grade to	invert	Rin	n to grade	Ft
Down	МНЗ				Rim to invert		Grade to	invert	Rin	n to grade	Ft



3

Setup

Certificate # P0038923-082022

ECT

Owner LIVONIA

Constructional

Reviewed By Reviewer # **Work Order**

ETC P/O # Customer

Media Label МН3А Project ETC_STORM_TV_RD_12-21-2022

Surveyed By PIPETEK-RD

Date 2022/12/21 **Time** 9:41 Weather **Date Cleaned** Pre-Cleaning N Not Controlled Flow control Survey Purpose Routine Assessment **Direction** Downstream

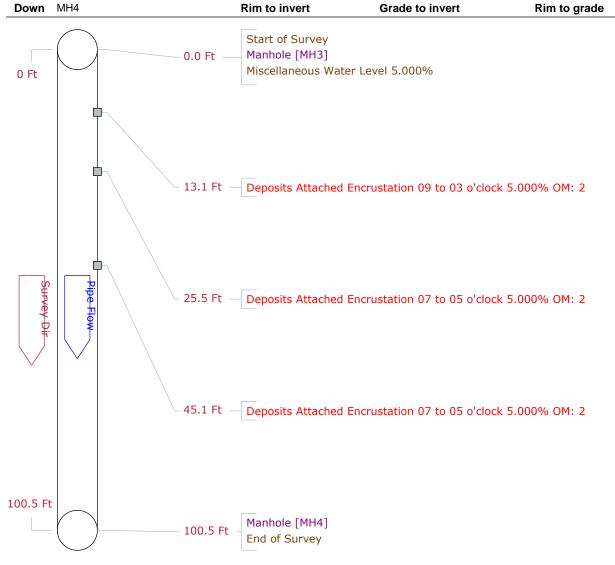
Street 7 MILE City LIVONIA Drainage area **Location Code** Pipe Use Stormwater Pipe Height 18 Location details Width ins

Lining Shape Circular Material Reinforced Concrete Pipe

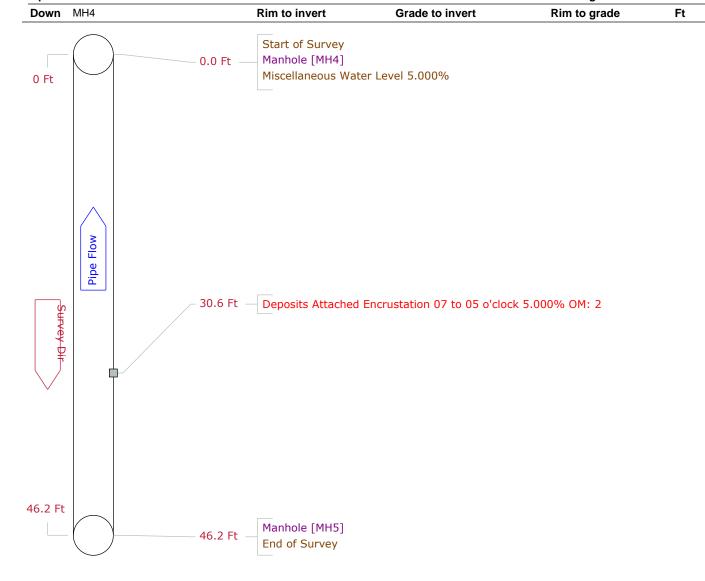
Coating **Pipe Joint length Total length** Structural O & M Ft Miscellaneous

100.50 Ft Year Constructed Year Renewed **Length Surveyed**

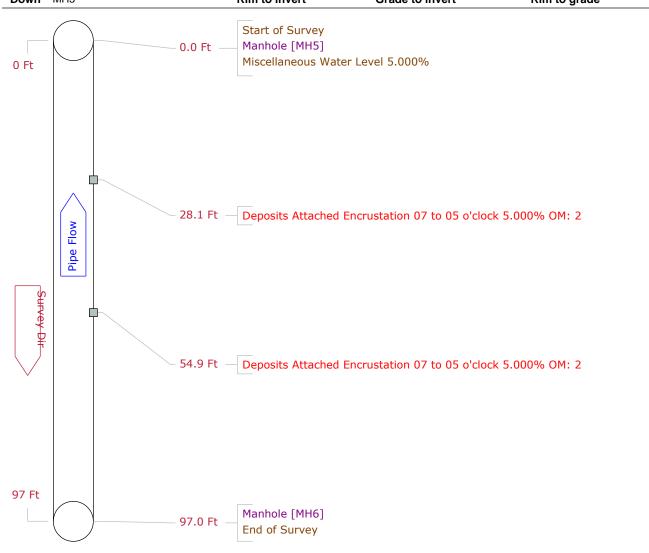
Additional info Up МНЗ Rim to invert Grade to invert Rim to grade Ft Ft



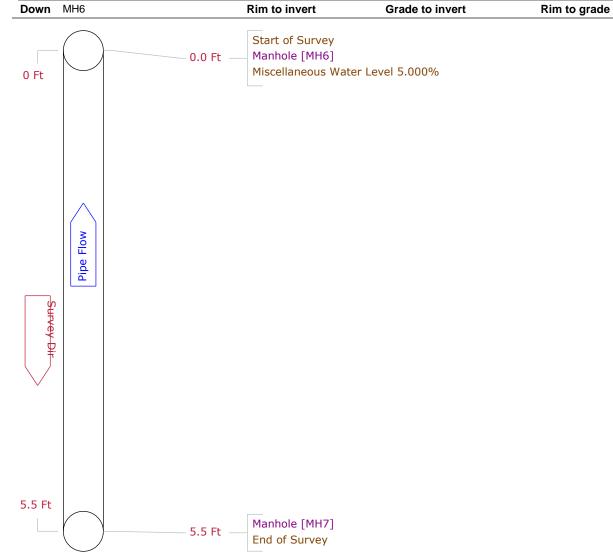
Setup	4	Surve	yed By PIF	ETEK-RD	Certific	ate#P	003892	3-082022	Ov	vner LIVONIA		
Reviewe	d By			Reviewer #				Work Order				
Custome	r	ETC						P/O	#			
Media La	bel	MH4A		Project ETC_STC	RM_TV_RI	D_12-21	-2022					
Date 20	22/12/	21	Time 9:52	Weath	ner		Pre	-Cleaning N		Date Cle	eaned	
Flow con	trol	Not Cont	trolled	Survey Purpos	e Routine	Assessr	nent			Direction	Upstream	
Street 7	MILE				City	LIV	/ONIA		Dra	ainage area		
Location	Code							Pipe Use	St	ormwater Pipe		
Location	detail	s						Height 18	Wie	dth ins		
Shape C	ircular			Material Re	einforced Co	oncrete	Pipe	Lining				
Coating				Pipe Joir	nt length	Ft	Total	length	Ft	Structural	O & M	
Length S	urvey	ed	46.20 F f	Year Constructe	ed \	ear Re	newed			Miscellaneou	s Construct	iona
Additiona	al info								1			
Up N	1H5			Rim to inv	ert	G	rade to	invert		Rim to gra	de I	Ft



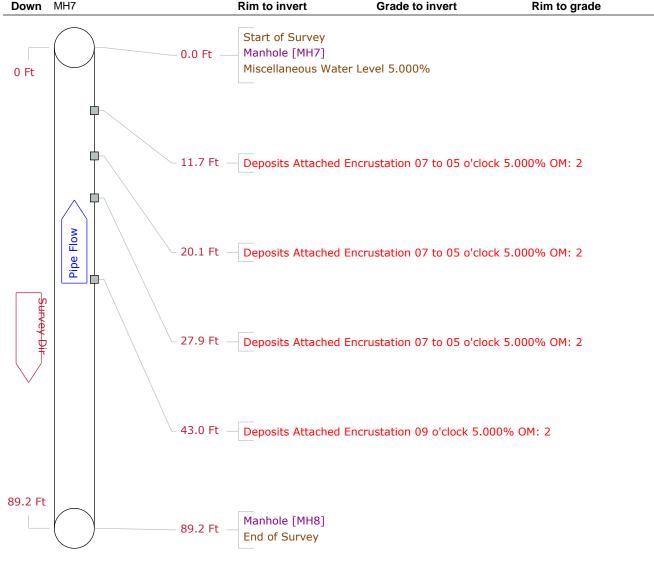
.p. 0p						_			
Setup 5	Surv	eyed By F	PIPETE	EK-RD Certifi	cate # P003892	3-082022	Ov	vner LIVONIA	
Reviewed B	у			Reviewer #		Work Order			
Customer	ETC					P/O	#		
Media Label	MH5A		Pr	roject ETC_STORM_TV_F	RD_12-21-2022				
Date 2022/1	2/21	Time 10):13	Weather	Pre	-Cleaning N		Date Clean	ed
Flow control	Not Cor	ntrolled		Survey Purpose Routine	Assessment			Direction Ups	stream
Street 7 MIL	.E			City	LIVONIA		Dra	inage area	
Location Cod	de					Pipe Use	St	ormwater Pipe	
Location deta	ails					Height 18	Wie	dth ins	
Shape Circul	lar			Material Reinforced C	Concrete Pipe	Lining			
Coating				Pipe Joint length	Ft Total	length	Ft	Structural	O & M
Length Surve	eyed	97.00	Ft Y	ear Constructed	Year Renewed			Miscellaneous	Construction
Additional in	fo								
Up MH6				Rim to invert	Grade to	invert		Rim to grade	Ft
Down MH5				Rim to invert	Grade to	invert		Rim to grade	Ft



6	C									
-	Surve	eyed By	PIPE	TEK-RD	Certification	ate # P003892	23-082022	Ow	ner LIVONIA	
ed By				Reviewer #			Work Order			
er	ETC						P/O	#		
abel	MH6A			Project ETC_STORM	1_TV_RD)_12-21-2022				
2022/12/	21	Time 1	0:36	Weather		Pre	e-Cleaning N		Date Clean	ed
ntrol	Not Con	trolled		Survey Purpose F	Routine A	Assessment			Direction Ups	stream
7 MILE					City	LIVONIA		Drai	nage area	
n Code							Pipe Use	Sto	rmwater Pipe	
n detail	ls						Height 18	Wid	th ins	
Circular	r			Material Reinfo	orced Co	ncrete Pipe	Lining			
l				Pipe Joint le	ength	Ft Total	length	Ft	Structural	O & M
Survey	ed	05.50	Ft	Year Constructed	Y	ear Renewed			Miscellaneous	Constructiona
nal info)							_		
MH7				Rim to invert		Grade to	invert		Rim to grade	Ft
MH6				Rim to invert		Grade to	invert		Rim to grade	Ft
) · · · · · · · · · · · · · · · · · · ·	er abel 022/12/ ntrol 7 MILE 1 Code 1 detai Circular Survey nal info	er ETC abel MH6A 022/12/21 ntrol Not Con 7 MILE n Code n details Circular Surveyed nal info MH7	er ETC abel MH6A 022/12/21 Time 1 ntrol Not Controlled 7 MILE n Code n details Circular Surveyed 05.50 nal info MH7	er ETC abel MH6A 022/12/21 Time 10:36 ntrol Not Controlled 7 MILE n Code n details Circular Surveyed 05.50 Ft nal info MH7	er ETC abel MH6A Project ETC_STORM 022/12/21 Time 10:36 Weather ntrol Not Controlled Survey Purpose F 7 MILE n Code n details Circular Material Reinfo Pipe Joint le Surveyed 05.50 Ft Year Constructed nal info MH7 Rim to invert	er ETC abel MH6A Project ETC_STORM_TV_RE 022/12/21 Time 10:36 Weather ntrol Not Controlled Survey Purpose Routine A 7 MILE City n Code n details Circular Material Reinforced Co Pipe Joint length Surveyed 05.50 Ft Year Constructed Year	er ETC abel MH6A Project ETC_STORM_TV_RD_12-21-2022 022/12/21 Time 10:36 Weather Pre- ntrol Not Controlled Survey Purpose Routine Assessment 7 MILE City LIVONIA in Code in details Circular Material Reinforced Concrete Pipe Pipe Joint length Ft Total Surveyed 05.50 Ft Year Constructed Year Renewed inal info MH7 Rim to invert Grade to	er ETC abel MH6A Project ETC_STORM_TV_RD_12-21-2022 022/12/21 Time 10:36 Weather Pre-Cleaning N ntrol Not Controlled Survey Purpose Routine Assessment 7 MILE City LIVONIA n Code Pipe Use n details Height 18 Circular Material Reinforced Concrete Pipe Lining Pipe Joint length Ft Total length Surveyed 05.50 Ft Year Constructed Year Renewed nal info MH7 Rim to invert Grade to invert	er ETC abel MH6A Project ETC_STORM_TV_RD_12-21-2022 022/12/21 Time 10:36 Weather Pre-Cleaning N ntrol Not Controlled Survey Purpose Routine Assessment 7 MILE City LIVONIA Drain Code Pipe Use Storm details Height 18 Widd Circular Material Reinforced Concrete Pipe Lining Pipe Joint length Ft Total length Ft Surveyed 05.50 Ft Year Constructed Year Renewed and Info MH7 Rim to invert Grade to invert	er ETC abel MH6A Project ETC_STORM_TV_RD_12-21-2022 022/12/21 Time 10:36 Weather Pre-Cleaning N Date Clean ntrol Not Controlled Survey Purpose Routine Assessment Direction Ups 7 MILE City LIVONIA Drainage area Stormwater Pipe In details Height 18 Width ins Circular Material Reinforced Concrete Pipe Lining Pipe Joint length Ft Total length Ft Structural Miscellaneous and info MH7 Rim to invert Grade to invert Rim to grade



		-											
Setup	7	Surve	yed By	PIPE	TEK-RD	Certific	ate # P00389	23-082022	Ov	vner LI\	/ONIA		
Reviewed	Ву				Reviewer #			Work Order					
Customer		ETC						P/0) #				
Media Lab	el	MH7A			Project ETC_STOR	M_TV_RE	0_12-21-2022						
Date 2022	2/12/2	21	Time 1	1:03	Weathe	er	P	e-Cleaning N		Da	ate Clean	ned	
Flow contr	ol	Not Cont	trolled		Survey Purpose	Routine A	Assessment			Direc	ction Ups	stream	
Street 7 N	/ILE					City	LIVONIA		Dra	ainage a	area		
Location C	ode							Pipe Use	e Si	tormwate	er Pipe		
Location d	etail	s						Height 18	Wi	dth	ins		
Shape Cir	cular				Material Rein	nforced Co	ncrete Pipe	Lining					
Coating					Pipe Joint	length	Ft Tota	l length	Ft	Structu	ıral	O & M	
Length Su	rvey	ed	89.20	Ft	Year Constructed	Y	ear Renewe	d		Miscell	laneous	Constru	ctiona
Additional	info												
Up M⊦	18				Rim to inve	rt	Grade 1	o invert		Rim t	to grade		Ft
Down ME	17				Pim to invo	rt	Grado	o invort	,	Dim 1	o arado		E+



8

Certificate # P0038923-082022

Owner LIVONIA

Miscellaneous

Constructional

Setup Surveyed By PIPETEK-RD Reviewed By Reviewer # **Work Order**

Customer ETC P/O #

Media Label MH8A Project ETC_STORM_TV_RD_12-21-2022

Date 2022/12/21 Time 11:34 Weather $\textbf{Pre-Cleaning}\ N$ **Date Cleaned** Not Controlled Survey Purpose Routine Assessment **Direction** Upstream Flow control

Street 7 MILE City LIVONIA Drainage area **Location Code** Pipe Use Stormwater Pipe Location details Height 12 Width ins

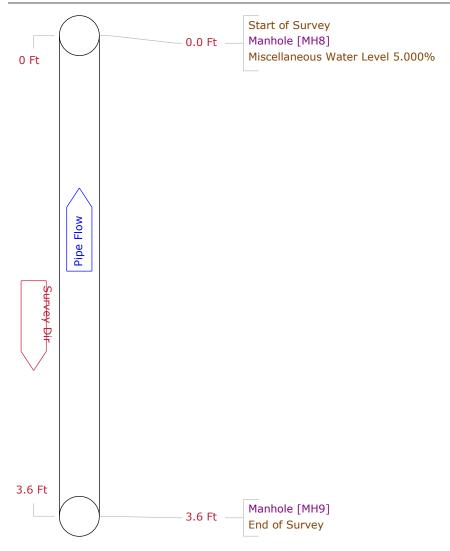
Shape Circular Material Reinforced Concrete Pipe Lining

Structural Coating Pipe Joint length Ft **Total length** O & M

Length Surveyed 03.60 Ft Year Constructed Year Renewed

Additional info

Up	MH9	Rim to invert	Grade to invert	Rim to grade	Ft
Down	MH8	Rim to invert	Grade to invert	Rim to grade	Ft



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TO: Doug Moore, City of Livonia

FROM: Emily Levine, ARC Staff

DATE: January 6, 2023

SUBJECT: IDEP Investigation Results: Outfall U2008221

ARC staff continued the illicit discharge investigation on storm drain outfall U2008221 in response to findings from the 2018 outfall screening and subsequent investigations. Our 2022 investigations identified an illicit connection coming from Saint Mary's Hospital. This connection was corrected by the hospital. Follow-up sampling to confirm that the connection was corrected revealed that a suspicious discharge still exists. Investigations to identify the source of this second discharge remain underway.

Background

Outfall U2008221 was investigated due to the high *E. coli* concentrations found during the outfall survey conducted in 2018. At that time, the *E. coli* concentration was >24,196 MPN/100 ml which is indicative of an illicit discharge containing sanitary sewage. ARC staff reinspected the outfall in 2019 and found *E. coli* concentrations at non-detect and >6,000 MPN/100 ml respectively, with Human *Bacteroides* concentrations of 1,010,000 gene copies/100 ml coinciding with the elevated *E. coli* levels.

It was initially uncertain where the outfall was draining from, as it is located in a culvert underneath Levan Road (Figure 1). Nonetheless, in 2019 and 2021 Wayne County conducted sampling within the manholes along the east side of Levan Road. However, these investigations did not reveal the source of the suspicious discharge.

Results

In May of 2022, the outfall was resampled by ARC staff and *E. coli* concentrations were >24,196 MPN/100 ml, with Human *Bacteroides* concentrations of 631,578,947 gene copies/100 ml (Table 1). At that time, it was determined that the outfall connects to private storm drains in the parking lot of Saint Mary's Hospital, located on the west side of Levan Road.

Inspections of manholes and review of utility drawings for the Hospital parking lot revealed a suspicious tap to the storm drain (Figure 2). Representatives from the Hospital cooperated with the City of Livonia and dye tested the area of the hospital closest to the tap. It was found that a section of the old emergency room had an illicit connection to the storm drain, which was subsequently corrected.

ECT resampled the outfall on November 3, 2022 to confirm that the corrected illicit connection had effectively reduced the *E. coli* levels coming from the outfall and found *E. coli* levels of 10 MPN/100 ml. However, during this sampling, bubbles that looked like soap were observed coming from the outfall (Figure 3). A test for surfactants was conducted in the field and surfactants level of 2.0 ppm was found. This indicates that although the *E. coli* source has been effectively eliminated, an additional pollutant source appears to be present that has been contributing surfactants to the river. Follow-up investigations were conducted later in November 2022. Surfactants levels of 2.0 ppm were consistently found in manholes in the hospital parking lot upstream of the outfall leading to the southern section of the parking lot. Due to a car being parked over a manhole, the investigation was not completed, and additional investigation is needed to narrow down the source of the surfactants.

Table 1. Sampling Results (E. coli in MPN/100 mL and Human Bacteroides in gene copies/100 ml)

	E. coli	E. coli	E. coli	Human Bacteroides	E. coli	Human Bacteroides	E. coli	Surfactants
	7/16/18	12/12/19	12/19/19	12/19/19	5/13/22	5/13/22	11/3/22	11/3/22
U2008221	>24,196	ND	>6,000	1,010,000	>24,196	631,578,947	10	2.0 ppm

Conclusions and Recommendations

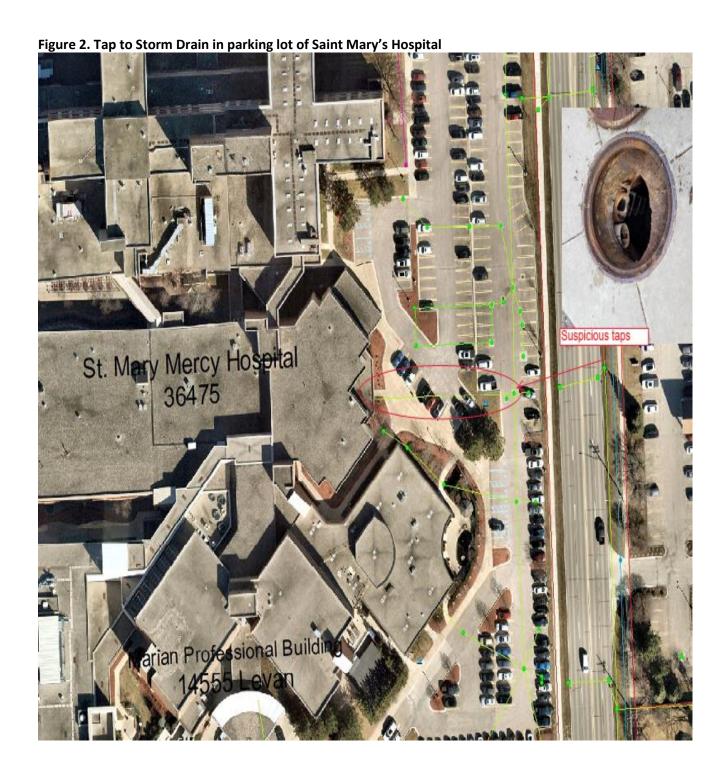
Work to date indicates that correcting an illicit connection has effectively eliminated the *E. coli* source for this outfall. However, an additional pollutant source remains that is contributing surfactants to the stormwater. Further investigation is necessary to determine where the surfactants are coming from and eliminate this pollutant source.

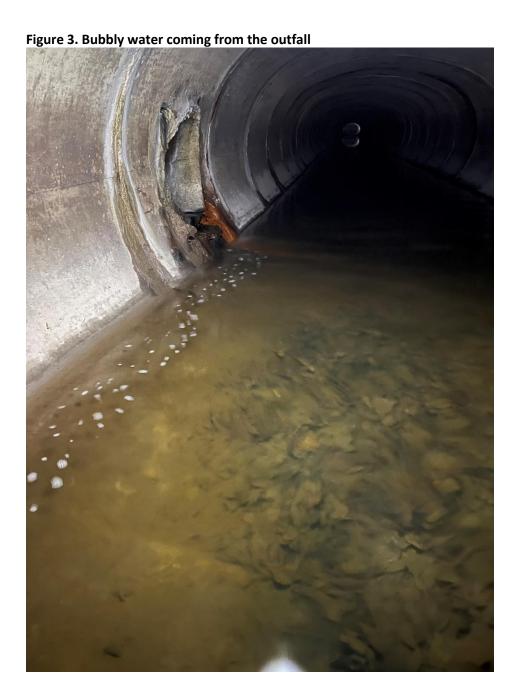
This work is being completed as outlined in the Rouge River Collaborative IDEP Plan in compliance with the City's MS4 permit and as a result of your ARC membership. If you have any questions, you can reach me at 248-763-1407 or elevine@ectinc.com.

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Figure 1. Storm Drain and Sampling Location







Auburn Hills Beverly Hills Bingham Farms

Birmingham

Bloomfield Hills Bloomfield Twp.

Canton Twp.

Commerce Twp.

Dearborn Heights

Farmington

Farmington Hills

Franklin Garden City

Henry Ford College

Inkster

Lathrup Village

Livonia Melvindale Northville

Northville Twp.

Novi

Oak Park
Oakland County

Orchard Lake

Plymouth

Plymouth Twp.

Redford Twp.

Rochester Hills

Romulus

Schoolcraft College

Southfield Troy

University of

Michigan-Dearborn

Van Buren Twp.

Walled Lake

Washtenaw County

Wayne

Wayne County

Wayne County Airport

Authority

West Bloomfield Twp.

Westland Wixom

Cooperating Partners:

Cranbrook Institute of Science Friends of the Rouge Great Lakes Water Authority Rouge River Advisory Council SEMCOG

Southeastern Oakland County Water Authority



TO: Patrick Cullen, Wayne County Deputy Drain Commissioner

FROM: Emily Levine, ARC Staff

DATE: February 7, 2023

SUBJECT: IDEP Investigation Results: Perrin Drain

Cc: Jerome Bivens, City of Inkster

Sue Thompson, Wayne County Department of Public Works

Environmental Services Division

ARC staff has partnered with Wayne County to conduct an illicit discharge investigation on the Perrin Drain in response to findings of high *E. coli* in samples collected from the Lower Rouge River by Wayne County.

Background

The Perrin Drain flows into the Lower Rouge River upstream of John Daly Road. Once an open creek, the drain is now contained in an underground pipe from southeast of Inkster Road and Avondale Street, continuing upstream through the neighborhood to the northwest of that intersection, towards Cherry Hill Road and Middlebelt Road (Figure 1). Samples collected from near the outlet in September and October of 2020 had elevated *E. coli* levels. Additional samples collected from various upstream manholes on October 29, 2020 showed some elevated *E. coli* levels. Additional sampling was conducted in March 2021 which resulted in a recommendation to televise portions of the storm drain system.

Results

Based on the sample results from 2020 and 2021, ARC staff had the drains along Helen Street and Tromley Street televised in December of 2022. Although excessive sediment was found in the storm drain on Tromley Street, no evidence was found of illicit connections. On Helen Street, a tap was identified coming from the east side of Helen Street, south of the intersection with Cherry Hill Road (Figure 1).

Conclusions and Recommendations

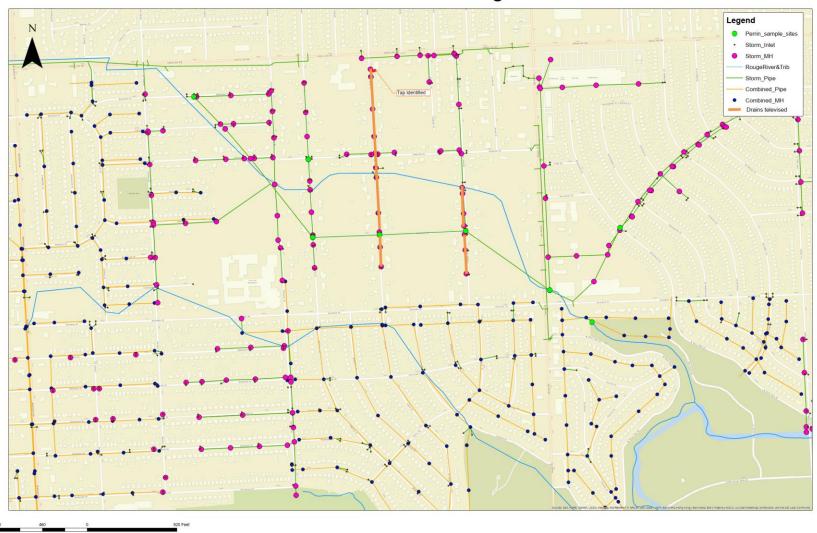
It is unclear whether the tap that was identified is an illicit connection or draining stormwater. Therefore, additional sampling immediately downstream of the tap is recommended to test for *E. coli* and human *Bacteroides*. If elevated levels are found, then dye testing the nearby apartment building may be the recommended next step.

This work is being completed as outlined in the Rouge River Collaborative IDEP Plan in compliance with the County's and City's MS4 permits and as a result of your ARC membership. If you have any questions, I can be reached at 248-763-1407 or elevine@ectinc.com.

 $P:\Alliance\ of\ Rouge\ Communities\ Tech\ Committee\ IDEP\ investigations\ Lower\ Rouge\ Perrin\ Drain\ Summary\ 2022. docx$

Figure 1. Storm Drain and Sampling Locations

Perrin Drain Televising Locations

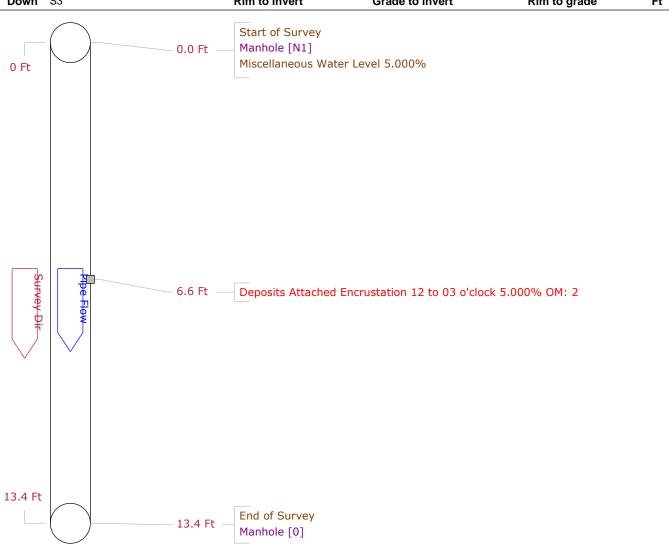


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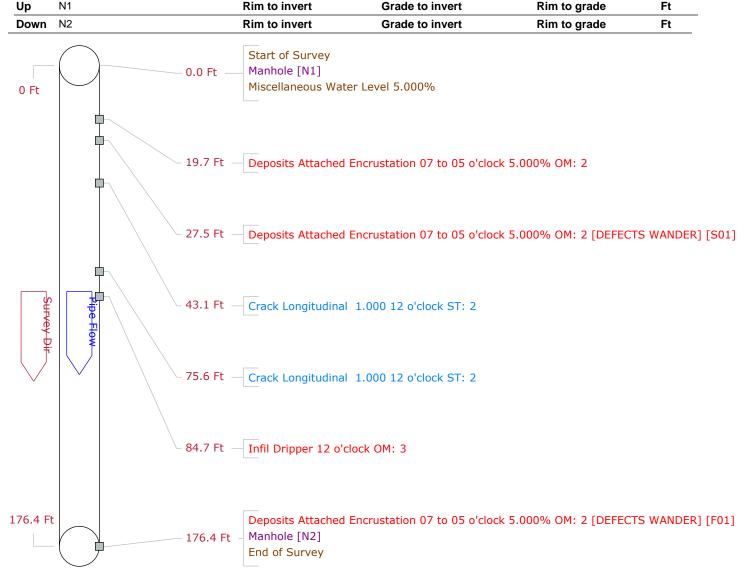
Figure 2. Tap in drain along Helen Street, south of Cherry Hill Road Setup:4 Dir:D PLR:N8A Street:HELEN FROM MH:N8 TO MH:N9 SZ:12ins _ MAT:RCP

Attachment A: CCTV Inspection Reports

	•									
Setup 9	Surve	eyed By	PIPE:	TEK-RD	Certifica	ate # P003892	3-082022	Ov	vner INKSTER	
Reviewed By				Reviewer #			Work Order			
Customer	ETC						P/O	#		
Media Label	N1A		F	Project ETC_STOR	M_TV_RD	_12-21-2022				
Date 2022/12/	21	Time 13	3:02	Weathe	r	Pre	-Cleaning N		Date Clean	ed
Flow control	Not Con	trolled		Survey Purpose	Routine A	Assessment			Direction Dov	vnstream
Street TROML	EY (SOU	ITH)			City	INKSTER		Dra	ainage area	
Location Code	•						Pipe Use	St	ormwater Pipe	
Location detai	Is PERF	RIN					Height 12	Wi	dth ins	
Shape Circular	r			Material Rein	forced Co	ncrete Pipe	Lining			
Coating				Pipe Joint	length	Ft Total	length	Ft	Structural	O & M
Length Survey	ed	13.40	Ft	Year Constructed	Υ	ear Renewed			Miscellaneous	Constructiona
Additional info	•									
Up S2				Rim to inver	rt .	Grade to	invert		Rim to grade	Ft
Down S3				Rim to inver	t	Grade to	invert		Rim to grade	Ft

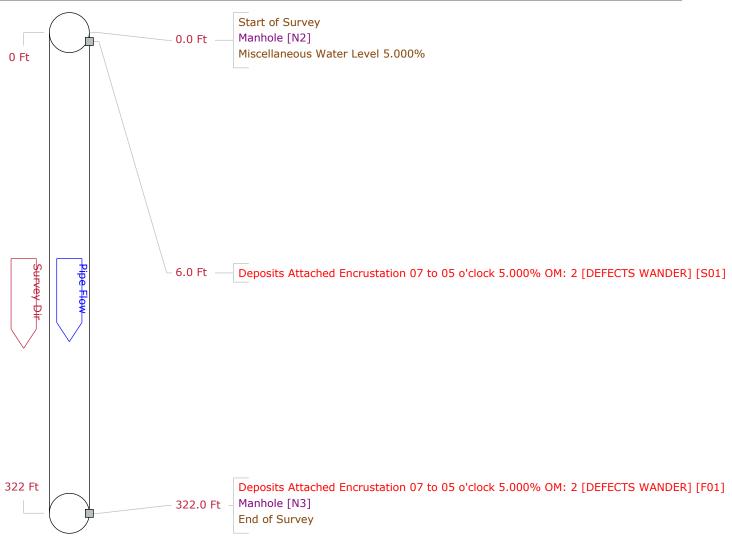


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Setup 10	Surveyed By PIPE	TEK-RD	Certifica	ate # P003892	3-082022	Owner INKSTER			
Reviewed By		Reviewer #	iewer # Work Order						
Customer	ETC				P/O	#			
Media Label	N1A-1	Project ETC_STORM	1_TV_RD	_12-21-2022					
Date 2022/12/	/21 Time 13:11	Weather		Pre	-Cleaning N		Date Clear	ned	
Flow control	Not Controlled	Survey Purpose	Routine A	ssessment			Direction Do	wnstream	
Street TROML	LEY (SOUTH)		City	INKSTER		Dra	inage area		
Location Code	•				Pipe Use	Sto	ormwater Pipe		
Location detai	Is PERRIN				Height 12	Wid	th ins		
Shape Circula	r	Material Reinfo	orced Co	ncrete Pipe	Lining				
Coating		Pipe Joint le	ength	Ft Total	length	Ft	Structural	O & M	
Length Survey	red 176.40 Ft	Year Constructed	Υ	ear Renewed			Miscellaneous	Constructional	
Additional info)					_			
Hn N1		Pim to invert		Grado to	invort		Dim to grado	E+	

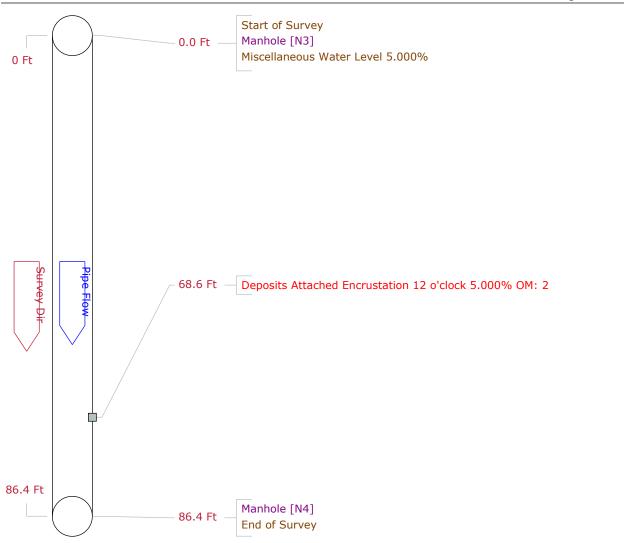


Surveyed By PIPETEK-RD Setup 11 Certificate # P0038923-082022 Owner INKSTER Reviewed By Reviewer # **Work Order** ETC P/O # Customer **Media Label** N2A Project ETC_STORM_TV_RD_12-21-2022 Date 2022/12/21 Time 13:48 Weather **Date Cleaned** Pre-Cleaning N Not Controlled **Direction** Downstream Flow control Survey Purpose Routine Assessment Street TROMLEY (SOUTH) City **INKSTER** Drainage area **Location Code** Pipe Use Stormwater Pipe Height 12 Location details PERRIN Width ins Lining Shape Circular Material Reinforced Concrete Pipe Coating **Pipe Joint length** Ft **Total length** Structural O & M 322.00 Ft Year Constructed Year Renewed Miscellaneous Length Surveyed Constructional Additional info

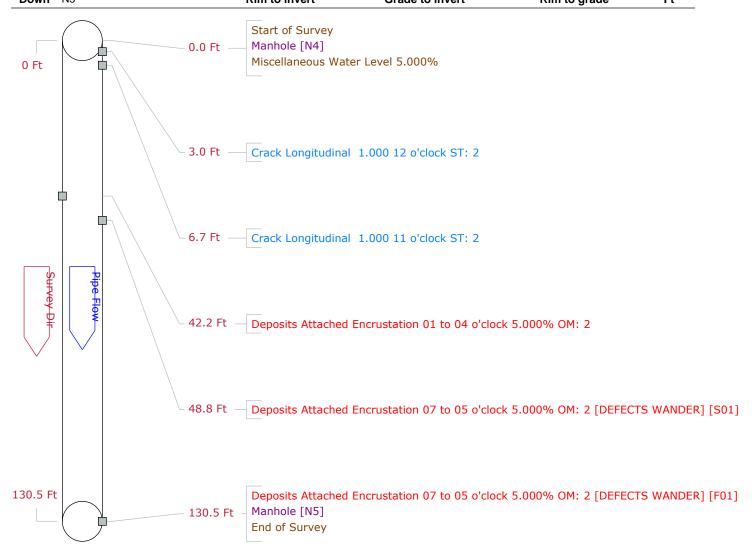
Up N2 Rim to invert Grade to invert Rim to grade Ft N3 Rim to invert Down **Grade to invert** Rim to grade Ft



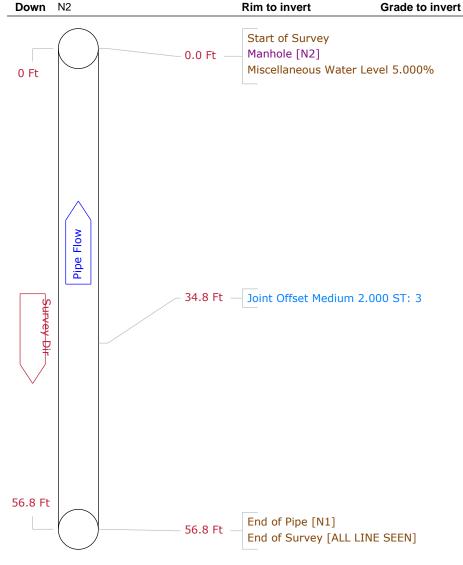
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Reviewed By		Reviewer #	Reviewer # Work Order							
Customer	ETC		P/O #							
Media Label	N3A	Project ETC_STORM	1_TV_RD_	12-21-2022						
Date 2022/12/21 Time 14:05		5 Weather	Weather Pre-Cleaning N				Date Cleaned			
Flow control	Not Controlled	Survey Purpose	Routine Ass		Direction Downstream					
Street TROML	-EY (SOUTH)		City	INKSTER		Drainage area				
Location Code	•				Pipe Use	Stormwater Pipe				
Location detail	Is PERRIN				Height 12	Width ins				
Shape Circular	r	Material Reinfo	orced Cond	rete Pipe	Lining					
Coating		Pipe Joint le	ength	Ft Total I	ength	Ft Structural	O & M			
Length Survey	red 86.40 F f	Year Constructed	Yea	ar Renewed		Miscellaneous	Constructiona			
Additional info	•									
Up N3		Rim to invert		Grade to	invert	Rim to grade	Ft Ft			
Down N4		Rim to invert		Grade to	invert	Rim to grade	e Ft			



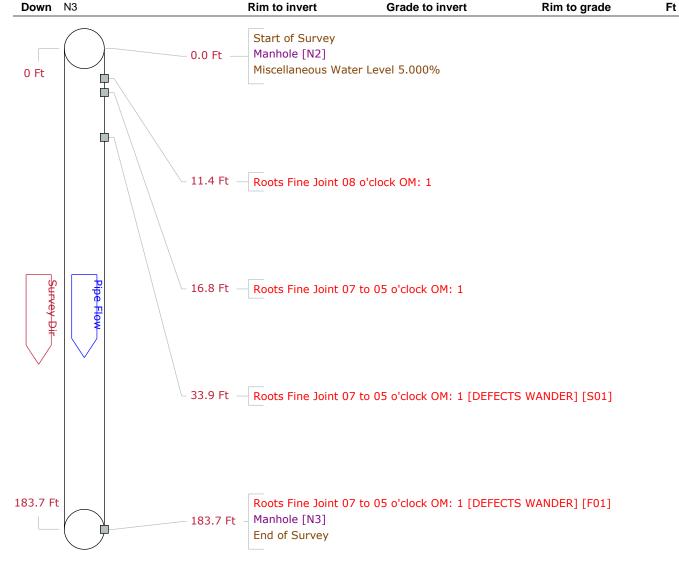
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Setup 13	Surv	eyed By PIPE	TEK-RD	Certifica	ate # P003892	3-082022	Ov	vner INKSTER		
Reviewed By	y		Reviewer #			Work Order				
Customer	ETC					P/C) #			
Media Label	N4A		Project ETC_STOR	M_TV_RD	_12-21-2022					
Date 2022/12	2/21	Time 14:39	Weathe	r	Pre	-Cleaning N		Date Clea	ned	
Flow control	Not Co	ntrolled	Survey Purpose	Routine A	ssessment			Direction Do	wnstream	
Street HELE	N			City	INKSTER		Dra	ainage area		
Location Cod	de					Pipe Use	St	ormwater Pipe		
Location deta	ails PER	RIN				Height 18	Wi	dth ins		
Shape Circul	ar		Material Rein	forced Co	ncrete Pipe	Lining				
Coating			Pipe Joint	length	Ft Total	length	Ft	Structural	O & M	
Length Surve	eyed	130.50 Ft	Year Constructed	Υ	ear Renewed			Miscellaneous	Construct	iona
Additional inf	fo									
Up N4			Rim to inver	t	Grade to	invert		Rim to grade		Ft
Down N5			Rim to inver	t	Grade to	invert		Rim to grade	· 1	Ft



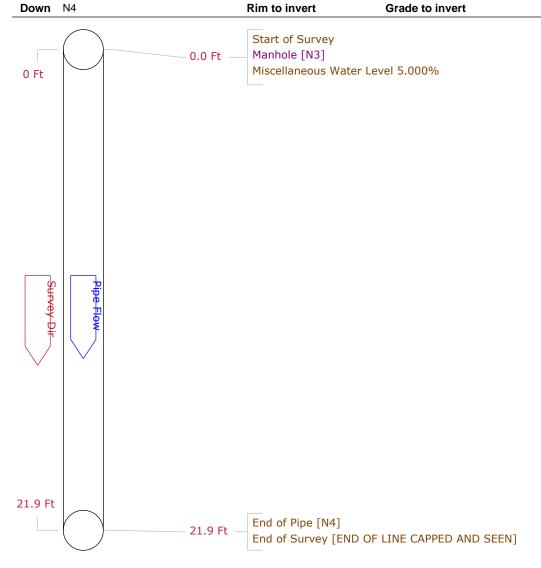
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Setup 14/28 Surveyed By PIP	ETEK-RD Cer	tificate # P0038923-082022	Owner INKSTER
Reviewed By	Reviewer #	Work Order	
Customer ETC		P/O	O #
Media Label N1A-1	Project ECT_STORM_TV	/_RD_12-21-2022	
Date 2022/12/22	Weather	Pre-Cleaning N	Date Cleaned
Flow control Not Controlled	Survey Purpose Rou	tine Assessment	Direction Upstream
Street TROMLEY (SOUTH)	С	ity INKSTER	Drainage area
Location Code		Pipe Use	e Stormwater Pipe
Location details PERRIN		Height 12	Width ins
Shape Circular	Material Reinforce	d Concrete Pipe Lining	
Coating	Pipe Joint leng	th Ft Total length	Ft Structural O & M
Length Surveyed 56.80 Ft	Year Constructed	Year Renewed	Miscellaneous Constructional
Additional info Reverse set up or	n sheet:29		
Up N1	Rim to invert	Grade to invert	Rim to grade Ft
Down N2	Rim to invert	Grade to invert	Rim to grade Ft



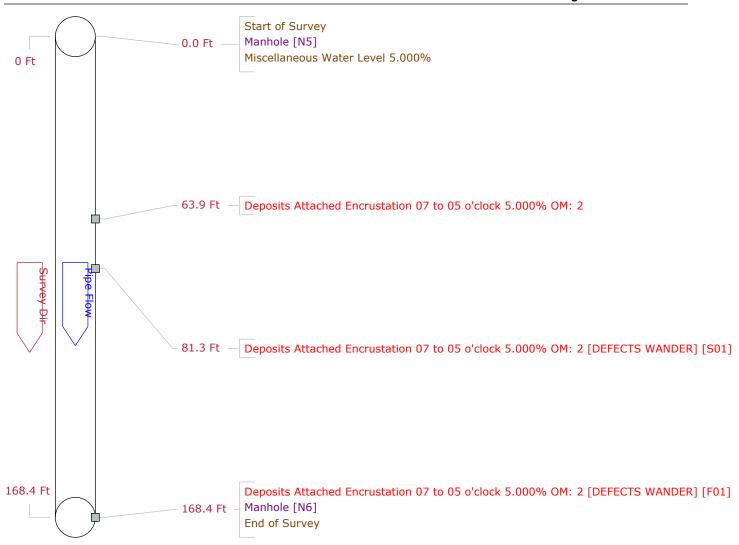
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Reviev	ved By			Reviewer #				Work Order				
Custon	ner	ETC						P/C	#			
Media L	_abel	N2A		Project ECT_STORM	/LTV_RD)_12-21-	2022					
Date 2	2022/12/	/22	Time 13:02	Weather			Pre-	-Cleaning N		Date Clea	aned	
Flow co	ontrol	Not Contr	rolled	Survey Purpose	Routine A	Assessm	ent			Direction D	ownstream	
Street	TROML	EY (SOUT	H)		City	INK	STER		Dra	inage area		
Locatio	n Code)						Pipe Use	St	ormwater Pipe		
Locatio	n detai	is PERRI	N					Height 12	Wie	dth ins		
Shape	Circula	r		Material Reinfo	orced Co	ncrete P	Pipe	Lining				
Coating	3			Pipe Joint le	ength	Ft	Total I	ength	Ft	Structural	O & M	
Length	Survey	/ed	183.70 Ft	Year Constructed	Y	ear Rei	newed			Miscellaneous	Construction	ona
Additio	nal info								,			
Up	N2			Rim to invert		Gr	rade to	invert		Rim to grad	e F	t
Danna	NO			Dim to invent		<u> </u>		invort		Dim to aread		-



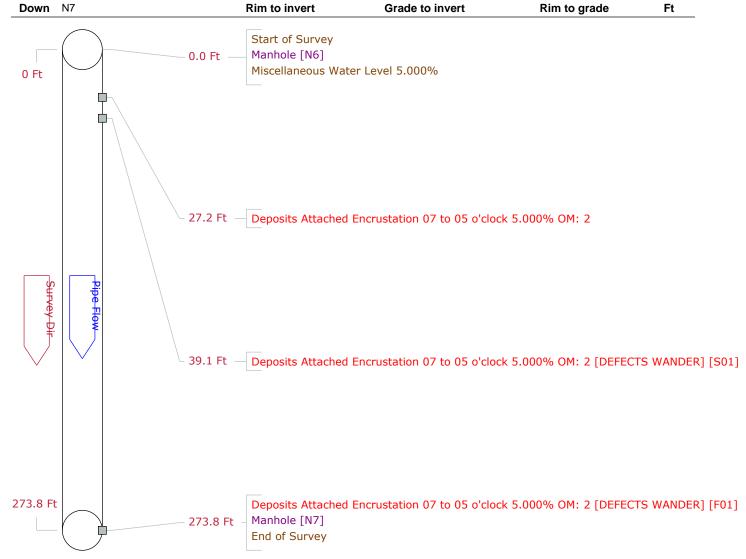
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Setup 16	Surveyed	By PIPE	TEK-RD	Certificate # P0038923-082022 Owner INKSTER							
Reviewed By			Reviewer #			Work Order					
Customer	ETC				P/O #						
Media Label	N3A	F	Project ECT_STOF	RM_TV_RD	_12-21-2022						
Date 2022/12/	/22 Ti ı	me 13:37	Weath	er	Pre-	-Cleaning N		Date Clean	ed		
Flow control	Not Controlle	ed	Survey Purpose	Routine A	ssessment		Direction Downstream				
Street TROMI	EY (SOUTH)			City	INKSTER		Dra	ainage area			
Location Code)					Pipe Use	St	ormwater Pipe			
Location detai	Is PERRIN					Height 12	Wi	dth ins			
Shape Circula	r		Material Rei	nforced Co	ncrete Pipe	Lining					
Coating			Pipe Joint	elength	Ft Total I	ength	Ft	Structural	O & M		
Length Survey	red 2	21.90 Ft	Year Constructed	I Y	ear Renewed			Miscellaneous	Constructional		
Additional info)										
Up N3			Rim to inve	rt	Grade to	invert		Rim to grade	Ft		
Down N4			Rim to inve	rt	Grade to	invert		Rim to grade	Ft		



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Setup 17	Surveyed By PIP	ETEK-RD Ce	rtificate # P003892	P0038923-082022					
Reviewed By		Reviewer #		Work Order					
Customer	ETC			P/O	#				
Media Label	N5A	Project ECT_STORM_T	V_RD_12-21-2022						
Date 2022/12/2	22 Time 8:45	Weather	Pre	-Cleaning N		Date Clean	ed		
Flow control	Not Controlled	Survey Purpose Rou	utine Assessment			Direction Dov	vnstream		
Street HELEN		C	ity INKSTER		Dra	inage area			
Location Code				Pipe Use	St	ormwater Pipe			
Location detail	s PERRIN			Height 18	Wi	dth ins			
Shape Circular		Material Reinforc	ed Concrete Pipe	Lining					
Coating		Pipe Joint leng	gth Ft Total	length	Ft	Structural	O & M		
Length Survey	ed 168.40 Ft	Year Constructed	Year Renewed			Miscellaneous	Constructiona		
Additional info									
Up N5		Rim to invert	Grade to	invert		Rim to grade	Ft		
Down N6		Rim to invert	Grade to	invert		Rim to grade	Ft		

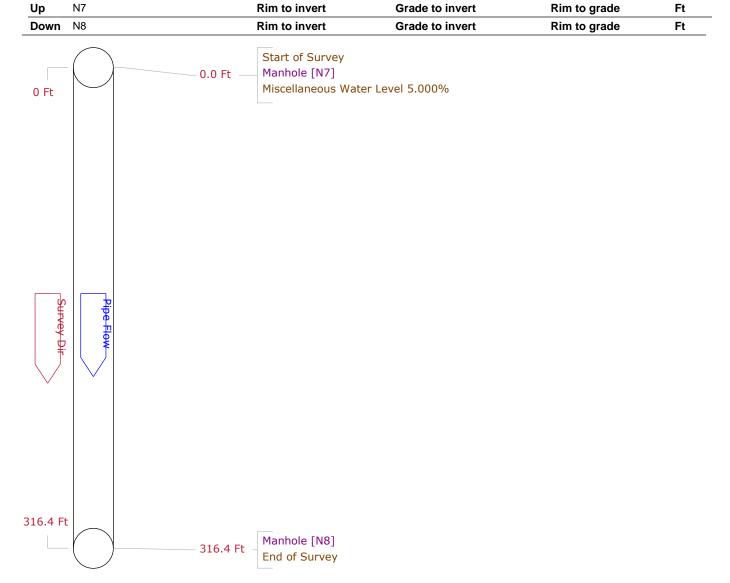


Surveyed By PIPETEK-RD Setup 18 Certificate # P0038923-082022 Owner INKSTER Reviewed By Reviewer # **Work Order** ETC P/O # Customer **Media Label** N₆A Project ECT_STORM_TV_RD_12-21-2022 Date 2022/12/22 Time 9:31 Weather **Date Cleaned** Pre-Cleaning N Not Controlled Flow control Survey Purpose Routine Assessment **Direction** Downstream Street HELEN City **INKSTER** Drainage area **Location Code** Pipe Use Stormwater Pipe Height 18 Location details PERRIN Width ins Shape Circular Material Reinforced Concrete Pipe Lining Coating **Pipe Joint length** Ft **Total length** Structural O & M 273.80 Ft Year Constructed Year Renewed Miscellaneous Length Surveyed Constructional Additional info Up N6 Rim to invert Grade to invert Rim to grade Ft

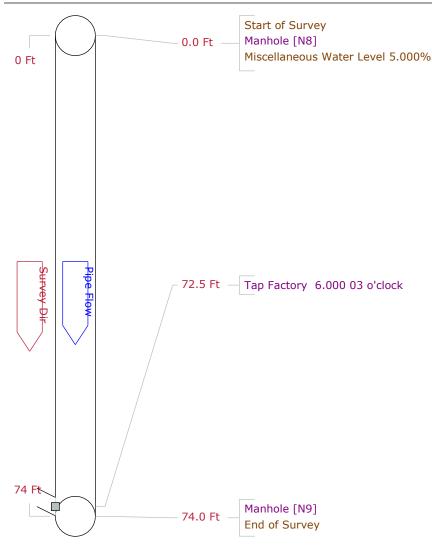


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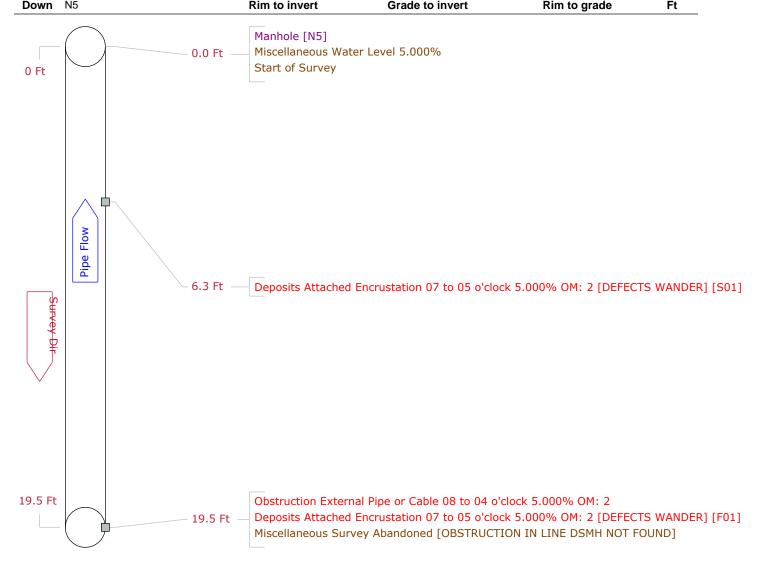
19 Surveyed By PIPETEK-RD Setup Certificate # P0038923-082022 Owner INKSTER Reviewer # Reviewed By **Work Order** Customer ETC P/O # **Media Label** N7A Project ECT_STORM_TV_RD_12-21-2022 Date 2022/12/22 **Time** 9:41 Weather **Date Cleaned** Pre-Cleaning N Not Controlled Survey Purpose Routine Assessment **Direction** Downstream Flow control Street HELEN City **INKSTER** Drainage area **Location Code** Pipe Use Stormwater Pipe Location details PERRIN Height 18 Width ins Shape Circular Material Reinforced Concrete Pipe Lining Coating Pipe Joint length Ft **Total length** Structural O & M **Length Surveyed** 316.40 Ft Year Constructed Year Renewed Miscellaneous Constructional **Additional info** Up N7 Rim to invert Grade to invert Ft



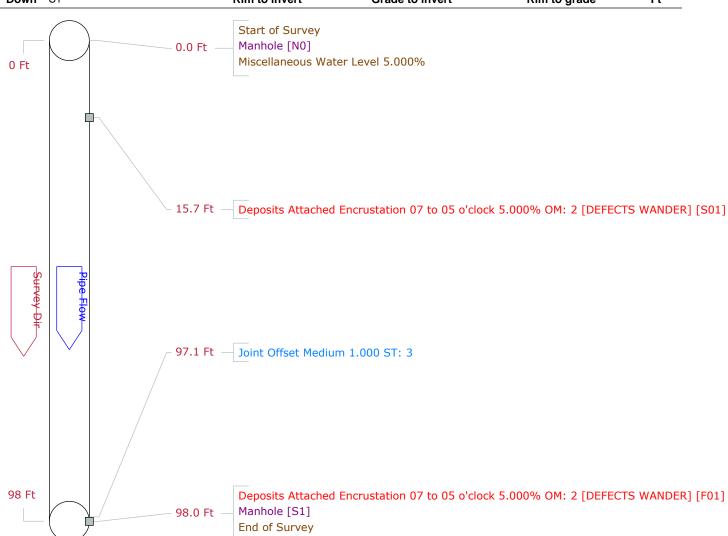
Setup 20	Surveyed B	y PIPE	TEK-RD	Certifica	tificate # P0038923-082022 Owner INKSTER					
Reviewed By			Reviewer #			Work Order				
Customer	ETC					P/O)#			
Media Label	N8A		Project ECT_STOR	M_TV_RD	_12-21-2022					
Date 2022/12/	'22 Time	9:52	Weathe	r	Pre-	-Cleaning N		Date Clean	ed	
Flow control	Not Controlled		Survey Purpose	Routine A	Assessment		Direction Downstream			
Street HELEN				City	INKSTER		Dra	inage area		
Location Code	•					Pipe Use	St	ormwater Pipe		
Location detail	Is PERRIN					Height 12	Wie	dth ins		
Shape Circular	r		Material Rein	forced Co	ncrete Pipe	Lining				
Coating			Pipe Joint	length	Ft Total I	length	Ft	Structural	O & M	
Length Survey	red 74.0	00 Ft	Year Constructed	Υ	ear Renewed			Miscellaneous	Constructional	
Additional info	•									
Up N8			Rim to inver	t	Grade to	invert		Rim to grade	Ft	
Down N9			Rim to inver	t	Grade to	invert		Rim to grade	Ft	

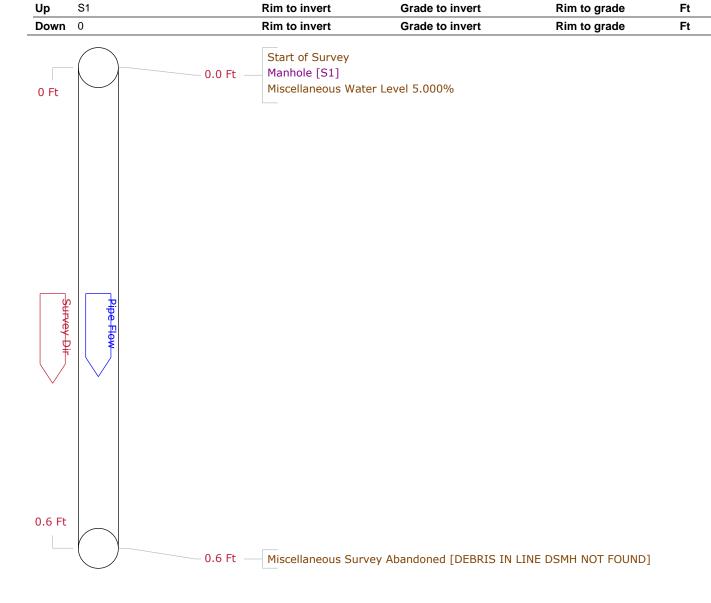


Setup	21	Surve	eved By	PIPE	TEK-RD	Certific	cate # P	003892	3-082022	Ωv	vner IN	IKSTER		
Review		Juite	, you by		Reviewer #	Cortini	outo II I	000002	Work Order	٠.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Custom	•	ETC			norione. "				P/C) #				
Media L	abel	N5B			Project ECT_STOR	RM_TV_R	D_12-21	-2022						
Date 2	2022/12	/22	Time 1	0:30	Weathe	er		Pre	-Cleaning N		D	ate Clean	ed	
Flow co	ntrol	Not Con	trolled		Survey Purpose	Routine	Assessn	nent			Dire	ection Ups	tream	
Street	HELEN	I				City	IN	KSTER		Dra	inage	area		
Locatio	n Code	•							Pipe Use	St	ormwa	ter Pipe		
Locatio	n detai	Is PERR	RIN						Height 18	Wie	dth	ins		
Shape	Circula	r			Material Rei	nforced C	oncrete F	Pipe	Lining					
Coating					Pipe Joint	length	Ft	Total	length	Ft	Struc	tural	O & M	
Length	Survey	red	19.50	Ft	Year Constructed	I	Year Re	newed			Misce	llaneous	Constru	ctiona
Additio	nal info)												
Up	SOME	RSET EAS	ST		Rim to inve	rt	G	rade to	invert		Rim	to grade		Ft
Down	N5				Rim to inve	rt		rada to	invert		Pim	to arada		F+



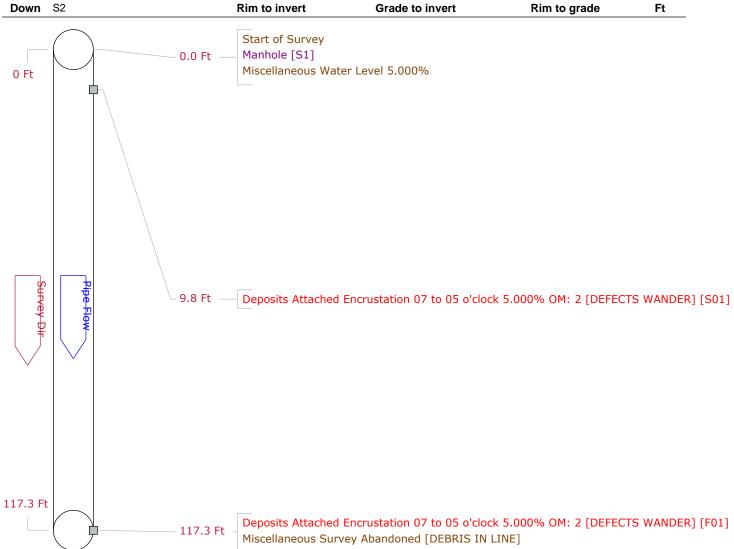
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Setup 22	2 Surv	eyed By F	PIPET	TEK-RD C	ertifica	ate # P003892	3-082022	Ov	vner INKSTER			
Reviewed E	Зу			Reviewer #			Work Order					
Customer	ETC						P/C) #	#			
Media Label	l N0A		F	Project ECT_STORM	_TV_RD	_12-21-2022						
Date 2022/	12/22	Time 10):59	Weather		Pre	-Cleaning N		Date Clean	ed		
Flow contro	Not Co	ntrolled		Survey Purpose R	outine A	Assessment			Direction Dov	wnstream		
Street HEL	EN (SOUTH				City	INKSTER		Dra				
Location Co	de						Pipe Use	St	ormwater Pipe			
Location de	tails PER	RIN					Height 12	Wie	dth ins			
Shape Circ	ular			Material Reinfo	rced Co	ncrete Pipe	Lining					
Coating				Pipe Joint le	ngth	Ft Total	length	Ft	Structural	O & M		
Length Surv	eyed	98.00	Ft	Year Constructed	Υ	ear Renewed			Miscellaneous	Construction		
Additional in	nfo											
Up N0				Rim to invert		Grade to	invert		Rim to grade	Ft		
Down S1				Rim to invert		Grade to	invert		Rim to grade	Ft		





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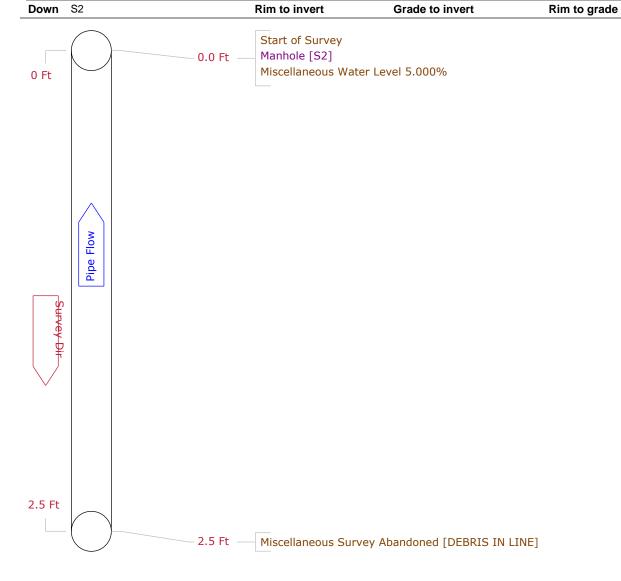
Surveyed By PIPETEK-RD Setup 24/25 Certificate # P0038923-082022 Owner INKSTER Reviewed By Reviewer # **Work Order** ETC P/O # Customer **Media Label** S₁A Project ECT_STORM_TV_RD_12-21-2022 Date 2022/12/22 Time 11:51 Weather **Date Cleaned** Pre-Cleaning N Not Controlled Flow control Survey Purpose Routine Assessment **Direction** Downstream Street TROMLEY (SOUTH) City **INKSTER** Drainage area **Location Code** Pipe Use Stormwater Pipe Height 12 Location details PERRIN Width ins Shape Circular Material Reinforced Concrete Pipe Lining Coating **Pipe Joint length Total length** Structural O & M Ft 117.30 Ft Year Constructed Year Renewed Miscellaneous Length Surveyed Constructional Additional info Up S1 Rim to invert Grade to invert Rim to grade Ft



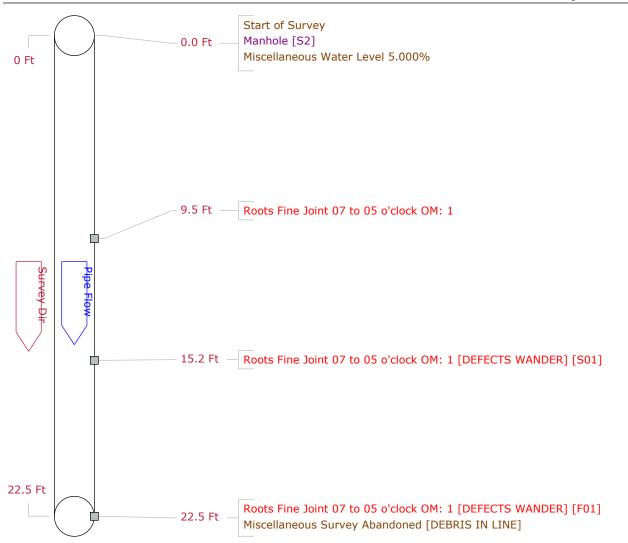
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Surveyed By P	IPETEK-RD	Certifica	ate # P003892	23-082022	Owr	ner INKSTER			
	Reviewer #			Work Order					
ETC				P/O	#	#			
S1A	Project ECT_STO	RM_TV_RD	_12-21-2022						
2 Time 12:	03 Weath	er	Pre	e-Cleaning N		Date Clear	ned		
Not Controlled	Survey Purpose	e Routine A	ssessment			stream			
Y (SOUTH)		City	INKSTER		Drainage area				
				Pipe Use	Sto	rmwater Pipe			
PERRIN				Height 12	Widt	h ins			
	Material Rei	inforced Co	ncrete Pipe	Lining					
	Pipe Join	t length	Ft Total	length	Ft	Structural	O & M		
d 02.50 I	Ft Year Constructed	Y t	ear Renewed			Miscellaneous	Constructional		
Reverse set up	on sheet:24				_				
	Rim to inve	ert	Grade to	invert		Rim to grade	Ft		
	Surveyed By Pi ETC S1A 2 Time 12: Not Controlled EY (SOUTH) FERRIN d 02.50 I	Surveyed By PIPETEK-RD Reviewer # ETC S1A Project ECT_STOR 2 Time 12:03 Weath Not Controlled Survey Purpose EY (SOUTH) S PERRIN Material Rei Pipe Join d 02.50 Ft Year Constructed Reverse set up on sheet:24	Surveyed By PIPETEK-RD Certificate Reviewer # ETC S1A Project ECT_STORM_TV_RD 2 Time 12:03 Weather Not Controlled Survey Purpose Routine A EY (SOUTH) City S PERRIN Material Reinforced Col Pipe Joint length d 02.50 Ft Year Constructed Y	Surveyed By PIPETEK-RD Certificate # P003892 Reviewer # ETC S1A Project ECT_STORM_TV_RD_12-21-2022 2 Time 12:03 Weather Properties Routine Assessment EY (SOUTH) City INKSTER Material Reinforced Concrete Pipe Pipe Joint length Ft Total d 02.50 Ft Year Constructed Year Renewed Reverse set up on sheet:24	Surveyed By PIPETEK-RD Certificate # P0038923-082022 Reviewer # Work Order ETC P/O S1A Project ECT_STORM_TV_RD_12-21-2022 2 Time 12:03 Weather Pre-Cleaning N Not Controlled Survey Purpose Routine Assessment EY (SOUTH) City INKSTER Pipe Use S PERRIN Height 12 Material Reinforced Concrete Pipe Lining Pipe Joint length Ft Total length d 02.50 Ft Year Constructed Year Renewed Reverse set up on sheet:24	Surveyed By PIPETEK-RD Certificate # P0038923-082022 Owr Reviewer # Work Order ETC P/O # S1A Project ECT_STORM_TV_RD_12-21-2022 2 Time 12:03 Weather Pre-Cleaning N Not Controlled Survey Purpose Routine Assessment EY (SOUTH) City INKSTER Drain Pipe Use Store Fipe Use Store Attendary Reinforced Concrete Pipe Lining Pipe Joint length Ft Total length Reverse set up on sheet:24	Surveyed By PIPETEK-RD Reviewer # Work Order ETC P/O # S1A Project ECT_STORM_TV_RD_12-21-2022 2 Time 12:03 Weather Pre-Cleaning N Date Clear Not Controlled Survey Purpose Routine Assessment Direction Up EY (SOUTH) City INKSTER Pipe Use Stormwater Pipe S PERRIN Material Reinforced Concrete Pipe Lining Pipe Joint length Ft Total length Miscellaneous Reverse set up on sheet:24		



Setup	26	Surve	eyed By	PIPETI	EK-RD	Certificate # P0038923-082022 Owner INKSTER						
Reviewe	d By				Reviewer #			Work Order				
Custome	r	ETC						P/O	#			
Media Lal	bel	S2A		Pı	roject ECT_STOF	RM_TV_RE	0_12-21-2022					
Date 202	22/12/	22	Time 12	2:14	Weathe	er	Pre	-Cleaning N		Date Clean	ned	
Flow conf	trol	Not Con	trolled		Survey Purpose	Routine A	Assessment	wnstream				
Street T	ROML	EY (SOU	TH)			City	INKSTER		Dra	inage area		
Location	Code							Pipe Use	St	ormwater Pipe		
Location	detail	s PERR	RIN					Height 12	Wie	dth ins		
Shape C	ircular				Material Rei	nforced Co	ncrete Pipe	Lining				
Coating					Pipe Joint	length	Ft Total	length	Ft	Structural	O & M	
Length S	urvey	ed	22.50	Ft Y	ear Constructed	l Y	ear Renewed			Miscellaneous	Constructiona	
Additiona	ıl info											
Up S	2				Rim to inve	rt	Grade to	invert		Rim to grade	Ft	
Down S	3				Rim to inve	rt	Grade to	invert		Rim to grade	Ft	



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Setup 28/14	Surveyed I	By PIPE	TEK-RD	Certifica	ate # P003892	3-082022	Ov	vner INKSTER	
Reviewed By			Reviewer #			Work Order			
Customer	ETC					P/O	#		
Media Label	N1A-1	ı	Project ECT_STOR	M_TV_RD	0_12-21-2022				
Date 2022/12/	22 Tim	e 12:38	Weathe	r	Pre	-Cleaning N		Date Clean	ed
Flow control	Not Controlled		Survey Purpose	Routine A	Assessment			Direction Dov	vnstream
Street TROML	.EY (SOUTH)			City	INKSTER		Dra	inage area	
Location Code						Pipe Use	St	ormwater Pipe	
Location detail	Is PERRIN					Height 12	Wi	dth ins	
Shape Circular	-		Material Rein	forced Co	ncrete Pipe	Lining			
Coating			Pipe Joint	length	Ft Total	length	Ft	Structural	O & M
Length Survey	ed 50.	.00 Ft	Year Constructed	Υ	ear Renewed			Miscellaneous	Constructiona
Additional info	1								
Up N1			Rim to inver	t	Grade to	invert		Rim to grade	Ft
Down N2			Rim to inver	t	Grade to	invert		Rim to grade	Ft

