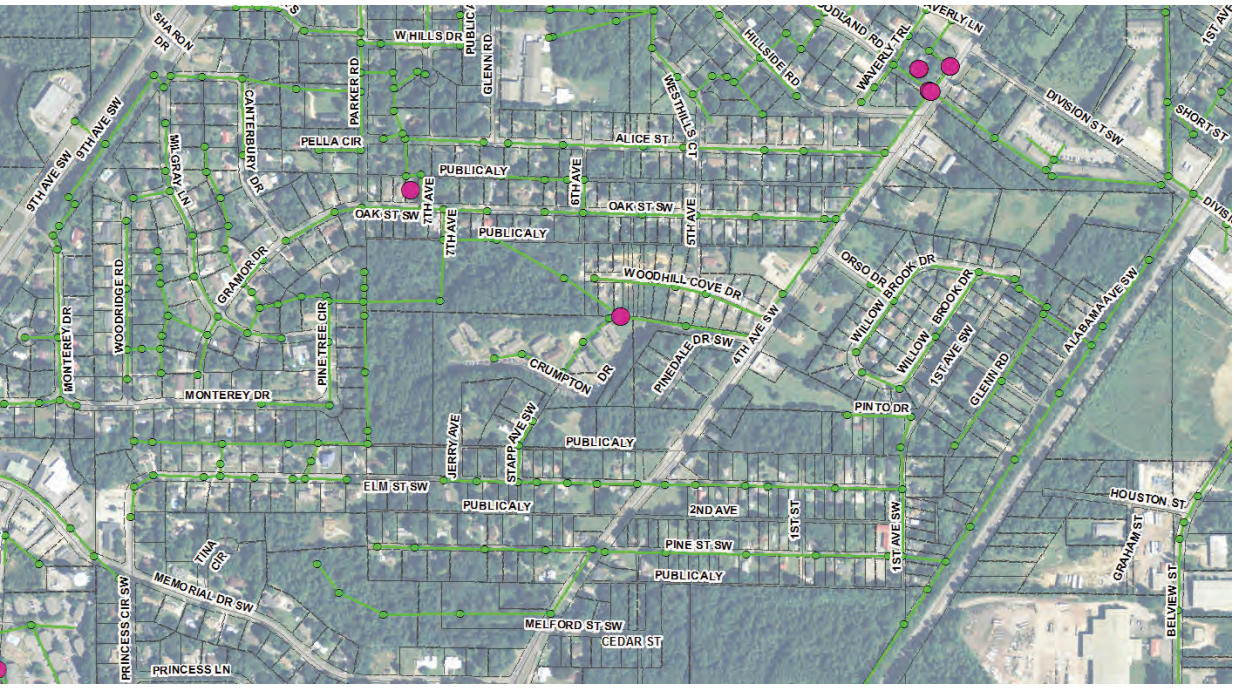

Jefferson County Environmental Services Department Capacity, Management, Operations and Maintenance (CMOM) Program

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Maintenance

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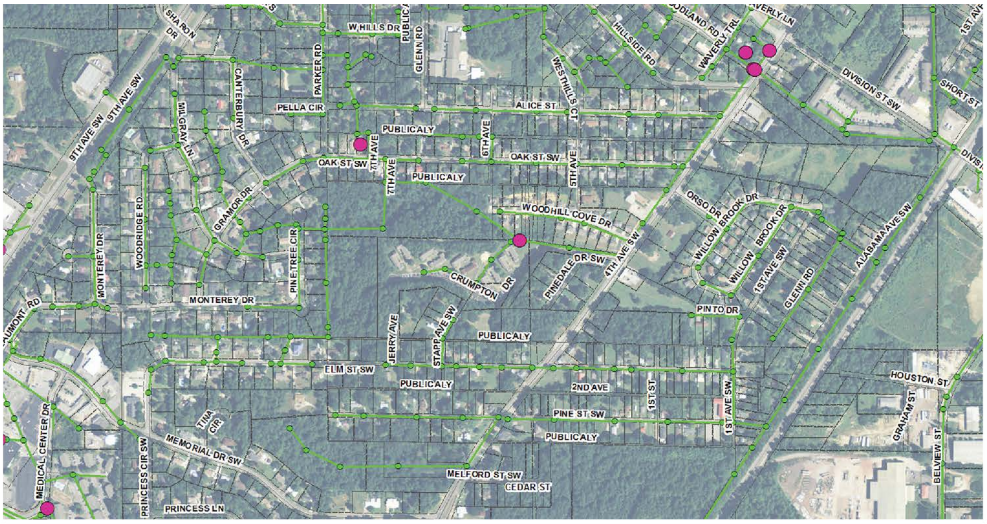
- Maintenance of Way Program

Standard Operating Procedures Handbook for Collection System Field Operations

Management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PINE ST SW
MEMORIAL DR SW
MELFORD ST SW
CEDAR ST
PRINCESS LN
HOUSTON ST
DIVISION ST SW
5TH AVE SW
6TH AVE
7TH AVE
8TH AVE
4TH AVE SW
1ST AVE SW
1ST ST
GLENN RD
PARKER RD
CANTERBURY DR
WILGRAY LN
GRAMOR DR
WOODRIDGE RD
PINETREE CIR
JERRY AVE
STAPP AVE SW
PREDALE DR SW
ORSO DR
WILLOW BROOK DR
ALABAMA AVE SW
GLENN RD
GRAHAM ST
BELVIEW ST
MEDICAL CENTER DR
PRINCESS CIR SW
LEILA CIR

Jefferson County Environmental Services Department Capacity, Management, Operations, and Maintenance (CMOM) Program Organization

FINAL

February 2022

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CMOM Revision History - February 2022

Revision Number	Page Number(s)	Description of Change	Date of Change
1	1	Overview updated to reflect 2016 CMOM plan and this revision	4/26/18
1	3	Description of wastewater treatment and collection system updated	4/26/18
1	3	Updated number of pump stations	11/17/18
1	7	JCESD WRFs and Collection System Overview updated	4/26/18
1	7	Table of force main lengths by diameters updated	4/26/18
1	8	Table of gravity sewer lengths by diameters updated	4/26/18
1	8	Description added regarding ID of unknown pipe type since 2016 and how it was established	4/30/18
1	8	Updated status of SSO root cause analysis method implementation	4/30/18
1	9	Added notation regarding current reorganization efforts	11/28/18
1	10	Updated JCESD staffing details	11/26/18
2	3	Updated sewer system asset numbers	2/2022
2	6	Updated Figure 1	2/2022
2	7-9	Updated Table 3-6	2/2022
2	11	Updated Table 7	2/2022
2	10-13	Updated some organizational language	2/2022

Approved by (Responsible Party)

8-30-2023

David Denard, PE — Date

Director

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Acronyms

ADEM	Alabama Department of Environmental Management
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
FOG	Fats, oils, and grease
FY	Fiscal year
GIS	Geographic Information System
IMS	Information management system
in	Inch
JCDH	Jefferson County Department of Health
JCESD	Jefferson County Environmental Services Department
LF	Lineal feet
MOM	Management, Operation and Maintenance
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
PM	Preventive maintenance
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility

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Capacity, Management, Operations, and Maintenance (CMOM) Program Organization

Overview

The Jefferson County Environmental Services Department (JCESD) has developed a comprehensive CMOM Program that is documented in various program plans, policies and procedures, and guidance documents.

JCESD began its formal Collection System Management, Operation and Maintenance Program (referred to as the "MOM") in 1998, and originally prepared a short-term written MOM Plan in 2001 as required by the United States Environmental Protection Agency (USEPA). The purpose of the MOM was to describe JCESD's plan for the management, operations and maintenance of the unified County sanitary sewer collection system. In a letter dated September 9, 2008, the USEPA approved JCESD's MOM Program Plan and supporting documentation, and since that time, JCESD has provided annual updates to the plan to USEPA.

In 2012, JCESD's MOM Plan described basic procedures employed by the County in managing, operating and maintaining its sanitary sewer collection system after the completion of rehabilitation performed pursuant to Section VII of the Consent Decree with USEPA, into which the County had entered. JCESD's 2016 CMOM Plan reflected significant advances that had been made to the ways in which it manages, operates, and maintains its collection system. Refinements to these approaches, and resultant impacts to the collection system performance, are described in this updated CMOM Plan.

In 2011, JCESD entered into contract with a consulting engineering firm to develop a Collection System Asset Management Program, which includes processes and procedures to identify and prioritize future collection system capital and operating replacement and maintenance requirements. As part of this program, a system of tools and data were developed and refined, including an asset management platform, hydraulic capacity model, detailed condition assessment data, and system performance data. Additionally, a comprehensive evaluation of the field operations and maintenance programs, practices, equipment and tools were undertaken, and a maintenance best practice operations training program was developed. As part of this training program, the field crews have gone through a standardization process during which best practices and new technologies have been adopted.

This document, and all the related associated program plans and referenced resources, describe the goals of the JCESD CMOM Program, as well as the means and methods that are in place and are being implemented to achieve the goals and ensure the successful execution of the various CMOM program elements.

Overall CMOM Program Goals

The County has a stated goal for the overall CMOM Program and is establishing goals for each of its areas of responsibility of wastewater conveyance and treatment. The overall CMOM Program goal is to:

> *Protecting public health and the environment by reducing the frequency and volume of sanitary sewer overflows (SSOs) in the JCESD collection system and providing the proper resources to effectively manage and maintain the collection system while supporting economic sustainability in the Jefferson County service area.*

This CMOM Program goal ties directly back to JCESD's Mission Statement, which is as follows:

> *The mission of Environmental Services is to protect human health and the environment through the effective and efficient operation of the County-wide sanitary sewer collection and treatment system.*

Overall CMOM Program Components

JCESD's Overall CMOM Program documentation reflects the USEPA's CMOM guidelines[1], and individual program plans have been developed for the following JCESD management, operations, and maintenance program initiatives that are currently in place:

<u>Capacity and Management Programs</u>

- CMOM Program Organization
- Engineering, includes:
  - Acquisitions
  - Capacity Assurance
  - Collection System Plans and Mapping
  - Continuous Sewer System Assessment
  - Infrastructure Rehabilitation
  - New Construction and Rehabilitation Inspection
  - System Design Standards
  - System Inventory
- CMOM Information Management Systems (IMS)
- Collection System Training
- Contingency Planning
- Customer Service
- Equipment and Supplies Management
- Financial Analysis
- Legal Support
- Overflow Tracking
- Safety
- Water Quality Monitoring

[1] United States Environmental Protection Agency, Office of Enforcement and Compliance Assurance (2224A), January 2005, *Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems*, EPA 305-B-05-002.

Operations and Maintenance Programs

- Fats, Oils and Grease (FOG) Management
- Gravity Line Preventative Maintenance (PM)
- Line Location
- Maintenance of Way
- Pretreatment
- Pump Stations Operations and Maintenance (O&M)
- Service Connection and Disconnection
- Sewer System Overflow Response and Reporting (SSORRP)

JCESD has developed a CMOM Program that is patterned after USEPA Region 4 guidance, with its own customized formatting of program elements to better conform to its organization structure. A crosswalk between the CMOM program element checklists provided in the 2005 USEPA CMOM guidance document and the individual plans that are included in the JCESD CMOM Program documentation is provided in **Table 1**.

Table 2 provides a summary of the individual program plans, which is intended to aid in understanding the interrelationships of the comprehensive CMOM Program.

Collection System Background Information

The following provides an overview of the Jefferson County collection system service area, components, and performance history.

Service Area

The JCESD provides wastewater collection and treatment services to approximately 145,000 residential, commercial, and industrial customer accounts in 23 municipalities located in Jefferson County, portions of unincorporated Jefferson County, and portions of Shelby and St. Clair Counties, as shown in **Figure 1**. The population within the JCESD service area is approximately 600,000.

Wastewater Treatment and Collection System Description

The County's wastewater collection and treatment system, overseen by the JCESD, consists of the following (as of February 2022):

- Approximately 3,113 miles of gravity sanitary sewer lines
- 178 collection system pump/lift stations
- Approximately 107 miles of sanitary sewer force main pipe
- 9 Water Reclamation Facilities (WRFs)

Table 1. EPA CMOM Guidance and JCESD CMOM Program Crosswalk

Region 4 CMOM Checklist Item					Jefferson County ESD CMOM Programs
Section	**Issue**				**Program Plan**
I.	General Information – Collection System Description				CMOM Program Organization
II.	Continuing Sewer Assessment Plan				Engineering
III.	Collection System Management	A.	Organizational Structure		CMOM Program Organization
		B.	Training		Collection System Training
		C.	Communication and Customer Service		CMOM Program Organization, Customer Service
		D.	Management Information Systems		CMOM Information Management Systems
		E.	SSO Notification Program		Sanitary Sewer Overflow Response and Reporting
		F.	Legal Authority		Legal Support
IV.	Collection System Operation	A.	Budgeting		Financial Analysis
		B.	Compliance		CMOM Program Organization
		C.	Water Quality Monitoring		Water Quality Monitoring
		D.	Hydrogen Sulfide Monitoring and Control		Corrosion Control, Engineering
		E.	Safety		Safety
		F.	Emergency Preparedness and Response		Contingency Planning
		G.	Modeling		Engineering
		H.	Engineering	System Mapping and As-built Plans	Engineering
		I.		Design	Engineering
		J.		Capacity	Engineering
		K.		Construction	Engineering
		L.1.	Pump Station Operation	Inspection	Pump Station O&M
		L.2.		Emergencies	Pump Station O&M
		L.3.		Emergency Response and Monitoring	Contingency Planning
		L.4.		Record Keeping	Pump Station O&M
		L.5.		Force Mains and Air/Vacuum Valves	Pump Station O&M
V.	Collection System Maintenance	A.	Maintenance Budgeting		Financial Analysis
		B.	Planned Maintenance		Gravity Line Preventative Maintenance
		C.	Maintenance Scheduling		Gravity Line Preventative Maintenance
		D.	Maintenance Right-of-Way		Maintenance of Way
		E.1.	Sewer Cleaning	Cleaning Equipment	Gravity Line Preventative Maintenance
		E.2.		Chemical Cleaning and Root Removal	Gravity Line Preventative Maintenance
		F.	Parts Inventory		Equipment and Supplies Management
		G.	Equipment and Tool Management		Equipment and Supplies Management
VI.	Management Information Systems: Performance Indicators				Each Program Plan as appropriate
VII.	Sewer System Capacity Evaluation	A.	Internal CCTV Inspection		Engineering, Gravity Line Preventative Maintenance
		B.	Survey and Rehabilitation (general)		Engineering
		C.	Sewer Cleaning Related to I/I Reduction		Gravity Line Preventative Maintenance
		D.	Flow Monitoring		Engineering
		E.	Smoke Testing and Dyed Water Flooding		Gravity Line Preventative Maintenance
		F.	Manhole Inspection		Engineering
VIII.	Rehabilitation	A.	Manhole Repairs		Engineering
		B.	Mainline Sewers		Engineering

Table 2. JCESD CMOM Program Plan Interrelationships Matrix

	CMOM Program Organization	Collection System Training	Safety	CMOM IMS	Engineering	Overflow Tracking	Financial Analysis	Equipment and Supplies Management	Customer Service	Legal Support	Water Quality Monitoring	Contingency Planning	Pump Station O&M	Pretreatment	Corrosion Control	FOG Management	Service Connection and Disconnection	Line Location	Gravity Line PM	Maintenance of Way	SSORRP	SOPs and WPDs for Collection Systems Field Operations
CMOM Program Organization		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Collection System Training	✓		✓						✓			✓	✓						✓		✓	✓
Safety	✓	✓						✓	✓			✓	✓						✓			✓
CMOM IMS	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Engineering	✓			✓			✓	✓	✓	✓					✓			✓	✓			✓
Overflow Tracking	✓		✓	✓					✓					✓		✓			✓		✓	✓
Financial Analysis	✓		✓					✓		✓			✓	✓		✓	✓					
Equipment and Supplies Management	✓		✓	✓	✓								✓						✓		✓	✓
Customer Service	✓			✓									✓			✓					✓	✓
Legal Support	✓			✓	✓		✓							✓		✓	✓	✓	✓			
Water Quality Monitoring	✓			✓		✓		✓	✓					✓		✓					✓	
Contingency Planning	✓	✓	✓	✓				✓	✓		✓		✓						✓		✓	✓
Pump Station O&M	✓	✓	✓	✓	✓		✓	✓				✓									✓	✓
Pretreatment				✓												✓	✓					
Corrosion Control	✓			✓	✓			✓						✓					✓			✓
FOG Management	✓					✓			✓	✓											✓	
Service Connection and Disconnection	✓			✓	✓		✓		✓			✓						✓				
Line Location			✓	✓	✓				✓	✓							✓					✓
Gravity Line PM	✓	✓	✓	✓	✓			✓	✓					✓	✓	✓	✓	✓		✓	✓	✓
Maintenance of Way	✓			✓	✓																	✓

✓ Indicates that the Program Plan references or is referenced in the associated Program Plan

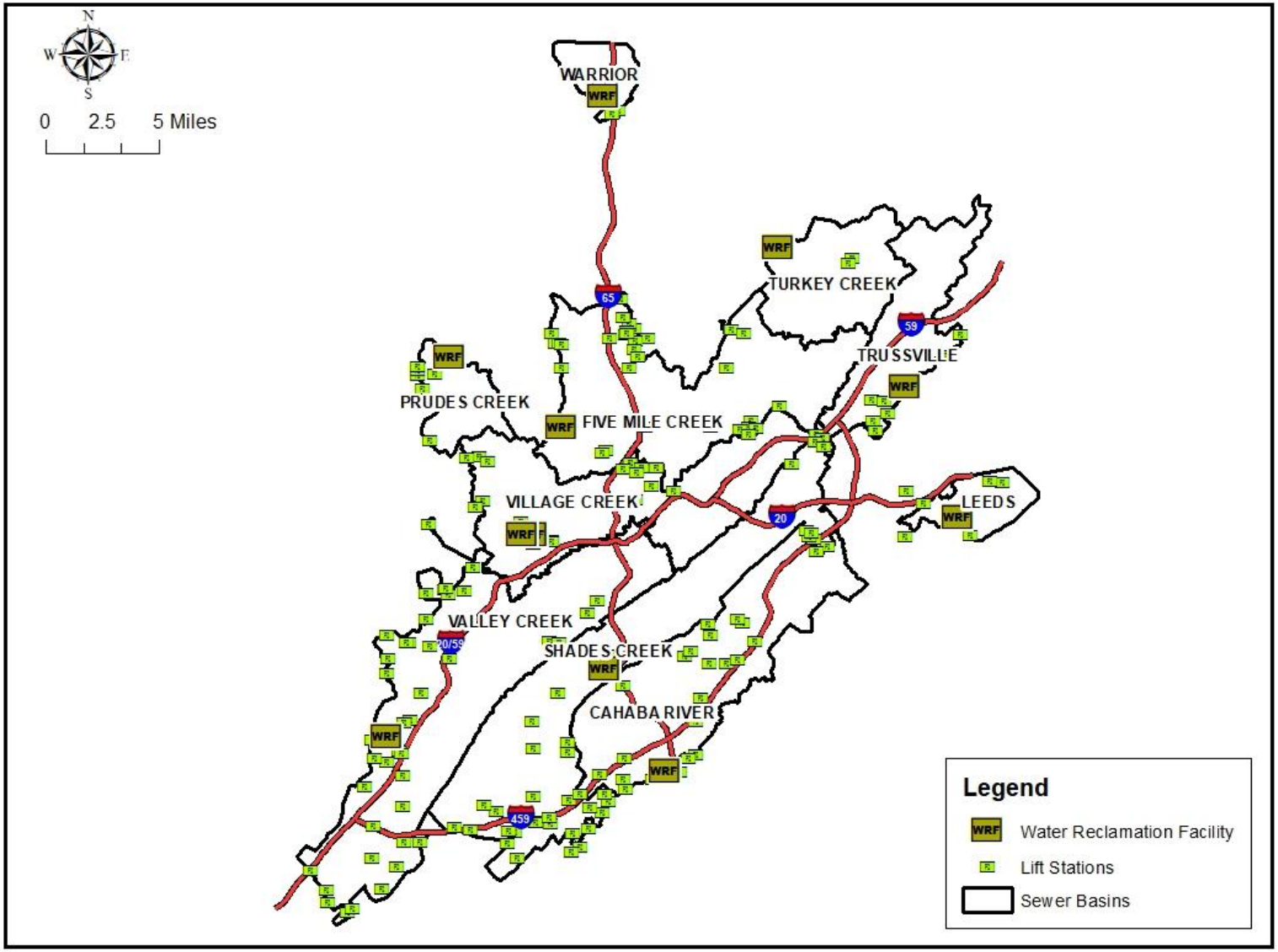

Figure 1. Jefferson County Sewer Service Area and Sewer Basins

Table 3 provides a listing of JCESD's WRFs and associated National Pollutant Discharge Elimination System (NPDES) permit numbers, as well as the lineal footage (LF) of force main and gravity sewers in each WRF tributary area that are active (in-service) and owned by the County.

Table 3. JCESD WRFs and Collection System Overview

WRF	NPDES Permit No.	Tributary Force Main (LF)*	Tributary Gravity Main (LF)*	Tributary Manholes
Cahaba River	AL0023027	70,195	1,848,788	10,707
Five Mile Creek	AL0026913	50,562	2,238,563	11,482
Leeds	AL0067067	31,048	266,183	1,366
Prudes Creek	AL0056120	16,408	152,216	777
Trussville	AL0022934	25,918	495,274	2,464
Turkey Creek	AL0022926	7,565	592,395	3,310
Valley Creek	AL0023655	289,057	7,444,515	36,328
Village Creek	AL0023647	47,703	3,356,087	16,164
Warrior	AL0050881	8,711	44,828	269
TOTAL		547,166	16,438,850	82,867

**Note: Gravity and Force Main Length as of August 2021 Asset Inventory*

The lengths by diameters (in inches (in)) of force main within the JCESD collection system are shown in **Table 4.** The lengths of pipe by diameter of gravity sewers are shown in **Table 5**.

Table 4. Force Mains in the JCESD Collection System

Diameter (in)	Length (LF)
2	7,445
3	34,551
4	68,844
6	155,178
8	63,152
10	61,955
12	27,378
14	54,333
16	5,488
18	18,090
24	5,259
36	37,574
48	5,690
54	862
60	360
unknown	1,007
Total	547,166

Table 5. Gravity Sewers in the JCESD Collection System

Diameter (in)	Length (LF)	Diameter (in)	Length (LF)	Diameter (in)	Length (LF)
4	7,330	25	770	52	70
6	176,172	26	1,001	54	115,092
8	12,851,338	27	25,897	55	746
10	589,833	28	1,010	56	315
12	694,201	29	1,940	60	134,980
13	101	30	158,508	66	44,785
14	16,071	32	1,180	72	23,271
15	199,615	34	12	84	41,485
16	145,164	36	169,223	96	21,460
17	5,073	38	391	102	13,284
18	345,114	42	53,582	120	14,065
20	29,605	43	497	132	3,291
21	60,026	45	291	144	4,415
22	5,177	46	822	146	242
23	157	47	1,648	Unknown	129,337
24	255,836	48	94,429		
Total					16,438,850

Since 2016, the lineal footage of unknown diameter pipe decreased by 13%. This is due to continued CCTV pipe inspections and field investigations through which pipe diameters were identified and confirmed. JCESD's geographic information system (GIS) is constantly updated as new asset information is made available.

System Performance Information

JCESD documents and reports all SSO occurrences, regardless of the size of the spill. A listing of SSOs experienced within the JCESD collection system during the past 5 years is presented in **Table 6**.

Table 6. Sanitary Sewer Overflow Occurrences, 2013 - 2017

Calendar Year	Total Annual Rainfall (inches)*	Number of SSOs	Number of Overflow Advisories Issued	SSO Rate per 100 Miles
2016	40.31	202	66	6.5
2017	69.04	282	169	9.1
2018	61.09	246	156	7.9
2019	52.55	199	144	6.4
2020	73.12	259	214	8.3

**Data obtained from the National Weather Service at the Birmingham Airport*

JCESD refined the method in which the primary causes of SSO occurrences are characterized, so that the dominant cause is more easily identifiable. For more information on how the primary cause analysis is performed, documented, and follow up actions are implemented, see the **SSORRP**, **Overflow Tracking Program**, and **Gravity Line Preventive Maintenance Program** plans**,** and the **Standard Operating Procedures and Work Process Documentation for Collection System Field Operations Handbook**.

CMOM Program Resources

JCESD CMOM Program Authority and Implementation Staffing

Jefferson County Commission

Jefferson County is governed by five Commissioners elected from specific districts of the County. Each Commissioner is responsible for oversight of assigned departments and functions of County government. The Commissioners elect one of their number to serve as President of the Commission. The President's duties include presiding over Commission meetings and authorization to execute contracts and other documents.

Jefferson County Manager

In 2009, Jefferson County changed to a County Manager form of government. A Deputy County Manager is assigned to oversee the County's infrastructure, and as such, is responsible for overseeing the administration of the Environmental Services Department through the County Manager's office.

Jefferson County Environmental Services Department

The JCESD is responsible for collecting, conveying, and treating sanitary sewage in the Jefferson County sanitary sewer service area. Each of the Department's divisions, discussed below, is responsible for a specific range of operations that work together to serve its customers, protect water quality, and meet all regulatory obligations.

Table 7 on the following page lists specific JCESD divisions (with Munis financial software codes) and number of positions within each division for fiscal year (FY) 2021 Organizational charts showing individual staff members and classifications for each division (with Organizational Codes used by Jefferson County Payroll) are included in **Appendix A**.

Administration Division

The Administration Division is responsible for providing direction to all phases of JCESD's operations. The JCESD Director has the ultimate responsibility for all aspects of the Department's CMOM Program. The Director has the following four direct reports:

- Deputy Director
- Impact, Planning, and Plans Review Division Manager
- Barton Laboratory Manager
- Billing, Budget, & HR Manage

Table 7. JCESD Staffing Details for FY 2021

Department Munis Code	Description	Number of Staff
7100	JCESD Administration	57
7101	Sewer Billing	15
7102	Barton Laboratory	20
7210	Inspection	24
7211	Survey	13
7230	Construction	24
7240	Pump Stations	26
7250	Line Maintenance - Administration	13
7252	Line Maintenance – Village	25
7253	Line Maintenance – Shades	47
7270	TV Inspection	49
7301	Cahaba WRF	26
7302	Five Mile WRF	25
7303	Leeds WRF	8
7304	Trussville WRF	23
7305	Turkey Creek WRF	9
7306	Valley Creek WRF	49
7307	Village Creek WRF	55
7308	Prudes WRF	*
7309	Warrior WRF	*
7320	Five Mile Maintenance Shop	8
7321	Valley Maintenance Shop	13
7322	Village Maintenance Shop	13
7323	Village Electrical Shop	13
7324	Instrumentation Shop	10
7330	Biosolids	14
	Total	**558**

** Personnel responsible for operating Prudes and Warrior WRFs are assigned to other WRF Departments*

*** All positions are not currently filled – see the Organization Charts in **Appendix A** for more information*

There are three deputy directors overseeing one of the following:

- Engineering and Project Management (or capital infrastructure)
- Collection System Management
- Wastewater Treatment

Impact, Planning, and Plans Review

The Impact, Planning, and Plans Review Division is responsible for field inspections and permitting of planned construction, as well as customer service related to private meters. Any proposed development requiring a sewer connection, even those located within the jurisdiction of a municipality within Jefferson County, must be reviewed by the JCESD Plan Review Department for issuance of an impact permit and sewer connection permit. Although not required, JCESD occasionally provides a sewer availability letter during the planning stages of a project.

The personnel responsible for developing and maintaining JCESD's ArcGIS work under this group. Additional related network support for Infor WRF computerized maintenance management system (CMMS), collection system Cityworks CMMS, and Pipetech video inspection database are also assigned to this group. In addition, the personnel who oversee JCESD's mobile devices, computer network, and associated security are provided by staff under the direction of the Deputy Director.

Billing, Budget, and HR

The Billing, Budget, and HR Division functions as the fiscal and human resources managers of JCESD. Activities of this Division include:

- Budget administration
- Customer billing
- Customer service
- Personnel coordination
- Customer interaction
- Accounting

Collection System Management

The Collection Systems Management Divisions are responsible for sewer line maintenance and construction activities, including:

- Call center and dispatch
- Service request response
- Sewer line cleaning
- Sewer line television inspection
- Pump station operation and maintenance
- Sewer main point repairs and manhole repair/rehabilitation

Engineering and Project Management

The Engineering and Project Management Divisions are responsible for sewer line maintenance and construction activities, including:

- Engineering
- Project management
- Capital improvement program management
- Sewer line construction inspection
- Surveying

Regulatory Compliance and Public Outreach/Education

The JCESD staff responsible for regulatory compliance and public outreach and education are housed within Barton Laboratory Division. This Division is responsible for the following:

- Water quality monitoring activities
- WRF laboratory quality control
- WRF reporting requirements
- Pretreatment program administration

- FOG management program administration
- Industrial pretreatment sampling and surcharge determinations

Water Reclamation Facility (WRF)

The Wastewater Treatment Plants Division is responsible for the operation and maintenance of the County's wastewater treatment plants and biosolids land application program.

Intradepartmental Functions

JCESD units routinely work together to fulfill the requirements of the CMOM Program. For example, the Line Maintenance personnel serve as first responders to sanitary sewer overflow (SSO) occurrences, as defined in the **SSORRP** plan, and act as a service provider to the **FOG Management Program**.

Barton Laboratory personnel are responsible for the implementation of the **FOG Management and Pretreatment Programs**. Line Maintenance is also responsible for the reporting requirements of the **SSORRP**.

The Plan Review Department is responsible for compliance with JCESD design requirements during the design of a project, while Engineering is responsible for compliance during the construction of a project.

CMOM Responsibilities

Due to the expansive nature of a CMOM program, responsibilities for CMOM activities are distributed among various JCESD Departments, with some being shared by two or more Departments. See the individual CMOM Program plans for more information on specific functions, staffing, and responsibilities.

Communications

JCESD understands communication between staff and management and for inter-departmental needs is critical to an organization operating in a large service area with multiple work activities requiring coordination. Internal communications include methods that work at inter-departmental levels between management and staff, and cross-departmental levels with other facets of the organization. These communication methods can be in the form of meetings, email, bulletin boards, telephone, conference calls, and cellular phone texts.

Communications from the senior management level to field Supervisors and operators is accomplished through email or cellphone, depending on the urgency of the need and complexity of the request. Communications from field supervisors to field operators utilize email, cell phones, and group or individual meetings with personnel at each facility.

Senior management meetings that include the Sewer Construction/Maintenance Supervisors in charge of field operations for line maintenance and construction are held regularly. Bimonthly meetings are held with the Director, Deputy Director, engineering managers, division managers, and supervisors to address safety, performance, budget, and equipment needs issues. Other meetings are held when needed to discuss FOG Management and Pretreatment Program-related issues.

Intergovernmental Relationships and Coordination

Unification Agreements

Intergovernmental Agreements (also referred to as "Unification Agreements") were established in 1998 with the 21 municipalities listed below, whose wastewater collection and conveyance system ownership and operations were transferred to JCESD:

- Adamsville
- Bessemer
- Birmingham
- Brighton
- Fairfield
- Fultondale
- Gardendale
- Graysville
- Homewood
- Hoover
- Hueytown
- Irondale
- Leeds
- Lipscomb
- Midfield
- Mountain Brook
- Pleasant Grove
- Tarrant
- Trussville
- Vestavia Hills
- Warrior

The agreements transferred the responsibility for ownership, maintenance, and operation of the conveyance system assets from the represented municipal government to JCESD. This includes transfer of all data related to past and future projects, as well as approval authority for proposed projects requiring sewer service or impacting the sewer system. For more information on these agreements, see the JCESD **Legal Support Program** plan.

Other municipalities in the JCESD service area include the cities of Center Point and Clay, which were both incorporated after the unification process was complete.

Coordination with Other Agencies

Numerous CMOM program activities require coordination with other agencies and departments outside of JCESD, including the following:

- Jefferson County Department of Health (JCDH)
- Jefferson County Department of Storm Water Management
- Alabama Department of Environmental Management (ADEM)
- USEPA

For more information on the JCESD's participation with these agencies, see the **Legal Support Program** plan.

CMOM Program Continuous Improvement

JCESD is committed to the continuous improvement of its CMOM Program initiatives and uses an adaptive management approach to improve the Department's decision-making process, as depicted in **Figure 2**. Adaptive management is an iterative learning process, producing improved understanding and improved management over time. As new or additional data is acquired through activities such as sewer system condition assessment, hydraulic modeling, and innovative technology evaluation, this information will be used to refine future capital improvement and system maintenance planning, prioritization, scheduling and operational practices.

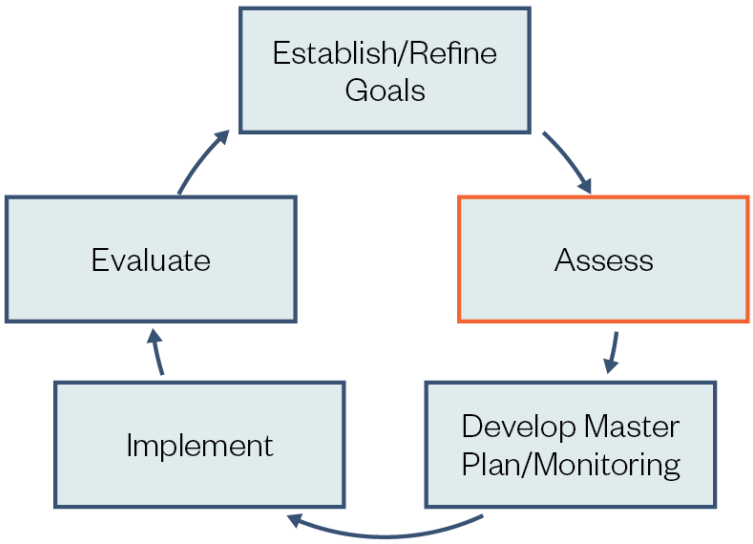

Figure 2. JCESD's Adaptive Management Approach for CMOM Program Continuous Improvement

The criteria used to recognize success in this adaptive management approach include the following:

- CMOM Program stakeholders (JCESD staff) are actively involved and committed to the process.
- Progress is made toward achieving management objectives and SSO reduction.
- Results from monitoring and assessment are used to adjust and improve management decisions and CMOM Program implementation.
- CMOM Program implementation is consistent with applicable laws.

Performance metrics have been developed for CMOM Program components that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The CMOM Program will be reviewed during the first quarter of each year for the previous year. This review will be conducted by the JCESD Management and Program Leaders. The review will include analyzing the programs that have been put in place and modifying them as necessary to better achieve the program goals.

APPENDIX

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Appendix A Department Organizational Charts

Department Munis Code	Description
7100	JCESD Administration
-	Sewer Impact Office
-	Sewer Construction Administration
7101	Sewer Billing
7102	Barton Laboratory
7210	Inspection
7211	Survey
7230	Construction
7240	Pump Stations
7250	Line Maintenance - Administration
7252	Line Maintenance - Village
7253	Line Maintenance – Shades
7270	TV Inspection
7301	Cahaba WRF
7302	Five Mile WRF
7303	Leeds WRF
7304	Trussville WRF
7305	Turkey Creek WRF
7306	Valley Creek WRF
7307	Village Creek WRF
7308	Prudes Creek WRF
7309	Warrior WRF
7320	Five Mile Maintenance Shop
7321	Valley Maintenance Shop
7322	Village Maintenance Shop
7323	Village Electrical Shop
7324	Instrumentation Shop
7330	Biosolids

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Training Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	5	Added reference to Appendix B in text	4/26/18
1	Appendix A	Updated to 2017 Operator Training Hours Summary	4/26/18
1	Appendix C, 5	Added Appendix C (a sample onboarding training module) and reference in text	4/26/18
2	2	Updated Table 1	2/2022

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Acronyms

ADEM	Alabama Department of Environmental Management
AWEA	Alabama Water Environment Association
CEH	Continuing education hours
CCTV	Closed-circuit television
CMOM	Capacity, Management, Operations, and Maintenance
CPR	Cardiopulmonary resuscitation
FOG	Fats, oils, and grease
JCESD	Jefferson County Environmental Services Department
KPI	Key performance indicator
NASSCO	National Association of Sewer Service Companies
NPDES	National Pollutant Discharge Elimination System
OJT	On-the-job training
PACP	Pipeline Assessment and Certification Program
PBJC	Personnel Board of Jefferson County
QA/QC	Quality assurance and quality control
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
TVI	Television inspection
WEF	Water Environment Federation
WPD	Work process documentation
WRF	Wastewater Reclamation Facility

Training Program

Program Overview

Purpose and Goals

Jefferson County Environmental Services Department's (JCESD) ultimate training goal is to develop a highly skilled workforce to ensure that decisions are made and work is performed in the safest and most effective manner possible to minimize the opportunity for, and occurrence of, sanitary sewer overflows (SSOs).

Program Components and Approach

JCESD employs personnel with a wide range of experience, talent, and abilities, including professional engineers, public relations and customer service specialists, scientists, sewer line cleaning and inspection personnel, wastewater and pump station operators, and construction workers. JCESD employees are provided with training opportunities in areas that focus on safety, technical development, and skills relevant to their job duties.

Several types of instruction methods are used, including interactive classroom sessions, in-field training, and one-on-one hands-on instruction. In addition, JCESD regularly enlists subject matter experts from a variety of internal and external sources to conduct training classes, including partnering agencies such as the Alabama Water Environment Association (AWEA) and the Water Environment Federation (WEF).

The **Collection System Training Program** is comprised of a comprehensive system of administrative, management, and documentation activities. This written plan includes a description of the following program components:

- The overall **Collection System Training Program**, including a summary of the Capacity, Management, Operations, and Maintenance (CMOM)-related training opportunities made available to JCESD Wastewater Reclamation Facility (WRF) and collection system personnel.
- A method for identifying and scheduling the appropriate training for personnel.
- Written standard operating procedures (SOPs) and work process documentation (WPD) that is used as a training platform for various activities supporting the work performed by JCESD personnel.
- Key Performance Indicators (KPIs) for tracking and documenting the performance and effectiveness of the **Collection System Training Program**.

JCESD's training initiatives assist the County in achieving compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements related to the sanitary sewer collection system, as established by Federal and State regulators.

In addition, Collection System Operator Certification is required by the Alabama Department of Environmental Management (ADEM) per regulations outlined in Division 335-10-1 as follows: [1]

> *335-10-1-.14 Certification Required for Operation. Wastewater treatment plants, water treatment plants, water distribution systems, and public wastewater collection systems classified in 335-10-1-.03 must be operated by an operator holding a valid certificate of the same grade or higher. Any person without a valid certificate can only work under the direct supervision of a properly certified operator, and may not work a shift as specified in 335-10-1-.04 unless a properly certified operator is present to supervise the work at all times.*

The **Collection System Training Program** supports preparation for the written certification examination and fulfillment of required continuing education hours (CEH) in the wastewater collection field.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed SOPs for various Capacity, Management, Operations, and Maintenance (CMOM)-related job duties. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations.** Pump station, bypass pump, and generator SOPs are provided in the JCESD's **Pump Station Operations and Maintenance Program** plan. Procedures used when responding to and reporting SSOs are detailed in JCESD's **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan.

For more information on Safety Training Resources, see the **Safety Program** plan.

Other CMOM Program plans that are referenced in the **Collection System Training Program** are as follows:

- CMOM Program Organization
- Customer Service Program
- Contingency Planning Program
- Safety Program

Staffing

The Public Relations Coordinator, assigned to the Barton Lab, oversees the program coordination and is responsible for tracking the training provided to JCESD personnel (for more information, see the **CMOM Program Organization** plan). The Public Relations Coordinator arranges for training that is requested by JCESD supervisory and management staff using in-house personnel, vendors, and other subject matter experts.

The Public Relations Coordinator is also responsible for tracking the status of WRF and collection system operator certifications, and sending reminders to Division Supervisors about recertification dates and required training hours. Division Supervisors are responsible for identifying the appropriate required

[1] Code of Alabama 1975, §§ 22-22A-5, 22-22A-6, 22-22A-8, 22-25-11, 22-25-13.

training for their personnel, and for notifying the Public Relations Coordinator that the training opportunities need to be scheduled.

Outside Resources

Classroom and field training opportunities related to safety, technical development, and job skills are also provided by other Jefferson County departments, the Personnel Board of Jefferson County (PBJC), external trainers, manufacturers, and vendors.

As shown in **Figure 1**, JCESD's training facility at the Shades Valley Complex has adequate capacity and the state-of-the art technology necessary for hosting all-hands classroom training events.

Figure 1.All-Hands Classroom Training

JCESD supports participation in professional organization-sponsored events and training opportunities provided by the AWEA, WEF, and Office of Water Programs, California State University, Sacramento. A copy of the handbook from the Fats, Oils, and Grease (FOG) Management Workshop jointly sponsored by JCESD, WEF, and AWEA is shown in **Figure 2**.

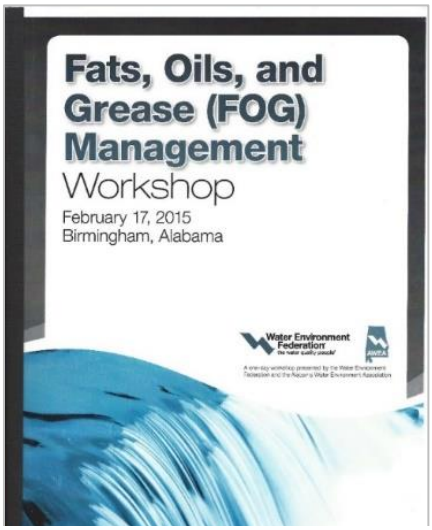

Figure 2.FOG Management Workshop Handbook, February 2015

Data Management

Most of the training received by JCESD staff is recorded and tracked in Microsoft® Excel by the Public Relations Coordinator.

Whenever training that is not coordinated by the Public Relations Coordinator is provided to staff, it is the responsibility of whoever arranged for the training to obtain the necessary documentation (sign-in sheets, curriculum, and/or certificates of attendance) and forward it to the Public Relations Coordinator so that the training can be recorded.

The following training-related information is maintained in Excel spreadsheets:

- List of personnel holding certificates (WRF and Collection System)
- Operator training hours completed by person
- Operator training hours by class (calendar year)

A copy of the 2017 Operator Training Hours Summary is provided in **Appendix A**.

Program Implementation

Safety Training

JCESD provides the following types of recurring safety training opportunities:

- Confined space entry
- Traffic management
- Trenching and shoring
- Cardiopulmonary resuscitation (CPR) / First Aid
- Chlorine and sulfur dioxide
- Arc flash

JCESD is developing a formal and documented safety training program that will include a schedule for specific training to be provided by in-house and contracted trainers. For more information on JCESD's Safety Program-related training, see the **Safety Program** plan.

Skills and Technical Training

Collection System Maintenance and Construction Development and Training Program

In 2012, JCESD initiated a best practices training program designed to empower and enable its collection system maintenance staff to achieve and maintain the level of proficiency and readiness needed to safely, efficiently, and effectively perform assigned duties. The results of this training program were demonstrated by reduced dry weather SSO occurrences.

In February 2015, JCESD entered into a 3-year professional services agreement with Tilson & Associates, LLC to continue to provide best practices training for its Collection System Maintenance and Construction Development and Training Program. As part of this initiative, best practice training is provided to Line Maintenance, Television Inspection (TVI), and Construction personnel on a quarterly basis.

Properly trained sewer maintenance and field operations personnel improve system reliability and sustainability by:

- Repairing and replacing sewer pipe and connections. Buried pipes and gravity sewer system components need to be repaired or rehabilitated.
- Installing, repairing and/or replacing manholes. Manhole structures, frames, and covers need to be raised, lowered, or repaired.
- Maintaining sewer easements through wooded areas and unimproved rights-of-way.
- Cleaning sewer pipe to remove deposits and organic materials that can interrupt flow and result in SSOs.
- Internally inspecting gravity sewer pipes with closed circuit television (CCTV) cameras to assess pipe conditions, collect information needed to schedule future maintenance, locate and identify defects, determine causes of SSOs, and to provide pipe cleaning and repair quality assurance and quality control (QA/QC) documentation.

JCESD sewer maintenance and construction crews use different types of equipment and tools to maintain sanitary collection systems, and to prevent SSOs. As part of the best practices training program, JCESD developed SOPs and WPDs that serve as a training platform for field operations and are designed to:

- Minimize injury to personnel and bystanders,
- Minimize damage to equipment and property,
- Promote efficient and effective sewer maintenance and repair, and
- Provide continuity in equipment use between operators and crews.

A copy of the field operations SOPs and WPDs are provided in JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations**. Pump station, bypass pump, and generator SOPs are provided in the JCESD's **Pump Station Operations and Maintenance Program** plan. A sample best practice classroom training syllabus and an all-hands meeting agenda are provided in **Appendix B**.

Onboarding Training

During the first year of employment, new employees receive onboarding training that focuses on critical job knowledge, job tasks, and soft skills that are relevant for their job classifications and assigned duties. Sample onboarding training material, including a PowerPoint handout and quiz, are provided in **Appendix C**.

On-the-Job Training (OJT)

Engineers, Inspectors, and Construction/Maintenance Supervisors are responsible for developing and implementing OJT for line maintenance, TVI, and construction field crews. The written Field Operations SOPs and WPDs are used as a resource for this type of training. OJT is also used for the onboarding process for new personnel.

Pump station personnel receive most of their training through the OJT platform, as deemed necessary by the WRF Manager.

Currently all Dispatchers receive OJT training on service request calls and Cityworks (computerized maintenance management system software). For more information on the customer service-related training provided to Dispatchers, see the **Customer Service Program** plan.

Sanitary Sewer Overflow Response and Reporting Program (SSORRP) Training

The JCESD provides training on the SSORRP program as part of new employee orientation and as needed to all personnel involved in responding to and reporting of SSOs, including the:

- Director
- Deputy Directors
- Engineering Staff
- Inspection Staff
- Line Maintenance Personnel
- TVI Personnel
- Pump Station Operations Personnel
- Sewer Line Construction Personnel

The training sessions are documented, and lists of personnel attending training sessions are maintained. Additional training sessions will be conducted to train personnel on any new and/or changed SSORRP procedures when appropriate.

NASSCO Pipeline Assessment & Certification Program (PACP) Training

The National Association of Sewer Service Companies (NASSCO) PACP Certification training is provided to engineers, inspectors, and TVI personnel. NASSCO PACP certification is necessary to properly code sewer line and manhole defect information stored in JCESD's asset management software system (Cityworks). PACP certificate holders are required to recertify every three years to keep their certification active. JCESD provides training opportunities for applicable personnel to obtain PACP certificates and recertify, when necessary.

Personnel Board of Jefferson County (PBJC) Training Opportunities

The PBJC Training and Development Department provides essential employee development opportunities to Jefferson County's Merit System personnel by offering access to training classes in computer software, human relations, effective customer service, management, and leadership. Example course offerings are listed in a PBJC flyer shown in **Figure 3** on the following page.

Training Matrix

Table 1 lists the regular and routine training that is commonly provided to JCESD staff.

Table 1. Staff Training Matrix

Training Opportunity*	Training Interval	JCESD Group or Job Classification
Onboarding Training	As Defined in Onboarding Training Matrix	All new employees
Best Practice Field Operations**	Quarterly (through 2021)	Line Maintenance, TVI Inspection, and Construction
SSORRP Refresher	Annual	All
PACP Recertification	Every 3 Years	Applicable Line Maintenance, TVI operators, engineers, inspectors, and others requiring PACP coding knowledge
Developmental Training	Annual	All

*See the **Safety Program** plan for more information on safety-related training opportunities

**As part of the Collection System Maintenance and Construction Development and Training Program

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The Training Program is evaluated on a consistent basis using employee performance reviews, post-training quizzes and questionnaires, field observations, and a review of training records. The success and effectiveness of JCESD's training initiatives can be evaluated by reviewing the following:

- Number of staff members that hold and maintain relevant certifications and licenses

- Hours of training for staff
- Accuracy of records maintained in training tracking spreadsheets
- Outcome of periodic staff evaluations, testing, and field observations

Figure 3.Example of PBJC Course Offerings

The following **Collection System Training Program** performance measures are established at JCESD:

Table 2. Collection System Training Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
# of Individuals with Certification or License	Value	Number of staff members that hold relevant certifications and licenses	No decrease	Annual	All
# of Personnel Receiving SSORRP Training	Value	Number of staff members involved in responding to and reporting SSOs that received training on the SSORRP	No decrease	Quarterly	All personnel involved in responding to and reporting of SSOs
# of Training Hours for Staff	Value	Total number of training hours provided to JCESD staff	No decrease	Annual	All

APPENDICES

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Appendix A 2017 Operator Training Hour Summary

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JCESD Training Program

	Flowview Operations	CPR		Phosphorus Removal	Gas Monitor	UST	Confined Space	Grit Dewatering	Operator Academy	UV	Corrosive Environ. L&L	Chemical Spill	L&L	PVC	L&L	Operator Academy	Best Practice AHM	L&L	Chlorine	I Tracker	Chlorine	Pump Station Design	Wet Well	Operator Academy	HR Certification	HR Cetification	AWEA Workshop	YSI Training	Confined Space	CPR	HR Certification	All-Hands	PBJC Classes
	2/10/17	2/8/17	2/9/17	3/1/17	3/7/17	3/14/17	3/15, 16/17	3/20/17	Mar 17	4/20/17	5/11/17	5/26/17	6/13/17	6/20/17	6/27/17	Jul 17	Jul 17	8/2/17	8/29/17	8/31/17	9/1/17	9/14/17	9/20/17	Sep 17	Oct 17	Nov 17	11/14/17	11/14/17	11/16/17	11/29/17	Dec 17	12/4/17	2017
Name	Hazen	Red Cross		J. Creel	C. Anderson		ISS J. Brown	Hydro	Tilson	J. House	GHM	Sigma	McWane	L&L	Landtech	Tilson	Tilson	Gerber	C. Bates	L&L	C. Bates	AWEA	L&L	Tilson	HR	HR	AWEA	YSI	ISS	Red Cross	HR	Tilson	PBJC
Acton, Jonathan																																
Adams, Scott																			3													
Adams, Stephen																																
Akins, Brigitte																																
Akins, James																																
Alpaugh, Matt									2		1				1		7			2		4		3								
Anderson, Brian																																
Andrews, Jeremy							6									3.5	7													6		3.5	
Ashley, Jason					2.5		6								1									2.5								3	
Barber, Jason					2.5		6										7							1.25								3	
Bates, Corey			6	3																						4		3					179
Bates, Jason				3																												
Bearden, Nick																																
Bell, Rocky																																
Bennett, Ken		6												1.5				2				4	2						6				
Bennett, Robby								1																								
Benson, Charley					2.5		6		4.75								7							2.5								3	
Blackmon, Bryan																												3				
Blackmon, Boone					2.5		6		1.75								7							5.5								3	
Bonds, Chris							6		1.75								7							3									
Bostic, Mickeese																										14							
Bradley, Brian					2.5		6										7							3								3	
Brandenburg, Mark													1		1																		
Brazeel, Charles																													6	6			
Brazill, James																																	
Bridges, Carl					2.5		6		1.75								7							2.5								3	
Bridier, Michael					2.5		6		1.75															5.5								3	
Brooks, Derrick			6	3																												
Brown, Celeste												8																					
Brown, Ellis										6																			6				
Brown, Jeff			6																										6				
Brown, Jerry													1																				
Brown, Rob								1																									
Brundige, Lovie																																	
Bryant, Sid																																	
Bryant, Tishia							6		1.75								7							2.5								3	
Burnett, Scott					2.5																												
Burns, Warren				3		4																											
Bush, Kenneth																																	
Byner, Rozzel					2.5		6		1.75						1		7							5.5								2	
Byrd, Michael																																	
Campbell, Johnny							6		6.75								7							5.5									
Campbell, Mike																																	
Capleton, Chris					2.5		6		6.75								7							5.5									
Capps, Eddie																										12							
Carl, Ray																																	
Carney, Tommy			6																3									3					
Carter, Douglas																									10	16							
Casey, Keith					2.5		6		4.75							1.5	7															1.5	
Cato, Ben																																	
Champion, Brian	2				2.5		6						1	1.5	1		7			2		4	2	4.25									
Childers, Todd					2.5		6		6.75															3								3	
Childers, Wayne										6																							
Clark, Andrew L					2.5		6		6.75								7							5.5								3	
Clark, Decory																																	
Clark, Jimmy							6		6.75								7							3								3	
Claughton, Ron																																	
Cledder, Larry						4															3							3					
Coalburn, LaDonna																																	
Cockrell, Brian																																	
Coe, William																					3							3					
Coleman, Coniah																													6				
Coleman, Dwayne		6								6	1																	3	6				
Coles, Sylvester Jr.																																	
Collier, Antione					2.5		6		5								7							2.5								3	
Collier, Ronnie					2.5		6		1.75																								
Corilla, Herman										6																							
Cowart, Thaddeus																4.5	7													6		3.5	
Cox, Donald									1.75								7							2.5								3	
Creel, Jeremy																		2									6.75						
Crenshaw, John																																	
Cruce, Mark																					3												
Crumley, Eddie																																	
Crumley, Robert																																	
Cummings, Chris					2.5		6										7							2.5								3	
Cunningham, Maurice																5.5	7													6		3.5	
Cunningham, Michael N.							6		3								7							3								3	
Currington, Rodney																				2													
Curry, Ricky		6																											6				
Daffron, Christopher																													6				
Daniels, Terrell									6.75								7																
David, Arand																																	
Deamues, Frederick				3																													
Dean, Bart John		6								6																		3	6				
Defnall, Josh					2.5		6		1.75								7							2.5								3	
Dernent, Leland																																	
Denard, David	2																						2	3			6.75	3					
Desmond, Albert III		6			2.5																								6				
Doss, William						4																											

JCESD Training Program

	Flowview Operations	CPR		Phosphorus Removal	Gas Monitor	UST	Confined Space	Grit Dewatering	Operator Academy	UV	Corrosive Environ. L&L	Chemical Spill	L&L	PVC	L&L	Operator Academy	Best Practice AHM	L&L	Chlorine	I Tracker	Chlorine	Pump Station Design	Wet Well	Operator Academy	HR Certification	HR Cetification	AWEA Workshop	YSI Training	Confined Space	CPR	HR Certification	All-Hands	PBJC Classes
	2/10/17	2/8/17	2/9/17	3/1/17	3/7/17	3/14/17	3/15, 16/17	3/20/17	Mar 17	4/20/17	5/11/17	5/26/17	6/13/17	6/20/17	6/27/17	Jul 17	Jul 17	8/2/17	8/29/17	8/31/17	9/1/17	9/14/17	9/20/17	Sep 17	Oct 17	Nov 17	11/14/17	11/14/17	11/16/17	11/29/17	Dec 17	12/4/17	2017
Name	Hazen	Red Cross		J. Creel	C. Anderson		ISS J. Brown	Hydro	Tilson	J. House	GHM	Sigma	McWane	L&L	Landtech	Tilson	Tilson	Gerber	C. Bates	L&L	C. Bates	AWEA	L&L	Tilson	HR	HR	AWEA	YSI	ISS	Red Cross	HR	Tilson	PBJC
Dotson, Antonio							6		1.75															2.5								3	
Drake, Dianne																																	
Early, Jason																3.5	7																
Ellard, John																									10	6							
Erby, Patrick																																	
Estes, Christopher																			3									3		6			
Etheridge, John			6							6																			6				
Evans, Dedric					2.5		6		4.75								7							5.5								3	
Evans, Lavon (C1)																	7	2															
Evans, Robert																																	
Faddis, Sylvester																2.5	7															3.5	
Findley, Garrett																																	
Fortenberry, Malcolm																																	
Foster, Roosevelt							6		6.75								7							5.5								3	
Fowler, Tommy		6																2				4	2						6				12
Franklin, Rodney																																	
Frederick, Keith																									10	4							
Gaines, Anthony				3																								3					
Gaitor, Daryl																			3														
Gardner, Jonathan																																	76
Gatson, Alice							6						1		1			2															
Gilham, Jack			6																										6				
Gilliland, Timothy																																	
Gingo, Ken																																	
Givens, Carmen																3.5	7															3.5	
Glass, Malcolm																																	
Gooden, Warren				3				1																				3					
Goodman, Sherry																5.5	7																
Goodson, John																																	
Goodwin, Don							6										7							1.25								3	
Goodwin, James																																	
Gordon, Lawrence					2.5		6		1.75								7							2.5									
Grady, LaShondra							6		1.75								7							5.5								3	
Graham, Elton																																	
Graves, Stacey			6																										6				
Gray, Dana																																	
Greathouse, Derrick																1.5																	
Green, Ric																																	
Green, Ty Juan							6		1.75								7							5.5								3	
Grimes, Doyle																					3	4											
Grimes, John									5								7							3								3	
Grimes, Trey																											6.75						
Gurley, Scott																																	
Hall, Byron																																	
Hall, Herbert																								3								3	
Hall, Richard																																	8
Hammack, Allen		6																															
Hardisty, Jeff							6														3					4		3					
Hardisty, Mary																					3							3					
Hardy, Glenn			6																										6				
Hargreaves, Gary																																	
Harmon, Willie Jr.																																	
Harper III, James					2.5		6		4.75								7							5.5								3	
Harper, Earl																					3				18	12		3			10		
Harris, Brandon					2.5		6		4.75								7							3								3	
Harris, Charles																								5.5								3	
Harris, David					2.5		6		1.75								7							5.5								3	
Harris, Joyce O'Hara									6.75								7							5.5								3	
Hayden, Cedric	2							1										2				4	2	3									16
Hicks, Daphne			6	3																													
Higginbotham, Forest																																	
Hill, James																																	
Hill, Jeff																									18	12					6		
Hill, Jeff																					3												
Hill, Sawonta					2.5		6										7							5.5								3	
Hinch, Heath Carey				3																								3					
Hogeland, Ricky																			3														
Holley, Douglas			6							6	1																	3	6				
Hollingsworth, Thomas							6									1.5		2												6			
Holt, Tari		6															7			2													
Howard, Eric																																	
Hubbard, David							6		1.75								7							5.5									
Hubbard, Padraic																																	
Hubbard, Vick					2.5		6										7							3.25								3	
Hudson, Andy			6	3			6					8									3												
Huey, Donnie																																	
Huey, Natalie																																	
Hughes, Chris																																	
Hughes, Josh				3															3						4								
Hughie, Donnie																																	
Human, Ametra																			3							9							
Humphryes, David																																	
Ingram, David																																	
Jacks, Dennis							6						1		1																		
Jackson, Linda				3			6												3							4		3					39
Jackson, Quentin																																	
Jackson, Randall					2.5		6		6.75																								
Johnson, Ronald																																	
Johnson, Terry																					3												

JCESD Training Program

	Flowview Operations	CPR		Phosphorus Removal	Gas Monitor	UST	Confined Space	Grit Dewatering	Operator Academy	UV	Corrosive Environ. L&L	Chemical Spill	L&L	PVC	L&L	Operator Academy	Best Practice AHM	L&L	Chlorine	I Tracker	Chlorine	Pump Station Design	Wet Well	Operator Academy	HR Certification	HR Cetification	AWEA Workshop	YSI Training	Confined Space	CPR	HR Certification	All-Hands	PBJC Classes
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Name	Hazen	Red Cross		J. Creel	C. Anderson		ISS J. Brown	Hydro	Tilson	J. House	GHM	Sigma	McWane	L&L	Landtech	Tilson	Tilson	Gerber	C. Bates	L&L	C. Bates	AWEA	L&L	Tilson	HR	HR	AWEA	YSI	ISS	Red Cross	HR	Tilson	PBJC
Johnson, William																																	
Jones, Calvin									3							4.5	7															3.5	
Jones, Karon																																	
Jones, Lynn								1		6																	6.75						
Jones, Mike							6		5								7							5.5								3	
Kelley, Tonya	2						6	1					1					2		2		4	2	3									
Kelly, Donald																									6	8					4		
Kemp, Emily													1									4											
Kennedy, Jimmy																																	
Key, Brian																																	
Kilgore, Ricky					2.5		6		1.75								7							5.5								3	
Kilgore, Wesley					2.5		6																	3								3	
Kimbrough, Ursula																																	66
King, Richard												8																					
King, Roosevelt			6		2.5																								6				
King, Veronica																																	
Knowles, Jonathan									5																								
Lane, Terrence						4																											10
Lawler, EricSr.																																	
Lawson, Juan					2.5		6		1.75															3								3	
Lee, Frankie					2.5		6		6.75																								
Lee, Mark			6	3																													
Leroy, Vincent																					3				3								
Lewis, Andrew		6																											6				
Light, Daniel																										6							
Limbach, Bob																1.5																	
Little, Peggy			6																														
Littleton, Michele									5								7													6		1.5	
Lopresti, Pete							6							1.5		1.5																	
Lovelady, Darryl			6																										6				
Lucas, Vernon																1.5																	
Lynn, Melissa (C1)		6		3									1	1.5																			
Lynn, Terry (C1)							6						1	1.5	1	1.5		2												6			
Madison, Nathaniel							6		6.75								7															3	
Mahaffey, John				3			6						1		1	1.5																	
Mahaffey, Terry																			3														
Maneice, Bobby				3		4													3								3						
Marian, Peter			6																										6				
Matthews, Jason							6		6.75								7							3								3	
Maxwell, Randy																											3						
May, Doug					2.5		6		6.75								7							3								3	
McCain, Wesley							6										7							2.5								3	
McCarty, Patrick				3																													
McClain, Herman																									10	8							
McCrary, Jody																																	
McIntosh, Enrico																			3							21							
McKinney, Gabriel		6									1																		6				
Melton, Robert																																	
Melvin, Jeff							6						1			1.5	7	2		2				6.75									
Melvin, Jerry																																	
Mendiola, George						4																											
Miles, Andre																					3					21							
Miller, Michael							6									1.5		2															
Mills, Travis					2.5		6										7							4.25								3	
Mims, Percy																																	
Minnifield, Ernest																																	
Mitchell, Ural																								5.5								3	
Mitchell, Wade		6																											6				
Mixon, Linda																																	
Mixon, Richard																																	
Mixon, Rodney C.																																	
Moore, Adam				3			6																										
Moore, Brad																																	
Moore, Doug																	7							3								3	
Moore, William						4																											
Morris, Iawame																																	
Morrow, Bill				3																	3												
Morse, Kevin																																	
Morton, Randy																																	
Myers, Robert						4																											
Nalls, Jonathan					2.5		6		1.75								7							5.5								3	
Nash, Everett					2.5		6		6.75								7																
Nash, Herman					2.5				1.75								7							5.5								3	
Neely, Brian																2																	
Neely, Chris							6						1			1.5		2												6			
Nelson, Gary												8						2															
Nichols, Noel							6						1	1.5	1	1.5		2				4	2							6			
Norwood, Orlandras					2.5		6		1.75								7							3								3	
Nunn, Brian																2.5	7															3.5	
Nygren, Zada			6	3						6									3								6.75	3					
Oates, Monica																																	
Pair, Donell																																	
Pappas, Thomas																																	
Parham, JeCory							6		6.75								7							5.5									
Parrish, Larry					2.5		6		4.75								7							3								3	
Parsons, Joel Bruce																																	
Partain, Michael			6					1																									
Passmore, Kimberly																					3						3						
Pate, Ben													1		1	1.5																	
Patterson, Donald					2.5		6										7							4.25								3	
Payne, Gerry																																	
Pennington, Ricky																																	

JCESD Training Program

	Flowview Operations	CPR		Phosphorus Removal	Gas Monitor	UST	Confined Space	Grit Dewatering	Operator Academy	UV	Corrosive Environ. L&L	Chemical Spill	L&L	PVC	L&L	Operator Academy	Best Practice AHM	L&L	Chlorine	I Tracker	Chlorine	Pump Station Design	Wet Well	Operator Academy	HR Certification	HR Cetification	AWEA Workshop	YSI Training	Confined Space	CPR	HR Certification	All-Hands	PBJC Classes
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Name	Hazen	Red Cross		J. Creel	C. Anderson		ISS J. Brown	Hydro	Tilson	J. House	GHM	Sigma	McWane	L&L	Landtech	Tilson	Tilson	Gerber	C. Bates	L&L	C. Bates	AWEA	L&L	Tilson	HR	HR	AWEA	YSI	ISS	Red Cross	HR	Tilson	PBJC
Peoples, Willis																																
Pickens, LeDerain			6							6	1																	6				
Pickens, Steve																																
Pilkington, James																																
Pitts, Anthony											1																					
Pond, Eric							6												3													
Poole, Troy Neal																			3								3					
Pressley, De Andre																																
Pressley, Mandre					2.5		6										7							4.25								3	
Ptomey, Terry																																
Quick, Chad			6	3																												
Ragland, Carl																																
Ramsey, Hermon																																
Ray, Carl										6																						
Reeves, Richard		6																														
Reid, Terrie																																
Rice, Harold																			3													
Richards, S. Raphel		6								6																	3					
Rickett, Steve																																
Riley, John																																
Rivers, Denise																												6				
Robb, Ronald																																
Robinson, Daniel																																
Rochell, Gregory							6										7															
Rogers, James																																
Rohling, Brian	2							1						1.5				2		2		4	2	3								
Roper, Jim																																
Rose, Harold																																
Russell, Crandle					2.5		6										7							4.25								3	
Sadler, Wayne					2.5		6										7							4.25								3	
Salter, Matt																																
Salter, Mike																																
Sanders, Darron		6									1																	6				
Santoro, Josh																																
Scott, Kevin						4																										
Sebert, Justin					2.5		6																	4.25									
Shaw, Mark																																
Shears, Emanuel																																
Shears, Samuel												8																				
Shiflett, Tommy									5							3	7														3.5	
Short, David			6							6																	3	6				
Simmons, Bobby																			3							6.75						
Sims, Jason																					3				6				6			
Skinner, Phillip													1		1	3																
Skinner, Robert									5								7														2	
Smith, Adam																										6.75						
Smith, Anthony																																
Smith, Asha		6								6	1																					
Smith, Charles																																
Smith, Wayne					2.5		6		8.5								7							5.5								3	
Sparks, Rose Mary																																
Standifer, Wes																																
Stell, Larry																																
Stephens. Ronald		6															7															28
Suggs, Monte			6							6																						
Sutton, Tony																																
Sweeney, Janelle																																
Sylvestyer, Thaddis																1																
Taylor, Alfonzo																											3	6	6			
Temple, Cecil							6		6.75								7														3	
Thomas, Emma																					3				18	14	3			8		
Thompson, Lether																																
Trull, Patrick													1		1																	
Turner, J. Andrew																																
Tyler, Robert			6									8						2														
Tyler, Russell																																
Tyler, Ryan				3		4	6												3							4		3				
Tyler, Wesley																																
Vance, Mel																																
Wade, Jasper																																
Waldrop, Glenda				3																												
Waldrop, Joel																											3					
Walker, Jereny																1																
Walker, Larry Jr.					2.5		6																									
Walker, Orlando																					3						3					
Walker, Thomas																5.5	7												6		3.5	
Walton, Eddie					2.5		6		4.75								7							5.5								3	
Ward, Terrence		6																														
Waters, Kevin				3																							3		6			
Watford III, William																																
Weams, Fred																																
Webb, Steve																												6				
Weldon, Anthony																																
Weldon, Eugene		6																										6				
Weston, Max			6		2.5					6																		6				
White, Daniel	2	6				4		1					1				7	2		2		4	2	3			6.75					
Wilder, Harold																3.5															3.5	
Wilder, Sherri																																
Willett, John																										6.75						
Williams, Antuan							6										7							3							3	
Williams, Ian							6						1			1.5																
Williams, Jimmie		6																										6				

JCESD Training Program

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Williams, Michael							6		1.75								7							5.5								3	
Williams, William II																	7							3								3	
Williamson, Heather							6		5								7							5.5								3	
Williamson, James																																	
Willoughby, Joe																																	
Wilson, Deborah		6														1.5																	
Wilson, Everette							6		4.75								7							5.5								3	
Wilson, Kerry							6										7							4.25								3	
Wilson, Steven																																	
Windham, Preston																																	
Witherspoon, TeQuisha Shay							6		6.75								7							5.5								3	
Wood, Gary					2.5		6		6.75								7							5.5								3	
Woods, Gary																	7																
Woods, Sedrick																	7							5.5								3	
Woolley, Phillip			6																										6				
Wren, Arthur																3.5	7															1.5	
Wright, Malcolm					2.5		6		3								7							3								3	
Wright, Michael																																	
Wyatt, Napoleon																																	
Heath, Latasha																																84	
Wallace, Donna																																28	
Yearwood, Marcus		6																											6				
	10	108	138	72	117.5	40	474	8	227.75	96	8	48	18	10.5	13	75.5	553	34	51	16	51	44	18	308	113	179	60.75	90	198	84	28	226.5	546

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OPERATOR ACADEMY CLASS SYLLABUS
HAND RODDING AND FLUSHING/VACUUM MACHINES
July 9 - 20, 2012

July 9, 2012 Classroom Training

The class will start at 7:30 am and conclude at 3:15 pm. We will need an appropriate training space for the number of people that will be in attendance, a marker board/black board (flip chart can be used), an LCD projector/screen, and extension cord with multiple plugs or power strip.

Introduction and Basics
Opening comments from Senior Management
The importance of collection systems
Overview of operations, data accuracy, and managing information
The Change concept and why it is necessary in progressive organizations

Maintenance Strategies
Reactive, basin cleaning, and Information based maintenance strategies
How each works and the role of operators in them

Rodding Machines
Brief history of hand rodding and the Rodding Machine
Operation parameters and deployment use

Rodding Tools and Applications
Tools and accessories necessary for safe and effective operation
Function and application of tools used with hand rodding
Selecting the proper tool for a specific situation

Root and Grease Formation
How roots and grease accumulate in pipes
Principles of removal and various techniques

Rodding Machine Set Up and Operation
Set up procedures at arrival to access point
Rod guide pipe placement and securing procedures
How and when rod turning machine is used
Controlling torque
Techniques for various cleaning situations

Rod Care and Failure Causes
Rod inspection
Determining causes of rod failure

Flushing Machines
Brief history of hydraulic cleaning and the Flushing Machine
Operation parameters and designed functions

Tools and Applications
Nozzle anatomy, functions of degree, pressure, and flow
Tools and accessories necessary for safe and effective operation
Function and application of tools used with Flushers
Selecting the proper tool for a specific situation

Flushing Machine Controls
Primary controls and operational functions

Set Up and Operation
Discussion of set up procedures including direction of cleaning and easement issues
Discussion of safe stoppage removal and full manhole avoidance
Proper machine pressure set up
Operation techniques for various cleaning situations

Vacuum Use
Vacuum tubes set up and use
Cautions of overhead and other obstructions
How vacuums can be used in spill mitigation
Hydro-excavation and other uses

Debris Quantification
Trapping during the cleaning process
Developing a quantification scale for data management and maintenance strategy

Safety
Personal safety in the collection system
Confined space awareness and hazards
Equipment hazards and avoidance
Traffic hazards and avoidance

Jefferson County Environmental Services Department
Collection System Maintenance and Construction Development & Training Program

All-Hands Meeting
July 28, 2015 8:30 am – 3:00 pm

Agenda

Purpose of the Meeting: Combine both Sewer Maintenance and Construction personnel in a single group meeting to: reinforce importance work the Operator Corps is performing, provide training on basic math and photography skills, review Hazen & Sawyer's progress to date on their efforts, and begin leadership training by addressing conflict resolution techniques.

1. Welcome and opening remarks
2. Basic math for field operations - SSO volume estimating, trench gravel/bedding volume estimating
3. Overview of sewer performance improvement programs - Review by Hazen
4. Photography basics for SSOs and other job related field photographs
5. Lunch
6. Conflict resolution presentation – Pete Blank Jefferson County Personnel Board
7. Adjourn

Appendix C Sample Onboarding Training Materials

PowerPoint Presentation

4/26/2018

Jefferson County Environmental Services Department
Onboarding Training Program

Personal Protective Equipment (PPE) for Construction Personnel

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Personal Protective Equipment (PPE Overview)

- This presentation is meant to provide training for employees using this equipment to the necessary level of competence
- This will provide training and awareness of safety hazards that may exist during the workday and equipment employees with the knowledge to reduce them using this equipment
- Training will help ensure each employee understands the importance of this equipment for their safety, the safety of co-workers, and safety of the public overall

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Learning Objectives

By the end of this class you should be able to:

1. Identify the different types of PPE assigned to you
2. Explain what each item does and how it protects them
3. Be able to select the appropriate PPE for various conditions
4. Why this equipment is important

Purpose of PPE

- Personal protective equipment (PPE) refers to protective clothing, helmets, goggles, foul weather gear, footwear, or other equipment designed to protect the wearer's body from injury.
- The purpose of PPE is to reduce employee exposure or risk to acceptable level from hazards that are present which cannot be controlled.
- PPE places a barrier between the wearer and the work environment to reduce or mitigate the risk or hazard but **does not eliminate** the hazard.
- It is important that PPE be kept with you so the proper items can be used appropriately for the risk or hazard encountered during the workday.

Head Protection

- **Hard hats** provide protection from various injuries to the head caused by hazards like falling or flying objects, or by contact with electrical conductors, which may include:
  - impact, penetration, electrical injuries
- Hard hats also keep long hair from getting caught in moving machine parts
- Before wearing your hard hat onsite, make sure it is properly adjusted for a good fit
- Keep your hard hat clean and in good condition
- Store according to the manufacturer's recommendations
- If a **hard hat sustains a substantial blow**, its function is compromised and it should be replaced

Mandatory Hard Hat Areas

- Hard hats ***must*** be worn:
  - On Alabama Department of Transportation sites
  - For **all** railroad work

The wearing of hard hats during any hazardous activity is mandatory. These activities include those maintenance and construction work areas where exposure to head injury might logically be anticipated. Supervisors and visitors to work sites are expected to wear and enforce the wearing of hard hats as noted above. Any exceptions to this should be handled on an individual basis with appropriate documentation in the personnel files.

--From ALDOT Rules of Operation, revised April 2017

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Foot and Leg Protection

- Hazards across all workplaces that cause foot and leg injuries include falling/rolling objects, sharp objects, wet or slippery surfaces, molten metals, hot surfaces, and electrical hazards
- Specialty foot guards, leg guards, and leggings should be provided if employees are exposed to these specific hazards
- During all construction work, **steel toe** or **composite toe** boots must be worn to provide the necessary foot protection from hazards that may be encountered

Foot and Leg Protection

- Where leg and foot hazards include primarily wet or slippery surfaces, or biological hazards in water, rubber boots are the appropriate choice of foot protection
- Ensure that, when selecting protective footwear, it fits snugly and comfortably
- Keep footwear clean and maintained, store in dry conditions, and be sure to replace when worn, cracked, or damaged

Leg Protection for Construction Personnel

- If construction site is near vegetation or woods, wear **snake chaps** to protect against potential snake bites
- If operating a chainsaw on a jobsite, wear **chainsaw chaps** to protect your legs
  - Chaps, rather than trousers, have open backs and are worn over pants to promote ease of movement and reduce the likelihood of heat stress
  - Chaps are constructed with multiple cut retardant fabric layers that, when they come in contact with a rotating saw chain, will pull out of the seam, wrap around the sprocket, and rapidly block the chain movement
  - Refer for the original equipment manufacturer's instructions for fitting, cleaning, and general care of chainsaw chaps to ensure the highest level of protection

Eye and Face Protection

- Eye and face protection should be used wherever hazards like flying fragments or objects, hot sparks, radiation, or particles, mist, dust, glare, or splashes are present
- Eye/face protection is diverse, and includes:
  - Safety glasses
  - Goggles
  - Face shields
  - Glasses/goggles with side shields
- For most inspection work, **safety glasses** are the most commonly appropriate eye protection
- Like all PPE, keep eye and face PPE clean and well maintained, and store in a safe and accessible location

Hearing Protection

- Exposure to high noise levels can cause permanent hearing loss and psychological stress
- Hearing protection, in the form of earplugs or earmuffs, should be worn wherever loud conditions are present, or where loud machinery may be used
- High quality, self forming, earplugs may be made from:
  - Foam
  - Waxed cotton
  - Fiberglass wool

Hearing Protection

- Ensure that you always have earplugs on your person, and be diligent about wearing it on jobsites
- Like all PPE, keep earplugs very clean and store appropriately
- Replace earplugs when they can no longer be cleaned, and replace earmuffs if they are damaged

Hand Protection

- Workers may be exposed to many harmful substances by way of skin absorption, cuts/lacerations, chemicals, or high heat
- Gloves afford hand protection from many hazards, however the type and level of protection must be chosen according to the anticipated hazards on a worksite
- Before using, make sure your gloves fit and are in good condition
- Request that gloves be replaced when worn out or damaged

Body Protection

- In some cases, workers must be shielded against scalding liquids, hazardous waste, heat and radiation exposure, and other hazards
  - In these cases, appropriate protective gear made of fire-retardant materials, rubber, leather, synthetics, or plastics should be provided along with training on how to use such PPE
- For construction work, required body protection includes **high visibility vests**, especially in conditions with possible traffic hazards or construction areas
- Ensure your vest is brightly colored, and preferably retroreflective, for optimal visibility
- Keep high visibility clothing clean and well-maintained for optimal performance on jobsite

Body Protection

- Other body PPE includes gear for foul weather, or conditions where splashing may occur
- Before heading to a jobsite, ensure that you are equipped with the appropriate PPE, and that the PPE assigned to you fits well

Additional Safety Items

In addition to PPE, construction crews should always carry several important safety items:

- First aid kit- restock as needed
- Insect repellent with DEET
- Sunscreen with UVA/UVB protection
- Water (Gatorade powder)
- Cooler
- Ice

Additional Safety Items

Construction crews must also carry:

- Traffic safety devices
  - Signs
  - Cones
  - Flags
- 2-Way radios if needed

Questions?

For more information, contact:
Matt Alpaugh, PE

Post-Training Quiz

Jefferson County Environmental Services Department
Onboarding Training Program

Construction Personal Protective Equipment Quiz

Name: _____ **Supervisor:** _____

Directions: Circle the correct answer from the given options, or fill in the blank.

1. Which of the following pieces of equipment are NOT considered Personal Protective Equipment?
   a. Hard hat
   b. Retroreflective Vest
   c. Engineering safety controls
   d. Goggles

2. True or false: hard hats protect against all the following: electrical injuries, impact, penetration, and long hair getting caught in machinery.

   a. True b. False

3. True or false: steel toed boots and rubber boots are appropriate protective footwear for sewer construction.

   a. True b. False

4. True or false: Exposure to high noise levels causes hearing loss, which is reversible with time.

   a. True b. False

5. What should you do with a hard hat if it receives a substantial blow or striking impact?_____

6. _____ should be worn to protect against absorption of harmful substances, cuts/lacerations, or burns to the hands.

7. Name one (of the two) important qualities of high visibility clothing? _____

8. True or false: PPE, as a barrier between a worker and the environment **completely eliminates** hazards that may be encountered.

   a. True b. False

9. True or false: Employees should be trained by their employer what types of PPE is needed for their work.

   a. True b. False

10. True or false: PPE can only be expected to protect you in the work environment if it is cleaned appropriately, properly stored, and made accessible for daily operations.

    a. True b. False

Quiz Answer Key

Jefferson County Environmental Services Department
Onboarding Training Program

Construction Personal Protective Equipment Quiz ANSWER KEY

Directions: Circle the correct answer from the given options.

1. Which of the following pieces of equipment are NOT considered Personal Protective Equipment?
    a. Hard hat
    b. Retroreflective Vest
    c. Engineering safety controls
    d. Goggles
2. True or false: hard hats protect against all the following: electrical injuries, impact, penetration, and long hair getting caught in machinery.
    a. True
    b. False
3. True or false: steel toed boots and rubber boots are appropriate protective footwear for sewer construction.
    a. True
    b. False
4. True or false: Exposure to high noise levels causes hearing loss, which is reversible with time.
    a. True
    b. False
5. What should you do with a hard hat if it receives a substantial blow or striking impact? Replace it
6. __Gloves__ should be worn to protect against absorption of harmful substances, cuts/lacerations, or burns to the hands.
7. Name one (of the two) important qualities of high visibility clothing? _Bright safety color or retroreflectiveness
8. True or false: PPE, as a barrier between a worker and the environment **completely eliminates** hazards that may be encountered.
    a. True
    b. False
9. True or false: Employees should be trained by their employer what types of PPE is needed for their work.
    a. True
    b. False
10. True or false: PPE can only be expected to protect you in the work environment if it is cleaned appropriately, properly stored, and made accessible for daily operations.
    a. True
    b. False

Collection System Safety Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	4	New section added to describe safety-related onboarding modules that have been created since 2016 CMOM	4/26/2018

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Acronyms

CMOM	Capacity, Management, Operations and Maintenance
JCESD	Jefferson County Environmental Services Department
JCPB	Jefferson County Personnel Board
O&M	Operations and maintenance
PPE	Personal protective equipment
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program

Collection System Safety Program

Program Overview

The Jefferson County Environmental Services Department (JCESD) considers safety to be a top priority in all duties performed by all employees.

The **Collection System Safety Program** (herein referred to as "**Safety Program**") followed by JCESD personnel to conduct Capacity, Management, Operations, and Maintenance (CMOM)-related work is described in this plan. The plan was developed for JCESD Collection System personnel as a basis on which each employee can establish the minimum actions and behavior necessary to work safely.

This plan is intended to meet the minimum safety requirements of local, state, and federal laws: it follows generally accepted industry standards and practices. In many instances, working safely will require actions and behavior beyond the general provisions of this plan. Each employee is expected to work safely, be alert for potential dangers, and seek and follow any information on further protection that may be necessary in particular situations.

All employees will be familiar with the hazards and protective measures associated with the jobs for which they are assigned. It is necessary that each employee performs their work in a safe manner to develop a culture of safety within the organization. It is especially necessary that supervisors assist in identifying hazards and communicate the protective measures required by this manual.

This plan will be reviewed regularly and updated as new legislation is passed, as new hazards are identified, and as new processes are developed. All employees are expected to assist in keeping this plan current by submitting any needed changes or additions to the safety personnel in their divisions for the next manual update. Copies of the plan are available through Collection System supervisors and safety representatives.

Purpose and Goals

JCESD is in the process of developing and implementing a comprehensive **Safety Program** to meet the goals and objectives set forth in its Safety Policy. JCESD's Safety Policy is as follows:

> *The Jefferson County Environmental Services Department intends to provide a safe work environment for all our workers and the public. A well-managed workplace safety program will benefit our organization and the community in measurable ways.*
>
> *The success of the program is dependent on the cooperative effort and active engagement of all JCESD employees, as well as the enforcement of program policies and standards.*
>
> *Both management and operations employees must become familiar with the program, follow and enforce the procedures, and become an active participant in this workplace safety program.*

JCESD is currently refining its **Safety Program**.

Program Resources

Related CMOM Program Documents and Other References

Jefferson County's **Employee Handbook** (current version) provides general guidance regarding the policies and procedures of the Jefferson County Commission, as well as the rules and regulations of the Jefferson County Personnel Board (JCPB). The **Jefferson County Employee Safety Handbook** (current version) provides guidelines on the following issues:

- Loss Prevention Policy
- Department Directors' Safety Responsibilities
- Department Supervisors' Safety Responsibilities
- Employee Safety Responsibilities
- General Safety Rules
- Safety Meetings
- Employee Accident/Injury Reporting Policy
- Driver Safety Rule and Procedures
- Driver Vehicle Accident/Injury Reporting Procedures
- Drug Testing Policy Statement
- Hazard Communication Program
- Your "Right to Know"
- Rules for Safe Lifting

For information regarding the Employee Handbook, contact Human Resources, Employee Services Division at (205) 325-5249. Copies of the **Personnel Board Rules & Regulations** (current version) are available from the JCPB at www.pbjcal.org.

Required dress codes for Line Maintenance, Television Inspection, and Pump Station personnel are described in internal policy books available from Department Supervisors.

Information on the following JCESD initiatives are provided in the **Contingency Planning Program** plan:

- Jefferson County Multi-Hazard Mitigation Plan
- Risk Management Plan
- Emergency Planning and Community Right-to-Know Act (SARA III) Reporting
- Chemical Accident Prevention
- Oil Spills Prevention and Preparedness

JCESD developed standard operating procedures (SOPs), work process descriptions, and checklists for its collection system operations and maintenance (O&M) practices. These SOPs are provided in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook. This handbook also contains Jefferson County's Lockout/Tagout and Confined Space Entry policies and procedures.

Procedures used when responding to and reporting sanitary sewer overflows (SSOs) are detailed in JCESD's **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan.

Other CMOM Program plans that reference or are referenced in the JCESD **Collection System Safety Program** plan include:

- CMOM Program Organization
- Customer Service Program
- Equipment and Supplies Management Program
- Gravity Line Preventive Maintenance Program
- Pump Station Operations and Maintenance Program
- Training Program

Staffing

All JCESD personnel are responsible for familiarizing themselves with applicable components of the **Safety Program** and engaging in safe work practices. Supervisors and managers are responsible for enforcing safety procedures.

For more information on the departments and personnel involved with the **Safety Program** initiatives, see the Organizational Charts provided in the **CMOM Program Organization** plan.

Data Management

Information related to the **Safety Program** training efforts is documented and maintained by the Public Relations Officer assigned to Barton Lab. The training requirements, courses provided, and employee participation are tracked in Microsoft Excel.

Program Implementation

JCESD's **Safety Program** consists of many initiatives, including the following:

- Hazard identification and risk assessment
- Communications
- Training

A description of these initiatives is provided below.

Hazard Identification and Risk Assessment

Following industry standards, the following steps are taken to address potential collection system safety hazards:

1. Identify collection system safety hazards.
2. Take steps to reduce or eliminate exposure to collection system safety hazards.
3. Control the hazard when it is not possible to eliminate.

Hazards are controlled using the following methods (in order, when feasible)

- Engineering controls
- Administrative controls
- Personal protective equipment (PPE)

Applying this hierarchy is a systematic approach to identify the most effective method of risk reduction.

Field supervisors conduct routine field crew visits to observe the jobsite and discuss and/or correct any safety concerns. JCESD has initiated several safety-related programs and processes to better ensure personnel are protected and have the necessary equipment to perform their work safely and effectively. Examples of the controls that have been put in place recently include the following:

- Standardization of traffic management devices and deployment strategies that result in higher visibility on roadways for construction and line maintenance operations.
- Provisions for a steel toed shoe annual allowance for all field personnel that encourages routine replacement of footwear.
- Use of trenching and shoring equipment on construction jobsites; appropriate shoring will be selected and utilized based on trench depth to ensure jobsite safety.
- Standardization of work practices in sewer line maintenance and inspection, which improves safety awareness.

Development of In-house training modules for safety topics such as Bloodborne and Waterborne Pathogens, PPE, Portable Gas Monitor Use, and Trenching and Shoring Overview. JCESD has also developed materials and trained its construction personnel on the safe use of specific equipment and tools, including chainsaws, pipe saws, and core tap machines. Additionally, field personnel are trained on the following:

> *If any employee sees, suspects, or knows of a potential safety hazard, including equipment components, tools, set up conditions, or traffic conditions, it is his/her responsibility to immediately bring it to the attention of the crew leader or the operator in charge of the work crew, and other crew members.*
>
> *The person in charge of the work site shall take appropriate corrective or preventive measures in addressing the situation. If the hazard is not able to be resolved with these actions, the person in charge of the work site shall notify the Field Supervisor (or onsite Supervisor or Inspector).*
>
> *Any additional actions should be made with this information in mind if corrective, anticipatory, or preventive measures are needed. If the hazard is not able to be resolved with these actions, the person in charge of the work site shall notify the Field Supervisor (or onsite Supervisor or Inspector).*

If the situation cannot be resolved, then the Field Supervisor (or onsite Supervisor or Inspector) shall consult with the Sewer Construction/Maintenance Supervisor or his/her representative prior to proceeding.

Communications

JCESD understands that communication between staff and management, and for inter-departmental needs, is critical to maintaining the safe operations of an organization operating in a large service area, with multiple work activities requiring coordination. Internal communications include methods that work at inter-departmental levels between management and staff, and cross-departmental levels with other facets of the organization. These communication methods can be in the form of meetings, email, bulletin boards, telephone, conference calls, and cellular phone texts.

Safety topics are discussed at morning tailgate meetings, department meetings, operator training events (in classrooms and in the field), and inter-departmental meetings.

For more information on the communication efforts within JCESD, see the **CMOM Program Organization** plan.

Safety Training

JCESD provides annual training on confined space entry, trenching and shoring, and other important safety topics. For more information on past training events, see the JCESD **Training Program** plan.

The training tracking process shown in **Table 1** is used to identify the applicable training for employees and ensure the required training opportunities are provided.

Table 1. Training Tracking Process

Step	Tracking System Element
1	Request lists of required training and required employee attendance from Department Supervisors and senior managers
2	Set up a monthly action schedule for the required training of employees by position
3	Confirm staff availability and schedule training; resolve conflicts or schedule course if unforeseen conflict arises
4	Post training notices when courses are scheduled and issue training notices to individual employees with adequate lead time before scheduled training events
5	Maintain a directory of each course conducted, including: name of course, name of instructor, course duration, attendee roster, and curriculum (if available)
6	Review roster after training to confirm scheduled employees were in attendance
7	If directed by employees' supervisors, reschedule training for employees who were unable to attend
8	Log employee attendance in tracking system and file roster in master training file
9	Collect certificate of attendance signed by trainer or issue certificates for the training coordinator to each attendee
10	File copies of certificates in employee training files

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The indicators that JCESD uses to measure the performance of its wastewater collection system and effectiveness of its **Safety Program** are listed below.

Table 2. Safety Program Performance Indicators

Performance Measure	Formula	Definition	Data Interval
# Employee Injuries	Value	Number of injuries reported by JCESD employees	Monthly
Days Lost w/Pay	Value	Number of days employees were absent from work due to injury sustained while on the job	Monthly

CMOM Information Management Systems Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	5	Freeance Mobile description added to Table 1	4/26/18
2	1	Minor updates to the Purpose and Goals section	2/2022
2	5	Changed from PipeTech to ITpipe in Table 1	2/2022

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Acronyms

CCTV	Closed-circuit television
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations and Maintenance
EAM	Enterprise asset management
FOG	Fats, oils, and grease
GIS	Geographic Information System
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
LIMS	Laboratory information management system
O&M	Operations and maintenance
PACP	Pipeline Assessment and Certification Program
PM	Preventive maintenance
SSO	Sanitary sewer overflow
TVI	Television inspection

CMOM Information Management Systems Program

Program Overview

Jefferson County Environmental Services Department (JCESD) utilizes a variety of off-the-shelf and customized computer hardware and software tools to manage the vast amount of data it collects, maintains, and analyzes to conduct its daily operations and maintain compliance with regulatory requirements.

The information management systems (IMSs) utilized by JCESD personnel to conduct CMOM-related work are described in this plan.

Purpose and Goals

JCESD has developed and implemented an integrated asset management system that effectively utilizes existing geographic information system (GIS) capabilities for the management of system attributes (pipes, manholes, etc.), inspection findings and actions (grease traps, construction sites, spills, etc.), and maintenance activities (pipe cleaning, defect rating and prioritization). Currently, JCESD is in the process of developing and implementing a vertical asset management system. The asset management system is designed to automate processes for compliance and monitoring, sewer line operations and maintenance (O&M), pump station O&M, continual sewer system assessment, and performance evaluation.

The objective of the integrated asset management system is to implement a web-based solution to achieve benefits such as:

- Enhance data sharing through efficient systems integrations.
- Enhance functionality offered by current solutions to further develop and improve business processes.
- Increase the availability of pertinent information to appropriate users.
- Decrease system support costs.
- Improve current systems by implementing the new asset management system in conjunction with current business processes, as well as key process improvements.
- Provide easy access to centralized geographic information by establishing a seamless integration with ESRI GIS.

The **CMOM IMS Program** enables JCESD management to adequately evaluate financial, operational, maintenance, customer service, and system rehabilitation, along with other capital improvement activities, to assess the overall system performance and make informed decisions concerning future strategies.

The IMS is used to track scheduled operations activities, to enhance operations performance, and to ensure timely and standardized reporting of field data and reports completed or derived from field activities. The IMS also is used to track scheduled maintenance activities and to enhance maintenance performance. The IMS is used to enhance customer service by tracking service requests to completion, as well as to track previous similar requests.

JCESD is continually refining its IMS (a.k.a., computerized maintenance management system or CMMS) program strategy using Cityworks software, and is reviewing the relationship between maintenance, operation, and management activities related to the various software products and databases used by JCESD.

The goal of the IMS Program is to have a robust means to document, store, and track maintenance, operation, and management activities to optimize system operations and level of service.

Program Resources

Related CMOM Program Documents and Other References

Other CMOM Program plans that reference, or are referenced, in the JCESD **CMOM Information Management System Program** plan include:

- CMOM Program Organization
- Contingency Planning Program
- Corrosion Control Program
- Customer Service Program
- Engineering Program
- Equipment and Supplies Management Program
- Financial Analysis Program
- Fats, Oils, and Grease Management Program
- Gravity Line Preventive Maintenance Program
- Legal Support Program
- Line Location Program
- Maintenance of Way Program
- Overflow Tracking Program
- Pretreatment Program
- Pump Station Operation and Maintenance Program
- Safety Program
- Service Connections and Disconnections Program
- Training Program
- Water Quality Monitoring Program

Staffing

For more information concerning staffing the IMS Program, see the organization charts presented in the **CMOM Program Organization** plan.

There are many individuals with read/write access to specific IMS software programs and databases, depending on responsibilities to the organization. Primary responsibility for maintaining IMS-related records is assigned to the Systems Analyst.

Data Management

The various computer software programs currently in use by JCESD are listed in **Table 1** on the following pages.

Program Performance Metrics

Currently, software is purchased on user or license agreements that provide updates as new releases are issued. Additionally, JCESD will evaluate new technology and software releases to implement improvements to enhance operations, data management, and data analysis.

Table 2. JCESD Information Management Systems

Software / Database	Responsible Party	Description	CMOM Program	Application
Cityworks	Systems Analyst	GIS-centric asset information data management repository for linear asset attribute information, mapping, and service request and work order system assignment and tracking	Customer Service	Track calls and complaints through service requests entered by Customer Service Department and executed by Line Maintenance, TVI, and Construction personnel
	Systems Analyst		Overflow Tracking	Recording SSOs and backups and tracking cleanup and repairs
	Systems Analyst		Engineering	PACP module for Cityworks to import PipeTech television inspection (TVI) field data from inspection vehicles to database
Infor Enterprise Asset Management (EAM)	Systems Analyst	Asset management database for vertical assets	Pump Station O&M	Pump station asset data, preventive maintenance (PM) and O&M schedules, and work orders
Capacity Assurance	Systems Analyst	Database of proposed projects requesting sewer reserved flow	Engineering	Tracks projects until they are completed and part of measured flow in the system
Grease Control Program	Environmental Coordinator	Database of food service facilities that could discharge grease into JCESD sewers	Fats, Oils, and Grease (FOG)	Tracks inspection and enforces compliance with FOG ordinances; provides licenses to facilities and inspects yearly
Munis	Finance Department	Enterprise-wide financial system used by many personnel with specific areas of responsibility concerning JCESD finances and budgeting	Financial Analysis	Tracks JCESD financial and budgeting information

Software / Database	Responsible Party	Description	CMOM Program	Application
Private Meter	Senior Systems Analyst	Database of water meters used for water that does not enter the sewer system (lawn and garden sprinklers, etc.).	Customer Service	Tracks water usage that does not discharge into JCESD sewer system and reimbursement of sewer charges made for that water usage
Sewer Impact and Sewer Connection Permits	Administrative Analyst	Database to track permits issued and inspections performed on new and upgraded sewer connections	Engineering	Tracks sewer impact and connection permits issued
Private Developed Sewer Projects (PDSIMS)	Administrative Analyst	Privately developed sewer projects (subdivisions or malls, etc.) wishing to donate their project to Jefferson County for maintenance	Engineering	Tracking and collecting proposed and as-built drawings and assigning reference numbers. Repository of proposed and as-built drawings of privately developed sewer projects
LIMS	Programmer Analyst	Barton Labs database of water quality samples	Water Quality Monitoring	Tracks water quality samples and test results
ITpipes	Systems Analyst	CCTV gravity line inspection data collection	Engineering	Software resides on TVI trucks for viewing inspections, and coding defects and other findings from a gravity line TVI inspection
Freeance Mobile for Cityworks	Systems Analyst	Mobile app for phones and tablets to allow direct update of the Cityworks database from the field.	Customer Service Overflow Tracking Engineering	Software resides on same server as Cityworks and allows mobile apps to create and update Work Orders Service Request and Inspections while in the field. Service Request and Work Orders can be retrieved by the assigned personnel complete with address and maps

Engineering Program

FINAL

September 2023

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Revision History

Revision Number	Page Number	Description of Change	Date of Change
1	2	Updated number of pump stations	11/12/18
1	7	Revised Figure 2	11/26/18
1	13	Revised Figure 4	11/12/18
1	23	Updated number of flow meters	5/24/18
1	30	Revised Figure 11	11/12/18
1	29	Updated hydraulic model status	5/24/18
1	30	Revised Figure 12	11/12/18
2	29	Updated capacity assurance decision flow	8/15/19
2	29	Revised Figure 11	8/15/19
3	1-12	Added Executive Summary	9/15/23
3	29	Updated Program Components and Approach	9/15/23
3	31	Updated Program Resources	9/15/23
3	32	Updated Program Resources	9/15/23
3	33	Deleted Figure 12	9/15/23

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Acronyms

AMP	Asset Management Program
CAP	Capacity Assurance Program
CCM	Consultant Construction Manager
CCTV	Closed-circuit television
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
COF	Consequence of failure
CSSAP	Continuous Sewer System Assessment Program
GIS	Geographic information system
GLPMP	Gravity Line Preventative Maintenance Program
GP	Gravity pipe
GPS	Global positioning satellite
I/I	Infiltration and inflow
ID	Identification
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
LDSAP	Large Diameter Sewer Assessment Program
MH	Manhole
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
OSARP	Ongoing Sewer Assessment and Rehabilitation Program
PACP	Pipe Assessment and Certification Program
POF	Probability of failure
QA/QC	Quality assurance and quality control
ROW	Right-of-way
SIMS	Sewer Infrastructure Management System
SL-RAT	Sewer Line Rapid Assessment Tool
SOP	Standard operating procedure
SSES	Sanitary sewer evaluation survey
SSO	Sanitary sewer overflow
TVI	Television inspection
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility

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Engineering Program

Executive Summary

The Executive Summary is intended to provide an overview of the modeling, capacity assessment, and remedial measure planning process used by the County under the Asset Management Program (AMP). The goals of the **CMOM Program** are to describe the current processes used to operate and maintain the sewer system and to ensure that all new connections and projected future growth do not exceed the available treatment and conveyance capacity of the wastewater treatment system. Hydraulic Models are the primary tools used by the Jefferson County Environmental Services Department (JCESD) to evaluate the existing and future hydraulic capacity of the sanitary sewer collection system and plan for system improvements needed to prevent SSO's in accordance with the capacity goals of the **Consent Decree**. Water Reclamation Facility (WRF) influent pump stations and headworks were modeled to apply boundary conditions set to ensure treatment capacities are not exceeded, simulate appropriate backwater conditions on adjacent gravity sewers, and inform remedial measures where additional treatment capacity may be required.

Models are developed and calibrated to perform capacity assessments for the identification of specific assets unable to meet both a 2-year 6-hour and a 2-year 24-hour level of service and to develop remedial measures to eliminate SSOs and meet level of service requirements. The County's **Capital Improvements Plan** (CIP) provides for the implementation of these corrective projects and incorporates considerations for system-wide prioritization, scheduling, and funding.

The hydraulic model development process consists of four phases that are documented in a Technical Memorandum for each sewer basin. Each phase is summarized as follows:

- **Flow Survey Analysis** – This phase reviews the flow monitoring and rainfall data to characterize metershed base sanitary and Rainfall-Derived Infiltration and Inflow (RDII) components and distribute them to model subcatchments for final adjustment during calibration. The Flow Monitoring Program is described in more detail in the CMOM engineering document.
- **Hydraulic Model Development and Calibration** – This phase includes development of the hydraulic model and calibration to reflect actual, "real world" system conditions. Dry and wet weather flow calibration is achieved by iteratively adjusting model parameters (e.g., diurnal curves, roughness coefficients, sanitary, groundwater and RDII characteristics) to match model results with flow monitor data.
- **Capacity Assessment** – Design storm hyetographs were generated using National Oceanic and Atmospheric Administration (NOAA, Atlas 14) localized precipitation estimates, and simulated for existing and future sewage flow conditions, to identify problem areas unable to meet the specified level of service.

  Level of Service is based on the risk of SSOs during the 2-year 6-hour and 2-year 24-hour design storm events. Analyzing both design events provide an opportunity to assess infrastructure sensitive to a shorter time of concentration (e.g., collector sewers, pump stations) and areas dependent on a longer time of concentration (e.g., trunk and interceptor sewers, Equalization

Storage). Potential SSO locations and estimated overflow volumes are identified under this Phase.

- **Remedial Measures Planning** – This phase evaluates and identifies system modifications needed to correct deficiencies identified in the Capacity Assessment phase. The remedial measures planning (RMP) phase develops conceptual level projects to eliminate SSOs in the existing and future condition modeled system. The selected level of service prevents system overflow SSO during 2-year design storm, and defines specific requirements for gravity sewers, pump stations, equalization storage, and WRF improvements as stated below:
    - 2-year 6-hour and 2-year 24-hour events are fully "contained" with current WRF operations and does not result in a by-pass.
    - Design flow rates use the greater of 2-year 6-hour and 2-year 24-hour design storm simulations under open system flow conditions (where upstream capacity constraints are removed).
    - Initial proposed storage improvements will be based on the 2-year 24-hour design storm volume requirements. The storage volume requirements will be refined during design using continuous simulation.
    - Full pipe replacement and up-sizing to increase conveyance capacity are used for existing sewers less than 30-inch diameter. For large diameter sewers (30-inch and greater), a new parallel relief sewer was assumed to provide the necessary additional capacity to convey the design flow in-pipe rather than replacing the existing pipe.
    - Existing system pipe slopes were used to size replacement sewers such that the 2-year design flow rate was less than the full-pipe capacity.
    - Surcharging is allowed up to the rim without causing an overflow in areas where there was no upsizing.
    - A pump station upgrade was required if the peak inflow is greater than the existing pump station capacity with all pumps running, and the model predicted an upstream overflow. Upsized pump stations were sized with a firm capacity (or with the largest pump out of service) designed to meet peak flow condition.
    - When remedial measure alternatives considered EQ storage, weir elevations were set to maximize conveyance in the trunk sewer and to keep the maximum HGL below the manhole rim elevation.

The hydraulic models are created and maintained using the full extent of resources available and are updated routinely. The model network is continually refined using survey field data and data from the ongoing flow monitoring program to reflect the latest system infrastructure records and major flow condition changes. Capacity assessments initially performed during model development are re-evaluated and updated after each model update iteration.

Similarly, proposed remedial measures are reviewed and refined with model updates, and then the CIP is amended. This process is an on-going cycle of investigation, refinement, and reprioritization, which is necessary to maintain an effective Program that achieves overall Consent Decree goals. **Figure ES-1**

provides the overall Asset Management Program Flow Schematic as it relates to planning for RMP projects and describes primary milestones and related activities.

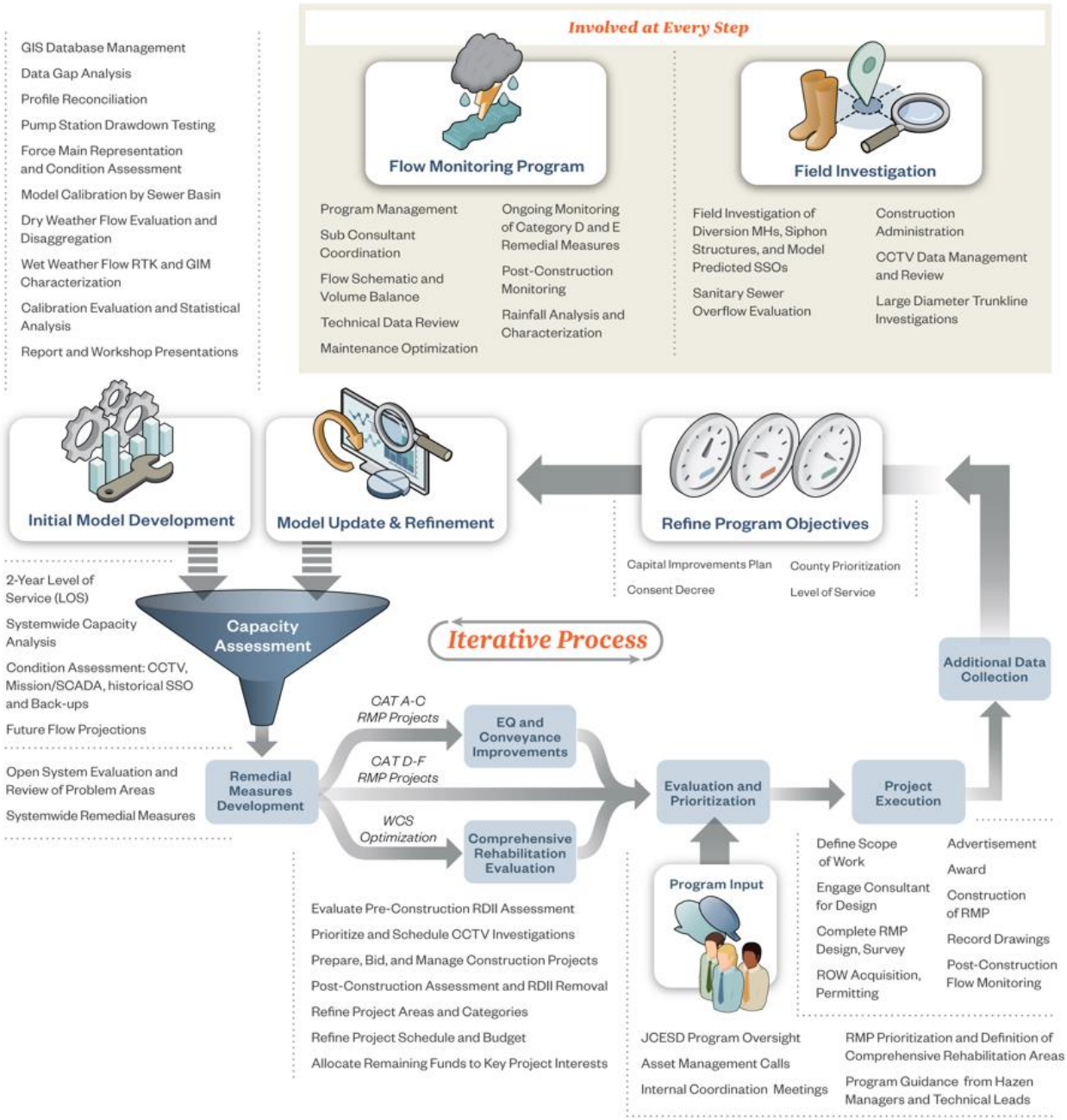

Figure ES-1: Asset Management Program Flow Schematic

Flow Survey Analysis

The flow monitoring program includes deploying flow meters at key locations to collect dry and wet weather sewer flow data throughout each model development phase for the nine sewer basins. Rain gauges are deployed throughout the System to record spatial variation in rainfall events and correlate rainfall volumes and RDII to the sewer. Flow survey data provides the fundamental information necessary to calibrate the hydraulic model and characterize baseline sewer flow contributions. The flow monitoring program was established during the initial model development stages and is the basis for calibrating models, validating capacity issues, characterizing RDII for consideration of comprehensive rehabilitation, and evaluating post-construction conditions following implementation of remedial measures. Specific flow survey information (including the number of monitoring sites, site flow, velocity, and level observations) used during model calibration for each sewer basin is discussed in respective **Flow Survey Analysis Summary** Memoranda.

The Pre- and Post-Rehabilitation Flow Monitoring Standard Operating Procedure (SOP) is provided under **Appendix N** to standardize the analysis of flow monitor data collected from comprehensive rehabilitation projects and to provide the means and methods to produce defensible and measurable data that can show the effectiveness of rehabilitation.

Additional Data Collection and Field Investigation

Field investigation has been essential for accurate representation of key network elements including diversion structures, pump stations (drawdown tests), siphon sewers, water reclamation facility boundary conditions, and model-predicted or historical overflow locations. Field investigation also includes the collection, evaluation, and management of CCTV data, manhole inspections, and large-diameter trunkline assessments.

Hydraulic Model Development and Calibration

Modeled extents are defined to evaluate calibration metersheds, lift stations, anticipated development areas, and known problem locations. Model subcatchments are delineated to refine model loading resolutions, account for changes in land use or buildout density, and to accommodate a **Capacity Assurance Program** (CAP). Drawdown tests are performed at pump stations to adjust manufacturer curves to reflect present conditions. Force main profiles are developed from record drawings to evaluate a system performance curve and calibrate force main roughness. Model calibration results and model development activities are discussed in the respective **Hydraulic Model Development and Calibration** Memoranda developed for each sewer basin.

Capacity Assessment

Capacity Assessment evaluations identify problem areas based on the 2-year level of service. Instead of focusing solely on individual overflow locations, model predicted overflows were clustered into "problem areas". This is because overflows in a particular location are often related to the same capacity problem. Through this approach, capacity problems and appropriate remedial measures are efficiently managed. Subsequently, problem areas were categorized based on the level of uncertainty in the model predicted overflows. **Table ES-1** summarizes the problem area categories for the capacity assessment.

Table ES-1: Capacity Assessment Problem Area Category Summary

Category	Model-Predicted Problem Area Description
1	Remedial measure implementation complete
2	Remedial measure designed, pending implementation
3	Remedial measure planned based on reported overflow conditions, pending design
4	Problem area identified based on model-predicted overflow conditions during the 1- and 2-year design storms, confirmed with historical overflow records or flowmeter data. Remedial measures plan to be developed.
5	Problem area identified based on model-predicted overflow conditions during the 2-year design storm, not confirmed with historical overflow records or flowmeter data. Additional field investigation recommended to verify model results

Remedial Measures Planning

Problem areas were initially screened and identified using GIS through visual review of locations where model-predicted overflows and historically confirmed SSOs were clustered. The problem areas were further categorized based on the following factors:

- Number of model-predicted overflows (1-yr 6-hr, 1-yr 24-hr, 2-yr 6-hr, and 2-yr 24-hr design storm results)
- The number and frequency of I/I related SSOs reported to and verified by JCESD.
- If a confirmed SSO manhole has 5 or more overflow events associated to it within the last 10 years, it is considered a recurring overflow.
- If a confirmed SSO manhole has fewer than 5 overflow events associated to it within the last 10 years, it is considered a non-recurring overflow.
- A detailed review of flow monitoring data across the problem area.
- A review of existing pump station SCADA data (Mission Communications).

The remedial measures categories are identified as category A through E based on the confidence with current information. Category F reflects a capacity problem under future flow conditions. Please refer to

Table ES-3 for a description of each confidence category. The remedial measures category will be used to assist with prioritizing each RMP project in the plan for implementation, scheduling, and budgeting.

Remedial Measure improvements were developed utilizing three primary strategies: performing comprehensive rehabilitation to reduce peak flow and volume resulting from RDII; increasing sewer conveyance capacity with new larger diameter sewers; and with storage by constructing flow equalization basins at strategic locations in the systems. SSO locations with a low confidence (i.e. model-predicted SSOs without historical overflow confirmation) do not have improvement plans developed, but additional data is collected to better understand the capacity issues. As additional information is obtained, the project order/sequencing may change as projects move from one category to another.

Remedial Measures were developed for all "problem areas"; however, it was not uncommon for multiple problem areas to be incorporated to the same design project. As such, there may be some discrepancy between the number of remedial measures developed and the total of completed or in design projects for each basin. The Remedial Measure improvement strategies are further described below:

Comprehensive Rehabilitation

Comprehensive rehabilitation projects utilize trenchless construction methods such as cured-in-place pipe (CIPP) lining, chemical grout, and protective coatings to seal sewers, laterals, and manholes to mitigate Infiltration. JCESD has realized favorable results from comprehensive rehabilitation and has become the preferred remedial measure strategy to be employed. The project areas are in various stages of the project execution process; from flow monitoring and evaluations to identify RDII characteristics, identification of defects and extent of rehab needed through CCTV inspections, the production of bid documents, to post-construction flow monitoring to quantify the percent reduction of peak flow rates and volume to measure success.

Advantages of comprehensive rehabilitation over pipe replacement and upsizing conveyance improvements include system-wide benefits provided by flow reduction, less disruptive construction practices, shorter project time from inception to completion, and less expensive system renewal per linear foot. In the prioritization and scheduling of related comprehensive rehabilitation areas and downstream conveyance projects, rehabilitation is completed first and flow reduction quantified, since those conveyance scopes of work may be reduced or eliminated depending on the effectiveness of the rehabilitation projects.

Conveyance Improvements

Conveyance improvements include pump station upgrades, force main improvements, or full pipe replacement and up-sizing to increase conveyance capacity for sewers less than 30-inch diameter. For large diameter sewers (30-inch and greater), new parallel relief sewers were sized to provide enough capacity to convey design flows in-pipe. Capacity Requirements for proposed conveyance improvements will be refined through subsequent model updates after the completion of rehabilitation in target areas.

Equalization Storage (EQ)

When remedial measure alternatives considered storage, weir elevations were set to maximize conveyance in the trunk sewer and to prevent flooding. Volume requirements for proposed EQ storage improvements will be refined through subsequent model updates after the completion of rehabilitation in target areas.

Optimization

Hazen worked with WCS Engineering (WCS), who evaluated the existing system using Optimatics software, to identify the most economic set of solutions to maximize system-wide SSO reduction for projects within interconnected sewer basins (Cahaba, Five Mile, Shades, Valley, and Village) which have the ability to redirect flow. In a single analysis, cloud computing is used to run thousands of solution permutations to identify the optimal solution to meet planning and performance criteria at the least cost. The software interfaces with the hydraulic model and considers detailed life-cycle cost data, design criteria, and improvement alternatives. Improvement alternatives included a mixture of conveyance, storage, and rehabilitation.

Hazen provided WCS with the ICM future conditions hydraulic model converted to PCSWMM for use with Optimatics software. Key design and performance criteria, including the required level of service (pertaining to surcharge, trunk freeboard or equalization storage), were applied to the optimization analysis. Unit costs rates adopted for the optimization analysis were planning level estimates developed by Hazen and Sawyer based on the County's Bid tab records. The unit costs included Capital, O&M and replacement estimates for all improvements. The optimization process was completed for the following scenarios identified in **Figure ES-2** which provides estimated Life-Cycle Costs for interconnected sewer basins defined above.

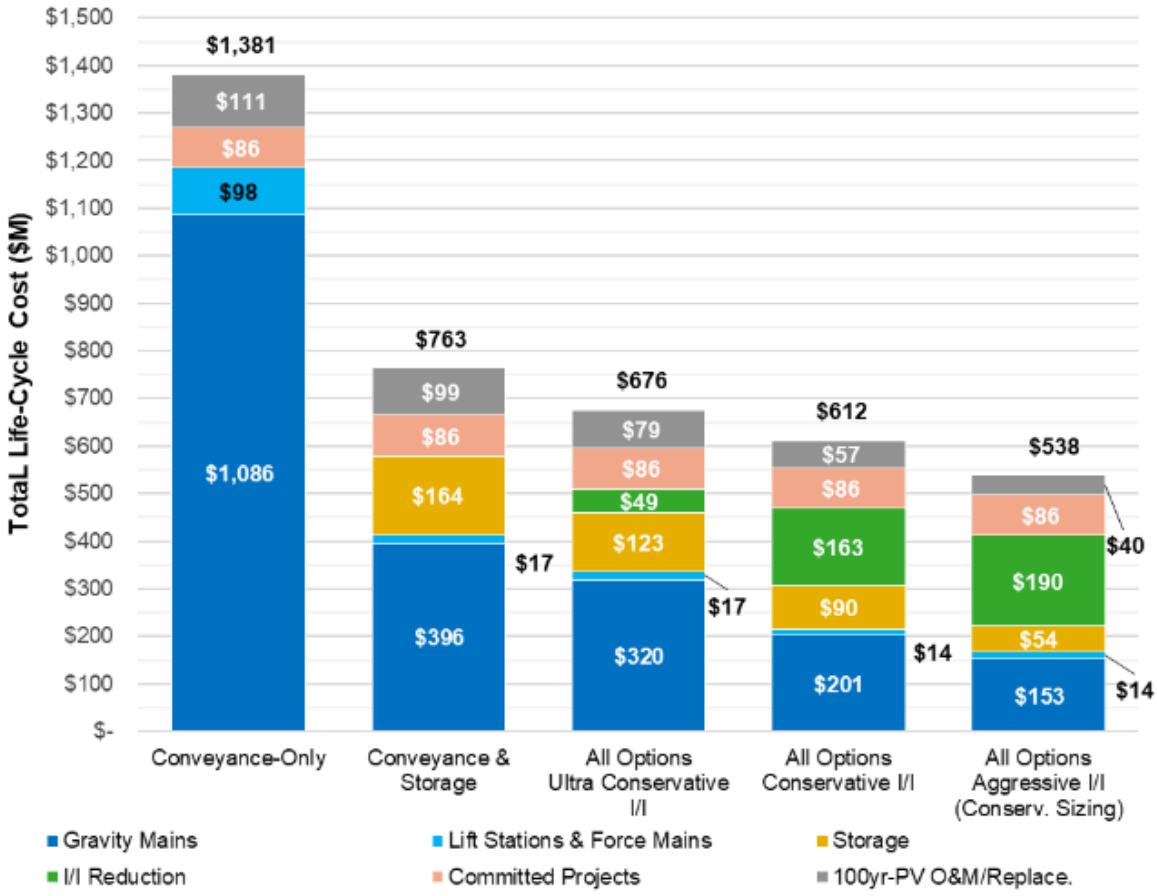

Figure ES-2: Comparison of Optimization Scenarios

The Aggressive I/I Reduction scenario defines the maximum I/I reduction that can be achieved in a metershed and is limited to 60%. The Conservative I/I Reduction scenario defines the maximum I/I reduction that can be achieved limited to 40%. The Ultra Conservative I/I Reduction scenario defines maximum I/I reduction as 50% or the value calculated for the Aggressive I/I Reduction scenario.

The original RMP Projects focused on solutions that solved local capacity problems through conveyance, storage, pump station upgrades, and necessary trunk improvements to handle the additional water conveyed by completing projects located upstream. Comprehensive rehabilitation was not originally included as an improvement alternative as confidence in reducing flow had not been proven in Jefferson County as a reliable long-term solution. Once the County completed a successful rehabilitation project (Chapel 2 PS area), where peak flows and volume were reduced by 79% and 89% respectively, comprehensive rehabilitation was considered a viable solution and evaluated for all remedial measure plans.

The Optimization process compared system-wide SSO reduction benefit(s) for every project, not just in the immediate improvement area. With the addition of comprehensive rehabilitation as an improvement alternative, some conveyance solutions were significantly changed, reduced, or eliminated due to the predicted I/I removal.

The program is continuously improved and refined as new approaches and tools are made available to produce the best available solutions. The assumptions for conservative and aggressive I/I reduction are considered reasonable; however, the effectiveness will not be measured, and assumptions confirmed, until the rehabilitation work and post-construction flow monitoring have been completed.

The Aggressive I/I solution was developed with gravity improvements sized conservatively for uncertainty in the I/I program and ultimately selected as the preferred RMP Strategy. The resulting solutions were compared to the conceptual projects developed under the preceding **Remedial Measures Plan** Memoranda.

Evaluation, Prioritization and Sequencing of Remedial Measures

All recommended remedial measure projects have been prioritized based on current information. Dependency relationships between remedial measures were considered in the prioritization and schedule development processes to facilitate proper project sequencing. As new information becomes available, the projects will be re-prioritized as needed. Once projects become recommended, they are prioritized based on the following considerations:

- Projects for which there was a higher level of confidence that a capacity-related issue exists were given a higher priority over projects formulated based only on model-predicted overflows, which were not corroborated with reported SSOs and/or flow monitoring observations.
- Projects which eliminate a greater number of overflow locations were given priority over projects which eliminate fewer overflow locations.
- Projects which reduce a greater volume of SSO were given a higher priority.
- Projects which are more cost-effective in terms of the cost per gallon of SSO eliminated were given a higher priority.
- Future condition.

Each of the above five criteria was assigned a score between 1 and 5. The new score was used to prioritize the implementation schedule. The scoring system for the first criterion is presented in **Table ES-2**.

Table ES-2 Confidence in Capacity Deficiency Scoring

Confidence Category	Description	Hazen Priority Score
A	Model-Predicted SSO(s) and Recurring Reported Capacity-Related SSO(s) (5 or More SSOs in 10 years)	5
B	Model-Predicted SSO(s) and Reported Capacity-Related SSO(s) (<5 SSOs in 10 years)	4
C	Model-Predicted SSO(s), No Reported Capacity-Related SSOs, but Flow Monitor in Vicinity indicates hydraulic issues exist	4
D	Model-Predicted SSO(s), No Reported capacity-Related Overflows and Flow Monitor in Vicinity does not indicate hydraulic issues exist	2
E	No Model-Predicted SSO, Reported Capacity-Related SSO(s)	2
F	Model-Predicted SSO(s) in Future Flow Condition Only	1

Additional scoring is included for scoring model-predicted SSO volume eliminated; scoring model-predicted SSO locations removed; and for scoring cost per gallon of SSO volume reduced.

It is important to recognize that the remedial measures cannot necessarily be implemented in the order in which they were prioritized. From a hydraulic standpoint, the implementation of a high-priority upstream remedial measure will convey larger peak flows downstream and may cause new capacity-related SSOs, or make existing SSOs worse in areas of the system where lower priority remedial measures are recommended. To avoid implementing an upstream remedial measure which merely transfers the SSOs further downstream, the proper sequencing of the remedial measures was established.

To facilitate proper project sequencing, it is important to identify dependency relationships that exist between remedial measures and consider these dependencies jointly with the prioritization when developing the schedule. The hydraulic model was used as a tool to help determine these dependencies. These dependency relationships can be either finish-to-start (predecessor must finish before successor can start) or finish-to-finish (predecessor must finish before successor can finish). An assumption of the type of dependency between predecessor and successor remedial measures was made during the budgeting and scheduling step of remedial measures planning.

Within each basin's respective **Remedial Measures Plan** Memoranda, proposed projects are classified and prioritized based on the scoring system. Projects included in the Optimization process are further

classified as either recommended or tentative based on the priority group contained in the **Optimization Report** (2021) which included results for all interconnected sewer basins (Cahaba, Five Mile, Shades, Valley, and Village).

For the basins included in the optimization process, seven priority groups were developed during the optimization process to determine the sequence of RMP project implementation that provides the maximum return on investment (ROI). RMP Projects in the other disconnected basins (Leeds, Prudes, Trussville, Turkey, and Warrior) were added to priority groups manually.

Project priority groups are based on several factors including the level of confidence, number or volume of overflows eliminated, cost-effectiveness ($/gallon removed), and overall system ROI. Priority Group 1-5 improvements were recommended for Implementation due to their high ROI. Group 6 and 7 improvements, where ROI is not as high, are typically classified as tentative, and are not included in the current schedule or Capital Improvement Plan. The tentative remedial measures will be recommended, refined, or eliminated based on the results of further system characterization in these areas.

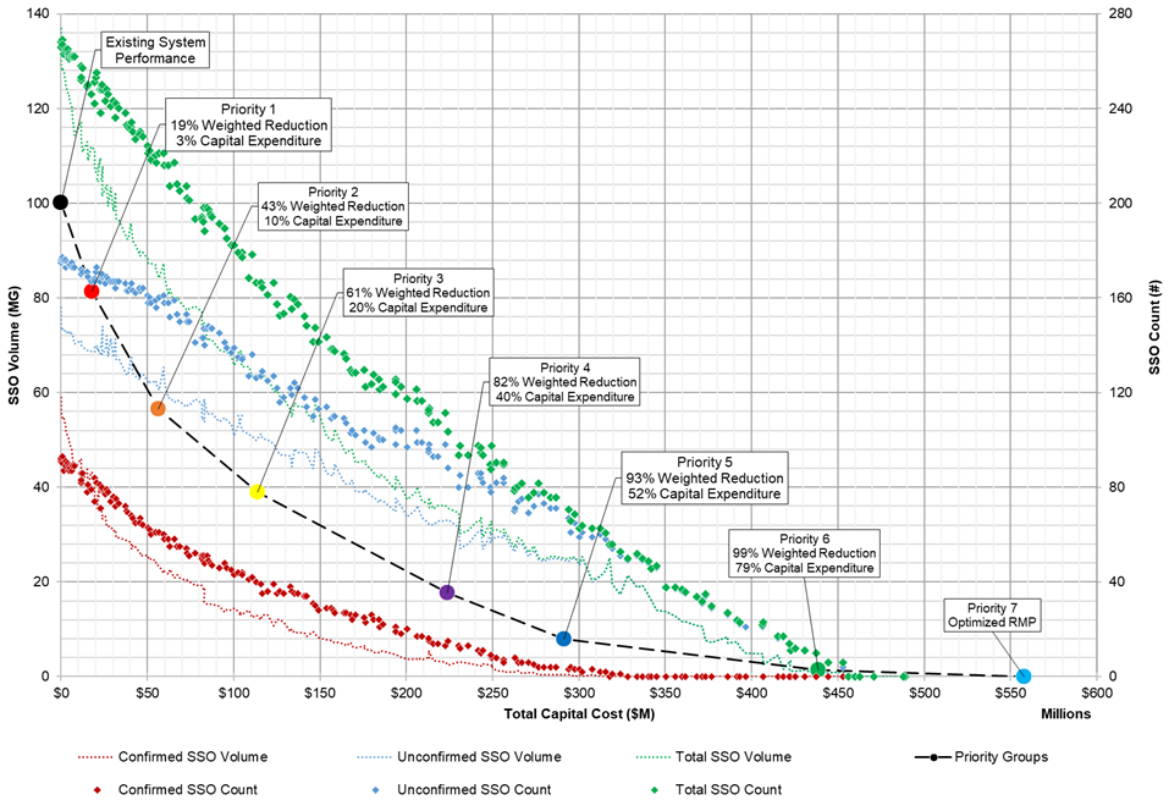

Figure ES-3: Return on Investment Curve – Capital Cost vs SSO Volume

Model Update and Refinement

Field investigations and the Flow Monitoring Program have been on-going efforts intrinsic to every part of the overall Asset Management Program. These efforts were essential to initial model development and calibration; and to the evaluation of model-predicted problem areas, proposed remedial measures,

and comprehensive rehabilitation areas. Field Investigation will continue to assist in subsequent model updates, future rehabilitation areas, and the refinement of proposed remedial measures. As development occurs, the model will be expanded to evaluate new areas.

Overview

The **Engineering Program** is the "backbone" of Jefferson County Environmental Services Department's (JCESD's) Capacity, Management, Operations, and Maintenance (CMOM) Program. This **Engineering Program** plan outlines a framework for:

- Maintaining an accurate inventory of JCESD's collection system assets.
- Maintaining current mapping and supporting documentation related to the collection system.
- Monitoring sewer flows, developing hydraulic models, and ensuring available system capacity for new development.
- Assessing the condition of existing collection system assets and prioritizing rehabilitation and replacement projects, when necessary.
- Ensuring collection system projects are designed and constructed in accordance with JCESD standards.
- Securing required utility easements rights-of-way (ROWs) related to JCESD construction projects and ensuring sanitary sewer assets are transferred to JCESD from new development projects, when applicable.

Maintaining accurate records of JCESD assets, facilitate the asset management and operations and maintenance (O&M) activities described in the remaining CMOM program plans. Through standardized design requirements and inspection procedures, JCESD can ensure that the collection system is constructed correctly and in accordance with industry best practices, which will ultimately minimize sanitary sewer overflows (SSOs) from the system.

The **Engineering Program** comprises the following initiatives:

- System Inventory Program
- Collection System Plans and Mapping Program
- System Design Standards Program
- New Construction and Rehabilitation Inspection Program
- Acquisitions Program
- Continuous Sewer System Assessment Program
- Infrastructure Rehabilitation Program
- Capacity Assurance Program

The purpose and goals of the individual program components are discussed in each program section.

System Inventory Program

Program Activities

Purpose and Goals

This program ensures that an inventory of JCESD's collection and transmission system is current and cataloged by water reclamation facility (WRF) service areas. The inventory lists the system components with their attributes and characteristics (e.g., pipe age, pipe size, pipe material, invert elevation, pump size, inverted siphon locations, pump station, manholes, etc.).

Program Components and Approach

JCESD maintains over 3,113 miles of gravity and pressure sewer lines, 178 collection system pump/lift stations, and nine wastewater treatment plants (as of Feb 2022). For more information on JCESD's wastewater treatment and collection system, see the **CMOM Program Organization** plan.

JCESD maintains its entire sewer collection and transmission system assets in an ESRI ArcSDE geographic information system (GIS) database. The database is continuously updated as the collection system is maintained, inspected, rehabilitated, and expanded.

JCESD uses Cityworks software for managing service requests, work orders, inspections, and construction activities. Cityworks is a computerized maintenance management system (CMMS) software that is GIS-centric (i.e., it uses an ArcGIS platform), and has an extensive sewer system asset data management repository.

The GIS component of Cityworks enables users to view the collection system in relation to other County information, including parcels, street centerline, topography, water features, and other data layers. **Figure 1** on the following page represents a portion of JCESD's wastewater sytem GIS data, as viewed in Cityworks.

See the JCESD **Information Management Systems (IMS) Program** plan for more information on ESRI ArcSDE GIS, SIMS, and Cityworks.

Each sewer system asset has a unique identification (ID) number consisting of three parts [2 Letter Feature Type, and Mini-Basin]-[Unique Numeric ID] For example, one gravity pipe (GP) asset ID within mini-basin 1076 is GP001076-058897. Asset attributes and characteristics such as pipe size, material, invert elevation, etc., are included in the GIS database.

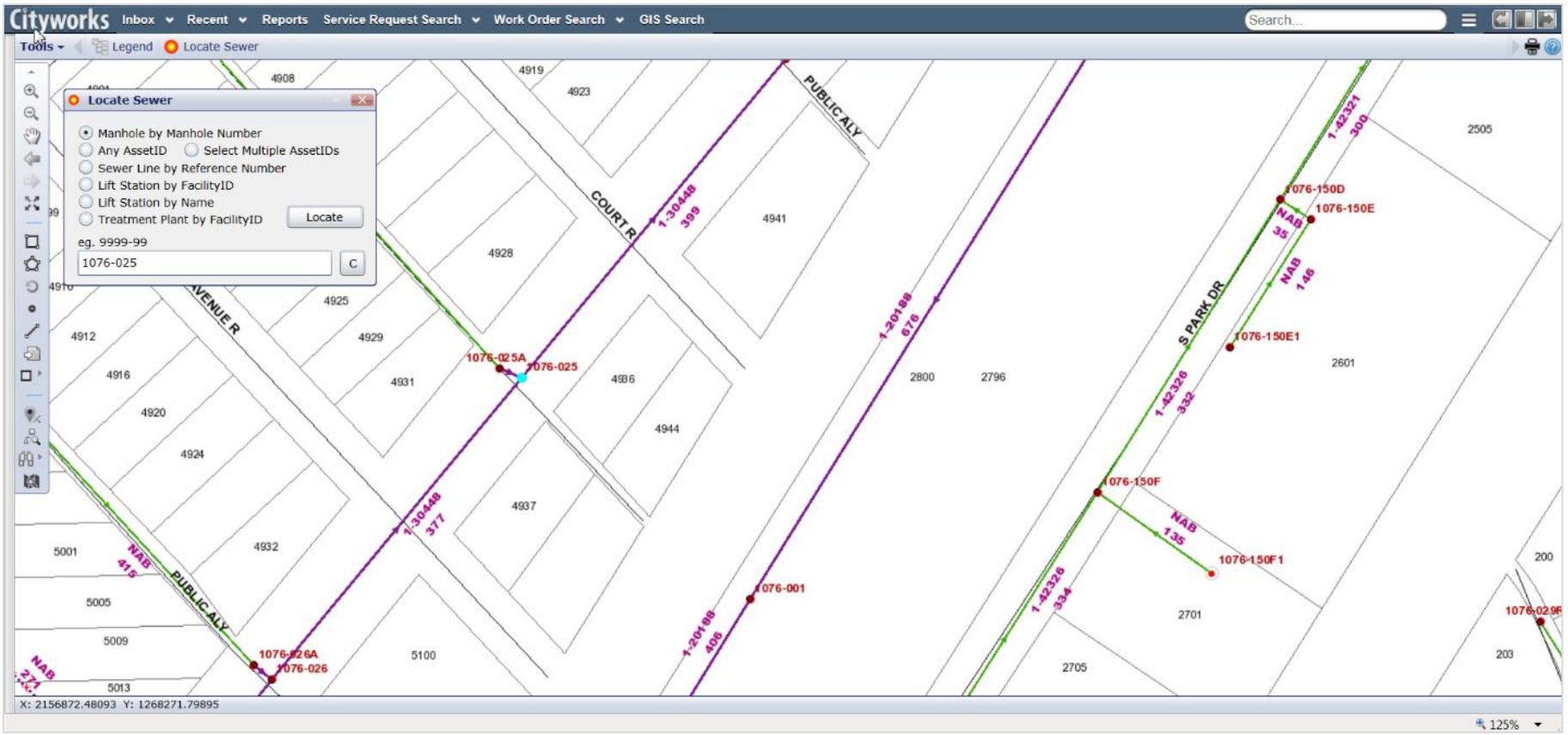

Figure 1.GIS Data as Viewed in Cityworks

Program Resources

Related CMOM Program Documents and Other References

JCESD developed standard operating procedures (SOPs) for various CMOM-related job duties, including the SOP for GIS Updates. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Other CMOM program plans that are referenced in, and/or are related to, the **System Inventory Program** include:

- Collection System Plans and Mapping Program, Continuous Sewer System Assessment Program (CSSAP), and System Design Standards Program, which are all described in this Engineering Program plan
- CMOM IMS Program
- CMOM Program Organization
- Equipment and Supplies Management Program
- Gravity Line Preventive Maintenance Program (GLPMP)
- Legal Support Program
- Line Location Program

Staffing

The system inventory is managed by JCESD GIS staff who reside in Department 7100 Administration, as shown in the Organizational Chart located in the **CMOM Program Organization** plan.

Applying changes to the GIS database is restricted to a single appointed GIS staff member with editing permissions (GIS editor), in accordance with the JCESD SOP for GIS Updates. The GIS editor reviews field crew and survey department data, as described below, and edits the GIS database accordingly. No other staff are allowed to make changes to the GIS database.

Data Management

For more information on JCESD's data management strategy, including the use of GIS and Cityworks, see the **CMOM IMS Program** plan.

Program Implementation

System inventory updates and changes are made using GIS desktop software and applied to JCESD's centralized ESRI ArcSDE geodatabase, as described under Program Components and Approach. The minimum asset attribute data requirements of JCESD are listed in **Table 1** on the following page.

JCESD's sewer collection system asset inventory and attributes are updated based on the following procedures, in accordance with the GIS Updates SOP:

- **Record Drawings** - Record drawings documenting changes to the system made during construction by outside contractors are entered by the GIS editor.

Table 1. Minimum Required Asset Attribute Data

Manholes (MH)	Gravity Lines	Force Mains	Lift Stations
Asset ID	Asset ID	Asset ID	Asset ID
MH Rim Elevation	Install or Replace Date	Install or Replace Date	Install or Replace Date
MH Depth	Upstream Invert Elevation	Line Diameter	Station Firm Capacity
Install or Replace Date	Downstream Invert Elevation	Pipe Material	Number of Pumps
Abandoned Date	Line Diameter		Station Pump Type (centrifugal, suction-lift, other)
Barrel Diameter	Pipe Material		Wet Well Shape (circular, rectangular, irregular)
MH Rehab	Cross Section Shape		Wet Well Cross-Sectional Area (if not regular)
Drop Manhole	Siphon		Standby Generator
	Upstream MH Asset ID		Upstream MH Asset ID
	Downstream MH Asset ID		Downstream MH Asset ID

- **Closed-Circuit Television (CCTV) Inspection Data** - The GIS editor is responsible for comparing height, width, shape, and material from the Pipe Assessment and Certification Program (PACP) inspection database for CCTV inspections by both County and outside contractor staff. GIS fields to be updated include date televised, Upstream Rim to Invert, Upstream Grade to Invert, Upstream Rim to Grade, Downstream Rim to Invert, Downstream Grade to Invert, and Downstream Rim to Grade.
- **New Assets Identified in the Field** - The GIS editor creates new asset IDs for manholes discovered in the field that are not currently in GIS and associated gravity lines.
- **Quality Assurance and Quality Control (QA/QC)** – Discrepancies in GIS are verified by field visits, survey, and CCTV.

JCESD survey department staff will verify the attribute information and/or physical location of utility assets in the field, when needed. Survey staff are responsible for providing information back to the GIS department, ensuring that the locations are accurate using a Global Positioning Satellite (GPS) system, and providing “points” to the GIS editor.

The GIS editor is responsible for regularly coordinating with operations and maintenance (O&M) staff to determine which work orders have been completed that require GIS updates.

All JCESD staff, including engineers, inspectors, and maintenance workers, are responsible to communicate any discrepancies in the collection system during the normal course of their work: the GIS editor is responsible for all updates.

Collection System Plans and Mapping Program

Program Activities

Purpose and Goals

This program ensures that a full set of as-built plans for JCESD's collection and transmission system are accessible to all JCESD personnel, and a written standard procedure is present to account for changes, updating the plans, and supplying revised versions to field crews in a timely manner. It also ensures that adequately detailed maps are available to be used in conjunction with other JCESD's CMOM programs.

Program Components and Approach

All of JCESD's collection system plans are located on the JCESD server, as described in the **System Inventory Program**. Collection system plans are tracked at every point, from submission, to plan approval, all the way to construction completion. All available detailed collection system mapping information is included in GIS and can be viewed in Cityworks, as previously described in the **System Inventory Program**.

Field crews use Freeance, a mobile application designed for use with Cityworks. Using Freeance, field crews have remote/on-demand access to GIS maps, photos, GPS, and other tools useful for locating system assets and asset information.

An example of a Cityworks drawing query is shown in **Figure 2** on the following page. An example plan as-built drawing accessed through Cityworks is shown in **Figure 3**.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed SOPs for various CMOM-related job duties, including the SOP for GIS Updates. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Field	Value
OBJECTID	72561
ENABLED	1
ADMINISTRATIVEAREA	6
FACILITYID	1076-202A-1076-202
LOCATION	2111 FULTON AVE SW, BIRMINGHAM, 35211
INSTALLDATE	
OPERATIONALAREA	VAL
SUBBASIN	1076
LIFECYCLESTATUS	ACT
SUBTYPE	5
WORKORDERID	
LEGACYID	321
WARRANTYDATE	
RECORDEDLENGTH	321.07000000
INSTALLCONTRACTOR	
FLOWMEASUREMENTID	VALLEY_VA22B
WATERTYPE	Sewage
MATERIAL	CIP
GROUNDTYPE	
EXTERIORCOATING	
JOINTTYPE1	
JOINTTYPE2	
LININGTYPE	
PIPECLASS	
ROUGHNESS	
NAME	FULTON AVE. SAN. SEWER
CROSSSECTIONSHAPE	
WIDTHTOP	
UPSTREAMINVERT	525.57000000
DOWNSTREAMINVERT	524.93000000

Gravitymain: GP001076-058897

All Lines in Project: FULTON AVE. SAN. SEWER

Reference Drawings
01-42318

Proposed_Reference_Drawings
none

Alias_Reference_Drawings
none

GPS_Reference_Drawings
01-70856

Rehab_Reference_Drawings
01-80343 01-80350

R_R_Reference_Drawings
none

R_R_Proposed_Reference_Drawings
none

Manhole Photos: **Upstream MH:** 202a-s.jpg **Downstream MH:** 202.JPG, 202a-s.jpg, 202B.JPG
(Due to differing naming conventions you may see several wrong manhole names displayed above. Please sele
direction and some do not. In order to find the correct ones the wrong ones are sometimes retrieved also.)

CCTV: View TV Inspections

Deeds: N/A

Figure 2. Example Record Drawing Query

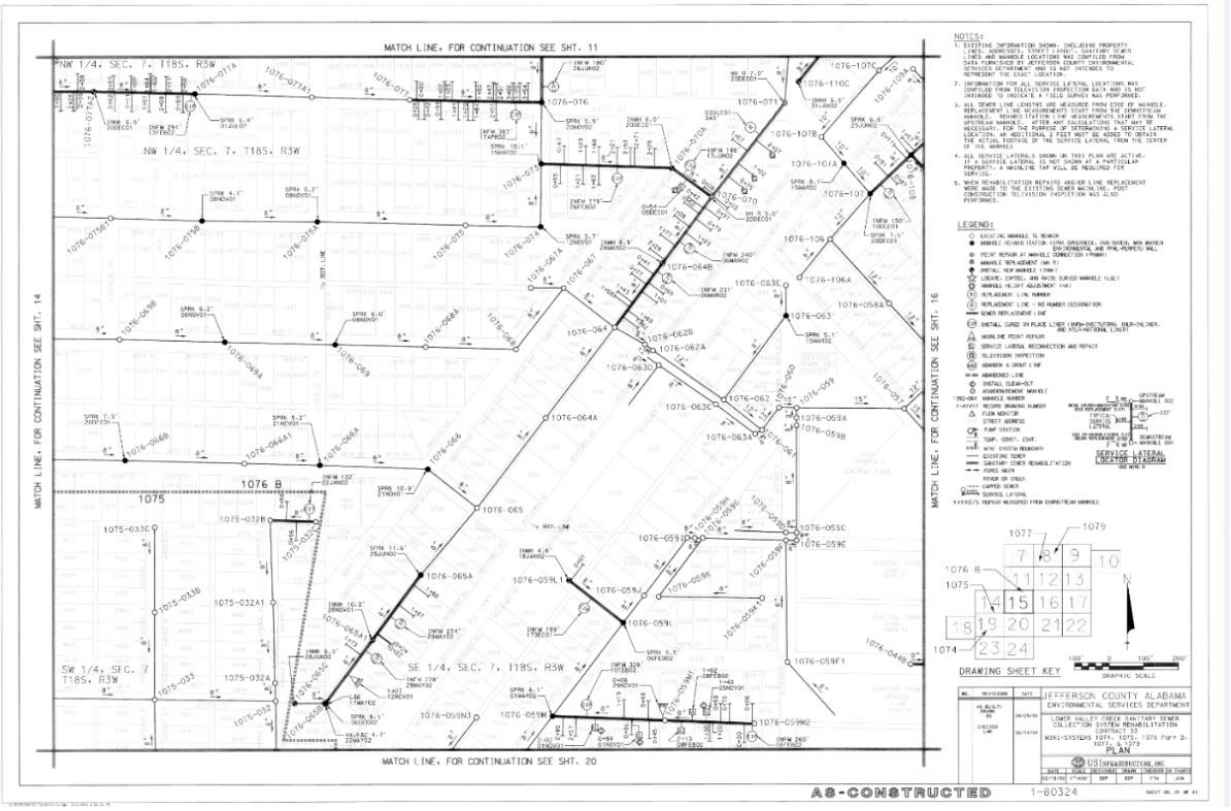

Figure 3. Example As-Built Drawing

Other CMOM program plans that are referenced and/or are related to the **Collection System Plans and Mapping Program** plan include:

- System Inventory Program, System Design Standards Program, and CSSAP, which are described in this Engineering Program plan
- CMOM IMS Program
- CMOM Program Organization
- Gravity Line Preventative Maintenance Program
- Line Location Program

Staffing

Updating collection system plans and mapping is managed by JCESD GIS staff. GIS staff reside in Department 7100 Administration, as indicated in the **CMOM Program Organization** plan.

Applying changes to the GIS database is restricted to a single appointed GIS staff member with editing permissions (GIS editor), in accordance with the JCESD SOP for GIS Updates. No other staff are allowed to make changes to the GIS database. The GIS editor reviews as-built information provided by Contractors and verified by internal survey staff. The approved edits are made in the GIS database accordingly.

Data Management

For more information on JCESD's data management strategy, including the use of GIS, Cityworks, and Freeance, see the **CMOM IMS Program** plan.

Program Implementation

Record drawings documenting changes to the system made during construction by outside contractors are submitted to JCESD project engineers and incorporated into to JCESD's centralized database, described in the **System Inventory Program**. The constructed assets are assigned reference numbers. The GIS editor then reviews the provided information and updates the GIS database accordingly.

As-Constructed Drawing Standards and Requirements

As indicated in the JCESD **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version):

> "Upon completion of construction, the JCESD/Developer shall have the project surveyed by an Alabama Licensed Surveyor to locate the constructed facilities on the As-Constructed Drawing(s) also commonly known as "record drawings." Information from the survey and from construction records will be incorporated into the approved Construction Drawings by the surveyor to accurately show pump station, force main, and/or main sewer installation."

System Design Standards Program

Program Activities

Purpose and Goals

This program ensures all new sewer system construction in JCESD will be adequately designed and constructed according to requirements and specifications that assure the integrity of the infrastructure. System components included are sanitary sewer service lines, connections, gravity sewers, force mains, and pump stations.

The purpose of these requirements is to provide uniform design and construction standards, in addition to establishing a minimum allowed level of quality and performance for these commercial and residential sanitary sewer systems. The system components are to be designed and constructed in a manner that minimizes sanitary sewer overflows and back-ups, and ensures effective long-term maintenance with the acquisition of new wastewater collection system assets. The end result should be public infrastructure that is cost-effective to operate and maintain by JCESD for the anticipated life of the asset.

Program Components and Approach

Since unification of the sanitary sewer system was completed in mid-1998, all additions to the system are subject to JCESD design and construction standards. Sewer system additions may be constructed by the municipalities or by private developers, provided that the addition meets JCESD requirements. JCESD adopted its original *Standards for Construction of Commercial and Residential Sanitary Sewer Systems, and Standard Guidelines for Design and Construction of Commercial and Residential Sanitary Sewer Pumping Stations* in November 1999, and the *Standard Guidelines for Design and Construction of Commercial and Residential Sanitary Sewer Pumping Stations* were updated in August 2006.

A new design manual was drafted and opened for public comments. The **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version), (hereafter referred to as "Manual"), is anticipated to be adopted in Fiscal Year 2022.

This Manual identifies a single set of standards, submittal, and approval procedures to be used in the planning, design, and construction of projects within the JCESD service area. The Manual is not intended to serve as a step-by-step design guide. The application of sound engineering, surveying, construction principles and judgment, combined with the information contained therein, are necessary to complete the planning, design, and construction of commercial and residential sanitary sewer system projects. In addition, other JCESD departments, as well as state and federal agencies, may have requirements other than those contained in the Manual that must be addressed to obtain approval.

Program Resources

Related CMOM Program Documents and Other References

Other CMOM program plans that are referenced and/or are related to the **System Design Standards Program** plan include:

- System Inventory Program, Collection System Mapping and Plans Program, New Construction and Rehabilitation Program, Acquisitions Program, CSSAP, and Capacity Assurance Program, which are all described in this Engineering Program plan
- CMOM Program Organization Plan
- Gravity Line Preventative Maintenance Program
- Legal Support Program

Staffing

JCESD is responsible for engineering, project management, and plans review. Staff reside in Department 7100 Administration as shown on the organizational chart located in the **CMOM Program Organization** plan.

Program Implementation

The JCESD **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) is to be used as a guide during the design and construction of projects connecting to the JCESD's sanitary sewer system. The manual should be referenced to verify necessary permits and design requirements for residential and commercial projects that include designs for service lines, main sewers, grease removal devices, force mains, and pump stations. Although requirements and specifications are included in the manual, the JCESD/Developer and the Designer/Engineer should take any special project conditions into consideration throughout design and construction.

Larger additions to JCESD's sanitary sewer system, such as major trunk sewer extensions, have been traditionally managed by JCESD staff or a designee. These projects are intended to expand the area served by County sewers in a systematic manner. For large trunk line additions, JCESD establishes the basic scope of a sewer extension project. A design consultant is retained to complete the detailed design. Consultants incorporate into the design those established County practices and standards found in the Manual, ensuring system uniformity and quality. Upon completion, review, and approval of design, JCESD lets the project for bid.

Program Updates

As stated, the Manual is intended to be a living document. As design and construction criteria and technology evolve, the Manual will require revisions and improvements. It is therefore recommended that, prior to the start of a project, consultants verify that the designer is using the latest version of the requirements and the associated details and specifications.

New Construction and Rehabilitation Inspection Program

Program Activities

Purpose and Goals

This program ensures that new construction or rehabilitative work is properly inspected and built using the JCESD **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (Manual) (current version). The program includes use of standardized construction procedures, standardized construction testing procedures, and standardized inspection and testing forms/reports. The program also provides for subsequent CCTV inspection (also referred to as television inspection "TVI") of line construction prior to expiration of the warranty, and retention of the information for reference.

Program Components and Approach

JCESD Inspections

JCESD staff make inspections on sewer projects project during construction. It is JCESD's intent that all main sewers, sewer service lines, pump stations, and force mains are constructed using acceptable materials and in a manner that meets the requirements of the Manual. Supervision and inspection by JCESD helps ensure that construction is completed in accordance with these standards. Contractors are responsible for contacting JCESD for inspection of constructed assets.

Consultant Inspections

Full and/or part time resident project representatives are provided by consultants as part of JCESD's Asset Management Program (AMP), to monitor progress and conduct on-site observations of a contractor's work to determine if the work generally conforms to the construction contract documents and that the design concept is implemented and integrity preserved by the contractor.

Program Resources

Related CMOM Program Documents and Other References

Other documents that are referenced and/or are related to the **New Construction and Rehabilitation Inspection Program** plan include:

- JCESD Construction Management Plan, May 2015
- JCESD Construction Management Procedures Manual, May 2015
- CMOM Program Organization
- Legal Support Program

Staffing

JCESD is responsible for Engineering, Project Management, Construction Administration and Inspections for the addition to existing assets, as well as new assets for the sanitary sewer system. More details concerning the staffing resources that support the functions of the Engineering Program are provided in the **CMOM Program Organization** plan.

AMP consultant staff are provided as needed to JCESD staff to supplement staffing for ongoing construction projects. Additional staff are requested by the JCESD Director from the AMP Manager.

Program Implementation

The following is a list of the minimum collection system-related inspection requirements:

- All main line sewers, service lines, manholes, force mains, pump stations, pipe connections, repairs, and disconnections shall be visible for inspection. Inspection shall be made of the construction materials, pipe joints, alignment and grade, pipe bedding, and any other items the inspector deems necessary to ensure full compliance.
- No backfilling shall take place until construction of the item to be covered has been approved by a JCESD Inspector or JCESD designee.
- Hydrostatic and all other specified testing shall be witnessed by a JCESD Inspector or JCESD designee. If the work does not pass the required test(s), or other issues are noted during the inspection associated with faulty materials or workmanship, the work shall be re-inspected and retested after the contractor makes the necessary corrections.

Asset Management Program (AMP)

As a part of the AMP, JCESD is contracting construction management services that supplement current JCESD staff, to ensure that these corrective measures are implemented effectively and properly per contract documents and industry accepted construction standards.

The Construction Manager (CCM) will assist JCESD in the procurement of contractors and provide construction administration services, as well as providing resident engineers for each project to monitor progress and conduct on-site observations of the contractor's work, as well as assisting in the resolution of field issues by bringing to bear collective construction experience. Further, inspectors are also provided to manage and QA/QC television inspection (TVI) contracts.

Figure 4 on the following page shows the relationship between JCESD and AMP Staff.

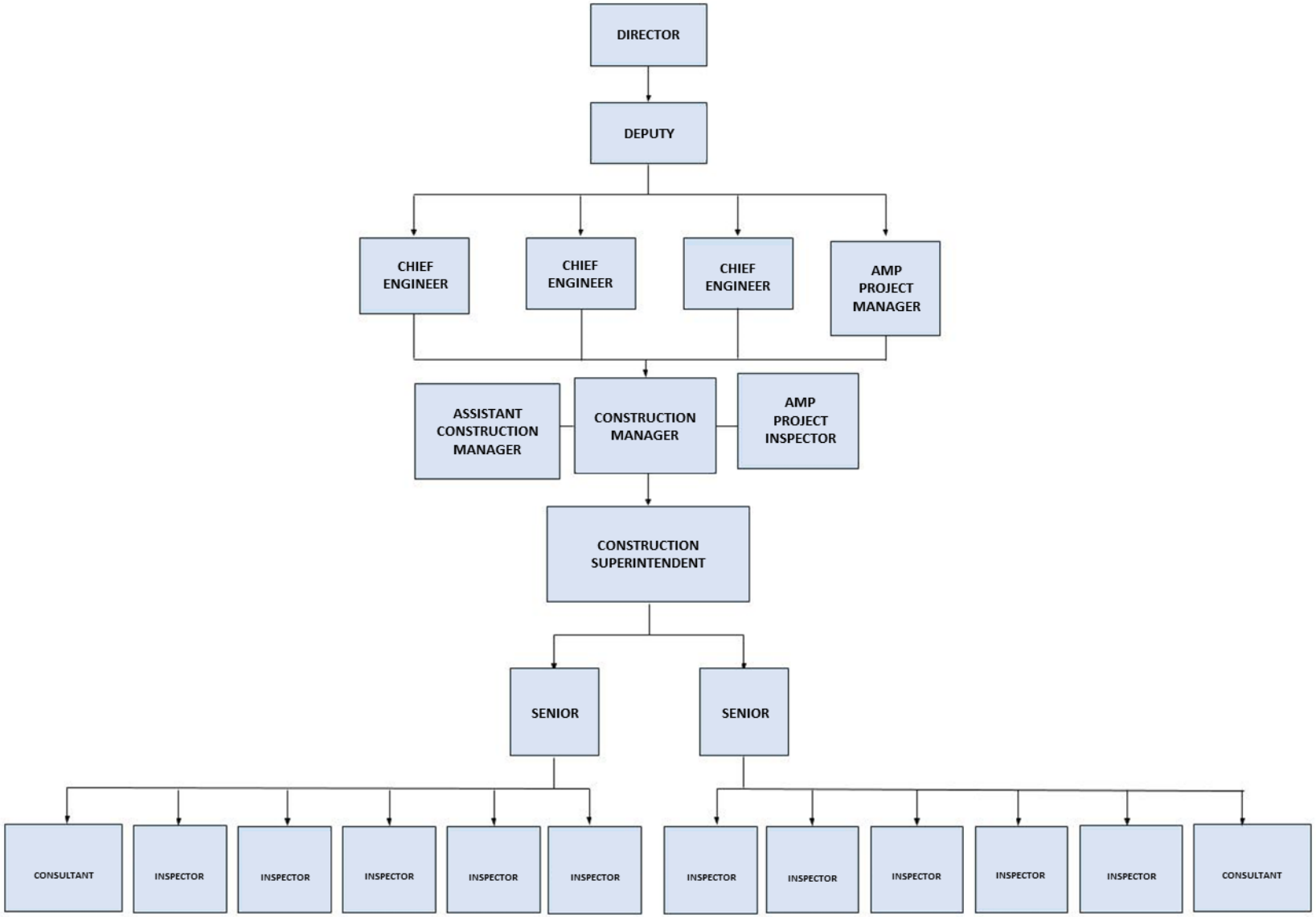

Figure 4.AMP Inspection Program Management and Staffing

Acquisitions Program

Program Activities

Purpose and Goals

JCESD obtains sanitary sewer easement ROWs for the purpose of future sewer maintenance and for ready access to the sewer lines. As indicated in the JCESD **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version), upon completion of pump stations, force mains, and/or main sewers and their acceptance by the JCESD, such work shall become the property of JCESD.

Program Components and Approach

The Acquisitions process includes obtaining a ROW deed either by a written offer or a condemnation (eminent domain) procedure. The written offer states that the landowner acknowledges the sale of said ROW and easement to JCESD. Condemning property to obtain a ROW deed includes involvement from the probate office and must be presented before the County Commission. In the case of private development, ROW must be acquired and deeded to JCESD prior to plans being approved.

In addition to sanitary sewer easement/ROW, there are also times when a utility easement/ROW is needed. In some cases, sewer lines will require crossing an existing utility (e.g., gas lines, underground power lines, water lines and railroad tracks). In those cases, an easement from the utility is normally obtained prior to plans being approved. Plans specifically identify the location of proposed sewer lines in relation to the existing utilities. Properties used for pump stations require fee simple ownership.

Program Resources

Related CMOM Program Documents and Other References

Other documents that are referenced and/or are related to the **Acquisitions Program** plan include:

- JCESD Construction Management Plan, May 2015
- JCESD Construction Management Procedures Manual, May 2015
- CMOM Program Organization Program
- Legal Support Program

Staffing

JCESD staff are responsible for administering the Acquisitions Program. Staff reside in Department 7100 Administration, as shown in the Organizational Chart located in the **CMOM Program Organization** plan.

JCESD is also supported by the ROW Division of the Jefferson County Roads and Transportation Department.

Program Implementation

Deeds

Deeds are prepared on JCESD standard deed forms. Copies of deeds may be obtained from the Sewer Plans Review Office, located in the JCESD Courthouse at 716 Richard Arrington Jr. North, Suite A-300, Birmingham, AL 35203.

State Road ROWs

Additional permits are required for project sites requiring right of entry access to any state road right-of-way. The JCESD Impact Division – ESD Commercial Project Checklist 2018, located on the JCESD website at www.jeffcoes.org, states that right of entry access to any state road right-of-way or easement for utility installation requires the issuance of a state permit without exception.

Evidence of this permit is required at the time of project submission and may affect the project's sewer availability and/or approval status. The Alabama Department of Transportation is the governing authority for state right-of-way permit applications, with JCESD being the pathway entity through which permits are preliminarily routed.

Railroad ROWs

In the event that a proposed main sewer or force main is to cross or be located within property and/or tracks owned by a railway, the Designer/Engineer or JCESD/Developer is responsible for providing all required information and a complete application packet, as required by the railway, to the JCESD. The JCESD will contact the railway and submit the documents as part of the process to obtain an agreement. The Designer/Engineer is responsible for designing the sewer or force main in accordance with the requirements of the railway and the JCESD. Costs, such as crossing fees and application fees, imposed by the railway are to be paid by the JCESD/Developer.

Existing Utility ROWs

In the event a proposed main sewer or force main is to cross or be located within property owned by a utility, the Designer/Engineer or JCESD/Developer is responsible for providing all required information and a complete application packet, as required by the utility, to the JCESD. The JCESD will contact the utility and submit the documents as part of the process to obtain an agreement. The Designer/Engineer is responsible for designing the sewer or force main in accordance with the requirements of the utility and the JCESD. Costs such as crossing fees and application fees imposed by the utility are to be paid by the JCESD/Developer.

Continuous Sewer System Assessment Program

Program Activities

Purpose and Goals

The purpose of the Continuous Sewer System Assessment Program (CSSAP) is to use a proactive and coordinated asset management-based approach to assessing, maintaining, and rehabilitating JCESD's sanitary sewer system. This program will serve as a guide to effectively and proactively prioritize and implement system inspection, cleaning, and rehabilitation/replacement needs, in order to identify and address wet weather infiltration and inflow (I/I) sources, and to prevent structural failures and blockage-related overflows.

Program Components and Approach

Under the **CSSAP**, sewer service areas are prioritized for sewer system assessment activities, which include CCTV, manhole inspections, and smoke testing where appropriate. Prioritization is based upon a risk analysis performed using information such as GIS data flow monitoring, modeling (where available), historical location of sewer overflows, field crew work orders, and other relevant information. JCESD has implemented an asset management-based approach to the overall **CSSAP**.

One key feature of this approach is the prioritization of assets for assessment, and subsequent rehabilitation or replacement. Typically, areas where problems are known to exist or where there is a high likelihood of problems are inspected first. Other factors, such as consequence of failure (criticality), also play a key role. These factors are balanced against the need to perform assessments in a logical, contiguous manner.

The following sections describe how the prioritization process was developed. It is important to note that this process is dynamic and as system characterization improves, the prioritization is updated to reflect this new information on an as-needed basis. The prioritization process and **CSSAP** goal is to assist JCESD in completing an assessment of the collection system in a prioritized manner completing the most critical assets earlier in the program.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed SOPs for various CMOM-related job duties, including the SOPs for flow monitoring and CCTV inspection. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Other CMOM program plans that are referenced and/or are related to the **CSSAP** include:

- CMOM IMS Program
- CMOM Program Organization
- Corrosion Control Program
- Customer Service Program
- Gravity Line Preventative Maintenance Program

Staffing

JCESD Staff

JCESD is responsible for Engineering and Project Management. Engineering Staff reside in Department 7100 Administration, as shown in the Organizational Chart located in the **CMOM Program Organization** plan.

AMP Staff

As part of the AMP program, JCESD's Consultant assists JCESD in the development and implementation of the CSSAP.

Data Management

For more information on JCESD's data management strategy, including the use of GIS, Infor, PipeTech, and Cityworks, see the **CMOM IMS Program** plan.

Program Implementation

Prioritization Program Setup

The key to setting up the program was to leverage existing data to prioritize the assessment and rehabilitation of the system using: GIS, CCTV, flowmeter, Infor, and Cityworks data. Other key activities of the program development were the creation of detailed SOPs, training and implementation of Cityworks, as well as the development of mobile solutions to optimize the generation and implementation of work orders.

Risk Analysis

The first step in the program setup was to conduct the risk analysis, which is a combination of the consequence of failure (COF) and probability of failure (POF). The goal of the risk analysis was to prioritize the complete assessment of the over 3,113 mile collection system (gravity sewers and force main).

The overall approach to the risk analysis was to utilize a mini-basin approach. Risk scores were developed by individual asset, but were also developed for each of the 499 mini-basins. The mini-basin prioritization approach allows for efficiencies in planning and scheduling condition assessment and rehabilitation. It is important to note that some system assets should be given priority regardless of their mini-basin. These sewers are typically larger diameter (greater than 24-inch diameter) trunks and are along creeks and rivers. Therefore, the highly critical pipes were given priority in addition to the basin priorities.

Consequence of Failure (COF)

The first step in developing a risk score for the collection system assets was to establish a COF score for the collection system assets. The criteria used to assess the COF included:

- Diameter
- Surface Type (roads, railroad, buildings)
- Risk of Public Contact
- Depth
- Vicinity to Water Body
- Near Critical Facilities

Each criterion was weighted based on the severity of the risk for the consequence risk factors. Each asset was given a score of 1-5 based on its attributes or spatial location relative to certain features. The spatial location relative to various features was conducted using the powerful "near" function within ArcGIS. Each pipe was given attributes based on its closest proximity to roads (including road type), railroads, buildings, critical facilities, and water bodies. GIS attribute information was used for diameter and depth.

Once the near analysis was complete, a risk analysis software was used to conduct the risk scoring. The risk scoring is done by entering weights and scoring criteria. The software then automatically generated the risk scores based on the user-defined values. The tool includes spatial views and can display data from almost any source. The key benefit of the tool is the ability to create any number of risk scenarios, which allows for comparison of results. **Figure 5** shows a screen capture of the software interface.

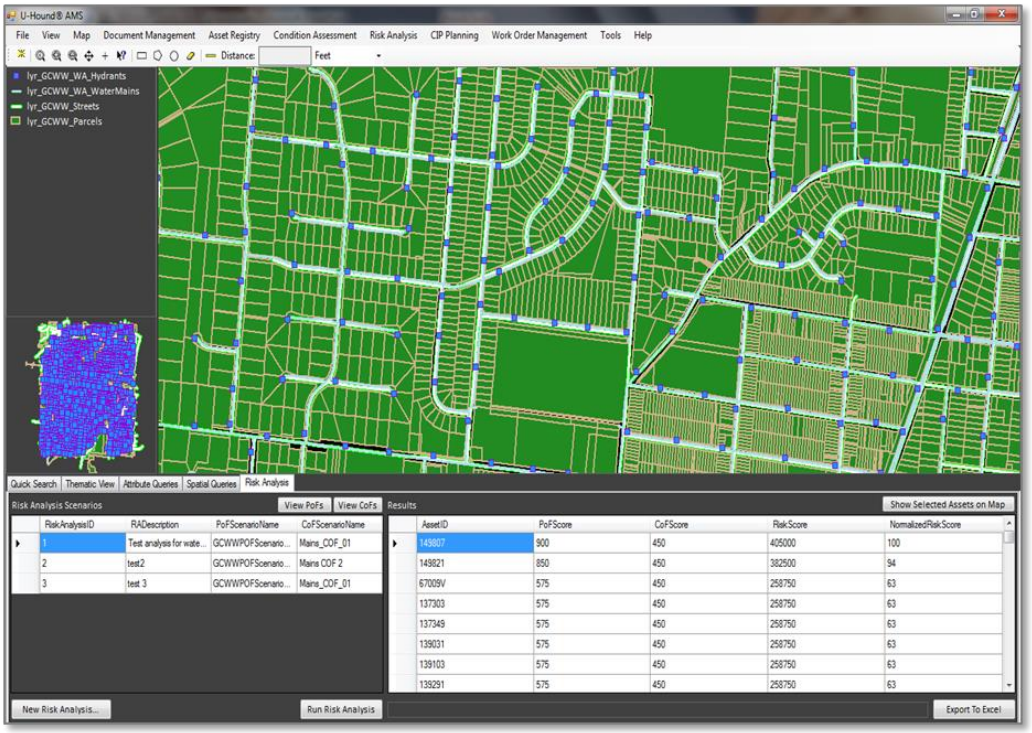

Figure 5.Risk Analysis Software Screen Capture

Probability of Failure (POF)

The probability of failure scores were based on three modes of failure:

1. Structural collapse
2. Blockage resulting in overflow
3. Overflow caused by excessive I/I

Individual pipe POF scores and mini-basin POF scores were developed using available data, such as overflow history, which was broken down into blockage and I/I related overflow causes. For the mini-basins, overflows were normalized in each mini-basin to overflows/100 miles/year. In addition to overflow data, flowmeters were used to quantify I/I in each meter basin, which was further correlated to each mini-basin. This was done utilizing a custom software program which automatically conducts detailed flow-based metrics such as base sanitary flow, groundwater flow, and rainfall derived I/I for every rainfall event in seconds. Figure 6**Figure 6** shows is a screen capture from the software showing auto-generated base flow patterns and flow statistics.

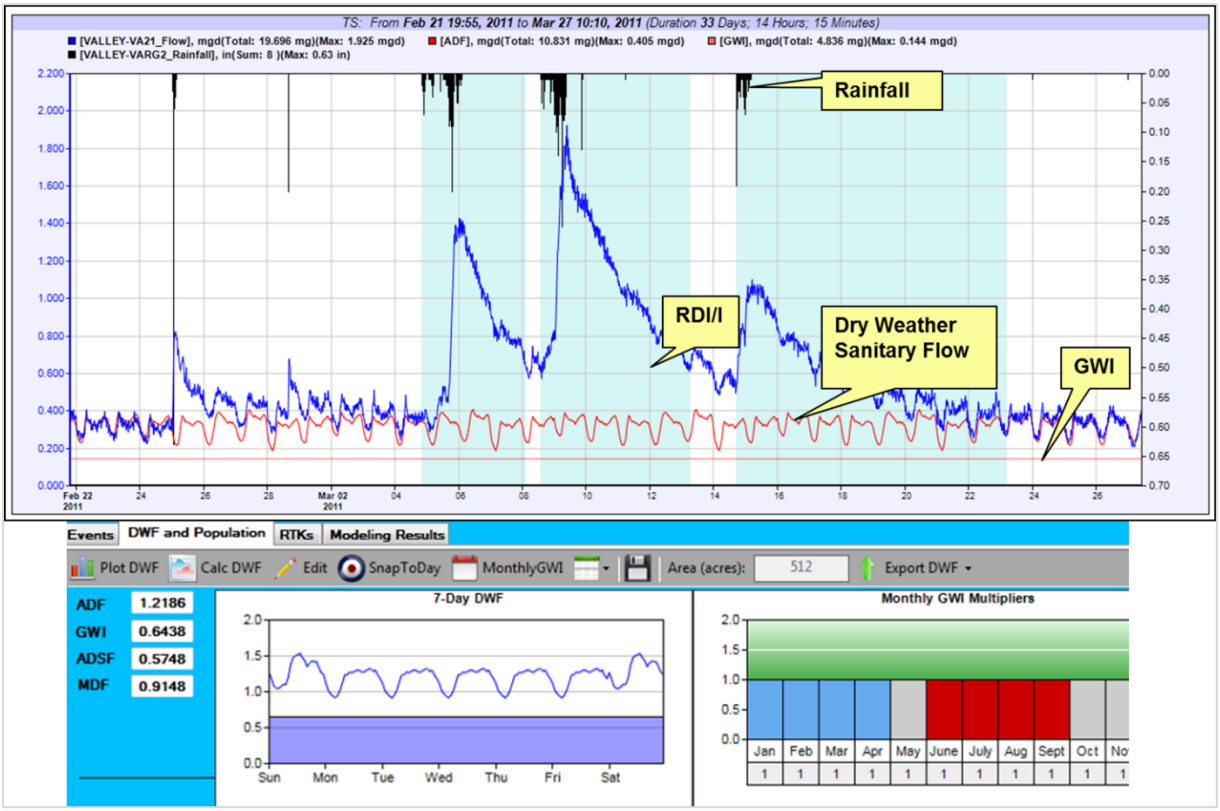

Figure 6.Flow Based Statistics

JCESD is currently developing a system wide wastewater collection system model for each individual sewer shed based on the conveyance system that transports wastewater to the individual treatment plant. To date, JCESD has developed fully calibrated wastewater collection system models for the Leeds WRF, Trussville WRF, Prudes Creek WRF, Warrior WRF, Valley Creek WRF, Cahaba River WRF, and Turkey Creek WRF sewer sheds. Additionally, the wastewater collection system model for the Five Mile Creek

WRF and Village Creek WRF sewer sheds will be completed in 2018. The remaining wastewater collection system hydraulic models for the Five Mile Creek WRF, Cahaba River WRF, Turkey Creek WRF, and Village Creek WRF sewer sheds are scheduled to be completed by 2018. Currently, for basins that do not have calibrated models, a tool has been implemented that assists in the assessment of peak flows in the collection system. This tool allows the user to generate a unit hydrograph model corresponding to fast, medium, and slow I/I responses. The benefit is the ability to calculate design storm peak flows emanating from each mini-basin. These peak flows were used to prioritize basins based on their normalized contribution to peak flows.

Figure 7 is a screen capture that shows the unit hydrograph generator. The red line represents the unit hydrograph model matched against the blue flowmeter data, and the values on the bottom left show the R values for fast (R1), medium (R2), and slow I/I (R3). This information is much more useful than just static R values, which is a total volume metric and does not directly measure impacts on peak flows. The unit hydrograph allows a better understanding and prediction of mini-basins that contribute more to peak flows resulting in recurrent SSOs.

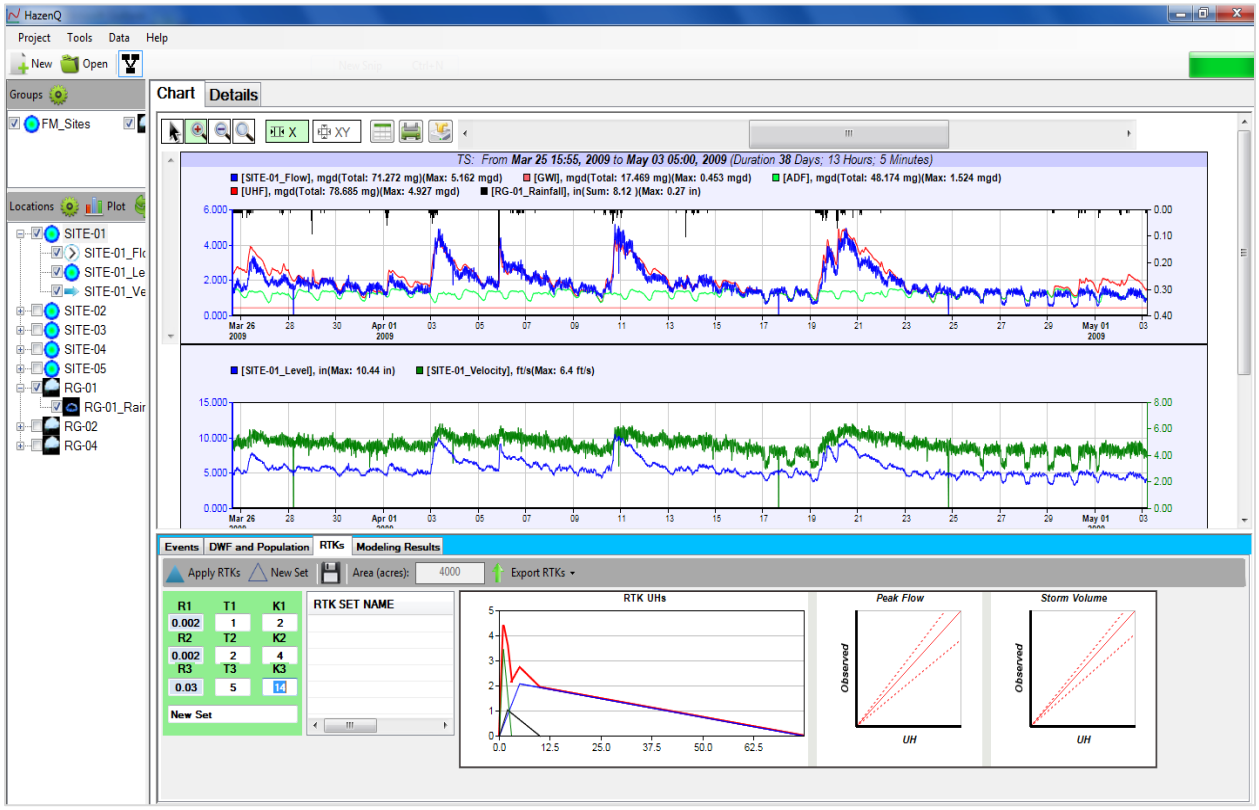

Figure 7.RTK Generator

Structural POF

The structural POF was developed using the following criteria:

1 Historical work order data

2 PACP CCTV scores

3 Pipe Age

For pipes with CCTV data, the PACP scoring was used for the POF score. For pipes without CCTV data, the historical work order data and pipe age were used. Work order data was obtained from JCESD's Cityworks software, entered into the risk analysis software, and joined to each pipe and mini-basin. **Figure 8** on the following page shows an example of the POF scoring for each mini-basin using the risk of blockage-related overflows.

The POF and COF scores were used to inform inspection, rehabilitation, and cleaning priorities. The following components further develop the prioritization of rehabilitation, inspection, and cleaning work.

Service Request Management

Service request management is a component of JCESD's **Customer Service Program**. JCESD generated service requests in response to calls from customers who suspect they have a problem related to their sanitary sewer. These calls may be a result of a building back-up, sinkhole formation, surface flooding, odor, or other type of service problem.

JCESD will send a crew to investigate the cause of the problem and will identify the necessary corrective action, such as cleaning and/or structural repair. The key identification activity is to determine if the problem is in the homeowner's lateral or if it is in the main sewer. Under certain circumstances, the service request will result in the investigation of surrounding sewers to see if other issues exist in the vicinity. Since this program is generally reactive, one goal of the overall **CSSAP** is to reduce the frequency of service requests.

For more information on service request management, see the **Customer Service Program** plan.

Ongoing Sewer Assessment and Rehabilitation Program (OSARP)

The OSARP program comprises activities designed to identify sewers with structural issues that may be sources of I/I. Assessment activities include, but are not limited to, CCTV and Sewer-Line Rapid Assessment Tool (SL-Rat). This program is conducted by targeting pipes suspected of hindering flow and targeting pipes based on the cleaning prioritization process.

Large Diameter Sewer Assessment Program (LDSAP)

The LDSAP program is targeted toward County sewers where the consequence of failure (criticality) is high, and generally includes all pipes 24-inches in diameter or greater. These pipes are inspected on a schedule outside the OSARP, with inspections typically performed by outside contractors.

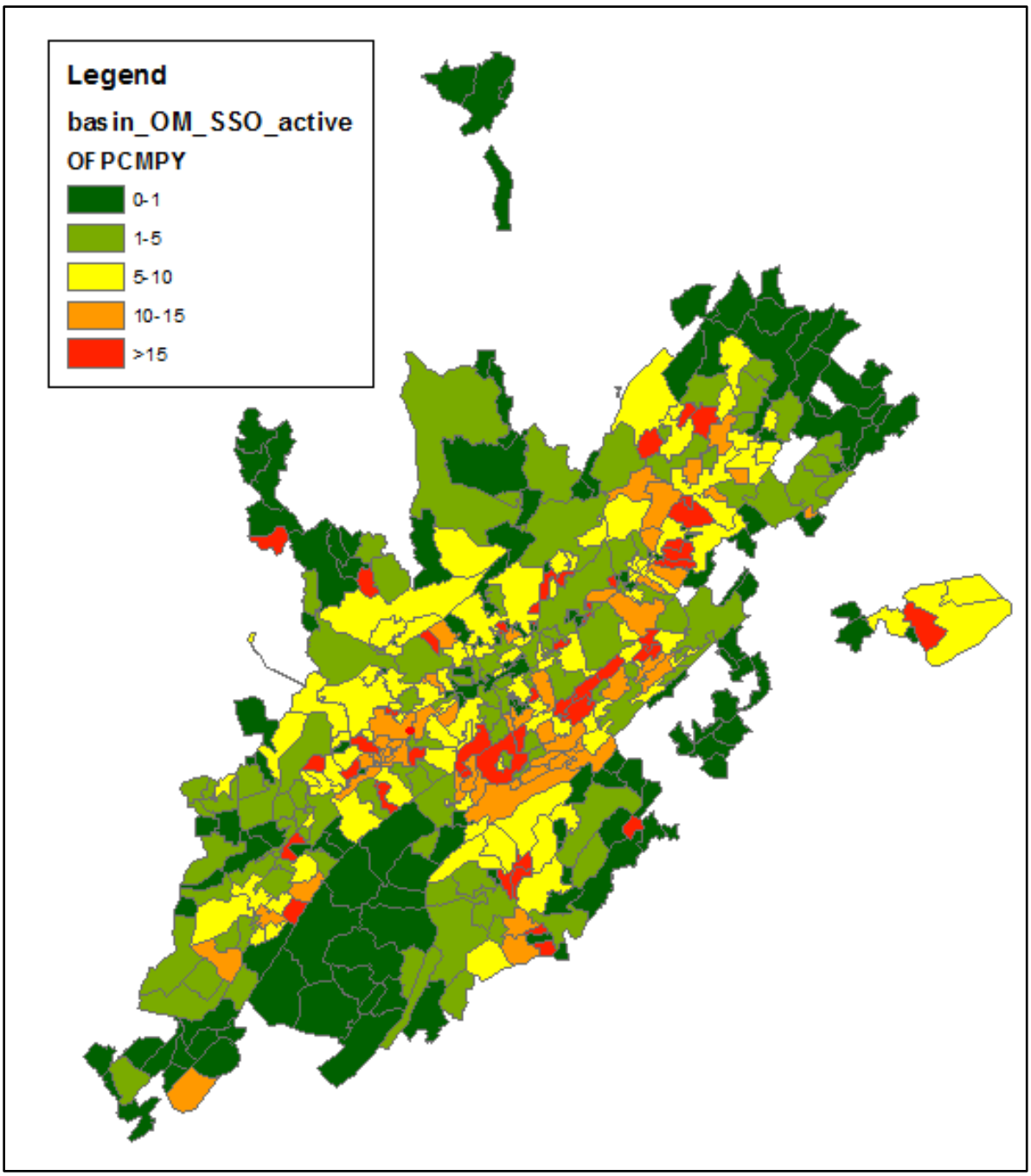

Figure 8.Blockage Overflow Risk by Mini-Basin (overflows/100 miles/year)

Rapid Assessment Program

The rapid assessment program uses acoustic technologies such as InfoSense's SL-RAT. Acoustic technologies require a minimal amount of equipment when compared to traditional CCTV inspection systems. This acoustic based technology has the potential to provide information in a matter of minutes to assist an operator in determining whether a sewer pipe might be partially or fully blocked and require cleaning or renewal. The speed of the assessment, using minimal equipment, has the potential to result

in significant cost-savings compared to traditional methods, such as CCTV inspection. For more information, see the **Gravity Line Preventive Maintenance Program** plan.

This acoustic inspection device will be a powerful tool in prioritizing cleaning and identifying re-cleaning frequencies. This data is recorded and then the result is used to determine the next SL-Rat inspection. The goal is to become more predictive when cleaning the pipes, due to the limited resources available and the significant challenges faced by the County with roots and grease.

Flow Monitoring

The purpose of JCESD's Flow Monitoring Program is to measure the flows in the sewer system for a specified period of time for various uses, including to:

- Refine and calibrate hydraulic models to be used for capacity assessment and assurance for current and future growth.
- Understand the frequency and volume of spills during wet weather.
- Support I/I studies in targeted areas by measuring flows before and after rehabilitation.
- Evaluate post monitoring for effectiveness of various remedial measures.
- Support ongoing assessment of the collection system performance over time.
- Provide alerts for active SSOs.

The goal of the Flow Monitoring Program is to provide adequate and accurate data to support JCESD's capacity assessment and assurance analyses and I/I investigation needs, as well as a gauge to determine the effectiveness of rehabilitation programs.

The County currently contracts with an outside firm to install, maintain, and manage up to 239 flow monitors throughout the system. The monitors are broken into 3 categories:

1. **Long Term**: These flow monitors are intended to serve as long term back bone monitors located throughout the entire service area. The data is used to inform ongoing system performance and to alert to potential issues in the collection system. These monitors can also serve as calibration and ongoing validation data or the collection system models.
2. **Movable**: These flow monitors are strategically located for the purposes of model calibration. Data is gathered for 12 months in each location to understand the range of flows throughout each season.
3. **Temporary**:

    a. **Short Term**: These flow monitors are installed for at least 45 days and are used to characterize smaller sections of the collection system where data from only a few events is needed. These are used in areas to inform pre- and post-rehabilitation characterization where I/I removal is desired.

    b. I-Tracker: These temporary depth monitors convert depth to flow. These devices collect data which can be transmitted over a cellular network. JCESD owns 14 of these devices and

uses them to help locate I/I sources as they can be placed in adjacent manholes as necessary.

Flow Data Analysis

Flow data undergoes rigorous QA/QC and analysis from both the flow monitoring contractor and with the flow analysis software, which was described previously. The software includes robust features to perform volume balances, scatterplots, and other features to identify potential flow meter or system performance issues, such as upstream overflows, rapidly and cost-effectively.

Figure 9 on the following page shows how two meters were added together into one hydrograph and compared to a single downstream monitor. **Figure 10** shows how flow monitor subtraction can be used to create a new hydrograph representing the net contribution to a downstream monitor. Not only can the user graphically observe the comparison, flow metrics can be seen on the screen, such as peak flows and total flow volume. This allows quantification of the comparison at a glance, and will enable the County to better and more quickly leverage its flow data into information it can use to make more informed decisions.

Manhole Inspection

The purpose of JCESD's Manhole Inspection Program is to conduct visual inspections of the manholes in the service area to confirm the accuracy of system mapping, determine the extent of I/I problems, and to provide an overall assessment of rehabilitation/replacement needs for each manhole. The ongoing goal of the Manhole Inspection Program is to gather sufficient and accurate data regarding the condition of manholes throughout the service area to identify sources of I/I and plan for rehabilitation needs.

The Manhole Inspection Program is an integral part of the **CSSAP**. It is linked to the same schedule as CCTV inspections, with visual inspections of the upstream and downstream manholes occurring at the same time as televised inspections of sewer segments. Crews also typically conduct manhole inspections during responses to service requests and during special projects, such as I/I investigations and smoke and dye testing in targeted areas. In addition, manhole inspections are occasionally performed in association with flow monitoring activities, and are routinely performed for newly constructed manholes by the Engineering Inspectors

Pump Station Performance and Adequacy

This program is conducted as part of the **CSSAP** for evaluating the performance and adequacy of pump stations in the collection system. The program includes regular assessment of vital information such as pump run-time, mechanical issues documented during the pump life, and a historical review of the fundamental causes of pump failures.

Corrosion Defect Identification

A separate **Corrosion Control Program** has been developed and included in the CMOM Program. The purpose of the **Corrosion Control Program** is to identify and inspect infrastructure within JCESD's Wastewater Collection and Conveyance System that is corroded or at risk of corrosion, conduct defect analysis, and prioritize repairs and rehabilitation.

For more information, see the **Corrosion Control Program** plan.

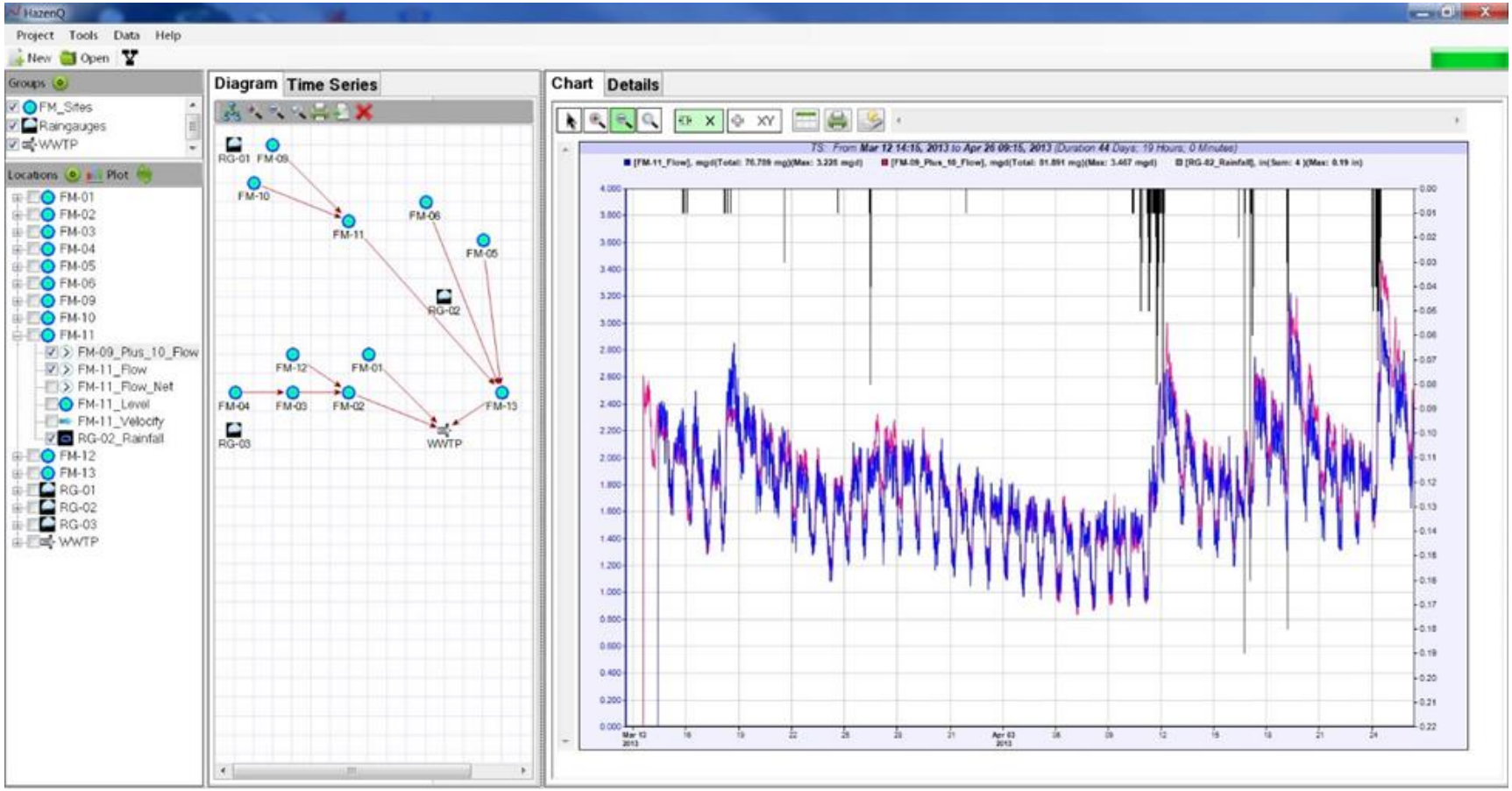

Figure 9.Screenshot Showing Combined Upstream Flow Compared to Downstream Meter

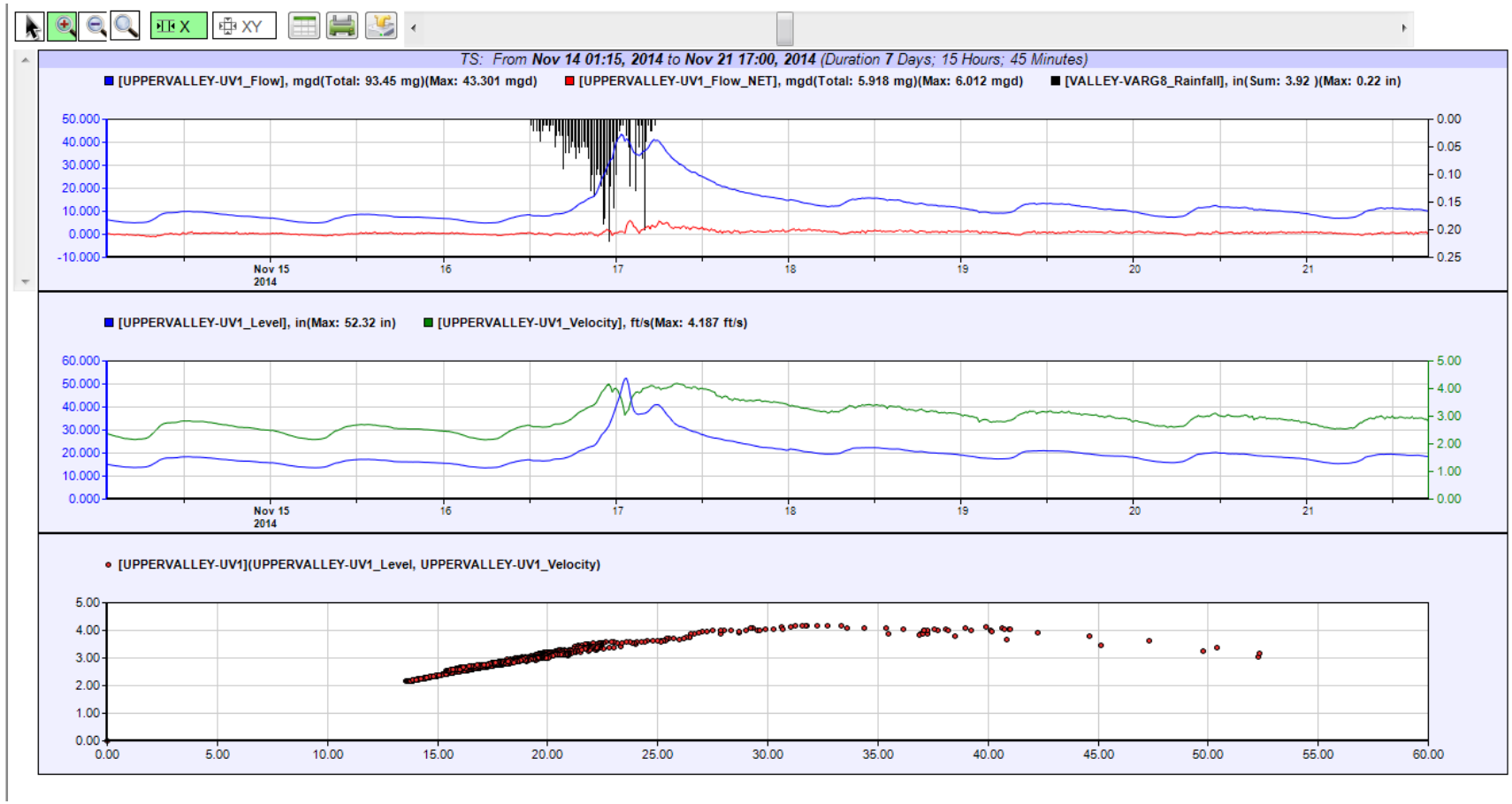

Figure 10. Screenshot Showing the Downstream Meter Flow and the Net Flow to the Meter After Subtracting Upstream Meters

Infrastructure Rehabilitation Program

Program Activities

Purpose and Goals

This program assists in planning for the rehabilitation of gravity sewer lines, force mains, manholes, pump stations, and related appurtenances.

Program Components and Approach

JCESD entered into a Consent Decree with the United States Environmental Protection Agency (USEPA) in December 1996 to address SSOs. Approximately $2.4 billion was spent between 1996 and 2006 on system improvements. Under the original Phase 3 activities of the Consent Decree, 203 projects were completed and an aggressive sanitary sewer evaluation survey (SSES) program was implemented in 1998.

In addition to in-house efforts, JCESD is implemented an AMP to address remaining collection system challenges, which include recurring wet-weather SSOs and ongoing O&M related overflows. JCESD contracted with a consultant in 2011 to develop and implement its AMP. This project expands the previous Pilot Asset Management Plan County-wide, leveraging tools, processes, and procedures developed under the previous Pilot Asset Management Contract. The AMP assists JCESD in prioritizing preventative and corrective measures related to the sanitary sewer collection system, with the main goal of reducing SSOs.

Program Resources

Related CMOM Program Documents and Other References

The following documents provide additional guidance and/or are related, or have components related to the **Infrastructure Rehabilitation Program**.

- Commercial and Residential Sanitary Sewer System Design and Construction Manual (current version)
- JCESD Construction Management Plan, May 2015
- JCESD Construction Management Procedures Manual, May 2015
- CMOM Program Organization
- CMOM IMS Plan
- Financial Analysis Program

Staffing

JCESD is responsible for Engineering, Project Management, Construction Administration and Inspections. Engineering Staff reside in Division 7100 – Administration; Construction Administration and Inspection staff reside in Division 7210 – Inspection, as shown in the Organizational Chart located in the **CMOM Program Organization** plan.

Data Management

For more information on JCESD's data management strategy, see the **CMOM IMS Program** plan.

Program Implementation

AMP services are provided by a consultant for a variety of professional engineering and related duties, including general AMP management and implementation; collection system operational, capacity and structural engineering assessments; rehabilitation and replacement design, planning, implementation and management; detailed design phase management; construction engineering services and construction observation oversight; Capital Improvements Program support; and other miscellaneous support services.

The consultant works in close coordination with JCESD staff to provide the necessary planning and administration of design and construction tasks as projects proceed.

Capital Projects

JCESD, in cooperation with the AMP, manage and update the long-range capital improvement plan. For more information, see the **Financial Analysis Program** plan.

Capacity Assurance Program

Program Activities

Purpose and Goals

The purpose of the Capacity Assurance Program (CAP) is to ensure that the entire County wastewater system, both collection and treatment, has sufficient capacity to convey and treat all wastewater generated by County customers. It also ensures there is adequate capacity to collect, transmit, and treat additional sewage expected as a result of prospective new sewer connections. Additionally, it tracks growth and provides numerical data for near and long-term capital planning

The goal of the CAP is to promote compliance with the Clean Water Act, through both prevention of SSOs and compliance with National Pollutant Discharge Elimination System (NPDES) permits at County WRFs, by ensuring that County collection systems and WRFs have capacity sufficient to convey flows and treat all flows received.

Program Components and Approach

The current CAP was submitted to and accepted by USEPA. This CAP has been updated to reflect the use of the collection system models as a tool to further assess system capacity.

The CAP utilizes results from hydraulic models to predict and manage available capacity. The County has developed a series of calibrated InfoWorks hydraulic models. Calibrated models for all basins have been completed. The comprehensive model will be used as the primary tool for capacity assurance, in accordance with the long-term plan.

The **Capacity Approval Decision Tree** is used to implement the CAP is shown in **Figure 11**. The decision tree includes a series of checks to assess capacity in the system with all current and approved future connections tied in.

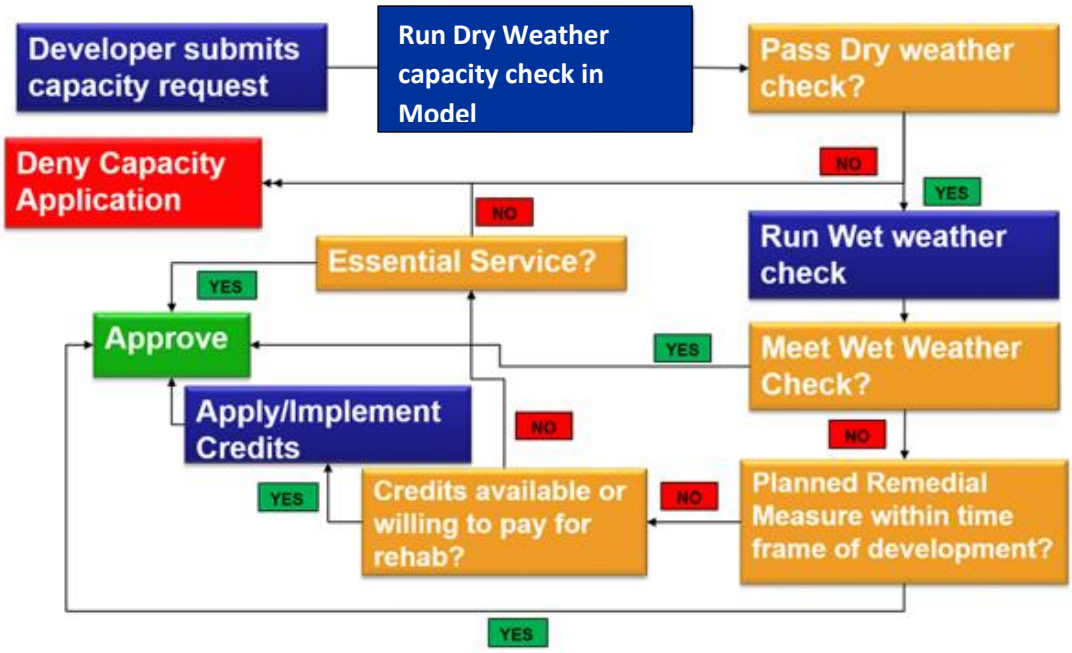

Figure 11. Capacity Approval Decision Tree

As shown in the figure above, the decision tree includes a few ways that a capacity connection can be approved even if there is not wet weather capacity available, including:

- **Planned Remedial Measure**: Under this condition, JCESD has a planned project that will provide adequate capacity to meet the wet-weather criteria when flows are expected to reach their peak from the proposed development.

- **Credits Available**: Jefferson County is investing significant resources into rehabilitating the sanitary sewers within its system. While much of the effort is for structural renewal, there are locations where comprehensive rehabilitation is being conducted with the goal of maximizing removal of infiltration and inflow (I/I). JCESD has a robust pre-and post-monitoring program that will be utilized to quantify the amount of I/I removed and will apply a "credit" for a portion of this I/I removal to allow for connections into the system where the wet-weather check is currently violated.

- **Essential Services**: The use of capacity exceptions for essential services such as Hospitals, Schools, Fire, and Police stations is a standard practice for CAP programs throughout the Country including many utilities within Region 4 EPA. JCESD will allow this exception on a case by case basis depending on the proposed facility and other factors.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed SOPs for various CMOM-related job duties, including the SOP for GIS Updates. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Other CMOM program plans that are referenced and/or are related to the **Capacity Assurance Program** plan include:

- Capacity Assurance Program
- User's Guide for the Capacity Assurance Program (CAP) Tool (separate document)
- Collection System Plans and Mapping Program and System Design Standards Program, which are described in this Engineering Program plan
- CMOM IMS Program
- CMOM Program Organization

Project Level Review

At present, Capacity Assurance is performed collaboratively at the individual project level by the ESD Plans Review Office staff and ESD Engineering staff when the proposed flow is less than 2,5000 gpd. When the proposed development flow is greater than 2,500 gpd, the review is completed collaboratively between ESD and the Asset Management Program Consultant by importing the proposed development flows into the calibrated hydraulic model/CAP Tool. A User's Guide for the Capacity Assurance Program (CAP) Tool has been prepared and is available through the Engineering Department.

Plans for new development (residential, commercial, industrial) which would need County sewer service must be submitted to the ESD's Plans Review Office initially using the "Capacity Review Form" and Tabel 3-1 contained Capacity Assurance Program (separate document). The Environmental Services Department reviews the development's plans for conformance to County design standards and checks for sewer availability and capacity. Sewer availability is checked by cross-referencing the submitted plans against County sewer maps in SIMS.

When the Plans Review Office is presented with a development, it turns the proposal over to the ESD Engineering staff. The Engineering staff reviews plans for the proposed development, along with the calibrated hydraulic model, flow monitoring records, pump station operating records, sewer maintenance work orders, and sewer overflow reports to assess current loading in the sewer. Sewer as-built drawings, pump station as-builts and pump curves, and other available information are used to assess overall capacity of the collection and/or pumping system. The Engineering staff develops its own estimate of wastewater to be generated by the development and adds that to estimated current flow for comparison purposes against the estimated capacity of the collection and/or pumping system.

ESD engineers also verify treatment capacity at the appropriate County WWTP. Projected wastewater flows are added to the historical annual average daily flow and compared to the permitted capacity of the WWTP to verify treatment capacity.

In some instances, developers request verification of available sewer capacity before they undertake design of a potential development. In these cases, ESD uses the same process of checking for sewer availability and comparing the projected flows to calculated capacity. The results of this evaluation are transmitted to the developer in a "Letter of Sewer Availability".

Collection System Review

ESD routinely verifies capacity at the collection system level. This component of the CAP was initiated in the Consent Decree's Capacity Analysis Plan and is continued under the Collection System Operation and Maintenance Plan. In the former, the County developed hydraulic models of each collection system for lines 12" and larger to identify potential capacity problems, as required by the Consent Decree. In the latter, the County committed to comply with the Consent Decree's requirement to "maintain" those collection system models by regularly updating them. ESD has operated and maintained a flow monitor network, which includes up to 255 flowmeters and 50 rain gauges for more than a decade. ESD continually reviews capacity analysis reports from the flow monitoring sites that have experienced a surcharged condition. ESD also investigates the cause of each known SSO to determine the root cause (capacity, O&M, or other).

Capacity Evaluation Process

All requests for connections to the system are tracked in the Capacity Assurance Tool. database and the effect of projected flows will be evaluated in accordance with written guidelines and procedures. Capacity within the collection system and at the treatment plant will be confirmed and documented prior to issuance of approved plans for construction or a "Letter of Sewer Availability".

Capacity Evaluation

Jefferson County uses the CAP Tool and the hydraulic model for all capacity evaluations. Please refer to the Capacity Assurance Program (CAP) Tool User's Guide for information on how the CAP process works and how the tool determines capacity.

Performance Measures

Performance measures for this program as listed below will be monitored by ESD supervisory staff.

- Number of sewer availability letters evaluated for sewer capacity.
- Number of development plans evaluated for sewer capacity.
- Volume of flow addition approved for each system.

Review, Evaluation and Revision

An annual review of the Capacity Assurance Program will be conducted. Any needed changes are made accordingly. The ESD Engineering staff will be the primary reviewing body.

Overflow Tracking Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	4	Updated SSO data collection and reporting process to reflect current practice	7/11/18
1	6	Updated Trend Analysis section to reflect bi-weekly meetings held to evaluate SSO occurrences	7/11/18
2	1	Updated the status of Overflow Tracking Program and some language relating to it	2/2022
2	2	Updated language under staffing	2/2022
2	3	Updated Figure 1	2/2022
2	4	Updated language under SSO Data Collection and Reporting	2/2022
2	5	Updated steps/information needed for SSO reporting to the most updated procedure	2/2022

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Acronyms

ADEM	Alabama Department of Environmental Management
CIP	Capital Improvement Plan
CMOM	Capacity, Management, Operations, and Maintenance
CSSAP	Continuous Sewer System Assessment Program
FOG	Fats, oils, and grease
GIS	Geographic Information System
JCDH	Jefferson County Department of Health
JCESD	Jefferson County Environmental Services Department
NPDES	National Pollutant Discharge Elimination System
QA/QC	Quality assurance and quality control
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Plan
USEPA	United States Environmental Protection Agency

Overflow Tracking Program

Program Overview

Purpose and Goals

The Jefferson County Environmental Services Department (JCESD) has developed its Overflow Tracking Program so that it utilizes leading edge technology and implements best practices to track, analyze, mitigate, and prevent collection system surcharges and sanitary sewer overflows (SSOs).

The **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan describes the policies and procedures taken by JCESD personnel to respond to, mitigate, report, categorize, and track SSOs. A copy of the SSORRP plan (included in the JCESD CMOM Program Plan) is available for download at:

http://www.jeffcoes.org/Sites/Jefferson_County_Environmental_Services/Documents/Main/JCESD%20CMOM%20Program%202017%200214.pdf

The JCESD's **Overflow Tracking Program** supports the implementation of the SSORRP and the additional steps taken to track the locations and categories of SSOs, evaluate root causes, and identify and implement targeted approaches to SSO prevention. These targeted approaches may include, but are not limited to:

- Optimizing the cleaning frequency of gravity sewers to reduce O&M related overflows(for more information on sewer pipe cleaning, see the **Gravity Line Preventive Maintenance Program** plan)
- Using chemical root control in certain areas
- Investigating upstream sources of fats, oils, and grease (FOG) dischargers, and/or industrial wastewater dischargers (for more information, see JCESD's **FOG Management Program** and **Pretreatment Program** plans)
- Performing additional condition assessments or flow monitoring, which may result in rehabilitating, repairing, or replacing defective or failing sewer infrastructure (for more information regarding JCESD's Continuous Sewer System Assessment Program (CSSAP), see JCESD's **Engineering Program** plan)

Program Components and Approach

The **Overflow Tracking Program** involves the coordinated efforts of JCESD personnel assigned varying levels of responsibilities to properly verify information and complete the following program components as described in this plan:

- Track and record relevant and required information related to SSO occurrences
- Make SSO event-related information available to all required parties
- Review the data and conduct trending analyses
- Identify measures to prevent recurrent SSOs

- Apply new knowledge of system performance to other potential areas at risk
- Provide SSO reporting in accordance with National Pollutant Discharge Elimination System (NPDES) permits
- Provide SSO reporting in accordance with Consent Decree requirements

JCESD's overflow tracking and follow-up activities assist the County in achieving compliance with the United States Environmental Protection Agency (USEPA) Consent Decree and provisions of its NPDES permits.

Program Resources

Related CMOM Program Documents and Other References

Policies and procedures observed when responding to and reporting SSOs are detailed in JCESD's **SSORRP** plan. JCESD developed standard operating procedures (SOPs) for various CMOM-related job duties related to response to SSO and backup reports, as well as documentation, reporting, and mitigation of SSOs. Copies of these SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations**.

Other CMOM Program plans that are referenced in the **Overflow Tracking Program** include:

- CMOM Program Organization
- CMOM Information Management Systems Program
- Customer Service Program
- Engineering Program
- FOG Management Program
- Gravity Line Preventive Maintenance Program
- Pretreatment Program

Staffing

The JCESD Director has the ultimate responsibility for SSO reporting, as designated by the Jefferson County Commission in accordance with NPDES permit requirements. The Superintendent overseeing the Line Maintenance Division is responsible for signing SSO forms submitted to the Alabama Department of Environmental Management (ADEM). The ADEM eSSO form and/or reports are also submitted by the Sewer Maintenance Supervisors Administrator and Principal Engineering Inspectors within Line Maintenance Admiration.

The **Overflow Tracking Program** is supported by JCESD personnel who respond to and document SSO events, take measures to prevent recurrent SSOs, and implement strategies to prevent SSOs throughout the County's service area. This includes, but is not limited to:

- Director
- Deputy Directors
- Engineering Staff
- Inspection Staff
- Line Maintenance Personnel
- Pump Stations Personnel
- Construction Personnel
- Call Center and Dispatch Staff
- FOG Program Staff
- Public Relations Coordinator

For more information on the Department's organization charts, see the **CMOM Program Organization** plan.

Data Management

JCESD maintains a Microsoft Access database of SSO reports that originated as a result of the Consent Decree and continues to be maintained, even with terminated basins. The information maintained in the SSO database is updated monthly. JCESD created a real-time report and archive of SSO events, that is available on the JCESD website as public information.. Website Link is http://www.jeffcoes.org/Default.asp?ID=44&pg=SSO+DATABASE. Figure 1 shows example of the SSO events shown on the website. The real-time report is updated as new information is made available.

Date	Location	City	Zip	Affected Waterway	Downstream Of	Reason
2016-02-19	200 2ND AVENUE SW	BIRMINGHAM	35211	Valley Creek	1ST AVENUE SW	Roots, Grease or I
2016-02-17	445 MEDFORD ROAD	BIRMINGHAM	35235	NONE	N/A	Roots, Grease or I
2016-02-13	1930 ABRAHAM WOOD JR. BLVD	BIRMINGHAM	35023	NONE	N/A	Roots, Grease or I
2016-02-12	607 BASSWOOD DRIVE	ADAMSVILLE	35005	PRUDES CREEK	TUNDRIDGE CIRCLE	Roots, Grease or I
2016-02-12	6076 SOUTHERN INDUSTRIAL DRIVE	TRUSSVILLE	35173	PINCHGUT CREEK TO TRUSSVILLE BASIN	DAWNS WAY	Roots, Grease or I
2016-02-12	1908 11TH AVENUE S	BIRMINGHAM	35205	Valley Creek	N/A	Roots, Grease or I
2016-02-12	8948 GLENDALE DRIVE	BIRMINGHAM	35206	NONE	N/A	Roots, Grease or I
2016-02-12	1801 FULTON ROAD	FULTONDALE	35068	NONE	N/A	Roots, Grease or I

Figure 1. JCESD Sanitary Sewer Advisory Webpage

Program Implementation

SSO Response

JCESD operates a Call Center monitored sixteen hours a day, every day, to receive calls regarding SSOs and backups. These calls may be received from other utilities, municipalities, JCESD staff, the public, or any individual that believes an SSO is occurring. Once a call is received, Dispatch creates a service request. Line Maintenance crews respond to the reported location to determine if an SSO is occurring or has occurred, mitigate and control the sewer spill, identify the cause, and estimate the volume of the overflow.

For more information on SSO responses and service requests, see the **Customer Service Program** plan.

SSO Data Collection and Reporting

All SSO related data is captured in County's CMMS system called Cityworks. JCESD has created SSO template for Service Request and Work Orders for the personnel to enter the information. All SSO events are notified to JCESD staff and health department via an electronic notification system called Everbridge. Media and local residents are notified of SSOs based on specific criteria. Figure 2 shows a flow chart describing the specific criteria of SSO notification to different groups.

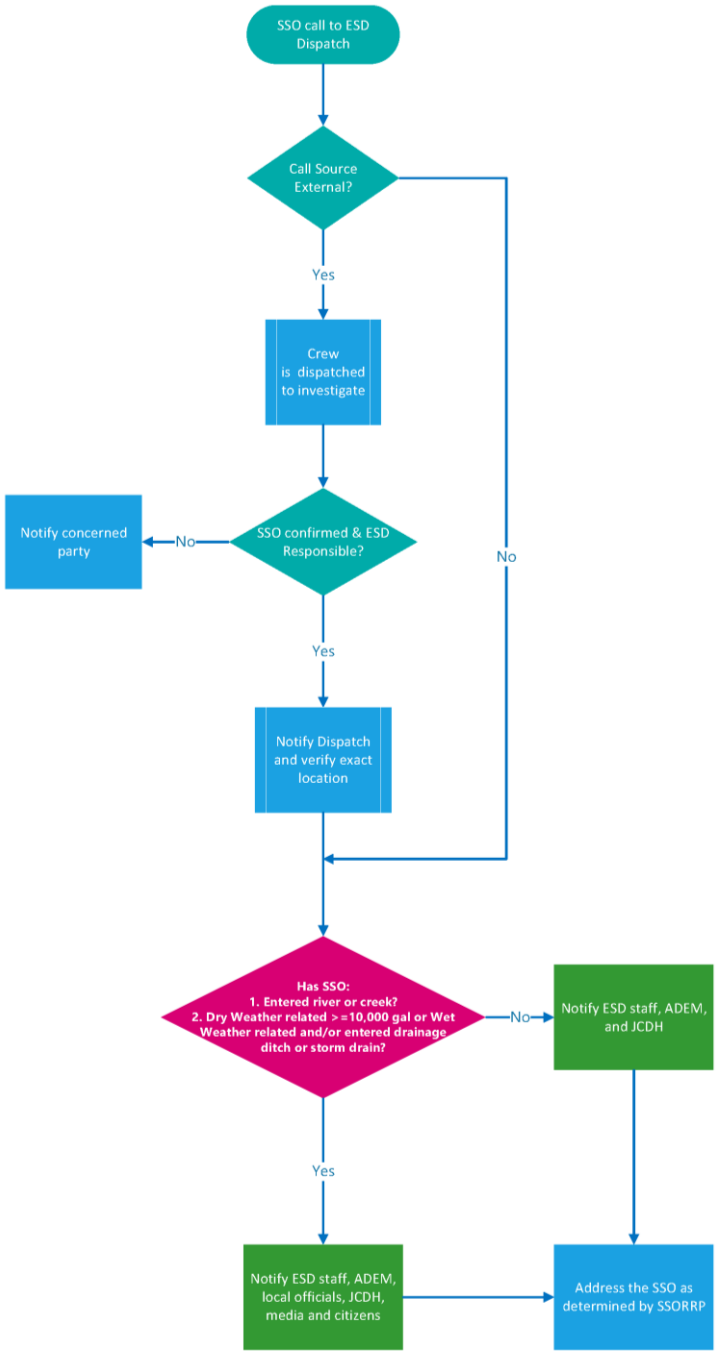

Figure 2: SSO Notification Criteria

The steps JCESD personnel take to document and report SSO information are described as follows:

1. SSO is observed and reported to JCESD Call Center.
2. Call Center Dispatcher creates service request and notifies Line Maintenance Supervisor or crew.
3. Line Maintenance crew responds to SSO location.
4. Line Maintenance crew confirms the SSO, determines the cause, estimates the volume, and all other pertinent information is entered into the Cityworks SSO templates.
5. Line Maintenance crew reports SSO information to the Dispatcher.
6. Dispatcher enters relevant SSO information into Everbridge notification system to send it to JCESD staff and health department and into the Sanitary Sewer Overflow Advisory website application.
7. Dispatcher submits 24-hour SSO notification to parties as identified in the **SSORRP** plan.
8. Dispatcher hands the 24-hour report to the Sewer Construction/Maintenance Supervisor, Principal Engineering Inspector, or Sewer Maintenance Superintendent for review and inclusion in the SSO packet.
9. Sewer Construction/Maintenance Supervisor, Principal Engineering Inspector, or Sewer Maintenance Superintendent prepares and submits the 5-day report to ADEM.
10. At the end of each month, the Sewer Construction/Maintenance Supervisor or anyone in the Line Maintenance Administration Staff sends all SSO reports to the Chief Civil Engineer for quality assurance and quality control (QA/QC) review.
11. Chief Civil Engineer enters SSO report information into the USEPA SSO database.
12. GIS Specialist personnel enters SSO report information into Cityworks IMS.

Information that is recorded for each SSO is based primarily on completed SSO reporting forms and includes, but may not be limited to:

- Date/time the SSO began
- Date/time the SSO stopped
- Estimated volume discharged (in gallons)
- Date and time reported to ADEM through eSSO; name and phone number of the person who made the notification, and if the ADEM SSO hotline was contacted
- Source of the discharge event (i.e., manhole, cleanout, lift station, treatment plant, broken line, or other (with description))
- Location of discharge (street address if appropriate)
- Known or suspected cause of the discharge
- Ultimate destination of the discharge (i.e., ground absorbed, creek or river (name), storm drain, drainage ditch, or other (with description))

- Efforts taken to notify the public, if applicable (i.e., press release, placement of signs, or other (with description))
- Officials that were notified, if applicable (i.e., Jefferson County Department of Health (JCDH) or other (with description))
- Name and title of the JCESD personnel who signed SSO form
- Date the SSO form was submitted

Responding personnel adhere to the policies and procedures outlined in the **SSORRP** plan to complete the appropriate reporting forms. As required, all notifications and report submittals are made as described in the **SSORRP** plan, and in accordance with the requirements of the USEPA Consent Decree and JCESD's Wastewater Treatment Plant NPDES permits.

Information related to the SSO occurrences, including SSO reporting forms, photographs and sketches, are maintained in the Administration offices.

SSO Root Cause Analysis

JCESD Line Maintenance, FOG Management, Engineering staff, and Asset Management Program Support review the data collected for each event and evaluate location, cause, and potential corrective action that may reduce the risk of a recurrent overflow. Actions that may result from this root cause analysis include:

- Accelerated cleaning of sewer segments upstream and downstream of the SSO location.
- Television inspection of certain suspect sewer segments.
- Investigation of FOG dischargers upstream of the SSO location.
- Point repair of sewer defect (e.g., collapsed pipe, severely offset joint, or dropped service connection).
- Follow up with other departments or agencies that may have caused a blockage to occur (e.g., contractor damage to a structure, or utility pole or cross bore through sewer line).

Trend Analysis

Data from SSO tracking activities and rain events are used to develop graphs and charts that are included in a monthly SSO Trend Analysis Report. The summary identifies and compares changes from past months and current months, and provides trending information on SSO occurrences related to seasonal, wet weather, temperature, causes, and pipe sizes. A geographical analysis of spatial parameters, such as sewer basins and sub-basins, is also used to evaluate trends. JCESD produces maps using different layers of data stored in its geographic information system (GIS) to assist in data analysis.

A trend analysis is conducted on the compiled SSO-related information monthly. A comprehensive annual review of the SSO-related information is performed by Engineering Staff to examine longer trends, repeat occurrences, and related information to update the Capital Improvement Plan (CIP) and update procedures.

An internal report is completed for review at monthly meetings attended by senior management from the Line Maintenance, Engineering, Grease Control Program staff, and representatives from other groups if appropriate. The SSO events and JCESD's responses to the events for the prior month are reviewed, and practices that can be improved or added to help reduce and/or prevent future SSOs are discussed. Analyses of data and maps are completed by the JCESD leadership and Line Maintenance staff. A meeting is held every two weeks between a different JCESD Line Maintenance crew and Engineering staff to review specific SSO events assigned to the crew for the prior month. Information is gathered from the crew to improve practices to help reduce and/or prevent future SSOs.

Results of these analyses, coordination, and meetings are used to determine measures that could be taken to prevent SSOs, such as:

- Areas within the collection system where aggressive cleaning requirements could be addressed through sewer repairs, rehabilitation, or replacement
- Locations where new lines could be installed and pump stations prone to failure and resultant SSOs could be taken out of service
- FOG dischargers who are not in compliance with program requirements

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

JCESD has performance metrics to track components of the **Overflow Tracking Program**, as listed in **Table 1**.

Table 1. Overflow Tracking Program Performance Measures

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
Total SSOs reported	Value	Number of total SSOs	Decrease as result of tracking and related response	Monthly	Line Maintenance
Total SSOs reported by Cause	Value	Number of total SSOs by Cause of Event	Decrease as result of tracking and related response	Monthly	Line Maintenance
Total SSOs reported by Basin	Value	Number of total SSOs by Basin of Event	Decrease as result of tracking and related response	Monthly	Line Maintenance
Total SSOs reported by Volume	Value	Number of total SSOs by Volume of Event	Decrease as result of tracking and related response	Monthly	Line Maintenance
Building Backups	Value	Number of total Building Backups	Decrease as result of tracking and related response	Monthly	Line Maintenance

Financial Analysis Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
2	2	Updated language under Data Management section.	2/2022

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Acronyms

BWWB	Birmingham Water Works Board
CIP	Capital Improvement Plan
CMOM	Capacity, Management, Operations, and Maintenance
FOG	Fats, oils, and grease
I/I	Infiltration and inflow
JCESD	Jefferson County Environmental Services Department
NPDES	National Pollutant Discharge Elimination System
SSO	Sanitary sewer overflow
TVI	Television inspection
WRF	Water Reclamation Facility

Financial Analysis Program

Program Overview

To ensure that financial resources are available when needed, and that they are used efficiently and effectively to accomplish Jefferson County Environmental Services Department (JCESD) goals and objectives, sound financial management processes have been put into place. These processes include the following:

- Budgeting and forecasting,
- Accounting and reporting,
- Identifying and implementing financing strategies,
- Auditing and analyzing, and
- Maintaining financial information management and reporting systems.

Pursuant to Amendment 73 to the Constitution of Alabama of 1901, the governing body of Jefferson County has sole authority to set sewer rates and charges for the system and to provide for the collection, payment, and enforcement thereof.

The financial management processes included in JCESD's **Financial Analysis Program** are described in this plan.

Purpose and Goals

The financial management initiatives undertaken by JCESD involve:

1. Planning for and acquiring the resources needed to achieve the Department's goals.
2. Planning, monitoring, analyzing, and reporting on the use of those resources.

The fundamental purpose of these efforts is to ensure that the resources are available when needed, and that the resources are used effectively and efficiently.

The goals of the Financial Analysis Management Program are to:

- Ensure the Department has the resources needed to meet all regulatory requirements and provide a high level of service for its customers.
- Manage the Department's finances to ensure the sustainability of its infrastructure.
- Perform long-term capital investment planning for regulatory compliance and reinvestment in aging infrastructure.

Program Resources

Related CMOM Program Documents and Other References

The following documents provide additional guidance and/or are related, or have components related to the **Financial Analysis Program**:

- **Jefferson County Annual Budget**, current version. Available for download at http://www.jccal.org/Default.asp?ID=138&pg=Budget+Management+Office
- **Jefferson County Sewer Use Administrative Ordinance**, effective version. Available for download at http://www.jeffcoes.org/Default.asp?ID=36&pg=ORDINANCES
- **Jefferson County Sewer Use Charge Ordinance**, effective version. Available for download at http://www.jeffcoes.org/Default.asp?ID=36&pg=ORDINANCES

Other CMOM Program plans that reference, or are referenced in, the **Financial Analysis Program** plan are as follows:

- CMOM Program Organization
- CMOM Information Management Systems Program
- Equipment and Supplies Management Program
- Fats, Oils, and Grease (FOG) Management Program
- Legal Support Program
- Pretreatment Program
- Pump Station Operations and Maintenance Program
- Service Connections and Disconnections Program

Staffing

The ultimate responsible authorities for the **Financial Analysis Program** are the Jefferson County Chief Financial Officer, County Manager, and the County Commission. All the financial analysis functions report to the Administration Division. In addition, JCESD management in each division and functional area is responsible for developing, expending, tracking, and reporting elements of the Operations and Capital Improvement budgets.

For more information on JCESD staffing, see the **CMOM Program Organization** plan.

Data Management

Jefferson County utilizes the Munis Enterprise-wide financial system. A COBOL-based mainframe system used to manage the County-billed customer accounts has been recently replaced with a CSM billing/collection software implementation. The new system offers a more efficient invoice management and payment processing system to better meet customer needs. The County receives regular reports from its contract billing providers that it periodically reviews and maintains.

For more information on JCESD's data management strategy, see the **CMOM Information Management Systems Program** plan.

Program Implementation

This section describes the major processes that comprise JCESD's financial management approach.

Budgeting and Forecasting

Budgeting involves developing monetary plans for specified time periods. Budgets are financial plans that are developed in response to forecasts of expected circumstances and events in the environment in which JCESD functions. By comparing budgeted activity to the actual results of the operation of its organization, management can identify areas that should be further evaluated for effectiveness and efficiency improvements.

Operating Budget

Jefferson County is required by Alabama Law to operate under a balanced budget. The County's fiscal year operates from October through September under an annual budget approved by the Jefferson County Commission. Each year, JCESD develops a budget that is reflective of the expected cost to operate its facilities, provide customer services, and meet regulatory requirements.

The JCESD operating budget can be summarized into the following seven major categories:

- Personnel
- Utilities
- Billing Services
- Legal & Professional Services
- Contractual Operations and Maintenance Support
- Functional Support Services
- Parts, Supplies, and Miscellaneous Equipment

In order to ensure that the appropriate supplies and parts are on hand for the wastewater treatment and collection system when needed, an adequate budget is established annually. Approximately 30% of the annual JCESD operating budget is allocated to collection system maintenance.

Jefferson County currently provides support services to JCESD for finance, accounting, purchasing, payroll, budget management, legal services, human resources, right-of-way, and fleet management. The costs allocated to JCESD for these services are based on a County-wide indirect cost allocation study and direct charges for parts and labor.

As part of the budgeting process, managers from 23 divisions are asked to develop division budget requests for operations and maintenance needs and provide appropriate documented justification. Standard forms for itemizing equipment, personnel, operating costs, and performance measures are

used to justify expenditures against performance, mission statements, measurable goals, and improvement strategies.

The division budget requests are reviewed by the JCESD Director and Deputy Director for accuracy and appropriateness. Workshops with division managers and engineering managers are conducted. Each request is evaluated against other budget needs and anticipated costs. When necessary, division budget requests are modified to fit within expected revenue projections.

The division budget requests are then assembled into a total departmental budget. Upon approval, the JCESD Director submits the draft departmental budget request to the County Manager. The County Manager and Finance Department review JCESD's budget request, along with the other County departments' requests. When approved by the County Manager, the draft budgets for all County departments are presented to the Jefferson County Commission for consideration and approval.

Capital Improvement Program

JCESD maintains a 10-year Capital Improvement Plan (CIP) that is used as a planning and fiscal management tool to coordinate the location, timing and financing of capital improvements and equipment purchases. The CIP is designed to:

- Meet specific utility needs,
- Provide operational reliability,
- Achieve Consent Decree compliance and termination,
- Provide a platform for long-term sustainability, and
- Help ensure compliance with the Clean Water Act, the Alabama Clean Waters Act, the County's National Pollutant Discharge Elimination System (NPDES) permits, and other regulatory and customer service requirements.

In order to reach the goal of a sustainable utility, JCESD has committed to have its capital improvements planned, designed, and constructed in a rational, methodical, defensible and prioritized manner. JCESD has established an Asset Management Program for its water reclamation facility (WRF) and collection system assets, focused on minimizing the life-cycle costs of assets at acceptable levels of risk through a disciplined approach to assessing project needs. This assessment is based on prevailing risks and prioritizing asset investments. For more information on various elements of the Asset Management Program, including continuous sewer system assessment, infrastructure rehabilitation, and capacity assurance, see the JCESD **Engineering Program** plan.

Recurring, wet weather-related sanitary sewer overflow (SSO) abatement and sewer system rehabilitation capital improvement projects are identified and developed through the Asset Management Program following the processes described below:

<u>Recurring Wet Weather SSO Abatement</u>

1. Recurring SSO locations are identified and prioritized.

2. Internal television inspection (TVI) is conducted in area upstream of the SSO (extent of TVI work is dependent on system configuration and SSO prioritization).
3. Remedial measures (initial project scopes) are developed to eliminate recurring SSOs, such as replacement, relief sewer, and lining where considered effective and needed to provide structural renewal.
    a. If the SSO is located in an area that is already included in a calibrated hydraulic model, the model is used to characterize and to develop remedial measures.
    b. If a calibrated model is not currently available for the area in which the recurrent SSO is located, and it is within a high priority area, flow monitoring is conducted to characterize the infiltration and inflow (I/I) response within the sewer system.

       A unit hydrograph hydraulic model is developed and calibrated to assess capacity and peak flows.
4. Projects are ranked and scheduled based on the priority, severity of the SSO, and budget constraints.
5. Remedial measures are designed and projects are bid based on priority.
6. Projects are constructed.
7. Post-construction monitoring is conducted to evaluate effectiveness.

<u>Sewer System Rehabilitation</u>

Sewer lines that require rehabilitation or replacement may be identified through TVI as a result of responses to service requests or mini-basin-wide inspection efforts.

1. Inspection videos and reports of sewer lines with significant defects are reviewed and evaluated. Sewer lines with significant defects that warrant rehabilitation or replacement work that are not immediate in nature are put onto the rehabilitation list.
2. Mini-basin inspection results are reviewed using in-house screening and assessment tools.
3. Rehabilitation and replacement recommendations are developed based on extent and type of defects identified.
4. Rehabilitation and replacement bid documents are developed as separate projects and bid.
5. Projects are constructed.
6. If I/I removal was targeted, post construction monitoring is conducted to evaluate effectiveness.

Capital financing is provided by a combination of funds on hand, current revenues, and warrant proceeds.

Accounting and Reporting

Accumulating, categorizing, and recording financial and other statistical data is the primary function of the account and reporting process of JCESD's financial management approach. Appropriate summaries of financial and management reporting are distributed to JCESD's internal and external users.

Monthly Reports

Each month, division managers prepare and submit a comprehensive report to JCESD senior management. These reports include financial and performance metrics and are used to gauge the effectiveness and efficiency of each division's operations.

Financing

The financing process of JCESD's financial management approach involves managing the flow of funds into the utility and acquiring needed funds. The following section provides an overview of the sources of funds collected by JCESD.

Sewer Use Charges and Fees

Amendment No. 73 to the Alabama Constitution (referred to as the "County Sewer Amendment") empowers the Jefferson County Commission to set sewer rates and charges and collect those use charges from its sewer system users. The County Sewer Amendment provides that the County Commission shall have a lien against properties served by the County's sewer system to secure the payment of any related service charges, and that the lien may be enforced by foreclosure. Monies derived by the sewer service charges may be expended by the County for purposes only related to the improvement, extension, maintenance and operation of the sewer system.

Jefferson County's monthly sewer charges reflect base charges, volume charges, and other usage and class-related billing determinates. Adjustments can be made to the recorded sewer charges to account for private water meter credits, leaks or usage anomalies, or misread meters. Other adjustments that may affect monthly billed revenues include account charge-offs, returned check charges, application of customer overpayments, and final bill adjustments.

An online residential bill calculator, shown in **Figure 1** on the following page, is available for customers at http://www.jeffcoes.org/Default.asp?ID=76&pg=RESIDENTIAL+BILL+CALCULATOR.

For more information on sewer rates and charges, see the **Jefferson County Sewer Use Charge Ordinance**, effective version. For additional information on the fees associated with JCESD's Grease Control Program, see the **FOG Management Program** plan.

Some industrial and commercial users are subject to a surcharge based on the composition, strength, and/or temperature of their discharged waste. The program that addresses industrial and commercial surcharges is administered by the JCESD Pretreatment staff. For more information on the surcharge and fees associated with that program, see the **Pretreatment Program** plan.

See the JCESD website for more information on sewer use charges and fees at http://www.jeffcoes.org/Default.asp?ID=67&pg=RATE+INCREASE+INFO.

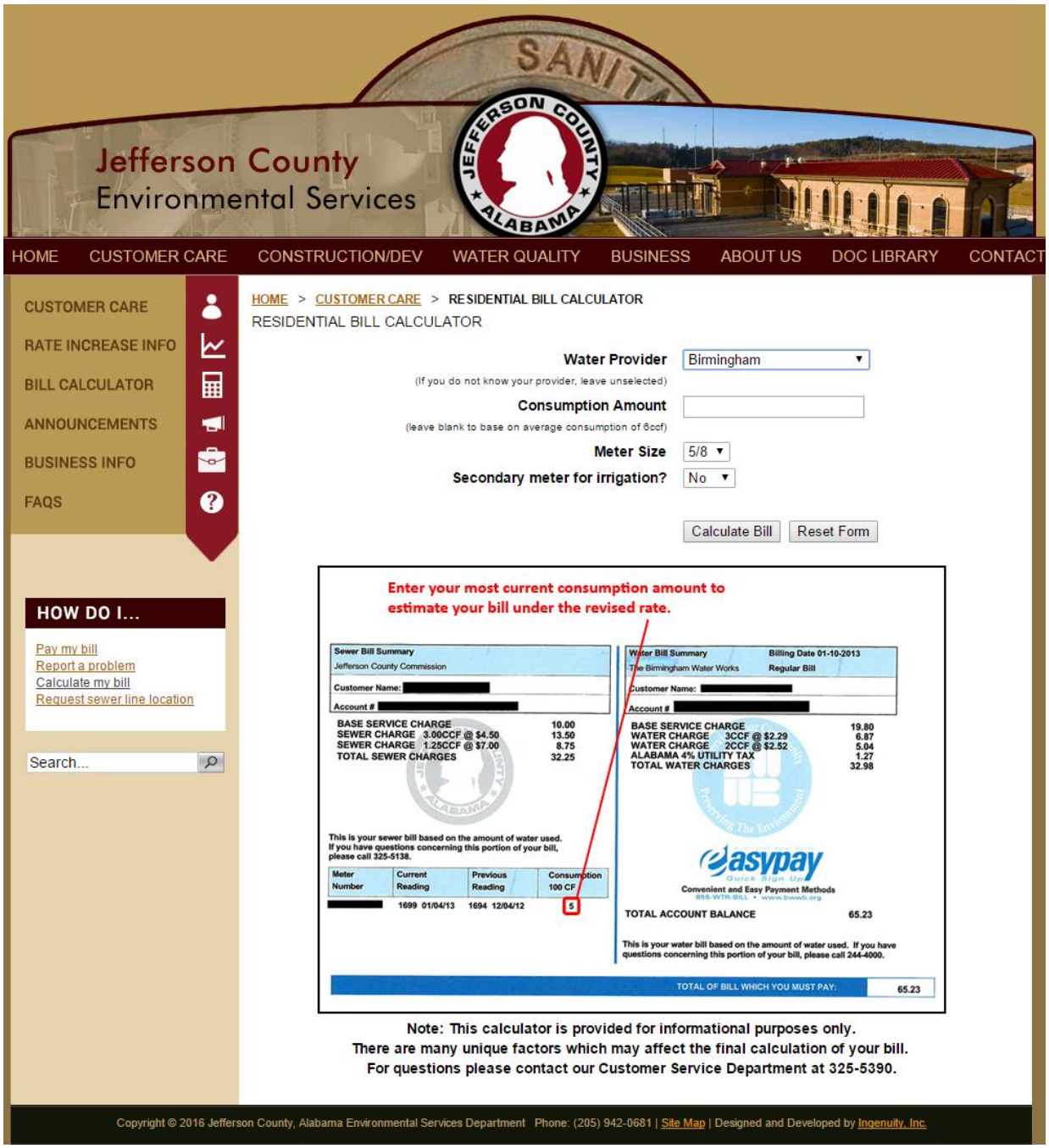

Figure 1. Online Residential Bill Calculator

Sewer Accounts and Billing

For more information on the JCESD service area and the sewer customers served, see the **CMOM Program Organization** plan.

Sewer users receive water service from the Birmingham, Bessemer, Trussville, Irondale, Leeds, Graysville, Warrior River, and Mulga water utilities. The Birmingham Water Works Board (BWWB) and Bessemer Utilities provide combined water and sewer billing through contractual agreements with

Jefferson County. Sewer users served by other water utilities are billed directly by the County for sewer service only.

Sewer Tax

A sewer tax is levied and collected by the County to be allocated, in addition to sewer revenues, for the purpose of paying a portion of the costs of improving, maintaining, and operating the County's collection system. The County does not possess the power to increase the sewer tax without authorization from the Alabama Legislature and approval by the public at a State-wide election.

Auditing and Analysis

Analysis of JCESD's operation is an important component of its financial management approach. JCESD has financial audits performed annually by independent auditors.

Program Performance Measures

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enables JCESD to determine if established goals and level of service are being met, and, if not, what activities need to be adjusted to meet program goals.

The **Financial Analysis Program** performance measures established by JCESD are shown in **Table 1** through **Table 3**.

Table 1. Operating Budget Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
$ Expended per month	Value	The amount of money spent on all operating expenses	Value	Monthly	All
$ Personnel	Value	The amount of money expended on personnel salary and benefits	Value	Monthly	All
$ Utilities	Value	The amount of money expended on electricity and natural gas each month	Value	Monthly	All
$ Operations	Value	The amount of money expended on communications; facility maintenance; vehicle titling, insurance, fuel, tires, spare parts, maintenance, and repair; staff development and travel; janitorial services, supplies; and other operations-related expenses	Value	Monthly	All
% Expended of Total Budget	$ Expended per month / total annual budget	The percent of the total annual budget that is expended	Value	Monthly	All

Table 2. Capital Budget Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
$ Capital	Value	The amount of money spent on capital improvements, equipment, and vehicles each month	Value	Monthly	All

Table 3. Revenue Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
Total Revenue	Value	Compared to prior period revenue	Value	Monthly /year to date	All
Sewer Use Revenue by Billing Entity	Values	Compared to prior month revenue	Value	Monthly	All
Industrial Surcharge	Value	Compared to prior month revenue	Value	Monthly	All
Septage	Value	Compared to prior month revenue	Value	Monthly	All
Sewer Impact Fees	Value	Compared to prior month revenue	Value	Monthly	All
# of Permits Issued	Value	Compared to prior month revenue	Value	Monthly	All
Other Revenues	Value	Compared to prior month revenue	Value	Monthly	All

Equipment and Supplies Management Program

FINAL

November 2018

Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	4	Updated Table 1 inventory of collection system vehicles and equipment	5/22/18
1	Appendix C	Updated Appendix C inventory checklist for wash trucks and combination cleaners	4/30/18
1	Appendix D	Updated Appendix D inventory checklist for rodding trucks	4/30/18
1	Appendix E	Updated Appendix E inventory checklist for TVI vans	4/30/18

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Acronyms

CCTV	Closed-circuit television
CMOM	Capacity, Management, Operations, and Maintenance
JCESD	Jefferson County Environmental Services Department
O&M	Operations and maintenance
OEM	Original equipment manufacturer
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
TVI	Television inspection
WRF	Water Reclamation Facility

Equipment and Supplies Management

Program Overview

An appropriate inventory of vehicles, equipment, tools, supplies, and critical spare parts is needed to ensure the safe, efficient, and effective operation and maintenance of a collection system. The inventory used by the Jefferson County Environmental Services Department (JCESD) collection system cleaning, inspection, and repair personnel is maintained and stored at the Shades Valley Complex, the Village Creek Water Reclamation Facility (WRF), and the Fleet Management maintenance shops at 1717 Vanderbilt Road in Birmingham and 1121 15th Avenue in Bessemer.

While JCESD's **Equipment and Supplies Management Program** is continuing to evolve, the following elements of the program are described in this document:

- **Vehicle and Equipment Repair**: JCESD's fleet of vehicles and most towed equipment (e.g., air compressors, backhoes, generators, and trailered equipment like backhoes) are purchased, maintained, and repaired by the County's Fleet Management Division personnel or the JCESD.
- **Spare Parts Inventory**: this program component ensures that critical spare parts are maintained in stock or are readily available from outside vendors to maintain vehicles, equipment, and tools in proper working order. This inventory is based on equipment manufacturer's recommendations, historical experience, and anticipated needs identified as a part of contingency planning efforts (for more information, see the **Contingency Planning Program** plan).
- **Equipment and Tools Inventory**: the equipment, tools, supplies, and materials used on a daily basis are stored in locations that are conveniently accessed by JCESD personnel. A complete inventory listing has been compiled, and a maximum-minimum inventory control system for the Main Line Cleaning, Television Inspection (TVI), and Construction Division is under development.

Purpose and Goals

The purpose of JCESD's **Equipment and Supplies Management Program** is to ensure collection system personnel are provided with reliable and appropriate resources needed to properly perform their work. Without these readily available resources, a collection system may experience accelerated deterioration or periods of inefficient operation, in the event of a system breakdown or malfunction.

The goals of the **Equipment and Supplies Management Program** are to:

- Identify critical spare parts necessary to keep the collection system operating, and ensure adequate inventory is on hand.
- Maintain organized storage areas for equipment, supplies, and spare parts at key locations that are accessible to field personnel.
- Coordinate the budgeting, purchasing, and maintaining/repairing of vehicles and equipment with the Fleet Management Department.

Program Resources

Related CMOM Program Documents and Other References

Procedures used when responding to and reporting sanitary sewer overflows (SSOs) are detailed in JCESD's **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan.

See the **Engineering Program** plan for more information on the County's sanitary sewer pump station design requirements, construction standards and specifications, and approved materials.

For more information on pump station-related safety issues, see the **Safety Program** plan.

Other CMOM Program plans that reference, or are referenced in, the **Equipment and Supplies Management Program** plan are as follows:

- CMOM Program Organization
- Gravity Line Preventive Maintenance Program
- CMOM Information Management Systems Program
- Pump Station Operation and Maintenance Program

Staffing

Each Division is responsible for developing a critical spare parts list, maintaining storage areas, and coordinating the purchase of vehicles, equipment, materials, and supplies used by Division personnel. At this time, this work is performed by a wide variety of employees in differing job classifications. Division Managers and Supervisors are ultimately responsible for procurement and directing personnel to organize and stock the storage areas.

Personnel assigned to Five Mile Creek, Valley Creek and Village Creek WRF maintenance shops provide repair services to Pump Station and Line Maintenance equipment.

All of the rolling stock, including cars, trucks, heavy trucks, trailers, and heavy equipment, and most of the towed equipment is maintained by the County's Fleet Management Division. Pump Station personnel perform routine maintenance and repair pumps and pump station equipment, including some of the permanently mounted emergency generators (large pump station heavy Caterpillar generators are maintained and repaired by contracted service providers).

For more information on staffing, including Division organization charts, see the **CMOM Program Organization** plan.

Data Management

Currently, Microsoft™ Excel spreadsheets are used to track inventory items, locations, and quantities. Examples of these spreadsheets are provided in the Appendices.

For more information on the Munis software program (Tyler Technologies, Inc.) used to requisition equipment, see the JCESD **CMOM Information Management Systems Program** plan.

Program Implementation

Vehicle and Equipment Repair

Acquisition of new and replacement vehicles and equipment is done by JCESD in conjunction with Fleet Management. Requests for equipment are made through the online Munis software program. Vehicles and equipment are budgeted by JCESD, and once approved, Fleet Management personnel procure the requested items through a competitive pricing-based requisition process. Vehicle replacement is generally based vehicle condition, mileage and/or age. Replacement criteria are determined by Roads and Transportation-Fleet Management Department.

Fleet Management maintains a current list of vehicles and equipment serviced for each JCESD Division (see **Table 1** on the following page), and keeps records of all preventive maintenance and repairs. Preventive maintenance requirements are established by Fleet Management, and it is the responsibility of the Department staff to schedule service and coordinate with Fleet Management when vehicles or equipment are damaged. Repairs are made by Fleet Management personnel when possible; however, complex repairs are sometimes performed by outside contractors.

The turn-around time for equipment service and repairs performed by Fleet Management varies. It is common for simple preventive maintenance work (e.g., oil changes) to take up to 1 week and non-complex repairs (e.g., brake repairs and air-conditioning system repairs) to take longer.

Hard copies of original equipment manufacturer (OEM) user manuals are kept at the Birmingham and Bessemer shops. These are used to identify critical spare parts and develop written equipment maintenance procedures.

Vehicles and motorized equipment are fueled at stations located at the Shades Valley Complex and Village Creek WRF, as well as other County Department fueling stations. Fuel can also be purchased at select gas stations using Fuelman cards.

Spare Parts Inventory

Fleet Management maintains a stock of certain critical spare parts for rolling stock, including vehicles, sewer cleaning machines, and other heavy equipment. If needed, Fleet Management and each Division have relationships with local vendors who will provide access to their inventory on a 7-day, 24-hour basis. In addition, the Construction and Pump Station crews can obtain loaned and/or rented equipment if needed.

Pump Station Spare Parts

Pump stations identified as “Critical” and associated spare parts necessary to keep these pump stations in operation during emergencies have been identified. The spare parts inventory for these pump stations and others is stored at the Shades Valley Complex. Due to the variations between pump station designs and years of construction, there is little standardization of items except for pumps that are common to some stations. This makes it more difficult to maintain an adequate inventory of spare parts for all pump stations. However, adequate spare parts are on hand to conduct repairs at several critical pump stations concurrently, if necessary.

Table 1. Inventory of Collection System Vehicles and Equipment (as of 5/22/2018)

Division	Equipment
Administration Line Maintenance	4 pickup truck and 1 automobile
Village Line Maintenance	3 pickup trucks and 4 crew trucks 6 jet wash trucks 1 dump truck 1 backhoe 3 trailers 2 air compressors 1 tower light (towable)
Shades Line Maintenance	3 pickup trucks and 4 crew trucks 9 jet wash trucks 5 Combination cleaning machines 1 flatbed truck 2 tractors 2 all-terrain utility vehicles 1 back hoe 2 dump trucks 1 forestry mulching machine 1 skid steer 1 trailer mounted rodding machine 6-inch bypass pump (stored/maintained at Pump Station facilities)
TV Inspection	12 pickup trucks 7 TV inspection trucks 4 jet washers 3 combination cleaning machines
Sewer Line Construction	6 pickup trucks, 2 service trucks and 2 crew cab work trucks, 1 automobile 1 flatbed truck 1 lowboy trailer, 4 trailers, and 1 utility trailer 1 single axle dump truck, 1 tandem axle dump trucks, and 4 tri-axle dump trucks 1 dozer 2 skid steers 2 rubber tire loaders 1 tandem boom truck 4 track excavators 1 tractor (lawnmower) and 1 landscaping tractor 3 trench box and 1 build-a-box 3-inch pump, 2 3-inch trash pumps, and 1 8-inch pump 1 5550-watt generator 3 2-inch pneumatic air pumps 2 air compressors 2 air spade/clay diggers 2 chainsaw 4 pipe saws 1 pipe laser beam 1 light source 2 jack hammer 1 hoe ram 1 drill, 1 rock sinker drill and 2 core drills 1 chainsaw 2 hand-held gas powered air blower 2 gas-powered packers
Pump Station	18 pickup and service trucks 1 tractor with flail mower 3 riding lawn mowers 1 boom truck 1 forklift

The Pump Station Operations and Maintenance (O&M) Group, which operates out of Shades Valley Complex, manages the repairs and maintenance of all station components. When necessary, outside contractors may be used (see the **Pump Station Operations and Maintenance Program** plan for more information).

Equipment and Tools Inventory

The equipment, tools, supplies, and materials that are used daily by JCESD crews are stored in locations that are conveniently accessible.

Mainline Cleaning and TVI Tools and Supplies

Mainline cleaning inventory is stored at both the Shades Valley Complex and Village Creek WRF. TVI inventory is stored at the Shades Valley Complex. Sample lists of tools and supplies used by each group are provided in **Appendix A** (Shades Valley) and **Appendix B** (Village Creek).

The equipment and tool inventory used for sewer cleaning and TVI has been standardized. Copies of inventory checklists used to stock jet wash trucks/combination cleaners/easement cleaning machines, rod trucks/power rodders, and TVI vans are provided in **Appendices C**, **D**, and **E**, respectively.

Some electrical and mechanical repairs are made onsite. The available area is adequate for the small repairs made on equipment such as closed-circuit television (CCTV) inspection cameras and sewer cleaning nozzles.

Construction Division Equipment, Tools, and Materials

Equipment, tools, construction and repair materials, and supplies used by the Construction Division are stored at the construction yard located at the Village Creek WRF. A sample list of the Construction Division tool room inventory is provided in **Appendix F**.

Pump Station Equipment and Tools

All pump station equipment, tools, and bulk inventory supplies are stored at the Pump Station storage area located at the Shades Valley Complex (see **Appendix G** for sample listing). Discarded equipment is salvaged for parts (i.e., impellers, cable, electrical components) and is kept in the storage area.

The pump station staff has the equipment available to perform required maintenance activities. Completed work orders serve as the maintenance logs for each pump station and the maintenance work performed on the force main system.

If necessary, JCESD can utilize an open purchase order to obtain pump or electrical components and rebuilding services.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The **Equipment and Supplies Management Program** performance measures established at JCESD are shown in **Table 2**.

Table 2. Equipment and Supplies Management Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
Vehicle Inventory	Value	Inventory of Vehicles critical to the performance of CMOM Activities	Maintain accurate records of vehicles	Annual
Equipment Inventory	Value	Inventory of Equipment critical to the performance of CMOM Activities	Maintain accurate records of equipment that support CMOM related activities	Annual
Tools Inventory	Value	Inventory of tools critical to the performance of CMOM Activities	Maintain accurate records of tools that support CMOM related activities	Annual
Vehicle and Equipment Maintenance Records	Value	Records of preventive and reactive maintenance to vehicles and equipment integral to performing duties related to the JCESD CMOM Program	Track maintenance records to predict useful life of equipment integral to implementation of CMOM activities and to predict renewal and replacement of equipment and vehicles	Annual
Spare Parts Inventory	Value	Inventory of critical spare parts for equipment and tools used that are integral to the successful implementation of the JCESD CMOM Program	Track records to maintain sufficient inventory of critical spare parts at JCESD facilities	Annual

APPENDICES

Appendix A Shades Valley Complex – Sample Collection System Tool Room Inventory

Shades Valley Complex - Collection System Tools and Supplies Inventory

Item	Invntry
3" hose clamp - S/Steel band type	3
Acetlyn/Oxygen cutting torch - w/cart	1
Air filter - Air compressor	1
Air filter - main - CAT skid steer loader	3
Air filter - secondary - CAT skid steer loader	1
Air hammer bit - breaker point	3
Air hammer bit - chisel point	1
Anchor shackle - ¾ inch	4
Anchor shackles - 1⅜ inch	2
Anti-freeze - 1 gallon	8
Bar and chain oil - 1 gallon	6
Broom - pole mount brush	3
Brush axe	1
Bypass pump - portable 3 inch	2
Bypass pump - portable 4 inch	1
Camlock fitting - female 6 inch	6
Camlock fitting - male 6 inch	5
Carburator cleaner - 12 ounce aerosol	12
Chain saw - pole type	1
Chopper tool head for threaded pole	4
CP Clamp - S/Steel - 3 in	50
CP Clamp - S/Steel - 3 in x ⅝ in	50
CP Clamp - S/Steel - 4 in x ⅝ in	45
CP Clamp - S/Steel - 4½ in x ⅝ in	50
CP Clamps - galvanized - 2 in x 5 in	46
Electric extension cord - 10 ga - 50 foot	1
Face shield	8
Fire extinquisher - 5 pound	11
Fork tool head for threaded pole	2
Fuel can - 2 gallon poly	8
Fuel can - 2 gallon steel - safety can	2
Fuel can - 2.5 gallon poly - with fuel	1
Fuel can - 5 gallon poly - with fuel	2

Item	Invntry
Fuel can - 5 gallon steel - safety can w/fuel	2
Fuel can - 6 gallon poly	3
Garden sprayer - backpack type - 4 gal	1
Garden sprayer - hand pump - 2.5 gal	2
Generator - portable - 3500 Wattd	1
Grabber - 3 foot	2
Grease cartridges - 14 ounce	150
Hand cleaner - 1 gallon	4
Handi-Clam (pinchers) - 10 foot	2
Handi-Clam (pinchers) - 12 foot	1
Handi-Clam (pinchers) - 16 foot	1
Hard hat - Pot type	17
Hedge trimmer - Stihl	1
Hickory handle - Bush Axe 36"	16
Hickory handle - Bush Axe 40"	31
Hickory handle - Dble Bit Axe 36"	5
Hickory handle - Sledge 6lb - 16lb	3
Hickory handle - Sledge/Maul 36"	10
Hoe - 5 foot	3
Hoe - 6 foot	3
Hose clamp - snaplock - 6 inch	4
Hydraulic root saw motor oil - 1 gallon	3
Leader hose - 10 foot	1
Mattock - tool head only	8
Mattock - with handle	3
Garden sprayer - hand pump - 2.5 gal	2
Work light - free standing portable 500 w	1
Paper towel dispenser	2
Nozzle - Anti-blast	0
Nozzle - Bulldog	0
Nozzle - Grenade Bomb	0
Nozzle - invert cleaner 18" - 30" pipe	1
Nozzle - invert cleaner - Tadpole 18" - 30" pipe	1

Shades Valley Complex - Collection System Tools and Supplies Inventory

Item	Invntry
Nozzle - Penetrator - chisel point large	0
Nozzle - Penetrator - chisel point small	0
Nozzle - Radial	0
Paper towel dispenser	2
Pole - fiberglass threaded - 5 foot	4
Post hole digger	4
Pressure washer - ext. Pole - 10 ft	1
Rake - earth type - 5 foot	1
Rake - earth type - 7 foot	1
Rock bar (crowbar) - 5 foot	4
Rod pipe bell end - 2" pipe	6
Rod turning machine - 8 hp	2
Rope - Nylon - ½ inch - spool (feet)	100
Round-Up weed killer - 5 gallon	2.5
Safety harnes for tripod use	5
Shovel - flat - 5 foot	6
Shovel - round/pointed - 5 foot	8
Shovel - trenching - 4 foot	5
Sledge hammer - 16 lb	2
Sledge hammer - 4 lb	2
Snake chaps	1
Socket & wrench set - with case	5
Starting fluid - 12 ounce aerosol	12
Submersible pump - portable - air operated	1
T handle probe - 5 foot	5
Tarp (blue) - 17 ft x 23 ft	1
Threaded couplings - M/F set - 3 inch	10
Threaded couplings - M/F set - 4 inch	8
Tiger tail - hose protectors 4 inch	7
Tiger tail - sewer hose protective guide	0
Trap - 10 inch open top scoop type	0
Trap - 12 inch open top scoop type	0
Trap - 6 inch open top scoop type	0

Item	Invntry
Trap - 8 inch open top scoop type	0
Trap - stand pipe elbow - 6 inch	3
Trap pole - Fiberglass, threaded 5 foot	5
Trash cans - 30 gallon metal w/lid	7
Two cycle oil - 12 ounce bottle	60
Water cooler - Igloo type - 5 gallon	1
Weed cutter - Gas	2
Wheel barrow	1
Wheel barrow - handles	9
Wheel chocks - rubber	1
Winch - tripod hand type	2
Work light - free standing portable 500 w	1
Rod Tools in Loft	
Root saw - 4 inch w/adaptor rod	41
Root saw - 6 inch w/adaptor rod	29
Root saw - 8 inch w/adaptor rod	106
Root saw - 10 inch w/adaptor rod	33
Root saw - 12 inch w/adaptor rod	40
Root saw - 15 inch w/adaptor rod	2
Auger - 8 inch w/adaptor rod	16

Appendix B Village Creek WRF – Sample Collection System Tool Room Inventory

Village Creek WWTP - Collection System Tool and Supplies Inventory

Item	Invntry
Adaptor rods - 5/16 inch x 8 inch	98
Adjustable wrench - 15 inch	2
Air compressor - towable	1
Air hammer - 30 lb w/buster point	1
Auger - 10 inch only	24
Auger - 10 inch w/adaptor rod	30
Auger - 4 inch only	1
Auger - 4 inch w/adaptor rod	6
Auger - 6 inch w/adaptor rod	3
Auger - 8 inch w/adaptor rod	14
Backhoe - small utility type (on trailer)	1
Barricade - foot stakes for nylon barricade straps	11
Barricade - nylon extension/retraction type	20
Boots - calf high water resistant type size 10 pairs	8
Boots - calf high water resistant type size 11 pairs	2
Boots - calf high water resistant type size 12 pairs	5
Boots - calf high water resistant type size 14 pairs	1
Boots - calf high water resistant type size 9 pairs	2
Brick tong - carrier	1
Broom - push type heavy bristle	1
Broom - push type medium bristle	4
Broom - std straw sweeping type	8
Brush axe	3
Brush axe	2
Bucket machine roller w/yoke - 12 inch	1
Bypass Lay flat hose - 6 inch bolting flanges	2
Bypass Lay flat hose w/ends - 6 inch x (unable to count)	2
Bypass lay-flat hose with ends - 3 inch x 50 feet	5
Bypass pump - 3 inch (on towing trailer)	1
Bypass pump - 6 inch (on towing trailer)	1
Bypass pump - portable 3 inch	3
Bypass pump suction hose - 12 foot	1
Bypass suction hose - 35 foot	1
Bypass suction hose - 6 inch debris filters	2
Cement mixer - towable	1
Chain saw - 24 inch bar	2
Chisel blades - assorted types/sizes for electric hammer	4
Cooler - Igloo 5 gallon	1
Cutting wheel - 12 inch	10
Cutting wheel - gas operated	1
Cutting wheel blade - masonry	32
Cutting wheel blade - metal	18
Drain cleaner - electric eel coiled rod type, 100 foot	1
Drain cleaner - pressure water type, 16 hp	1
Duct tape - 2 inch, roll	3
Dye - yellow/green, liquid in plastic bottles	13
File - 10 inch standard	1
Fill hose w/ends 2.5 inch x 50 feet	4
Filter - rebreathing dust masks	2
Fisher pipe detector - w/expanders	2
Fisher pipe detector - with expanders	5
Flagging tape - plastic type in roll	26
Flat snake - 50 foot w/assorted tools	2
Floor cleaner - 5 gallon jelled type	1
Floor cleaner - 5 gallon jelled type	2
Fuel container - 2 gallon safety type	1
Fuel container - diesel fuel type - 2 gallon	1

Item	Invntry
Galvanized pipe 3/4" straight 5 foot	1
Galvanized pipe 3/4" Z Pole 5 foot	7
Galvanized pipe coupling - 2.5 inch	5
Galvanized pipe coupling - 2.5 inch to 1.5 inch reducer	4
Gas meter calibrating kits	2
Generator - portable - 5000 watt	1
Grease cartridge - 14 ounce standard	12
Grease gun - small	1
Grinding tool - electrical type, 6" wheel (Mikita)	1
Grinding wheel tool - electric, 4.5 inch wheel	1
Handi-Clam (pinchers) - 16 foot	3
Handi-Clam (pinchers) - 6 foot	3
Handi-Clam (pinchers) - 8 foot	2
Hard hat - pot type	9
Hedge trimming machine	1
Hickory handle - axe, 36 inch	7
Hickory handle - brush axe, 36 inch	10
Hickory handle - pick, 36 inch	2
Hickory handle - sledge hammer, 36 inch	9
Hoe - concrete mixing type	1
Hydraulic Root Saw Coupling (HRC) for saw blades	3
Hydraulic swage tool	1
Insecticide - std bug killer in spray can	22
Jet Power - 5 gallon bucket	13
Level - 4 foot wood type	1
Lower manhole hose roller	3
Lower manhole rod guide tube - short, 20 degree	1
Lower manhole rod guide tube with bell end - std bend	8
Mop handle - rag mophead type	3
Nozzle - Anti-blast	0
Nozzle - Brass washdown type new	1
Nozzle - Bulldog	0
Nozzle - Grenade Bomb	0
Nozzle - Penetrator - chisel point large	0
Nozzle - Penetrator - chisel point small	0
Nozzle - Polywog 1" - used	1
Nozzle - Radial	0
Nozzle - Shamrocket 1" - used	1
Pavement cutter	1
Pick w/handle	1
Pintle hitch - bolt on type	1
Pipe wrench - 24 inch	1
Pipe wrench - 24 inch	4
Pitchfork - 5 foot	2
Proofing tool - 10 inch pipe	1
Proofing tool - 12 inch pipe	1
Proofing tool - 8 inch pipe	8
Quick couple chucks - for Rod Turning Machines	2
Rachet chain binder	3
Rake - asphalt type	4
Rake - asphalt type, 10 foot	1
Rake - earth type, 5 foot	20
Rake - extension for asphalt rake 10 foot	4
Rake - extension for asphalt rake 10 foot	1
Rake - metal lawn type	5
Rappo manhole cover cushion	9
Ratchet wrench - 3/8 inch drive	1

Village Creek WWTP - Collection System Tool and Supplies Inventory

Item	Invntry
Reel - for wash down hose	1
Road cone post for vehicle mounting	1
Road cones - 28 inch orange	?
Rock bar (crowbar) - 5 foot	1
Rod - sectional 36 inch x 5/16 inch (loose)	54
Rod Assembly Wrench	1
Rod assembly wrench - 5/16" rod	25
Rod pick up tool	8
Rod Pull Out tool	14
Rod puller	2
Rod Storage Reel - 350 foot capacity	4
Rod storage reel "eye" guide	20
Root saw - 10 inch concave blade only	4
Root saw - 10 inch standard blade only	5
Root saw - 10 inch standard blade w/adaptor rod	1
Root saw - 10 inch standard blade w/HRC adaptor	3
Root saw - 12 inch concave blade only	10
Root saw - 12 inch concave blade w/adaptor rod	7
Root saw - 12 inch extra curl blade only	6
Root saw - 12 inch extra curl blade w/adaptor rod	11
Root saw - 12 inch standard blade only	9
Root saw - 12 inch standard blade w/adaptor rod	6
Root saw - 12 inch standard blade w/HRC adaptor	5
Root saw - 15 inch extra curl blade only	3
Root saw - 15 inch standard blade only	6
Root saw - 15 inch standard blade w/adaptor rod	3
Root saw - 15 inch standard blade w/HRC adaptor	9
Root saw - 18 inch extra curl blade only	3
Root saw - 18 inch extra curl blade w/adaptor rod	5
Root saw - 4 inch concave blade w/adaptor rod	9
Root saw - 4 inch standard blade w/adaptor rod	15
Root saw - 6 inch concave blade w/adaptor rod	6
Root saw - 6 inch standard blade only	4
Root saw - 6 inch standard blade w/adaptor rod	11
Root saw - 8 inch concave blade only	27
Root saw - 8 inch concave blade w/adaptor rod	31
Root saw - 8 inch standard blade w/HRC coupling	2
Root saw - 8 inch with extra curl blade only	1
Root saw - 8 inch with extra curl blade w/adaptor rod	19
Root saw coupling - two tandem blades (Winters)	2
Safety harness	2
Safety harness	1
Sand trap elbow - 10 inch	1
Sand trap elbow - 15 inch	1
Sand trap elbow - 8 inch	2
Saw - reciprocating electrical type (Sawsall)	1
Sewer hose - 1 inch hose male end coupling	8
Sewer hose - 1 inch hose splice coupling	26
Sewer hose - 3/4 inch female end coupling - swivel type	45
Sewer hose - 3/4 inch hose male end coupling	68
Sewer hose - 3/4 inch hose splice coupling - long type	50
Sewer hose - 3/4 inch hose splice coupling - short type	25
Sewer hose -1 inch female end coupling - swivel type	2
Sewer hose reel - new, 1 inch sewer cleaning hse	9
Sewer hose reel - new, 3/4 inch sewer cleaning hose	4

Item	Invntry
Shovel - flat - 5 foot	11
Shovel - round/pointed - 5 foot	7
Shovel - spoon type - 8 foot	2
Shovel - trenching - 4 foot	2
Shovel extension for spoon shovel	1
Sledge hammer - 3 lb	3
Spear head cutter - 1.75 inch only	1
Spear head cutter - 1.75 inch w/adaptor rod	1
Spray lubrication - 3-36 type in can	91
Spray paint - Green	58
Sprayer - hand pump type	3
Squarebar Corkscrew - 10 inch only	9
Squarebar Corkscrew - 10 inch w/adaptor rod	4
Squarebar Corkscrew - 12 inch w/adaptor rod	11
Squarebar Corkscrew - 14 inch only	1
Squarebar Corkscrew - 14 inch w/adaptor rod	4
Squarebar Corkscrew - 4 inch w/adaptor rod	4
Squarebar Corkscrew - 6 inch w/adaptor rod	3
Three blade cutter - 10 inch blades	16
Three blade cutter - 12 inch blades	18
Three blade cutter - 6 inch blades	39
Three blade cutter - 8 inch blades	3
Three blade cutter - Chuck only	2
Tiger tail - sewer hose protective guide	0
Tracka sub surface locator, device w/sonds in case	1
Trap - 10 inch open top scoop type	0
Trap - 12 inch open top scoop type	1
Trap - 6 inch open top scoop type	0
Trap - 8 inch open top scoop type	0
Trap pole - Fiberglass, threaded 5 foot	0
Tripod only - manhole entry	3
Upper manhole hose roller	2
Utility trailer - flat with ramps	1
Wash down gun - machine gun grip type	1
Wash down hose - 1/2 inch x 10 foot	1
Wash down hose - 1/2 inch x 20 foot	1
Weed trimmers - gas operated	4
Wheel barrow complete	1
Wheel barrow kid - opened but not assembled	2
Wheel barrow kit - boxed	2
Wheel chock sets - small	8

Appendix C Inventory Checklist for Wash Trucks and Combination Cleaners

Wash Truck Inventory List

Nozzles		
Radial (Enz)	1	☐
Chisel (Enz)	1	☐
Bull Dog	1	☐
Hydraulic root cutter	1	☐
Grenade	1	☐
Brass nozzle	1	☐

Fins/Proofers		
2-inch finned skid	1	☐
6-inch proofer	1	☐
8-inch proofer	1	☐
10-inch proofer	1	☐
12-inch proofer	1	☐
	1	☐

Hose Aids		
Leader hose (10 foot)	1	☐
Tiger tail	2	☐
Upper MH roller	1	☐

Traps		
6-inch open top	1	☐
8-inch open top	1	☐
10-inch open top	1	☐
12-inch open top	1	☐
5-foot Fiberglass pole:	4	☐

Access Tools		
Cover hook - JC type	2	☐
Hydrant wrench	1	☐
Wheel chocks	2	☐
Counter wheel	1	☐
100-foot reel tape	1	☐
50-foot fill hose rolls	1	☐

Long Tools		
Fork head	1	☐
Chopper head	1	☐
12-foot Pincher shovel	1	☐
10-foot Pincher shovel	1	☐
8-foot Pincher shovel	1	☐
Rock bar	1	☐

Hand Tools		
Brush cutter (Gerber)	1	☐
Brush axe	1	☐
Shovel - round	1	☐
Shovel - flat	1	☐
Sledge - 12 lb	1	☐

Mechanical Tools		
Socket set tool box	1	☐
Asstd tools - tool box	1	☐
Grease gun	1	☐
Spray lube	1	☐
18-inch pipe wrench	2	☐
Hose reel crank	1	☐

Traffic Safety		
Road cones orange	12	☐
Stop/slow paddles	1	☐
Road work sign set	1	☐

SSORRP		
SSO measuring stick	1	☐
SSO Signage	2	☐

Misc. Item		
Green paint	2	☐
Rags (several)	1	☐
Dye - yellow/green	2	☐
Atlas map	1	☐
Caution/flag tape roll	2	☐
Rain gear sets	2	☐
Radio - hand held	2	☐
Boots - calf high	2	☐
Spot light	1	☐
Flashlight	1	☐
Water jug or cooler	1	☐
Anti bacterial soap	1	☐
Burlap sacks	5	☐
5-gallon bucket	1	☐
Vice mounted on bed	1	☐
Nozzle orifice cleaner	1	☐

PPE		
Gloves - leather	2 pair	☐
Gloves - rubber	2 pair	☐
Gloves - latex	1 box	☐
Safety glasses	2	☐
Hard Hat	2	☐
Hearing - push-ins	1 box	☐
Tyvek suits	2	☐
Dust mask	1 box	☐
Mirror	1	☐
Magnet	1	☐
Snake chaps	1	☐

Nozzle Type		Grease	Roots	Grit/Sags	Stoppage	Exploration	Proofer
	Std Radial		●	◑	◑	○	○
	Grenade	○	●	○	●	◑	●
	Chisel Point	●	●	●	○	●	◑
	Bulldog	○	○	◔	●	◑	●
	Root Cutter	◑	○	●	◔	●	●

Legend	○	◑	◔	●
	Best use	Can work	Limited use	Not suitable

Appendix D Inventory Checklist for Rod Trucks

Standard Inventory List for Rod Trucks

Rod Operation		
5/16" x 36" rod	350'	
Rod Turning Mach	1	
Gas can - 2 gal	1	

Galvanized Pipe		
2' pipe	2	
3' pipe	2	
4' pipe	3	
5' pipe	2	
6' pipe	2	
8' pipe	2	
10' pipe	2	
Pipe Couplings	6	
30° Bend with end	2	

Rod Tools		
4" Root saw	2	
6" Root saw	2	
8" Root saw	2	
4" Auger	2	
6" Auger	2	
1.5" Spear head	2	
3" Spear head	2	
Assembly wrench	2	
Pull out handle	1	

Traps		
6" Open top	1	
8" Open top	1	

PPE/Safety		
Gloves - leather (pr)	8	
Gloves - rubber (pr)	8	
Gloves - latex (box)	1	
Safety glasses	4	
Hard Hat	4	
Boots - knee high (pr)	4	
Rain gear (sets)	4	
Hearing push-ins - box	1	
Tyvek suits	2	
Dust masks - box	1	
SSO Signs	5	
Snake chaps (sets)	4	

Set Up & Access tools		
Cvr hook JC type	2	
Cvr hook cold rolled	1	
wheel chocks	2	
Counter wheel	1	
100' Reel tape	1	
Mirror	1	
Magnet with rope	1	
Steel palm mitts (pairs)	3	

Long Tools		
Fork head (pole)	1	
Chopper head (pole)	1	
12' Pincher shovel	1	
Rock bar - 12'	1	
Rock bar - 6'	1	

Traffic Safety		
Road cones orange	12	
Road work sign set	1	
Stop paddles	2	

CSE Equipment		
Tripod	1	
Winch (manual haul)	1	
Blower	1	
Bellows 20' min	1	
Harness	1	
Gas detector	1	

Hand Tools		
Brush cutter - Gerber	1	
Brush axe	2	
Shovel - round	2	
Shovel - flat	2	
Shovel - trench	1	
Sledge 16 lb	1	
Rake - metal leaf type	1	
Rake - metal earth type	2	
Post hole digger	1	
Mattock	2	
T handle probe - 5'	1	
Concrete mixing hoe	1	
Wheel barrow	1	
Concrete trowel	2	
Push broom	1	

Misc Item		
Green paint	2	
Rags - some/several	1	
Dye - yellow/green	2	
Atlas map	1	
Petzl head lamps	4	
Caution/flag tape roll	2	
Rain gear sets	4	
Radio - hand held	4	
Boots - calf high (pr)	4	
Flashlight	4	
Water jug or cooler	1	
Anti bacterial soap	1	
SSO measuring stick	1	
10' Chain 3/8" link	1	
Level - 4'	1	
Manhole cushion	5	
Rachet straps (set)	2	

Mechanical Tools		
Socket set tool box	1	
Asstd tools box	1	
Grease gun	1	
Assorted sprays	1	
Pipe wrench 24"	2	
Bolt/Chain cutter	1	

Misc supplies		
Water in 50 gal tank	25	
5- g bucket lime	3	
5- g bucket quickcreet	3	
5- g bucket concrete	2	
5- g bucket sand	3	
Spare MH cover 20"	2	
Spare MH cover 22"	2	
MH Riser - steel	2	
MH Frame - 20"	1	
Burlap sacks	12	

Rodder Tools		Grease	Roots	Grit/Sags	Stoppage	Exploration
	Root Saw	◐	○	●	◐	◐
	Concave Saw	◐	○	●	◐	◐
	1.5" Spear Point	●	●	●	○	●
	Auger	○	○	●	●	◐
	Square Bar	◐	◐	●	○	◐
	3-Blade cutter	○	○	●	●	●

Legend

○ Best use

◐ Can work

● Not suitable

Appendix E Inventory Checklist for TVI Vans

Standard Inventory List for TVI Vans

Cameras			Other Items		
Pan & tilt camera	1		Lime green spray paint	2	
Camera transporter	1		Liquid dye (green and purple)	2	
Hydrauic root saw	2		5-gallon bucket	2	
			Locator/metal detector	1	
Expanders and Wheels			Flagging tape	2 roll	
Set up for 8-inch pipe	1		Rags	box	
Set up for 10-inch pipe	1		Radio	2	
Set up for 12-inch pipe	1		Spotlight	2	
Set up for 15-inch pipe	1		Flashlight	2	
			Water jug	1	
Cable Aids			Toilet bowl cleaner	1	
Tiger tail	1		Water repellant spray	1	
Upper manhole roller	1		Spray lube	1	
Lower manhole roller	1		Grease gun	1	
Large hook winch	1		Mirror	?	
Small hook winch	1		Magnets	2	
			Rope (100-feet)	1	
Hand Tools					
Cover hook	2		**Personal Protective Devices**		
5-foot fiberglass poles	8		Safety glasses	2 pair	
Probe bar	1		Hard Hat	2	
Pick	1		Hearing - push ins	1 box	
Flat shovel	1		Rubber gloves	2 pair	
Round shovel	1		Canvas gloves	2 pair	
Broom	1		Latex gloves	1 box	
12-lb. sledge hammer	1		Rain Gear	2 sets	
Saw	1		Mid-length boots	2 pair	
Lopers	1		Antibacterial soap	1	
Brush cutter	1		Fire extinguisher	1	
Brush axe	1		First aid kit	1	
Metal detector	2		Snake chaps	1	
Measuring Wheel	3		Tyvek suits	box	
Story pole	1				
			SSORRP		
Traffic Safety Devices			SSO Signage		
Road cones	12		SSO meauring stick		
Raod work signs	set				
Stop/slow paddles	2				
Wheel chocks	4				

See other side for additional inventory

Standard Tool Box Inventory List for TVI Vans

25- and 100-foot tape measures	
Adjustable wrench - large	
Adjustable wrench - small	
Allen wrench set	
American standard cresent wrench set (7/16-inch to 3/4-inch)	
Bailing wire	
Channel locks	
Deep well sockets (if needed for truck)	
Duct tape	
Electrical tape	
Flat head screw driver - large	
Flat head screw driver - small	
Hack saw	
Phillips head screw driver - large	
Phillips head screw driver - small	
Pipe wrench (2)	
Pliers	
Side cutters	
Small hammer	
Small socket set and American standard sockets 3/8-inch drive	
Socket for draining pump	
1 1/8-inch socket	
1-inch socket	
T-handle Allen wrench (for truck-sized Allen scres)	
Utility knife	
Wire cutters	

Appendix F Sample Construction Division Tool Room Inventory

Item	Inventory
Air Compressor, Towable	2
Air Spade	2
Asphalt Cutter w/ trailer	1
Bend, 11° - 4"	18
Bend, 22° - 4"	11
Bend, 45° - 4"	17
Bend, 90° - 4"	3
Blower - Yard Type	1
Blower - for manholes	2
Boots, Rubber, Size 7	2
Boots, Rubber, Size 8	3
Boots, Rubber, Size 9	0
Boots, Rubber, Size 10	1
Boots, Rubber, Size 11	3
Boots Rubber, Size 12	5
Boots Rubber, Size 14	3
Brick	125
Broom, Household	1
Broom, Push	2
Broom, Street	12
Burlap Bags	1000
Bush Axe	0
C-900 Pipe - 4", 20ft. Joint	75
C-900 Pipe - 6", 20ft. Joint	17
C-900 Pipe - 8", 20ft. Joint	33
C-900 Pipe - 10", 20ft. Joint	10
C-900 Pipe - 12", 20ft. Joint	5
C-900 Pipe - 16", 20ft. Joint	1
Chain Saw -18" bar	1
Chain Saw -24" bar	1
Concrete Bucket	2
Cone, Orange w/ reflective stripes	30
Cooler, 1-Gal.	0
Cooler, 5-Gal.	5
Discharge Hose, 3"	500'
Discharge Hose, 8"	800'
Disposable Coveralls	50
Duct Tape, Roll	1
Ductile Iron Pipe - 4", 20ft. Joint	1
Ductile Iron Pipe - 6", 20ft. Joint	1
Ductile Iron Pipe - 8", 20ft. Joint	1.5
Dust Mask - Box	1
Ear Plugs - Corded, Pair	30
Flange & Gasket - 4"	145
Flange & Gasket - 6"	50
Flange & Gasket - 8"	21
Flange & Gasket - 10"	20
Flange & Gasket - 12"	11
Flat Snake, 50'	1
Flex Pipe - 18"	3
Flex Pipe - 24"	3
Flex Pipe - 32"	1
Floor Buffer	1
Gas Can, 2-Gal.	6
Gas Monitor	2
Generator, Portable	2
Grease, 5-Gal. Bucket	1
Grease Gun - Small	2
Grease Pump, for 5-Gal. Bucket	1
Hard Hat	2
Hoe - for concrete mixing	3
Inserta Tee, 4" - for 6" C-900	24
Inserta Tee, 4" - for 6" D.I.	5
Inserta Tee, 4" - for 8" D.I.	5
Inserta Tee, 4" - for 8"C-900	24
Inverted Marking Paint, Green	87
Jackhammer	2
Lawn Mower, Push	1
Lawn Mower, Riding	1
Level - 4'	5
Lifting Sling - 4'	14
Lifting Sling - 6'	5
Lifting Sling - 8'	11
Light Source w/ generator	1
Machete	6
Manhole Base - 2'	4
Manhole Base - 3'	2
Manhole Base 4'	3
Manhole Base/Cone	1
Manhole Cone - 2'	2
Manhole Cone - 3'	0
Manhole Cone - 4'	3
Manhole Ring & Cover, Bolt-down	3
Manhole Ring & Cover, Low profile	0
Manhole Ring & Cover, Standard	19
Manhole Riser - 16"	5
Manhole Riser - 32"	2
Manhole Riser - 48"	2
Mission Coupling, Clay-D.I - 4"	65
Mission Coupling, Clay-D.I. - 10"	0
Mission Coupling, Clay-D.I. - 12"	21
Mission Coupling, Clay-D.I. - 15"	6
Mission Coupling, Clay-D.I. - 6"	61
Mission Coupling, Clay-D.I. - 8"	149
Mission Coupling, D.I.-D.I. - 8"	0
Mission Coupling, D.I.-Liner - 8"	30
Mop Handle	3
Mop Head	3
Mop Bucket	2
Multi-Range Pipe Plug	2
Oil Dry, Bag	60
Pick - with handle	1
Pintle Hitch	5
Pipe Saw	3
Pipe Saw Blade - Concrete	40
Pipe saw Blade - Metal	50
Plug - 8"	2
Plug - 12"	3
Plug - 18"	1
Posthole Digger	2
Pressure Washer	1
Pump, 3" - Gas Powered	2
Pump, 3" - Electric	2
Pump, 3" - Air Powered	2
Pump, 8"	1
Quickset, 5-Gal. Bucket	34
Quikrete, 80lb Bag	24
Rain Suit, XL	8
Rain Suit, 2X	13
Rain Suit, 3X	11
Rake, Street	4
Rake, Yard	1
Ratchet Chain Binder	8
Recipricating Saw (Sawsall)	1
Saddle - 4"	65
Road Ramp for Pumps	2
Safety Harness	1
Sand blaster	1
ShopVac	2
Shovel, Flat	15
Shovel, Round	6
Shovel, Track, Short Handle	9
Shovel, Track, Long Handle	13
Sledge Hammer, 36"	2
Sleeve, D.I. - 4"	16
Sleeve, D.I. - 6"	11
Sleeve, D.I. - 8"	8
Sleeve, D.I. - 12"	2
Sleeve, D.I. - 16"	1
Spray Lubricant	11
Sprayer - yard type	1
Suction Hose, 3"	20'
Suction Hose, 8"	40'
Tee - 6"x6"x6"	6
Tee - 8"x8"x4"	1
Tee - 8"x8"x6"	2
Tee - 8"x8"x8"	2
Tracing Dye, Green, Bottles	116
Tracing Dye, Orange, Bottles	72
Tracing Dye, Red, Bottles	4
Trench Box - Build-A-Box 8' and 10' length	1
Trench Box, for Manholes	2
Trench Box, Steel - 10'	2
Trench Box, Steel - 24'	1
Tripod - for manhole entry	1
Utility Trailer - flat w/ ramps	4
Vacuum, Household	1
Weed Trimmer	1
Wheelbarrow	5
Wrap-around, Stainless, Liner, 8"	10

Appendix G Sample Pump Station Inventory List

7/26/07

Inventory Standard

7/26/2007 JEFFERSON COUNTY ENVIRONMENTAL SERVICES Pa

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
.	Hyd. Pump 20 Hp, *See Specs.	6308ZZ	KBC	MS-R4A-S3	2.00	$23.33	BRNG
AIR-COMP-GR002	Air Compressor Mays Village AC Voltage	1119696000	Gorman Rupp	EL-C3-S3	1.00	$0.00	COMPRE
AIR-COMP-VAC-001	Air Compressor	M01310T5	Air Dimensio	EL-C2-S2	0.00	$0.00	COMPRE
AIR-COMP-VAC-003		4Z436	THOMAS	EL-C2-S1	0.00	$1.00	COMPRE
AIR-COMP-VAC-004	1/20 HP 5 Max/5 Constant	5Z347	GRAINGER	MZ-R10-S2	6.00	$201.00	COMPRE
AIR-COMP-VAC-005	Compressor, 1/12 HP, 115 Volt, Frame, Mason City		GRAINGER	MZ-R10-S1	0.00	$249.00	COMPRE
AIR-COMP-VAC-006	Compressor, 1/8 HP, 115 Volt, 3.1 Amp, 26" Max	5Z646	GRAINGER	MZ-R10-S2	3.00	$200.25	COMPRE
AIR-COMP-VAC-007	1/20 HP Compressor For Blueridge	5Z-346	GRAINGER	MZ-R10-S2	0.00	$148.05	COMPRE
AIR-COMP-VAC-008	1/12 HP Compressor, For Chapel Drive #2	4Z791	GRAINGER	MZ-R10-S2	1.00	$138.80	COMPRE
AIR-COMP-VAC-009	Air Compressor, 1/2 HP Max/50 Constant, Morgan/Grn	819	GRAINGER	MZ-R10-S2	3.00	$589.48	COMPRE
AIR-COMP-VAC-010	Air Compressor for Mississippi & Collegeville	b49	GRAINGER	MZ-R10-S1	2.00	$376.45	COMPRE
AIR-COMP-VAC-011	1/6 Hp Compressor For Warrior WWTP	2Z 867	GRAINGER	MZ-R10-S1	1.00	$279.90	COMPRE
AIR-COMP-VAC-012	Vacuum Prime Pump For Ellis Road	1VBF-10-M100X	GAST	MZ-R10-S1	2.00	$514.00	COMPRE
AIR-COMP-VAC-FAN001	Fan For GH505B Vaccum Prime Purmp	1868025	GRAINGER	EL-C7-S6	4.00	$12.70	COMPRE
AIR-COMP-VAC-S&L001	Air Compressor For Walker Avenue	9L25	S & L	MZ-R9-S2	1.00	$1.00	COMPRE
AIR-COMP-VAC-VREED001	Valve Reed For GH 505B Vacuum Prime Pump	1868728	GRAINGER	EL-C7-S6	20.00	$6.54	COMPRE
AIR-PUMP-D.C.-GR001	D.C. Air Pump, Gorman Rupp, Lake Sterling	48221-044	GORMAN RUPP	EL-C3-S3	0.00	$323.00	AIRPUM
AIR-PUMP-D.C.-GR002	D.C. Air Pump For Gorman Rupp Pump Stations	26813-009	GORMAN RUPP	EL-C3-S3	2.00	$160.95	AIRPUM
AIR-PUMP-WISA-001	Wisa Air Pump For Gorman Rupp Bubbler System	03048221-022	WISA	ELEC-C3-2	-1.00	$322.55	AIRPUM
AIR-PUMP-WISA-002	Wisa Air Pump For Gorman Rupp Bubbler System	26813-007	WISA	EL-C3-S3	3.00	$284.28	AIRPUM
AIR-PUMP-WISA-REP-001	Wisa Air Pump Repair Kit	03026813-903	WISA	ELEC-C3-3	3.00	$19.75	AIRPUM
AIR-SEAL-001	Large Air Seal For Scotts Blower	8500390	GAR/DEN	GA-C14	0.00	$312.00	BRNG
AIR-SEAL-002	Small Rotor Shaft Seal For Scotts Blower	8500389	GAR/DEN	GA-C14	2.00	$342.62	BRNG
BACK-FLPV-001	BackFlow Preventer 3/4"	6A770A	GRAINGER	MS-R5-S2	1 00	$183.00	BFLPV
BACK-FLPV-002	BackFlow Preventer 1"	6A771	GRAINGER	MS-R5-S2	0.00	$182.55	BFLPV
BACK-FLPV-003	BackFlow Preventer 3/4" - Watts Brand Overton 1	009-QT RPZ	WATTS	MS-R5-S2	2.00	$148.00	BFLPV
BACK-FLPV-004	BackFlow Preventer 1" - Watts Brand	009-QT RPZ	WATTS	MS-	1.00	$160.00	BFLPV
BACK-FLPV-005	BackFlow Preventer 2" For Shades Site & BIO Filter	909-QT RPZ	WATTS	MS-R5-S2	0.00	$439.84	BFLPV
BACK-FLPV-006	BackFlow Preventer 3/4" For Shades Site	909-QT RPZ	WATTS	MS-R5-S2	2.00	$155.00	BFLPV
BACK-FLPV-007	BackFlow Preventer 1" Mt. View, Maysvillage	909 -QT RPZ	WATTS	MS-R5-S2	1.00	$189.00	BFLPV
BACK-FLPV-008	BackFlow Prventer 2", Watts Bio-Filter/Shades Site	909- QT RPZ	WATTS	MS-R5-S2	1.00	$542.00	BFLPV
BACK-FLPV-009	BackFlow Preventer 1/2" Watts Brand	009-QT RPZ	WATTS	MS-R5-S2	1.00	$104.00	BFLPV
BACK-FLPV-010	BackFlow Preventer 2"	009-QT RPZ	WATTS	MS-R5-S2	1.00	$343.00	BFLPV
BATT-RAD-001	Battery For Radio	HNN-9629	ALLCOM	HC1-R1-S5	4.00	$51.00	BATTRY
BATT-RAD-002	Battery For Radio	NTN-7144	ALLCOM	HC1-R1-S5	2.00	$90.00	BATTRY
BATTERY-PS-001	Emergency Rechargeable Battery Pack For Patton #1	PS670	POWERSONICS	EL-C3-S1	10.00	$22.00	BATTRY
BATTERY-RADIO-001	Radio Batteries, High Capacity For GTX Portable Ra	MNN9628		-	5.00	$70.00	BATTRY
BATTERY-RADIO-002	Radio Batteries, Ultra Capacity For MTS-2000 Radio	NTN7144		-	3.00	$90.00	BATTRY
BATTERY-SAMPLER-001	AC Back Up Power Supply For Sigma 900 Sampler at W	1803	HACH CO.	CHMS-R2-S1	1.00	$488.00	BATTRY
BELT-001	Belt			GA	0.00	$0.00	BELT
BELT-002	Belt	3L-290	INDU SUPPLY	GA-W61	5.00	$0.00	BELT
BELT-003	Belt			GA	0.00	$0.00	BELT
BELT-004	Belt			GA	0.00	$0.00	BELT
BELT-005	Belt For Edgewater Oaks Pump #2	3VX710	DAYCO	GA-W64	6.00	$8.21	BELT
BELT-006	BeltScotts Inf. P/House Exfan	4L340		GA-W58	6.00	$0.00	BELT
BELT-007	Belt			GA	0.00	$0.00	BELT
BELT-008	BeltMorgan G/wood 2 Pump 1	5V900		GA-W47	3.00	$0.00	BELT
BELT-009	Belt	5VX600		GA-W28	25.00	$0.00	BELT
BELT-010	Belt			GA			BELT
BELT-011	Belt			GA			BELT
BELT-012	Belt	9480		GA-W13	9.00	$0.00	BELT
BELT-013	Belt	AP60		GA-W22	5.00	$0.00	BELT
BELT-014	Belt	B33		GA-W08	2.00	$0.00	BELT
BELT-015	Belt	B46		GA-W12	6.00	$0.00	BELT
BELT-016	Belt	B51		GA-W16	5.00	$0.00	BELT
BELT-017	Belt			GA			BELT
BELT-018	Belt for John D. 345 & Carbon T #5 (Scotts)& Bio	B62	DAYCO	GA-W78	15.00	$7.13	BELT
BELT-019	Belt	B64		GA-W34	26.00	$0.00	BELT
BELT-020	Belt	B67		GA-W35	3.00	$0.00	BELT

Belt, Scotts Scum Pump B63

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Inventory Standard

JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BELT-021	Belt			GA	0.00	$0.00	
BELT-022	Belt	B81		GA-W44	1.00	$0.00	BELT
BELT-023	Belt			GA	0.00	$0.00	BELT
BELT-024	Belt			GA			BELT
BELT-025	Belt for #1 Clarifier Exhaust Fan at Scotts	BP64	CARLISLE	GA-W80	4.00	$6.17	BELT
BELT-026	Belt Hopewell Fan	~~BP68~~ B68		GA-~~74~~ W72	0.00	$0.00	BELT
BELT-027	Belt	BX100		GA-W50	0.00	$0.00	BELT
BELT-028	Belt	BX120		GA-W90	5.00	$0.00	BELT
BELT-029	Belt			GA			BELT
BELT-030	Belt RAS Pump at Scotts	BX90		GA-W65	5.00	$0.00	BELT
BELT-031	Belt			GA	0.00	$0.00	BELT
BELT-032	Belt			GA			BELT
BELT-033	Belt			GA			BELT
BELT-034	Belt			GA	0.00	$1.00	BELT
BELT-035	Belt		GATES	GA			BELT
BELT-036	Belt	3VX500		GA-W15	-1.00	$0.00	BELT
BELT-037	Belt	B 128		GA-W57	3.00	$0.00	BELT
BELT-038	Belt			GA	0.00	$0.00	BELT
BELT-039	Belt For Brummitt Heights, K-Mart Med. C/East, Greenwood	5VX800		GA-W59	12.00	$0.00	BELT
BELT-040	Belt G/R,Acad. Dr ,Vin.Trace, SeeSpec's	3 V X 850 → X	DAYCO	GA-W63	7.00	$9.86	BELT
BELT-041	Belt	BP60		GA-W26	4.00	$0.00	BELT
BELT-042	Belt			GA	0.00	$0.00	BELT
BELT-043	Belt	5 L 310		GA-W06	6.00	$0.00	BELT
BELT-044	Belt	BP63	INDU SUPPLY	GA-W60	3.00	$6.32	BELT
BELT-045	Multi V-Belt	BP118	INDU SUPPLY	GA-W91	4.00	$11.38	BELT
BELT-046	Belt, Academy Drive Pump #2	3VX670	DAYCO	GA-W81	3.00	$7.76	BELT
BELT-047	Belt, Vineyards Pump #1	3VX800	DAYCO	GA-W82	3.00	$9.20	BELT
BELT-048	Belt, Edgewater Oaks Pump #1	3VX900	DAYCO	GA-W83	3.00	$10.72	BELT
BELT-049	Belt, The Cottages For Engine	5VX710	DAYCO	GA-W84	3.00	$19.12	BELT
BELT-050	Cottages P#2, Crosshaven Eng, Bio F. Fans, Vineyar	5VX750	DAYCO	GA-W85	7.00	$20.31	BELT
BELT-051	Belt, Crosshaven Pump #2, ~~Morgan Greenwood #1~~ Pump	5VX850	DAYCO	GA-W92	15.00	$23.19	BELT
BELT-052	Belt, Morgan Greenwood Pumps 1 & 2	5VX900	DAYCO	GA-W87	3.00	$24.07	BELT
BELT-053	Belt, The Cottages Pump #1, Crosshaven Pump #1	5VX950	DAYCO	GA-W88	3.00	$26.02	BELT
BELT-054	Belt For #4 Carbon Tower at Scotts	BP 75 —		GA-W94	12.00	$6.85	BELT
BELT-055	Belt For RAS Pumps at Scotts Branch	BP93	CARLISLE	GA-W75	9.00	$8.78	BELT
BELT-056	Belt For RAS P / Scotts /Parkwood CT	BX94		GA-W79	9.00	$15.41	BELT
BELT-057	Belt For #3 Carbon Tower at Scotts	BX41 —	CARLISLE	GA-W73	6.00	$5.75	BELT
BELT-058	Belt For Muffin M. at I-59 (See Belt-059/3VX315)	2L381	GRAINGER/DAY	GA-W72	6.00	$9.06	BELT
BELT-059	Belt For Riverchase (See BELT-058)	3VX315	GOODYEAR	GA-W67	6.00	$5.48	BELT
BELT-060	Belt For Generator at Overton II	178597	CUMMINS	GA-W57	6.00	$40.37	BELT
BELT-061	Belt, The Cottages, For Engine	GA-W84	DAYCO	GA-W84	3.00	$19.12	BELT
BELT-062	Belt For Edgewater Oaks	3VX710	GOODYEAR	GA-W56	4.00	$9.56	BELT
BELT-BAND-BLWR-001	5 Matched Belts - Band - Makes One (1) Set, Scotts	R5VX1000-BAND	INDU SUPPLY	MS-R7-S3	2.00	$195.05	BELT
BELT-BLWR-001	Belt Blowers at Scotts & GR/P Fox Hollies/SEE SPEC	5VX1000		GA-W89	25.00	$33.66	BELT
BELT-BLWR-002	G/R, War.Blwr, Truss.#2, Scotts Br.See Spec's	3VX560		GA-W86	12.00	$7.63	BELT
BELT-BLWR-003	Belt For Blower at Warrior	3 V X 450		GA	0.00	$0.00	BELT
BELT-BLWR-004	Belt	AP31	INDU SUPPLY	GA-W7	2.00	$3.15	BELT
BELT-BLWR-005	Belt For Blower at Newfound	3L430	DAYCO	GA-W60	7.00	$3.80	BELT
BELT-CLAR-001	Belt For Scott's Clarifier	B 60		GA			BELT
BELT-EDGER-001	Belt For the Edger	84300		GA			BELT
BELT-LNMR-001	Belt For the Gravley Lawnmower, 44" Deck	A115		GA-W51-52	6.00	$0.00	BELT
BELT-LNMR-002	Belt For the Flail Mower	B58		GA-W20	5.00	$0.00	BELT
BELT-LNMR-003	Belt For Kubota Mower Small PTO	6931	GATES	GA-W68	6.00	$14.01	BELT
BELT-LNMR-004	Belt For Kubota Mower Large PTO	6934	GATES	GA	0.00	$0.00	BELT
BELT-LNMR-005	Belt For Kubota Mower Large 54"	76529-34710		GA	1.00	$0.00	BELT
BELT-LNMR-006	Belt For Gravley Mower Large 54"	A128		GA-W53	10.00	$0.00	BELT
BELT-LNMR-007	Belt For Kubota Mower Small 44' (Scotts RAS Pump)	B94	GATES	GA-W49	1.00	$0.00	BELT
BELT-LNMR-008	Belt For PTO on Kubota 1800, *See Specs.	L534	DAYCO	GA-W70	0.00	$21.30	BELT
BELT-LNMR-009	Belt For John Deer 345	M118685	TRAC & TURF	GA-W76	5.00	$29.25	BELT

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JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BELT-LNMR-010	Belt For PTO on Kubota 1600	L531	DAYCO	GA-W02	0.00	$6.57	BELT
BELT-LNMR-011	Belt For Lawnmower	L532	DAYCO	GA-W66	10.00	$6.73	BELT
BELT-LNMR-012	Belt For Deck on B7300 Kubota	70000-73997	KUBOTA	GA-W77	4.00	$34.65	BELT
BELT-LNMR-013	Belt For PTO 1600 Kubota	58X310	CARLISLE	GA-W62	10.00	$4.75	BELT
BELT-LNMR-014	Belt For JD #345 NEW DECK 48"	M110313	LAWN&TRACTO	GA-W63	0.00	$28.75	BELT
BELT-PUMP-001	Belt For the Pump at Airport& Maysvillage	3VX630		GA-W31	20.00	$0.00	BELT
BELT-PUMP-002	Belt For Pump at Gdale and Truss 2	5VX560	INDU SUPPLY	GA-W71	8.00	$0.00	BELT
BELT-PUMP-003	Belt For Pump at McAdory	3VX600		GA-W24	10.00	$0.00	BELT
BELT-PUMP-004				GA	0.00	$0.00	BELT
BELT-ROTOR-001	Belt For Rotors at Warrior	B70		GA-W40-42	2.00	$0.00	BELT
BELT-VLR-001	Poly Chain Belt For VLR at Scotts Branch	14MGT-4410-68	GATES	MS-R6-S3	2.00	$620.32	BELT
BLADE-LAWNM-001	Lawn Mower Blade For Promaster60 Gravely	25124	RIVER-LAWN	GA-LN-C	12.00	$7.95	BLADE
BLADE-LAWNM-002	Lawn Mower Blade For 50" Deck Gravely	11234	RIVER-LAWN	GA-LN-C	6.00	$6.95	BLADE
BLADE-LAWNM-003	Lawn Mower Blade For John Deere 345	M115496	TRAC & TURF	GA-LN-C	11.00	$9.50	BLADE
BLADE-LAWNM-004	Lawn Mower Blade For 1600 Kubota-Replaces Blade #7	70000-00604	CAHABA TRAC	GA-LN-C	21.00	$6.33	BLADE
BLADE-LAWNM-005	Lawn Mower Blade For Kubota 7300 & 1800	76529-34330	CAHABA TRAC	GA-LN-C	9.00	$12.94	BLADE
BLWR-EXPANCHAM-001	Expansion Chamber #AST 60195, Scotts Blower			-			GRSL
BLWR-FANW-001	Fan Wheel For Allegro Blower Model 9505	9509-09		-			BLOWER
BLWR-OILER-001	Constant Level Oiler #AST 60196, Scotts Blower			-	1.00	$165.00	GRSL
BLWR-ROOTS-001	Roots Blower 33-U-RAI	33-U-RAI	ROOTS	MS-R1B-S3	-1.00	$1,115.00	BLOWER
BLWR-SCRN-001	Socket Set Screen For Portable Allegro Blower	9500-01		-			BLOWER
BLWR-SEALMAG-001	Magnetic Seal, ISOMAG, For Scotts Blower	2625 MS3500	SEAL/RES.	GA-C3	0.00	$315.00	SEAL
BLWR-SHAFK-001	Shaft Key For Allegro Blower Model 9505	9505-09A		-			
BLWR-SHIM-001	Shim Set, Large Shaft, PN 8500257, Scotts Blower	8500257	GAR/DEN	GA-C14	12.00	$13.05	SHIMS
BLWR-SHIM-002	Shim Set, Small Shaft, PN 8500253, Scotts Blower	8500253	GAR/DEN	GA-C14	6.00	$12.96	SHIMS
BLWR-SP-001	3/4" Sight Plug For Blower	IU916	GRAINGER	GA-C25	10.00	$8.20	PLUGS
BLWR-SP-002	1/2" Sight Plug For Blower	IU917	EBARA	GA-C25	10.00	$7.84	PLUGS
BRNG-001	Bearing For Ashville Road	7305	BL	MS-R4A-S2	4.00	$39.28	BRNG
BRNG-002	Spare Bearing - No Name	35950		MS-R4A-S2	0.00	$14.55	BRNG
BRNG-003	Bearing For Clarifier at Scotts	B 2816	TIMKEN	MS-R3A-S1	0.00	$7.26	BRNG
BRNG-004	Bearing For Clarifier at Scotts	SJ 8406	RBC	MS-R4A-S1	1.00	$26.43	BRNG
BRNG-005	Bearing For Parkwood Carbon Tower	6308 2Z	SKF	MS-R4A-S2	1.00	$35.08	BRNG
BRNG-006	Bearing For Parkwood Carbon Tower	308 WG	TIMKEN	MS-R3A-S2	3.00	$27.00	BRNG
BRNG-007	Bearing For Graysville Pump Station	6308 ZZ	KBC	MS-R4A-S2	1.00	$16.48	BRNG
BRNG-BLWN-004	Bearing For Blower at Warrior	MR 1304		MS-R3A-S1	0.00	$0.00	BRNG
BRNG-BLWR-001	Bearing For Blower at Warrior	6206-2ZTN	BEARINGS	MS-R4A-S3	0.00	$3.03	BRNG
BRNG-BLWR-CON001	Bearing For Scotts Blower (Non Drive End)	NJ315E	CONSOL	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-BLWR-FAG-001	Bearing For Blower (Non. Dr)	NJ315E	SNR	MS-R1-S8	2.00	$1.00	BRNG
BRNG-BLWR-FAG001	Bearing For Blower at Scotts (Non Drive End)	NJ315E	FAG	MS-R3A-S1	-1.00	$0.00	BRNG
BRNG-BLWR-FAG002	Bearing For Blower at Scotts Branch	NJ312E.M1A.P53	FAG	MS-R3A-S2	1.00	$142.07	BRNG
BRNG-BLWR-FF001	Bearing For Blower at Warrior	304K	FAFNIR	MS-R3A-S1	11.00	$9.66	BRNG
BRNG-BLWR-FF002	Bearing For Blower at Warrior	304KDD	FAFNIR	MS-R3A-S1	1.00	$42.00	BRNG
BRNG-BLWR-KO-001	Bearing For Blower at Scott's Branch	7415 BGC3	KOYO	MS-R4A-S1	1.00	$380.00	BRNG
BRNG-BLWR-MRC001	Bearing For Blower at Scotts Branch	7415PJDU	MRC	MS-R4A-S1		$370.60	BRNG
BRNG-BLWR-NS001	Bearing For 5 HP Blower at Warrior	6205ZZ	NSK	MS-R4A-S3		$1.00	BRNG
BRNG-BLWR-NS002	Bearing For 5 HP Blower at Warrior	6206ZZ	NSK	MS-R4A-S3	-1.00	$1.00	BRNG
BRNG-BLWR-NTN-001	Bearing For Scotts blower (Non Drive End)	NJ315EC3	NTN	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-BLWR-NTN-002	Bearing For Scotts blower (Non Drive End)	NU312	NTN	MS-R3A-S2	1.00	$0.00	BRNG
BRNG-BLWR-NTN003	Bearing For Blower at Warrior	NR 304	NTN	MS-R3A-S2	5.00	$34.60	BRNG
BRNG-BLWR-NTN004	Bearing For Scotts Blower	7312 BL1G	NTN	MS-R4A-S2	0.00	$72.20	BRNG
BRNG-BLWR-NTN005	Bearing For Blower at Scotts	312 EV2	NTN	MS-R3A-S2	2.00	$127.69	BRNG
BRNG-BLWR-NTN006	Bearing For Blower at Scotts	7415 BMG	NTN	MS-R4A-S1	0.00	$344.28	BRNG
BRNG-BLWR-SK001	Bearing For Blower at Scotts Branch (Dr. End)	7312 BECBM	SKF	MS-R4A-S2	0.00	$164.73	BRNG
BRNG-BLWR-SK002	Bearing For Blower at Scotts Branch	7415 BCBM	SKF	MS-R4A-S1	3.00	$541.17	BRNG
BRNG-BLWR-SK003	Bearing For Blower at Scotts Branch	NJ312ECM	SKF	MS-R3A-S2	0.00	$183.05	BRNG
BRNG-BLWR-SK004	Bearing For Warrior Blower	NJ304ECP	SKF	MS-R3A-S2	1.00	$33.32	BRNG
BRNG-BLWR-SK005	Bearing For Blower at Warrior	6304-2Z-JEMUE01	SKF	MS-R4A-S3	1.00	$13.15	BRNG
BRNG-BLWR-SK006	Bearing For Blower at Warrior	6304-2Z/C3HT	SKF	MS-R4A-S2	0.00	$33.32	BRNG
BRNG-BLWR-SK007	Bearing For Blower At Scotts	7312BMG	SKF	MS-R4A-S2	1.00	$114.29	BRNG

Blade-Lawn Kubota Zero Turn #103212 K5576-34340

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BRNG-BLWR-SK008	Bearing-Blower at Scotts (Non Dr. End) *See Specs.	NJ315ECM	SKF	MS-R3A-S1	0.00	$292.62	BRNG
BRNG-BLWR-SK009	Bearing Pump Woods T. Scotts Blower Motor	6315-2ZJEM	SKF	MS-R4A-S2	1.00	$179.50	BRNG
BRNG-BLWR-SNR001	Bearing For Scotts blower (non drive end)	NJ315E	SNR	MS-R3A-S1		$0.00	BRNG
BRNG-BLWR-SNR002	Bearing For Blower at Amerex	NJ 306.E.615	SNR	MS-R3A-S2	2.00	$0.00	BRNG
BRNG-BLWR-SNR003	Bearing For Blower (Non. Dr)	NU312E	SNR	MS-R3A-S2	3.00	$0.00	BRNG
BRNG-BLWR-URB001	Bearing For Scotts Blower (Non Drive End)	NJ 315 EMAC3	URB	MS-R3A-S1	1.00	$104.03	BRNG
BRNG-BLWR-URB002	Bearing For Blower at Scotts	NJ 312 EMC3	URB	MS-R3A-S2	0.00	$127.69	BRNG
BRNG-CARRIER-001	Bearing Carrier Inlet Housing at Scotts/Blower	8502791	G DENVER	SHOP	1.00	$3,500.38	BRNG
BRNG-COMM-001	Bearing For Comminuter at Amerex	6309		MS-R4A-S3	0.00	$30.16	BRNG
BRNG-COMM-FF001	Bearing For Chicago Comminuter at Collegeville	215WDD	FAFNIR	MS-R3A-S2	4.00	$71.42	BRNG
BRNG-COMM-FF002	Bearing For Chicago Comminuter at Collegeville	5212W	FAFNIR	MS-R3A-S1	1.00	$69.32	BRNG
BRNG-COMM-FF003	Bearing For Comminuter at I-59	W307PP	FAFNIR	MS-R3A-S2		$1.00	BRNG
BRNG-COMM-FF004	Bearing For Chicago Comminuter at Pinewood	211KDD	FAFNIR	MS-R3A-S3	1.00	$37.55	BRNG
BRNG-COMM-FF005	Bearing For Comminutor at Pinewood	309KG	FAFNIR	MS-R3A-S2	2.00	$34.58	BRNG
BRNG-COMM-FM001	Bearing For Chicago Comminuter at Pinewood	211CC	FEDMOGAL	MS-R3A-S3	2.00	$49.85	BRNG
BRNG-COMM-MR002	Bearing For Chicago Comminuter at Pinewood	309ZZC	MRC	MS-R3A-S2	0.00	$0.00	BRNG
BRNG-COMM-MRC001	Bearing For Chicago Comminuter at Pinewood	211KDD	MRC	MS-R3A-S3	1.00	$37.55	BRNG
BRNG-COMM-NS001	Bearing For Chicago Comminuter at Pinewood	63309DDU	NSK	MS-R4A-S2	2.00	$0.00	BRNG
BRNG-COMM-SNR001	Bearing For Chicago Comminuter at Pinewood	3609NR	SNR	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-CON001	Bearing Motor	5404	CONSOL	MS-R4A-S3	4.00	$75.56	BRNG
BRNG-FA001	Myer Pump at Oak Grove	6305-2RSRC3	FAG	MS-R4A-S2	0.00	$1.00	BRNG
BRNG-FF001	Fafnir Bearing For Blue Ridge P.S.	316 WDDN	FAFNIR	MS-R3A-S1	2.00	$207.20	BRNG
BRNG-FF002	Bearing For Warrior Rotors	5306WG	FAFNIR	MS-R3A-S1	2.00	$0.00	BRNG
BRNG-FF003	Unknown	314K	FAFNIR	MS-R3A-S1	1.00	$0.00	BRNG
BRNG-FF004	Bearing For Prudes #1 - #1 Pump	308W	FAFNIR	MS-R3A-S2	0.00	$32.00	BRNG
BRNG-FF005	Bearing For Clarifier at Scotts	317 K	FAFNIR	MS-R3A-S1	1.00	$194.85	BRNG
BRNG-FF006	Bearing For Pump at Lewisburge #1	5310K	FAFNIR	MS-R4A-S3	4.00	$74.66	BRNG
BRNG-FLAIL-001	Bearing For Flail Mower	204 KRR	FAFNIR	MS-R3A-S3	4.00	$17.33	BRNG
BRNG-GU001	UNKNOWN	6212	GULF	MS-R4A-S3	1.00	$0.00	BRNG
BRNG-GU002	Riverchase Chicago Pumps	6215zz	GULF	MS-R4A-S3	2.00	$0.00	BRNG
BRNG-LNMR-FF001	Bearing For Flail Mower Can Use 207 KLL	207 KRR	MRC	MS-R3A-S3	1.00	$29.96	BRNG
BRNG-LNMR-MRC001	Bearing For Gravely 16G	5307C	MRC	MS-R3A-S1	1.00	$35.31	BRNG
BRNG-LNMR-MRC002	Bearing For Flail Mower (can use 207 KRR)	207 KLL	MRC	MS-R3A-S3	2.00	$24.96	BRNG
BRNG-LNMR-SK001	Bearing For Deck on Kubota Mower	6205ZZ	SKF	MS-R4A-S3	-2.00	$0.00	BRNG
BRNG-LNMR-TI001	Bearing For Deck On The Gravely Mower	L44643	TIMKEN	MS-R4A-S2	1.00	$5.20	BRNG
BRNG-LNMR-TI002	Bearing For Jack Shaft On Gravely Mower	L44610	TIMKEN	MS-R4A-S2	5.00	$2.19	BRNG
BRNG-LNMR-TI003	For Gravely Mower - 16G Use With LM11949	LM11910	TIMKEN	MS-R4A-S2	7.00	$2.58	BRNG
BRNG-LNMR-TI004	For Gravely Mower - 16G Use With LM11910	LM11949	TIMKEN	MS-R4A-S2	7.00	$4.84	BRNG
BRNG-MCSL-001	Bearing With Seal Assembly For Channel Monster at	A34320	JWC-ENV	MS-R4A-S2	0.00	$543.18	BRNG
BRNG-MCSL-002	For Muffin Monster Model 3005-18 at Visionland	A35320	JWC-ENV	MS-R1B-S3	0.00	$559.48	BRNG
BRNG-MM-001	Bearing/Bushing, Outer For M/Monster, Mod#CMO 1800	068027	NAT. HYD.	MS-R1B-S3	0.00	$10.80	BRNG
BRNG-MM-002	Bearing Thrust For M/Monster, Mod#CMO 1800	069017	NAT. HYD.	MS-R1B-S3	0.00	$11.70	BRNG
BRNG-MM-003	Bearing/Bushing, Inner For M/Monster, Mod#CMO 1800	071019	NAT. HYD.	MS-R1B-S3	0.00	$15.30	BRNG
BRNG-MM-004	Bearing Thrust For M/Monster, Mod#CMO 1800	68024	NAT. HYD.	MS-R1B-S3	0.00	$4.37	BRNG
BRNG-MM-005	Bearing Muffin Monster at Birmingham Zoo	30047-003	NACHI	MS-R4A-S2	4.00	$24.70	BRNG
BRNG-MOTOR-001	Motor Bearing at Jackson Heights, Kubota	205SFF	MRC	MS-R3A-S3	2.00	$8.15	BRNG
BRNG-MOTOR-002	Bearing For Motor at Wenonah	6212ZZ	CHINA	-	2.00	$14.51	BRNG
BRNG-MOTOR-BL001	Motor Bearing For Harriman	6206 2RS		MS-R4A-S3	5.00	$8.93	BRNG
BRNG-MOTOR-FAG001	Bearing For Motor On S&L Pump at Rice Creek	6207-ZZ/C3	FAG	MS-R4A-S3	0.00	$7.75	BRNG
BRNG-MOTOR-FF001	Bearing For Motor on S&L Pump at Morgan, Greenwood	207W	FAFNIR	MS-R3A-S3	3.00	$21.87	BRNG
BRNG-MOTOR-FF002	Bearing For Motor on S&L Pump at Morgan, Greenwood	5212CZZ	FAFNIR	MS-R3A-S1	-1.00	$57.19	BRNG
BRNG-MOTOR-FF003	Bearing For Motor on S&L Pump at Rice & Tin Mill	207KDD	FAFNIR	MS-R3A-S3	0.00	$13.12	BRNG
BRNG-MOTOR-FF004	Bearing For Motor on S&L Pump at Roberts	310KDD	FAFNIR	MS-R3A-S2	0.00	$39.05	BRNG
BRNG-MOTOR-FF005	Bearing For Motor on S&L Pump at Roberts,Tin Mill	209KDD	FAFNIR	MS-R3A-S3	3.00	$27.61	BRNG
BRNG-MOTOR-FF006	Motor Bearing at Sandusky	310KDDW	FAFNIR	MS-R3A-S2	3.00	$39.05	BRNG
BRNG-MOTOR-FF007	Bearing For Motor on Fairbanks Pump at Second Cree	314K FAFNIR	FAFNIR	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-MOTOR-FF008	Bearing For Motor on S&L Pump at Tin Mill Road	207KDD	FAFNIR	MS-R3A-S3	2.00	$13.12	BRNG
BRNG-MOTOR-FF009	Bearing For #2 Pump Motor at Wenonah	212KDD	FAFNIR	MS-R3A-S3	0.00	$39.04	BRNG
BRNG-MOTOR-FF010	Bearing For Motor on S&L Pump at Tin Mill Road	310KDDW	FAFNIR	MS-R3A-S2	-1.00	$0.00	BRNG

Inventory Standard

JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BRNG-MOTOR-FF011	Bear./Motor Jack/Heights Harriman, Wen. SEE SPECS	206KDD	FAFNIR	MS-R3A-S3	1.00	$8.50	BRNG
BRNG-MOTOR-FF012	Motor Bearing at Second Creek	214KDD	FAFNIR	MS-R3A-S2	1.00	$0.00	BRNG
BRNG-MOTOR-FF013	Motor Bearing For Jackson Heights	205KDD	FAFNIR	MS-R3A-S3	1.00	$8.00	BRNG
BRNG-MOTOR-FF014	Motor Bearing at Sandusky	310W	FAFNIR	MS-R3A-S2	4.00	$39.12	BRNG
BRNG-MOTOR-FF015	Motor Bearing (Top) at Vail, *See Specs.	210KDD	FAFNIR	MS-R3A-S3	4.00	$27.67	BRNG
BRNG-MOTOR-FF016	Bottom Motor Bearing For Bessemer Hospital	7310WN	FAFNIR	MS-R4A-S2	3.00	$64.18	BRNG
BRNG-MOTOR-KBC001	Laura Motor/ Hillshire Motor *See Specs.	6207ZZ	KBC	MS-R4A-S3	1.00	$10.06	BRNG
BRNG-MOTOR-KO-001	Bearing For Motor at Rice C. & Hillshire	6207 ZZC3	KOYO	MS-R4B-S3	1.00	$10.08	BRNG
BRNG-MOTOR-MRC001	Bearing For Motor On S&L Pump at Rice Creek, Harri	5211CFF	MRC	MS-R3A-S1	-1.00	$64.98	BRNG
BRNG-MOTOR-MRC002	Motor Bearing at Sandusky	207SFF	MRC	MS-R3A-S3	0.00	$13.12	BRNG
BRNG-MOTOR-MRC003	Bearing For Motor on Fairbanks Pump at Second Cree	MRC 207M	MRC	MS-R3A-S3	1.00	$0.00	BRNG
BRNG-MOTOR-MRC004	Bearing For Motor on Roberts & Tin Mill Motor	209SFF	MRC	MS-R3A-S3	3.00	$27.61	BRNG
BRNG-MOTOR-MRC005	Motor Bearing For S&L Morgan/Greenwood	5212CZZ	MRC	MS-R3A-S1	4.00	$0.00	BRNG
BRNG-MOTOR-MRC006	Motor Bearing For S&L Morgan/Greenwood	5212MFF	MRC	MS-R3A-S1	1.00	$0.00	BRNG
BRNG-MOTOR-MRC007	Motor Bearing at Sandusky	207KDD	MRC	MS-R3A-S3	4.00	$13.84	BRNG
BRNG-MOTOR-MRC008	Bearing For Motor (Top) at Vail Avenue	210KDD	MRC	MS-R3A-S3	1.00	$30.50	BRNG
BRNG-MOTOR-MRC009	Bearing For Motor Southpark Pump #3	314KDD	MRC	MS-R3A-S1	4.00	$2,385.00	BRNG
BRNG-MOTOR-MRC010	Bearing For Jackson H. & Harriman	206-SFF	MRC	MS-R3A-S3	1.00	$8.92	BRNG
BRNG-MOTOR-MRC011	Bearing For Motor For Rotors at Warrior Plant	207-SFF	MRC	MS-R3A-S3	0.00	$11.67	BRNG
BRNG-MOTOR-NTN001		207	NTN	MS-R3A-S3	1.00	$13.12	BRNG
BRNG-MOTOR-SK001	Motor Bearing (Top) at Vail, *See Specs.& Tin Mill	6210 2Z JEM	SKF	MS-R4A-S3	2.00	$27.67	BRNG
BRNG-MOTOR-SK002	Motor Bearing (Bottom) For Cunningham II	5217A	SKF	MS-R3A-S1	2.00	$127.37	BRNG
BRNG-MOTOR-SK003	Bearing For Tin Mill	6310-2RSNRJEM	SKF	MS-R4A-S2	1.00	$32.24	BRNG
BRNG-MOTOR-SK004	Motor Bearing For Harriman	6206 2ZJEM	SKF	MS-R4A-S3	1.00	$9.87	BRNG
BRNG-MOTOR-SK005	Motor Bearing - Harriman	5211-A-2Z/C3	SKF	MS-R3A-S1	3.00	$82.63	BRNG
BRNG-MOTOR-SNR001	Top Motor Bearing For Vail Avenue	6210-ZZ J30D43A50	SNR	MS-R4A-S3	0.00	$1.00	BRNG
BRNG-MRC001	Prudes Creek # 1 For # 1 Pump	308W	MRC	MS-R3A-S2	0.00	$0.00	BRNG
BRNG-MRC002	Bearing	5306	MRC	MS-R3A-S1	5.00	$0.00	BRNG
BRNG-MRC003	Unknown	5310C	MRC	MS-R4A-S3	2.00	$71.22	BRNG
BRNG-MRC004	Unknown	5313CZZ	MRC	MS-R4A-S3	0.00	$197.38	BRNG
BRNG-NT001	Spare Pump Bearing (Ebara)	6305	NTN	MS-R4A-S3	0.00	$0.00	BRNG
BRNG-NTN001	UNKNOWN	NJ305	NTN	MS-R3A-S2	0.00	$0.00	BRNG
BRNG-NTN002	UNKNOWN	NJ305	NTN	MS-R3A-S2	0.00	$0.00	BRNG
BRNG-NTN003	Bearing For Vacuum Truck Blower	6415	NTN	MS-R4A-S2	0.00	$252.17	BRNG
BRNG-PB001	Pillow Block Bearing For Scotts Rotor (Floating)	ERPB 307-C2	SEALMASTER	MS-R1B-S1	2.00	$968.70	BRNG
BRNG-PB002	Pillow Block Bearing For Scotts Rotor (Fixed)	RPB 307-C2	SEALMASTER	MS-R1B-S1	2.00	$807.13	BRNG
BRNG-PB003	Pillow Block Bearing For Parkwood Carbon Tower	P2-U335	LINKBELT	MS-R4-S1	2.00	$263.34	BRNG
BRNG-PB004	P/Block Bearing (Fixed) Scotts Rotor 4 7/16" Bore	RPB 407-C2	SEALMASTER	MS-R1B-S1	0.00	$1,957.46	BRNG
BRNG-PBLOCK-001	Pillow B. Bearing Drives. S/P and C/ville	RAS 1 3/16	FAFNIR	MS-R1-S1	8.00	$107.32	BRNG
BRNG-PBLOCK-003	Pillow Block Bearing - Drive Shaft at S/P, C/Ville	RAS 1 3/16	TIMKEN	MS-R1B-S1	0.00	$127.44	BRNG
BRNG-PBLOCK-FF001	Pillow Block Bearing, PN YAS1-3/16	YAS1-3/16	FAFNIR	MS-R1B-S1	6.00	$33.91	BRNG
BRNG-PBLOCK-SK001	Pillow Block Bearing For #4 & #5 Carb. Tower at Sc	SAF 509	SKF	MS-R4A-S2	2.00	$171.71	BRNG
BRNG-PUMP-001	Bearing For Pump at Amerex Big Station	5309CF	MRC	MS-R3A-S1	1.00	$0.00	BRNG
BRNG-PUMP-003	Bearing For Pump at Chapel I & Bham Zoo /Hillshire	203KDD	FAFNIR	MS-R3A-S3	7.00	$4.09	BRNG
BRNG-PUMP-004	Bearing For Clow Pump at Hooper,Woodbrook	5210	MRC	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-PUMP-005	Bearing For Clow Pump at Hooper,Lanceway	6311		MS-R4A-S2	0.00	$65.35	BRNG
BRNG-PUMP-006	Bearing For Hydro Pump at K-Mart	5216W		MS-R3A-S2	0.00	$0.00	BRNG
BRNG-PUMP-007	Bearing For Hydro Pump at K-Mart	6313/313KDD		MS-R4A-S2	0.00	$0.00	BRNG
BRNG-PUMP-009	Bearing For Clow Pump at Lanceway	6312		MS-R4A-S2	0.00	$0.00	BRNG
BRNG-PUMP-010	Bearing For S&L Pump at Morgan	321B		MS-R3A-S1		$1.00	BRNG
BRNG-PUMP-012	Bearing For Pump No 3 at Southpark	6313		GA-R3-S2-3	3.00	$0.00	BRNG
BRNG-PUMP-015	Bearing For Pump at Adamsville	NU/NJ313 ?		MS-R3A-S2	3.00	$113.93	BRNG
BRNG-PUMP-016	Bearing For Pump at Adamsville, Jeff Memo	7313 WN SU	FAFNIR	MS-R4A-S2	0.00	$114.93	BRNG
BRNG-PUMP-017	Bearing For Pump at Jefferson Memorial	6309W		MS-R4A-S3	0.00	$0.00	BRNG
BRNG-PUMP-019	Bearing For Pump at Jefferson Mem. & Adamsville	7313-PJDU/H503	MRC	MS-R4A-S2	0.00	$127.59	BRNG
BRNG-PUMP-020	Bearing For Pump at Woods Trace	6309		MS-R4A-S3	-1.00	$30.16	BRNG
BRNG-PUMP-021	Bearing For Pump at Chapel 1	6205		MS-R4A-S3		$1.00	BRNG
BRNG-PUMP-022	Bearing For Pump at Cades Code	6309 ZZ		MS-R4A-S3			BRNG
BRNG-PUMP-023	Bearing For Pump at Adamsville, Jeff Memo.	7313-AGGA	BEARINGS	MS-R4A-S2	0.00	$80.00	BRNG

Inventory Standard

JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BRNG-PUMP-024	Upper Bearing For Hydromatic Pump SPGF 5000 M 3-4	650301	SST	MS-R4A-S2	4.00	$16.64	BRNG
BRNG-PUMP-BL001	Pump Bearing at Adamsville	5313A-2RS	BEARINGS	MS-R4A-S3	3.00	$188.71	BRNG
BRNG-PUMP-BL002	Bearing For Pump at Bessemer Hospital	5308E-NR1	BEARINGS	MS-R3A-S1	0.00	$50.00	BRNG
BRNG-PUMP-BW001	Spare Pump Bearing	MR1305	BOWER	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-PUMP-CON001	Pump Bearing Newfound	7313 BMG		MS-R4A-S2	0.00	$0.00	BRNG
BRNG-PUMP-CON002	Pump Bearing Newfound	NU22 15E	CONSOL	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-PUMP-CON003	Pump Bearing Newfound	NJ 313 EC/3	CONSOL	MS-R3A-S2	2.00	$131.42	BRNG
BRNG-PUMP-FA001	Bearing For Pump at Oak Grove PS	6202	FAG	MS-R4A-003	0.00	$5.34	BRNG
BRNG-PUMP-FA002	Second Creek Pump Bearing	214K	FAG	MS-R3A-S2	1.00	$0.00	BRNG
BRNG-PUMP-FA003	Jefferson Memorial,	6309-2ZR C3	FAG	MS-R4A-S2	0.00	$22.00	BRNG
BRNG-PUMP-FA004	Pump Bearing	212K	FAG	MS-R3A-S3	2.00	$1.00	BRNG
BRNG-PUMP-FA005	Hooper & Lanceway *See Specs.	311 KDD	FAG	MS-R3A-S2	0.00	$62.42	BRNG
BRNG-PUMP-FA006	Pump Bearing #3 Pump at Southpark	314 KDD	FAG	MS-R3A-S1	-1.00	$0.00	BRNG
BRNG-PUMP-FA007	Bearing for Pump at Adamsville, Jeff. Mem.	7313 B MP UA	FAG	MS-R4A-S2	2.00	$110.68	BRNG
BRNG-PUMP-FE001	Bearing For Roots Dresser Pump at Warrior	ZF5212	FEDERAL	MS-R3A-S1			BRNG
BRNG-PUMP-FF001	Bearing For Clow Pump at Amerex	5209 WD	FAFNIR	MS-R3A-S1	6.00	$37.40	BRNG
BRNG-PUMP-FF002	Bearing For Clow Pump at Amerex	5309 WD	FAFNIR	MS-R3A-S1	3.00	$61.45	BRNG
BRNG-PUMP-FF0023	Unknown	203K	FAFNIR	MS-R3A-S3	0.00	$0.00	BRNG
BRNG-PUMP-FF003	Bearing For Chicago Pump at Bess. Hospital	5308WD	FAFNIR	MS-R3A-S1	5.00	$68.72	BRNG
BRNG-PUMP-FF004	Bearing For Chicago Pump at Bess. Hospital	G1108KRR+Col	FAFNIR	MS-R3A-S1	3.00	$47.43	BRNG
BRNG-PUMP-FF005	Bearing For Hydro Pump at Graysville 3rd St.	5304K	FAFNIR	MS-R3A-S1	7.00	$0.00	BRNG
BRNG-PUMP-FF006	Bearing For Pump at Fairmont	310KDDN	FAFNIR	MS-R3A-S2	1.00	$39.05	BRNG
BRNG-PUMP-FF007	Bearing Used on Chicago Pump at Halls	217K	FAFNIR	MS-R3A-S2	3.00	$0.00	BRNG
BRNG-PUMP-FF008	Bearing For Ebara Pump at Valewood	6308KDDN	FAFNIR	MS-R4A-S3	0.00	$30.19	BRNG
BRNG-PUMP-FF009	Bearing For Ebara Pump at Valewood	6308KDDW	FAFNIR	MS-R4A-S3			BRNG
BRNG-PUMP-FF010	Spare Pump Bearing	309WPP FAFNIR	FAFNIR	MS-R3A-S2	3.00	$75.90	BRNG
BRNG-PUMP-FF011	Bearing For Pump at Oak Grove	202KDD	FAFNIR	MS-R3A-S3	2.00	$5.34	BRNG
BRNG-PUMP-FF012	Bearing For Bessemer Hospital	5308W	FAFNIR	MS-R3A-S1	1.00	$63.80	BRNG
BRNG-PUMP-FF013	Bearing For Clow Pump at Lanceway, (Coosa-Motor)	312NPP	FAFNIR	MS-R3A-S2	2.00	$83.46	BRNG
BRNG-PUMP-FF019	Bearing For Pump at Woods Trace, Scotts Blow Motor	315KDD	FAFNIR	MS-R3A-S1	0.00	$153.05	BRNG
BRNG-PUMP-FF020	Jefferson Memorial	309KDD	FAFNIR	MS-R3A-S2	0.00	$0.00	BRNG
BRNG-PUMP-FF021	Double Wide Bearing	W309PP	FAFNIR	MS-R3A-S2	3.00	$75.90	BRNG
BRNG-PUMP-FF022	Hooper, Lance Way, & Blue Ridge	311 KDD	FAFNIR	MS-R3A-S2	-1.00	$63.05	BRNG
BRNG-PUMP-FF023	Ball Bearing, Jefferson Memorial	309K	FAFNIR	MS-R3A-S2	1.00	$20.00	BRNG
BRNG-PUMP-FF024	Bearing For Ebara Pump at Valewood	308KDD	FAFNIR	MS-R3A-S2	0.00	$30.19	BRNG
BRNG-PUMP-FF025	Hooper & Lanceway	311NPP	FAFNIR	MS-R3A-S2	0.00	$1.00	BRNG
BRNG-PUMP-FF026	Pump Bearing at Second Creek	214K	FAFNIR	MS-R3A-S2	1.00	$1.00	BRNG
BRNG-PUMP-FF027	Pump Bearing For 7 HP Hydromatic Pumps	5305K	FAFNIR	MS-R3A-S1	2.00	$1.00	BRNG
BRNG-PUMP-FF028	Bearing For Pump at Airport	SM-1108-KT	FAFNIR	MS-R3A-S1	1.00	$58.53	BRNG
BRNG-PUMP-FF029	Pump Bearing For Lance Way, *See Specs.	312PP	FAFNIR	MS-R3A-S2	0.00	$86.24	BRNG
BRNG-PUMP-FF030	Pump Bearing For Lance Way, *See Specs.	312K	FAFNIR	MS-R3A-S2	-2.00	$69.51	BRNG
BRNG-PUMP-FF031	Pump Bearing at Fairmont, K-Mart *See Specs.	313KDD	FAFNIR	MS-R3A-S2	1.00	$62.42	BRNG
BRNG-PUMP-FF032	Pump Bearing For Chapel II	306KDD	FAFNIR	MS-R3A-S2	4.00	$18.61	BRNG
BRNG-PUMP-FF033	Bearing For Pump at Airport/Southpark #3 motor	310KDDN	FAFNIR	MS-R3A-S2	3.00	$43.47	BRNG
BRNG-PUMP-FF034	Bearing For Lance Way	6311-2ZJEM	SKF	MS-R4A-S2	4.00	$63.19	BRNG
BRNG-PUMP-FF035	Bearing For Newfound	NJ313 ECP/C3	FAFNIR	MS-R3A-S2	4.00	$229.60	BRNG
BRNG-PUMP-FM001	Double Wide Bearing	W309CC	FEDMOGAL	MS-R3A-S2	4.00	$78.64	BRNG
BRNG-PUMP-JE001	Bearing For Pump at Larkway	6310ZZWRJEM	JEM	MS-R4A-S2	3.00	$0.00	BRNG
BRNG-PUMP-JE002	Bearing For Chicago Pump at Pinewood	6213	JEM	MS-R4A-S3	0.00	$44.64	BRNG
BRNG-PUMP-JE003	Pump Bearing For Larkway	6231	JEM	MS-R4A-S3	0.00	$0.00	BRNG
BRNG-PUMP-K0-001	Bearing For Pump at Larkway & Airport	6310 ZZC3	KOYO	MS-R4A-S2	1.00	$29.96	BRNG
BRNG-PUMP-KBC002	Pump Bearing For Lewisbruge, *See Specs.	6311ZZ	KBC	MS-R4A-S2	-1.00	$48.16	BRNG
BRNG-PUMP-KBC003	(Pump B) For Mixer P.C. & Jeff. M., *See Specs.	6309ZZ	KBC	MS-R4A-S2	-1.00	$25.22	BRNG
BRNG-PUMP-KBC004	Pump Bearing For Lewisburge, *See Specs.	6311DD	KBC	MS-R4A-S2	1.00	$48.16	BRNG
BRNG-PUMP-KO-001	Bearing For Pump at Larkway & Airport	6310 ZZC3	KOYO	MS-R4A-S2	4.00	$29.96	BRNG
BRNG-PUMP-KO-002	Bearing P. at Woods Trace - Scott's Blower Motor	6315 ZZC3	KOYO	MS-R4A-S2	2.00	$84.62	BRNG
BRNG-PUMP-KO-003	Bearing For Pump at Chapel I & B'ham Zoo/Hillshire	6203 ZZC3	KOYO	MS-R4A-S3	4.00	$3.35	BRNG
BRNG-PUMP-MAX001	Bearing For Clow Pump at Brighton	6313	MAX	MS-R4A-S2	0.00	$0.00	BRNG
BRNG-PUMP-MRC001	Bearing For Clow Pump at Brighton	5312	MRC	MS-R4A-S3	-1.00	$75.00	BRNG

Inventory Standard

JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BRNG-PUMP-MRC002	Bearing For Pump at Fairmont	313SFF	MRC	MS-R3A-S1	2.00	$109.03	BRNG
BRNG-PUMP-MRC003	Bearing Used on Chicago Pump at Halls	217S	MRC	MS-R3A-S2	2.00	$0.00	BRNG
BRNG-PUMP-MRC004	Bearing For Chicago Pump 2,3 at Riverchase	5212	MRC	MS-R3A-S1	4.00	$0.00	BRNG
BRNG-PUMP-MRC005	Hooper and Lanceway Heather Tatum	311SFF	MRC	MS-R3A-S2	1.00	$0.00	BRNG
BRNG-PUMP-MRC006	Unknown	203K	MRC	MS-R3A-S3	1.00	$0.00	BRNG
BRNG-PUMP-MRC007	Bearing For #1 Amerex Station OSS	5209W	MRC	MS-R3A-S1	1.00	$0.00	BRNG
BRNG-PUMP-MRC008	K-mart Pump Bearing	5216M	MRC	MS-R3A-S1	0.00	$0.00	BRNG
BRNG-PUMP-MRC009	Bearing For Myers Pump Leeds City Hall	5303SBKFF	MRC	MS-R3A-S1	2.00	$0.00	BRNG
BRNG-PUMP-MRC010	Pump at Jeff Memo, Adamsville	7313 PJDU	MRC	MS-R4A-S2	1.00	$100.15	BRNG
BRNG-PUMP-MRC011	Bearing For Pump Halls	414S	MRC	MS-R3A-S1	3.00	$0.00	BRNG
BRNG-PUMP-MRC012	Bearing For Pump at Larkway	310 KDD	MRC	MS-R3A-S2	0.00	$37.40	BRNG
BRNG-PUMP-MRC013	Bearing For Chicago Pump, Riverchase, Pinewood	409K	MRC	MS-R3B-S1	2.00	$56.00	BRNG
BRNG-PUMP-MRC014	Pump Bearing - Also See 203K	203S	MRC	MS-R3A-S3	-1.00	$1.00	BRNG
BRNG-PUMP-MRC015	Pump Bearing For 7 Hp Hydromatic Pumps Heather T.	5305CFF	MRC	MS-R3A-S1	2.00	$42.49	BRNG
BRNG-PUMP-MRC016	Bearing For Pump at Chapel #2 P.S.	306KDD	MRC	MS-R3A-S2	2.00	$18.58	BRNG
BRNG-PUMP-MRC017	Pump Bearing at Walker P.S.	305SFF	MRC	MS-R3A-S2	3.00	$11.40	BRNG
BRNG-PUMP-MRC018	Hyd. Pump - 20 Hp	308KDD	MRC	MS-R3A-S2	-2.00	$27.70	BRNG
BRNG-PUMP-MRC019	Pump Bearing For Lance Way	309KDD	MRC	MS-R3A-S2	1.00	$40.00	BRNG
BRNG-PUMP-MRC020	Bearing For Pump at Summit	5214 A/C3	MRC	MS-R3A-S1	4.00	$100.01	BRNG
BRNG-PUMP-NA001	For Adam., PC #1, Newfound, *See Specs.	7313 BMU	NACHI	MS-R4A-S2	1.00	$105.35	BRNG
BRNG-PUMP-NAC001	Bearing For Pump at Adamsville	5313-2NS	NACHI	MS-R4A-S3	0.00	$192.49	BRNG
BRNG-PUMP-NS001	Chicago Pump at Patton 2, Pump Sears	6309ZZC3	NSK	MS-R4A-S3	0.00	$30.15	BRNG
BRNG-PUMP-NS002	Bearing For Chicago Pump at Patton 2	6311-ZZ	NSK	MS-R4A-S2	0.00	$65.35	BRNG
BRNG-PUMP-NTN001	Bearing - Lance Way Pump	6311ZZ	NTN	MS-R4A-S2	1.00	$62.00	BRNG
BRNG-PUMP-NTN003	Pump Bearing Newfound	NJ313G1C3	NTN	MS-R3A-S2	0.00	$0.00	BRNG
BRNG-PUMP-SK001	Bearing For Chicago Pump 2,3 at Riverchase,Pinewd	6409	SKF	MS-R4A-S2	2.00	$56.38	BRNG
BRNG-PUMP-SK002	Bearing For Larkway and Airport	6310 2ZNRJEM	SKF	MS-R4A-S2	1.00	$69.47	BRNG
BRNG-PUMP-SK003	Pump Bearing For Valewood and McNail	63082ZJEM	SKF	MS-R4A-S3	0.00	$0.00	BRNG
BRNG-PUMP-SK004	Bearing For Chicago Pump at Pinewood	6213ZZ	SKF	MS-R4A-S3	6.00	$44.64	BRNG
BRNG-PUMP-SK005	Bearing For Ebara Pump at Valewood	6305	SKF	MS-R4A-S3	8.00	$55.41	BRNG
BRNG-PUMP-SK006	Bearing For Ebara Pump Valewood	5216A	SKF	MS-R3A-S1	1.00	$0.00	BRNG
BRNG-PUMP-SK007	Bearing For Pump No. 3 at Southpark	6314 2Z JEM	SKF	MS-R4A-S2	5.00	$118.42	BRNG
BRNG-PUMP-SK008	Bearing/Pump/Newf./Jeff.Met/Adamsville	7313 BECY	SKF	MS-R4A-S2	6.00	$145.87	BRNG
BRNG-PUMP-SK009	Pump Bearing Newfound (Bottom)	NU 2215 ECP	SKF	MS-R3A-S1	6.00	$115.81	BRNG
BRNG-PUMP-SK010	Pump Bearing, Valewood, Scott Blower Motor	6313-2ZJEM	SKF	MS-R4A-S2	3.00	$150.55	BRNG
BRNG-PUMP-SK011	Bearing For Pump at Airport	5307-AC3	SKF	MS-R3A-S1	0.00	$28.87	BRNG
BRNG-PUMP-SK012	Bearing for pump at Highland	6203-2ZJEM	SKF	MS-R4A-S3	0.00	$37.40	BRNG
BRNG-PUMP-SK013	Bearing For Pump at the Summit	5214 A/ C3	SKF	MS-R3A-S1	0.00	$133.00	BRNG
BRNG-PUMP-SK014	Bearing For Pump At Hopper, Woodbrook	5210 AC3	SKF	MS-R3A-S1	3.00	$45.20	BRNG
BRNG-PUMP-SK016	Bearing Pump at Woods T./Scotts Blwr Motor	6315 2Z/C3	SKF	MS-R4A-S2	1.00	$152.00	BRNG
BRNG-PUMP-SK017	Bearing	6909 2Z JEM	SKF	MS-R4A-S2	4.00	$55.41	BRNG
BRNG-PUMP-SK018	Bearing For PUmp at Brighton	5312 E	SKF	MS-R4A-S3	2.00	$175.53	BRNG
BRNG-PUMP-SNR-001	Bearing For Pump at Larkway	6310-ZZ	SNR	MS-R4A-S2	1.00	$30.00	BRNG
BRNG-PUMP-SNR-002	Motor Bearing For Vail Avenue	6310-ZZ	SNR	MS-R4A-S3	2.00	$23.00	BRNG
BRNG-PUMP-URB001	Bearing Pump at Woods T., Scotts Blower Motor	6315-2ZC3	URB	MS-R4A-S2	2.00	$106.40	BRNG
BRNG-ROTOR-001	Bearing For VLR rotor gear box at Scotts	208W	FAFNIR	MS-R3A-S3	3.00	$22.68	BRNG
BRNG-ROTOR-004	Bearing For Rotor/Envirex at Scotts Branch	208KG		MS-R3A-S3	6.00	$22.68	BRNG
BRNG-ROTOR-005	Bearing For Rotor/Envirex at Scotts Branch	305MG	MRC	MS-R3A-S2	0.00	$11.86	BRNG
BRNG-ROTOR-008	Bearing For Rotor at Warrior			GA-R3-S2-3	1.00	$0.00	BRNG
BRNG-ROTOR-009	Bearing For Rotor at Scotts, PN 305K	305K	FAFNIR	MS-R3A-S2	2.00	$13.00	BRNG
BRNG-ROTOR-FF006	Bearing For Rotor/Envirex at Scotts Branch	308WG	FAFNIR	MS-R3A-S2	0.00	$23.79	BRNG
BRNG-ROTOR-FF007	Bearing For Rotor at Warrior	306WG	FAFNIR	MS-R3A-S2	1.00	$0.00	BRNG
BRNG-ROTOR-FF008	Bearing For Rotor gearbox at Warrior	9117KG	FAFNIR	MS-R4A-S2	2.00	$0.00	BRNG
BRNG-ROTOR-FF009	Bearing For Rotor/Envirex at Scotts Branch	208DWW	FAFNIR	MS-R4A-S2	0.00	$24.97	BRNG
BRNG-ROTOR-FF010	Bearing For Rotor/Envirex at Scotts Branch	208WDD	FAFNIR	MS-R3A-S3	4.00	$24.57	BRNG
BRNG-ROTOR-FF011	Bearing For Rotor at Scotts Branch	208WG	FAFNIR	MS-R3A-S3	3.00	$22.68	BRNG
BRNG-ROTOR-FF012	Top Motor Bearing For Bessemer Hospital	208KDD	FAFNIR	MS-R3A-S3	4.00	$19.07	BRNG
BRNG-ROTOR-MRC001	Rotor at VLR Scotts Branch	305MG	MRC	MS-R3A-S2	8.00	$22.24	BRNG
BRNG-ROTOR-MRC002	Bearing For Rotor at Scotts VLR Gear Box	208W	MRC	MS-R3A-S3	9.00	$23.78	BRNG

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
BRNG-ROTOR-TI002	Bearing For Rotor/Envirex at Scotts Branch	39520	TIMKEN	MS-R4A-S2	7.00	$10.75	BRNG
BRNG-ROTOR-TI003	Bearing For Rotor/Envirex at Scotts Branch	39590	TIMKEN	MS-R4A-S2	6.00	$17.10	BRNG
BRNG-SK001	SKF Bearing	6211 JEM	SKF	MS-R4A-S3	3.00	$0.00	BRNG
BRNG-SK003	UNKNOWN	6304ZZ	SKF	MS-R4A-S3	5.00	$0.00	BRNG
BRNG-SK004	UNKNOWN	6212JEM	SKF	MS-R4A-S3	2.00	$0.00	BRNG
BRNG-SNR001		6215ZZ J30D43A50	SNR	MS-R4A-S3	2.00	$0.00	BRNG
BRNG-SPACER-001	Large Bearing Spacer For Scotts Blower	8500037	GAR/DEN	GA-C14	6.00	$260.68	BRNG
BRNG-SPACER-002	Small Bearing Space For Scotts Blower	8504506	GAR/DEN	GA-C14	8.00	$153.79	BRNG
BUSHING-001	Bushing For Morgan/Greenwood #1	SFX 2 3/8	WOODS	MS-R1B-S2	0.00	$19.51	BUSHIN
BUSHING-BLWR-001	Bushing For Blower at Scotts	E 2 5/8	BROWNING	MS-R1B-S2	2.00	$38.16	BUSHIN
BUSHING-BLWR-002	Bushing	E2- 7/8	BROWNING	MS-R1B-S2	0.00	$38.00	BUSHIN
CABLE-COMM-001		HMI-CAB-C93	MAYER	EL-C7-S8	2.00	$97.30	ELEC
CABLE-THR-001	Throttle Cable For 1800 Kubota	66101-43243	CAHABA TRAC	GA-LN-C	1.00	$25.05	CABLE
CAM-FOLLOW-001	Cam Followers For Blue Ridge Elevator	856L	S & L	EL-C5-S5	0.00	$38.83	CAM
CARB-NGAS-001	N-GAS Carb. For Wisconsin Eng. #VG4DG - For Gorman	L-94-C	JIM HOUSE	MS-R1B-S2	1.00	$235.72	CARB
CARTG-RESP-001	North Brand	4RM25		-	4.00	$9.68	SFTY
CARTG-RESP-002	Respirator Cartage Cabot Safety	R53-A		-	16.00	$6.60	SFTY
CHAIN-M/M-001	Chain 1/2 Pitch For M/M at Airport #CMD 1800 MS	CMC 0040	JWC-ENV	MS-M1B-S3	1.00	$0.00	CHAIN
CHARGER-BATT-001	12 Volt Battery Charger For Hidden Trace	GM 11849-KP1	Onan	EL-	0.00	$196.68	ELEC
CHARTS-FLOW-001	Cir. Charts, For Scotts Fits Fish/Port 1392 Rec.	216A020U08	CHARTS INC	CHMS-C1	11.00	$12.94	CHARTS
CHARTS-FLOW-002	Cir. Charts, For Prudes C. Fits Sparling Ins. PR76	CC-2441	CHARTS INC	CHMS-C1	14.00	$9.69	CHARTS
CHARTS-FLOW-003	Flow Charts, To Fit Bailey-Fisher & Porter Flow Re	216A020U68	FISCHER-PORT	-			CHARTS
CHARTS-FLOW-004	Cir. Charts For Prudes C. For Euro Chess. Brand -	GDTW0100U100	EURO CHESS	CHMS-C1	8.00	$23.50	CHARTS
CHARTS-FLOW-ROLL001	Plotter Paper To Fit Fisher Porter Flow Recorder F	GD204080U50	CHARTS INC	CHMS-C1	25.00	$6.23	CHARTS
CHARTS-FLOWR-001	Flow Recorder Pens, For Sparkling Ins. Model RR 76	141D001U25		-			CHARTS
CHARTS-FLOWR-002	Flow Rec Pens - Prudes C. For Euro. Chess Brand -	LA203291	EURO CHESS	CHMS-C1	2.00	$18.50	CHARTS
CHEM-ANTIF-COOL-001	Antifreeze and Coolant		NAPA	STORRM-F	49.25	$4.99	CHEM
CHEM-BYOGENPX-001	109 Biological Stimulant For Grease Removal & Cont			-			CHEM
CHEM-CITRIC-ACID-001	Grainular Citric Acid -50 Lb Bags For Prudes Creek	CITRIC ACID	HARCROS	COPS-F	5.00	$45.00	CHEM
CHEM-CITRUS-DEO-001	Citrus Floating PS Deodorant, 55 Gal. Per Drum			-	1.00	$295.00	CHEM
CHEM-DEGREAS-001	Floating Digest Assist Degreaser, 55 Gal. Drum		AMEROSMNT	OIL-H	-94.50	$326.00	CHEM
CHEM-HTH-001	Calcium Hypochloryte, Granular 100 Lb. Drum	CALCIUM HYPOCHLORYTE	CHEM IND	COPS-F	5.00	$1.15	CHEM
CHEM-HTH-002	Calcium Hypochloryte, Granular 100 Lb. Container	CALCIUM HYPROCHILORYTE	LESLIE'S	COPS-F	5.00	$88.29	CHEM
CHEM-ODOR-CONTRL-001	Ban Air Odor Control For Fan #2 55 Gal Per Drum	511441-001	PAPER & CHEM	COPS - F	3.00	$735.00	CHEM
CHEM-OIL-DISP-001	Oil Dispersant, K-Chem, 55 Gal Drum	OIL-DISP-K-CHEM	K-CHEM	OIL-H	1.00	$297.00	CHEM
CHEM-PERMATE-001	Potassium Permangantate, 110 Lb. Drum	POTASSIUM PERMANGANATE	CHEM IND	COPS-F	-1.50	$1.38	CHEM
CHEM-PTS-WASH-001	Parts Washer Fluid	PRO-POWER II RED	MANTEK	MSHOP	7.00	$22.00	CHEM
CHEM-ROUNDUP-001	Round Up Weed Killer		MONSAN	MEZZ-F	-51.33	$45.00	CHEM
CHEM-START-FLUID-001	Starting Fluid, CRC, 16 Oz. Can	20B	MILL/TEXT	STOR RM-C3	4.00	$12.72	CHEM
CK-VAL-001	4"" WAFFER SLEEVES PIN CHECK VALVE		GORMAN-RUPP	GA-R6A-S3	2.00	$1.00	CKVAL
CK-VAL-002	4"" CAST IRON 11 1/2"" F/F NIA (8 BOLT)			GA-R6A-S3	3.00	$1.00	CKVAL
CK-VAL-003	4"" CAST IRON 11 1/2"" F/F NIA (8 BOLT)			GA-R6A-S3	1.00	$1.00	CKVAL
CK-VAL-004	6"" CAST IRON 14"" F/F WIA	F-619-N	AMER PIPE	GA-R6A-S3	2.00	$1.00	CKVAL
CK-VAL-005	4"" X 6"" CAST IRON 13 5/8"" F/F WIA (8 BOLT) LEWI		M & H	GA-R6A-S3	2.00	$1.00	CKVAL
CK-VAL-006	3"" BRASS Sm brass			GA-R6A-S2	3.00	$1.00	CKVAL
CK-VAL-007	2"" BRASS			GA-R6A-S2	4.00	$1.00	CKVAL
CK-VAL-008	1 1/4 "" BRASS			GA-R6A-S2	12.00	$1.00	CKVAL
CK-VAL-009	1"" BRASS			GA-R6A-S2	2.00	$1.00	CKVAL
CK-VAL-010	3/4"" BRASS			GA-R6A-S2	16.00	$1.00	CKVAL
CK-VAL-011	1/2 "" BRASS			GA-R6A-S2	13.00	$1.00	CKVAL
CK-VAL-012	2"" BRASS IN LINE SPRING TYPE			GA-R6A-S2	3.00	$1.00	CKVAL
CK-VAL-013	1"" BRASS IN LINE SPRING TYPE			GA-R6A-S2	8.00	$1.00	CKVAL
CK-VAL-014	4"" CASTIRAN BALL TYPE FOR HYDROMATIC (USED)			GA-R6A-S3	2.00	$1.00	CKVAL
CK-VAL-015	2"" CASTIRAN BALL TYPE FOR			GA-R6A-S3	3.00	$1.00	CKVAL
CK-VAL-016	6" Wafer Type Check Valve Morgan / Greenwood	120703060813519	KEYSTONE	GA-R6-S1	2.00	$426.00	CKVAL
CK-VAL-017				MZ-R10-S1	4.00	$249.00	
CK-VAL-018	12" Nisco Swing Ck/val.w/lever Scotts	12"F918BLW-125IBBM	NOLAND	MS-F	2.00	$2,385.00	CKVAL
CK-VAL-019	8" Nisco Swing Ck. Val with lever For Scotts	8"F918BLW-125IBBM	NOLAND	MS-F	0.00	$970.00	CKVAL
CK-VAL-020	6"x10" Check Valve W/Spring A. & Spring For Cunni	3259-02	CLOW/M&H	MS-F	2.00	$160.00	VALVE

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
CK-VAL-021	4" Wafr Check Valve W/Lever & Spring For Gadsden H	120-813-517	KEYSTONE	MS-F	0.00	$388.00	VALVE
CK-VAL-FLAM-001	4"" CHECK VALVE BOLT TYPE & ARM	F 918 4"		MS-F	0.00	$0.00	CKVAL
CK-VAL-FLAM-002	4"" CHECK VALVE		M & H	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VAL-FLAM-003	6"" CHECK VALVE FLAPPER & ARM	FLAPPER #406168 ARM #250	M & H	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VAL-FLAM-004	8"" CHECK VALVE FLAPPER & ARM	FLAPPER #408105 ARM# 250	M & H	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VAL-FLAM-005	CHECK VALVE SIZE?		M & H	GA-R6A-S2	2.00	$1.00	CKVAL
CK-VAL-FLAM-006	CHECK VALVE SIZE?	55A33/A	S & L	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VAL-FLOAT-S&L001	Check Valve For S & L Float Check Valve Assembly	1L333	S & L	GA-C15	5.00	$25.30	CKVAL
CK-VAL-FLPHOU-HY001	CK Valve Flapper Housing For Hydromatic 40 MP	120000002	HYDROMATIC	MS-R6B-S2	1.00	$712.00	CKVAL
CK-VAL-FLSU-GR003	8" Flap Valve For Gor. R Pump 8" Suction Lift Pump	46411-066	G-RUPP	MS-R8-S2	4.00	$191.00	CKVAL
CK-VAL-FLSU-ITT001	Check Valve To Fit ITT Model 40DTH24-EB - Dover	4661900	BUNA	MS-R8-S3	1.00	$92.95	CKVAL
CK-VALFL-001	BRASS 4"" (FOR MORGAN 1 & 2)		S & L	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VALFL-002	BRASS 4"" (FOR RICE) S & L BOLT TYPE		S & L	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VALFL-003	STEEL 4"" (FOR GARDENDALE 1 & 2)		GORMAN RUPP	GA-R6A-S2	1.00	$1.00	CKVAL
CK-VALFL-APC001	Flapper For APCO 12" Check Valve For 5 Mile West	112-10/76	JIM HOUSE	MS-	1.00	$637.00	CKVAL
CK-VALFL-SL001	6" Check Valve Flapper For S&L	55A16	S & L	MS-R8-S3	1.00	$218.18	CKVAL
CK-VALFLHY-001	Flap Check Val-Housing #12000-000-2, Ret #86			MS-R8-S2	1.00	$685.00	CKVAL
CK-VALFLRD-001	3/4"" X 11"" (FOR ACTON ROAD S & L)	#55B251E	S & L	GA-R6A-S2	4.00	$1.00	CKVAL
CK-VALFLRD-002	1/2"" X 11"" (FAIRMONT, OLD AIRPORT)		M & H	GA-R6A-S2	2.00	$1.00	CKVAL
CK-VALFLRD-003	FOR 1/2"" RODES		M & H	GA-R6A-S2	2.00	$1.00	CKVAL
CK-VALFLST-001	BRASS FOR 4"" X 6"" LEWISBURGES CHECK VALVE		M & H	GA-R6A-S2	2.00	$1.00	CKVAL
CK-VALFLST-002	BRASS FOR 4"" CHECK VALVE S & L 4"" CK		S & L	GA-R6A-S2	3.00	$1.00	CKVAL
CK-VALFLSU-GR001	Suct, Ck Val Flapper Gorman T3 Lake sterling	46411-060	GORMAN RUPP	MS-R8-S2	9.00	$95.35	CKVAL
CK-VALFLSU-GR002	Suction Check Valve Flapper - GORMAN T4	46411-062	G-RUPP	GA-C3	1.00	$117.35	CKVAL
CK-VALFLSU-GR003	Suction Check Valve Flapper G-Rupp T6	46411-064	GORMAN RUPP	MS-R8-S2	2.00	$137.70	CKVAL
CK-VALFLSU-HY001	FOR 40MP HYDROMATIC SUCTION FLAPPER	12018-001-1	HYDROMATIC	GA-R6A-S2	0.00	$1.00	CKVAL
CK-VALGASK-GR001	Check Valve Gasket To Fit Gorman Rupp 4" Check Val	25113-095	GORMAN RUPP	GA-C3	4.00	$2.95	CKVAL
CK-VALRFF-001	RUBBER SEAT RINGS OVER FLAPPER	55A31	S & L	GA-R6A-S2	4.00	$1.00	CKVAL
CK-VALSEAT-GR001	Check Valve Seat To Fit Gorman Rupp 4" Check Valve	31265-041	GORMAN RUPP	GA-C3	2.00	$68.20	CKVAL
CK-VALSEAT-SL001	Check Valve Flapper Seat For S&L For 6" Check Valv	55A17	S & L	MS-R8-S3	2.00	$131.85	CKVAL
CK-VALSNF-001	SLATED NUTS FOR FLAPPERS	6L113E	S & L	GA-R6A-S2	4.00	$1.00	CKVAL
CK-VALSPIG-001	SPRING FOR CHECK VALVE INDICATOR ARMS	#11L88A	S & L	GA-R6A-S2	5.00	$1.00	CKVAL
CLAR-BRNG-RX001	Bearing for clarifier thrust at Warrior	ZF5215	REX	MS-R4A-S1	0.00	$0.00	BRNG
CLAR-RET/PLATE-001	Retainer-Spring Plate-Scotts Clarifier	403-201410-2	US FIL/JIM H	MS-R2B-S3	1.00	$70.00	PLATE
CLIP-RET-HY001	Retaining Clip For Flange Bracket-Hydromatic	05519-000-3	HYDROMATIC	MS-R1B-S2	12.00	$14.00	CLIPS
CLIP-RET-HY002	Retaining Clip/Lug For Hydromatic 6" Sub.	11282-000-2	HYDROMATIC	MS-R1B-S2	14.00	$16.50	CLIPS
CLUTCH-LNMR-001	Clutch Assembly - Elec. PTO For John Deere 345	AM131779	JOHN DEERE	GA-LN-C	3.00	$135.00	CLUTCH
COMM-GRSL-N006	Grease Seal for Comminuter at Pinewood	470530	NATIONAL	GA-R2-S2	2.00	$0.00	GRSL
COMM-GRSL-N007	Grease Seal for Comminuter at Pinewood	473010	NATIONAL	GA-R2-S2	1.00	$0.00	GRSL
CPLG-D001	Dodge Coupling		DODGE	GA-R7-S3	2.00	$0.00	CPLG
CPLG-FK001			FAULK	MS-R2B-S2	1.00	$0.00	CPLG
CPLG-FK003	Faulk Coupling	762813	FAULK	MS-R2B-S2	4.00	$0.00	CPLG
CPLG-FK004	Faulk Coupling	704621	FAULK	MS-R2B-S2	2.00	$0.00	CPLG
CPLG-FLEX-001	1 1/4" x 1 1/4" Flex Coupling	4P003	GRAINGER	MS-R5-S3	4.00	$3.17	CPLG
CPLG-FLEX-002	1 1/2" x 1 1/2" Flex Coupling	4P005	GRAINGER	MS-R5-S3	4.00	$3.40	CPLG
CPLG-FLEX-003	2" x 2" Flex Coupling	4P007	GRAINGER	MS-R5-S3	4.00	$3.67	CPLG
CPLG-FLEX-004	3" x 3" Flex Coupling	4P009	GRAINGER	MS-R5-S3	4.00	$4.95	CPLG
CPLG-FLEX-005	4" x 4" Flex Coupling	4P011	GRAINGER	MS-R5-S3	4.00	$6.21	CPLG
CPLG-JWC-001	Coupling For Zoo Muffin Monster	30017-0005-001	JWC	MS-R2A-S3	-1.00	$86.76	CPLG
CPLG-JWC-002	Coupling For Zoo Muffin Montser	30017-0005-003	JWC	MS-R2A-S3	2.00	$86.76	CPLG
CPLG-LJ007	Love Joy Coupling 5JES	5JES	LOVE JOY	MS-R2B-S2	10.00	$7.53	CPLG
CPLG-LJ008	Love Joy Coupling		LOVE JOY	GA-R7-S3	3.00	$0.00	CPLG
CPLG-LJ009	Love Joy Coupling	36881	LOVE JOY	MS-R2B-S2	0.00	$0.00	CPLG
CPLG-LJ010	Love Joy Coupling 8JES	8JES (36707)	LOVE JOY	MS-R2B-S2	2.00	$21.02	CPLG
CPLG-LJ011	Love Joh Coupling for VLR at Scotts	12E	LOVE JOY	MS-R2B-S2	0.00	$0.00	CPLG
CPLG-LJ012	Love Joy Coupling	7JE	LOVE JOY	MS-R2B-S3	10.00	$0.00	CPLG
CPLG-LJ013	Love Joy Coupling 6JES	6JES	LOVE JOY	MS-R2B-S2	10.00	$0.00	CPLG
CPLG-LJ014	Love Joy Coupling	5JE	LOVE JOY	MS-R2B-S3	3.00	$0.00	CPLG
CPLG-LJ015	2 Pc Coupling Sleeve For VLR at Scotts Branch	12HS	LOVE JOY	MS-R2B-S3	8.00	$200.00	CPLG

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
CPLG-LJ016	Love Joy Coupling For Odor Control	3JES	LOVE JOY	MS-R2B-S2	2.00	$2.52	CPLG
CPLG-PCUV-001	Quick Connect Hose Coupling For UV System at Prude	07PG0	INFILCO	-	4.00	$12.58	CPLG
CRANKS-EXFAN-001	CrankShaft For Exhaust Fan To Fit 3 1/2 Hp Briggs	497832	ADVANCED	MS-R1A-S2	0.00	$92.98	CRANKS
DIAPH-AR-GR001	Air Release Diaphragm For Gorman Rupp Air Rel. Val	38676-404	GORMAN RUPP	GA-C3	0.00	$53.01	DIAPH
DIAPH-SEAL-HY001	6" Sealing Diaphragm For Hyd. Pump Model S6LX2000	4850-000-1	HYDROMATIC	MS-R6-S3	14.00	$54.00	DIAPH
DIAPH-SEAL-HY002	4" Sealing Diaphragm For Hyd. Pump Model S4LRC2500	3544-000-1	HYDROMATIC	MS-R6-S3	4.00	$21.00	DIAPH
DIAPH-SEAL-HY003	2" Sealing Diaphragm For Hyd. Submersible Pump	06898001	HYDROMATIC	MS-R6-S3	-3.00	$28.00	DIAPH
DISK-COMP-M/M-001	Compression Disk For M/M at Airport #CMD 1800 MS	34034	JWC-ENV	MS-R1B-S3	0.00	$36.67	DISK
EAR-HY001	Pump Discharge Ear To Fit 7.5 Hp Hydromatic Pump		ENG. ENVIR.	GA-C7	15.00	$14.00	EAR
ELEC-3WSOL-001	3-Way Solenoid	1L4068	S&L	EL-C1-S2	5.00	$0.00	ELEC
ELEC-ACTUATOR-T/S-001	Linear Actuator For T/Switch at Jeff Metropolitan	306-3401-06	ONAN	EL-C3-S2	0.00	$387.70	ELEC
ELEC-ALT-001	Alternator	47AB10AF	Furnas	EL-C1-S4	5.00	$162.09	ELEC
ELEC-ALT-002	Alternator	311XBXPR	Struthers-Du	EL-C1-S4	-6.00	$125.80	ELEC
ELEC-ALT-003	Alternator	ARA-120-ABA	Diversified	EL-C1-S4	9.00	$54.00	ELEC
ELEC-ALT-004	Alternator	ARA-120-ADA	Diversified	EL-C1-S4	4.00	$58.00	ELEC
ELEC-ALT-005	Alternator	14-40 7113	ITT Flygt	EL-C1-S4	4.00	$0.00	ELEC
ELEC-ALT-006	Alternator, Consolidated Electric	CMC09	CONSOL	EL-C4-S8	2.00	$201.60	ELEC
ELEC-ALT-007	Alternator, Wetwell Timers (10 Min.)	4L343A	S & L	EL-C1-S3	2.00	$117.63	ELEC
ELEC-ALT-008	Alternator For Grants Mill Pump Stations	LJRS2	SYRELEC	EL-C1-S4	4.00	$73.50	ELEC
ELEC-ARMATU-001	Armature, For Furnas Starter, Size 4 For 150/459	D17725001		EL-R2-S2	1.00	$154.11	ELEC
ELEC-ARREST-001	Lightning Arrestors	LA603UL	Delta	EL-C3-S4	5.00	$0.00	ELEC
ELEC-AUTTRANF-001	Autotransformer, Square D, 50 HP, Fan #2	MSA-50202-H2		COPS-SS	1.00	$550.00	ELEC
ELEC-AUXCT-003	Auxiliary Contacts, Normally Open, Square D, Size	9999SX6		EL-R2-S3	6.00	$30.78	ELEC
ELEC-AUXCTS-001	Auxiliary Contacts	C320KGS 42	Cutler Hamme	EL-R2-S3	1.00	$0.00	ELEC
ELEC-AUXCTS-002	Auxiliary Contacts	9999SX9	SQUARE D	EL-R2-S3	4.00	$0.00	ELEC
ELEC-AUXCTS-004	Auxiliary Contacts, Normally Open, Cutler Hammer	C300KA-1	Cutler Hamme	EL-R2-S3	6.00	$15.69	ELEC
ELEC-AUXCTS-005	Auxiliary Contacts, Normally Open, Furnas 49AAFD	49AAF0	Furnas	EL-R2-S2	2.00	$37.00	ELEC
ELEC-AUXCTS-006	Auxiliary Contacts - Five Mile West - Crane		M&G ELECTRON	EL-R2-S3	6.00	$15.00	ELEC
ELEC-BHTR-001	Block Heater	3313272	FLEETGUARD	EL-C2-S2	2.00	$0.00	ELEC
ELEC-BHTR-002	Block Heater To Fit Cunnin Generator	SUA10	KIMHOTSTART	EL-	4.00	$9.28	ELEC
ELEC-BHTR-002	Block Heater To Fit Cunnin Generator	SUA10	KIMHOTSTART	EL-CI-S2	9.00	$9.28	ELEC
ELEC-BHTR-003	Block heater For Second Creek Kim Hotstart	SB-122-108-00	KIMHOTSTART	EL-C2-S2	0.00	$193.81	ELEC
ELEC-BHTR-004	Block Heater For Bessemer Hosp	DD6V-751-S	KIMHOTSTART	EL-C2-S2	0.00	$1.00	ELEC
ELEC-BHTR-005	Block Heater For Black Creek	SB122108-000	KIMHOTSTART	EL-C2-S2	1.00	$194.00	ELEC
ELEC-BHTR-006	Block Heater For Visionland/Onan Generators	333-0568-01	ONAN	EL-C3-S5	3.00	$178.98	ELEC
ELEC-BHTR-007	1000 Watt 120 V Block Heater	3825411C	FLEETGUARD	EL-C2-S1	7.00	$49.60	ELEC
ELEC-BHTR-008	1500 Watt 120 Volt Block Heater	259223	FLEETGUARD	EL-C2-S1	2.00	$54.38	ELEC
ELEC-BHTR-009	Block Heater, Catepillar, For Acton Road	7E6250	CAT	EL-C6-S1	2.00	$268.02	ELEC
ELEC-BHTR-010	Block Heater, Catepillar For Pinewood	7E-6247	CAT	EL-C6-S1	2.00	$472.74	ELEC
ELEC-BHTR-011	Block Heate For Rice Creek (See Specs)	3E3520	CAT	EL-C2-S2	0.00	$54.64	ELEC
ELEC-BHTR-012	Block Heater For Onan Generators	0333-0568-01	ONAN	EL-C6-S7	0.00	$173.30	ELEC
ELEC-BHTR-013	Block Heater For Patton 1 & 2	200-6504	CAT	EL-C5-S4	1.00	$530.75	ELEC
ELEC-BHTRC-001	Block Heater/ T'stat 72" Y Cord	3825424	FLEETGUARD	EL-C2-S2	5.00	$64.52	BHEAT
ELEC-BLST-001	Fluorescent Ballast	R-2S40-TP	ADVANCE	EL-R1-S2	-15.00	$0.00	ELEC
ELEC-BLST-002	400 Watt H.P.S. Ballast	71A8443-001	ADVANCE	EL-R1-S3	6.00	$0.00	ELEC
ELEC-BLST-003	250 Watt H.P. S. Ballast	71A8271-DO1D	ADVANCE	EL-R1-S2	2.00	$90.43	ELEC
ELEC-BLST-004	250 Watt M.V. Ballast	71A3572-001D	ADVANCE	EL-R1-S2	14.00	$41.60	ELEC
ELEC-BLST-005	150 Watt H.P.S. Ballast	71A8172-001D	ADVANCE	EL-R1-S2	7.00	$88.28	ELEC
ELEC-BLST-006	100 Watt M.H. Ballast	71A5390-001D	ADVANCE	EL-R1-S2	5.00	$0.00	ELEC
ELEC-BLST-007	70 Watt H.P.S. Ballast	71A7971-001D	ADVANCE	EL-R1-S2	4.00	$53.77	ELEC
ELEC-BLST-008	Ballast for Newfound Fluorecent Lights	R-2E75-S-TP		EL-R1-S3	-5.00	$18.00	ELEC
ELEC-BLST-009	Ballast for UV at Warrior Plant	3RBLT-302403	TROJAN	EL-R1-S2	2.00	$103.00	ELEC
ELEC-BLST-010	8 Ft. Ballast	R5-2S11-TP	ADVANCE	EL-R1-S2	10.00	$1.00	ELEC
ELEC-BLST-011	1000 Watt, For Sodium Vapor Lamps, Scotts Branch	71A8743001	ADVANCE	EL-R1-S2	10.00	$178.00	ELEC
ELEC-BLST-012	Ballast For UV at Prudes Creek Plant - Model Aq	E264UCPI120G02	INFILCO	EL-R1-S3	10.00	$1.00	ELEC
ELEC-BLST-013	Electronic Ballast - Sola Basic From Buffalo Elec.	E-758-F432	TRIAD	EL-R1-S	9.00	$18.75	ELEC
ELEC-BLST-014	Ballast For UV at Purdes C. Plant For Model Aquara	61795G01	ONDEO D.	EL-R1-S3	15.00	$92.47	ELEC
ELEC-BLST-015	Ballast For Scotts, 400 W.	71A6071001D		EL-R1-S2	14.00	$46.90	ELEC
ELEC-BLST-016	1000 Watt, 480 V. Ballast For Pole Lights at Scott	S1000ML5AC5M-500K	UNIVERSAL	EL-R1-S3	7.00	$145.00	ELEC

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
ELEC-BLST-017	Ballast 120V for Office Lighting	REL 1P32SC	ADVANCE	EL-R1-S2	10.00	$15.10	ELEC
ELEC-BOARD-T/S-001	Transfer Switch Board - Onan - Payne Road	300-4750-01	ONAN/CUMMINS	EL-C4-S7	0.00	$607.30	ELEC
ELEC-BOARD-T/S-002	Transfer Switch Timer Board Acton Road Generator	295462	ASCO	EL-C4-S7	1.00	$619.20	ELEC
ELEC-BRKR-001	Breaker 3 Pole	BR 3100	Cutler Hamme	EL-C2-S3	3.00	$0.00	ELEC
ELEC-BRKR-002	Breaker 3 Pole	BR 360	Cutler Hamme	EL-C2-S4	7.00	$0.00	ELEC
ELEC-BRKR-003	Breaker 3 Pole	EHB 3030	WESTINGHOUSE	EL-C2-S3	2.00	$0.00	ELEC
ELEC-BRKR-004	Breaker 3 Pole	FB 3125L	WESTINGHOUSE	EL-C2-S3	2.00	$0.00	ELEC
ELEC-BRKR-005	Breaker 3 Pole	EHB 3015L	WESTINGHOUSE	EL-C2-S3	4.00	$0.00	ELEC
ELEC-BRKR-006	Breaker 1 Pole	EHB 1030	WESTINGHOUSE	EL-C2-S3	2.00	$99.00	ELEC
ELEC-BRKR-007	3 Pole 60 Amp Breaker	SQDQU360	SQUARE D	EL-C1-S6	2.00	$145.52	ELEC
ELEC-BRKR-007	3 Pole 60 Amp Breaker	SQDQU360	SQUARE D	EL-C2-S4	4.00	$145.52	ELEC
ELEC-BRKR-008	Plug in Breaker	Q0120	SQUARE D	EL-C2-S4	10.00	$1.00	ELEC
ELEC-BRKR-009	Breaker-2 Pole-Square D For Airport	EDB24040		EL-C2-S4	1.00	$117.03	ELEC
ELEC-BRKR-010	Breaker - 225 Amp, 600 Volt For Riverchase	SFLA36A10250A	GE/MAYER	EL-C2-S4	1.00	$876.03	ELEC
ELEC-BRKR-011	3 Pole, 90 Amp - 250 Volt Breaker For Lewisburg #2	QOU390	SQUARE D	EL-C2-S4	0.00	$1.00	ELEC
ELEC-BRKR-012	100 Amp, 3 Pole, 480 Volt For Lewisburg #1	EHD3100L	Cutler Hamme	EL-C2-S4	0.00	$298.00	ELEC
ELEC-BRKR-013	Breaker, 3 Phase, 480 Volt, 70 Amp For Hoover High	FAL34070	SQUARE D	EL-C2-S4	0.00	$185.00	ELEC
ELEC-BRKR-014	Breaker, 3 Pole, 15 Amp, 240 Volt Minor Rd PS-G'da	QOU315	SQUARE D	EL-C2-S5	0.00	$57.00	ELEC
ELEC-BRKR-015	Breaker 3 Pole, 100 Amp, 600 Volt, For Wylam	FAL3610018M	SQUARE D	EL-C2-S4	0.00	$430.87	ELEC
ELEC-BRKR-016	3 P/ 600V /200A/Hoover HS, Lakecrest, StadiumT, Ma	KAL36200	SQUARE D	EL-C2-S4	2.00	$452.00	ELEC
ELEC-BRKR-017	Low V. C/Breaker (Reconditioned) Minor Parkway	AKRT-10D-50H	GE	EL-C2-S4	0.00	$6,500.00	ELEC
ELEC-BULB-EME-001	Emergency Light Bulb 12 Volts, 12 Watts	4044-1	GE	MZ-R1-S2	12.00	$16.35	ELEC
ELEC-BULB-FLO-001	150 W Flood Lamps	150PARA/KL/	SYLVANIA	MZ-R2-S2	-1.00	$1.00	BULBS
ELEC-BULB-FLO-002	150 W Flood Lamps	15PAR/FL120	GENELEC	MZ-R2-S2	8.00	$1.00	BULBS
ELEC-BULB-FLU-001	8 Foot Fluorescent Bulb	F96T12	Phillips	M2-R1-S3	-40.00	$1.00	BULBS
ELEC-BULB-FLU-002	4 Foot Fluorescent Bulb	F40CW	SYLVANIA	MZ-R4-S1	-64.00	$1.00	BULBS
ELEC-BULB-FLU-003	Fluorescent Lamps, Outside, Phillips Trussville NE	PLC15MM/28W/27	Phillips	MZ-R2-S1	1.00	$18.04	ELEC
ELEC-BULB-FLU-004	Fluor. Bulb For Showers at Scotts & TV Inspects.	CF13DS/841	SYLVANIA	MZ-R1-S2	36.00	$2.27	ELEC
ELEC-BULB-IN-001	1000 W Incandescent Clear Med Base		GENELEC	MZ-R1-S2	2.00	$1.00	BULBS
ELEC-BULB-IN-002	300 W Incandescent Clear Med Base	PS30	SYLVANIA	MZ-R1-S1	48.00	$1.00	BULBS
ELEC-BULB-IN-003	300 W Incandescent Clear Med Base	300/99	WESTINGHOUSE	MZ-R1-S1	27.00	$1.00	BULBS
ELEC-BULB-IN-004	300 W Incandescent Clear Med Base	21023	GENELEC	MZ-R1-S1	42.00	$1.00	BULBS
ELEC-BULB-IN-005	200 W Incandescent Frosted Small Base	36291-3	Phillips	MZ-R2-S2	94.00	$1.00	BULBS
ELEC-BULB-IN-006	100 W Incandescent Frosted Small Base	22291-9	Phillips	MZ-R2-S2	86.00	$1.00	BULBS
ELEC-BULB-IN-007	300 W Incandescent Clear Small Base		GENELEC	MZ-R2-S2	1.00	$1.00	BULBS
ELEC-BULB-LU-001	250 W Lumalux Lamp	LU250	SYLVANIA	MZ-R2-S1	22.00	$1.00	BULBS
ELEC-BULB-MA-001	100 W Metal Arc MP/U/Med Base	MP100/U/MED	SYLVANIA	MZ-R2-S1	5.00	$1.00	BULBS
ELEC-BULB-MA-002	400 W Metal Arc Cleaner Mogul Base	M400/U	SYLVANIA	MZ-R2-S1	22.00	$1.00	BULBS
ELEC-BULB-MOGB-001	70 W Lucalox, Mogal Base, Sylvania, Patton 1 & 2	LU70ECO	SYLVANIA	MZ-R1-S2	0.00	$12.89	ELEC
ELEC-BULB-MOGB-002	70 Watt, Mogul Base Phillips	C70S62	Phillips	MZ-R1-S2	5.00	$11.80	ELEC
ELEC-BULB-MV-001	175 W Mercury Vapor DX White Mogul Base	H39KC-175		MZ-R2-S1	0.00	$1.00	BULBS
ELEC-BULB-MV-002	Mercury Vapor Lamps, 250 Watts	H37KC-250DX	Phillips	MZ-R2-S1	-10.00	$17.50	ELEC
ELEC-BULB-PANEL-001	Panel Light at the Bio Filter	2711 NL1	ALLEN B.	EL-C4-S5	3.00	$79.76	ELEC
ELEC-BULB-PILOT-001	Pilot Light, Square D, PSControl Panel	9001 KP1		EL-C3-S1	9.00	$48.80	BULBS
ELEC-BULB-TH-001	250 W Tungston Halogen	250Q/CLDC/ESS	SYLVANIA	MZ-R2-S2	9.00	$1.00	BULBS
ELEC-BULB-UV-001	UV Bulb, For Infilco System For Prudes Creek Plant	59619-G09	INFILCO	MZ-F	94.00	$30.00	BULBS
ELEC-BULB-UV-002	UV Bulbs For Trojan UV 3300K System, Warrior Plant	302418	TROJAN	MZ-F	4.00	$44.00	BULBS
ELEC-CABLE-001	8/4 S.O. Cable In 250' Roll	8/4 S.O. Cable	BUFFALO	EL-BW	1.00	$387.50	ELEC
ELEC-CABLE-002	Cable 6/5 Conductor Cable 40 Roll For Ashville Rd	SOW 6/5	MAYER	EL-BW	1.00	$120.40	ELEC
ELEC-CABLE-003	Cable Ass. 30 Hp Ebara at Woods Trace	DADL1-8970	ESHELMAN	EL-BW	0.00	$2,291.00	ELEC
ELEC-CABLE-004		18079480	KSB	EL-C3-S5	0.00	$1,076.00	ELEC
ELEC-CABLE-ORING-001		00373092	KSB	EL-C3-S5	4.00	$18.00	ELEC
ELEC-CAP-001	Capacitor, Amrad Engineering, 20 UF 370 VAC, Oak G	20UF370VAC		EL-DR-S2	6.00	$5.20	CAPACI
ELEC-CAPC-001	Cap Cord, Male, Welding Machines, PN 26415	26418	HUBBELL	EL-C2-S4	0.00	$121.00	ELEC
ELEC-CAPC-002	Cap Cord, Female, Welding Machines	26419	HUBBELL	EL-C2-S4	1.00	$221.31	ELEC
ELEC-CAPC-003	Cap Cord Assembly For Hydromatic 30 Hp Submersible	054650435	EEE	EL-C2-S4	1.00	$780.00	ELEC
ELEC-CB-001	Circuit Board	332-3435.A	ONAN	EL-C2-S2	1.00	$0.00	CIRBRD
ELEC-CB-002	Circuit Board	G292806	KOHLER	EL-C2-S2	0.00	$0.00	CIRBRD
ELEC-CB-003	Transfer Switch Circuit Board I-59	297375	KOHLER	EL-C2-S2	-2.00	$12.00	CIRBRD

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
ELEC-CB-004	Circuit Board For Bess. Hosp., Longleaf & Corbet 2	297878	KOHLER	EL-C2-S2	1.00	$1,224.00	CIRBRD
ELEC-CB-005	Circuit Board - For MMC Panel For Riverchase	1C693MDL340	GE/MAYER	EL-C2-S2	2.00	$385.00	CIRBRD
ELEC-CB-006	Volt Regulator Circuit Board For Prudes #1 PS	C255670	KOHL	EL-C2-S2	1.00	$284.00	CIRBRD
ELEC-CB-007	Circuit Board For Brummitt Heights	300-3160	ONAN	EL-C2-S2	0.00	$337.70	CIRBRD
ELEC-CB-008	Output Relay Cir.B. For PipeS., ParkW., Saddlers G	448	TIME MARK	EL-C5-S7	1.00	$183.00	CIRBRD
ELEC-CELL-001	Photo Cell	K4	Intermatic	EL-R1-S2	4.00	$0.00	BULBS
ELEC-CELL-002	Photo Cell	2007	TORK	EL-C4-S6	3.00	$1.00	BULBS
ELEC-CELL-003	Photo Cell	2002	TORK	EL-C4-S6	10.00	$1.00	BULBS
ELEC-CHARG-BATT-001	12 Volt Battery Charger For Stand-By-Generators	ABC-12-8	NEW MAR	EL-	1.00	$1.00	ELEC
ELEC-CHARG-INV-001	Emergency Lighting Inverter Charger, Bodine Brand			EL-R1-S3	3.00	$47.50	ELEC
ELEC-CHTR-001	Canister Heater For Onan Generator	333-0568-01	ONAN	EL-C7-S8	2.00	$176.30	ELEC
ELEC-CIRBOARD-001	Circuit Board For Minor Parkway	1336-MCB-SP1J	ALLEN B.	EL-	1.00	$1,161.94	ELEC
ELEC-CIRBOARD-002	C/Board For Transfer Switch - Prudes I, Corbet 1&2	E-297375	KOHLER	EL-C2-S2	0.00	$1,331.40	ELEC
ELEC-CIRBOARD-003	Circuit B. For Main B. For Kohler T/Switch For Pru	292302	KOHLER	EL-C2-S2	1.00	$823.20	ELEC
ELEC-CIRBOARD-004	Circuit Board For Generator at Hidden Trace	650-093	OLYMPIAN	EL-C2-S2	0.00	$370.28	ELEC
ELEC-CIRBOARD-005	Circuit Board, Transfer Switch, Jeff. Metro.	300-3959-01	ONAN	EL-C2-S2	0.00	$432.63	ELEC
ELEC-CNDTF-001	3/4" Steel Liquid Tight Flex conduit	X075001001	Ultratite	EL-R1-S1	1.00	$1.00	ELEC
ELEC-COIL-001	120 Volt Coil	9-1891-1	Cutler Hamme	EL-R2-S3	2.00	$0.00	ELEC
ELEC-COIL-002	Furnas size 3 starter coil for Hoover High S	75D73251A	Furnas	EL-R2-S3	-2.00	$97.50	ELEC
ELEC-COIL-003	Contactor coil for Shades Site street lights	31041-400-42	SQUARE D	EL-1	1.00	$48.80	ELEC
ELEC-COIL-004	Compressor coil for Scott's Br A.C.	31074-400-44	SQUARE D	EL-1	-1.00	$102.00	ELEC
ELEC-COIL-005	Coil Piece, Laminated For Size 5 Furnas Starter	D18826001		EL-R2-S2	1.00	$381.00	ELEC
ELEC-COIL-006	Coil For Riverchase	78009204857	GE	EL-C4-S7	1.00	$125.38	ELEC
ELEC-COIL-007	Coil, Size 3, 480 Volts For Shades Trunk Fan	31074-400-57	SQUARE D	EL-R2-S2	2.00	$100.53	ELEC
ELEC-COIL-008		31074-400-38	SQUARE D	EL-R2-S2	2.00	$100.53	ELEC
ELEC-COMPKIT-001	Compressor Repair Kit	11305	Air Dimensio	EL-C2-S2	1.00	$0.00	COMPRE
ELEC-CONTPAK-001	Low Voltage Control Pak For Newfound	144600	GEMS S.	EL-C5-S6	4.00	$133.00	ELEC
ELEC-CONTPANEL-001	Total Control Panel for Riverchase.	CQPM3D200B2PA	GE	EL-R2-S2	1.00	$476.45	ELEC
ELEC-CONTRL-001	Controller	27781-023EPS	Gorman Rupp	EL-R2-S1	1.00	$0.00	ELEC
ELEC-CONTRL-002	Electronic Level Processor For Blueridge	4L410A	S&L	EL-R2-S1	-1.00	$982.00	ELEC
ELEC-CONTRL-003	Liquid Level Controller, For PipS., ParkW., Saddle	403	TIME MARK	EL-C5-S7	1.00	$779.00	ELEC
ELEC-CONTRL-004	Pump Controller For (New) Morgan/Greenwood #1 & #2	1760	A-B	EL-R2-S1	2.00	$193.60	ELEC
ELEC-CONTRL-005	Controller for Visionland	INFP-0300-C2/E	NEWPORT	EL-R2-S1	-1.00	$720.00	ELEC
ELEC-CONTRL-006	Level Controller For Newfound #1	AB 2707L8P2	ALLEN B.	EL-R2-S1	1.00	$1,140.57	ELEC
ELEC-CONTRL-007	Pump Director Control B. For Newfound #1	7600	GA INDUSTRIE	EL-	0.00	$2,393.00	ELEC
ELEC-CONTRL-008	Level Controller For Adamsville P.S.	120	PULSAR	EL-C4-S6	0.00	$1,090.00	ELEC
ELEC-CONTRL-009	Duplex Controller Board For Airport	DC101D	CSI	EL-R2-S1	1.00	$310.00	ELEC
ELEC-CONTRL-DEV001	Lift Station Controller, 3 1/2 Digit, Alternating	SLCS-332-AP-SC	DEVAR	EL-R2-S1	1.00	$435.00	ELEC
ELEC-CONTRL/B-001	Main Control Board For Allen B. - VFD at Minor Par	1336F-MCB-SP1L	ALLEN B.	EL-R2-S2	0.00	$1,180.00	ELEC
ELEC-CONTRLMOD-001	Control Module For Generator Engine at Wylam	6V6153	CAT	EL-C2-S2	0.00	$1,233.09	GEN
ELEC-CPU-001	Control Panel Unit For Riverchase	1C693UDR001EP1	GE/MAYER	EL-C2-S2	2.00	$240.00	ELEC
ELEC-CPU-002	Control Panel Unit For Riverchase	IC693UDR001RP1	GE/MAYER	EL-C4-S7	2.00	$240.00	ELEC
ELEC-CRARMASS-001	Cross Arm Assembly For Furnas Starter Size 4	D51145001		EL-R2-S2	1.00	$39.23	ELEC
ELEC-CTKIT-001	Kit for Size 3 Square D Starter	9998SL7	SQUARE D	EL-R2-S2	1.00	$281.72	ELEC
ELEC-CTS-001	Contactor, Five Mile West - Crane	ABB/A16301084	M&G ELECTRON	EL-C6-S8	2.00	$71.40	ELEC
ELEC-CTS-002	Contactor, Five Mile West - Crane	ABB/A12301084	M&G ELECTRON	EL-C6-S8	3.00	$58.80	ELEC
ELEC-CTS-003	Contractor For Sm Cranes in Shop Water Heater at P	8910DPA33V02	SQUARE D	EL-C6-S8	0.00	$69.75	ELEC
ELEC-DEHUMIF-001	Dehumidifier, 30 Pt/24 Hr, 115V - Grainger	3HZ92	GRAINGER	MZ-F	0.00	$295.00	ELEC
ELEC-DEHUMIF-002	Dehumidifier, 30 Pt/24 Hr, 115V - Grainger - Made	4YH17	GRAINGER	MZ-F	0.00	$185.27	ELEC
ELEC-DEHUMIF-003	Dehumidifier, 50 Pt/24 Hr, 115V - Grainger - Made	5E821	GRAINGER	MZ-F	0.00	$237.02	ELEC
ELEC-DEHUMIF-004	Dehumidifier, 40 Pt/24 Hr, 115V - Grainger	4YH13	GRAINGER	MZ-F	0.00	$177.73	ELEC
ELEC-DEHUMIF-005	Dehumidifier, 50 Pt/24 Hr Grainger	1KW85	GRAINGER	MZ-F	1.00	$237.25	ELEC
ELEC-DEHUMIF-006	Dehumidifier, 65 Pt/24 Hr Grainger	1KW84	GRAINGER	MZ-F	0.00	$260.00	ELEC
ELEC-DEHUMIF-007	Dehumidifier, 50 PT/24 Hr, 115 Volt - Grainger	5E822A	GRAINGER	MZ-F	1.00	$577.63	ELEC
ELEC-DEHUMIF-008	Dehumidifier, 40 Pt/24 Hr. 115V	1KW86	GRAINGER	MZ-F	7.00	$170.00	ELEC
ELEC-DEHUMIF-009	Dehumidifier, 45 PT/24 Hr., 115V, Grainger	5BB56	GRAINGER	MZ-F	8.00	$211.50	ELEC
ELEC-DFLT-001	Daytank Float	N/A	Kohler	EL-C2-S2	2.00	$0.00	ELEC
ELEC-DSCSWITCH-001	Disconnect Switch	DH361URK	Cutler Hamme	EL-R2-S3	1.00	$0.00	ELEC
ELEC-ELECTRODE-01	Electrode for USEMCO vacuum prime pump systems	04126400	USEMCO	-	2.00	$66.15	ELEC

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
ELEC-ELECTRODE-02	Electrode for Smith and Loveless suction lift sta	87A229A	S&L	GA-C15	8.00	$1.00	ELEC
ELEC-ELTRO-DOME-001	Electrode Dome, PN 87B1331B, S & L	87B1331B	S&L	GA-C15	9.00	$1.00	ELEC
ELEC-ETM-001	Elapsed Time Meters	6X137	GRAINGER	EL-C3-S1	12.00	$39.42	ELEC
ELEC-ETM-002	Elapsed Time Meters	1T897	Simpson	EL-C3-S1	7.00	$0.00	ELEC
ELEC-EXFAN-006	For #4 Blower Control Panel For Scotts	T-FP41	Hoffman	EL-C1-S6	-3.00	$90.00	EXFAN
ELEC-FILM-001	Film, Caterpillar PN 7C9129, Wylam	7C9129	CAT	EL-C2-S2	-1.00	$8.82	GEN
ELEC-FLT-001	Level Control Floats (40 Feet Length)	S40NONC	Roto-Float	EL-C1-S1	0.00	$0.00	ELEC
ELEC-FLT-002	Level Control Floats (40 Feet Length)	S40NO	Roto-Float	EL-C1-S1	11.00	$39.00	ELEC
ELEC-FLT-003	Level Control Floats (60 Feet Length)	S60NO	ROTO-FLOAT	EL-C1-S1	6.00	$68.75	ELEC
ELEC-FLT-004	Level Control Floats (20 Feet Length)	1001898	SJE-RHOMBUS	EL-C5-S1	9.00	$45.62	ELEC
ELEC-FLTSWITCH-001	Float Switch	6717	SQUARE D	EL-C1-S2	1.00	$0.00	ELEC
ELEC-FUSE-001	Fuse 600V	FRS-R-400	Fusetron	EL-C3-S3	5.00	$0.00	ELEC
ELEC-FUSE-002	Fuse 600V	KLPC 800	Little Fuse	EL-C3-S2	2.00	$75.00	ELEC
ELEC-FUSE-003	Fuse 600V	LLSRK 200	Little Fuse	EL-C3-S2	10.00	$49.15	ELEC
ELEC-FUSE-004	Fuse 600V	LLSRK 150	Little Fuse	EL-C3-S2	14.00	$49.15	ELEC
ELEC-FUSE-005	Fuse 600V	LLSRK 100	Little Fuse	EL-C3-S2	14.00	$0.00	ELEC
ELEC-FUSE-006	Fuse 250V	LLNRK 100	Little Fuse	EL-C3-S2	13.00	$0.00	ELEC
ELEC-FUSE-007	Fuse 600V	LLSRK 60	Little Fuse	EL-C3-S2	20.00	$10.64	ELEC
ELEC-FUSE-008	Fuse 250V	LLNRK 60	Little Fuse	EL-C3-S2	12.00	$0.00	ELEC
ELEC-FUSE-009	Fuse 600V	LLSRK 30	Little Fuse	EL-C3-S2	10.00	$0.00	ELEC
ELEC-FUSE-010	15 Amp/600 Volt Fuse	FLSR 15	Little Fuse	EL-C3-S2	30.00	$4.06	ELEC
ELEC-FUSE-011	Fuse 600V	LPJ-17 1/2 SP	BUSSMAN	EL-C3-S2	19.00	$0.00	ELEC
ELEC-FUSE-012	Fuse 600V	KLDR 1/2	Little Fuse	EL-C3-S2	10.00	$0.00	ELEC
ELEC-FUSE-013	Fuse 250V	FLNR 6/10	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-014	Fuse 600V	KLKR 1	Little Fuse	EL-C3-S2	20.00	$0.00	ELEC
ELEC-FUSE-015	Fuse 250V	FLM-1 4/10	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-016	Fuse 500V	FLQ 2	Little Fuse	EL-C3-S2	5.00	$0.00	ELEC
ELEC-FUSE-017	Fuse 600V	KLDR 3	Little Fuse	EL-C3-S2	4.00	$0.00	ELEC
ELEC-FUSE-018	Fuse 500V	FLQ 3	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-019	Fuse 250V	NLN 3	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-020	Fuse 250V	FLNR 3 2/10	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-021	Fuse 250V	KLNR 1 6/10	Little Fuse	EL-C3-S2	5.00	$0.00	ELEC
ELEC-FUSE-022	Fuse 600V	KLDR 4	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-023	Fuse 250V	FLM 5 6/10	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-024	Fuse 250V	FLNR 5	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-025	Fuse 600V	KLKR 10	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-026	Fuse 500V	FLQ 15	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-027	Fuse 600V	KLKR 10	Little Fuse	EL-C3-S2	8.00	$0.00	ELEC
ELEC-FUSE-028	Fuse 250V	LLNRK 30	Little Fuse	EL-C3-S2	10.00	$0.00	ELEC
ELEC-FUSE-029	Slo-Blo Glass Fuses 250V	3AG 5A 313	Little Fuse	EL-C3-S2	9.00	$0.00	ELEC
ELEC-FUSE-030	400 Amp 600V Fuse	6AAIS400		EL-C3-S3	6.00	$57.00	ELEC
ELEC-FUSE-031	400 Amp 250V Fuse	0T400	Gould Shawmu	EL-C3-S3	6.00	$18.90	ELEC
ELEC-FUSE-032	60 Amp 250 Volt Fuse	TR60R	Gould Shawmu	EL-C3-S2	18.00	$4.48	ELEC
ELEC-FUSE-033	40 Amp 250 Volt Fuse	TR40R	Gould Shawmu	EL-C3-S2	20.00	$4.48	ELEC
ELEC-FUSE-034	30 Amp 250 Volt Fuse	TR30R	Gould Shawmu	EL-C3-S2	20.00	$2.46	ELEC
ELEC-FUSE-035	Pole Light Fuse-Littlefuse	PNKLK-R-3	Little Fuse	EL-C3-S2	20.00	$4.99	FUSE
ELEC-FUSE-036	Fuse - 300 Amp, 600 Volt For Coosa PS	FLSR300	Little Fuse	EL-C3-S2	3.00	$50.65	ELEC
ELEC-FUSE-037	10 Amp/600 Volt Fuse	FLSR10	Little Fuse	EL-C3-S2	19.00	$8.67	ELEC
ELEC-FUSE-038	20 Amp/600 Volt Fuse	FLSR20	Little Fuse	EL-C3-S2	19.00	$8.67	ELEC
ELEC-FUSE-039	30 Amp/600 Volt Fuse	FLSR30	Little Fuse	EL-C3-S2	20.00	$8.67	ELEC
ELEC-FUSE-040	10 Amp/250 Volt Fuse	FLNR10	Little Fuse	EL-C3-S2	16.00	$2.68	ELEC
ELEC-FUSE-041	15 Amp/250 Volt Fuse	FLNR15	Little Fuse	EL-C3-S2	19.00	$2.68	ELEC
ELEC-FUSE-042	20 Amp/600 Volt Fuse	FLNR20	Little Fuse	EL-C3-S2	20.00	$2.68	ELEC
ELEC-FUSE-043	30 Amp/600 Volt Fuse	FLNR30	Little Fuse	EL-C3-S2	20.00	$2.68	ELEC
ELEC-FUSE-044	Fuse 600V	KLKR2	Little Fuse	EL-C3-S2	38.00	$4.10	ELEC
ELEC-FUSE-045	4 Amp 250 Volt Fuse	FLM 4	Little Fuse	EL-C3-S2	6.00	$1.66	ELEC
ELEC-FUSE-046	Transducer-Lower Ass. 0 To 20 Feet	KLKR 4	Little Fuse	EL-C3-S2	7.00	$4.40	ELEC
ELEC-FUSE-047	Fuse 2 Amp 250 Volt	FLM 2	Little Fuse	EL-C3-S2	10.00	$1.60	ELEC
ELEC-FUSE-048	25A/600 V For Muffin Monster at Warrior Plant	AJT 25	SHAWMUTT	EL-C3-S2	4.00	$1.00	ELEC

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ELEC-FUSE-049	Fuse 660V - 80 Amp For Bio-filter	170M 1366	BUSSMAN	EL-C3-S2	9.00	$24.80	ELEC
ELEC-FUSE-050	10 Amp/600 Volt Midget Control Fuse	ATMR10	FS	EL-C3-S2	14.00	$3.85	ELEC
ELEC-FUSE-051	2 Amp/600 Volt Midget Control Fuse	ATMR4	SHAWMUTT	EL-C3-S2	18.00	$4.10	ELEC
ELEC-FUSE-052	5 Amp/60 Volt Midge Control Fuse	ATMR5	SHAWMUTT	EL-C3-S2	30.00	$3.85	ELEC
ELEC-FUSE-HLD-001	Inline Fuse Holder, Bussman Brand, For Scotts	HEB-AA	BUSSMAN	EL-C3-S1	20.00	$4.39	ELEC
ELEC-FUSELINK-001	400 Amp 600V Link fuse	RLS400	Gould Shawmu	EL-C3-S3	10.00	$1.00	ELEC
ELEC-FUSELINK-002	400 Amp 250V Link fuse	RL400	Gould Shawmu	EL-C3-S3	10.00	$8.55	ELEC
ELEC-GAUGE-LEVEL-001	Magnetic Liquid- Level Gauge- Day Tank, Visionland	215920	ROCHESTER	EL-C4-S3	0.00	$135.00	ELEC
ELEC-GEN-VOL-REG-001	Gen. Voltage Reg. For Cummins - At Black Creek	332-1956	ONAN	EL-C2-S2	0.00	$307.90	ELEC
ELEC-GENBRKR-001	Generator Breaker	302-0431	Onan	EL-C2-S2	5.00	$0.00	ELEC
ELEC-GENSOL-001	Generator Solenoid	3916301	Cummins	EL-C2-S2	2.00	$0.00	ELEC
ELEC-HEAT-PORT-001	Heaters, Milk House, 1300/1500 Watt, 3 Wire Ground	3UG67	GRAINGER	MZ-R9-S3	0.00	$36.60	ELEC
ELEC-HEAT-PORT-002	Heater, Port., Holmes, 1500W, 3 Wire	HFH 680	HOLMES/LONG	MZ-R9-S3	4.00	$0.00	ELEC
ELEC-HEAT-PORT-003	Portable Heaters For Pump Stations	3VU32	DAYTON/GRAIN	MZ-R9-S3	8.00	$36.00	ELEC
ELEC-JBOX-001	Junction Box	A-18R188	Hoffman	EL-R2-S1	3.00	$0.00	ELEC
ELEC-JBOX-002	Hoffman 12" x 10"	HOFA1210CHNF	Hoffman	EL-R1-S1	1.00	$60.25	ELEC
ELEC-JBOX-003	Junction Box-Hinged - 4" x 4" x 4"			EL-C5-S8	10.00	$16.98	ELEC
ELEC-JBOX-004	4" Weather Proof Back Box For Patton 1 & 2	WB	FEDERAL S.	EL-R2-S1	3.00	$23.16	ELEC
ELEC-LIFIX-001	100 Watt, Ceiling Mount, Roughlyte, Vapor Tight	VCXL11GC	STONCO	EL-R1-S3	4.00	$35.00	ELEC
ELEC-LIFIX-002	Explosion Proof Light Fixture With Glass Globe	VPWB50	MAYER	EL-C4-S1	4.00	$118.70	ELEC
ELEC-LIFIX-003	Explosion Proof Light Fixture (Fixture Only)	EL-C4-S1	MAYER	EL-C4-S1	2.00	$34.50	ELEC
ELEC-LOUVOP-001	Louver Operators, Scotts Branch	M9216-AGA-2	JOHNCONT	EL-C5-S1	0.00	$155.62	ELEC
ELEC-MECH-INTL-001	Mechanical Interlock - Five Mile West - Crane	ABB/VM51	M&G ELECTRON	EL-R2-S3	2.00	$14.70	ELEC
ELEC-MODULE-001	Electric Module For Riverchase	78009204877	GE	EL-C4-S7	1.00	$205.62	ELEC
ELEC-MODULE-002	Engine Interface Module For Hidden Trace	630-083	THOMPSON	EL-C4-S7	0.00	$161.91	ELEC
ELEC-MOTOR-001	Dehumidifier Motor For White/W.H. Model MDD 30 WW	5303279144	Frigidaire	EL-C2-S1	-2.50	$72.50	ELEC
ELEC-MOTOR-002	Dehumidifier Motor	5303208878	Frigidaire	EL-C2-S1	0.00	$0.00	ELEC
ELEC-MOTOR-003	5 HP Motor Baldor, M3615T-5-1800-TEFE-30, Warrior			COPS-SS			ELEC
ELEC-MOTOR-004	1/4 Hp, 460V, 3 PH - Motor To Fit EIM Gate Control	9C4603FC-C	ECO-TECH	EL-C4-S1	0.00	$435.00	ELEC
ELEC-MOTOR-005	Elec. Motor 5 Hp For Plant Water Pump at P. Creek	V3116	GE	EL-C4-S1	1.00	$560.00	ELEC
ELEC-MOTOR-006	Motor - Fan For Dehumidifiers	5303279144	ELECTROLUX	EL-C7-S7	6.00	$91.01	ELEC
ELEC-MOTOR-007	For 5 Hp Ebara at Birmingham Zoo & Chesswood	CDL 04-6650	EBARA	MS-R4A-S1	0.00	$1,412.00	ELEC
ELEC-MOTOR-008	Elec Motor 10 HP For Pump at Harriman	TV-9	US BRAND	EL-C4-S1	1.00	$2,056.66	ELEC
ELEC-MOTOR-009	Electric Motor 5 Hp Ebara For Birmingham Zoo	CDL06-6102	EBARA	MS-R4A-S1	1.00	$1,487.00	ELEC
ELEC-MOTOR-010	Elec. Motor For Water Seal Pump at Riverchase PS	CM 3545	BALDOR	EL-C4-S8	1.00	$225.55	ELEC
ELEC-MSWITCH-001	Micro-Switch	LSA1A	HONEYWELL	EL-C1-S2	3.00	$0.00	ELEC
ELEC-MSWITCH-002	Micro-Switch	Z-15G-B7-K	DMRON	EL-C1-S2	14.00	$0.00	ELEC
ELEC-MSWITCH-003	Micro-Switch	BZ-2RS-A2	MICRO SWITCH	EL-C1-S2	8.00	$0.00	ELEC
ELEC-OILMON-001	Oil Level Monitor For Vaughn P. #V4K-089 - Airport	V800-488	DANIEL W. CO	EL-	0.00	$254.00	ELEC
ELEC-OLOADHT-001	Overload Heaters Size #1 Woodbrook Apt.	328	SQUARE D	EL-R2-S2	6.00	$7.78	ELEC
ELEC-OLOADHT-002	Overload Heaters Size #3	CC94	SQUARE D	EL-R2-S2	12.00	$7.96	ELEC
ELEC-OLOADHT-004	Overload Heaters, Square S, To Fit Size 1 Motor St	B-45		EL-R2-S2	6.00	$7.70	ELEC
ELEC-OLOADHT-005	Overload Heaters, Furnas	K-86	Furnas	EL-R2-S3	6.00	$1.00	ELEC
ELEC-OLOADHT-006	Overload Heaters For Scotts - Blower	H-2006B-3	Cutler Hamme	EL-R2-S3	1.00	$24.40	ELEC
ELEC-OVERLOAD H-003		CC167		EL-R2--S3	5.00	$7.77	ELEC
ELEC-PHMNTR-001	Phase Monitor	SLA-230-ALE	Diversified	EL-C1-S3	-1.00	$0.00	ELEC
ELEC-PHMNTR-002	Phase Monitor	SLA-440-ALE	Diversified	EL-C1-S3	-1.00	$0.00	ELEC
ELEC-PHMNTR-003	Phase Monitor	SLA-230-ASA	Diversified	EL-C1-S3	14.00	$72.00	ELEC
ELEC-PHMNTR-004	Phase Monitor Relay 440V	SLA-440-ASA	Diversified	EL-C1-S4	0.00	$77.00	ELEC
ELEC-POWER-SUP001	Power Supply to Control Panel at Riverchase - 24 V	S82K-05024	OMRON	EL-C4-S5	1.00	$135.00	ELEC
ELEC-PROBEFIT-001	Probe Fitting For Fox H., Parkway, Dunnavant	6012 EP1	USEMCO	EL-C7-S5	5.00	$31.08	ELEC
ELEC-PSWITCH-001	Pressure Switch	1823-80	DWYER	EL-C1-S2	-1.00	$0.00	ELEC
ELEC-PSWITCH-002	Pressure Switch	836-NX50	Allen-Bradle	EL-C1-S2	3.00	$0.00	ELEC
ELEC-PSWITCH-003	Pressure Switch	L404B1304	HONEYWELL	EL-C3-S4	3.00	$110.00	ELEC
ELEC-PSWITCH-004	Pressure Switch For Air Compressor Tanks	9013 FHG9S2J27P	SQUARE D	EL-C1-S2	7.00	$11.70	ELEC
ELEC-PSWITCPH-004	Pressure Switch - Riverchase PS	9012GNG5	SQUARE D	EL-C1-S5	0.00	$106.60	ELEC
ELEC-PVLV-001	Pressure Valve	111B-111BA	MAC	EL-C1-S2	-1.00	$0.00	ELEC
ELEC-R/FIT-KIT-001	Retro Fit Kit / Transducer Patton 1$2, Race C.	601264-10	CONSOL	EL-C4-S3	2.00	$27.05	ELEC
ELEC-REC-TF-001	Rectifier For Transfer Switch, Prudes & Corbet 2	294544	KOHL	EL-C2-S2	2.00	$154.00	ELEC

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ELEC-RECEP-001	GFI Ground Fault Receptacle	GF5352A	HUBBELL	EL-C2-S4	4.00	$1.00	ELEC
ELEC-RESIN-001	Electrical Resin	Scotchcast 4 Size C	3M	EL-C7-S7	8.00	$26.20	ELEC
ELEC-RESIN-002	Electrical Resin	Scotchcast 4 Size A	3M	EL-C2-S2	1.00	$0.00	ELEC
ELEC-REST-001	Transfer Switch Resistor, Kohler	328011	KOHL	EL-C2-S2	1.00	$182.00	ELEC
ELEC-REST-002	Resistor For 2 Ton Crane in Garage	822J1-100	YALE	EL-C2-S2	0.00	$70.02	ELEC
ELEC-RLY-001	Relay	RH4B-U	IDEC Corpora	EL-C1-S4	1.00	$0.00	ELEC
ELEC-RLY-002	Relay For: 150/459 Lakecrest Magnolia T Stadium T	RR3B-UL	IDEC Corpora	EL-C1-S4	35.50	$10.50	ELEC
ELEC-RLY-003	24V Relay	20547-82	Deltrol Cont	EL-C1-S3	8.00	$0.00	ELEC
ELEC-RLY-004	Time Delay Relay	80E3A607	EAGLE SIGNAL	EL-C1-S3	9.00	$0.00	ELEC
ELEC-RLY-005	Relay	PRD-3AGD-120	Potter and B	EL-C1-S4	2.00	$0.00	ELEC
ELEC-RLY-006	Relay	KP13P14V20	SQUARE D	EL-C1-S4	9.00	$14.00	ELEC
ELEC-RLY-007	Relay	KP12P14V20	SQUARE D	EL-C1-S4	7.00	$13.00	ELEC
ELEC-RLY-008	Relay	KUP-14A35-120	Potter & Bru	EL-C1-S4	-3.00	$0.00	ELEC
ELEC-RLY-009	Relay	RH2B-U	IDEC Corpora	EL-C1-S4	-2.00	$0.00	ELEC
ELEC-RLY-010	Relay	RY2V-U	IDEC Corpora	EL-C1-S4	2.00	$0.00	ELEC
ELEC-RLY-011	Relay	RY4V-U	IDEC Corpora	EL-C1-S4	2.00	$0.00	ELEC
ELEC-RLY-012	Overload Relay	48GC38AA4	Furnas	EL-C1-S4	1.00	$0.00	ELEC
ELEC-RLY-013	Relay	MK3P5-s	OMRON	EL-C1-S4	1.00	$0.00	ELEC
ELEC-RLY-014	Double Pole Double Throw Relay	8501C07V20	SQUARE D	EL-C1-S4	7.00	$33.10	ELEC
ELEC-RLY-015	Double Pole Single Throw Relay	8501C016420	SQUARE D	EL-C1-S4	4.00	$44.95	ELEC
ELEC-RLY-016	Time Delay Relay 8 Pin	1073-1P-1B-1-1	ISSC	EL-C1-S4	9.00	$67.00	ELEC
ELEC-RLY-017	Time Delay Relay	70F3A601	EAGLE SIGNAL	EL-C1-S3	1.00	$64.00	ELEC
ELEC-RLY-018	Single Phase Start Relay SEE SPECIFICATIONS	19167	MARS	EL-C1-S4	14.00	$13.46	ELEC
ELEC-RLY-019	30 Amp 250 Vac Relay	PRD3AY0	Potter and B	EL-C1-S4	5.00	$1.00	ELEC
ELEC-RLY-020	Relay, Phase Failure, 480 Volt, 3 Phase	SLA-440-ASA	Diversified	EL-C1-S3	7.00	$91.67	ELEC
ELEC-RLY-021	A.C. Control Relay For New Found & Visionland	8501X040V02	SQUARE D	EL-C1-S4	5.00	$52.67	ELEC
ELEC-RLY-022	Time Delay Relay For Visionland	8501XTE2	SQUARE D	C1-S3	0.00	$92.00	ELEC
ELEC-RLY-023	Relay, Phase Failure, 230 Volt, 3 Phase	SLA-230-ASA	Diversified	EL-C1-S	1.00	$74.66	ELEC
ELEC-RLY-024	Relay, 120V, Mode-Direct, For Fox Hollies	16MC1A0	WARRICK	EL-C1-S4	1.00	$98.10	ELEC
ELEC-RLY-025	Relay/Presence, Sarasota For Gate at Shades V. Sit	625X	GORRIE-REGAN	EL-C1-S4	-1.00	$195.00	ELEC
ELEC-RLY-026	Relay - 8 Pin - Single Tier	8501 NRB	SQUARE D	EL-C1-S	18.00	$3.32	ELEC
ELEC-RLY-027	Relay 4 pole for Minor Parkway	700-CF220D	ALLEN B.	EL-C1-S2	4.00	$33.55	ELEC
ELEC-RLY-028	Time Delay Relay For Minor Parkway	100-FPTA180	ALLEN B.	EL-C1-S3	1.00	$71.53	ELEC
ELEC-RLY-029	Relay For Newfound 1 & 2	TSD 1423	SSAC	EL-C5-S5	5.00	$28.50	ELEC
ELEC-RLY-030	Relay For Newfound 1 & 2	TSD 2421	SSAC	EL-C5-S5	4.00	$28.50	ELEC
ELEC-RLY-031	Relay For Gorman Rupp Pump Stations	700-P200 A1	ALLEN B.	EL-C1-S5	3.00	$74.62	ELEC
ELEC-RLY-032	Relay 8 Pin	CR420KPM022J	GE/MAYER	EL-C5-S5	63.00	$5.75	ELEC
ELEC-RLY-033	Relay, Overload - Brighton	48BSL3M20		EL-C1-S5	1.00	$219.88	ELEC
ELEC-RLY-034	Relay For Alabama Boulevard	ISO 120 AFA	Diversified	EL-C1-S3	1.00	$103.51	ELEC
ELEC-RLY-BASE-001	Relay base 3 pole NO/NC	8501NR61	SQUARE D	EL-C1-S4	18.00	$5.00	ELEC
ELEC-RLY-BASE-002	Relay base 2 pole NO/NC	8501HR51	SQUARE D	EL-C1-S4	20.00	$5.00	ELEC
ELEC-RLY-BASE-003	Relay Base	CR420KA2	GE/MAYER	EL-C1-S4	20.00	$2.90	ELEC
ELEC-RLY-OLOAD-001	Overload Relay Scott's Br. Blower	C300CN3	Cutler Hamme	EL-R2-S3	1.00	$69.78	ELEC
ELEC-RLY-OLOAD-002	Overload Relay - Scotts Blower	C306DN3B	Cutler Hamme	EL-R2-S3	1.00	$56.40	ELEC
ELEC-RLY-SENS-001	Sensitivity Relay For Gate at Shades Complex	625X	SARASOTA	EL-C1-S	4.00	$210.00	ELEC
ELEC-RUNCAP-001	Run Capacitor	440/40	AMRAD	EL-DESK	4.00	$0.00	ELEC
ELEC-RUNCAP-002	Run Capacitor	370/50R	AMRAD	EL-DESK	1.00	$0.00	ELEC
ELEC-RUNCAP-003	Run Capacitor 20 MFD 370V Oak Grove PS	370/20	AMRAD	EL-DESK	3.00	$9.20	ELEC
ELEC-RUNCAP-004	Run Capacitor 45 MFD 370V Oak Grove PS	370/45	AMRAD	EL-DESK	5.00	$12.33	ELEC
ELEC-RUNCAP-005	20 MFD 440 Volts Capacitor	RC20X440	Phillips	EL-DESK-2	-1.00	$6.30	ELEC
ELEC-RUNCAP-006	60 MFD 440 Volts Capacitor	RC60X440	Phillips	EL-DESK-2	-3.00	$21.62	ELEC
ELEC-RUNCAP-007	72 MFD 330 Volts (Sherman Oaks) Capacitor	1440952	AEROVOX	EL-DESK-2	8.00	$13.85	ELEC
ELEC-SENB-001	Circuit Sensor Board For Generator Fuel Tanks	900310-1	PNEUMER	EL-C2-S2	0.00	$177.00	CIRBRD
ELEC-SEND-UNIT-001	Advanced Matrix Film Twinsite Send. Unit Day T. Vi	215950	ROCHESTER	EL-C4-S3	0.00	$60.00	ELEC
ELEC-SENS-001	Liquid Level Sensor For PipeS., ParkW., Saddlers G	408	TIME MARK	EL-C5-S7	1.00	$822.00	ELEC
ELEC-SFNB-001	Generator Fuel Tanks	900310-1	PNEUMER	EL-C2-S2	2.00	$177.00	ELEC
ELEC-SIGPKP-001	Signal Pickup	A257099	Kohler	EL-C2-S2	3.00	$0.00	ELEC
ELEC-SIREN-001	Electronic Siren For Patton 1 & 2	SST-MV	FEDERAL S.	EL-C6-S9	2.00	$338.98	ELEC
ELEC-SOFT/ST-001	Pump Soft Start For Pleasant Grove	ATS48D624	GEN MACH	EL-C2-S5	1.00	$803.92	ELEC

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ELEC-SOFT/ST-002	Soft Start For Belmont Road #1	ATS48D38Y	SQUARE D	EL-C2-S5	2.00	$651.00	ELEC
ELEC-SOFT/ST-003	Soft Start For Rice Creek	ATS48D88YU	SQUARE D	EL-C2-S5	0.00	$1,080.00	ELEC
ELEC-SOL-001	Solenoid Fuel Shut Off Cat. Gen. 5 Mile West	9X-1413	CAT	EL-C1-S2	1.00	$126.43	ELEC
ELEC-SOL-002	4-Way Solenoid Valve For Newfound 1 & 2	8344G074	ASCO	EL-C1-S2	1.00	$426.50	ELEC
ELEC-SPLICKIT-001	Splice Kit From Mayer	82-A2	3M	EL-C7-S7	4.00	$25.79	ELEC
ELEC-ST/ENCLS-001	Starter Enclosure For Patton 1 & 2	GV2 MC02	TELECANIQUE	EL-R2-S2	2.00	$47.44	ELEC
ELEC-START-001	Motor Starter Size 1 Woodbrook	8536SC03V025	SQUARE D	EL-R2-S2	0.00	$202.00	ELEC
ELEC-START-002	Motor Starter Size 3	8536SE01V025	SQUARE D	EL-R2-S2	-2.00	$596.00	ELEC
ELEC-START-003	Motor Starter Size 3 Fieldstown	14HSK32AA	SQUARE D	EL-R2-S2	2.00	$650.00	ELEC
ELEC-START-004	Starter for Magnolia Trace	8606SG01NV81Y	SQUARE D	EL-R2-S2	0.00	$195.00	ELEC
ELEC-START-005	Motor Starter, Size 2, Vail Pump Station	8536SD01V02S	SQUARE D	EL-R2-S2	-2.00	$226.18	ELEC
ELEC-START-006	Starter Kit For 2 Hp Ebara Pump-230V, Single Phase	871-2HPS-G	EBARA	EL-C7-S8	1.00	$65.00	ELEC
ELEC-START-007	Starter For Ellis Rd., Goodrich, Well. P.	LC1D 3210G6	TELEMECH	EL-R2-S2	1.00	$86.72	ELEC
ELEC-START-008	Starter For Mt. Olive Ave. P.S.	LC1D 1810G6	TELEMECH	EL-R2-S2	0.00	$68.43	ELEC
ELEC-START-009	Starter For Oak Grove P.S.	8536SC03V02H2OS	SQUARE D	EL-R2-S2	2.00	$226.00	ELEC
ELEC-START-010	Starter For Exhaust Fan For Patton 1 & 2	GV2ME06	TELEMECH	EL-R2-S2	2.00	$96.58	ELEC
ELEC-STCAP-001	Start Capacitor	S330/161	Phillips	EL-DESK	1.00	$0.00	ELEC
ELEC-STCAP-002	Start Capacitor	S250/124	Phillips	EL-DESK	2.00	$0.00	ELEC
ELEC-STCAP-003	Start Capacitor	S250/216	Phillips	EL-DESK	3.00	$0.00	ELEC
ELEC-STCAP-004	Start Capacitor	72/86X330	AEROVOX	EL-DESK	4.00	$0.00	ELEC
ELEC-STCAP-005	Start Capacitorfor Wood Trace	500-600/250	Mallory	EL-DESK	6.00	$0.00	ELEC
ELEC-STCAP-006	270-324 MFD 250 Capacitor	SC0270X250	Phillips	EL-DESK-2	8.00	$7.36	ELEC
ELEC-STCAP-007	Start Capacitor 500-600MFD, 250 V. SEE SPECS	CAPA3015	AEROVOX	EL-DESK-2	13.00	$29.40	ELEC
ELEC-STCAP-008	Start Capacitor For Chesswood & B'ham Zoo	216-259	AEROVOX	EL-DESK	12.00	$11.33	ELEC
ELEC-STCAP-009	Start Capacitor (Add A Phase) SEE SPECS	270-324	GLOBAL	EL-DESK	24.00	$8.38	ELEC
ELEC-STCAP-010	Start Capacitor	161-193	GLOBAL	EL-DESK	4.00	$6.14	ELEC
ELEC-STCOIL-001	Starter Coil For Hoover H/S & Brighton	75D73251A	Furnas	EL-R2-S2	2.00	$133.80	ELEC
ELEC-STCTS-001	Starter Contact	75JB14	Furnas	EL-R2-S2	11.00	$320.72	ELEC
ELEC-STCTS-002	Starter Contact	75EA14	Furnas	EL-R2-S2	4.00	$0.00	ELEC
ELEC-STCTS-003	Starter Contact	75KB14	Furnas	EL-R2-S2	3.00	$0.00	ELEC
ELEC-STCTS-004	Starter Contact Square D To Fit Size 1 For Dunnava	9998SL3	SQUARE D	EL-R2-S3	0.00	$77.40	ELEC
ELEC-STCTS-005	Starter Contact For Size 2 3 Pole, Adamsville& Bes	6-34-2	Cutler Hamme	EL-R2-S2	1.00	$153.12	ELEC
ELEC-STCTS-006	Starter Contacts, Square D, Size 1 3 Phase	9998SL3	DAYTON	EL-R2-S3	6.00	$73.68	ELEC
ELEC-STCTS-007	Starter Contacts To Fit C/Hammer Size 4 Starter	6-26-2	Cutler Hamme	FL-R2-S2	6.00	$497.00	ELEC
ELEC-STCTS-008	Starter Contact Kit - Size 3 For Rosebud, Corbet 1	626B187G13	Cutler Hamme	EL-R2-S2	4.00	$122.32	ELEC
ELEC-STCTS-009	St/ Cont,- Size 2 Lewisburge 2 & Wenonah	75GF14	Furnas	EL-R2-S2	3.00	$110.98	ELEC
ELEC-STCTS-010	Starter Contacts - Size 1 3/4, 3 Poles Per Set	75EF14	Furnas	EL-R2-S2	4.00	$140.37	ELEC
ELEC-STCTS-011	Starter Contacts - 3 Poles/3 Poles Per Set For Lau	75HF14	Furnas	EL-R2-S2	1.00	$292.95	ELEC
ELEC-STCTS-012	Starter C. For Size 2, 1 Pole Starter, See Specs.	40420-322-51	ALLEN B.	EL-R2-S2	3.00	$48.35	ELEC
ELEC-STCTS-013	Starter C. For Size 3 Starter For Cottages&Waterma	40430-300-51	ALLEN B.	EL-R2-S2	3.00	$80.55	ELEC
ELEC-STCTS-014	Starter Contacts For Belmar, Dean, Don B. Minor Rd	42CF35AF	Furnas	EL-R2-S2	3.00	$27.43	ELEC
ELEC-STCTS-015	For Size 1 Starter For Oaks, J. Met., SEE SPECS	75DF14	Furnas	EL-R2-S2	10.00	$41.49	ELEC
ELEC-STCTS-016	Starter Contact For 3rd Pl, 2nd Ave, 3rd St & 7th	8910DPA 43 V02	SQUARE D	EL-R2-S2	2.00	$72.96	ELEC
ELEC-STCTS-017	Starter Contact For Brighton P.S.	75IF14	Furnas	EL-R2-S2	4.00	$152.00	ELEC
ELEC-STCTS-018	Starter Conts. Size 3 - Sq. D For Collegeville PS	9998SL7	SQUARE D	EL-R2-S2	1.00	$201.00	ELEC
ELEC-STCTS-019	Starter Contacts For Size 2 Virginiana & Harriman	9998SL4	SQUARE D	EL-R2-S2	4.00	$186.65	ELEC
ELEC-STCTS-020	Starter Contacts For Five Mile West	9998SL11	SQUARE D	EL-R2-S2	-2.00	$1.00	ELEC
ELEC-STVCONTRL-001	Controller To Fit EMI Gate Controller For Scotts P	2343	ECO-TECH	EL-C4-S7	1.00	$1,435.00	ELEC
ELEC-SVLV-001	Solenoid Valve	8210G2	ASCO	EL-C1-S2	3.00	$0.00	ELEC
ELEC-SVLV-002	MAC Brand, PN 111B-111BA	111B-111BA	MAC	-	10.00	$20.00	VALVE
ELEC-SWITCH-001	Single Pole Light	CS-115	PASS/SEYMOUR	EL-C4-S2	20.00	$1.00	ELEC
ELEC-SWITCH-002	Mercury Switch For Minor Pkwy - Check Valve	TS-470	KELE	EL-C4-S2	2.00	$40.44	ELEC
ELEC-SWITCH-003	Mercury Switch For Bess. Hosp. & Five Mile West	9-5107SA-8T	DWYER	EL-	8.00	$23.25	ELEC
ELEC-SWITCH-004	Damper End Switch For Minor Pkwy & Morgan GW 1 & 2	TS470	KELE	EL-C4-S2	6.00	$50.52	ELEC
ELEC-SWTHRSET-001	Set Reset Switch, To fit Kohler Generator, Gard #2	250512	KOHLER	EL-C2-S2	1.00	$76.00	ELEC
ELEC-T/SWITCH-001	Transfer Switch For Acton Road	D00300030104C10F	ASCO	EL-R2-S1	0.00	$1,585.00	ELEC
ELEC-TDCB-001	Time Delay Circuit Board	300-3094	Onan	EL-C2-S2	2.00	$0.00	CIRBRD
ELEC-TERMINAL/B-001	Terminal Board Assembly For Summit For F/Morse Pum	CP 9003 AP	F.M.	EL-C2-S2	0.00	$164.00	ELEC
ELEC-TERMINAL/P-001	Terminal Post To Fit ABS=AST Model #0010EX Pump	12940026	HYDRA SERV	EL-C4-S4	3.00	$108.64	ELEC

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
ELEC-THMST-001	Thermostat	M526	Marley Elect	EL-C1-S2	2.00	$0.00	ELEC
ELEC-THMST-002	Thermostat, Fleetguard, Y Cord With Thermostat	3825424	FLEETGUARD	EL-C2-S1	1.00	$104.52	ELEC
ELEC-THMST-003	Thermostat For Generator Block Heater To Fit Cat.	127-6260	CAT	EL-C2-S1	2.00	$113.46	ELEC
ELEC-TIMER-002	Pneumatic Timer, Furnas, Lakecrest and Stadium Tra	55AB1AF	Furnas	EL-C1-S2	2.00	$174.15	ELEC
ELEC-TIMER-003	Time Clock with Battery Backup - Indoor Type - Out	E103	TORK	EL-C5-S8	5.00	$98.00	ELEC
ELEC-TMR-001	Timer	DA2020A3	EAGLE SIGNAL	EL-C1-S3	1.00	$0.00	ELEC
ELEC-TMR-002	Delay Timer	32391	MARS	EL-C1-S3	12.00	$15.00	ELEC
ELEC-TMR-003	16HR Timer	4L365A	Precision Ti	EL-C1-S3	5.00	$0.00	ELEC
ELEC-TMR-004	10 Min. Timer	4L343A	Precision Ti	EL-C1-S3	1.00	$0.00	ELEC
ELEC-TMR-005	Delay Timer	U9842C	AUTOMATIC TI	EL-C1-S3	5.00	$0.00	ELEC
ELEC-TMR-006	Electronic Timer	RTE-P11	IDEC Corpora	EL-C1-S3	2.00	$0.00	ELEC
ELEC-TMR-007	Pneumatic Timer , Lake C, 150/459, SEE SPECS	55BA1AF	Furnas	EL-C1-S3	4.00	$174.00	ELEC
ELEC-TMR-008	On Delay Relay Timer	70E3A601	M&G ELECTRON	EL-C1-S3	2.00	$52.80	ELEC
ELEC-TMR-009	Pneumatic Timer Siemans Brand For *See Specs.	3RP1505-1BQ30	SIEMANS/BRAN	EL-C1-S3	0.00	$95.00	ELEC
ELEC-TMR-010	Pneumatic Timer For Gorman Rupp Pump Stations	700 PT	ALLEN B.	EL-C1-S3	3.00	$173.47	ELEC
ELEC-TMR-011	Timer - Multi Range Repeat Cycle For Riverchase	422A500FX10		EL-C1-S3	2.00	$71.00	ELEC
ELEC-TMR-012	Timer For Use On 100-C and 700-CF Relays	100-FPTA 180	ALLEN B.	EL-C1-S3	4.00	$88.96	ELEC
ELEC-TRANS-PRESS-001	Pressure Transmitter For Primary Bubbler Sys. at R	3051CD2A02A1AH2	ROSEMOUNT	EL-C2-S5	1.00	$1,394.05	ELEC
ELEC-TRANSF-001	Transformer, Square D, 10KVA 480 Volts Primary	MPZ10S40		COPS-SS	1.00	$1,059.00	ELEC
ELEC-TRANSF-002	Transformer For Scotts P. Sluice Gate Controller	2157	RODNEY HUNT	EL-C6-S9	0.00	$575.00	ELEC
ELEC-TRANSFAU	Auto Transformer, Square D For Pump #1 Magnolia Tr	MSA125		COPS-SS	1.00	$975.00	ELEC
ELEC-TRDCR-001	Electro/Pneumatic Transducer T-8000	TT8001-001000	FAIRCHILD	EL-C1-S2	1.00	$485.00	ELEC
ELEC-TRDCR-002	Pressure Transducer, PX25 - 005G - 11D - B	4L410B		EL-C3-S4			ELEC
ELEC-TRDCR-003	Transducer 0-10PSI, 4-20MA, 9-30 VDC	01002 AU	BLUE RIBBON	EL-C3-S4	1.00	$785.00	ELEC
ELEC-TRDCR-004	Transducer- 0 To 20 FT. B'ham Race & Patton 1 & 2	6012950003	CONSOL	EL-C3-S4	2.00	$579.60	ELEC
ELEC-TRDCR-005	Transd/-L/Ass 0-10 Ft. Scotts & H/ Met/jArbors	601295-0002	CONSOL	EL-C3-S4	1.00	$579.60	ELEC
ELEC-TRDCR-006	Ultra Sonic Transducer For Adamsville	dB10	PULSAR	EL-C4-S6	0.00	$440.00	ELEC
ELEC-TRDCR-007	Transducer & 50' Wire Letson F. Hidden T Al. Blvd	700-140-0005	ESTERLINE	El-C3-S4	1.00	$477.50	ELEC
ELEC-TRDCR-008				EL-C4-S3	0.00	$0.00	ELEC
ELEC-TRDCR-C/A-001	Cable Assembly For Transducer For B'ham Race Cours	6012640006	CONSOL	EL-C3-S4	0.00	$633.70	ELEC
ELEC-TRDCR-DEV001	Submersible Pressure Transducer With 25 Feet Of	#700	DEVAR	EL-C3-S4	2.00	$487.50	ELEC
ELEC-TRDCR-PLATE-001	Adapter Plate For 601295-0003 Transducer For Race	601264-10	CONSOL	EL-C3-S4	0.00	$27.05	ELEC
ELEC-UV-PROBE	U.V. Intensity Probe For Warrior WWTP	UV3000PTP	TROJAN	EL-C3-S1	1.00	$0.00	ELEC
ELEC-V.F. DRIVE-001	Variable F. Drive For Scotts, 15 Hp Pump, *See Spe	CSD415-N	WESCO	EL-C3-S5	0.00	$1,180.00	ELEC
ELEC-VALSOL-001	Solenoid Valve For Ellis Road PS	8210G2	ASCO	EL-	0.00	$80.75	ELEC
ELEC-VARDRIVE-001	Variable Frequency Drive, Motortronics, K Plus	CSD415		EL-C1-S1	2.00	$1,150.00	ELEC
ELEC-VARDRIVE-002	Variable Drive, Benshaw, For Moss Lane, 30 Hp, 230	RS1030 S2	BENSHAW	EL-C1-S1	0.00	$2,319.00	ELEC
ELEC-VREG-001	Voltage Regulator Onan Gen. at Rowan Springs	305-0823	ONAN	EL-C2-S2	0.00	$780.88	ELEC
ELEC-VSEN-001	Voltage Sensor	300-3121	Onan	EL-C2-S2	1.00	$0.00	ELEC
ELECOSWITCH-002	Mercury Switch For Minor Pkway - Check Valve	TS-470	KELE	EL-C4-S2	4.00	$40.44	ELEC
EXFAN-BELT-001				GA			BELT
EXFAN-BELT-002	Belt for Fan 1 at	5VBX100		GA	5.00	$0.00	BELT
EXFAN-BELT-003	Belt for Fan 2 at	5VBX120		GA	5.00	$0.00	BELT
EXFAN-BELT-004				GA			BELT
EXFAN-BELT-006	Belt For Exhaust Fan at Minor Parkway	2870	GATES	GA-W93	4.00	$8.08	BELT
EXFAN-BELT-007	Belt For Exhaust Fan - Pump House/Scotts	2340	GATES	GA-W69	9.00	$3.87	BELT
EXFAN-BRNG-SM001	Bearing For Exhaust Fan at Scotts Branch (Pt W)	L-12	SEALMASTER	MS-R4A-S2	4.00	$0.00	BRNG
EXFAN-BRNG-SM002	Bearing For Exhaust Fan at Scotts Branch	L-16	SEALMASTER	MS-R4A-S2	4.00	$0.00	BRNG
EXFAN-BRNG-SM003	Bearing For Exhaust Fan in Blower Building	217700015	SEALMASTER	GA-R3-S2-3	0.00	$0.00	BRNG
EXFAN-PSCAN-001	Ventilating Blower For	4C667	DAYTON	EL-C1-S6	0.00	$96.99	ELEC
EXFAN-PSCAN-002	Ventilating Blower For Cades,Nursing and Don Berri	4C442	DAYTON	EL-C1-S5	2.00	$59.05	ELEC
EXFAN-PSCAN-003	Ventilating Blower For Acton Road/I 59	4C444	DAYTON	EL-C1-S5	2.00	$111.06	ELEC
EXFAN-PSCAN-004	Ventilating Blower For Morgan #1 and #2	2C791	DAYTON	EL-C1-S1	2.00	$67.94	ELEC
EXFAN-PSCAN-005	ExFan-Harriman, Wenonah, Fieldstown Pipeshop	4C447	DAYTON	EL-C5-S9	4.00	$71.55	ELEC
EXFAN-PSCAN-006	Vent Fan	2C067A	DAYTON	EL-C1-S3	2.00	$0.00	ELEC
EXFAN-PSCAN-007	Vent Fan	2C646A	DAYTON	EL-C1-S3	1.00	$0.00	ELEC
EXFAN-PSCAN-008	Vent Fan For: Dean Dr., Don Berri, McAdory	4C446	DAYTON	EL-C5-S9	4.00	$54.29	ELEC
EXFAN-PSCAN-009	Dayton, Vent. Blwr. For Lance Way SEE SPECS	4C445	DAYTON	EL-C1-S6	1.00	$123.10	ELEC
EXFAN-PSCAN-010	Blower Shaded Pole 158 RPM 2.9 Amps	4C444A	DAYTON	EL-C1-S6	0.00	$101.17	ELEC

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
EXFAN-PSCAN-011	Dayton, Venting Blower, For Cunningham #2Garden G.	2C-946	DAYTON	EL-C6-S9	1.00	$146.03	ELEC
EXFAN-PSCAN-012	Dayton Vent Fan For Coleman Lakes& Cunningham 2	4C831	DAYTON	EL-C1-S6	1.00	$191.73	ELEC
EXFAN-PSCAN-013	Vent Fan For Johns Transfer	4C658	DAYTON	EL-C5-S9	0.00	$90.40	ELEC
EXFAN-PSCAN-014	Exhaust Fan For Lakesterling	D1066	FASCO/BRANNO	EL-C5-S8	1.00	$72.69	ELEC
EXFAN-PSCAN-015	Exhaust Fan For Dover & Brummitt Heights	1HLA1	DAYTON	EL-C5-S9	0.00	$107.73	ELEC
EYEWEAR-PROT-001	Protective Eyewear For MShop	01961705	MSC	HC1-R2-S5	4.00	$10.59	SFTY
FAC-WDTR-13	Echo Weed Trimmer	SRM-3100	ECHO	-	1.00	$310.00	BLADE
FAC-WDTR-14	Echo Weed Trimmer	SRM-3100	ECHO	-	1.00	$310.00	BLADE
FAN-BRNG-FF001	Bearing For Vent Fan - Trunk Line	RSAO 2-15/16	FAFNIR	GA-R3-S2-3	2.00	$0.00	BRNG
FAN-COMP-001	Fan For Compressor at Biofilter	5.0682.7	KAESER	MS-R1B-S3	0.00	$134.52	FAN
FIL-AIR-001	Air Filter for Pinewood Gen.	1067	NAPA	GA-R2-S2	0.00	$12.46	FILAIR
FIL-AIR-002	Air Filter for Pinewood Gen.	PURAF2087	PEROLATOR	GA-R1-S1	1.00	$12.46	FILAIR
FIL-AIR-003	Unknown	AF-178	HASTINGS	GA-R2-S1	0.00	$2.91	FILAIR
FIL-AIR-004	Air Filter For Black Creek Gen	2124	NAPA	GA-R2-S1	1.00	$18.91	FILAIR
FIL-AIR-005	Air Filter For Cunningham 1 Gen	P101246	BALDWIN	GA-R2-S1	0.00	$9.76	FILAIR
FIL-AIR-006	Air Filter For Cunningham 1 Gen	2126	NAPA	GA-R1-S3	1.00	$9.76	FILAIR
FIL-AIR-007	Unknown	A137C	Unknown	GA-R1-S2	5.00	$3.77	FILAIR
FIL-AIR-008	Unknown	LAF-121	Unknown	GA-R1-S2	9.00	$3.77	FILAIR
FIL-AIR-009	Air Filter For Acton rd Gen	7N1225	Nelson	GA-R2-S2	0.00	$13.26	FILAIR
FIL-AIR-010	Air Filter For Acton rd Gen	2255	NAPA	GA-R2-S3	4.00	$13.26	FILAIR
FIL-AIR-011	Air Filter For Lake Sterling Gen	FW-A052527	Donaldson	GA-R2-S2		$0.00	FILAIR
FIL-AIR-012	Air Filter For Patton Gen	6L4714	CAT	GA-R2-S2		$38.68	FILAIR
FIL-AIR-013	Air Filter For Patton Gen	2595	NAPA	GA-R2-S3	1.00	$38.68	FILAIR
FIL-AIR-014	Unknown	PO1-7665	BALDWIN	GA-R2-S2	0.00	$11.76	FILAIR
FIL-AIR-015	Unknown	WIX-42759	WIX	GA-R1-S1	0.00	$20.21	FILAIR
FIL-AIR-016	Unknown	PA-1613S	BALDWIN	GA-R2-S2	0.00	$17.11	FILAIR
FIL-AIR-017	Air Filter For Patton 2 Gen	4L9852	CAT	GA-R1-S3	0.00	$15.94	FILAIR
FIL-AIR-018	Air Filter For Patton 2 Gen	2852	NAPA	GA-R2-S3	5.00	$15.94	FILAIR
FIL-AIR-019	Air Filter For Trussville No. East	AF-110	HASTINGS	GA-R2-S1	0.00	$3.28	FILAIR
FIL-AIR-020	Air Filter For Trussville NE Gen	2095	NAPA	GA-R2-S2	0.00	$3.28	FILAIR
FIL-AIR-021	Air Filter For Dover Gen	AF-125	HASTINGS	GA-R2-S1	0.00	$3.38	FILAIR
FIL-AIR-022	Air Filter For Dover Gen	2050	NAPA	GA-R2-S2	1.00	$3.38	FILAIR
FIL-AIR-023	Air Filter For Visionland Gen	AF-947	Unknown	GA-R2-S1	0.00	$0.00	FILAIR
FIL-AIR-024	Air Filter For Visionland Gen	2676	NAPA	GA-R2-S1	3.00	$0.00	FILAIR
FIL-AIR-025	Air Filter For Riverchase Gen	8N6309	Nelson	GA-R2-S1	-1.00	$49.16	FILAIR
FIL-AIR-026	Air Filter For Riverchase Gen	6352	NAPA	GA-R2-S1	0.00	$49.16	FILAIR
FIL-AIR-027	Air Filter For Five Mile West Gen	4N0015	CAT	GA-R2-S1	0.00	$38.52	FILAIR
FIL-AIR-028	Air Filter For Five Mile West Gen	6580	NAPA	GA-R1-S3	1.00	$38.52	FILAIR
FIL-AIR-029	Air Filter For Rice Creek Gen	9Y1404	CAT	GA-R2-S3	1.00	$29.45	FILAIR
FIL-AIR-030	Air Filter For I-59 Gen	11N84	CAT	GA-R2-S3	0.00	$0.00	FILAIR
FIL-AIR-031	Air Filter For Blue Ridge Gen	Unknown	Unknown	GA-R2-S3	0.00	$0.00	FILAIR
FIL-AIR-032	Air Filter For Lake Crest Gen	1P-8482	CAT	GA-R2-S3	0.00	$0.00	FILAIR
FIL-AIR-033	Air Filter For Denver Gardner Blower	5A146	Unknown	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-034	Unknown	5A9	Unknown	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-035	Air Filter For Corbet 2 Gen	5N88	CAT	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-036	Air Filter For Magnolia Ridge Gen	7524893-GM	Unknown	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-037	Air Filter For Scotts Blower	81-1163	UNIVSIL	GA-R1-S1	4.00	$0.00	FILAIR
FIL-AIR-038	Air Filter For Brummit Hghts Gen	F1-9	Unknown	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-039	Air Filter For Garden Grove Gen	Impco F1-7	Unknown	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-040	Air Filter For Corbet 2 Gen	N70316	Nelson	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-041	Air Filter For Corbet 1 Gen	N70456	Nelson	GA-R1-S2	0.00	$0.00	FILAIR
FIL-AIR-042	Air Filter- Cross Number Is WIX 42088	AF-178	LUBERFINER	GA-R1-S2	16.00	$1.00	FILAIR
FIL-AIR-043	Air Filter	LAF-1246	LUBERFINER	GA-R1-S3	4.00	$1.00	FILAIR
FIL-AIR-044	Air Filter - Kaeser Comp. For Bio-Filter	6.2003.0	KAESER	GA-R1-S2	1.00	$26.02	FILAIR
FIL-AIR-045	Air Filter For Powder Plant Road/459 Generator	0140-3272	ONAN	GA-R1-S3	2.00	$0.00	FILAIR
FIL-AIR-046	Wire Mess Air Filter For G.Denver Blower at Scotts	81-1Z00/CE	COMP/ENG SUP	GA-R2-S2	0.00	$241.58	FILAIR
FIL-AIR/COMP-001	Compressed Air Filter For The Biofilter	4ZL55	GRAINGER	MS-R1B-S3	1.00	$87.62	FILAIR
FIL-CUN-001	Cuno Filter	U30F8	SOUTHERN F.	GA-C23	49.25	$3.45	FILCUN
FIL-CUN-002	Cuno Filter	UR 375-25	SOUTHERN F.	GA-C23	1,200.00	$2.03	FILCUN

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
FIL-CUN-HOUS-001	Cunno Filter Housing	4410901	CUNNO	GA-C23	11.00	$58.59	FILCUN
FIL-FU-001	Fuel Filter For Acton- Adamsville- Gardendale#1- P	LFP440F	LUBERFINER	GA-FC	1.00	$3.32	FILFUE
FIL-FU-002	Fuel Filter For Acton- Adamsville- Gardendale#1- P	PER53	PEROLATOR	GA-FC	1.00	$1.00	FILFUE
FIL-FU-003	Fuel Filter forBlack Creek- Cunningham I and II	PER62	PEROLATOR	GA-FC	4.00	$4.44	FILFUE
FIL-FU-004	Fuel Filter Black Creek- Cunningham I and II	LFF1131	LUBERFINER	GA-FC	0.00	$1.00	FILFUE
FIL-FU-005	Fuel Filter Black Creek- Cunningham I and II	33334	WIX	GA-FC	1.00	$0.00	FILFUE
FIL-FU-006	Fuel Filter Bess Hosp	261F	LUBERFINER	GA-FC	1.00	$2.36	FILFUE
FIL-FU-007	Fuel Filter Corbet I and II-Gardendale#2-I-59-Morg	FP-586F	LUBERFINER	GA-FC	-1.00	$3.96	FILFUE
FIL-FU-008	Fuel Filter Corbet I and II-Gardendale#2-I-59-Morg	FF5052	FLEETGUARD	GA-FC	0.00	$1.00	FILFUE
FIL-FU-009	Fuel Filter Corbet I and II-Gardendale #2-I-59-Mor	BF788	BALWIN	GA-FC	-3.00	$1.00	FILFUE
FIL-FU-010	Fuel Filter Patton #1-Five Mile West	LFF5823	LUBERFINER	GA-FC	4.00	$6.48	FILFUE
FIL-FU-011	Day Tank	3522	NAPA	GA-FC	1.00	$1.00	FILFUE
FIL-FU-012	Day Tank	2A-17A	NAPA	GA-FC	1.00	$1.00	FILFUE
FIL-FU-013	Fuel Filter, Morgan Greenwood 1 & 2	3358	NAPA	GA-FC	-3.00	$4.04	FILFUE
FIL-FU-014	Fuel Filter	3374	NAPA	GA-FC	0.00	$6.37	FILFUE
FIL-FU-015	Fuel Filter For Fuel Tank at Pinewood	33115	WIX	GA-FC	0.00	$1.00	FILFUE
FIL-FU-016	Fuel Filter For Black Creek & Cunninghams	3371	NAPA	GA-FC	2.00	$1.00	FILFUE
FIL-FU-017	Fuel Filter - Cunningham #1	3369	NAPA	GA-FC	3.00	$9.30	FILFUE
FIL-FU-018	Fuel Filter	3356	NAPA	GA-FC	5.00	$3.90	FILFUE
FIL-FU-019	Fuel Filter	3121	NAPA	GA-FC	1.00	$1.00	FILFUE
FIL-FU-020	Fuel Filter For Acton, Adams. Pinewood, Rice C.,	3352	NAPA	GA-FC	3.50	$3.24	FILFUE
FIL-FU-021	Fuel Filter Patton #1, Five Mile Creek West	3384	NAPA	GA-FC	0.00	$6.19	FILFUE
FIL-FU-022	Fuel Filter For Cunningham 1 & 2	3334	NAPA	GA-FC	6.00	$4.33	FILFUE
FIL-FU-023	Fuel Filter For Bessemer Hospital	3311	NAPA	GA-FC	2.00	$6.24	FILFUE
FIL-FU-024	Fuel Filter For New Cummings Morg/Gn 1 & 2, Overto	3012	NAPA	GA-FC	8.00	$1.66	FILFUE
FIL-FU-025	Fuel Filter For Scotts Generator	3514	NAPA	GA-FC	8.00	$5.39	FILFUE
FIL-FU-GR001	Fuel Filter For Wisconson Engine	04006	JIM HOUSE	MS-R1B-S2	1.00	$0.00	FILFUE
FIL-FUSP-001	Fuel Separator For Black Creek- Cunningham I and I	PER41	PEROLATOR	GA-FC	0.00	$2.76	FILFUS
FIL-FUSP-002	Fuel Separator For Black Creek- Cunningham I and I	FP230F	LUBERFINER	GA-FC	1.00	$2.76	FILFUS
FIL-FUSP-003	Fuel Separator For Black Creek- Cunningham I and I	33351	WIX	GA-FC	1.00	$2.76	FILFUS
FIL-FUSP-004	Fuel Separator For Black Creek- Cunningham I and I	LFF1129	LUBERFINER	GA-FC	1.00	$9.95	FILFUS
FIL-FUSP-005	Fuel Separator For Corbet I and II, Gardendale#2,	FF5038	FLEETGUARD	GA-FC	0.00	$4.00	FILFUS
FIL-FUSP-006	Fuel Separator For Corbet I and II-Gardendale#2, I	BF787	BALWIN	GA-FC	1.00	$4.46	FILFUS
FIL-FUSP-007	Fuel Separator For Corbet I & II-Gardendale I & II	3357	NAPA	GA-FC	2.00	$4.34	FILFUS
FIL-FUSP-008	Fuel Seperator, WIX # Is 33351, Black Creek, Cunni	3351	NAPA	GA-FC	9.00	$3.00	FILFUS
FIL-FUSP-009	Fuel Separator For Acton Road & Gardendale #1	8N-9803	CAT	GA-FC	1.00	$1.00	FILFUS
FIL-FUSP-010	Fuel Separator For Morgan/Greenwood	4071	WIX	GA-FC	2.00	$5.74	FILFUS
FIL-HYD-001	Hydraulic Filters	1551	NAPA	GA-FC	4.00	$5.00	FILHYD
FIL-HYD-002	Hydraulic Filters	921999-10C	PARKER	GA-FC	0.00	$1.00	FILHYD
FIL-HYD-003	Hydraulic Filter For Kubota B7300	KB 15853-32439	KUBOTA	LN-C	0.00	$8.25	FILHYD
FIL-MAT-001	Filter Mat - Kaeser Comp. For Bio-Filter	6.1943.0	KAESER	GA-R1-S2	16.00	$6.39	FILMAT
FIL-OIL-001	Oil Filter For Greenwood I and II	FP251F	LUBERFINER	GA-FC	2.00	$9.84	FILOIL
FIL-OIL-002	Oil Filter Corbet I and II-Gardendale#2-I-59-Prude	BT427	BALWIN	GA-FC		$3.00	FILOIL
FIL-OIL-003	Oil Filter Corbet I and II,Gardendale #2,I-59,Prud	51602	WIX	GA-FC	0.00	$2.51	FILOIL
FIL-OIL-004	Oil Filter Corbet I and II,Gardendale #2,I-59,Prud	LF3345	FLEETGUARD	GA-FC	1.00	$1.00	FILOIL
FIL-OIL-005	Oil Filter Blue Ridge, Brummit Hght, Dover Ellis r	1515	NAPA	GA-FC	-1.00	$2.55	FILOIL
FIL-OIL-006	Oil Filter Black Creek- Cunningham I and II	LP132	LUBERFINER	GA-FC	0.00	$1.00	FILOIL
FIL-OIL-007	Oil Filter For Black Creek & Cunningham II	EP-78	PEROLATOR	GA-FC	7.00	$1.00	FILOIL
FIL-OIL-008	Oil Filter Adamsville,Patton #2,Pinewood,Rice Cree	PER-67	PEROLATOR	GA-FC	1.00	$4.46	FILOIL
FIL-OIL-009	Oil Filter Adamsville,Patton #2,Pinewood,Rice Cree	1791	NAPA	GA-FC	6.00	$4.46	FILOIL
FIL-OIL-010	Oil Filter Bess Hosp,Brighton	51138	WIX	GA-FC	0.00	$2.99	FILOIL
FIL-OIL-011	Oil Filter Acton, Gardendale #1	LFP5570	LUBERFINER	GA-FC	8.00	$2.62	FILOIL
FIL-OIL-012	Oil Filter Pleasant Grove, Summit, Visionland	1748	NAPA	GA-FC	2.00	$18.61	FILOIL
FIL-OIL-013	Oil Filter Five Mile West,Lake Crest,New Found I a	1792	NAPA	GA-R1-S2	7.00	$9.23	FILOIL
FIL-OIL-014	Oil Filter For Black Creek	1133	NAPA	GA-FC	2.00	$3.12	FILOIL
FIL-OIL-015	Oil Filter Warrior Plant	1602	NAPA	GA-FC	-1.00	$2.92	FILOIL
FIL-OIL-016	Oil Filter For Generator at Scotts Branch	1591	NAPA	GA-FC	0.00	$15.70	FILOIL
FIL-OIL-017	Oil Filter For Generator at Scotts Branch	4P-2839	CAT	GA-R2-S3	-5.00	$1.00	FILOIL
FIL-OIL-018	Oil Filter For Magnolia Ridge	1061	NAPA	GA-FC	1.00	$2.65	FILOIL

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
FIL-OIL-019	Oil Filter for Academy D., Ventage T, Vineyards	1051	NAPA	GA-FC	-2.00	$2.73	FILOIL
FIL-OIL-020	Oil Filter For Prudes Plant	1607	NAPA	GA-FC	10.00	$3.36	FILOIL
FIL-OIL-021	Oil Filter	1067	NAPA	GA-FC	2.00	$1.00	FILOIL
FIL-OIL-022	Oil Filter For Morgan/Greenwood	1649	NAPA	GA-FC	4.00	$1.00	FILOIL
FIL-OIL-023	Oil Filter For Kubota B7300	KB 66021-36060	KUBOTA	LN-C	-2.00	$4.86	FILOIL
FIL-OIL-024	Oil Filter For Generator at Cunningham I	1796	NAPA	GA-FC	2.00	$8.99	FILOIL
FIL-OIL-025	Oil Filter For Generator at Wylam	1798	NAPA	GA-FC	0.00	$11.99	FILOIL
FIL-OIL-026	Oil Filter For Brighton	1458	NAPA	GA-FC	8.00	$5.62	FILOIL
FIL-OIL-027	Oil Filter For Trussville NE	1060	NAPA	GA-FC	4.00	$2.65	FILOIL
FIL-OIL-028	Oil Filter For Rosebud	1714	NAPA	GA-FC	4.00	$4.99	FILOIL
FIL-OIL-029	Oil Filrer - Kaeser Comp. For Bio-Filter	6.1985.1	KAESER	GA-R1-S2	1.00	$13.63	FILOIL
FIL-OIL-030	Oil Filter For Bess. Hosp. & Brighton	1138	NAPA	GA-FC	0.00	$2.96	FILOIL
FIL-OIL-031	Oil Filter For Jeff. Metropolitan, Payne Rd.	1516	NAPA	GA-FC	-5.00	$2.65	FILOIL
FIL-OIL-032	Oil Filter For The Arbors	1452	NAPA	GA-FC	1.00	$3.46	FILOIL
FIL-OIL-033	Oil Filter For Coleman L. Saddler G., Parkwood	1372	NAPA	GA-FC	-1.00	$2.81	FILOIL
FIL-OIL-034	Oil Filter For Powder Plant Road/459	LF 581	FLEETGUARD	GA-FC	2.00	$0.00	FILOIL
FIL-OILSP-001	Oil Separator - Kaeser Comp. For Bio-Filter	6.2008.1	KAESER	GA-R1-S2	0.00	$149.46	FILMAT
FITTING-COMP-EL001	Hydraulic Compression Fitting, 1/2" 90 Degree Elbo	C2500-08-08-SS	BRENNAN	MS-R1B-S3	8.00	$19.43	FITTIN
FLANGE-RING-FM001	Ring Flange For F.M. Pump K4G1-078281X at Summitt	P4A664A9649	FAIRBANKS	MS-R1B-S3	1.00	$57.00	FLANGE
FLANGE-SEAL-FM001	Flange Seal For FM Pump K4G1-078281X at Summitt	HYD2T2 9906	FAIRBANKS	MS-R1B-S3	1.00	$11.00	FLANGE
FLNG-FK001	Faulk Flange	1050T10-07785810	FAULK	MS-R2A-S3	1.00	$0.00	FLANGE
FLNG-G001	1 1/4 Steel Discharge Flange	4RC79	GRAINGER	GA-R5B-S1	6.00	$1.00	FLANGE
FLNG-LJ001	Love Joy Flange for VLR at Scotts	12S 3 7/16	LOVE JOY	MS-R2A-S3	8.00	$114.89	FLANGE
FLNG-LJ002	Love Joy Flange	36131	LOVE JOY	MS-R2A-S3	8.00	$0.00	FLANGE
FLNG-LJ003	Love Joy Flange	6S - 3/4	LOVE JOY	MS-R2A-S3	1.00	$0.00	FLANGE
FLNG-LJ004	Love Joy Flange	6S - 1 1/8	LOVE JOY	MS-R2A-S3	-1.00	$0.00	FLANGE
FLNG-LJ005	Love Joy Flange	36135	LOVE JOY	MS-R2A-S3	4.00	$0.00	FLANGE
FLNG-LJ006	Love Joy Flange	36143	LOVE JOY	MS-R2A-S3	0.00	$0.00	FLANGE
FLNG-LJ007	Love Joy Flange	36146	LOVE JOY	MS-R2A-S3	1.00	$0.00	FLANGE
FLNG-W001	Woods Flange For Riverchase	6S - 3/4	WOODS	MS-R2A-S3	1.00	$0.00	FLANGE
FLNG-W002	Woods Flange	6S - 1 1/8	WOODS	MS-R2A-S3	1.00	$0.00	FLANGE
FLNG-W003	Woods Flange	6S - 1 3/8	WOODS	MS-R2A-S3	2.00	$0.00	FLANGE
FLNG-W004	Woods Flange	8S - 1	WOODS	MS-R2A-S3	1.00	$1.00	FLANGE
FLNG-W005	Woods Flange	9S - 1 1/8	WOODS	MS-R2A-S3	1.00	$1.00	FLANGE
FLNG-W006	Woods Flange For Motor at Vulcan P.S.	7S-1 1/8	WOODS	MS-R2A-S3	1.00	$14.29	FLANGE
FLNG-W007	Woods Flange For Pump at Vulcan P.S.	7S-1 5/8	WOODS	MS-R2A-S3	1.00	$14.29	FLANGE
GASKET-BLWR-001	Blower Cover Gasket Scott Branch Blowers	8502800	GAR/DEN	MS-R9-S2	9.00	$24.47	GASKET
GASKET-CKVAL-APC001	Gasket For APCO 12" Check Valve For 5 Mile West	112-3/A1	JIM HOUSE	MS-	1.00	$49.00	GASKET
GASKET-M/M-001	Bottom Gasket For M/M at Airport #CMD 1800 MS	CMC 0014-078	JWC-ENV	MS-R1B-S3	1.00	$21.36	GASKET
GASKET-M/M-002	Top Gasket For M/M at Airport #CMD 1800 MS	CMC 0014-077	JWC-ENV	MS-R1B-S3	1.00	$21.36	GASKET
GASKET-MCSL- PUMP-KSB001	Mechanical seal gasket For KSB pump (Oak Grove PS)	19524732	KSB	GA-C9	1.00	$42.00	MCSL
GASKET-O/RING-EB001	O-Ring Kit For Ebara Pump #100DLM6222 30 HP - Moss	ORDLDV11	EBARA	GA-C3	1.00	$117.00	GASKET
GASKET-PUMP-ABS001	Gasket 6" For ABS Pump at Hoover High School	A920	ABS	MS-R2A-S3	1.00	$1.00	GASKET
GASKET-PUMP-HY001	6" Discharge Pump Gasket For Hydromatic Sub Pumps	048980001	HYDROMATIC	GA-C7	9.00	$26.00	GASKET
GASKET-PUMP-HY002	Flange Gasket 2" for 7.5 HP Hudromatic Pump	068980001	HYDROMATIC	GA-C7	8.00	$28.00	GASKET
GASKET-PUMP-HY003	4" Discharge Pump Gasket For Hydromatic Sub Pumps	3544-000-1	HYDROMATIC	GA-C7	7.00	$25.00	GASKET
GASKET-SET-EXFAN-001	Gasket Set For Exhaust Fan To Fit 3 1/2 Hp Briggs	495605	ADVANCED	MS-R1A-S2	0.00	$19.48	GASKET
GASKET-VICTAULIC-001	10" Victaulic Gask. For 31 Coupling DI, Med/C/EAST	78368		GA-C6	4.00	$61.00	GASKET
GASKET-VOL-FM001	Volute Gasket For D.M. Pump K4G1-078281X at Summit	CP2928-8380	FAIRBANKS	MS-R1B-S3	2.00	$4.00	GASKET
GASKET-WPO-GR002	O-Ring for T4 Wearplate Housing	S1674	GORMAN RUPP	GA-C3	8.00	$2.90	GASKET
GAUGE-PRESS-001	Pressure Gauges Lq. Filled 2.5" 1/4 Connection	P55220	GRAINGER	VC	9.00	$15.00	GAUGE
GAUGE-PRESS-002	Pressue Gauge For Prudes Creek	3T321	GRAINGER	EL-C3-S4	3.00	$51.35	GAUGE
GAUGE-PRESS-003	Pressure Gauge, 100 PSI	9767061	WIKA	MS-R1A-S2	10.00	$13.49	GAUGE
GAUGE-PRESS-004	Press. Gauge 2 1/2" 5000 PSI	36156479702	ASHCROFT	-		$14.80	GAUGE
GAUGE-PRESS-004	Press. Gauge 2 1/2" 5000 PSI	36156479702	ASHCROFT	MS-R1A-S2	4.00	$14.80	GAUGE
GAUGE-PRESS-005	Pressure Gauge - 4" - 0 - 200 PSI	G40200 IPS	PETRO	MS-R1A-S2	5.00	$23.67	GAUGE
GAUGE-VAC-001	Vacuum Gauge - Vac/30	9767002	WIKA	MS-R1A-S2	9.00	$17.39	GAUGE
GEAR-PIN/DR-001	Gear Pin Drive For M/M at Airport #CMD 1800 MS	34019	JWC-ENV	MS-R1B-S3	0.00	$189.00	GEAR
GEAR-ROTOR-001	Gear For Rotor at Scotts	1200059	FALK	MS-R1B-S3	1.00	$1.00	GEAR

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
GRSL-N005	Grease Seal - National	472394	NATIONAL	GA-R2-S2	5.00	$0.00	GRSL
GRSL-N006	Grease Seal - National	49270	NATIONAL	M2-R3B-S1	9.00	$0.00	GRSL
GRSL-N008	Grease Seal - National	472354	NATIONAL	MS-R4B-S3	1.00	$0.00	GRSL
GRSL-N009	Grease Seal - National	470898	NATIONAL	MS-R3B-S3	1.00	$0.00	GRSL
GT-VAL-001	4"" CASTIRAN 9"" F/F (8 BOLT FLAGES)			GA-R6A-S3	2.00	$1.00	VALVE
GT-VAL-002	6"" CASTIRAN 10 1/2"" F/F (8 BOLT FLAGES)	F-818-BL&S	AMER PIPE	GA-R6A-S2	0.00	$479.00	VALVE
GT-VAL-003	4"" CASTIRAN PLUGE TYPE (USED)			GA-R6A-S2	1.00	$1.00	VALVE
HOUSING-SEAL-001	Seal Housing For Ebara P. #50 DGFU 63.72 (5 HP)	CDGI-1412	EBARA	MS-R6-S3	1.00	$360.00	HOUSIN
HY-HOSERPFITG-001	3/8" Male NPT Thread For Hyd Hose - 3/8" BARB	00625582	MSC	MS-R1A-S2	6.00	$4.87	FITTIN
HY-HOSERPFITG-002	1/2" Male NPT Thread For Hyd Hose - 1/2" BARB	00625608	MSC	MS-R1A-S2	6.00	$6.49	FITTIN
HY-HOSERPFITG-003	3/4" Male NPT Thread For Hyd Hose - 3/4" BARB	00625616	MSC	MS-R1A-S2	6.00	$11.04	FITTIN
HY-HOSERPFITG-004	3/8" Female NPSM SWVL For Hyd Hose - 3/8" BARB	00625673	MSC	MS-R1A-S2	6.00	$10.74	FITTIN
HY-HOSERPFITG-005	1/2" Female NPSM SWVL For Hyd Hose 1/2" BARB	00625699	MSC	MS-R1A-S2	6.00	$14.02	FITTIN
HY-HOSERPFITG-006	3/4" Female NPSM SWVL For Hyd Hose - 3/4" BARB	00625707	MSC	MS-R1A-S2	6.00	$22.53	FITTIN
IMPL- WSTPUMP-001	Waste Pump Impeller at Scotts Branch		WEMCO	GA-R4-S1	2.00	$0.00	IMPL
IMPL-001	Large Impeller	60C78-101	S&L	GA-R8-S1	1.00	$500.00	IMPL
IMPL-002	Large Impeller			GA-R8-S1	1.00	$0.00	IMPL
IMPL-003	Small Impeller			GA-R9-S1	1.00	$0.00	IMPL
IMPL-004	Impeller for Amerex			MS-R6-S1	1.00	$0.00	IMPL
IMPL-005	Impeller at Visionland, One rotation			MS-R7-S1	2.00	$0.00	IMPL
IMPL-006	Impeller With Wear Ring For Newfound - W/Ring #2VR	Z01964G0001053A	F.M.	MS-R6-S2	0.00	$4,400.00	IMPL
IMPL-007	Impeller 3rd St./2nd Ave. (Upgrade)	11303755	KSB	MS-R6-S2	2.00	$1.00	IMPL
IMPL-008	Impeller 3rd Place/1st Ave. (Upgrade)	11185986	KSB	MS-R6-S2	2.00	$1.00	IMPL
IMPL-ABS-001	Impeller For Southwood	35070032	ABS	MS-R6-S2	1.00	$410.00	IMPL
IMPL-BKPLATE-HY001	Back Plate For Hydromatic Pumps at Cades MP40	02005-0002	HYDROMATIC	MS-R6-S2	2.00	$174.00	IMPL
IMPL-BLT-GR001	Bolt For Impeller on Gorman T3	03000DM1004S	GORMAN RUPP	GA-C3	5.00	$1.80	IMPL
IMPL-BP-HY001	Backing Plate for Impeller For Cades,Dean,DB,Gasde			GA-R8-S2	1.00	$0.00	IMPL
IMPL-CL001	Clow Impeller at Lewisburge 1&2, LH		CLOW	GA-R8-S1	1.00	$0.00	IMPL
IMPL-CL002	Clow Impeller at Lewisburge 1&2, RH		CLOW	MS-R7-S2	1.00	$1.00	IMPL
IMPL-CL003	Clow Impeller Clockwise, For Lance W. Model 4312 P	M-97737-001	CLOW	MS-R6-S1	1.00	$1,850.00	IMPL
IMPL-CL004	Clow Impeller, C/Clockwise, For Lance W. Model 431	M-97736T-001	CLOW	MS-R6-S1	1.00	$1,850.00	IMPL
IMPL-EB001	Ebara Impeller at Woods Trace, One rotation		EBARA	MS-R7-S3	0.00	$0.00	IMPL
IMPL-EB002	Impeller For Ebara P. M6222 Woodstrace	CDL11-2402	EBARA	MS-R7-S1	0.00	$2,098.13	IMPL
IMPL-FLY-001	Impeller For Fly. P. Model 3300.180-88 HP Hi Head	481-72-10	FLYGT	MS-R7-S2	0.00	$3,929.00	IMPL
IMPL-FM001	F. M. Impeller at Pleasant Grove, RH		F.M.	MS-R7-S2	2.00	$0.00	IMPL
IMPL-FM002	F. M. Impeller at Pleasant Grove, LH		F.M.	MS-R7-S2	2.00	$0.00	IMPL
IMPL-FM003	Impeller - LH For Parkwood PS	T4B1BN	F.M.	MS-R7-S3	1.00	$1.00	IMPL
IMPL-FM004	Impeller - RH For Parkwood PS	T4B1B0	F.M.	MS-R7-S3	1.00	$1.00	IMPL
IMPL-FM005	Impeller For Pipe Shop P.S.	PIPE SHOP		MS-R7-S2	2.00	$1.00	IMPL
IMPL-FM006	Impeller /LH For Rice C. (USEMCO) F/M Pumps		F.M.	MS-R7-S2	0.00	$0.00	IMPL
IMPL-FM007	Impeller/RH For Rice C. (USEMCO) F/M Pumps	T6CIEP-0220F	F.M.	MS-R7-S2	1.00	$2,347.92	IMPL
IMPL-FM008	Impeller For FM Pump - 12" Diameter To Pump 325 G	K4G1-078281	F.M.	MS-R6-S1	0.00	$1,936.00	IMPL
IMPL-FM009	Impeller For FM Pump, 1100 GPM, RH Pump #1 at Pade		F.M.	MS-R6-S1	1.00	$1.00	IMPL
IMPL-FM010	Impeller For FM Pump, 1100 GPM, LH Pump #2 at Pade		F.M.	MS-R6-S1	1.00	$1.00	IMPL
IMPL-GR001	Impeller For Gorman Rupp T3 A3 Suction Lift Pump	11406	GORMAN-RUPP	MS-R6-S1	6.00	$275.00	IMPL
IMPL-GR002	Impeller for Gorman Rupp T-4	10528	GORMAN RUPP	MS-R6-S1	6.00	$291.05	IMPL
IMPL-HUB-FLY-001	Impller Hub For Fly. P. Model 3300.180-88 HP Hi He	434-49-03	FLYGT	MS-R7-S2	0.00	$1,531.00	IMPL
IMPL-HY001	Hydromatic Impeller for Cades,Dean,Don Berry,Gadsd	8880002	HYDROMATIC	MS-R6-S1	4.00	$568.00	IMPL
IMPL-HY002	Hydromatic Impeller at K-Mart 12 3/4"	023040132	HYDROMATIC	MS-R7-S2	1.00	$1,479.00	IMPL
IMPL-HY003	Hydromatic Impeller at Prudes Creek #1 Pump Statio	025940062	HYDROMATIC	MS-R7-S2	2.00	$1.00	IMPL
IMPL-HY004	Impeller Dia. 10.31 - Hydromatic Sub Jeff Mem	S4LRC	HYDROMATIC	MS-R7-S2	1.00	$1,300.00	IMPL
IMPL-HY005	Impl. For K-mart, 12 3/4" For Hyd. Pump - Suction	02304-013-2		MS-R7-S2	1.00	$1,304.00	IMPL
IMPL-INBOLT-FLY001	Impeller Bolt, To Fit Flygt Pump Model 3152-181	820080	FLYGT	MS-R1B-S3	1.00	$15.00	IMPL
IMPL-KSB-001	Impl. For 5 Mile West 130 Hp KSB Pump	113307	KSB	MS-R6-S1	1.00	$0.00	IMPL
IMPL-PUMP-SLO12	LH Impeller for Garden Grove PS	60c77-101	S&L	GA-R8A-S1	1.00	$500.00	
IMPL-RTNPUMP001	Return Pump Impeller at Scotts Branch			GA-R4-S1	2.00	$0.00	IMPL
IMPL-SETS-HY001	Set Screws For Hydromatic Impeller at Prudes Cree	13-004-1	HYDROMATIC	MS-R7-S2	2.00	$1.00	IMPL
IMPL-SL001	S & L Impeller at I-59, LH		S&L	GA-R8-S1	2.00	$0.00	IMPL
IMPL-SL002	.		S&L	GA-R8-S1	1.00	$0.00	IMPL

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
IMPL-SL003	S & L Impeller at Morgan/Greenwood, RH Full		S&L	MS-R7-S1	2.00	$0.00	IMPL
IMPL-SL004	S & L Impeller at Morgan/Greenwood, LH 3/4 Off		S&L	MS-R7-S1	1.00	$0.00	IMPL
IMPL-SL005	S & L Impeller at Morgan/Greenwood, RH 1 3/8 Off		S&L	MS-R7-S1	1.00	$0.00	IMPL
IMPL-SL006	S & L Impeller at Morgan/Greenwood, LH 1 3/8 Off		S&L	MS-R7-S1	0.00	$0.00	IMPL
IMPL-SL007	S&L Impeller at Rice Creek, LH		S&L	MS-R7-S1	3.00	$0.00	IMPL
IMPL-SL008	S&L Impeller at Rice Creek, RH		S&L	MS-R7-S1	2.00	$0.00	IMPL
IMPL-SL010	RH S&L Impeller atGarden Grove PS	60C78-101	S&L	MS-R7-S1	1.00	$500.00	IMPL
IMPL-SL011	LH S&L Impeller at Garden Grove Pump Station	60c77-101	S&L	MS-R7-S1	1.00	$500.00	IMPL
IMPL-SL012	Impeller For S & L Pump at Walker Avenue		S & L	MS-R6-S1	1.00	$1.00	IMPL
IMPL-SL013	Impeller For S & L Pump 3" Bore - RH	S & L		MS-R7-S1	1.00	$1.00	IMPL
IMPL-SL014	Impeller For S & L Pump 3" Bore - LH		S & L	MS-R7-S1	1.00	$1.00	IMPL
IMPL-SL015	Full Size, LH, Old Black Creek		S&L	MS-R-S	1.00	$1.00	IMPL
IMPL-SL016	Full Size, RH, Old Black Creek		S&L	MS-R-S	1.00	$1.00	IMPL
IMPL-WP-003	Wear Plate For Impeller For Hydromatic Pump at Pru	42890023	HYDROMATIC	MS-R7-S2	1.00	$1.00	IMPL
IMPL-WP-EB001	Wear Plate for Impeller at Trace			MS-R6-S2	0.00	$0.00	IMPL
IMPL-WP-GR001	Wear Plate for Impeller For Gardendale 1&2,McAdory	03000011407A	GORMAN RUPP	MS-R6-S2	7.00	$104.30	IMPL
IMPL-WP-GR002	Wear Plate, For Gorman Rupp Pump, Model T4A-3B	10532A	G-RUPP	MS-R6-S2	3.00	$102.70	IMPL
IMPL-WP-HY001	Wear Plate For Impeller at Cades, Dean, Gadsden	00891-000-2	HYDROMATIC	MS-R6-S2	3.00	$278.00	IMPL
IMPL-WP-HY002	Wear Plate For Impeller at K-Mart	019340012	HYDROMATIC	MS-R6-S2	2.00	$465.00	IMPL
IMPL-WP-WEM-001	Wear Plate To Fit WEMCO Pump Model RPD-5	74277-1		MS-R6-S2	0.00	$486.00	IMPL
IMPL-WSH-GR001	Washer for Impeller on Gorman T3	030000019278	GORMAN RUPP	GA-C3	5.00	$4.55	IMPL
INSERT-CART-001	Cartridge Insert For Muffin/M at Birmingham Zoo	31036-TM-B	JWC	GA-C9	2.00	$122.48	INSERT
JACKET-QU-001	Quartz Jacket, For Infilco U.V. System at Prudes C	59545-H04	INFILCO	MZ-F	113.00	$35.00	JACKET
JACKET-QU-002	Quartz Jacket, For Trojan UV 3300 System, Warrior	302208	TROJAN	MZ-F	2.00	$27.00	JACKET
KEY-MUFFINM-001	For Muffin Monster Model 3005-18 at Visionland.	30307	JWC-ENV	MS-R1B-S3	0.00	$6.33	KEY
KIT SEAL-MM-001	Seal Kit For M/Monster at Trussville NE	SK 000092	NAT. HYD.	MS-R1B-S3	0.00	$34.20	KITS
KIT-SOL.V.-001	Repair Kit For Asco 4-Way Sol. Val. For New F. 1&2	302711	ASCO	EL-C1-S2	1.00	$111.60	KITS
LAB-CARBOY-001	Carboy, W/SPIGOT, 50 LTR	02-963-2C	FISCHER-PORT	SC-LAB	1.00	$137.01	LABEQ
LAB-CHEM-001	Glucose Glutamic Acid	LC148451	FISHER	CHMS-R1-S6	2.00	$20.14	LABCHM
LAB-DISPFILT-001	Disposable Filter	09-034-162	FISHER	SC-LAB	2.00	$16.10	LABSUP
LAB-FILT-001	Glass Filter, 90MM, PN 1827-090, For Scotts Lab	1827-090	FISHER	SC-LAB	10.00	$41.40	LABSUP
LAB-FILT-002	Glass Filter, 24MM, PN 1822-024, For Scotts Lab	1822-024	FISHER	SC-LAB	10.00	$31.12	LABSUP
LAB-FILTHLD-001	Filter Holder	09-034-155	FISHER	SC-LAB	2.00	$59.80	LABEQ
LAB-LABEL/DISP-001	Label Dispenser, PN 11-865-35, For Scotts Lab	11-865-35	FISHER	SC-LAB	1.00	$41.33	LABEQ
LAB-STBATH/HT-001	Electrically Heated Concentric Ring For Steam Bath	PSI 66501/66501K	FISHER	EL-C4-S7	2.00	$222.35	LABEQ
LAB-STBATH/SWT-001	3 Position Switch For Steam Bath, Scotts Lab	PSI 240178	FISHER	EL-DL-S1	1.00	$64.63	LABEQ
LAB-STILL/HT-001	Heating Element For Glass Still at Scotts Lab	NC9433359	FISHER	EL-C5-S1	3.00	$485.90	LABEQ
LAB-TAPE-001	Yellow Tape, 3/4" x 500", PN 11-880-58, For Scotts	11-880-58	FISHER	SC-LAB	1.00	$53.24	LABSUP
LNMR-TRANS-001	Transmission For 1600 Kubota	66091-82200	KUBOTA	SHOP	1.00	$1,301.95	TRANSM
LOCK-RING-001	Locking Ring For Mixer at Prudes Creek	9360031	LANDIA	MS-R1B-S2	1.00	$1.50	LOCK R
LOCK-RING-002	For Mixer at Prudes Creek	9360022	LANDIA	MS-R1B-S2	0.00	$1.10	LOCK R
LOCK-RING-003	For Muffin Monster Model 3005-18 at Visionland	30287	JWC-ENV	MS-	1.00	$4.15	LOCK R
LOCK-RING-004	Lock Ring For M/M at Airport #CMD 1800 MS	30287	JWC-ENV	MS-R1B-S3	8.00	$4.15	LOCK R
LOCK-RING-005	Lock Ring For M/M at Airport #CMD 1800 MS	CMC 5165	JWC-ENV	MS-R1B-S3	8.00	$0.00	LOCK R
MCLS-PUMP-GOR004	Mechanical Seal For T-8 G/R Pump at Morgan/GW 1&2	12590	GORMAN RUPP	GA-C3	2.00	$1.00	MCSL
MCSL-KIT-ABS001	Mechanical Seal Kit For ABS Pump at Southwood	61196032	ABS	GA-C9	2.00	$500.00	MCSL
MCSL-KIT-ABS002	Mechanical Seal Kit For ABS-RAS Pump at Prudes Cr	61196034	ABS	GA-C9	2.00	$101.62	MCSL
MCSL-KIT-FLY001	Mech. Seal Kit For Fly Model 3085 For Sherman Oaks	6018904	FLYGT	GA-C9	0.00	$342.00	MCSL
MCSL-KIT-FLY002	Mechanical Seal Kit For 10 Hp Flygt P. Model 3127	6018909	FLYGT	GA-C9	2.00	$7.84	MCSL
MCSL-KIT-FLY003	Mechanical Seal Kit For			GA-C9	0.00	$0.00	MCSL
MCSL-KIT-FLY004	Mech. Seal Kit For Flygt 3085 For Sherman Oaks	6018947	FLYGT	GA-C9	2.00	$451.00	MCSL
MCSL-KIT-HYD001	Mech. Seal Kit , HYD. P. 40MP/40MMP Gadsden H.	51700-025-7	HYDROMATIC	GA-C9	1.00	$341.00	MCSL
MCSL-KIT-HYD002	Mech. Seal Kit for Hyd. Prudes P.	51700-052-7	HYDROMATIC	GA-C9	3.00	$317.00	MCSL
MCSL-KIT-HYD003	Mech Seal Kit For Hyd. Pump 60 MMPH For K-mart	51700-047-7	HYDROMATIC	GA-C9	1.00	$1,813.00	MCSL
MCSL-M/M-001	Mechanical Seal For Muffin M. Model 1800MS Airport	A34320-3401-TB	JWC	GA-C9	0.00	$543.18	MCSL
MCSL-M/M-002	Mech. Seal For Muffin Monster at B'ham Zoo(Bottom)	30053-TB3/D	JWC	GA-C9	0.00	$504.00	MCSL
MCSL-M/M-003	Mech. Seal For Muffin Monster at B'ham Zoo (Top)	30053-TB1/D	JWC	GA-C9	2.00	$504.00	MCSL
MCSL-MIXER-BUR001	Mech Seal Shaft For Mixer at Prudes Creek	9280150	LANDIA	MS-R1B-S2	0.00	$400.00	MCSL
MCSL-PUMP-001	Mech Seal For Pump at Belmar			GA-C9			MCSL

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
MCSL-PUMP-002	Mechanical Seal For Pump at Dennison			GA-C9			MCSL
MCSL-PUMP-003	Mech Seal for Edgewater, Gadsden H. SEE SPECS:	46513-150		GA-C2	0.00	$1.00	MCSL
MCSL-PUMP-004	Mech Seal For Pump at Graysville 7th Ave.			GA-C9			MCSL
MCSL-PUMP-005	Mech Seal For Pump at Valewood Station	AD1DV5004		GA-C2	1.00	$0.00	MCSL
MCSL-PUMP-006	Mech Seal For Pump at Riverchase (Rebuilt) Double	TYPE 21 - 3 5/8"	SEAL/RES.	GA-C3	1.00	$539.75	MCSL
MCSL-PUMP-007	Mechanical Seal For Pump at Summitt	532	PAC SEAL	GA-C3	0.00	$145.34	MCSL
MCSL-PUMP-008	Mechanical Seal For Pump at Summitt	12213	PAC SEAL	GA-C3	0.00	$188.58	MCSL
MCSL-PUMP-009	Mechanical Seal For Pump at Trussville NE	22998	JOHN CRANE	GA-C4	2.00	$500.00	MCSL
MCSL-PUMP-010	Mechanical Seal Pump 3rd	3340A0001	KSB	GA-C4	2.00	$1.00	MCSL
MCSL-PUMP-011	Mechanical Seal Pump 3rd Place/1st Ave. (Upgrade)	215027623	KSB	GA-C4	2.00	$1.00	MCSL
MCSL-PUMP-ABS001	Mech. Seal For ABS RAS Pump at Prudes C.	M3/40-E1-R	ABS	GA-C2	1.00	$0.00	MCSL
MCSL-PUMP-ABS002	Mech. Seal For ABS Pump Model 2501 125 Hp at River	11110052	ABS	GA-C2	0.00	$1,370.00	MCSL
MCSL-PUMP-AUR001	Mechanical Seal - For Hidden Trace	SR 4518	BRAG	GA-C2	0.00	$136.00	MCSL
MCSL-PUMP-CHI001	M/Seal For Adamsville & Lewisburge Hydl. Sub.	04700050	CHICAGO	GA-C1	0.00	$170.00	MCSL
MCSL-PUMP-CHI002	Mechanical Seal For Pump at Bess Hospital	55150UCRJ	CHICAGO	GA-C2	1.00	$0.00	MCSL
MCSL-PUMP-CHI003	Mechanical Seal For Pump at Pinewood	10295-A Seal	CHICAGO	GA-C2	2.00	$0.00	MCSL
MCSL-PUMP-CLO001	Mechanical Seal For Pump at Amerex No.1	B019-85	CLOW	GA-C2	2.00	$0.00	MCSL
MCSL-PUMP-CLO002	Mechanical Seal For Pump at Brighton/Clow Pump	PAC SEAL-889N	CLOW	GA-C2	0.00	$443.40	MCSL
MCSL-PUMP-EBA001	Model 50DGUII63.72 And 50DGEII 63.723 3 ST, TR.R	ADGS005	EBARA	GA-C1	1.00	$413.00	MCSL
MCSL-PUMP-EBA002	For Ebara P. At Chesswood Model 100DLU 63.75	ADLDVS003	EBARA	GA-C1	-2.00	$446.00	MCSL
MCSL-PUMP-EBA003	Mechanical Seal For Ebara P. Model 8DLMC6112	ADLDVS004	EBARA	GA-C9	1.00	$669.00	MCSL
MCSL-PUMP-EBA004	Mech. Seal For Woods T./Moss Ln.	ADLDVS005	EBARA	GA-C9	2.00	$1,075.50	MCSL
MCSL-PUMP-FAI001	Mechanical Seal For Pump at Pleasant Grove		FAIRBANKS	GA-C2	4.00	$0.00	MCSL
MCSL-PUMP-FAI002	Mechanical Seal For Pump at Second Creek	HYD1AD11	FAIRBANKS	GA-C2	1.00	$0.00	MCSL
MCSL-PUMP-FAI003	Mchanical Seal at Belmont 1 and Parkwood & Rice C	HYD1AD8	FAIRBANKS	GA-C2	5.00	$0.00	MCSL
MCSL-PUMP-FAI004	Mechanical Seal For Pinewood	SE12143	PAC SEAL	GA-C1	-1.00	$312.15	MCSL
MCSL-PUMP-FAI005	M.Seal - Fbanks P. For Bkview Ch,Ov'ton 1	HYD1AD9	FAIRBANKS	GA-C3	5.00	$1.00	MCSL
MCSL-PUMP-FAI006	Mechanical Seal For Pump at Paden Park	HYD1AD10	FAIRBANKS	GA-C1	2.00	$1.00	MCSL
MCSL-PUMP-FLY001	Mechanical Seal for Pump at Five West		FLYGT	GA-C1			MCSL
MCSL-PUMP-GOR001	Mechanical Seal for Pump at Amerex Plant	1264-A	GORMAN RUPP	GA-C2	2.00	$0.00	MCSL
MCSL-PUMP-GOR002	Mechanical Seal for Pump at Amerex No.1	B019-85	GORMAN RUPP	GA-C2	2.00	$0.00	MCSL
MCSL-PUMP-GOR003	Mechanical Seal For T4'sat Lk. Sterling, Vineyard	46513-150	GORMAN RUPP	GA-C2	5.00	$0.00	MCSL
MCSL-PUMP-GOR004	Mechanical Seal - T10A3B Pump Med. Center East	12590A	GORMAN RUPP	GA-C2	2.00	$495.92	MCSL
MCSL-PUMP-HYD001	Mechanical Seal for Gadsden Hwy.& Don Berri	51700-25-7	HYDROMATIC	GA-C9	0.00	$302.00	MCSL
MCSL-PUMP-HYD002	Mechanical Seal For Hyd. 7 1/2 Hp Pumps - 3rd St.	361-21	PAC SEAL	GA-C1	1.00	$30.79	MCSL
MCSL-PUMP-HYD003				GA-C2			MCSL
MCSL-PUMP-HYD004	Mechanical Seal - Two Faces - For Prudes Creek #1	SR 4517	BRAG	GA-C2	0.00	$241.00	MCSL
MCSL-PUMP-HYD005	Mechanical Seal For Hyd. Pump Model S6LX2000, 20 H	08073-000-1	HYDROMATIC	GA-C1	3.00	$160.00	MCSL
MCSL-PUMP-HYD006	Mechanical Seal For Hyd. Pump at Northbrook	SE441	BRAG	GA-C2	3.00	$16.32	MCSL
MCSL-PUMP-HYD007	Mechanical Seal For Hyd. Pump at Northbrook	16SGP21CBN10	BRAG	GA-C2	2.00	$66.70	MCSL
MCSL-PUMP-HYD008	Mechanical Seal For Hyd. Pump at Northbrook	44D	BRAG	GA-C2	2.00	$13.17	MCSL
MCSL-PUMP-ITT001	Mechanical Seal For Pump at Trussville NE	52-237-862-801	ITT-MARLOW	GA-C2	-1.00	$0.00	MCSL
MCSL-PUMP-ITT002	For ITT Marlow Pump at Brummitt Heights	28SGP21CBS10	ITT-MARLOW	GA-C2	1.00	$190.00	MCSL
MCSL-PUMP-JC001	Mechanical Seal For Pump at Riverchase	HYDC1CW4-9906	JOHN CRANE	GA-14C	0.00	$1,280.00	MCSL
MCSL-PUMP-JC002	Mechanical Seal For Pump at Newfound	5610 3"	JOHN CRANE	GA-C9	1.00	$1,550.00	MCSL
MCSL-PUMP-KSB001	Mechanical Seal For KSB Pump Oak Grove PS	0511208	KSB	GA-C9	1.00	$286.00	MCSL
MCSL-PUMP-KSB002	Mechanical Seal For KSB Pump Oak Grove PS	0514264	KSB	GA-C9	1.00	$249.00	MCSL
MCSL-PUMP-KSB003	Mechanical Seal For KSB Pump Oak Grove PS	01027183	KSB	GA-C9	1.00	$249.00	MCSL
MCSL-PUMP-KSB004	Mechanical Seal For KSB pump Oak Grove PS	00200623	KSB	GA-C9	1.00	$9.00	MCSL
MCSL-PUMP-KSB005	Mechanical Seal For KSB Pump at Summit	HYD1CB1	KSB	GA-C2	3.00	$272.00	MCSL
MCSL-PUMP-KSB006	Mechanical Seal For KSB Pump at Summit	HYD1CE1	KSB	GA-C2	3.00	$306.00	MCSL
MCSL-PUMP-MYE001	Mechanical Seal For Pump at Chapel 1	SE-309	MYERS	MS-R3A-S2	3.00	$24.28	MCSL
MCSL-PUMP-PEL001	Mech Seal For Peerless Plant Water Pump/Warrior	256	PAC SEAL	GA-C3	2.00	$64.70	MCSL
MCSL-PUMP-S&L001	Mechanical Seal For Pump at Acton Rd, Laurel,	H60A119	S&L	GA-C1	0.00	$217.29	MCSL
MCSL-PUMP-S&L002	MCSL For Pump at Corbet 1,2 & Blue/R Cunningham 2	H60A121	S&L	GA-C1	1.00	$444.08	MCSL
MCSL-PUMP-S&L003	Mech Seal For Pump at Morgan/Greenwd 1,2 (P-004)	H60A120	S&L	GA-C1	2.00	$317.21	MCSL
MCSL-PUMP-SEP001	Mech Seal For Pump at Sears Drive		SEPCO	GA-C1	1.00	$217.00	MCSL
MCSL-PUMP-SEP003	Mechanical Seal Hillshire (Lower)SEE SPECS (NEW)	18SGP21CBK10	SEPCO	GA-C1	2.00	$87.50	MCSL
MCSL-PUMP-SEP005	Mech Seal For Pump at Graysville 3rd St	SE361	SEPCO	GA-C1	0.00	$0.00	MCSL

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
MCSL-PUMP-SEP006	Mechanical Seal For Pump at Graysville 3rd St	SE185	SEPCO	GA-C1	2.00	$1.00	MCSL
MCSL-PUMP-SEP007	Mechanical S. Pump Jeff. Mem. Adamsville SEE SPEC	SE-12092-2	SEPCO	GA-C2	3.00	$299.00	MCSL
MCSL-PUMP-SEP008	Mechanical Seal For Pump at Jefferson Memorial	32-SGP-21-CVK-10	SEPCO	GA-C2	2.00	$180.00	MCSL
MCSL-PUMP-SEP009	Mechanical Seal For P. /Larkway (Repaired)	UAA004BSS-AIAA-00	SEPCO	GA-C1	1.00	$745.90	MCSL
MCSL-PUMP-SEP010	Mechanical S.Parkway, Rice, Lewisburg SEE SPEC	SE 12090	SEPCO	GA-C2	3.00	$255.00	MCSL
MCSL-PUMP-SEP011	Mechanical Seal Harriman SEE SPECS	SE-674-21	SEPCO	GA-C2	3.00	$231.30	MCSL
MCSL-PUMP-SEP012	Mechanical Seal For Pump at Cunningham 2	A-48-436-3	SEPCO	GA-C1	1.00	$0.00	MCSL
MCSL-PUMP-SEP013	Mechanical Seal For Pump at Cunningham 1	PS1107	SEPCO	GA-C1	3.00	$0.00	MCSL
MCSL-PUMP-SEP014	Mechanical Seal Pump at Tin Mill & Vail	1105	SEPCO	GA-C1	4.00	$256.20	MCSL
MCSL-PUMP-SEP015	Mechanical Seal For Pump at 2 1/8 S&L Pumps	1107	SEPCO	GA-C1	1.00	$0.00	MCSL
MCSL-PUMP-SEP016	Mechanical Seal for Pump at Roberts Field	1104	FAIRBANKS	GA-C1	4.00	$0.00	MCSL
MCSL-PUMP-SEP017	Mechanical - Shaft Sl. 2.65" - OD 1.375" For Airpo	28SGP21SVS10	SEPCO	GA-C1	3.00	$372.00	MCSL
MCSL-PUMP-SEP018	Mechanical Seal For Pump at Prudes Creek #1	SE12245	SEPCO	GA-C3	6.00	$180.00	MCSL
MCSL-PUMP-SEP019	Mechanical Seal For Hillshire (Upper)SEE SPECS	20SGP21CBK10	SEPCO	GA-C1	1.00	$63.40	MCSL
MCSL-PUMP-SEP020	Mech. Seal Upper & Lower For B'ham Zoo	18SGP21CBT10	SEPCO	GA-C1	-1.00	$156.50	MCSL
MCSL-PUMP-SEP021	Mechanical Seal For Hillshire (Lower)	21BC1125/AXK-18	SEPCO	GA-C2	0.00	$87.85	MCSL
MCSL-PUMP-SEP022	Mechanical Seal For Hillshire (Upper)	21BC1250/AXK-20	SEPCO	GA-C2	0.00	$50.75	MCSL
MCSL-PUMP-SEP023	Mechanical Seal For Larkway P.S.(NEW)	UAA0040BSS-AIAA-00	SEPCO	-GA-C1	0.00	$1,144.23	MCSL
MCSL-PUMP-USS- 001	Mechanical Seal For Harriman	PS 674	U.S. SEAL	GA-C2	0.00	$202.40	MCSL
MCSL-PUMP-VAU001	Mech. Seal For Airport, Vau. Pump Model V4K-089	V801-300	VAUGHAN	GA-C1	1.00	$1,375.00	MCSL
MCSL-PUMP-WEM-REL001	Relap - Mechanical Seal Scotts RAS Pump	157458 REL	JOHN CRANE	GA-C2	0.00	$290.00	MCSL
MCSL-PUMP-WEM001	Mechanical Seal For Pump at Scotts Branch	157444	JOHN CRANE	GA-C2	4.00	$0.00	MCSL
MCSL-PUMP-WEM002	Mechanical Seal For Waste Pump at Scotts	157445	JOHN CRANE	GA-C3	8.00	$1,400.00	MCSL
MCSL-PUMP-WEM003	Mechanical Seal For Pump at Scotts Branch	157458	JOHN CRANE	GA-C2	2.00	$106.00	MCSL
MCSL-PUMP-WEM004	Mechanical Seal For Pump at Scotts Branch	157484	JOHN CRANE	GA-C4	4.00	$1,339.00	MCSL
MCSL-PUMP-WEM005	Mechanical Seal Pump at Prudes Creek Motor Side	157250	JOHN CRANE	GA-C1	1.00	$722.00	MCSL
MCSL-PUMP-WEM006	M.Seal, Pump at P.Creek Wemco Pump Model #E5K-LM-E	157262	JOHN CRANE	GA-C1	1.00	$96.00	MCSL
MCSL-RAS-HYD002	Mechanical Seal For RAS at Prudes Creek - Top	24-SGP-21-CUK-10	HYDROMATIC	GA-C2	-1.00	$0.00	MCSL
MCSL-RAS-HYD003	Mechanical Seal For RAS at Prudes Creek - Bottom	24-CSGP-1-SVS-10	HYDROMATIC	GA-C2	0.00	$0.00	MCSL
MCSL-RAS-WEM001	Mechanical Seal For Scotts/RAS	08-400-01	WEMCO	GA-C2	2.00	$54.00	MCSL
MCSL-RKIT-FLY001	Repair Seal Kit For Flygt 3300-642 Pump SEE SPECS	6018924	FLYGT	MS-R1B-S3	2.00	$4,052.00	MCSL
MCSL-SPRING-001	Spring For MCSL - 532 or 12213 For Long Shaft at	SPRING	PAC SEAL	GA-C3	1.00	$0.00	MCSL
METAL-ALU-001		340810	SISKIN STEEL	COPS	3.00	$21.00	
METAL-ALU-A001	2" X 2" X 1/4" Angle Bar	300220	SISKIN STEEL	COPS	3.00	$1.00	
METAL-CHANNEL-001	Steel Channel, 2" x 1" x 1/8" x 20 Feet	299900 #00ROIL17P50	CHATHAM	MSHOP	100.00	$0.56	METAL
METAL-CHANNEL-002	Steel Channel, 3" x 4.1 x 20 Feet	21080 #00E02B11E20	CHATHAM	MSHOP	100.00	$0.87	METAL
METAL-CHANNEL-003	Steel Channel, 4" x 5.4 x 20 Feet	21311 #00R02D68Y90	CHATHAM	MSHOP	80.00	$1.70	METAL
METAL-EXPM-001	9 Gauge, 48" x 8 Feet, Expanded Metal	56441 #00F2S93C60	CHATHAM	MSHOP	24.00	$3.97	METAL
METAL-FBAR-001	Flat Bar, Cold Roll, 1/8" x 1 1/2" x 12 Feet	44321 #00R00P85M40	CHATHAM	MSHOP	60.00	$1.04	METAL
METAL-STEELA-001	Steel Angle, 1" x 1" x 1/4" x 20 Feet	38 #00R00499B10	CHATHAM	MSHOP	200.00	$0.40	METAL
METAL-STEELA-002	Steel Angle, 1" x 1" x 1/8" x 20 Feet	34 #00R00D48M40	CHATHAM	MSHOP	200.00	$0.21	METAL
METAL-STEELA-003	Steel Angle, 2" x 2" x 1/4" x 20 Feet	399 #00R01YB10	CHATHAM	MSHOP	200.00	$0.65	METAL
METAL-STEELA-004	Steel Angle 3" x 3" x 1/4" x 20 Feet	4979 #00R2223R00	CHATHAM	MSHOP	100.00	$0.98	METAL
METAL-STEELA-005	Steel Angle, 4" x 4" x 1/4" x 20 Feet	3719 #00R3016B10	CHATHAM	MSHOP	80.00	$1.47	METAL
METAL-STEELP-001	16 Gauge, 48" x 10 Feet, Steel Plate	28804 #00R03M34R00	CHATHAM	MSHOP	40.00	$3.88	METAL
METAL-STEELP-002	Steel Plate, 11 Gauge, 48" x 10 Feet	28458 #00R05Y39R00	CHATHAM	M-SHOP	50.00	$6.77	METAL
METAL-TUBING-001	Steel Tubing, 1" x 1" x 1/8" x 20 Feet	45410 #00R00P05P50	CHATHAM	MSHOP	200.00	$0.43	METAL
METAL-TUBING-002	Steel Tubing, 2" x 2" x 1/4" x 20 Feet	45676 #00R00L17P50	CHATHAM	MSHOP	80.00	$2.11	METAL
METAL-TUBING-003	Steel Tubing, 2 1/2" x 2 1/2" x 1/4 x 20 Feet		CHATHAM	MSHOP	100.00	$2.71	METAL
METER-FLOW-001	Flow Meters, Key Instruments Brand, Grainger, Bubb	5P364	GRAINGER	EL-C3-S4	2.00	$69.00	METER
METER-FLOW-002	Flow Meter, Dwyer Brand	VFA-3-SSV	DWYER	EL-C3-S4	2.00	$40.00	METER
METER-FLOW-SHADE-001	Ultrasonic Sensor Sunshade with Adaptor To Fit Mod	60-3004-142	CC LYNCH	EL-C6-S9	2.00	$50.00	METER
METER-MANO-001	Manometers, Well Type, For Carbon Towers	123016D	DWYER	MZ-R3-S3	-7.00	$140.00	METER
MODULE-LNMR-001	Ignitor Module For John Deere 345	AM105574	JOHN DEERE	GA-LN-C	1.00	$250.00	LAWNEQ
NUT-ROTOR-LOCK001	Lock Nut For Rotor at Scotts	0905274	FALK	MS-R1B-S3	1.00	$4.40	NUT
OIL-CAP-001	Capella Oil	WF 68	TEXACO	STORRM-R1-S1	9.75	$10.98	OIL
OIL-CHESYN-001	Synthetic Oil	266172	CHEVRON	OIL-H	41.00	$1.00	OIL
OIL-DURO-220-001	Duro 220 AW	10552	ARCO	OIL-H	40.00	$1.00	OIL
OIL-ISO-220-001	ISO 220	232948	CHEVRON	OIL-H	58.25	$1.00	OIL

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
OIL-ISO-68-001	ISO 68 AW	255673	MOBIL	OIL-H	62.50	$1.00	OIL
OIL-MOBSYN-001	Synthetic Oil	SMC-630	MOBIL	OIL-H	55.00	$1.00	OIL
OIL-MOTOR-001	Motor Oil 15W40	225044	CHEVRON	OIL-H	210.00	$1.00	OIL
OIL-MOTOR-002	Motor Oil 15W40	225046	CHEVRON	OIL-H	165.00	$1.00	OIL
OIL-SRING-001	Oil Sealing Ring For Mixer at Prudes Creek	9280074	LANDIA	MS-R1B-S2	0.00	$19.00	OILRIN
ORING-001I	ORing For Gorman Rupp Pump, Model T4A-3B	46411-062	G-RUPP	MS-R9-S1	4.00	$117.35	ORING
ORING-002	ORing, Pump at P.Creek Wemco Pump - Model #E5K-LM-	142237	WEMCO	GA-C1	1.00	$31.00	ORING
ORING-003	Oring, Pump at P.Creek Wemco Pump - Model #E5K-LM-	142202	WEMCO	GA-C1	1.00	$18.00	ORING
ORING-SET-001	Oring Set For Mixer at Prudes Creek	8117038	LANDIA	MS-R1B-S2	0.00	$35.00	ORING
ORING-UV-001	Oring For Trojan UV #3000 at Warrior Plant	302300	TROJAN	GA-C1	13.00	$0.50	ORING
ORING-UV-002	Oring For Trojan UV #3000 at Warrior Plant	302314	TROJAN	GA-C1	14.00	$0.50	ORING
PACK-SCORE-001	Solid Core 1/8" Pump Packing	ML 4002 1/8	BRAG	GA-C11	6.50	$55.45	PACKIN
PACK-SCORE-002	Solid Core 1/4" Pump Packing	ML 4002 1/4	BRAG	GA-C11	6.00	$51.30	PACKIN
PACK-SCORE-003	Solid Core 3/8" Pump Packing	ML 4002 3/8	BRAG	GA-C11	11.60	$51.30	PACKIN
PACK-SCORE-004	Solid Core 1/2" Pump Packing	ML 4002 1/2	BRAG	GA-C11	4.00	$51.30	PACKIN
PAINT-COALTAR-OOI	Coal Tar		SHERIWINWILL	PS-SR	0.38	$28.00	PAINT
PAINT-DURUST-001	Duro Rust Extend, Rust Arrestor	1543958	SHERIWINWILL	PS-SR	-50.50	$35.00	PAINT
PAINT-EPOXY-001	Two Part Epoxy Paint			PS-SR	-513.75	$1.00	PAINT
PAINT-LATEX-001	All Latex Paints		SHERIWINWILL	PS-SR	-287.00	$18.00	PAINT
PAINT-OIL-001	All Oil and Enamel Paints		INDURON	PS-SR	-123.75	$23.00	PAINT
PAINT-POLY-001	Polyurethane Paint			PS-SR	-805.88	$22.00	PAINT
PAINT-PRIMER-001	Metal Primer		SHERIWINWILL	PS-SR	-321.38	$15.00	PAINT
PAINT-SPRAY-CAN-002	Rust Inhibiter, Spray Cans, 12-15 Ounce Qt 12 Cans			PTS	10.75	$2.95	PAINT
PAINT-THORSEAL-001	Thoroseal Concrete Cover		SHERIWINWILL	PS-SR	-75.50	$75.00	PAINT
PIPE-SS-001	3/4" SS Pipe - Sch. 40	3/4"	PETRO	MSHOP	80.00	$2.05	PIPE
PIPE-SS-002	1" SS Pipe - Sch. 40	1"	PETRO	MSHOP	40.00	$2.63	PIPE
PIPE-SS-003	1/2" SS Pipe - Sch. 40	1/2"	PETRO	MSHOP	40.00	$1.71	PIPE
PIPE-SS-004	1 1/2" SS Pipe - Sch. 40	1 1/2"	PETRO	MSHOP	40.00	$3.85	PIPE
PIPE-SS-005	2" SS Pipe - Sch. 40	2"	PETRO	MSHOP	40.00	$5.03	PIPE
PLUG-001	Plug To Wemco Pump Model #E5K-LM-EE3R7-RAS at P.Cr	242281	WEMCO	GA-C1	1.00	$22.00	PLUG
PULY-001	Pulley	211174-5 C-10		GA-R7-S1	1.00	$0.00	PULY
PULY-002	Pulley	A106 B10		GA-R7-S1	1.00	$0.00	PULY
PULY-003	Pulley	110 PD 3B		GA-R7-S1	1.00	$0.00	PULY
PULY-004	Pulley			GA-R7-S1			PULY
PULY-005	Pulley			GA-R7-S1	1.00	$0.00	PULY
PULY-006	Pulley	3 3V 6.0 2517		GA-R7-S1	2.00	$0.00	PULY
PULY-007	Pulley	16043		GA-R7-S1	5.00	$0.00	PULY
PULY-008	Pulley	D4 700-20		GA-R7-S1	1.00	$0.00	PULY
PULY-009	Pulley	405BSD C2J		GA-R7-S1	3.00	$0.00	PULY
PULY-010	Pulley			GA-R7-S1	1.00	$0.00	PULY
PULY-011	Pulley			GA-R7-S1	1.00	$0.00	PULY
PULY-012	Pulley	A56B60		GA-R7-S1	1.00	$0.00	PULY
PULY-013	Pulley	5X60H		GA-R7-S1	1.00	$0.00	PULY
PULY-014	Pulley	BK65H		GA-R7-S1	1.00	$0.00	PULY
PULY-015	Pulley	3X919	CONGRESS	GA-R7-S1	0.00	$5.00	PULY
PULY-016	Pulley For Sprayer	3X790	GRAINGER	MS-R2A-S1	0.00	$11.05	PULY
PULY-017	Pulley For Morgan/Gwood 1 & 2 9 1/4" Dia. - 5V Sty	5V9.753		MS-R2A-S1	0.00	$95.81	PULY
PULY-INST-001	Pulley Insert	2517		GA-R7-S1	2.00	$0.00	PULY
PULY-INST-002	Pulley Insert	2517		GA-R7-S1	5.00	$0.00	PULY
PULY-INST-003	Pulley Insert	2517		GA-R7-S1	1.00	$0.00	PULY
PULY-INST-004	Pulley Insert			GA-R7-S1	1.00	$0.00	PULY
PULY-INST-005	Pulley Insert	1315		GA-R7-S1	2.00	$0.00	PULY
PULY-INST-006	Pulley Insert	1610		GA-R7-S1	1.00	$0.00	PULY
PULY-INST-007	Pulley Insert	29-01		GA-R7-S1	1.00	$0.00	PULY
PULY-INST-008	Pulley Insert			GA-R7-S1	1.00	$0.00	PULY
PULY-INST-009	Pulley Insert 1 3/4 Morgan/Greenwood #1 & 2, T8 Pu	3020	DODGE	MS-R1B-S2	1.00	$32.12	PULY
PUMP-AIR-001	Air Pump, WISA, 120 Volt, To Fit Gorman Rupp Pump	48221-022	GORMAN RUPP	EL-C3-S3	2.00	$322.65	PUMP
PUMP-CASING-001	Lower Seal Casing For 30 Hp Ebara at Moss Lane	CDL11-1035	EBARA	MS-R6-S2	0.00	$711.00	PUMP
PUMP-CGASKET-FLY001	Cooling Gasket To Fit Flygt Pump CP3300X-454-88 HP	6465900	FLYGT	MS-R1B-S3	1.00	$15.00	PUMP

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
PUMP-DEWAT-001	DeWater Pump #JC 10W/11W ABS SEE SPECS	CD10W/11W	ABS	MS-R1A-S1	1.00	$562.50	PUMP
PUMP-DIAPKIT-001	Diaphram Kit, WISA, To Fit WISA Air Pump For Gorma	26813-903	GORMAN RUPP	D3-S3	3.00	$19.75	
PUMP-EB-GRIN-001	Ebara, 2 HP, Grinder Pump & Control Panel, Oak Gro			-	2.00	$1,485.00	PUMP
PUMP-EBARA-001	Ebara 2 Hp Pumps For Oak Gr, Chapel 1, & Day Stre	32DGUII61.582	EBARA	MS-F	1.00	$1,385.00	PUMP
PUMP-EBARA-002	5 Hp PUmp For Trace Ridge & 2nd & 3rd Street	50DGFU6372	EBARA	MS-F	1.00	$3,827.00	PUMP
PUMP-FLNG-HY001		055190003	HYDROMATIC	GA-C7	15.00	$13.00	FLANGE
PUMP-FLPCUP-HY001	Rubber flapper Cup For Hydromatic 40 MP Flapper	120180012	HYDROMATIC	GA-R6B-S2	1.00	$33.00	PUMP
PUMP-FUELT-001	Fuel Transfer Pump 1/4 Hp - 15 GPM - 115 VAC	4RP93	GRAINGER	MZ	1.00	$315.43	PUMP
PUMP-FUELT-002	Fuel Transfer Pump 1/4 Hp - 20 GPM - 12 VDC	4RP94	GRAINGER	MZ	1.00	$271.96	PUMP
PUMP-GRSL-002	Grease Seal For Pump at Pinewood	4730109		GA-R2-S2	1.00	$0.00	GRSL
PUMP-GRSL-003	Grease Seal For Pump at Pinewood	470530		GA-R2-S2	2.00	$0.00	GRSL
PUMP-GRSL-CR001	Grease Seal For Pump at Halls	35201	CR	GA-R2-S2	-1.00	$0.00	GRSL
PUMP-GRSL-CR002	Grease Seal For Pump at Halls	32501	CR	MS-R3B-S2	2.00	$0.00	GRSL
PUMP-GRSL-CR003	Grease Seal For Pump at Hooper	20109	CR	MS-R3B-S2	4.00	$7.94	GRSL
PUMP-GRSL-CR004	Grease Seal For Pump at Hooper, Larkway	16245	CR	MS-R3B-S3	8.00	$0.00	GRSL
PUMP-GRSL-CR005	Grease Seal For Pump at K-Mart	29866	CR	MS-R3B-S2	5.00	$0.00	GRSL
PUMP-GRSL-CR006	Grease Seal For Pump at K-Mart, Larkway	19831	CR	MS-R3B-S2	3.00	$0.00	GRSL
PUMP-GRSL-CR007	Grease Seal For Pump #3 at South Park	18581	CR	MS-R3B-S2	13.00	$0.00	GRSL
PUMP-GRSL-CR008	Grease Seal For Pump #3 at South Park	24898	CR	MS-R3B-S2	15.00	$2.67	GRSL
PUMP-GRSL-CR009	Grease Seal For Pump at Lance Way	17716	CR	MS-R3B-S2	4.00	$10.62	GRSL
PUMP-GRSL-CR010	Grease Seal For Pump at Lance Way	16337	CR	GA-R2-S2	1.00	$0.00	GRSL
PUMP-GRSL-CR011	Grease Seal For Pump at Newfound	27368	CR	MS-R3B-S2	2.00	$8.38	GRSL
PUMP-GRSL-CR012	Grease Seal For Pump at Southwood.	11665	CR	MS-R3B-S3	2.00	$1.00	GRSL
PUMP-GRSL-ISP001	Grease Seal For Pump at Southwood	R00166	ISP	MS-R3B-S3	2.00	$2.18	GRSL
PUMP-GRSL-JC001	Grease Seal For Pump at Newfound	0275-9732	JIM CLIPPER	MS-R4B-S2	6.00	$0.00	GRSL
PUMP-GRSL-N001	Grease Seal For Pump at Newfound	472636	NATIONAL	MS-R4B-S3	1.00	$5.84	GRSL
PUMP-INSPSCREW-FLY001	Inspection Screw, To Fit Flygt Pump Model 3152-181	827034	FLYGT	MS-R1B-S3	1.00	$19.00	PUMP
PUMP-LOBE-WE-001	8" Rotor For 8" Lobe Wemco Pump/Lamination	RL800	WEMCO/APC	MS-F	-4.00	$2,584.00	LOBE
PUMP-LOBE-WE-002	5" Rotor For 5" Lobe Wemco Pump/Lamination	RL500	WEMCO/APC	MSHOP-F	-1.00	$1,236.00	LOBE
PUMP-LOBE-WE-REC001	8" Rotor For 8" Lobe Wem. Pump Recovered	RPD-8	WE/EQUIPUMP	MS-	4.00	$1,280.00	LOBE
PUMP-LOBE-WE003	5" Rotor For 5" WEMCO Pump - Scotts RAS/P.	RPD-5	WEMCO	MS-R6-S2	4.00	$850.00	LOBE
PUMP-LUG-001	Mounting Lug, 4", Hydromatic Pump	10941-000-2	HYDROMATIC	MS-R1B-S2	4.00	$109.33	PUMP
PUMP-MCSL-SE008	Mech Seal For Jeff. Mem. - Prudes C. #1 Hydro Pump	32SGP21CVK10	SEPCO	GA-C2	2.00	$180.00	MCSL
PUMP-MTR-PTS-001	Points & Repair Kit For Yellow Portable Pump	UQ21-WF	GUTHRIES ENG	VC	1.00	$20.00	PUMP
PUMP-PAIL-STICK-001	Pail Stick Pump For Odor Control	MZ-R5-S3	UNITED	MZ-R5-S3	3.00	$166.80	PUMP
PUMP-PISTCUP-001	Piston Cup, For Hyd. Pump S/Lift 40MP	12018-001-01		MS-R8-S2	9.00	$49.50	PUMP
PUMP-PISTCUP-002	Piston Cup For Hydromatic Pump 60 MP	12018-003-1		MS-R8-S2	4.00	$113.00	PUMP
PUMP-PRIHOU-001	Globe for S & L Vacuum Prime Pump	87813316	S&L	GA-C15	10.00	$1.00	PUMP
PUMP-SEALPLATE-001	Seal Plate For 40MP Hydromatic Pump at Gadsden Hwy	009010002	HYDROMATIC	MS-R6-S2	2.00	$227.00	PUMP
PUMP-SLVS-001	Wear Sleeve For Pump at Adamsville	1002		GA-C4	1.00	$0.00	SLVS
PUMP-SLVS-002	Wear Sleeve For Pump at Amerex	1004		GA-C4	1.00	$0.00	SLVS
PUMP-SLVS-003	Wear Sleeve For Pump at Amerex No1	11876A		GA-C4	2.00	$0.00	SLVS
PUMP-SLVS-004	Wear Sleeve For Pump at Halls Branch	1005		GA-C4	3.00	$0.00	SLVS
PUMP-SLVS-005	Wear Sleeve For Pump at Larkway	1003		GA-C4	2.00	$0.00	SLVS
PUMP-SLVS-006	Wear Sleeve For Pump at Lewisburge	1009		GA-C4	0.00	$0.00	SLVS
PUMP-SLVS-007	Wear Sleeve For Pump at Mulga Loop	540A14A 9630 F		GA-C4	1.00	$0.00	SLVS
PUMP-SLVS-008	Wear Sleeve For Pump at Parkway	1001		GA-C4	2.00	$0.00	SLVS
PUMP-SLVS-009	Wear Sleeve For Pump at Riverchase	PO 17273-2-000		GA-C4	2.00	$0.00	SLVS
PUMP-SLVS-010	Wear Sleeve For Pump at New Found			GA-C4	5.00	$0.00	SLVS
PUMP-SUCT/COV-EB001	Suction Cover For Ebara Pump Model 6222 Woods T.	CDL12-1024	EBARA	MS-R1B-S2	0.00	$528.75	PUMP
PUMP-SUCTION-COV-001	Suction Cover To Fit Ebara Model 100 DLM	CDL 12-1024		MS-R9-S2	1.00	$387.00	PUMP
PUMP-SUMP-BAR001	Barnes 1/2 HP Sump Pump (Float Attached	100949A	BARNES	MS-R1A-S1	2.00	$180.00	PUMP
PUMP-SUMP-GODW001	Godwin 1 Hp Sump Pump 58 Ft. Max Head	GSP-10-1	GODWIN	MS-R1A-S1	4.00	$830.00	PUMP
PUMP-SUMP-PON001	Ponstare Sump Pump	PS-65011	PONSTAR	GA-5A-SI	0.00	$180.00	PUMP
PUMP-SUMP-ZOL001	Zoeller Sump Pump	2P550	ZOELLER	MS-R1A-S1	5.00	$200.93	PUMP
PUMP-TWINPIS-TEL001	Twin Piston Sprayer Pump	Grainger 2P336C		GR-R5A-S1	2.00	$157.68	PUMP
PUMP-TWPIST-001	Twin Pist. Pump 3.0 GPM, 800 PSI -Odor/C. SEE SPEC	2P336C	GRAINGER	MS-R2A-S2	0.00	$100.35	PUMP
PUMP-TWPIST-002	Twin Pist. Pump 2.2GPM 1000 PSI -Odor Control	2P339C	GRAINGER	MS-R2A-S2	0.00	$191.75	PUMP
PUMP-TWPIST-003	Twin Pist. Pump 2.2 GPM 1000 PSI Odor C. Mag.	2P 341C	GRAINGER	MS-R2A-S2	2.00	$103.10	PUMP

Inventory Standard

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Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
PUMP-TWPIST-004	Twin Pist. Pump 3 GPM Max - 800 PSI Max Odor Contr	3YB49	GRAINGER	MS-R2A-S2	1.00	$258.75	PUMP
PUMP-UPCK-001	Style 10 Packing Stick	STYLE 10	JOHN CRANE	GA-C11	16.00	$30.50	PUMP
PUMP-UPCK-FIT-003	Fitting, Palmetto, PN-1202	1202	PALMETTO	-	8.00	$1.00	PUMP
PUMP-UPCK-FIT001	Button Head Fitting for Pump Up Packing	03245016		GA-C11	20.00	$3.61	PUMP
PUMP-UPCK-FIT002	Button Head Fitting for Pump Up Packing	03245025		GA-C11	18.00	$5.49	PUMP
PUMP-WATER-MY001	Myers Water Pump for Airport Flush System	HJ100S	MYERS	COPS-F	1.00	$442.00	PUMP
PUMP-WRING-FLY001	Wear Ring Rubber For Fly. 3300 Imp Code 464	3193800	FLYGT	MS-R1B-S3	0.00	$179.00	PUMP
PUMP-WRING-FLY002	Wear Ring STEEL For Fly. 3300 Imp Code 464	3452502	FLYGT	MS-R1B-S3	1.00	$158.00	PUMP
PUMP-WRING-FLY003	Wear Ring - Stationary For Flygt Pump CP3300 at Fi	3797100	FLYGT	MS-R1B-S3	1.00	$240.00	PUMP
PUMP-WSEAL-001	No Name			GAR-5A-S1	3.00	$300.00	PUMP
PUMP-WSEAL-002	Water Seal Pump For Riverchase	CR3-6	GRUNDFOS	MS-R4A-S1	1.00	$836.00	PUMP
RAM-HYDRAUL-001	Hydraulic Ram, 4 Ton, Grainger, PN 3ZC68	3ZC68	GRAINGER	-	2.00	$213.75	
RAS-GRSL-N001	Grease Seal For RAS at Scotts Branch		NATIONAL	GA-R2-S2	2.00	$0.00	GRSL
RECPUMP-GRSL-N001	Grease Seal For Recipricating Pump at Scotts	472258	NATIONAL	GA-R2-S2	1.00	$0.00	GRSL
REG-GASPRESS-001	Gas Pressure Regulator - Lever Acting Pipe 1" x 1"	4E225	GRAINGER	MS-M1B-S3	1.00	$57.03	REGULA
ROTOR-GRSL-CR001	Grease Seal For Rotor at Scotts Branch	26237	CR	GA-R2-S2	7.00	$0.00	GRSL
ROTOR-GRSL-CR002	Grease Seal For Rotor at Warrior	33590	CR	MS-R3B-S1	2.00	$0.00	GRSL
ROTOR-GRSL-CR003	Grease Seal For Rotor at Warrior	20426	CR	GA-R2-S2			GRSL
ROTOR-GRSL-CR004	Grease Seal For Rotor at Scotts Branch	17284	CR	MS-R3B-S3	4.00	$9.47	GRSL
ROTOR-GRSL-GA001	Grease Seal For Rotor at Warrior	244211	GARLOCK	MS-R3B-S1	8.00	$0.00	GRSL
SAMP-EQ-001	Flow Meter - Isco Brand	4210	ISCO	MZ-R9-S2	2.00	$3,095.00	SAMPLE
SAW-BLBAN-001	Band Saw Blade 12'6" x 1" x .035" 8 Teeth Per Inch	4L169	GRAINGER	MSHOP	2.00	$48.27	SMATLS
SAW-BLBAN-002	Band Saw Blade 12' 6" x 1" x .035" 10 Teeth Per In	4L175	GRAINGER	MSHOP	2.00	$48.27	SMATLS
SEAL-ASS-001	Seal Assembly To Fit Ing.-Dres. Model CA205AFW5B2	M040127G	CLAY-GREENE	GA-C3	0.00	$792.00	SEAL-A
SEAL-ASS-002	Seal Assembly For M/M at Airport #CMD 1800 MS	A-34120-TB	JWC-ENV	MS-R1B-S3	0.00	$543.00	SEAL-A
SHAFT-JACK-001	Jack Shaft Housing & Bearing For #345 John Deere	AM121342	LAWN&TRACTO	GA-LN-C	3.00	$69.00	SHAFT
SHAFT-LNMOW-001	Drive Shaft To Fit G1800 Kubota Lawn Tractor	66101-81810		GA-	1.00	$287.78	SHAFT
SHIM-GASKET-KIT001	Shim,Rotor Gear Box at Scotts For Faulk 1050F22A	757562	FALK	MS-R6-S3	3.00	$27.15	GASKET
SIGHT-PLUG-001	Sight Plugs, Liquid Level, Low Pressure, Grainger	1U916	GRAINGER	-	10.00	$8.20	
SIGHT-PLUG-002	Sights Plugs, Liqued Level, Low Pressure, Grainger	1U917	GRAINGER	-	10.00	$7.84	
SLVE-PUMP-001	Sleeve For Pump at Second Creek	Size2.75-OD,2.50-ID	SHADE SHOP	GA-R3-S2-3			BRNG
SLVS-001	Wear Sleeve	52237-895-881	NO NAME	GA-C4	2.00	$0.00	SLVS
SLVS-002	Wear Sleeve	1006		GA-C4	1.00	$0.00	SLVS
SLVS-003	Wear Sleeve	1007		GA-C4	1.00	$0.00	SLVS
SLVS-004	Wear Sleeve, T8 Gor. Rupp For Morgan/Greenwood 1&2	12359-16000	GORMAN RUPP	GA-C4	2.00	$0.00	SLVS
SLVS-PUMP-HY001	Shaft Sleeve To Fit Hyd. Sub. Pump Model S6LX2000,	2310-007-3	HYDROMATIC	MS-R1B-S2	-1.00	$360.00	SLVS
SMT-1/2 BUCKLES-001	Clamp Band - 1/2" Buckles	CL0008-C254	BRAG	MSHOP	100.00	$0.31	SMATLS
SMT-3/4 BUCKLES-002	Clamp Bank - 3/4" Buckles	CL0012-C256	BRAG	MSHOP	100.00	$0.55	SMATLS
SMT-BANDINGT-001	Clamp Band It Tool	CL0001-C001	BRAG	MSHOP	1.00	$81.64	SMATLS
SMT-BANDROLL-001	Clamp Band S/S 1/2" x 100"	CL0008-C204	BRAG	MSHOP	100.00	$0.45	SMATLS
SMT-BANDROLL-002	Clamp Band S/S 3/4" x 100"	CL0012-C206	BRAG	MSHOP	100.00	$0.68	SMATLS
SMT-BORHSET-001	12 Pc. Boring Head Set, Series 203, 3" Boring Head	06768758	MSC	MSHOP	1.00	$231.75	SMATLS
SMT-BORTLH-001	3 Bar Boring Tool Holder, 3 Plain Boring Bar, 6 To		MSC	MSHOP	1.00	$731.12	SMATLS
SMT-CARBCUT-001	2"-R-8 Shank Carbide Face Cutter	03026028	MSC	MSHOP	1.00	$135.86	SMATLS
SMT-CENTER FIND-001	Center Finder Complete with Case & Four Attachment	6425279	MSC	MSHOP	1.00	$30.90	SMATLS
SMT-DRILL/SINK-001	Combined Drills & Count Sink Set	3769996	MSC	MSHOP	1.00	$30.27	SMATLS
SMT-EMILLMF-001	6 Pc., Multi-Flute, End Mill Set, 3/4", Shank Bri	01720028	MSC	MSHOP	1.00	$115.00	SMATLS
SMT-EMILLSET-001	20 Pc., Tin Mill Coated, End Mill Set	92000439	MSC	MSHOP	1.00	$99.99	SMATLS
SMT-EMSETR8-001	R8 End Mill Holder Set, 8 Pc. Set	08453201	MSC	MSHOP	1.00	$312.00	SMATLS
SMT-HOSEREP-001	Hose Repair Kit, Low Pressure #3000	00651182	MSC	MSHOP	1.00	$149.95	SMATLS
SMT-HOSEREP-002	Hydraulic Hose Repair Kit	00625558	MSC	MSHOP	1.00	$199.95	SMATLS
SMT-KLDRILLCK-001	Keyless Drill Chuck with Integral Shank		MSC	MSHOP	1.00	$255.00	SMATLS
SMT-LIGHTSTAND-001	Magnetic Light Stand For MShop	06580310	MSC	HC1-R2-S5	2.00	$24.99	SMATLS
SMT-MULFMETER-001	Multi Function Meter	787	FLUKE	VC	1.00	$495.00	SMATLS
SMT-PARSET-001	Parallel Set, 9 Pr. 1/4"	09972340	MSC	MSHOP	1.00	$131.31	SMATLS
SMT-PARSETTS-001	Parallel Set, 10 Pr., Thin Style	06820898	MSC	MSHOP	1.00	$100.00	SMATLS
SMT-PNTOOLSET-001	22 Pc Pneumatic Tool Set Nuline Air Tools & Kits	82996217	MSC	MSHOP	2.00	$165.74	SMTOOL
SMT-PORTLIGHT-001	High Intensity Portable Spot Lights	6VR50	GRAINGER	STORRM-R1-S3	4.00	$44.85	SMATLS
SMT-QUARTZLIGHT-001	Hand Carry Quartz Light	4-VM72	GRAINGER	STORRM-R1-S3	4.00	$16.25	SMATLS

Inventory Standard

JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
SMT-S BORING BAR-001	Small Tools	9870691	MSC	MSHOP	1.00	$414.00	SMATLS
SMT-TAPEM-001	100' Tape Measure	6A502	GRAINGER	HC1-R2-S5	3.00	$29.95	SMATLS
SMT-TOOLBOX-001	8 Drawer, Roll Away Tool Box	9-65913	SEARS	MSHOP	2.00	$296.96	SMTOOL
SMT-VBLOCK-CLAMP-001	V-Block 1 Pair & Clamp V-Block & Clamp	0540336	MSC	MSHOP	2.00	$51.25	SMATLS
SNUB-SL001	Snubbers For S&L Bubbler System	1L186A	S & L	GA-C15	25.00	$24.18	COMPRE
SOLE-NGAS-001	Solenoid Val. Lock -Off, 12 VD, 2 Way - 1" For Gor	8215B50	JIM HOUSE	MS-R1B-S2	1.00	$239.85	SNOID
SPRAYERHAND-REPKIT-001	Poly Wand Kit, PN R15C, For Comp. Air Sprayer Mode	R15C	SPRAY DOC	GA-LN-C	15.00	$5.49	
SPRAYGUN-001	Spray Gun - High Pres., Rear Entry, 10 GPM, 4000 P	4VL20	GRAINGER	STORRM-C2	3.00	$28.59	SMATLS
SPRING-AIRR-GR001	Air Release Valve Spring	38571-717	GORMAN RUPP	GA-C3	6.00	$7.50	SPRING
SPRING-UV-001	Spring For Trojan UV #3000 at Warrior Plant	700105	TROJAN	GA-C1	12.00	$0.50	SPRING
TIRE-LNMOW-003	Tires	6-12		MZ-F	3.00	$32.40	TIRE
TIRE-LNMOW-004	Tires	20X10-10NHS		MZ-F	2.00	$40.13	TIRE
TIRE-LNMOW-006	Tires	16X6.5-8NHS		MZ-F	8.00	$17.30	TIRE
TIRE-LNMOW-007	Tires	23X10.5-12NHS		MZ-F	3.00	$39.15	TIRE
TRIM-HEADS-001	Weedeater trimmer heads for Echo weed trimmers	462810	ECHO	LN-C	7.00	$23.00	LAWNEQ
TUBING-SAMP-001	Clear Vinyl Tubing, 1/4" IO x 7/16" OD	TX0004-RNT7	BRAG	CHMS-R1-S1	0.00	$10.40	TUBING
TUBING-SAMP-002	Med. Grade Tub. 3/8 IDX5/8OOD 1/8 Wall	686700047	CC LYNCH	CHMS-R1-S1	2.00	$245.00	TUBING
TUBING-SAMP-003	Clear Vinyl Tubing 3/8" x 9/16" For Warrior Sample		BRAG	CHMS-F	0.00	$25.50	TUBING
TWRFAN-BELT-001	Belt For the Carbon Tower Fan 1 at Scotts Branch	B133		GA-W74	2.00	$20.00	BELT
TWRFAN-BELT-002	Belt For the Carbon Tower Fan 2 at Scotts Branch	B133	GATES	GA-W74	0.00	$17.45	BELT
U-JNT-LNMOW-001	U Joint To Fit G1800 Kubota Lawn Tractor	37410-13722		GA	2.00	$24.32	UJNT
UJNT-G001	Genuine U-Joint	5-155X	GENUINE	MS-R1B-S1	3.00	$0.00	UJNT
UJNT-S001	Spicer U-Joint	5-153X	SPICER	MS-R1B-S1	-2.00	$0.00	UJNT
UJNT-S002	Spicer U-Joint	5-160X	SPICER	MS-R1B-S1	4.00	$0.00	UJNT
UJNT-S003	Spicer U-Joint	5-178X	SPICER	MS-R1B-S1	4.00	$11.60	UJNT
UN-DES BAGS-001	Dessicant Bags - 8 oz.	2140K56	INFILCO	MZ-F	100.00	$1.16	
UN-VAL-001	Unloader Valve For Lg. Pressure washer	2P591	GENPUMP	O-VC	0.00	$43.44	VALVE
VAL-AR-GR001	Air Release Valve For Gorman Rupp Pump	GRP33-07B	Gorman Rupp	MS-R1B-S2	1.00	$1.00	VALVE
VAL-ARS-GR001	Compression Spring For Gorman Air Release Valve	0308571-715	GORMAN RUPP	GA-C3	4.00	$6.25	SPRING
VAL-ARS-GR002	Compression Spring For G/RAir Release Valve BLACK	0308571-717	GORMAN RUPP	GA-C3	10.00	$7.35	SPRING
VAL-ARS-GR003	Compression Spring For Gorman Air Release Valve	0308571-610	GORMAN RUPP	GA-C3	4.00	$3.25	SPRING
VAL-BALL-001	1/4" Ball Valve		WATTS	MS-R5-S2	4.00	$4.15	VALVE
VAL-BALL-002	1/2" Ball Valve			MS-R5-S2	0.00	$1.00	VALVE
VAL-BALL-003	3/4" Ball Valve			MS-R5-S2	0.00	$1.00	VALVE
VAL-BALL-004	1" Ball Valve			MS-R5-S2	-1.00	$1.00	VALVE
VAL-BALL-005	1 1/2" Ball Valve			MS-R5-S2	10.00	$18.37	VALVE
VAL-BALL-006	2" Ball Valve			MS-R5-S2	11.00	$23.62	VALVE
VAL-CK-001	1/2" Brass Check Valve			MS-R5-S3	10.00	$1.00	VALVE
VAL-CK-002	3/4" Brass Check Valve			MS-R5-S3	16.00	$1.00	VALVE
VAL-CK-003	1" Brass Check Valves			MS-R5-S3	19.00	$9.96	VALVE
VAL-CK-004	1 1/4" Brass Check Valves			MS-R5-S3	29.00	$13.65	VALVE
VAL-CK-005	2" Brass Check Valve			MS-R5-S3	6.00	$33.15	VALVE
VAL-CK-006	1 1/2" Brass Check Valve			MS-R5-S3	10.00	$20.48	VALVE
VAL-CKGATE-001	4" Gate Val., 4" Plug Aroo For Sears, P. Grove Sho	500-272	AL. PIPE	MS-R8-S1	0.00	$593.36	VALVE
VAL-FLOAT-001	Float Valve For Ellis Road	9190812	JACUZZI	EL-C7-S5	2.00	$127.80	VALVE
VAL-FUEL-L/OFF001	N/Gas Fuel L/ Off Valve L/Sterling SEE SPEDS	26665-002	JIM HOUSE	MS-R2A-S2	2.00	$379.30	VALVE
VAL-GATE-001	1/4" Gate Valve			MS-R5-S1	6.00	$2.69	VALVE
VAL-GATE-002	1/2" Gate Valve			MS-R5-S1	3.00	$1.84	VALVE
VAL-GATE-003	3/4" Gate Valve			MS-R5-S1	1.00	$2.39	VALVE
VAL-GATE-004	1" Gate Valve			MS-R5-S1	0.00	$2.91	VALVE
VAL-GATE-005	1 1/4" Gate Valve			MS-R5-S1	7.00	$4.51	VALVE
VAL-GATE-006	1 1/2" Gate Valve			MS-R5-S1	15.00	$5.88	VALVE
VAL-GATE-007	2" Gate Valve			MS-R5-S1	4.00	$9.60	VALVE
VAL-GATE-008	Gate Valve 4" Non Rising Stem	F619-4"	NIBCO	MS-F	2.00	$296.06	VALVE
VAL-GATE-009	Gate Valve 6" Non Rising Stem	F619-6"	NIBCO	MS-F	2.00	$538.00	VALVE
VAL-GATE-010	4" Gate Valve For Sears Drive Plug Aroo	FG 175	WHEATLEY	MS-R8-S1	0.00	$664.00	VALVE
VAL-GATE-011	10" Gate Valve With Hand Wheel For Cunningham	7561-02	M & H	MS-F	2.00	$945.00	VALVE
VAL-SOL-001	Solenoid Valve, 3 Way, To Fit Smith & Loveless	744140115	SMITH&LOV	EL-C1-S2	1.00	$64.57	VALVE
VAL-UNLOAD-001	Valve - Underloader - Odor Control Magnolia T.	2P-591	GRAINGER	MS-RZA-S2	1.00	$24.48	VALVE

Inventory Standard

JEFFERSON COUNTY ENVIRONMENTAL SERVICES

Item No.	Description	Mfg Part No.	Manufacturer	Stock Location	Qty on Hand	Average Unit Cost	Inventory Type
WAS-BELT-001	Belt For the WAS Pump in Blower Bldg	B68		GA-W36-37	4.00	$0.00	BELT
WASHER-001	Washer To Use with Plug #242281 For Wemco Pump Mod	181773	WEMCO	GA-C1	1.00	$1.00	WASHER
WASHER-MM-001	Thrust Washer For M/Monster, Mod#CMO 1800	400136	NAT. HYD.	MS-R1B-S3	0.00	$4.90	WASHER
WSTPUMP-GRSL-CR001	Grease Seal For Waste Pump at Scotts Branch	17285	CR	MS-R3B-S3	6.00	$0.00	GRSL
WSTPUMP-GRSL-CR002	Grease Seal For Waste Pump at Scotts Branch	532866	CR	MS-R4B-S3	2.00	$0.00	GRSL
WSTPUMP-GRSL-CR003	Grease Seal For Waste Pump at Scotts Branch	13569	CR	GA-R2-S2			GRSL
WSTPUMP-GRSL-CR005	Grease Seal For Waste Pump at Scotts Branch	21320	CR	MS-R3B-S2	3.00	$0.00	GRSL
WSTPUMP-GRSL-CR006	Grease Seal For Waste Pump at Scotts Branch	35410	CR	MS-R3B-S1	3.00	$0.00	GRSL
WSTPUMP-GRSL-CR007	Grease Seal For Waste Pump at Scotts Branch	49270	CR	GA-R2-S2	8.00	$0.00	GRSL
WTRPUMP-SLVS-001	Wear Sleeve For Water Pump at Scotts Branch	2623324-186		GA-C4	4.00	$0.00	SLVS
WTRPUMP-SLVS-002	Wear Sleeve For Water Pump at Scotts Branch	1923 24		GA-C4	1.00	$0.00	SLVS
WTRPUMP-SLVS-003	Wear Sleeve For Water Pump at Scotts Branch	2623272		GA-C4	4.00	$0.00	SLVS
WTRPUMP-SLVS-004	Wear Sleeve For Water Pump at Scotts Branch	1000		GA-C4	1.00	$0.00	SLVS
WTRPUMP-SLVS-005	Wear Sleeve For Water Pump at Scotts Branch	2601754386		GA-C4	1.00	$0.00	SLVS
Grand Total					7,625.64		

Customer Service Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	4, 5, 6, 7	Updated Figures 1-5 regarding service statistics	4/24/18
1	9	Updated dispatch script in Figure 6	5/16/18
1	14	Updated JCESD website homepage found in Figure 9	4/30/18
1	17	Updated Figure 11 to current version	5/22/18
1	18	Updated community event list	9/20/18
2	4-7	Updated Figures 1-5	2/2022
2	10	Updated Figure 7 and 8	2/2022

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Acronyms

BMP	Best management practice
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
DBE	Disadvantaged business enterprise
FAQs	Frequently asked questions
FOG	Fats, oils, and grease
FSF	Food service facility
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
KPI	Key performance indicator
MBE	Minority business enterprise
NPDES	National Pollutant Discharge Elimination System
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
TVI	Television inspection
WEF	Water Environment Federation
WRF	Water Reclamation Facility

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Customer Service Program

Program Overview

Purpose and Goals

The purpose of the Customer Service Program is to:

- Receive, record, and coordinate the response to customer feedback, complaints, and service requests processed by Jefferson County Environmental Services Department (JCESD) Dispatchers
- Notify residents in the service area when a sewer overflow occurred
- Notify the public on current construction work and possible impacts to traffic or access to properties
- Inform and educate JCESD staff, external customers, and community groups about the services offered and user rates charged
- Provide programmatic and educational information on Fats, Oils, and Grease (FOG) to target audiences

The goals of the Customer Service Program are to:

- Efficiently resolve customer complaints and emergency request calls in a professional manner
- Comply with Sanitary Sewer Overflow Response and Reporting Program (SSORRP) notification requirements

Program Components and Approach

Customer Service-related initiatives are components of the following programs:

- Service Request Management
- Public Information and Education

The **Customer Service Program** includes a comprehensive system of administrative, management, and documentation activities. The following program elements are described in this program plan:

- Service Request Management process and protocols, staffing, and data management system
- Notification requirements for sewer overflows
- Programmatic support for Food Service Facility (FSF) and residential FOG management
- Methods used to inform and educate the public on the work performed by JCESD personnel
- Educational materials and methods used to inform the public about water quality issues
- Key Performance Indicators (KPIs) for tracking and documenting the performance and effectiveness of the Customer Service Program initiatives

Educating JCESD staff, customers, and external groups about the wastewater industry helps to develop an engaged and informed community and garners support for initiatives focused on mitigating and preventing sanitary sewer overflows (SSOs). A strong, responsive Customer Service Program also encourages changes in behavior by promoting viable actions that can be taken by the public to prevent SSOs in the community, including proper FOG disposal methods and what not to flush down toilets.

Service Request Management

JCESD has procedures in place to receive, process, and respond to customer complaints and requests for service. Complaints related to the performance of the collection system are routed by a Dispatcher or on-call Supervisor to sewer maintenance personnel for immediate response. Requests for service, such as locating a sewer connection or other non-emergency issue, are processed and addressed by the appropriate work group in a timely manner.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed Standard Operating Procedures (SOPs) for various Capacity, Management, Operations, and Maintenance (CMOM)-related job duties. Copies of the SOPs for collection systems mainline cleaning and inspection are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations.** Pump station, bypass pump, and generator SOPs are provided in the JCESD's **Pump Station Operations and Maintenance Program** plan. Procedures used when responding to and reporting sanitary sewer overflows (SSOs) are detailed in JCESD's **SSORRP**.

Other CMOM Program Plans that are referenced in the **Customer Service Program** plan are as follows:

- CMOM Information Management Systems
- CMOM Program Organization
- FOG Management

Staffing

Communication Operators (referred to as "Dispatchers"), who report to the Line Maintenance Administration Division, are responsible for manning the Dispatch Office, located at the Shades Valley Complex. The shifts filled by the Communication Operators are from 7:00 am to 3:00 pm and 3:00 pm to 11:00 pm. The on-call Supervisor is responsible for responding to calls received at other times.

For more information on program staffing, see the organization charts in the **CMOM Program Organization** plan.

The Dispatchers are responsible for receiving and logging complaint/service request data into the Cityworks IMS and for notifying the appropriate sewer maintenance staff of the information received. The Dispatchers are also responsible for receiving completed work orders from field crews, reviewing, and closing out work orders.

Dispatchers and on-call Supervisors receive calls on a variety of collection system issues, including:

- Basement backups
- Blockages
- Broken sewers
- Local flooding
- Homeowner service lines
- Mainline and service line locations
- Missing or broken manhole covers
- Overflowing manholes
- Odors
- Pump station problems
- Sinkholes

Data Management

All pertinent information is recorded and maintained in JCESD's Cityworks™ computerized maintenance management system (CMMS), including when the call was received, where the complaint originated, and the actions taken to resolve the issue. Complaints and service requests are tracked, printed, and filed at the Shades Valley Complex, Dispatch Office.

Service request records are used to:

- Generate reports for JCESD supervisors and managers
- Assist in documentation and reporting of SSOs
- Assess which sewer segments should be maintained more frequently
- Identify system trends and problem areas
- Determine which areas within the collection system should be evaluated for upgrades or repair

For more information on Cityworks service requests and work orders, see the **CMOM Information Management Systems Program** plan.

The following figures were generated by data extracted from the CityWorks database. **Figure 1** presents the number of service requests received within each municipality served by JCESD. The type of sewer problems and complaints received during the month of October 2020 is presented in **Figure 2**.

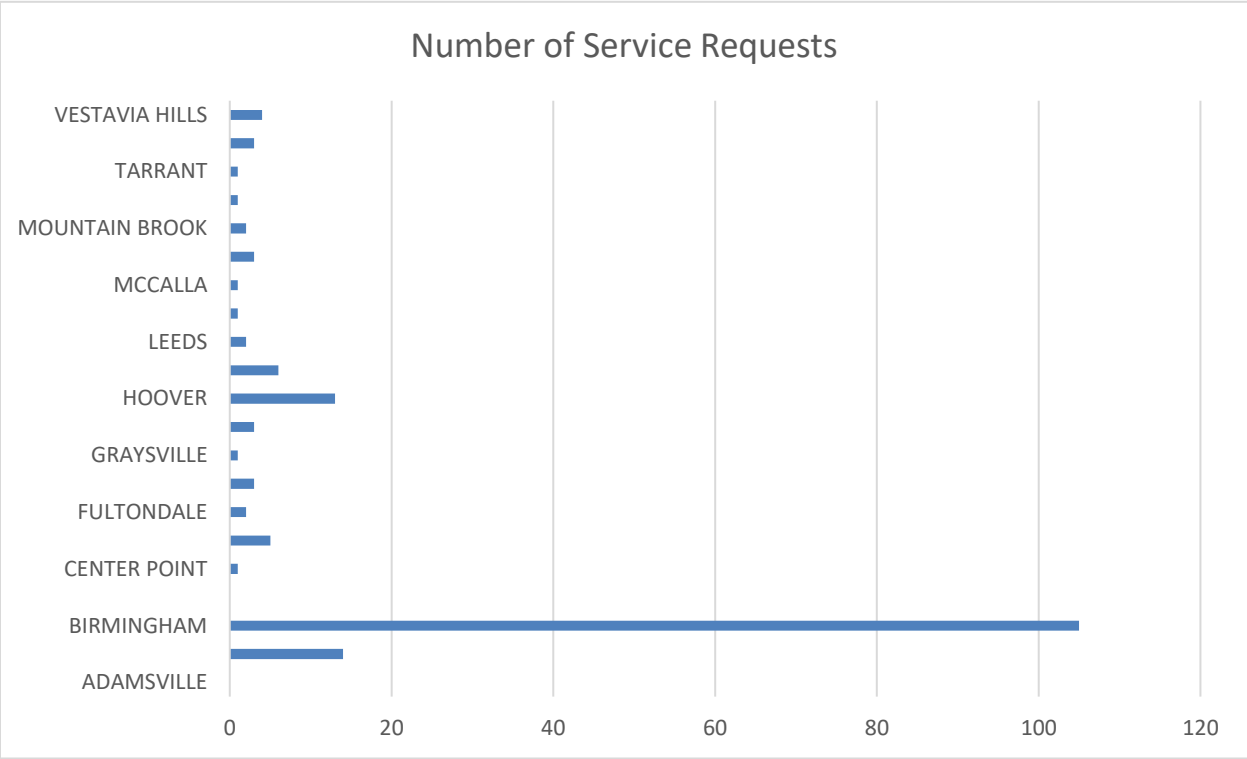


Figure 1. Number of Service Requests by Municipality in October 2020

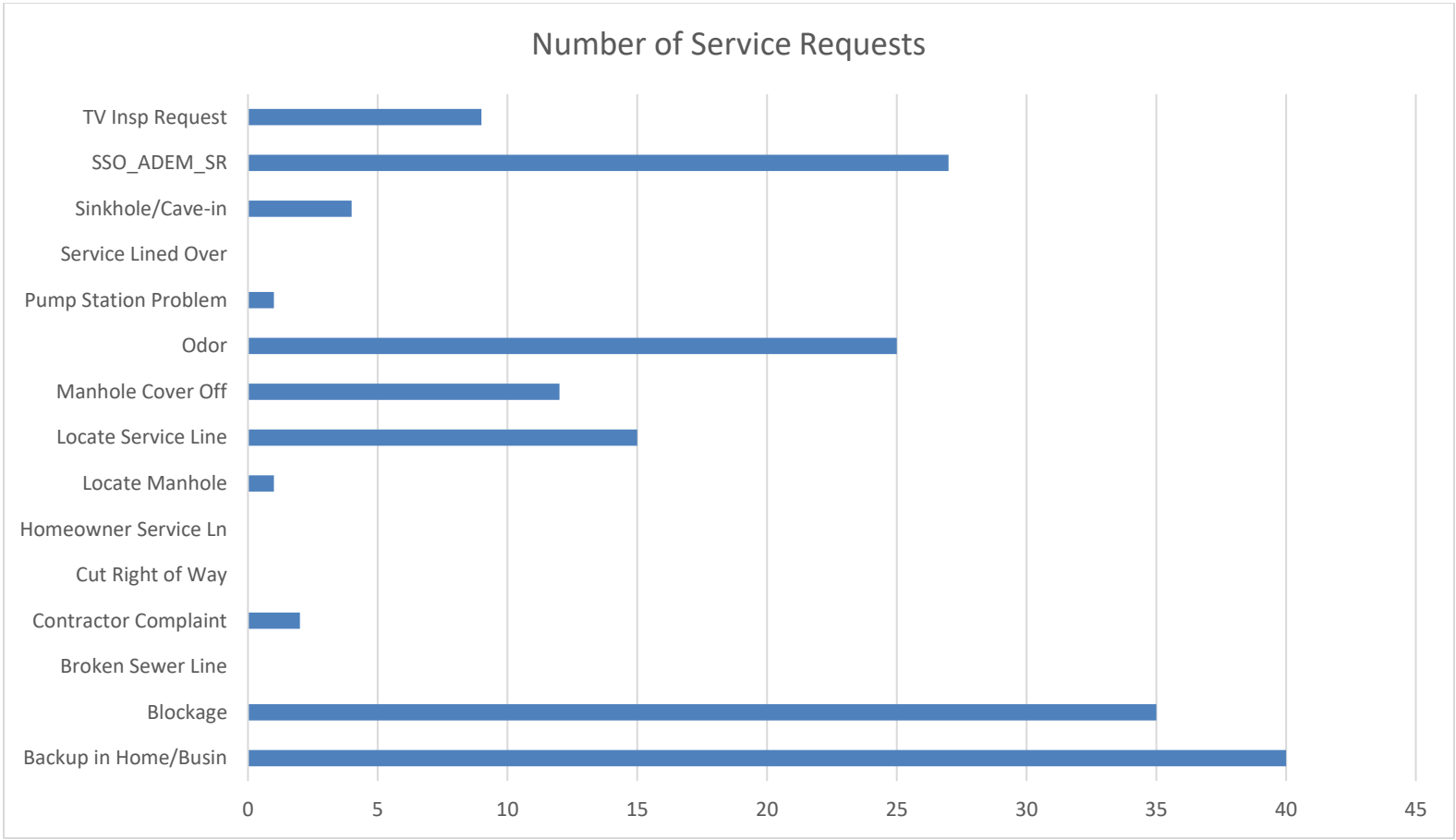


Figure 2. Number of Service Requests by Type of Complaint, October 2020

In addition to evaluating the location and type of complaints received, JCESD evaluates the call volume on an hour-by-hour, day-by-day basis. The following figures were generated from Cityworks data (October 2020). A summary of the total service request calls per month (1223-month period) received at the Dispatch Office is provided in **Figure 3**.

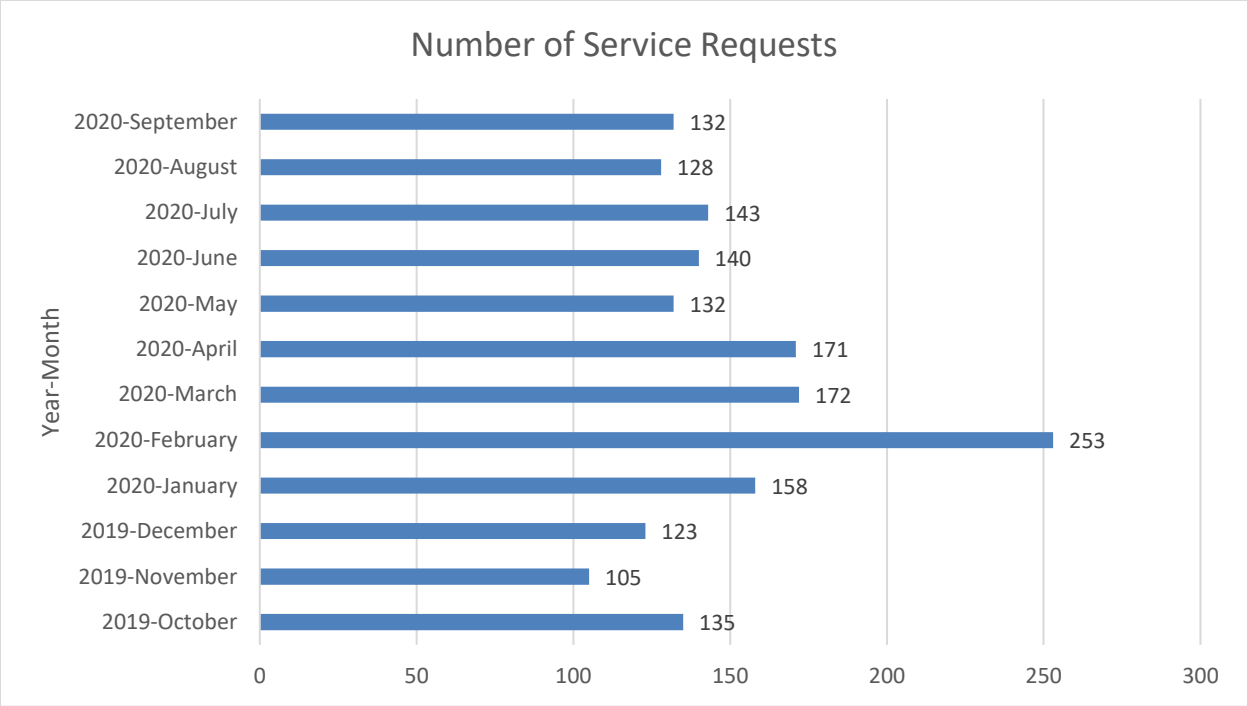


Figure 3. Total Service Request Calls per Month, September 2019 through October 2020

The charts in **Figures 4** and **5** present a summary of the number of service request calls received by day of week and by hour of the day, respectively. This information is helpful to JCESD for staffing purposes and for preparing the maintenance crews for daily activities.

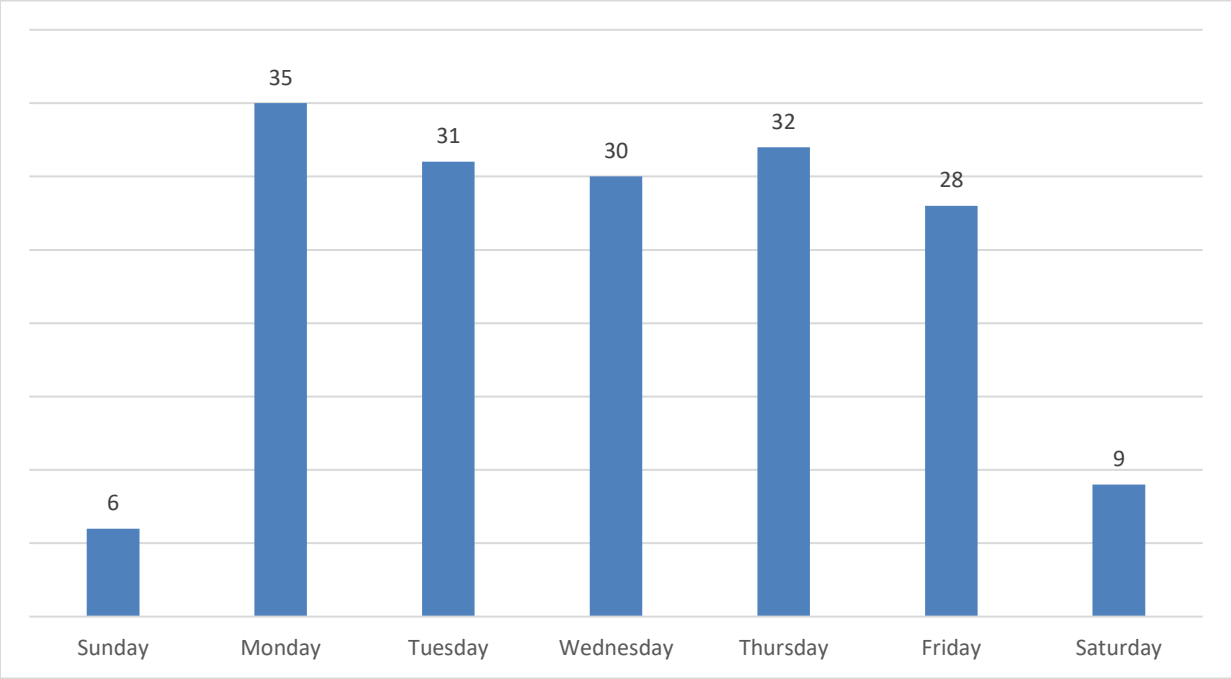


Figure 4. Number of Service Request Calls per Day of the Week Received in October 2020

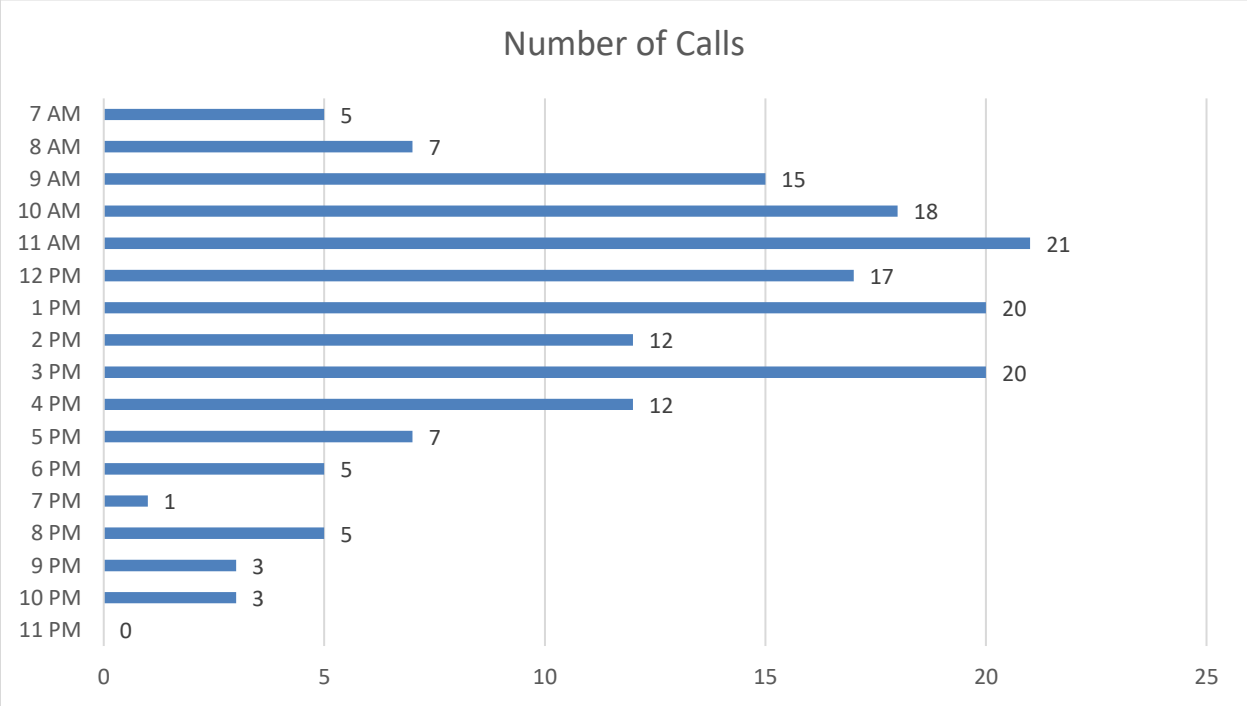


Figure 5. Number of Calls per Hour of the Day Received in October 2020

Service Request Program Implementation

Receiving and Processing Service Requests

The public can report a sanitary sewer emergency, such as a backup into a home or business, or an overflowing manhole by calling the 24-hour Emergency Contact number: (205) 942-0681. Occasionally, calls are routed to the Dispatch Office by other JCESD groups that receive the initial call.

Callers reach a Dispatcher when a call is placed between 7:00 am and 11:00 pm, Sunday through Saturday, including holidays. An on-call Supervisor is contacted via an automated voice mail system if a call is placed between 11:00 pm and 7:00 am.

When a call is received, the Dispatcher determines if the complaint or service request is related to the County's sanitary sewer system. If the call is related to another system (e.g., storm sewer or water line), the caller is referred to the proper authority.

If the call is determined to possibly concern JCESD sewers, detailed information is collected from the caller and entered into the Cityworks IMS.

The Dispatcher follows the trouble identification script shown in **Figure 6** to gather relevant information on possible SSO or building backup events. For more information on Sewer Overflow advisories, notifications, and reporting requirements, see JCESD's **SSORRP**, Section 2.

As shown in the Service Request Input Screen capture provided in **Figure 7**, information entered into service requests include the following:

- Date/time of request
- Dispatching personnel receiving the service request
- Customer contact information
- Nature of the request
- Location of the problem
- To whom the request was assigned

An example Sewer Service Request form generated by Cityworks is shown in **Figure 8**.

The Dispatch Office contacts a Line Maintenance Supervisor by cell phone and a crew via radio or cell phone, and provides the reported address and service request information. Crews may be dispatched from the Shades Valley Complex or the maintenance yard located at the Village Creek Water Reclamation Facility (WRF).

PROBLEM CODE	SEQUENCE	QUESTION
BROKEN SEWER LINE		
	1	*IS THERE SEWAGE COMING OUT OF THE GROUND?*
	2	*WHERE IS THE LINE BROKEN?*
	3	*WHAT IS BROKEN?*
MANHOLE OVERFLOW		
	1	*WHERE IS THE OVERFLOW LOCATED?*
	2	*DID YOU NOTICE THE OVERFLOW WHEN IT WAS RAINING?*
CLEANOUT OVERFLOW		
	1	*WHAT IS THE LOCATION OF THE CLEANOUT?*
HOME/BUSINESS BACKUP		
	1	*DID YOU NOTICE THE BACKUP AFTER FLUSHING A TOILET OR RUNNING THE WASHING MACHINE?*
	2	*HAS A PLUMBER BEEN OUT TO YOUR HOUSE?*
	3	*DID THE PLUMBER ASK YOU TO CALL THE COUNTY?*
	4	*HAVE YOU HAD TO CALL THE PLUMBER OUT FOR THIS PROBLEM MORE THAN ONCE?*
	5	*HOW MANY TIMES?*
FLOODING		
	1	*WAS IT RAINING WHEN THE FLOODING BEGAN?*
	2	*HAVE YOU HAD FLOODING PROBLEMS IN THE PAST?*
	3	*HAS A PLUMBER BEEN CALLED OUT TO INVESTIGATE?*
	4	*HAS A PLUMBER BEEN OUT TO INVESTIGATE THE ISSUE MORE THAN ONCE?*
	5	*HOW MANY TIMES?*
	6	*DID THE PLUMBER ASK YOU TO CALL THE COUNTY?*
SINKHOLE/CAVE-IN BACKUP		
	1	*WHERE IS THE SINKHOLE/CAVE-IN LOCATED?*
ODOR		
	1	*CAN YOU TELL WHERE THE ODOR IS COMING FROM?*
PUMP STATION PROBLEM		
	1	*WHAT IS THE ISSUE?*
MANHOLE COVER OFF/REPAIR		
	1	*IS THE MANHOLE COVER MISSING?*
	2	*DO YOU SEE THE MANHOLE COVER ANYWHERE?*
	3	*WHERE IS THE MANHOLE COVER?*
	4	*DOES THE COVER NEED TO BE SET FLUSH TO THE GROUND?*
	5	*IS THE COVER IN NEED OF REPAIR?*

Figure 6. Dispatch Trouble Identification Script

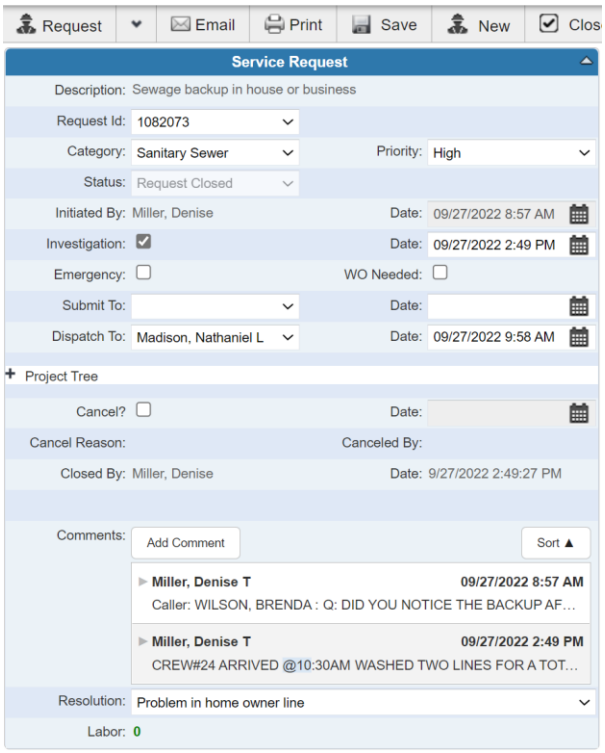


Figure 7.Cityworks Service Request Input Screen

Jefferson County, Alabama
Environmental Services Department
Sewer Service Request

Request Number: 1082073	**Map Page:** 2	**Service Priority:** High
Code: Backup in Home/Busin	**Description:** Sewage backup in house or business	**Associated WO Number:**
Problem Address: 944 BURWELL ST, BIRMINGHAM 35221		
Resolution: Problem in home owner line		
Date / Time Reported: 9/27/2022 8:57:46 AM	**Date Submitted:**	**Tile No.:** VALLEY CREEK
Intitiated By: Miller, Denise	**Dispatched To:** Madison, Nathaniel L	**Date Dispatched:** 9/27/2022 9:58:14 AM
Submitted To:		**Number of Calls:** 1

Customer Call #	First Name	Last Name	Address		Apt. #
1083906	BRENDA	WILSON	944 BURWELL ST, 35221		
Business Name					
City	**Zip**	**Home Phone**	**Work Phone**	**Other Phone**	**Date & Time Of Call**
	35221				9/27/2022 7:12:37 AM
Customer Email			**Cell Phone**		
			205-356-8624		

Closed By: Miller, Denise	**Closed Date/Time:** 9/27/2022 2:49:27 PM
Was Customer Contacted? N	**Name of Customer Contacted:**

Customer Comments: RESIDENT IS EXPERIECING A BACKUP
Location Details:
Problem Details:

Custom Fields

Custom Field Names	Custom Field Value
ESD Sewer Issue Found?	No

Existing Service Request Comments:
By Miller, Denise T: 9/27/2022 8:57:46 AM
Caller: WILSON, BRENDA :
Q: DID YOU NOTICE THE BACKUP AFTER FLUSHING A TOILET OR RUNNING THE WASHING MACHINE?
A: YES
Q: HAS A PLUMBER BEEN OUT TO YOUR HOUSE?
A: YES
Q: DID THE PLUMBER ASK YOU TO CALL THE COUNTY?
A: YES

By Miller, Denise T: 9/27/2022 2:49:19 PM
CREW#24 ARRIVED @10:30AM
WASHED TWO LINES FOR A TOTAL OF 252FT WITH NO OBSTRUCTIONS
WASHED FROM MH#1059-096 TO MH#1059-097 AND FROM MH#1059-097 TO MH#1059-097A
THIS IS A SERVICE LINE ISSUE

Figure 8. Example Sewer Service Request Work Order

SSO Notifications

For more information on Sewer Overflow advisories, notifications, and reporting requirements, see JCESD's **SSORRP, Section 2**.

Responding to Complaints/Service Requests

Sewer Line Maintenance crew trucks are fully equipped to respond to ordinary sewer problems such as root blockages, debris buildup, and grease blockages. Television Inspection (TVI) crew trucks are fully equipped to respond to requests for locating sewer connections and performing sewer line condition assessments.

Responding crews are knowledgeable about the public image they display, and are trained in visibility issues and how to deal with the public. In addition:

- All responding personnel wear JCESD uniforms and/or display JCESD employee identification badges.
- Vehicles and equipment are identifiable as utility property and are kept in good working order.
- Vehicles are equipped with adequate emergency lighting, flashers, and traffic control devices.
- Responding crews verbally provide information to customers on cleanup and safe procedures following backups and overflows, and explain that they can clean up the backup, or JCESD will engage a cleaning contractor. Customers are then provided contact information for the Risk Management Division, if requested.

The responding sewer maintenance crew, or other party assigned to resolve the service request, provides the remaining information captured on the Service Request entry form.

- Cause of the problem
- Feedback to customer
- Date follow up action assigned/scheduled
- Date the request was resolved

Field crews create Work Orders for any work performed in the collection system resulting from the issues reported on Service Requests. Once the outstanding fields on the Service Request form have been completed by responding personnel, the Service Request form is attached to a Work Order and forwarded electronically to the Dispatchers, where both forms are reviewed and entered into Cityworks.

Complaint/Service Request Management Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enables JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

Data currently tracked includes the following:

- Number of Service Requests per Month
- Peak Daily Call Volume
- Average Daily Calls

The success and effectiveness of these efforts can be evaluated by reviewing the following:

- How quickly customer complaints and emergency calls are resolved
- Percentage of calls that are resolved "as soon as possible"

The Complaint/Service Request Management performance measures established at JCESD are shown in **Table 1**.

Table 1. Complaint/Service Request Management Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
Number of Service Request Calls	Value	Number of Service Request Calls Recorded	Maintenance of call volume and type of call to document service calls and differentiate between calls indicating significant maintenance issues needed	Monthly
Peak Daily Call Volume	Value	Volume and time of calls to track peak call time	Track call times and volumes to ensure proper number and skilled customer service personnel are available to respond	Monthly
Call Resolution Time for Customer Complaints and Emergencies	Value	Time to resolve customer service calls	Maintenance of records to demonstrate time to respond and resolve customer complaints and emergencies	Monthly

Public Information and Education

JCESD's public information and outreach efforts reach a diverse group of stakeholders, including:

- Customers
- Regulators
- Elected officials
- Community leaders and groups
- Members of the business community
- Media outlets
- Environmental organizations
- Students and teachers

Required public notification, including the issuance of prompt Sewer Overflow Advisories and other warnings, and information on JCESD's wastewater and collection system services and user rates are disseminated through many types of communication channels, including (but not limited to):

- News releases
- Bill inserts, brochures, door hangers, and other printed materials
- Website content
- Newspaper articles
- Direct correspondence with residential, commercial, and industrial customers
- Other electronic media, such as Everbridge notifications, Twitter, and Facebook

Program Resources

Staffing

The Public Relations Coordinator, assigned to the Barton Lab, is responsible for:

- Coordinating with the FOG Management Program to develop educational materials for residents, FSFs, and best management practice (BMP) training
- Researching and developing press releases, fact sheets, and information packets for various events
- Developing public relations campaigns designed to educate and highlight positive aspects of JCESD work
- Arranging or attending meetings with groups to address concerns about various activities/programs
- Producing educational video materials for distribution within the County
- Organizing WRF tours for schools and civic groups
- Participating in community creek clean up and scouting "badge days"
- Attending various environmental events to represent the County, distributing materials, and answering questions from the public
- Coordinating other community outreach programs at the direction of the Commission

In addition, FOG Management Program staff are responsible for assisting with the development of program-related information materials, participate in community presentations to civic groups, and provide training on Kitchen BMPs to FSFs.

Data Management, Tools

The Public Relations Coordinator utilizes Microsoft Office suite programs, including Word and Publisher.

Public Information and Education Program Implementation

Website

As shown in **Figure 9 below**, JCESD maintains a website (www.jeffcoes.org) that provides user rate information, technical information for contractors, and other outreach information. A summary of the website pages and content is presented below:

- **Home** – basic information about JCESD and the County. Fast links on how to pay bills, report problems, and other common issues and news to customers
- **Customer Care** – residential and commercial billing rates and rate increase information, Grease Control Program, Industrial Pretreatment Program, list of water providers in Jefferson County, private meter information, links to Sewer Use Charge Ordinance and Sewer Use Administrative Ordinance, residential bill calculator, waste hauling requirements, locations of household cooking oil and grease recycling centers, and Frequently Asked Questions (FAQs)

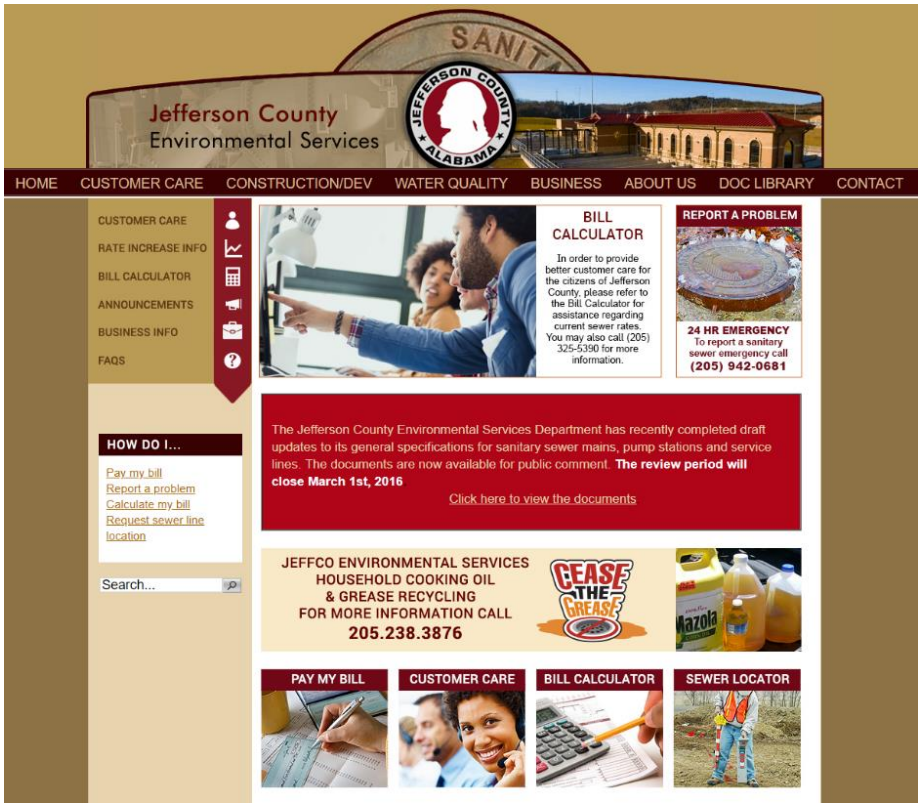


Figure 9. Jefferson County Environmental Services Website Homepage

- **Construction/Development** – Sewer Impacts & Connections information and links to the **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version), procedures to request the location of a sewer line, documents associated with sewer line construction, and a link to Jefferson County surveying monument data
- **Water Quality** – a description of JCESD's water quality-related mission statement and regulatory compliance requirements, links to regulatory reports, SSO database, National Pollutant Discharge Elimination System (NPDES) permits, Consent Order, Collection System Capacity, Management Operation and Maintenance (CMOM) Program, Capacity Assurance Program, SSORRP, Non-Compliance Violation forms, and links to other water quality online resources
- **Contracts** - prequalification application, qualification-based selection information, notices to bidders, Minority/Disadvantaged Business Enterprise (MBE/DBE) utilization information, bid archives
- **News** – current and archived news releases and public notices, information on events and contests sponsored by JCESD
- **Contact**– administrative and customer care contact information and a 24-hour emergency contact telephone number
- **About Us** – brief explanation of the utility, size, and organization

FOG Management Program Materials

Materials that have been made available in support of JCESD's FOG Management Program include the following:

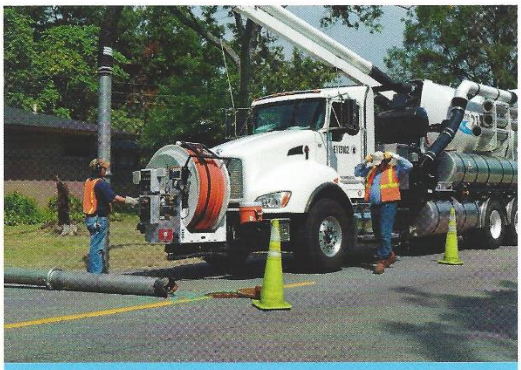
- Door hangers provided to residences near FOG-related SSO and basement back up locations (see **Figure 10**)
- Bilingual informational posters provided to apartment managers (see **Figure 11**)
- Water Environment Federation (WEF) Fat-Free Sewers brochure
- List of residential FOG and waste oil collection centers

For more information on the printed material on FOG BMPs developed in support of JCESD's FOG Program, see the Public Education section of the Fats, Oils & Grease (FOG) Management Program plan.

Where does the fat, oil and grease come from?

- Meat fats
- Lard
- Cooking oils
- Shortening
- Butter
- Margarine
- Food scraps
- Baking goods
- Sauces
- Dairy products

... don't let this happen to your pipes !!



Contact the Grease Control Program Office for more information about household oil and grease recycling

205-238-3876

www.jeffcoes.org

ATTENTION RESIDENT

We need your HELP!!

This area has experienced a sanitary sewer overflow and/or blockage in the sewer lines caused by the build up of fats, oils and grease. Excessive accumulation of fats, oils and grease in the line restricts the flow of wastewater and can result in sanitary sewer overflows and blockages.

By following the steps below, **you** can prevent blockages caused by fats, oils and grease and the occurrence of costly sewer overflows:

- NEVER pour fats, oils and grease down sink drains or toilets. Allow grease to cool and then pour into a container and put in the trash or recycle.
- Place leftover food, scraps and fat trimmings in the trash instead of the garbage disposal.
- Use paper towels to remove excess oils from pots and dishes before placing in wash water or dishwater.
- Use sink strainers to catch pieces of food and empty into trash can.

Jefferson County Commission
Environmental Services Department
Grease Control Program
To report an overflow call:
205-942-0681

Figure 10. Door Hanger with FOG Information

Prevent Sanitary Sewer Overflows in **your** Unit

Please **DO NOT** flush or wash these items down any drain:

- Kitchen Grease
- Cooking Oils
- Fats and fatty food residue
- Paint
- Paper Towels or other paper wipes
- Kitty Litter
- Diapers
- Grinds (egg shells, peelings, tails, etc.)

Please dispose of these items in the trash!

For additional information on proper disposal of household kitchen wastes, call the Jefferson County Environmental Services Grease Control Program at 205-238-3876

Evite que se desborden las tuberías en su hogar

Por favor, no tire ni lave estos artículos en ningún drenaje:

- Grasa de la cocina
- Aceites para cocinar
- Grasas y residuos de comida de grasosa
- Pintura
- Papel tolla u otros tipos de totallitas desechables
- Arena para gatos
- Pañales
- Molidos (cascarones de huevos, cascaras de fruta, caparazon de mariscos, etcetera)

¡Por favor, tire estos articulos en la basura!

Para obtener información adicional sobre como descartar adecuadamente los desechos de la cocina de su hogar, por favor llame al Programa de Control de la Grasa de Servicios Ambientales del Condado de Jefferson al 205-238-3876

Figure 11. Example Bilingual FOG Poster Provided to Apartment Managers

Construction and Maintenance Work Notification

Contracted Construction, Maintenance, and Inspection Work

Construction and Maintenance contractors are required by their contracts to not enter private property, except right-of-way easements, for any reason without first obtaining written permission from the property owner and/or occupant. Contractors are also required to notify the appropriate representatives of any public service corporation, company, or individual not less than 24-hours in advance of performing any work which might damage or interfere with the operation of their property, along or adjacent to the work site.

In-House Construction, Maintenance, and Inspection Work

Before major construction or maintenance work is scheduled by in-house crews, affected property owners are notified. When work will be performed in public right-of-way that may limit access to driveways, crews will attempt to contact property owners and occupants directly by knocking on doors.

Door hangers are used when crews will need to travel through private property to access sewer easements. Property owners and occupants are encouraged to call the Construction Supervisor; an explanation of the work to be performed is provided and permission to enter private property is requested. Once permission is granted, the Maintenance/Construction Supervisors schedules the work.

In emergency situations, in-house crews will seek permission to access private property if needed. However, if the property owner or occupant is not present, protection of public health and property allows work to be done.

Site Visits, Presentations, and Talks

When requested, and as staff availability allows, JCESD arranges WRF tours and provides educational programming to students, scout groups, civic groups, and other interested parties. Examples of the informational materials provided during these events are shown in **Figure 12** on the following page.

Community Events

JCESD is an active participant in many community events, including:

- Bessemer Storm Water Community Lunch and Learn
- Do Dah Day
- Earth Day at the Gardens (Birmingham Botanical)
- East Lake Fishing Rodeo
- Household Hazardous Waste Days
- La Fiesta Festival (Hispanic Cultural Day)
- National Neighborhood Night Out

At each event, JCESD staff distributes materials and educates the public about the County's Grease Control Program and recycling household cooking oil and grease.

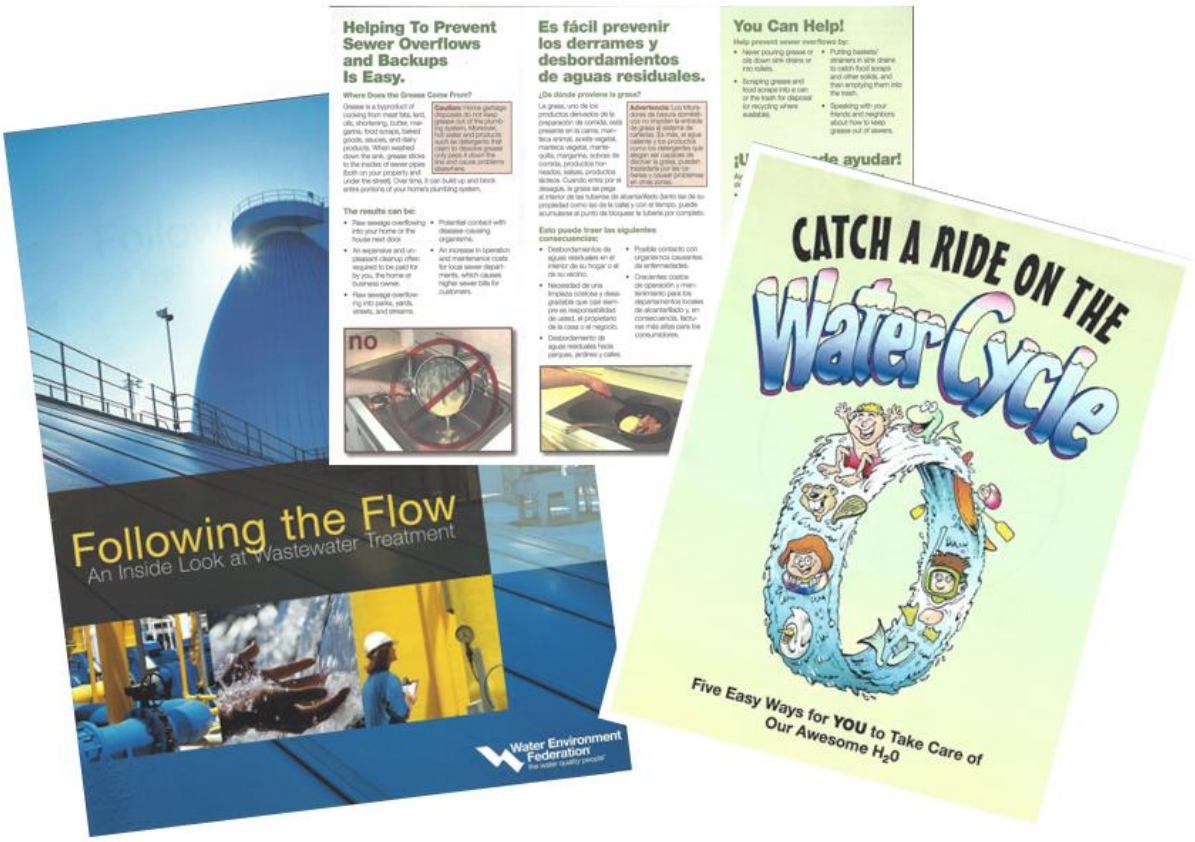


Figure 12. Examples of Materials Provided to the Public

Public Information and Education Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The Public Information and Education performance measures established at JCESD are shown in **Table 2**.

Table 2. Public Information and Education Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
Community events attended	Value	Number of community events that JCESD provided representatives to support	3 events per year	Annual
Public education materials distributed	Value	Number of public education materials distributed (flyers, pamphlets, bill stuffers)	Ongoing as needed	Annual

Legal Support Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
2	4	Updated language under the Biosolids monitoring and reporting requirements for ADEM and USEPA section	2/2022

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Acronyms

ADEM	Alabama Department of Environmental Management
CFR	Code of Federal Regulations
CPP	Continuing planning process
CWA	Clean Water Act
CMOM	Capacity, Management, Operations, and Maintenance
FOG	Fats, oils, and grease
JCESD	Jefferson County Environmental Services Department
JCDH	Jefferson County Department of Health
I/I	Infiltration and inflow
MS4	Municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly owned treatment works
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
TMDL	Total maximum daily load
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility

Legal Support Program

Program Overview

Legal authority for sewer use and control in Jefferson County, Alabama is implemented through sewer use ordinances, resolutions, contracts, service agreements, and other legally binding documents. The **Legal Support Program** includes a description of each program element.

The following items are included in this program document, where appropriate:

- Sewer Use Ordinance Program: This component of the **Legal Support Program** develops, revises, and amends sewer ordinances as needed to support the proper management, operation, and maintenance of the utility. The program provides adequate legal authority for the utility regarding sewer use, grease management, pretreatment, private service laterals, sump pumps and roof drains, private haulers, recovering costs of damage to utility infrastructure, and other legal authorities, as required. Legal support is provided for case work and guidance for utility staff.
- Adequate legal authority for the utility to acquire sewer system additions.
- Adequate legal authority to oversee sewer use, grease management, pretreatment, private service laterals, sump pumps and roof drains, private haulers, recovering costs of damage to utility infrastructure, and other authority, as required.
- Unification Agreements: In 1998, municipalities that connected to Jefferson County Environmental Services Department (JCESD) trunk sewer and interceptors, and were thus provided sanitary sewer service by JCESD, signed agreements that transferred the responsibility for ownership, maintenance, and operation of the conveyance system assets from the represented municipal government to JCESD.
- Legal support provided for case work and guidance for utility staff. In addition, assistance from the Jefferson County Attorney's Office is in place to assist with enforcement actions and code amendments.
- Consent Decree compliance and termination.
- National Pollutant Discharge Elimination System (NPDES) permits establish legal authority to discharge.

Purpose and Goals

The purpose of legal authority is to establish, enforce, and protect wastewater system assets and personnel and to satisfy all regulatory requirements to protect public health and the environment in the Jefferson County service area. Local ordinances and regulations also address wastewater system compliance with applicable State and Federal regulations. The goal of legal authority is to minimize legal costs, reduce legal liabilities, provide risk management, and provide quality service to customers.

Program Resources

Related CMOM Program Documents and Other References

The following Administrative Ordinances (current versions) are referenced in this Plan:

- Jefferson County Sewer Use Administrative Ordinance
- Jefferson County Sewer Use Charge Ordinance
- Jefferson County Public Records Policy (Administrative Order 03-01 (effective 4-22-03) and Amendment No. 1)

The current sewer use charge and sewer use administrative ordinances are provided on Jefferson County's website at http://www.jeffcoes.org/Default.asp?ID=36&pg=Ordinances. The **On-Site Sewage Disposal Regulations** (current version) can be accessed through the Jefferson County Department of Health's website at https://www.alabamapublichealth.gov/onsite/assets/onsitesewagedisposalrules.pdf.

A copy of the County's Public Records Policy is provided in **Appendix A**.

Other CMOM Program plans that reference, or are referenced in, the JCESD **Legal Support Program** include:

- CMOM Program Organization
- CMOM Information Management Systems Program
- Engineering Program
- Fats, Oils, and Grease (FOG) Management Program
- Financial Analysis Program
- Gravity Line Preventive Maintenance Program
- Line Location Program
- Pretreatment Program
- Service Connection and Disconnection Program

Staffing

The **Legal Support Program** is supported primarily by the CMOM Coordinator, housed in the JCESD Administration Office. For more information, see the organization charts for 7100 Administration presented in the **CMOM Program Organization** plan.

JCESD receives support for legal issues from the Jefferson County Attorney's Office, as well as multiple other County Departments. If code changes are required, the JCESD Director will send code amendments to the County Attorney's Office that would be assigned the work or task.

Program Implementation

Legal Authority and Responsibility

JCESD is responsible for compliance and participation in joint program administration duties with Federal, State, and local regulatory authorities, including the United States Environmental Protection Agency (USEPA), the Alabama Department of Environmental Management (ADEM), and the Jefferson County Department of Health (JCDH).

ADEM Regulatory Requirements

As part of the 1996 Consent Decree with USEPA, JCESD is required to report sanitary sewer overflows (SSOs) to USEPA, ADEM and JCDH, and other requirements as defined in the Consent Decree. The JCESD **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan provides policies and procedures for the response to and reporting of SSOs, to protect public health and the environment and meet applicable regulatory requirements. ADEM is also responsible for administration of numerous programs related to the State's surface water quality. These programs, which include aspects of sanitary sewer-related pollution, include the following:

- **NPDES Program** - USEPA delegated the authority to manage the NPDES program for municipal (point source and municipal stormwater) and non-industrial sources, such as semi-public and private facilities, to ADEM.

  A list of Jefferson County's NPDES Permits for each of its nine water reclamation facilities (WRFs), which include collection system-related provisions, can be found at http://www.jeffcoes.org/Default.asp?ID=45&pg=NPDES+PERMITS. Additionally, a description of JCESD's WRFs and associated NPDES permits is provided in the **CMOM Program Organization** plan.

- **Water Quality Standards** - include both the designated uses of surface waters and the criteria intended to protect those uses. Designated uses are listed in ADEM regulations at 335-6-11 and the criteria are found in 335-6-10.

- **List of Impaired Waters (303(d) List)** - list of waterbodies in Alabama that do not fully support their designated uses based on a review of water quality data and information. The list is submitted to the USEPA for approval after an opportunity for public comment. The list includes the causes and sources of water quality impairment for each waterbody listed, and a schedule for development of total maximum daily loads (TMDLs) for each pollutant causing impairment.

- **Total Maximum Daily Load (TMDL) Development** - for waterbodies included on the 303(d) list the State must determine the amount of each pollutant causing water quality impairment that can be allowed such that the water quality standards for the waterbody are maintained. The TMDLs are developed per a specified schedule and must be approved by the United States Environmental Protection Agency after an opportunity for public comment.

- **Waste Load Allocation Development** - waste load allocations are developed for proposed and existing dischargers to surface waters in support of NPDES permits that are protective of water quality standards.

- **Water Quality Planning** - Section 303(e) of the Federal Clean Water Act (CWA) requires that each State establish and maintain a continuing planning process (CPP) consistent with the CWA and pertaining to all navigable waters of the State. The State is responsible for managing its water quality program to implement the processes specified in the CPP. The USEPA is responsible for periodically reviewing the adequacy of the State's CPP. Alabama's CPP is an umbrella document that provides the framework to coordinate and unify the activities and procedures necessary for maintaining waters of an acceptable quality throughout the State, in a manner consistent with the Alabama Water Pollution Control Act and the Federal CWA.
- **Biosolids monitoring and reporting requirements for ADEM and USEPA** ADEM approves land application sites under the Beneficial Use of By-product Materials for the Purpose of Land Application (ADEM Admin. Code r. 335-13-16-.03). EPA regulates biosolids through 40 CFR Part 503 - Standards for the Use or Disposal of Sewage Sludge.

USEPA Consent Decree Requirements

USEPA is responsible for ensuring JCESD complies with the requirements of the 1996 Consent Decree between USEPA and JCESD.

The portions of Jefferson County's sewer system tributary to the following WRFs have been removed from the County's Consent Decree:

- Leeds
- Prudes Creek
- Trussville
- Turkey Creek
- Warrior

The sewer basins tributary to the following WRFs remaining under the consent decree:

- Five Mile
- Valley Creek
- Village Creek
- Cahaba

USEPA CMOM Program Guidance

JCESD maintains an active program to incorporate CMOM guidelines as part of their **Legal Support Program** activities, as applicable. USEPA CMOM guidelines[1] (referred to as the "Guidance") state that the collection system owner should select and enforce the legal authority to regulate the following:

General prohibitions: The Guidance states that the system owner should control materials entering the system that present fire and explosion hazards, corrosive and obstructive materials, material that may cause interference at the wastewater treatment plant, heat that may inhibit biological activity at the treatment plant, oils, or petroleum products that may cause interference or pass through the wastewater treatment plant.

[1] United States Environmental Protection Agency, Office of Enforcement and Compliance Assurance (2224A), January 2005, *Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems*, EPA 305-B-05-002.

These prohibitions are detailed in the **Jefferson County Sewer Use Administrative Ordinance**. For more information on the program that controls the discharges of pollutants to the County's sewer system from industries, see the **Pretreatment Program** plan. See the **Fats, Oils, and Grease Management Program** plan for more information on JCESD's efforts to control discharges of FOG into the collection system.

Volume of flow entering the collection system: The Guidance states that the collection system owner or operator should select and enforce the legal authority necessary to regulate the volume of flow entering the collection system, including residential and commercial customers, satellite communities and industrial users. The legal authority may take the form of sewer use ordinances, contracts, service agreements, and other legally binding documents.

Provisions to regulate the volume of flow entering the collection system are detailed in the **Jefferson County Sewer Use Administrative Ordinance**. For more information on design standards that limit the amount of infiltration and inflow (I/I) entering the system for newly constructed and rehabilitated sewers, see the **Engineering Program** plan.

Pretreatment Standards: The pretreatment program seeks to prevent the discharge of materials into the sewer system (by non-domestic users) that interfere with proper operation of the wastewater treatment plant or may pass through the plant untreated. At the time the operator of a wastewater treatment plant submits its pretreatment program to the regulatory authority for approval, the plant operator must include a statement from JCESD or other legal authority that the plant has the authority to carry out the program [40 CFR 403.9(a)(1)]. The reviewer should verify the existence of this statement and inquire as to whether any significant changes have occurred in the program such that the legal authority may need further review. Additionally, some owners or operators may have a pretreatment program approved by the state, through which discharge permits are issued to industrial users and enforcement is conducted. Further information on legal authority under the pretreatment program may be found in *Procedures Manual for Reviewing a POTW Pretreatment Program Submission* (USEPA 1983).

For more information on the program that controls the discharges of pollutants to the County's sewer system from industries, see the **Pretreatment Program** plan.

New construction standards: The owner or operator should have the authority to ensure that new and rehabilitated sewers and connections have been properly designed, constructed, and tested before being put into service. This authority could take the form of design and performance specifications in a sewer use ordinance or other legal document, such as a statute or series of contracts or joint powers agreements. The ordinance or legal document should contain, at a minimum, general prohibitions, adequate grease control requirements and measures, prohibitions on stormwater inflow, infiltration from laterals, and new construction standards.

For more information on design standards that limit the amount of I/I entering the system for newly constructed and rehabilitated sewers, see the **Engineering Program** plan.

Adequate grease control requirements and measures: The grease control portion of the code should contain the requirement to install grease traps at appropriate facilities (e.g., restaurants). Additionally,

these facilities should be required to properly maintain the grease traps and pump them out on a regular basis. The document should also address periodic inspections of grease traps by collection system personnel and the ability to enforce (i.e., levy fines on persistent offenders).

See the **Fats, Oils, and Grease Management Program** plan for more information on JCESD's efforts to control discharges of FOG into the collection system.

Prohibitions on stormwater inflow: The owner or operator should also have the legal authority to prohibit stormwater connections to the sanitary sewer. Stormwater connections may include building downspouts; catch basins; roof, cellar and yard drains; sump pumps; direct connections between the storm and sanitary sewers; leaking manhole covers; uncapped cleanouts; and the direct entrance of streams into the collection system. This practice is now discouraged. Direct stormwater connections to a separate sanitary sewer system are known as inflow. Inflow can severely impact the ability of the collection system to transport flows to the treatment plant during wet weather, leading to overflows and noncompliance with the wastewater treatment plant's NPDES permit.

Prohibitions on stormwater inflow are detailed in the **Jefferson County Sewer Use Administrative Ordinance**.

Control over connection of private sewer laterals to sewer mains: The owner or operator should maintain strict control over the connection of private sewer laterals to sewer mains. These connections have significant potential as sources of infiltration. Standards for new connections should be clearly specified. The sewer use ordinance should contain provisions for inspection, approval of new connections, and a program to implement the requirements.

For more information on private sewer connections to JCESD sewers, see the JCESD **Sewer Connection and Disconnection Program** plan.

Department of Health

The Jefferson County Department of Health is a division of the State Health Department. The mission of the JCDH is to prevent disease and assure access to quality health care, promote a healthy lifestyle and environment, and protect against public health threats. These goals relate to the CMOM program in several areas: on-site sewage disposal, septic hauler permitting, food preparation facility permitting, and issuance of health advisories related to water pollution. This requires coordination between JCDH and JCESD to maintain the success of both organizations. JCDH and JCESD coordinate closely during the reporting and response related to SSOs as described in the **SSORRP** plan.

In addition to the coordination efforts between JCDH and JCESD during SSOs as described in the **SSORRP** plan, JCDH has the authority to regulate the planning, construction, and maintenance of on-site sewage disposal. JCDH has a three-fold strategy to ensure properly operating onsite sewage disposal systems. This three-fold strategy includes proper: 1) site evaluation, 2) system construction, and 3) system maintenance. The regulations are enforced in accordance with the **On-Site Sewage Disposal Regulations** (current version).

Any person or company engaged in the hauling of wastewater (either septic or grease) to the Jefferson County sanitary sewer system, must have a current valid Certificate of Competency from the JCDH and a license from the Alabama Onsite Wastewater Board. The discharge of hauled wastewater to the sanitary sewer system will not be permitted without such documentation of credentials. More information on this program can be found in the **FOG Management Program** plan.

Unification Agreements

The industrial boom at the beginning of the 20th century resulted in the creation of several towns and villages that constructed sewers to remove wastes, usually discharging untreated sewage to nearby streams and creeks. In 1901, the Alabama legislature mandated Jefferson County to construct trunk sewers and wastewater treatment facilities, combining the numerous individual systems and unincorporated county systems into one countywide system. However, the towns and villages retained control over their own systems, including the construction of lateral lines connecting homes and businesses to the trunk lines constructed by Jefferson County. The separation of these two responsibilities resulted in a system that did not provide the County with authority to hold the cities accountable for maintenance of their systems.

The process of unifying the sewer system under the direction of Jefferson County began in 1996, with the signing of a consent agreement between the County and the USEPA. The terms of this agreement required the County to assume responsibility for the sewer assets that formerly had been maintained by the cities, and to develop the capacity within the unified system to process the volume of waste generated within Jefferson County, while meeting Federal and State environmental standards.

Intergovernmental Agreements (also referred to as "Unification Agreements") were established in 1998 with the 21 municipalities listed below whose wastewater collection and conveyance system ownership and operations were transferred to JCESD after the consent agreement was executed.

Table 1. Unification Agreements

City	Conveyance Date	City	Conveyance Date	City	Conveyance Date
Adamsville	8/1/1998	Bessemer	8/1/1998	Birmingham	5/1/1998
Brighton	3/1/1998	Fairfield	8/1/1998	Fultondale	3/1/1998
Gardendale	3/1/1998	Graysville	3/1/1998	Homewood	3/1/1998
Hoover	3/1/1998	Hueytown	3/1/1998	Irondale	8/1/1998
Leeds	8/1/1998	Lipscomb	3/1/1998	Midfield	8/1/1998
Mountain Brook	3/1/1998	Pleasant Grove	3/1/1998	Vestavia Hills	3/1/1998
Tarrant	3/1/1998	Trussville	3/1/1998	Warrior	8/1/1998

The agreements transfer the responsibility for ownership, maintenance, and operation of the conveyance system assets from the represented municipal government to JCESD. This includes transfer of all data related to past and future projects, as well as approval authority for proposed projects requiring sewer service or impacting the sewer system. In doing so, the agreements gave JCESD the right

to develop legal ordinances and standard criteria for the construction of new assets to be acquired by JCESD. A sample Unification Agreement (all agreements are identical except for the City name) is provided in **Appendix B**.

Sewer Ordinances

Sewer ordinances under management of JCESD include the following:

1. **Jefferson County Sewer Use Administrative Ordinance** (current version) addresses wastewater sewer use in Jefferson County and includes the program to reduce discharge of FOG into the sewer system.

2. **Jefferson County Sewer Use Charge Ordinance** (current version) establishes sewer charges for those using Jefferson County's wastewater collection and treatment system for disposal of sewerage.

Proposed code revisions/amendments are coordinated with the Jefferson County Attorney's Office and submitted to the County for consideration and approval. Code Amendments are submitted to the Jefferson County Attorney's Office, and an attorney on staff is assigned to work with JCESD staff regarding the proposed amendment.

The **Jefferson County Sewer Use Administrative Ordinance** also provides adequate authority for the utility regarding sewer use, grease management, pretreatment, private service laterals, sump pumps and roof drains, private haulers, recovering costs of damage to utility infrastructure, and other legal authorities as required.

The **Jefferson County Sewer Use Administrative Ordinance** specifically addresses, but is not limited to, the following elements:

- General prohibitions (fire and explosion hazards, oils or petroleum, corrosive and obstructive materials, material that may cause interference at the wastewater treatment plant, heat that may inhibit biological activity at the treatment plant, oils or petroleum products that may cause interference or pass through the wastewater treatment plant);
- Volume of flow entering the collection system, including commercial customers and industrial users;
- New construction standards, inspections, and approval;
- The authority to ensure that new and rehabilitated sewers and connection have been properly designed, constructed, and tested before being put into service;
- Adequate grease control requirements and measures;
- Prohibitions on stormwater inflow;
- Control over connection of private sewer laterals to sewer mains;
- Pretreatment requirements, wastewater discharge permits, inspections, and enforcement; and

- Procedures and enforcement actions for FOG, I/I, building structures over sewer lines, storm water connections to sanitary lines, and defects in service laterals located on private property.

The **Jefferson County Sewer Use Charge Ordinance** establishes sewer charges for those whose sewage is disposed of or treated by Jefferson County's wastewater collection and treatment system. The ordinance contains the County's reasonable and nondiscriminatory rules and regulations, fixing rates and charges for sewer service, providing for the payment, collection, and enforcement thereof, and the protection of its property. These rules and regulations accomplish the equitable distribution of costs of the System.

The County's Public Records Policy establishes access to public records to:

(i) Comply with Code of Alabama, Section 36-12-40,

(ii) Facilitate reasonable public access to the County's public records,

(iii) Prevent the inadvertent release of sensitive or confidential information,

(iv) Minimize the disruption of County business as a result of citizen inspection of records,

(v) Establish a uniform procedure and fee schedule, and

(vi) Provide for the security of records relating to public buildings and works vital to the health, safety, and welfare of the citizens of Jefferson County.

Program Performance Metrics

JCESD has no specific performance metrics to track components of the legal activity, which reside within the individual CMOM programs.

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APPENDICES

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Appendix A Jefferson County Public Records Policy

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ADMINISTRATIVE ORDER
OF THE
JEFFERSON COUNTY COMMISSION
03-01

PURSUANT to the authority vested in the Jefferson County Commission by law, the following Administrative Order is hereby issued:

PURPOSE

To establish the following access to public records policy in order to (i) comply with Code of Alabama, § 36-12-40, (ii) facilitate reasonable public access to public records of the County, (iii) prevent the inadvertent release of sensitive or confidential information, (iv) minimize the disruption of County business as a result of citizen inspection of records, (v) establish a uniform procedure and fee schedule, and (vi) provide for the security of records relating to public buildings and works vital to the health, safety and welfare of the citizens of Jefferson County, Alabama.

I. POLICY

It shall be the policy of the Jefferson County Commission that Alabama citizens may request to inspect documents and records maintained by County officials, department heads and employees which are required to be kept by state law or which are maintained for the efficient and convenient operation of County government, in accordance with Code of Alabama (1975), § 36-12-40. Records already governed by separate Federal or State statute or local act are not subject to this Order and shall continue to be treated in accordance with the appropriate controlling legislation. In order to further the goals of the Alabama Public Records Act (hereinafter "the Act"), it is the desire of the Commission to establish a uniform procedure and fee schedule for the handling of document requests pursuant to the Act.

II. PROCEDURE

Every Alabama citizen seeking to inspect and make copies of documents pursuant to the Act shall first complete and submit the appropriate Citizen Request for Information form setting out the person's name, address, list of documents requested for inspection and purpose of each request. [Copy attached hereto as Exhibit "A"] The form shall be signed by the applicant and delivered to the appropriate official or employee in charge of keeping and maintaining the record or document sought to be examined. Each department head shall keep a log showing the date of each request, the name of the individual requesting to inspect documents and the action taken on each such request. [Copy attached hereto as Exhibit "B"] Each department head shall designate an employee to be present during the citizen inspection to preserve the integrity of original County documents. At no time shall any department head or employee permit a citizen to take an original document from County premises for copying. Inspection of County records shall only be allowed during regular business hours. No more than two (2) persons may review the records in any department or area at any given time. The head of a department or section may, in his or her discretion, limit that number because of space limitations. Further, the Department Head may schedule the examination at a later date or time if the examination would disrupt or hamper the operation of the department subject to the request.

A request for immediate copies may be denied for any reason and should normally be denied if the number of copies is significant or if the staff is busy at the time of the request. If a small number of copies (25 pages or less) is requested, the photocopies may be provided at the time the initial request and payment is made. However, if more than 25 photocopies are requested, copies may be made within three (3) business days and mailed

to the requester. The requester must leave a self-addressed envelope with sufficient size and capacity to mail the requested copies.

This policy should not be construed to require the County to disclose or allow inspection of any document that is not a "public document" or that is sensitive, confidential or otherwise not required to be disclosed, or that is not allowed to be disclosed by law, rule or regulation. The County reserves the right to make a determination that a record or document is not a "public document" subject to public inspection.

A Department Head may also deny any request to examine public documents or records if the documents or records sought to be inspected are of public buildings, public works or other similar facilities the damage or destruction of which could significantly affect the public health, safety and welfare of the citizens of Jefferson County.

III. FEE SCHEDULE

The following fee schedule is hereby adopted which shall be uniformly applied by each department upon receipt of a citizen request for inspection and copying of public documents as defined in Code of Alabama (1975), § 36-12-40:

	COST PER COPY	
Legal and Letter Size Copies Per Page	.50	
Computer or Laser Copies Per Page	1.00	
If Copies are to be Mailed	1.00	Plus Postage
Fax Copies	1.00	
Roads and Transportation Maps	15.00	
Tax Assessment PRC-Record	1.00	
Tax Assessment Printout of Assessment	1.00	
Assessment/Appraisal Info (Disk or Tape) - Portion of County	1,000.00	
Individual Assessment Maps	5.00	
Microfiche	1.00	
Microfilm	2.00	
Aerial Photo	10.00	

Partial Voter's List (One Beat or District)	5.50 Per 1,000 Names
Complete Voter's List	5.50 Per 1,000 Names
CD-ROM of Voter's List	45.00 Per Set Up and 5.50 Per 1,000 Names
Cassette Tape of Voter's List	35.00 Per Set Up and 5.50 Per 1,000 Names
Certification of Any Requested Document	1.00

DIGITAL INFORMATION SERVICES FEES (DISF)

Information Technology (IT) costs fluctuate according to current costs and are maintained separately by the IT Department. The current DISF schedule is attached hereto as Exhibit "C".

Payment for copies made must be in cash or cashier's check, certified check or money order payable to the Jefferson County Treasurer. No personal checks will be accepted. Payment must be received at the time the copies are presented to the citizen applicant.

IV. DISPUTES

If any dispute arises concerning the right of any Alabama citizen to inspect and copy a County document or record, the matter shall be referred to the County Attorney's Office. If the County Attorney determines that the request is due to be denied, he shall so advise the official, department head or employee. The department head shall notify the applicant of the denial. Any Alabama citizen aggrieved at the denial of his request for inspection and copying of County documents or records may appeal to the Jefferson County Commission within thirty (30) days of the date of the denial of the request for a review of the negative determination. The Jefferson County Commission shall have the final authority to grant or deny the request.

V. PRIVACY/SECURITY

While the Commission recognizes the requirements of state law to make public

documents and records available for inspection and copying by Alabama citizens, at the same time the Commission understands that public information may be used for potentially unlawful purposes. Therefore, if the purpose of a document request appears to threaten the security of persons or property, the Commission may ask the applicant for further information to support the request or deny the request. Further, if a public official receives a specific threat to his or her person or property, such official may request that he or she be given notice of requests made for information by the named individual concerning a county record or document pertaining to their real or personal property.

VI. **WAIVER OF FEES**.

The fees established herein may be waived by the County Attorney as follows:

1. Where the request is from a law enforcement authority relatable to a law enforcement activity;
2. The request is from a government or a governmental agency and the estimated fee would not exceed $100 and the County Attorney determines the waiver is in the best interest of the County or the citizens of the County.

ORDERED at the Jefferson County Courthouse this 22nd day of April, 2003.

LARRY P. LANGFORD, President
Jefferson County Commission

APPROVED BY THE
JEFFERSON COUNTY COMMISSION
DATE: 4-22-03
MINUTE BOOK: 141
PAGE(S): 262-264

15. Approval of Amendment No. 1 to Administrative Order 03-1 regarding fee schedule for copying of public documents.

	COST PER COPY		
	OLD		**NEW**
Legal and Letter Size Copies Per Page	.50		1.00
Computer or Laser Copies Per Page	1.00		2.00
If Copies are to be Mailed	1.00	Plus Postage	2.00
Fax Copies	1.00		2.00
Roads and Transportation Maps	15.00		30.00
Tax Assessment PRC-Record	1.00		2.00
Tax Assessment Printout of Assessment	1.00		2.00
Assessment/Appraisal Info (Disk or Tape)			
Portion of County	1,000.00		1,000.00
Individual Assessment Maps	5.00		10.00
Microfiche	1.00		2.00
Microfilm	2.00		4.00
Aerial Photo	10.00		20.00
Partial Voter's List (One Beat or District)	5.50	Per 1,000 Names	11.00
Complete Voter's List	5.50	Per 1,000 Names	11.00
CDROM of Voter's List	45.00	Per Set Up and	90.00
	5.50	Per 1,000 Names	11.00
Cassette Tape of Voter's List	35.00	Per Set Up and	70.00
	5.50	Per 1,000 Names	11.00
Certification of Any Requested Document	1.00		2.00

Appendix B Example Unification Agreement

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STATE OF ALABAMA)

JEFFERSON COUNTY)

UNIFICATION AGREEMENT

THIS AGREEMENT is between Jefferson County, Alabama (hereinafter the "County") and the City located within the County, identified below (hereinafter the "City").

RECITAL

The County is a defendant in a lawsuit styled Kipp, et al. v. Jefferson County, Alabama, Federal District Court Case No. CV 93-G-2492-S, and United States of America v. Jefferson County, Federal District Court Case No. CV 94-G-2497-S, in which the County has been found to be in violation of the federal Clean Water Act (hereinafter the "Act"). The violations of the Act concern unauthorized discharges of sewage into the receiving streams in violation of the County's National Pollutant Discharge Elimination System permits. These discharges occur at bypass facilities, sewer manholes and from broken and deteriorated sewer pipe connections and other unintended points in the collection system. The discharges result primarily during periods of high rainfall which produce water infiltration and inflow (hereinafter "I&I") into the sewer collection system at the broken and deteriorated points. This results in excess water in the system which greatly exceeds the capacities of the County's wastewater treatment plants (hereinafter "WWTP's"). In order to protect the plants from flooding and washout of their treatment capacity, the system bypass facilities divert some excess water around the affected WWTP's. Following the finding of violation of the Act the District Court ordered the parties to develop a remedy that would eliminate or greatly reduce the unpermitted discharges from the collection system. The parties developed a remedy for incorporation into a Consent Decree. The remedy requires a renovation and restoration of the sewage collection system to reduce the I&I. The sewage collection system is mainly located within the cities in the County and is owned, operated and maintained by the respective cities. The Clean Water Act and the Court would require the County to in turn require each city to investigate and discover the location and extent of the broken and deteriorated collection system and perform the necessary restoration and renovation, all within court-established deadlines. The undertaking of this massive public works simultaneously by the individual cities and the County would result in chaos and disruption of public services and enormous extra costs and could not reasonably be expected to be completed within legally mandated time limits. The cities and the County have concurred and agreed that a unification of the sanitary sewer collection and treatment system under the County will benefit all parties by allowing for orderly, efficient and timely fulfillment of the mandated public works thereby greatly diminishing the disruption of public services and inconveniences as well as enhancing public cost savings.

WHEREFORE, IN CONSIDERATION OF THE PREMISES and in further consideration of the mutual benefits to the parties and the citizens of Jefferson County, the receipt and sufficiency of which as consideration is hereby acknowledged, and upon the determination by the City and the County that it is in the best interest of the City and the County and the citizens thereof, the City hereby agrees to convey to the County and the County hereby agrees to accept from the City, the City's sanitary sewer collection system and facilities in accordance with the following terms and conditions.

1. The City hereby agrees:

(a) To convey to the County without charge the ownership of the City's sanitary sewer system. (The date of conveyance is set out at the end of this Agreement.) The conveyance shall include the sanitary sewers, manholes, sewage pump stations, force mains and all other facilities whatsoever which form the City's sewer system and which collects and convey sewage to the County trunk facilities and treatment plants (hereinafter "sewer facilities"). The form of conveyance shall operate to transfer to the County all right, title and interest of the City in the sewer facilities conveyed. Provided, the conveyance shall not operate to extinguish or diminish any obligation, financial or otherwise, owed to the City by reason of any promissory note or mortgage or contract in payment of sewer construction for individuals or neighborhoods, whether by assessment or by contract. The conveyance of sewer facilities shall be free and clear of any liens or encumbrances whatsoever. If not free and clear, upon request by the County, the City shall, at its cost and expense, immediately take all steps as may be necessary to remove any such liens or encumbrances. This obligation shall survive closing, be continuous, and run with the land as to any such liens or encumbrances existing at the time of conveyance or attaching at any time thereafter by reason of the City's former ownership of the sewer facilities. To the extent allowed by law, the City hereby agrees to indemnify, hold harmless and defend the County against any claim, suit or judgment made or asserted or holding that any individual or entity whatsoever has any lien or encumbrance or legal interest whatsoever in any of such sewer facilities.

(b) To convey to the County, without charge, ownership of all existing sanitary sewer easements, rights of way, licenses or any other legal interest in land (hereinafter "sewer easements") upon or in which any of the sewer facilities are located. (The date of conveyance is set out at the end of the Agreement.) The form of conveyance shall be the highest level of property conveyance owned or held by the City. Provided, sewage pump stations and any other sewer facilities located on the surface shall be conveyed to the County by fee simple title and shall include right of access sufficient for operation, maintenance and construction work thereon. The conveyance of sewer easements shall be free and clear of any liens or

encumbrances and affirmative promises of obligations whatsoever, unless expressly agreed to by the County. If the City is unable to fulfill this conveyance requirement at closing, the obligation shall survive closing and be continuous until fulfilled. Upon request by the County, the City shall at its cost and expense immediately take all steps as may be necessary to fulfill the conveyance requirement. This shall include the acquisition by purchase or condemnation, if required, of the required sewer easements including fee simple title where required. If it is determined that the City has no standing or power of condemnation, the County may condemn the required easement at the expense of the City. And further, the City shall take legal action including suits as may be necessary to remove liens or encumbrances existing at the time of conveyance or attaching at anytime thereafter by reason of the City's former ownership of the sewer system. To the extent allowed by law, the City hereby agrees to indemnify, hold harmless and defend the County against any claim, suit, or judgment made or asserted, or holding that the sewer system or sewer easement or sewer facility is encroaching or otherwise existing in trespass or other violation of another's property rights; and against any claim, suit, or judgment holding that any individual or entity whatsoever has any lien or encumbrance or legal interest whatsoever in any of such sewer facilities.

(c) To convey to the County, without charge, any such sewer facilities and sewer easements for sewer projects which are under construction or as may be constructed in the future. Such sewer easements include those easements, rights of way, licenses, as are reflected on subdivision plans, development plans and any form of plan, contract or commitment whatsoever approved or filed or otherwise received by the City under its ordinances, rules and regulations relating to construction and development of improvements within the City. The form of conveyance shall operate to transfer to the County all right, title and interest of the City in the sewer facilities and easements conveyed. With respect to those sewer easements reflected on plans as "utilities" or other terminology indicating multiple uses for the easement, the conveyance to the County may be in joint ownership with the City in order to accommodate other "utilities" in addition to sewer facilities, provided, the sewer use shall be predominant and have priority over all other "utilities" that are installed after the sewer installation.

(d) To deliver to the County, without charge, the original or legible copies of all documents, maps, drawings (including electronic format) plans, specifications and any other document whatsoever which shows the location and configuration of the sewer facilities and sewer easements conveyed to the County. The foregoing also shall include as-built drawings, O & M manuals, shop drawings, operational logs, maintenance records and other documents requested by the County. If requested by the County, the City will provide, within reason, personnel to assist the County to locate sewer facilities where not shown, or incorrectly shown on maps provided to the County.

(e) In the event the City elects to dispose of sewer equipment or supplies, give the County a first right of refusal to obtain without charge from the City all parts, supplies, inventory, special tools, machines, equipment and items whatsoever owned by the City whether in actual use or storage, used or intended to be used in the construction, operation and maintenance of sewer facilities.

(f) To waive all permitting and inspection fees for all future construction carried out by or on behalf of the County on all sewer facilities within the City, whether such facilities were previously owned by the City or the County. This waiver includes all construction by the County or its authorized contractors carried out on treatment plants, pump stations or any other sewer or sewer appurtenance. (The foregoing does not change any legal requirement of the County or its contractors to obtain the applicable permits.)

2. The City hereby acknowledges and agrees that any sewer facilities, sewer lines or form of sewage conveyances whatsoever which do not connect directly to County owned sewer trunk lines are not conveyed by this agreement and are expressly excluded from this agreement and will not be the responsibility of the County. The foregoing includes any "package plant," discharge of sewage to any storm water pipe or facility, drain, ditch or form of conveyance whatsoever that is not lawfully connected to a County trunk line. Further, the City hereby agrees to immediately disconnect and remove from the sewer system without charge to the County, any storm water pipe or facility, downspout, drain, ditch or form of conveyance whatsoever that is not designed or intended to receive sewage as a part of the sanitary sewer system. This obligation shall be continuous and effective whenever any such connection may be discovered and notice is given to the City to disconnect and remove it. Provided, this obligation is limited to work within the public right of way.

3. The City hereby acknowledges and agrees that any contract, conveyance, agreement or commitment whatsoever by the City to construct, operate or maintain in any way whatsoever any private sewer systems located within apartment complexes, homeowners associations, condominiums, townhouses, gated communities, shopping centers, industrial developments or any other form of organization or entity whatsoever, which provides for any form of City responsibility or duty to be performed on private property or any property not owned by the City, is hereby expressly excluded from this agreement and will not be the responsibility of the County. Provided, the City may submit to the County for consideration any specific situation which is or may be asserted to be included in the foregoing exclusion. Any agreement by the County with respect to any such situation must be separately approved in writing by the parties.

4. Effective upon the date of execution of this agreement the City hereby agrees that all sewer construction projects of the City that will connect to the County sewer system

which have not been put out for bid shall be constructed in accordance with minimum standards included in the County ordinances, rules and regulations. The City shall submit its new sewer construction drawings, plans and specifications to the County for review and approval prior to the City putting them out for bid. Following award, the sewer construction will be inspected by the County for compliance with County requirements. The City will include in all sewer construction contracts the requirement on the contractor to construct all sewer facilities in accordance with minimum standards included in the County ordinances, rules and regulations and that the construction shall be inspected and approved by the County before such sewer construction projects are connected to the sewer system. The City will forward to the County, prior to allowing any connection to the sewer system (unless otherwise authorized by the County), one full set of surveyed record drawings ("As-builts"). Record drawings shall be signed and dated by a representative of the City. The County shall have no legal responsibility or liability whatsoever for any injury including death, or property damage whatsoever, in any way arising out of the City's sewer construction projects. To the extent allowed by law, the City hereby agrees to defend, hold harmless and indemnify the County against any claims, suits or judgments arising out of such City sewer construction projects.

5. Effective upon the date of execution of this agreement, the City hereby agrees to require all private developers, builders and others to submit all their sewer construction plans to the County for review and approval prior to the City's approval of such development plans. The foregoing requirement includes any form of construction or work that may impact, conflict with or interfere with any sewer facility. The County will require the private developer or builder to provide one full set of surveyed record drawings ("As-built") prior to County approval of the connection to the County sewer system. Such record drawings must be signed and dated by a representative of the developer or builder.

6. Effective upon the date of execution of this agreement, the City agrees to require all plumbers, contractors, property owners and others intending to connect any building sewer lines, house sewer lines and any other sewer lines and laterals to the County sewer system to first obtain County approval and inspection for all such taps and connections. Further, the City shall require such applicants to obtain impact connection permits from the County and to perform all work in accordance with County standards and specifications.

7. Effective upon the date of execution, to the extent allowed by law, the city hereby agrees to:

(a) Join the County in requiring sewer customers in the City to repair damaged or defective sewer service connection lines ("service laterals"), or portions thereof, where deemed necessary by the County, which are located on private property. Such repairs must be made in accordance with County specifications. Enforcement of such requirements for repairs may cause the County and the City, to suspend sewer and water service to sewer customers in accordance with Alabama law, until such repairs are made to the satisfaction of the County.

(b) Join and assist the County in establishing and enforcing in the City design and construction standards (including materials of con-struction) for future service laterals or portions thereof installed on private property.

8. Effective upon the date of execution of this agreement, the City hereby agrees that it will not issue or otherwise approve the issuance of any form of certificate of occupancy or use of any new building, development or improvement whatsoever until the County has inspected and approved the sewer construction all in accordance with County ordinances, rules and regulations and this agreement. Provided, the City shall immediately provide the County with a list of all projects already permitted and under construction, and provide the County with reasonable opportunity to perform inspection for satisfactory workmanship before the City approves the sewer installation. Provided, such inspection shall be for compliance with standards in effect at the time the project was permitted.

9. Effective upon the date of execution of this agreement, the City hereby agrees to assist and join the County as a co-party in any legal action that may be required or result from the County's enforcement of its ordinances, rules and regulations and this agreement with respect to property located within the City's boundaries but outside of Jefferson County.

10. Effective upon the date of execution of this agreement, and to the extent allowed by law, the City hereby agrees to hold harmless and indemnify the County, its elected officials and employees from and against any claims, suits and judgments arising out of any injury to any person, including death, and damage to property which arises out of any event or occurrence occurring before the execution of this agreement and occurring between the execution of this agreement and the date upon which the County accepts the portion of the sewer system or facility which is involved in the occurrence.

11. The City hereby agrees to remain responsible for and to pay all costs of operating and maintaining the sewer system and sewer facilities through the date of conveyance as set out below. This responsibility includes (a) payment of all utility charges for electric power, gas and water; (b) the City shall remain responsible for removal of blockages, repair of breaks and leaks and resulting cleanup and shall resolve any claims for any injury or death resulting from such blockages, breaks or leaks; (c) the City shall remain responsible for the assessment of any fines or penalties by any legal authority including the Environmental Protection Agency and the Alabama Department of Environmental Management.

12. The County hereby agrees:

(a) To accept from the City the conveyance of the City's sanitary sewer system including the sewer facilities and sewer easements in accordance with the provisions of this Agreement.

(b) To use its best efforts to carry out the County's inspection, review and approval functions as provided for in this Agreement.

(c) To operate the sanitary sewer system in accordance with applicable federal and state laws and regulations and the Consent Decree and orders of the Court identified in the RECITAL, above.

(d) To review all new sewer construction plans submitted for such review by the City, private developers, builders and others as expeditiously as possible.

(e) To perform all necessary inspections as expeditiously as possible.

13. The date of conveyance to the County of the City's sanitary sewer system as set out in Paragraph 1, above, is August 1, 1998.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives, this 15 day of April, ~~1997~~ 1998

JEFFERSON COUNTY, ALABAMA

By Mary M. Buckelew

Mary M. Buckelew, President
Jefferson County Commission

CITY OF BESSEMER

By Quitman Mitchell

Its: Mayor

M:\JOANN\UNIFIC.AGR

Water Quality Monitoring Program

Final

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
2	4	Updated SSORRP link	2/2022

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Acronyms

ADEM	Alabama Department of Environmental Management
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
DO	Dissolved Oxygen
FOG	Fats, oils, and grease
JCESD	Jefferson County Environmental Services Department
LIMS	Laboratory information management system
NPDES	National Pollutant Discharge Elimination System
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Plan
WRF	Water Reclamation Facility

Water Quality Monitoring Program

Program Overview

Water quality monitoring of streams and rivers within Jefferson County is performed to protect public health and the environment. Water quality monitoring data are used for the following purposes:

- **Routine Monitoring** – Through continued coordination with the local stormwater management authority, the Jefferson County Environmental Services Department (JCESD) is notified of any sampling results that may indicate a water quality impact caused by a sanitary sewer overflow (SSO) or failing sewer system infrastructure
- **Investigative Monitoring** – Water quality samples are taken by JCESD staff to verify compliance with Pretreatment Program and Fats, Oils, and Grease (FOG) Management Program requirements, to identify possible cross connections between storm water and sanitary sewers, and for other purposes
- **Impact Monitoring** – JCESD measures the impacts of significant discharge violations at the water reclamation facilities (WRFs) that may potentially have a detrimental impact on public health or the environment

Figure 1 on the following page shows the major watersheds and streams within the JCESD service area. **Figure 2** shows locations of surface waterbodies within the JCESD service area that are classified as "Swimming" according to ADEM Administrative Code Chapter 335-6-11. Other areas within the service area where swimming is known to occur is also shown in **Figure 2**.

This plan describes water quality monitoring performed within Jefferson County and how it applies to addressing the impacts and mitigation of SSOs and potential failing sewage infrastructure that may result in water quality impairments.

For more information on the Pretreatment Program, see the **Pretreatment Program** plan. For more information on the FOG Management Program, see the **FOG Management Program** plan. For recordkeeping related to SSOs, see the JCESD **Overflow Tracking Program** plan.

Program Goals

The goal of JCESD's **Water Quality Monitoring Program**, as it applies to SSOs, is to monitor the impact of SSOs on the waters of the State and to determine if additional action or notification is warranted.

Implementation of this program assists the County in achieving compliance with National Pollutant Discharge Elimination System (NPDES) requirements related to the sanitary sewer collection system, as established by Federal and State regulators.

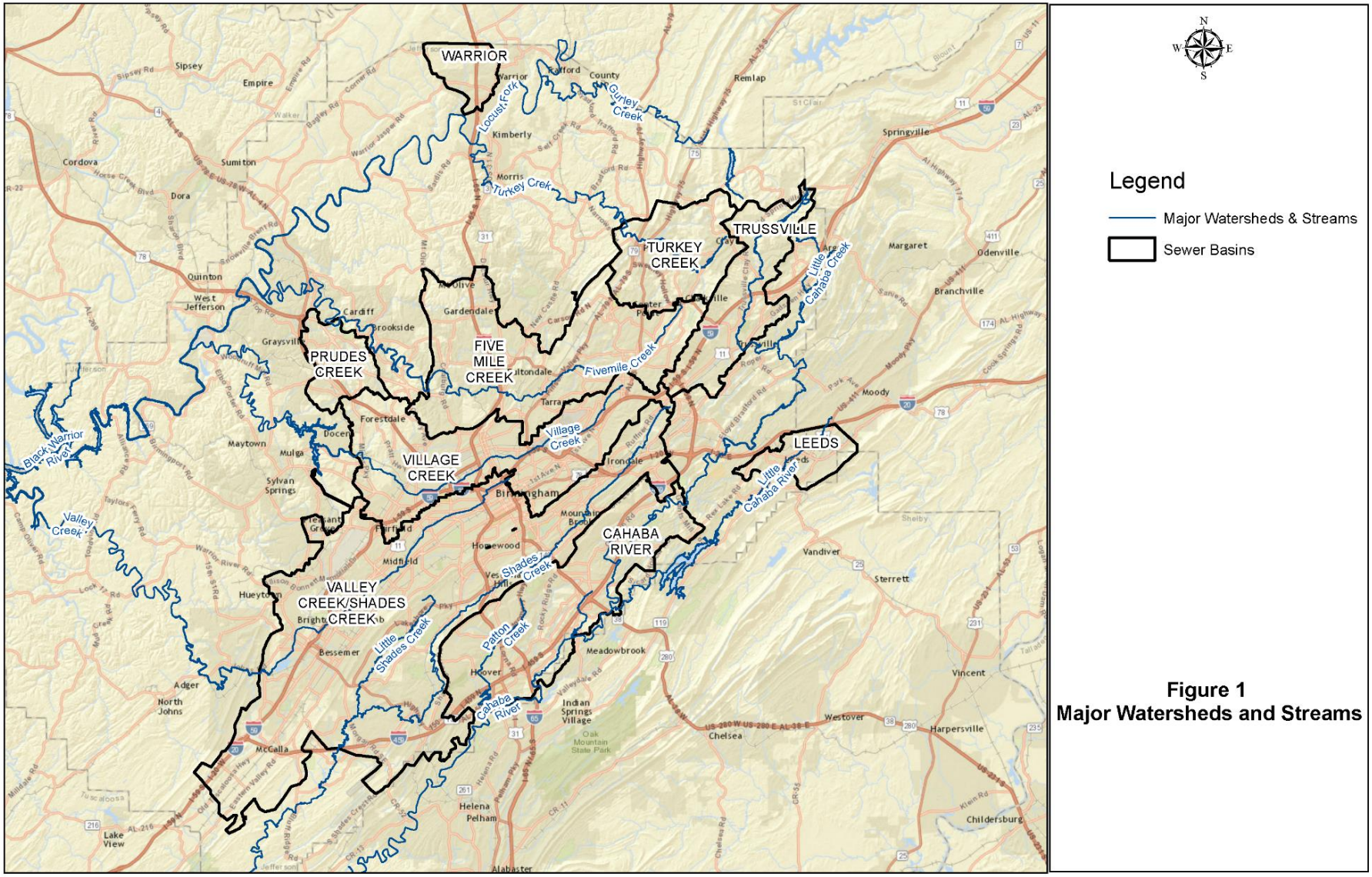

Figure 1
Major Watersheds and Streams

Figure 1. Major Watershed and Streams in the JCESD Service Area

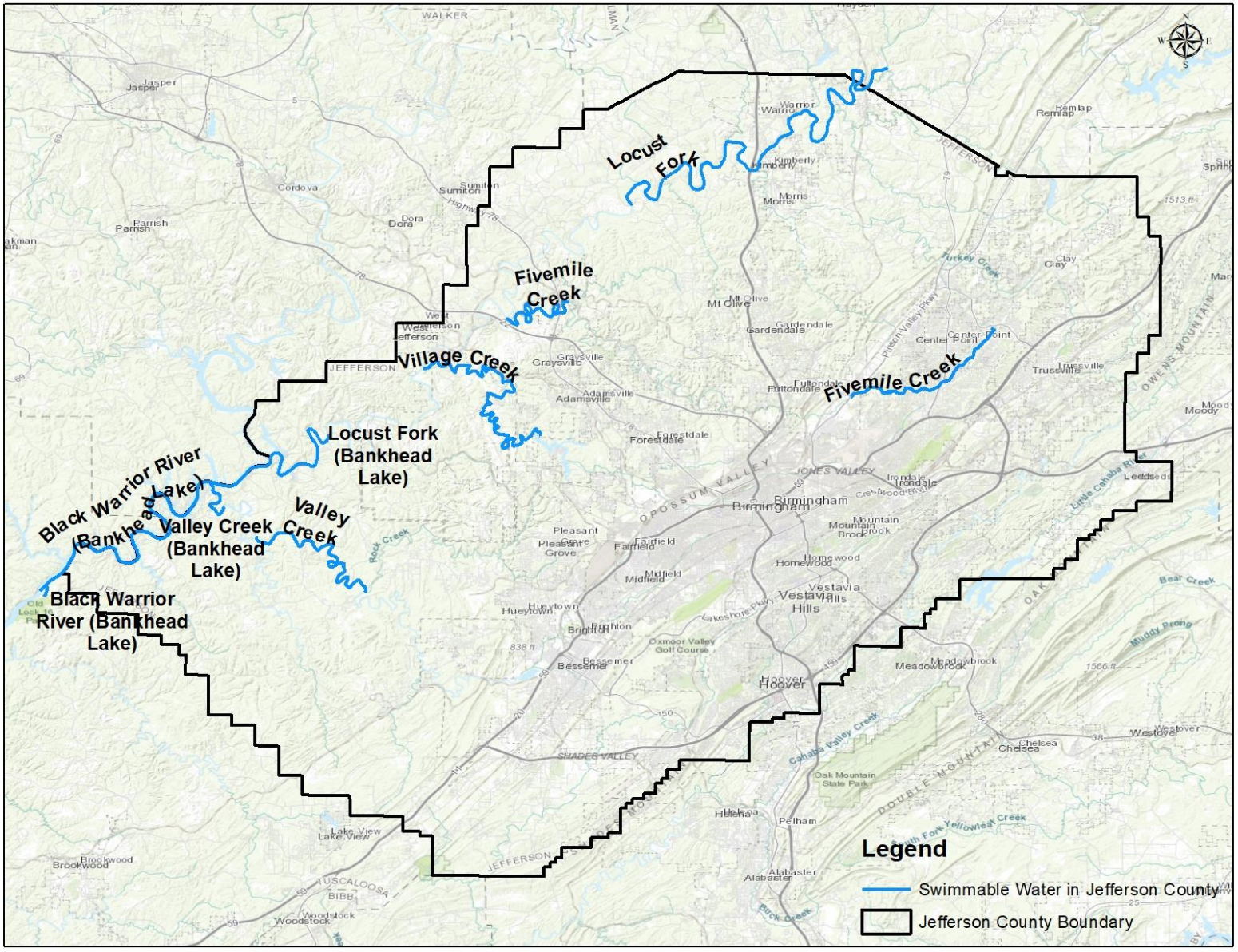

Figure 2. Locations of Swimmable Surface Waterbodies and Other Areas Where Swimming Occurs in the JCESD Service Area

Program Resources

Related CMOM Program Documents and Other References

JCESD developed standard operating procedures (SOPs) for various CMOM-related job duties. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations.**

Procedures used when responding to and reporting SSOs are detailed in JCESD's **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan, which can be obtained at: ESDcopier2-20190423134630 (jeffcoes.org).

Other CMOM Program plans that are referenced in the **Water Quality Monitoring Program** plan include:

- CMOM Program Organization
- Customer Service Program
- Equipment and Supplies Management Program
- FOG Management Program
- Information Management Systems
- Pretreatment Program

Staffing

Barton Laboratory staff are responsible for water quality monitoring related to the CMOM program. Line Maintenance staff coordinate with Barton Laboratory related to any known SSOs reaching waters of the state, or observations made in the field that might indicate localized or in-stream water quality issues.

For more information on the Barton Laboratory (Division 7102) organization charts, see the **CMOM Program Organization** plan.

Data Management

For all applicable SSOs occurrences, water quality monitoring forms and reports are retained for JCESD records and are forwarded to the CMOM Coordinator for inclusion in the official record.

For more information on SSO reporting requirements, see the JCESD **SSORRP** plan. For more information on LIMS and Cityworks, see the **CMOM Information Management Systems Program** plan.

Program Implementation

Routine Monitoring

JCESD maintains communication with the watershed monitoring staff of Jefferson County's Department of Storm Water Management in addition to permitted MS4 Municipalities within the Jefferson County sewer service area. The purpose of this communication is to ensure awareness of any sampling results that may indicate an SSO has occurred or is occurring. If routine monitoring indicates potential sewage contamination, personnel from Line Maintenance will go to the site to determine if there are any conditions allowing sewage to contaminate the state waters that have not been previously identified.

In addition, if Line Maintenance staff observes conditions in a stream in the field that may indicate water quality issues, Barton Laboratory is notified and staff will perform sampling at the site to determine the potential cause of the issue. If these samples indicate a possible source other than sewage, Barton Laboratory staff review industrial discharge permits in the vicinity to identify other potential pollutant sources from these dischargers. If no source can be identified, ADEM will be notified.

Water Use Mapping

ADEM has a water bodies GIS file which classifies each water body into Public Water Supply (PWS), Fish and Wildlife (F&W), Limited Warmwater Fishery (LWF), Agricultural and Industrial Water Supply (A&I), Outstanding Alabama Waters (OAW) and Swimmable Water (S). For each sewer feature in GIS, JCESD has determined which water body the sewage flow will flow into in case of a sewer overflow. When an overflow occurs, JCESD can quickly determine which water body the sewage will run into to report it to ADEM.

Impact Monitoring

Line Maintenance and Barton Laboratory coordinate to perform all the required monitoring and associated recordkeeping. Reports are maintained at Barton Laboratory and are stored in Cityworks with the work order associated with the SSO.

Sample Procedures

Stream monitoring of the affected area is performed upstream to collect a background sample and downstream to get a representative sample of the blended water (SSO + natural stream flow). The upstream and downstream monitoring shall occur at a safe access point approximately 100 feet upstream where, based on observations, there is no influence of the SSO and the receiving water.

Likewise, the downstream sample should be taken approximately 500 to 1,000 feet downstream of the point of confluence of the SSO, at a safe access point in the receiving stream and at a point, based on observations, where there appears to be sufficient mixing to adequately assess the impact of the SSO on the receiving stream. However, if a point source (e.g., stream, stormwater outfall) exists between the point of confluence of the SSO and desired downstream sample location, the sample should be taken at a safe location upstream of the point source, but not less than 100 feet downstream of the confluence point.

Sample Parameters

The following parameters are monitored in the receiving stream for the upstream and downstream samples: dissolved oxygen (DO) and *E. coli* bacteria. On-site testing is done for DO. One grab sample is collected from each location for laboratory analysis of *E. coli* bacteria. Samples are assigned chain of custody forms that are completed throughout the sampling, analysis, and reporting process. If necessary, a visual assessment of detrimental impacts such as fish kill, odor, and presence of visual spill material will be conducted.

A summary of the dry weather SSO sampling protocol is provided in **Table 1**.

Table 1. Dry Weather SSO Impact Monitoring Sampling Protocol

Dry Weather SSO Volume	Sample Frequency	Sample Locations	Sample Parameters
>10,000 gallons	One-Time	• >100 feet upstream • 500-1,000 feet downstream	DO and *E. coli* bacteria
>50,000 gallons	Daily	• >100 feet upstream • 500-1,000 feet downstream	DO and *E. coli* bacteria

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and if not, what activities need to be adjusted to meet program goals.

Table 2 lists the performance measures that have been established at JCESD for the **Water Quality Monitoring Program**.

Table 2. Water Quality Monitoring Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
Dry Weather SSO Samples	Value	Number of dry weather SSO events greater than 10,000 gallons and Number of samples collected and analyzed	Value	Monthly	Barton Laboratory

Contingency Planning Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	8	Updated text in accordance with current bypass pumping operation practices	5/12/18
1	3	Updated references to current Jefferson County Multi-Hazard Mitigation Plan	11/12/18

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Acronyms

AEMA	Alabama Emergency Management Agency
AERC	Alabama Emergency Response Commission
ARV	Air release valve
CFR	Code of Federal Regulations
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
EPCRA	Emergency Planning and Community Right-To-Know Act
FEMA	Federal Emergency Management Agency
FOG	Fats, oils, and grease
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
MSDS	Material safety data sheet
O&M	Operations and maintenance
OSHA	Occupational Safety and Health Administration
RMP	Risk Management Plan
SCADA	Supervisory Control and Data Acquisition
SOP	Standard operating procedure
SPCC	Spill Prevention Control and Countermeasures
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility

Contingency Planning Program

Program Overview

The Jefferson County Environmental Services Department (JCESD) is preparing and implementing contingency plans for its wastewater collection and conveyance system and its water reclamation facilities (WRFs) during emergency situations. Emergency situations may be defined as severe natural events; third-party actions that may result in the impairment or failure of the systems or an unpermitted discharge; a surcharge that results in a backup into a building; or sanitary sewer overflow (SSO) from manholes, pipes, or pump stations that may endanger public health or the environment.

Examples of severe natural events may include hurricanes, low atmospheric pressure storms, tornadoes, freezing conditions, excessive rainfall, and flooding.

Regulatory Requirements

The United States Environmental Protection Agency (USEPA) Region IV requires sewer utilities within its region to implement Contingency Planning Programs that include the following elements:

- Conduct Vulnerability Assessments to identify the utility's weaknesses to system failures, natural causes, or failures caused by others
- Develop contingency plans for sanitary sewer system and treatment facilities for emergency response and operations
- Using a root cause failure analysis, develop strategies to enable timely repairs or overcome predicted component failures that address:
    - Public Notification
    - Agency Notification
    - Emergency Flow Control
    - Emergency Operation and Maintenance
    - Preparedness Training
    - Water Quality Monitoring
- Develop a Response Flow Diagram for each strategy that clearly identifies roles and responsibilities

Approach to JCESD Contingency Planning

The JCESD **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** serves as the baseline to meet the contingency planning requirements for responding to unpermitted discharges and SSOs from manholes, pipes, and pump stations.

JCESD has developed controls and identified actions to reduce the risks and associated vulnerabilities to its pump stations, pressure sewer system, gravity sewer system, and wastewater treatment plants. These controls and actions are described in this plan.

Purpose and Goals

The purpose of JCESD's **Contingency Planning Program** is to ensure collection system personnel are properly trained, equipped, and supported to implement emergency response procedures.

The goals of the **Contingency Planning Program** are to:

- Create awareness of potential vulnerabilities to the County's sewer and WRF infrastructure
- Identify potential risks and possible causes
- Develop appropriate response plans and protocols
- Provide a framework for ensuring safe operations during emergencies, including identifying contacts, expected personnel response times and conditions, and, when possible, actions and strategies to address certain scenarios

For more information on emergency response training, see the **Training Program** plan. For more information on resources, equipment, tools, and critical spare parts inventories that may be used during emergency situations, see the **SSORRP** plan and the **Equipment and Supplies Management Program** plan.

Program Resources

Related CMOM Program Documents and Other References

CMOM Program Documents

JCESD developed Standard Operating Procedures (SOPs) for various Capacity, Management, Operations, and Maintenance (CMOM)-related job duties. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual. Procedures used when responding to and reporting SSOs are detailed in the **SSORRP** plan.

Other CMOM Programs that are referenced in, or refer to, the **Contingency Planning Program** are as follows:

- CMOM Program Organization
- CMOM Information Management Systems (IMS) Program
- Customer Service Program
- Equipment and Supplies Management Program
- Gravity Line Preventive Maintenance Program
- Pump Station Operation and Maintenance Program
- Safety Program
- Training Program
- Water Quality Monitoring Program

Jefferson County Multi-Hazard Mitigation Plan

The **December 2015 Jefferson County Multi-Hazard Mitigation Plan**, is a multi-jurisdictional guide that fulfills the requirements of the Federal Disaster Mitigation Act of 2000, as administered by the Alabama Emergency Management Agency (AEMA) and the Federal Emergency Management Agency (FEMA) Region IV. While the mitigation plan was written specifically to address the need for continued eligibility for FEMA Hazard Mitigation Assistance grants, the information contained is useful to JCESD as it continues to refine its **Contingency Planning Program**.

Each natural hazard (e.g., floods, tornadoes, severe storms, etc.) that is viewed as a possible risk to Jefferson County is described in detail, and the vulnerability of the County and each jurisdiction to the hazards are addressed. The plan includes goals, objectives, and mitigation strategies and actions for the identified hazards, as well as directions for the implementation and monitoring.

A copy of the Jefferson County Multi-Hazard Mitigation Plan can be downloaded from the AEMA website at https://alabamaema.files.wordpress.com/2017/01/jeffersoncountycompletefile.pdf.

Risk Management Plan

JCESD has developed and is implementing a **Risk Management Plan (RMP)** in accordance with Section 112(r) of USEPA's Clean Air Act Amendments. The **RMP** is updated every five years and addresses the following areas:

- Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases;
- Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and
- Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g., the fire department) should an accident occur.

The Jefferson County Commission has identified substances used in JCESD's wastewater collection and treatment systems that are listed as a regulated substance under the Risk Management Program Rule contained in the Code of Federal Regulations (CFR), Title 40, Part 68 (40 CFR 68) Chemical Accident Prevention Provisions. The County has developed Hazard Assessment reports that contain the results of the offsite consequence analyses and the associated required documentation specified in 40 CFR 68.39.

A copy of the Jefferson County **Risk Management Plan**, which includes Hazard Assessment reports, is available upon request from the Jefferson County Emergency Management. Specific risk management elements contained within the plan are described below.

Emergency Planning and Community Right-To-Know Act (SARA III) Reporting

The Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 requires JCESD to plan for emergencies involving hazardous substances. By March 1 each year, JCESD submits Tier II Chemical Inventory Reports for Hazardous Chemical Storage on substances it stores for which a material safety data sheet (MSDS) is required by the Occupational Safety and Health Administration (OSHA) and in

quantities exceeding the Threshold Planning Quantity (specified for Extremely Hazardous Substances, 10,000 pounds for everything else). These reports are submitted to the Alabama Emergency Response Commission (AERC), the local emergency planning committee, and local fire departments.

Copies of the **Tier II Chemical Inventory Reports** are available upon request from JCESD senior management.

Oil Spills Prevention and Preparedness

The federal regulations for oil pollution prevention are described in 40 CFR 112. JCESD has developed **Spill Prevention Control and Countermeasure (SPCC) Plans** for each of its Tier I Qualified Facilities. The primary objective of these plans is to prevent any oil products or hazardous substances from reaching navigable waters. Oil and hazardous material-handling personnel at JCESD facilities have been familiarized with the areas of potential spills, procedures used to respond to a spill, and the methods and procedures used to inspect equipment so that the risk of an accidental spill is reduced.

Copies of JCESD's **SPCC Plans** are available upon request from JCESD senior management.

Staffing

The overall lead for the Contingency Planning Program is the JCESD Director. However, all JCESD staff members may be available for response to emergency situations based on their unique responsibilities. JCESD assigns and communicates to the staff members who are responsible for implementing various contingency plan components, and assignments are made and adjusted based on the workloads of the available staff. See the **CMOM Program Organization** plan for JCESD staffing resources.

Depending on the situation, JCESD may contract out certain work (e.g., emergency bypass pumping) to an outside contractor that specializes in the needed service.

Data Management

The current version of JCESD's contingency plans are maintained on the JCESD's intranet and made accessible to all staff members responsible for implementing the plans.

Program Implementation

Sanitary Sewer Overflow Response and Reporting Program

As indicated previously, JCESD's **SSORRP** addresses the contingency planning requirements for responding to unpermitted discharges and SSOs from manholes, pipes, and pump stations. Training on the **SSORRP** is provided annually, at a minimum, to personnel that are responsible for implementing the **SSORRP**.

For more information on the clearly defined response procedures, and roles and responsibilities assigned to personnel responding to and reporting SSO occurrences, see the JCESD **SSORRP** plan**.**

Vulnerability Assessment

As shown in **Table 1** on the following pages, many potential risks to JCESD's gravity and pressure sewers, pump stations, and wastewater treatment plants have been evaluated.

Existing Controls

Controls that are in place to reduce risks are described in various CMOM Program documents, including:

- Legal Support
- Acquisition Considerations
- Air Release Valve Preventive Maintenance Engineering
- Continuous Sewer System Assessment
- Corrosion Control
- Equipment and Supplies Management
- Fats, Oils, and Grease (FOG) Management
- Gravity Line Preventive and Reactive Maintenance
- Infrastructure Rehabilitation
- Line Location
- Maintenance of Way
- New Construction and Rehabilitation Inspection Sewer System Design
- Pretreatment Program
- Pump Station Operation and Maintenance
- Service Connection and Disconnection
- System Capacity Assurance
- Water Quality Monitoring Program

Collection and Conveyance System Initiatives

Pump Stations

A listing of all JCESD pump stations that includes the information listed below is provided in the **Pump Station Operations and Maintenance Program**:

- Pump station name
- Address
- Sewer basin
- Number of pumps
- Horsepower, voltage, and phases for each pump
- Total dynamic head
- Type and brand of pump
- Discharge
- Standby power rating, brand, and fuel source

Table 1. Sewer Infrastructure Potential Risks

Asset at risk	Possible cause	Existing controls	What can happen?	When can it occur?	Likelihood	Potential Consequences
Gravity Collection System	Aging, collapsed, or broken pipe	Regular inspection and repair; capital improvement repair and rehabilitation program	Surcharge or overflow	Anytime	Likely	Violation, water quality impact, public safety, public exposure, property damage
	Accumulated debris, roots, grease	Regular inspection and maintenance				
	Poor construction and rehabilitation practices	Design Guidelines, Standards and Construction Specifications	Structural defects	Anytime	Likely	Violation, water quality impact, public safety, public exposure
	Caused by third party	Service Connection / Disconnection Program; installation of fencing and gates where appropriate				Violation, water quality impact, public safety, public exposure, property damage
Pump Stations	Alarm failure	Regular inspection and maintenance	Surcharge or overflow	Anytime	Likely	Violation, property damage, water quality impact
	Failure in electrical system or sensors	Regular inspection and maintenance; monitoring and alarm system				
	Mechanical failure	Regular inspection and maintenance; monitoring and alarm system				
	Loss of power supply from energy authority, storm damage, mechanical failure or external cause	Backup power supply and quick-connect fittings/portable generators				
	Excessive inflow/infiltration; change in upstream sewer usage	Infiltration/Inflow Program; Capacity Assurance Planning Program	Surcharge or overflow due to inadequate capacity	Anytime	Likely	Violation, water quality impact, public safety, public exposure, property damage

Asset at risk	Possible cause	Existing controls	What can happen?	When can it occur?	Likelihood	Potential Consequences
Pressure Sewer System	Aging pipes	Regular inspection of force main routes and tracking pump run times for changes in trends	Surcharge or overflow	Anytime	Likely	Violation, water quality impact, public safety, public exposure, property damage
	Broken air release valve	Air Release Valve Program				
	Caused by third party; cleanout component damage	Same as documented above plus securing areas vulnerable to public threats				
WRF	Loss of power supply from energy authority, storm damage, mechanical failure, or external cause	High level alarms, response to callout system, onsite storage capacity	Discharge to the environment	Anytime	Unlikely	Violation, water quality impact, public exposure
	Inadequate WRF capacity due to change in population, sewer users, or conveyance system configuration	Capacity Assurance Planning Program; sewer system design; Infiltration/Inflow Program				
	Failure in electrical system or sensors	Routine inspection and maintenance; Performance Improvement Plans			Likely	
	Process upset	Pretreatment Program; process monitoring; routine inspection and maintenance				
	Mechanical system failure	Routine inspection and maintenance; Performance Improvement Plans				
	Pumping system failure					

Pump Station Monitoring and Alarm System

As described in the **Pump Station Operations and Maintenance Program** plan, JCESD does not currently utilize traditional Supervisory Control and Data Acquisition (SCADA) for remote control of pump stations; however, each pump station is equipped with a wireless monitoring and alarm system manufactured by MISSION Communications. These systems, which use cellular technology to communicate, monitor such functions as available power supply, wet well level, pump starts, pump run times, pump failure, and generator failure and will notify JCESD personnel in the event of a failure or alarm. While the monitoring systems do not facilitate remote control of the pump stations, they do provide real-time information that allows JCESD staff to respond to any issues in a timely manner.

All but three pump stations located in the collection system have redundant pumping capabilities built into the station. The three pump stations that do not have redundant pumping capabilities, Day Optometry (Gardendale), Leeds City Hall, and Ashville Road (Leeds), serve single buildings and were acquired through the unification process. Backup power sources are available at approximately sixty percent of the pump stations. For more information on the backup power sources available at each pump station, see the **Pump Station Operations and Maintenance Program** plan.

Pump Station Emergency Response and Operations

In the event a pump station becomes inoperable due to a power or mechanical failure, JCESD is prepared to respond to restore service as quickly and efficiently as possible. While Pump Station Operation and Maintenance (O&M) crews are on staff five days a week, backup crews are available and can be called in to assist in an emergency. JCESD electrician and instrumentation personnel are on-call for support when needed. Additional support crews are also available from Sewer Line Construction and Sewer Line Maintenance.

Pump station personnel are dispatched to pump stations when an alarm is activated to assess and respond to the situation. Responding personnel can request combination cleaning machines for containment and control measures from Sewer Line Maintenance, or bypass pumping support from the Sewer Construction Division. Work orders are generated by the responding Crew Supervisor to address the cause of the pump station failure. Once all problems have been addressed, work orders are closed out and entered into the Cityworks computerized maintenance management system (CMMS). For more information on work orders associated with emergency response efforts, see the **CMOM IMS Program** plan.

Bypass pumps are maintained by the Pump Station O&M group and are also available from Sewer Line Construction, Sewer Line Maintenance and several WRFs, if needed. For more information and details on the available portable pumps and pumping capacities, see the **Equipment and Supplies Management Program** plan. A copy of JCESD's Bypass Pumping System SOP is provided in the **Standard Operating Procedures and Work Process Documentation for Collection System Field Operations** manual. An emergency declaration can be made to call in local contractors with additional pumps, if needed.

In the event of a power failure, Alabama Power Company maintains and repairs electrical lines that provide power to the County pump stations. JCESD also has five mobile generators on hand that can be used to provide station power at pump stations that are not equipped with standby generators.

Backup generators are installed in approximately sixty percent of all the pump stations operated and maintained by JCESD (see the **Pump Station Operations and Maintenance Program** plan for details). Pump stations that are not equipped with generators are compatible with mobile generator units. The targeted response time to a power failure is to have emergency power or a generator connected within 2 to 2.5 hours of notification.

For more information and details on JCESD's backup generators, including the pump station generator inspection and maintenance standard operation procedures, see the **Pump Station Operations and Maintenance Program** plan.

Manholes

JCESD has implemented a remote manhole monitoring plan for manholes that have a history of surcharging or overflowing at specific design storms.

Water Reclamation Facilities

JCESD maintains nine WRFs throughout its service area as described in **Table 2**.

Table 2. JCESD Water Reclamation Facilities

WRF	Type	Design Flow (million gallons per day)	Available Onsite Storage
Cahaba River	Major	12	Equalization Basin
Five Mile Creek	Major	30	Equalization Basin
Leeds	Minor	2	Equalization Basin
Prudes Creek	Minor	0.9	Empty Basin
Trussville	Minor	4	Empty Basin
Turkey Creek	Minor	5	Equalization Basin
Valley Creek	Major	85	Equalization Basin
Village Creek	Major	60	Equalization Basin
Warrior	Minor	0.1	Empty Basin

Minor WRF Monitoring and Alarm System

The Leeds, Prudes Creek, Trussville, Turkey Creek and Warrior WRFs, which are not staffed at all times, are equipped with a monitoring and alarm system. In the event an alarm is sounded due to a high-water condition or power supply, electrical, or mechanical failure, JCESD WRF personnel, including on-call instrumentation and electrical personnel, are prepared to respond to restore service as quickly and efficiently as possible.

Backup Power

Backup power generators that can run the full plant critical loads are installed at each of the WRFs.

JCESD has one fuel truck that can be used to maintain the fuel supply for the generators; however, other County Departments can supply fuel trucks as needed.

Redundant Power Supplies

The Dispatch offices located at the Shades Valley Complex and the Scotts Branch Pretreatment Facility are furnished with redundant power supplies.

Emergency Flow Storage

All WRFs have capacity to effectively treat the highest expected flows. Dedicated storage capacity is available at most of the WRFs to handle excessive peak flows. JCESD has the ability with its resources and contracted support to provide fuel to backup generators in the event of an extended emergency.

Other Facilities

If an emergency is identified at other facilities within the JCESD collection system limits, such as private properties, highways, County buildings, schools, or other sites where there is the potential for damage from or to its sewer infrastructure, JCESD is prepared to respond to assist as needed and/or restore service as quickly and efficiently as possible.

For more information on JCESD's service request management and response procedures, and details concerning the 24-hour on-call Dispatch Office, see the **Customer Service Program** plan.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

Performance measures related to the **Contingency Planning Program** are currently monitored in other related programs that track emergency response. As part of regular CMOM Program reviews, JCESD staff will consider amendments to the **Contingency Planning Program** to improve overall response and maintenance of the JCESD wastewater system.

Sanitary Sewer Overflow Response and Reporting Program

Effective: November 2018

Review and Revision History

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Reviewers:

Daniel White, Deputy Director — 2-20-19 Date

Brian Rohling, Chief Civil Engineer — 2-20-19 Date

Brian Champion, Sewer Maintenance Construction Supervisor — 2-20-19 Date

Approved by (Responsible Official):

David Denard, Director — 2/20/19 Date

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1	ii	Added tables and figures tables of contents	5/22/2018
2	1	Updated text in Section 1.2 on distribution of plan	11/26/2018
3	2	Added Section 1.4 on ADEM-mandated requirements	5/22/2018
4	2	Added Section 1.5 on plan review and update commitment	5/22/2018
5	3	Added Table 1 on SSORRP/NPDES Permit Crosswalk	5/22/2018
6	5	Updated Table 2	11/26/2018
7	6	Updated Table 3	11/26/2018
8	9	Added text and Figure 4 on ADEM's Sanitary Sewer Overflow Map	5/22/2018
9	19	Added text on coordination meetings	5/22/2018
10	Appendix D	Removed Tables for Estimated SSO Flow Out of 36" Manholes	5/22/2018

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- **ESD Form WS1-1** SSO Volume Estimating Worksheet for Manholes
- **ESD Form WS2-1** SSO Volume Estimating Worksheet for Service Cleanouts
- **ESD Form WS3-1** SSO Volume Estimating Worksheet for Pipes or Cleanouts

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Acronyms

ADEM	Alabama Department of Environmental Management
CMOM	Capacity, Management, Operations, and Maintenance
DCNR	Alabama Department of Conservation and Natural Resources
JCESD	Jefferson County Environmental Services Department
JCDH	Jefferson County Department of Health
N/A	Not applicable
SCMS	Sewer Construction Maintenance Supervisor
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
TVI	Television Inspection
USEPA	United States Environmental Protection Agency

Sanitary Sewer Overflow Response and Reporting Program

Section 1 Introduction

1.1 Purpose

On October 21, 1996, Jefferson County (County) entered into a Consent Decree with the United States Environmental Protection Agency (USEPA). As part of the Consent Decree, the Jefferson County Environmental Services Department (JCESD) is required to report to the USEPA all Sanitary Sewer Overflows (SSOs) as defined in the Decree.[1] The JCESD also reports all SSOs to the Alabama Department of Environmental Management (ADEM) and the Jefferson County Department of Health (JCDH).

The purpose of the Sanitary Sewer Overflow Response and Reporting Program (SSORRP) is to provide policies and procedures for the response to and reporting of SSOs in an effort to protect public health and the environment, and to meet applicable regulatory requirements.

1.2 Distribution of the SSORRP

This **SSORRP** will be made available to all individuals involved in responding to and reporting SSOs within the JCESD. Copies of this program will be distributed to the following JCESD personnel:

- Director
- Deputy Directors
- Engineering Staff
- Inspection Staff
- Line Maintenance Personnel
- Television Inspection (TVI) Personnel
- Pump Station Operations Personnel
- Sewer Line Construction Personnel

A copy of this plan is available for download at http://www.jeffcoes.org/Default.asp?ID=47&pg=PROGRAMS.

[1] As defined in JCESD's Consent Decree, Civil Action No. 93-G-2492-S, "*"Sanitary Sewer Overflow," "SSO," and "Overflow" shall mean any discharge of wastewater from the County Collection System prior to treatment at a permitted treatment facility. SSO's include, but are not limited to, discharges from manholes, pipes, or pump stations*."

1.3 Personnel Training

JCESD will provide training sessions upon the adoption of this program to all personnel involved in responding to and reporting of SSOs. New personnel will be trained as soon as practicable after hire. All JCESD operations and maintenance personnel listed in Section 1.2 will be provided training sessions as needed to refresh them of the adopted procedures. The training sessions and personnel trained will be documented for tracking purposes.

As this **SSORRP** is updated, additional training sessions will be conducted to retrain personnel on new and/or changed procedures.

1.4 ADEM-Mandated Sanitary Sewer Overflow Response Plan Requirements

ADEM's draft National Pollution Discharge Elimination System Permit for the Cahaba Wastewater Treatment Plant includes specific requirements for JCESD's Sanitary Sewer Overflow Response Plan. While this plan (Sanitary Sewer Overflow Response and Reporting Program) contains details on the majority of the required plan components, other JCESD Capacity, Management, Operations and Maintenance (CMOM) Program plans address other components. **Table 1** on the following page presents a "crosswalk" between the requirements and the corresponding JCESD's CMOM Program Plan(s) where relevant information can be found.

1.5 SSORRP Plan Review and Update Commitment

JCESD commits to reviewing and evaluating this SSORRP plan at least once every three years. The documented plan review and evaluation will be signed and dated by the responsible JCESD official or appointed designee.

In addition, when requested by the ADEM Director (or designee), JCESD will provide the SSORRP plan to ADEM. Within 30 days of receipt of notification from ADEM, JCESD will modify any noted plan deficiency, and certify to ADEM that the appropriate modifications have been made.

Table 1. SSORRP / NPDES Permit Requirement Crosswalk

Cahaba WWTP NPDES Permit No. AL0023027 Requirements Part IV. Specific Requirements, Conditions, and Limitations G. Sanitary Sewer Overflow Response Plan						Jefferson County ESD CMOM Programs
Section	**Issue**					**Program Plan, Section**
1.	SSO Response Plan	a.	General Information	(1)	Population of City/Town	**CMOM Program Organization**, Collection System Background Information
				(2)	Number of Customers Served	
				(3)	Designated Sub basins	
				(4)	Estimated Linear Feet of Sewers	
				(5)	Number of Pump/Lift Stations in System	
		b.	Responsibility Information	(1)	SSO Response Coordinators (Key Positions)	**SSORRP**, Section 2 and **Customer Service Program**, Responding to Complaints/Service Requests
				(2)	SSO Responders (Key Positions)	
		c.	SSO and Surface Water Assessment	(1)	Likely SSO Locations	**Overflow Tracking Program**, Trend Analysis and **Engineering Program**, Continuous Sewer System Assessment Program, Program Implementation
				(2)	General Collection System Map	**Water Quality Monitoring**, Program Overview
				(3)	Classified Swimming Surface Waterbodies	
				(4)	Locally Known Swimming Surface Waterbodies	
		d.	Public Reporting of SSOs	(1)	Contact Information for Public to Report SSO	**SSORRP**, Section 2.1 and **Customer Service Program**, Service Request Management, Service Request Program Implementation
				(2)	Information Requested from Person Reporting the SSO	**Customer Service Program**, Service Request Management, Service Request Program Implementation
				(3)	Communication Procedures for Reported SSO	**SSORRP**, Section 2.3 and **Customer Service Program**, Service Request Management, Service Request Program Implementation
		e.	SSO Notification Procedures for Department, County, and Affected Entities			**SSORRP**, Section 2.3
		f.	SSO Notification Methods for the Public	(1)	List of Feasible Methods for Public Notification	
				(2)	Minimum Required Information for Public Notification	
				(3)	Determination of Public Notification Method	
		g.	Standard Procedures	(1)	General SSO Response Procedures	**SSORRP**, Section 2.3 and **Standard Operating Procedures and Work Process Documentation for Collection System Field Operations (SOP Handbook)**, SSORRP SOP
				(2)	SSO Collection and Disposal Procedures	
				(3)	Coordination of Instream Water Quality Monitoring	**Water Quality Monitoring**, Program Implementation
				(4)	Applicable Document References	n/a
		h.	Date, Titles, and Signatures of SSO Response Plan Author/Reviews/Modifications			**SSORRP**, Signature Page
2.	SSO Response Plan Implementation					**SSORRP**, Title Page
3.	Department Review of SSO Response Plan	a.	Plan Availability for Review			**SSORRP**, Section 1.5
		b.	Director Notification of Required Plan Modifications			
		c.	Modification Timeframe			
4.	SSO Response Plan Administrative Procedures	a.	Availability of Plan Copy At Permitted/Approved Facility			**SSORRP**, Section 1.2
		b.	Plan Availability Upon Public Request			**SSORRP**, Section 1.2 and **Overflow Tracking Program**, Program Overview
		c.	Personnel Training Required for Implementation			**SSORRP**, Section 1.3 and **Training Program**, Program Implementation
		d.	Designated SSO Response Plan Review and Evaluation Timeframe			**SSORRP**, Section 1.5

Section 2 – SSO Notification

2.1 SSO Call Center

JCESD operates a Call Center that is continually monitored twenty-four hours a day to receive calls regarding SSOs and backups. These calls may be received from other utilities, municipalities, JCESD staff, the public, or any individual that believes an SSO is occurring. Any JCESD employee that discovers an SSO or evidence of an SSO will call the Call Center to report the details of the event. The phone number to report an SSO is 205-942-0681.

The Call Center is physically manned by dispatchers 16 hours per day from 7:00 AM to 11:00 PM. Between the hours of 11:00 PM to 7:00 AM, an automated voice mail system plays a recorded message which instructs the caller to leave a detailed message of the problem. The automated system then notifies the Sewer Construction/Maintenance Supervisor and the on-call supervisor.

The Communication Operator IIs (referred to as "Dispatchers") on duty log information including, but not limited to: the complaint/service request address, caller's name, and service request details into Cityworks IMS, the JCESD's information management system.

2.2 Notification of JCESD Personnel

Crews are manned seven days per week from 7:00 AM to 7:30 PM, except for holidays that occur during the week (7:00 am to 3:30 pm). Following the receipt of a possible overflow call during business hours, the Dispatcher notifies a crew from the Shades Valley Line Maintenance facility or the Village Creek Line Maintenance facility and the crew responds to the call as appropriate.

During business hours, the managing supervisor of the responding crew or an inspector is also notified via two-way radio or cell phone. The Sewer Construction/Maintenance Supervisor and Principal Engineering Inspectors are also notified of any possible SSO occurrence via email to their cell phone. After hours, the on-call supervisor notifies the on-call maintenance crew for response. **Table 2** lists the JCESD personnel that are notified of potential SSO-related service requests.

2.3 Notification of Regulatory Agencies and the Public

If an SSO is determined to reach surface waters in accordance with Section 3.3, a *Sewer Overflow Advisory* (ESD Form RF4-1) is sent to the ADEM, the JCDH, local officials, JCESD employees, and media groups (see **Table 3**).

Table 2. JCESD Personnel Notified of Potential SSO-Related Service Requests

Position	Name	Phone Number	Email Address
Sewer Construction Maintenance Supervisor (SCMS)	Brian Champion	205-601-5054	championb@jccal.org
Principal Engineering Inspector	Jeff Melvin	205-215-4308	melvinj@jccal.org
Principal Engineering Inspector	Position Vacant	205-xxx-xxxx	name@jccal.org
Sewer Video Supervisor	Don Goodwin	205-296-2012	goodwind@jccal.org
SCMS	Jonathan Acton	205-21353464	actonj@jccal.org
SCMS	Josh Defnall	205-332-0760	defnallj@jccal.org
SCMS	Mel Vance	205-541-5871	vanceme@jccal.org
Public Works Supervisor	Todd Childers	205-369-3821	childerst@jccal.org
Public Works Supervisor	Wayne Smith	205-213-7266	smithwa@jccal.org
Sewer Service Inspector	Jason Ashley	205-601-5052	ashleyj@jccal.org
Sewer Service Inspector	Chris Cummings	205-368-3287	cummingsc@jccal.org

Table 3. Regulatory Agencies, Officials, and Media Outlets Notified if SSO Reaches Surface Water

Agency	Contact	Phone Number*	Email Address
ADEM – 24-HR Notification	ADEM SSO Hotline	334-274-4200(O)	N/A
ADEM – 24-HR Report	Nick Caraway	334-279-3051(F)	H2omail@adem.state.al.us
ADEM – 5-Day Report	Nick Caraway	334-279-3051(F)	H2omail@adem.state.al.us
ADEM – Birmingham Office	N/A	205-942-6168	N/A
JCDH – 24-HR Report	Jonathan Stanton	205-939-9019(F)	N/A
JCDH – 5-Day Report	Jonathan Stanton	205-939-9019(F)	N/A
JCESD Director	David Denard	205-325-5979(O)	denardd@jccal.org
JCESD Deputy Director	Daniel White	205-214-8610(O)	whited@jccal.org
JCESD Deputy Director	Margaret Tanner	205-215-7445	tannerma@jccal.org
JCESD Chief Civil Engineer	Brian Rohling	205-521-7512(O)	rohlingb@jccal.org
SCMS	Brian Champion	205-601-5054(C)	championb@jccal.org
Principal Engineering Inspector	Jeff Melvin	205-383-5512	melvinj@jccal.org
Principal Engineering Inspector	Position Vacant	205-xxx-xxxx	name@jccal.org
County Manager	Tony Petelos	205-731-2880(O)	petelost@jccal.org
Deputy County Manager	Dan Biles	205-583-8327(O)	bilesd@jccal.org
WABM	N/A	205-290-2115(F)	N/A
ABC 33/40	N/A	205-982-3942(F)	N/A
CBS 42	N/A	205-320-2722(F)	N/A
FOX 6	N/A	205-583-4356(F)	N/A
NBC 13	N/A	205-323-3314(F)	N/A

*O – Office, F – Fax, C - Cell

As shown in **Figure 1**, *Sewer Overflow Advisories* are also listed on the JCESD website at http://www.jeffcoes.org/Default.asp?ID=44&pg=SSO+DATABASEl

Figure 1. Sanitary Sewer Overflow Advisory Webpage

If it is determined that a significant danger to public health exists due to contact with affected surface waters, the portable sign shown in **Figure 2** will be placed in the immediate vicinity of the SSO. The portable sign shown in **Figure 3** will be placed at likely points of public access to the affected downstream surface waters. The signage will remain in the area until the SSO has ceased and sufficient time has elapsed to mitigate its effects.

The rationale for determining whether an SSO poses a significant danger to the public include, but are not limited to: the volume of the overflow, the size of the receiving stream, weather conditions, upstream and downstream fecal coliform testing results (if available), accessibility of the area near and downstream of the SSO, population density and the presence of sensitive or public facilities such as schools, parks, etc. If it is determined that there is a threat for exposure by a specific individual or group, JCESD will notify them directly.

Figure 2. **Portable Warning Sign Posted Near Discharge Source in Area that May Endanger Human Health**

Figure 3. **Portable Surface Water Warning Sign Posted Near Surface Waters**

ADEM's Sanitary Sewer Overflow Map, as shown in **Figure 4**, is available through its e-Maps Portal at http://www.adem.state.al.us/emaps.cnt. This map allows users, including the general public, to see the locations of SSOs that have been reported to the Department for up to 10 days after the SSO has ceased. This platform serves as a dynamic communication method for parties interested in locating where SSOs have occurred.

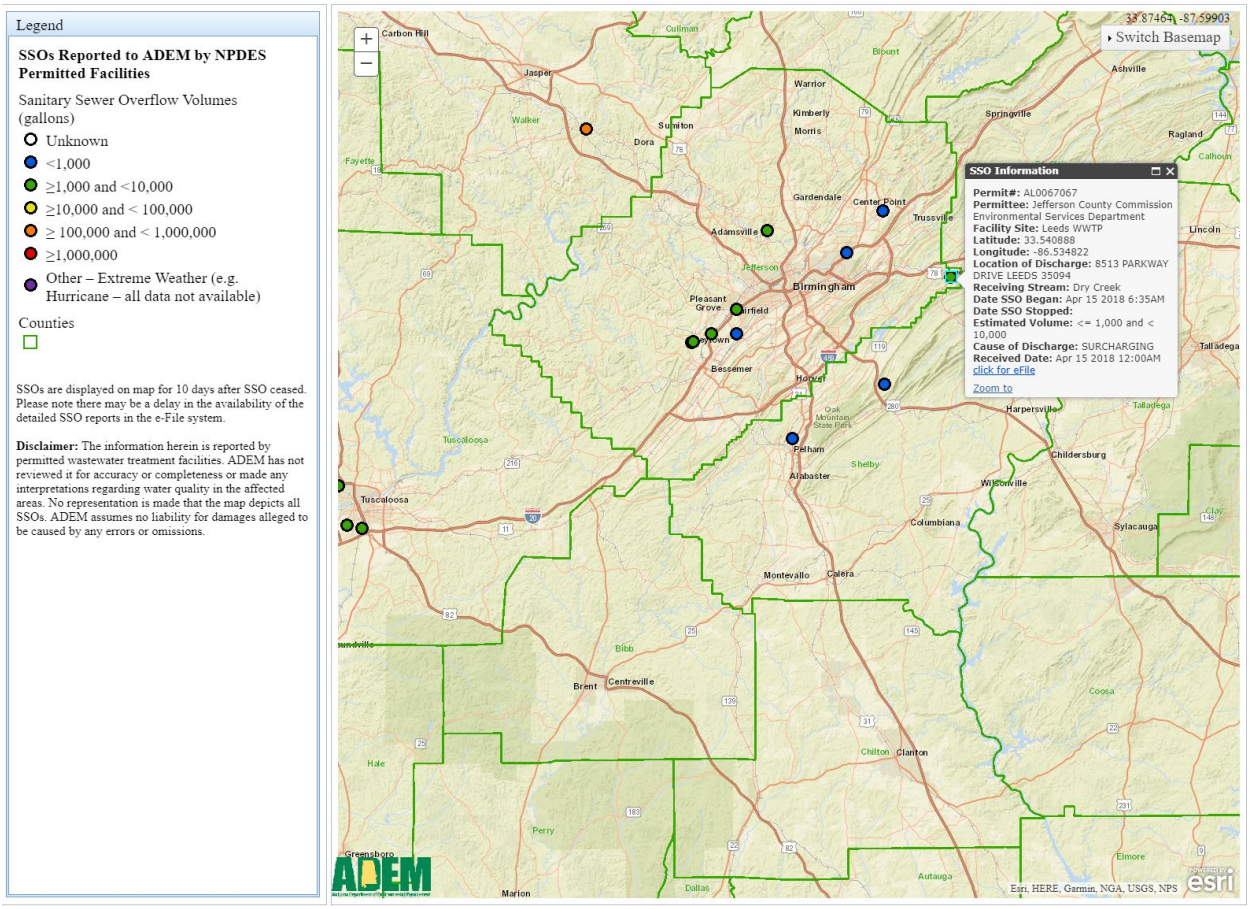


Figure 4. Screenshot of ADEM's Sanitary Sewer Overflow Map

Within 24 hours of any SSO, ADEM will be notified via their phone number, and the *24-Hour Report* (ESD Form RF2-1) will be submitted to ADEM and the JCDH. A *5-Day Follow-up Report* (ESD Form RF3-1) is prepared and sent to ADEM and JCDH within 5 days of the SSO occurrence. Each month, the JCESD submits a report and database of the SSOs from within the collection system to the USEPA in accordance with the requirements of the Consent Decree. In addition, copies of these reports are provided to the local ADEM office in Homewood, AL and the Government Documents Department at the Birmingham Public Library.

If an SSO is attributed to grease–related causes and not attributable to a food service facility, the personnel of the Grease Control Program will alert the nearby public of the overflow in an effort to limit the introduction of grease to the system and prevent future overflows.

The Grease Control Program Inspectors will place door hangers (see **Figure 5**) on the doors of the residences in the area neighboring the overflow following the event. This notification may occur significantly after the SSO has occurred and is not intended to serve as an immediate public health warning.

Figure 5. Door Hanger Placed by Grease Control Inspectors Following a Grease-Related SSO

Section 3 - SSO Determination

3.1 Cause of SSO

The Line Maintenance crew supervisor that responds to the call initially determines the primary cause of the SSO. In cases where the Line Maintenance crew supervisor is not able to make that determination, a Supervisor or Inspector will assist. Determination of the cause will include the following:

1.) In those instances where assistance is needed to investigate the SSO to determine the cause, a Supervisor or inspector will be contacted. This includes but is not limited to: Sewer Construction/Maintenance Supervisor, Principal Engineering Inspector, Public Works Supervisor, Sewer Video Operations Supervisor, or Sewer Service Inspector.

2.) The name of the Line Maintenance crew supervisor, Supervisor, or Inspector reviewing the call is to be put on the Service Request for that call.

- Example of Wet Weather Event: "Name (Public Works Supervisor) verified that all proper procedures for investigating an overflow due to surcharge were met. The lines were traced all the way to the trunk line if surcharge is present. Name and Crew #number believe that the probable cause of this overflow is due to a surcharge."

- Example of Dry Weather Event: "Name (Public Works Supervisor) verified that all proper procedures for investigating an overflow due to a blockage were met. Name and Crew #number believe that the probable cause of this overflow is due to a grease blockage."

3.) During a rain event, the investigation will include opening manholes and tracing the surcharged sewer flow to the trunk line and washing or rodding in an attempt to remove any potential blockage. Following the rain event, follow up inspections will be performed to determine whether the SSO was due to general surcharge from infiltration and inflow-induced flows or a blockage.

4.) During a non-rain event, every attempt should be made to determine the cause of the SSO based on visual inspection. If the SSO is caused by a blockage, the type of blockage should be determined based on the material removed during the cleaning process. If the SSO is caused by Construction Damage, Vandalism, a Line Break or other external cause, a picture should be made of the cause for documentation.

5.) If a manhole or cleanout is overflowing due to general surcharge, the code should be "Manhole Overflow – Surcharge" or "Cleanout Overflow – Surcharge" on the Service Request.

6.) If a manhole or cleanout is overflowing but not due to a surcharge, the code should be "Manhole Overflow – *cause*" or "Cleanout Overflow – *cause*" on the Service Request.

7.) Following an SSO, sewer lines in the area will be television inspected along with a Supervisor or Inspector to proof the cleaning of the pipe, find any sources of infiltration/inflow and to

determine if any other cause might have contributed to an SSO during a rain event or non-rain event.

8.) In cases where further investigation shows that the original attributed cause is not the actual cause of the SSO, the Service Request, any associated reports and database should be corrected in accordance with Section 7.

- Example Correction Statement: "TV Crew #number inspected the overflow location along with Name (Public Works Supervisor) on January 1, 2018 and found that the overflow was not due to surcharging from rain but was due to a collapsed pipe".

3.2 Source of SSO

The Line Maintenance crew that responds to the call along with a Supervisor or Inspector determines the discharge source of the SSO and whether the contributing asset (service lateral, pipe, manhole, pump station, etc.) is privately or County maintained. All service laterals are privately maintained and are defined as any connection outside the tee at the County-maintained line. Privately-maintained collector lines shall be determined from Cityworks and other records. Upon the report of a discharge from a cleanout, purported service lateral or backup within a structure, the County-maintained line shall be inspected and, if the County main is not determined to be obstructed or surcharged, the contributing factor shall be determined to be private.

If the discharge source is maintained by the County and the factors contributing to the SSO are due to the County, the SSO is reported in accordance with Section 2 of the **SSORRP**. If the discharge source is not maintained by the County, but the contributing factors are due to the County, the SSO is reported in accordance with Section 2 of the **SSORRP**. If the discharge source is privately maintained and the factors contributing to the SSO are not due to the County, the SSO is not reported in accordance with Section 2 of the **SSORRP**, but it is documented on the Service Request within Cityworks, Form RF1-1 is completed, and the JCDH is notified. Backups that are contained within a structure are also recorded on a service request within Cityworks and Form RF1-1 is completed. If a backup exits the structure, it is classified as a SSO and is reported in accordance with Section 2 of the **SSORRP**.

The criteria listed in **Table 4** is used in the decision-making process regarding the reporting of an SSO.

Table 4. SSO Reporting Requirements Based on SSO Source

Source	Maintained	Contributing Factors	Reportable by JCESD in Accordance with SSORRP Section 2
Manhole, service lateral, cleanout, pipe, pump station	County	County	Yes
Manhole, service lateral, cleanout, pipe, pump station	Privately	County	Yes
Manhole, service lateral, cleanout, pipe, pump station	Privately	Private	No. Documented on Service Request and Form RF1-1 completed. JCDH notified.

3.3 Destination of SSO

The Line Maintenance crew that responds to the call along with a Supervisor or Inspector determines the destination of the SSO and whether a *Sewer Overflow Advisory* (**ESD Form RF4-1**) is to be sent and the Portable SSO Signs (**Figures 4** and **5**) placed. As previously discussed, the *Sewer Overflow Advisory* is sent when a SSO reaches "surface waters." "Surface waters" for the purposes of this document are generally defined herein as flowing or standing waters of any river, stream, watercourse, pond or lake, natural or artificial. This does not include waters which are entirely confined and retained completely upon a single property and are not readily accessible to the public.

The following definitions and the criteria listed in **Table 5** are used to aid in this decision-making process.

Creek or river:	During wet or dry weather has continuous flowing water
Drainage ditch or storm drain:	During wet weather has continuous flowing water, or
	During dry weather does not have continuous flowing water
Ground absorbed:	Contained within an area that does not reach a creek, river, drainage ditch or storm drain as described above

Table 5. SSO Destination Criteria and Notification Actions

Event	Destination	Action
Any SSO that enters a creek or river	Surface waters	ESD Form RF4-1 sent to ADEM, JCDH, local officials and media. *Surface Water Sign* placed near receiving water.
Wet Weather SSO that enters a drainage ditch or storm drain	Surface waters	ESD Form RF4-1 sent to ADEM, JCDH, local officials and media. *Surface Water Sign* placed near receiving water if receiving water can be determined and/or *Warning Sign* placed in an area that may endanger human health.
Dry weather SSO that is greater than 10,000[1] gallons and enters a drainage ditch or storm drain	Field determination[2]	ESD Form RF4-1 sent to ADEM, JCDH, local officials and media. *Surface Water Sign* placed near receiving water if receiving water can be determined and/or *Warning Sign* placed in an area that may endanger human health.
Dry weather SSO that is less than 10,000[1] gallons and enters a drainage ditch or storm drain	Field determination[2]	If in an area that may endanger human health, *Warning Sign* placed.
Wet weather or Dry weather SSO that is ground absorbed	Non-surface waters	If in an area that may endanger human health, *Warning Sign* placed.

[1]Based on an equivalent flow rate of 166 gallons per minute (gpm) for 60 minutes. 166 gpm equals an average flow height of 5" from a manhole with the cover in place or an average flow height of ½" from a manhole with the cover removed as seen in Appendix D.
[2]In cases of a field determination, the responding Supervisor or Inspector along with the line maintenance crew will visually inspect the surrounding area and trace downstream to determine whether the SSO reaches flowing water. In cases where the destination is indeterminate, it shall be assumed to have reached surface waters.
NOTE: ESD Form RF2-1 and ESD Form RF3-1 are sent to ADEM and JCDH for all Dry Weather and Wet Weather Events.

Section 4 – SSO Volume Estimation

4.1 SSO Worksheets

JCESD has adopted procedures for estimating SSO volumes based on the type of overflow that has occurred. The Line Maintenance personnel utilize the *SSO Volume Estimating Worksheet for Manholes* (**ESD Form WS1-1**), the *SSO Volume Estimating Worksheet for Service Cleanouts* (**ESD Form WS2-1**), or the *SSO Volume Estimating Worksheet for Pipes or Cleanouts* (**ESD Form WS3-1**).

All worksheets require personnel to record the time the SSO was reported, the time they arrived, and the time that the SSO stopped. Following the SSO event, the estimated volume is calculated and inserted into the *Wastewater Discharge Reporting Form* (**ESD Form RF1-1**) that is completed by the ESD Line Maintenance personnel responding to the SSO. The *Wastewater Discharge Reporting Form* is then submitted to the dispatcher or On-call Supervisor.

4.2 SSO Field Data

When the JCESD Line Maintenance personnel first arrive on-site to the SSO, digital photographs of the overflow and the surrounding area will be taken in accordance with the *SSO Picture Procedure* (**Appendix C**) and inserted on the *SSO Picture Form* (**Appendix C**). If there is not an active SSO when the crew arrives, pictures will be taken of any evidence that will document the occurrence. The digital photographs aid in identifying the address where the SSO occurred, the correct manhole or cleanout, and provide evidence of the event. All Line Maintenance crews are supplied with the equipment needed to take digital images of the overflow occurrence. A measuring stick with highly visible marking is used by crews to measure and document the height of discharge from manholes and cleanouts, and ponded water depth.

The estimated height of the overflow shall be measured with the provided plastic measuring stick as accurately as possible; however, given the dynamic and transient nature of collection system hydraulics, steady-state height estimates may be difficult. Field personnel should, therefore, record the average, estimated height of the observed flow. In circumstances where the Line Maintenance personnel cannot safely access the SSO point to utilize the plastic measuring stick, a visual field estimate will be made.

All relevant field data shall be gathered on-site and recorded on the provided forms. Whenever possible, data should be recorded in the field as soon as possible after the event. Other field information should be provided as necessary as comments on or attached to the provided forms. Field crews are encouraged to gather and record any additional information.

4.3 SSO Volume Estimating Worksheet for Manholes

The *SSO Volume Estimating Worksheet for Manholes* (**ESD Form WS1-1** and **Appendix B**) and the *Tables for Estimated SSO Flow Out of Manholes* (**Appendix D**) enable the Line Maintenance personnel to estimate the overflow volume. If the manhole is not overflowing when the personnel arrive, a ponding calculation is utilized to estimate the overflow volume.

4.4 SSO Volume Estimating Worksheet for Service Cleanouts

The *SSO Volume Estimating Worksheet for Service Cleanouts* (**ESD Form WS2-1**) enables the Line Maintenance personnel to estimate the overflow volume from cleanouts. If the cleanout is not overflowing when the personnel arrive, a ponding calculation is utilized to estimate the overflow volume and recorded on the *SSO Volume Estimating Worksheet for Pipes or Cleanouts* (**ESD Form WS3-1**).

4.5 SSO Volume Estimating Worksheet for Pipes or Cleanouts

The *SSO Volume Estimating Worksheet for Pipes or Cleanouts* (**ESD Form WS3-1**) allows the ESD personnel to estimate the overflow volume using the number of residential connections upstream of the overflow or the ponding calculation if the pipe is not overflowing upon arrival.

4.6 SSO Volume Estimating by Other Methods

While the methods provided in **Sections 4.3** to **4.5** are to be the primary methods for estimation, there are occasions where other methods may be employed due to: insufficient field data to use standard methods, those standard methods produce results which are not reasonable or consistent with field observations, the nature of the overflow may be non-standard, or a more accurate estimation method may be available. These alternate estimation sources and methods may be used by JCESD engineering staff and include: Manning or other hydraulic flow equations, actual run times of a pump station and calculated pumping capacity, data collected by SCADA or other remote collection devices, and long-term flow monitor network data. Rationale for using non-standard estimation methods shall be based on the professional engineer's judgment and shall be sufficiently reviewed and documented.

Section 5 - Mitigation

Once the first Line Maintenance personnel arrives on-site and determines that there is an SSO, the process begins to identify and eliminate the root cause of the SSO. The JCESD Line Maintenance division can employ the use of hand and/or power rod turning machines, jet-washer trucks, and combination jet-washer/vacuum trucks to eliminate blockages in the sanitary sewer.

If there is a pipe break, the JCESD Sewer Line Construction division maintains a supply of pipe of varying sizes and materials, as well as manhole bases, risers, covers, and frames. Portable bypass pumps are available to bypass sanitary sewer flow from an upstream manhole to a downstream manhole when a blockage cannot be immediately eliminated, or a pipe repaired. If practical, the SSO will be contained with sand bags and/or a berm with the aid of the Sewer Line Construction division.

Utilizing the tools available to them, the personnel of the JCESD will make every effort to stop the SSO as expeditiously as possible. In circumstances where, in their judgment, the safety of JCESD personnel currently assigned to the SSO is threatened or a higher priority incident arises, as determined by an JCESD supervisor, JCESD personnel may suspend mitigation efforts until conditions allow a return to work. In the event an active SSO is left unattended, the site shall be secured by barricades or other means and a warning sign shall be placed at the site.

After the SSO has stopped and the cause remedied, clean-up of the impacted area begins. Hand tools including shovels, rakes, and brooms are carried on the Line Maintenance trucks and are used to collect any solids that remain for proper disposal. Combination trucks are utilized to vacuum up any liquids and/or solids that might remain following an event. Lime is also carried on the Line Maintenance trucks and applied to the area surrounding the SSO for disinfection. Follow-up visits to the impacted area may be required to return the location to pre-event conditions.

If staff observe or it is reported that a SSO that reaches the Waters of the State may have resulted in a fish kill, in addition to notifying ADEM for the SSO, JCESD will notify ADEM's Birmingham Field Office as well as the Alabama Department of Conservation and Natural Resources (DCNR). DCNR will investigate the cause of the fish kill and provide responsible cleanup.

In the event that JCESD identifies an overflow or discharge that that reaches the Waters of the State but was not caused by JCESD's sanitary sewer system, JCESD shall immediately notify ADEM's Birmingham Field Office as well as the DCNR if there appears to be any adverse impacts on the fish and wildlife in the vicinity or downstream of the event.

Section 6 - Safety

JCESD personnel are made aware of the potential hazards of contact with untreated wastewater and other, associated safety hazards in responding to an SSO. Among the equipment issued to the personnel are safety glasses, reflective vests, rubber gloves, boots, and rain suits. Hepatitis inoculations are also offered to the JCESD personnel that may come in contact with untreated wastewater.

Supervisors should use sound judgment in deciding when responding to an SSO places JCESD personnel in unreasonable danger or harm. For example, there may be times where an SSO is surrounded by swift flowing or deep water and the personnel are advised not to enter due to the risk of being swept away or drowning. Supervisors should document the unsafe conditions and report to their Manager if working conditions prevent the JCESD from responding and remain on-site until further instructions are received.

Section 7 - Quality Assurance/Quality Control

7.1 Line Maintenance

The JCESD has developed Check Lists (**Appendix E**) to be utilized by the JCESD personnel involved in the SSO reporting process to ensure accuracy of the data. When corrections are made to the data by JCESD personnel, the original data are struck through and the corrected data are noted, dated, and initialed on the reporting forms by the person making the revisions. An explanation for any data corrections and/or changes should be noted on the corrected form and/or an attachment if needed

Following the submission of the *Wastewater Discharge Reporting Form* (ESD Form RF1-1), the Dispatcher will use the *Service Request Check List* to verify that the form and Service Request are correct and complete. Any corrections are dated and initialed by the Dispatcher

The Public Works Supervisor or Sewer Video Operations Supervisor then completes their respective *SSO Check List for Line Maintenance* after receiving the *Wastewater Discharge Reporting Form* (**ESD Form RF1-1**) and SSO pictures from the Line Maintenance personnel. The Supervisors date and initial any corrections made on **ESD Form RF1-1** and/or the SSO Volume Estimating Worksheet. The Public Works Supervisor or Sewer Video Operations Supervisor forwards **ESD Form RF1-1**, the SSO pictures, his completed check list and the *Service Request Check List* to the Principal Engineering Inspector.

The Sewer Construction/Maintenance Supervisor or Principal Engineering Inspector will review the previously completed check lists to see if corrections are needed prior to completing his respective *5 Day Check List for Line Maintenance* and submitting the *5 Day Follow-up Report* (ESD Form RF3-1). The Sewer Construction/Maintenance Supervisor/Principal Engineering Inspector dates and initials any remarks or corrections. If significant corrections and/or changes are required, the Line Maintenance crew supervisor responsible for completing the *Wastewater Discharge Reporting Form* will be contacted to review the form with the Sewer Construction/Maintenance Supervisor or Principal Engineering Inspector. At the end of the month, for each SSO, the Sewer Construction/Maintenance Supervisor or Principal Engineering Inspector packages copies of the Service Requests, check lists, and completed forms and forwards to the Chief Civil Engineer.

7.2 Engineering

The package of SSOs for the previous month is sent to the Chief Civil Engineer prior to submission to the USEPA the following month. The SSO package is first reviewed by a Senior Civil Engineer who completes the *SSO Check List for Administration* for each SSO, notes any corrections and signs and dates the check list.

After the review by a Senior Civil Engineer, the Chief Civil Engineer reviews the *SSO Check List for Administration* and enters the SSO data in the Access database for that specific month.

Once all data have been entered, the SSO data is printed from the Access database and compared to the SSO package and the *SSO Check List for Administration* for each SSO by an additional Senior Civil Engineer who notes any omissions and/or corrections prior to preparation and submission to the USEPA.

The two Senior Civil Engineers, and/or Chief Civil Engineer initial, date, and sign for any remarks or corrections made on the *SSO Check List for Administration or 5 Day Follow-up Report*.

The GIS Specialist receives the final Access database and imports the information into Cityworks to represent the data geographically and ensure that the SSO corresponds with the reported location and provides corrections to the Chief Civil Engineer, as appropriate.

Following the completion of the review process, the Sewer Construction/Maintenance Supervisor or Principal Engineering Inspector are provided the corrections/changes for their copy of the SSO reporting forms.

7.3 Coordination Meetings

Every other week, Line Maintenance and Engineering representatives meet to discuss recent SSO occurrences and follow up on actions taken to prevent future SSOs.

7.4 Records

All original and corrected forms related to an individual SSO are kept together in a file by month and year at the Shades Valley Administration Building for historical and reporting purposes. Copies can be requested by contacting the Sewer Construction/Maintenance Supervisor.

APPENDICES

Appendix A SSO Reporting Forms

Jefferson County, AL
Environmental Services Department
Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

WASTEWATER DISCHARGE REPORTING FORM

Reported Information — Service Request Number:

Photos Taken: ☐ Yes ☐ No Number of Photos Taken: _____

Date Reported: _____ Time SSO Began _____ Time SSO Stopped _____

Caller Name: _____ Caller Phone No.: _____

Location from Caller Street Address: _____

Overflow Location Street Address: _____

Collection System Permit # _____ Overflowing Manhole Number: _____

Enter Mini-system number if overflow is from a cleanout

Municipality	☐ County Maintained	☐ Privately Maintained
☐ Adamsville ☐ Bessemer ☐ Birmingham ☐ Brighton ☐ Center Point ☐ Fairfield ☐ Fultondale ☐ Gardendale ☐ Graysville ☐ Homewood ☐ Hoover ☐ Hueytown ☐ Irondale ☐ Leeds ☐ Lipscomb ☐ Mountain Brook ☐ Midfield ☐ Pleasant Grove ☐ Tarrant ☐ Trussville ☐ Vestavia ☐ Warrior	☐ Cahaba ☐ Five Mile ☐ Leeds ☐ Prudes ☐ Trussville ☐ Turkey Creek ☐ Valley ☐ Village ☐ Warrior	☐ Referred caller to municipality ☐ County Investigated ☐ Other ☐ Notification of Public ☐ Press Release ☐ Placement of Signs

Field Observation (If County Investigated)

Destination of Discharge: ☐ Ground absorbed ☐ Drainage Ditch ☐ Storm Drain ☐ Creek or River _____ ☐ Other _____ ☐ Backup in Structure Exit? ☐ Yes ☐ No

Estimated Discharge Volume: ☐ Volume not determinable ☐ Estimated Volume (Gallons) _____

Discharge Source: ☐ Cleanout ☐ Pipe ☐ Treatment Plant ☐ Other _____ ☐ Manhole ☐ Pump Station ☐ Private Lateral/ Line

Known or Suspected Discharge Cause: (Check all that apply)
☐ Construction Damage ☐ Debris ☐ Infiltration/Inflow ☐ Force Main Break ☐ Gravity Main Break ☐ Grease ☐ Power outage ☐ P.S. Equipment Failure ☐ Rags ☐ Rocks ☐ Roots ☐ Surcharge from rain ☐ Vandalism ☐ Other _____

Comments _____

Recent Weather ☐ None **Rain:** ☐ Light ☐ Mod. ☐ Heavy **Estimated Duration:** _____

Conditions Contributing to the Discharge: **Flooding from rain in overflow area:** ☐ Yes ☐ No

Action Taken (If County Investigated)

☐ Blockage Removed ☐ Line Repaired ☐ Manhole Repaired ☐ Power Restored ☐ Additional Rehab Considered ☐ Project Planned to Replace/Repair Line ☐ Pump Station Repaired ☐ Other _____

SSO 24-Hour Notice FAXED? ☐ Yes ☐ No Date: _____

Remarks: _____

Maintenance Supervisor's Signature: _____ Date _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

JEFFERSON COUNTY, AL
ENVIRONMENTAL SERVICES DEPARTMENT
SUITE A - 300
716 RICHARD ARRINGTON JR. BOULEVARD, N
BIRMINGHAM, AL 35203

TO: Alabama Department of Environmental Management - Montgomery Office
Fax Number: (334) 279 - 3051
Attention: Kimberly Minton

SANITARY SEWER OVERFLOW (SSO)
24 - HOUR REPORT

The Jefferson County Environmental Services Department verified the occurrence of a sanitary sewer overflow (SSO).

I am _____at 205-942-0681. The SSO started on _____ at _____ at the following
(date) *(time)*

location: _____
(Street Address) *(City, Zip)*

The *estimated* volume of the SSO was: _____ Destination of Flow: _____
(Gallons) *(Basin)* *(Permit Number)*

Length of Occurrence: _____ Cause of the SSO due to: _____
(Minutes) *(Blockage Type)*

Corrective action taken: _____

The receiving water if any was: _____

Additional information will be provided in a Follow-up Report within five (5) days.

****

FOR JEFFERSON COUNTY ESD PERSONNEL ONLY

Service Request Number: _____

Date Called: _____ Date Faxed: _____

Time Called: _____ Time Faxed: _____

By: _____ _____
Name **Title**

Jefferson County Environmental Services
Sewer Line Maintenance
1295 Oak Grove Road, Homewood, AL 35209
205 - 942 - 0681

If this page does not transmit clearly, please contact Sewer Line Maintenance @ 205-942-0681

Jefferson County, AL
Environmental Services Department
Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

WASTEWATER DISCHARGE REPORTING FORM
SSO - 5 - DAY FOLLOW - UP REPORT

Reported Information — Service Request Number:

Photos Taken: ☑ Yes ☐ No Number of Photos Taken: _____

Date Reported: _____ Time SSO Began _____ Time SSO Stopped _____

Caller Name: _____ Caller Phone No.: _____

Reported Location Street Address: _____

Overflow Location Nearest Address: _____

Collection System Permit # _____ Overflowing Manhole Number: _____
Enter Mini-system number if overflow is from a cleanout

Latitude/Longitude of discharge (**REQUIRED**)
[Report coordinated in decimal degrees to the precision indicated (e.g. 32.463022°,-86.397067°)]
_____ ° Latitude
- _____ ° Longitude

Municipality			☑ County Maintained		☐ Notification of Public
☐ Adamsville	☐ Graysville	☐ Mountain Brook	☐ Cahaba	☐ Turkey Creek	☐ Press Release
☐ Bessemer	☐ Homewood	☐ Midfield	☐ Five Mile	☐ Valley	☐ Placement of Signs
☐ Birmingham	☐ Hoover	☐ Pleasant Grove	☐ Leeds	☐ Village	☐ Other (Describe)
☐ Brighton	☐ Hueytown	☐ Tarrant	☐ Prudes	☐ Warrior	
☐ Center Point	☐ Irondale	☐ Trussville	☐ Trussville		
☐ Fairfield	☐ Leeds	☐ Vestavia			
☐ Fultondale	☐ Lipscomb	☐ Warrior			
☐ Gardendale		☐ Unincorporated			

Field Observation (If County Investigated)

Destination of Discharge: ☐ Ground absorbed ☐ Drainage Ditch ☐ Storm Drain ☐ Creek or River _____

Monitoring of the receiving water is: ☐ Complete ☐ Ongoing

Did the discharge reach a designated swimming water? ☐ Yes ☐ No ☐ Unknown

Estimated Discharge Volume: ☐ Volume not determinable ☐ Estimated Volume (Gallons) _____

Discharge Source: ☐ Cleanout ☐ Manhole ☐ Pipe ☐ Pump Station | | Treatment Plant ☐ Other _____

Known or Suspected Discharge Cause: (Check all that apply)
☐ Construction Damage ☐ Debris ☐ Infiltration/Inflow ☐ Force Main Break ☐ Gravity Main Break
☐ Grease ☐ Power outage ☐ P.S. Equipment Failure ☐ Rags ☐ Rocks
☐ Roots ☐ Surcharge from rain ☐ Vandalism ☐ Other _____

Comments _____

Recent Weather ☐ None **Rain:** ☐ Light ☐ Mod. ☐ Heavy Estimated Duration: _____

Was the SSO caused by an extreme weather event? ☐ Yes ☐ No If yes, describe the nature of the extreme weather event:

Conditions Contributing to the Discharge: Flooding from rain in overflow area: ☐ Yes ☐ No

Action Taken (If County Investigated)

☐ Blockage Removed ☐ Line Repaired ☐ Manhole Repaired ☐ Power Restored ☐ Additional Rehab Considered ☐ Project Planned to Replace/Repair Line ☐ Pump Station Repaired ☐ Other _____

Service Request Number: _____

Was the affected area: **Cleaned?** ☐ Yes ☐ No **Disinfected?** ☐ Yes ☐ No

Are you aware of any other potential health or environmental impacts? ☐ No ☐ Yes **If Yes, Please Describe**

SSO 24-Hour Notice FAXED? ☐ Yes ☐ No Date: _____

Were any public water supply intake locations affected? ☐ No ☐ Yes

Remarks: _____

Maintenance Supervisor's Signature: _____ Date _____

Brian Champion

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

ENVIRONMENTAL SERVICES - 477

Sewer Overflow Advisory

Issued By

Jefferson County Commission
Environmental Services Department
A-300
716 Richard Arrington, Jr. Blvd. North
Birmingham, AL 35203

Sewer Line Maintenance
24 hour Dispatch Center
(205)942-0681

Date Issued _____ Time _____

Overflow Location _____

Waterway(s) Affected _____

Downstream Of _____

Advisory

A Jefferson County sanitary sewer line at the location listed above has experienced an overflow. Overflow was due to

Additional advisories will be issued as information becomes available.

Appendix B SSO Volume Estimating Worksheets

JEFFERSON COUNTY, AL

ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

SSO VOLUME ESTIMATING WORKSHEET FOR MANHOLES

Date: _____ Sewer Service Request Number: _____

If MANHOLE is overflowing or not overflowing at the time the crew arrives at the reported location, pictures will be taken in accordance with the SSO Picture Procedure. The Jefferson County SSO Volume Estimating Procedure will be used to determine the estimated flow rate.

Determine Duration

Time SSO Reported: _____ Time SSO Stopped: _____
(Dispatcher)

Time of Arrival: _____ * Duration of SSO: _____ Minutes

* DURATION OF SSO: If the MH is overflowing when crews arrive, then the SSO Start Time will be the Time SSO Reported (dispatcher) shown above. The duration of the SSO will be the difference between Time SSO Reported and Time SSO Stopped (minutes).

Determine Volume

○ *SSO Digital Photo Measurement - to be used when MH is overflowing upon crew arrival.*

_____ Average measured height from measuring stick.

_____ Cover On or Off _____ Table Used _____ GPM

Volume from Table - _____

Duration of SSO - _____ Minutes

Estimated Volume = _____ Gallons (est. rate in GPM X est. duration in minutes)

○ *Ponding Calculation - to be used when SSO originated from MH, is not overflowing upon crew arrival, but is contained in an area*

Volume of Sewage = length (ft) X width (ft) X depth (ft) X 7.48* _____ length (ft)

_____ width (ft)

* 7.48 gallons = 1 ft^3 _____ depth (ft)

Volume = _____ ft^3 **X** 7.48 = _____ Gallons

○ *Not Determinable - when an SSO from a MH is not overflowing upon crew arrival and rate can not be determined.*

Explain: _____

_____

_____

_____

_____

Crew # : _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

JEFFERSON COUNTY, AL
ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

Date: Sewer Service Request Number:

SSO VOLUME ESTIMATING WORKSHEET FOR SERVICE CLEANOUTS

1 Determine diameter (d) of service cleanout. = _____ inches
2 Estimate height (h) of flow from service cleanout. = _____ inches
3 Determine estimated flow rate (Q) from charts below. = _____ gpm
4 Estimate time (t) of discharge. = _____ minutes
5 Multiply step 3 & 4 to obtain estimated volume. = _____ Gallons

4" Diameter Cleanout	
h (in)	Q (gpm)
0.25	6
0.5	14
0.75	24
1	35
1.5	60
2	86
2.5	108
3	128
3.5	145
4	160
4.5	173
5	184
6	205
7	223
8	239
9	254
10	268
11	282
12	295
14	320
16	345
18	367
20	388

6" Diameter Cleanout	
h (in)	Q (gpm)
0.25	9
0.5	23
0.75	40
1	58
1.5	100
2	150
2.5	205
3	250
3.5	293
4	330
4.5	365
5	395
6	445
7	485
8	520
9	550
10	585
11	631
12	650
14	705
16	755
18	800
20	850

Time SSO Reported:
(Dispatcher)
_____

Time of Arrival:
_____

Time SSO Stopped
_____

* Duration of SSO
_____
Minutes

*Duration of SSO: If the cleanout is overflowing when crews arrive, then the SSO start time will be the time SSO reported (dispatcher) shown above. The duration of SSO will be the difference between time SSO reported and time SSO stopped (minutes).

Crew #: _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

Disclaimer:

This table was developed by the Jefferson County ESD utilizing *Chapter 14-Measurements in Pressure Conduits, Section 13-Trajectory Methods* of the *U.S. Department of the Interior Bureau of Reclamation Water Measurement Manual.* This table is provided as an example. Other Agencies may want to develop their own estimating tables.

JEFFERSON COUNTY, AL

ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

SSO VOLUME ESTIMATING WORKSHEET FOR PIPES OR CLEANOUTS

Date: _____ Sewer Service Request Number: _____

If CLEANOUT is overflowing or not overflowing at the time the crew arrives at the reported location, pictures will be taken in accordance with the SSO Picture Procedure. The Jefferson County SSO Volume Estimating Procedure will be used to determine the estimated flow rate.

Determine Duration

Time SSO Reported: _____ Time SSO Stopped: _____
(Dispatcher)

Time of Arrival: _____ * Duration of SSO: _____ Minutes

* DURATION OF SSO: If the PIPE is overflowing when crews arrive, then the SSO Start Time will be the Time SSO Reported (dispatcher) shown above. The duration of the SSO will be the difference between Time SSO Reported and Time SSO Stopped (minutes).

Determine Volume

○ *Determine number of residential connections upstream of overflow. Each residence contributes approximately 250 gal/day-res (100 gal/day-cap X 2.5 cap/res), or 10.5 gal/hr-res (0.175 gal/min-res).*

Res. Connections - _____ X 0.175 = _____ GPM
Duration of SSO - _____ Minutes
Estimated Volume = _____ Gallons (est. rate in GPM X est. duration in minutes)

○ *Ponding Calculation - to be used when SSO is not overflowing upon crew arrival, but is contained in an area.*

Volume of Sewage = length (ft) X width (ft) X depth (ft) X 7.48* _____ length (ft)
_____ width (ft)
* 7.48 gallons = 1 ft^3 _____ depth (ft)
Volume = _____ ft^3 **X** 7.48 = _____ Gallons

○ *Volume computed by Engineering Staff of ESD -*
Attach copy of supporting documentation and Engineer's name.

Comments: _____

Crew # : _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

Appendix C SSO Picture Procedure and SSO Picture Form

SSO PICTURE PROCEDURE

Please follow all steps to ensure that SSO pictures comply with requirements.

1) Verify that camera time and date are correct prior to taking pictures.
2) Verify that the time and date stamp is set to be active within the camera.
3) First picture should be taken from the side of the manhole or cleanout to show the height of the discharge on the measuring stick.
4) Second picture should be taken from a distance and angle so that a landmark (i.e.,house, street sign, mailbox) is visible in the picture.
5) If the SSO has ceased upon arrival, pictures are to be taken of the area surrounding the overflow.
6) The minimum number of pictures taken should be two. Additional pictures should be taken if necessary.
7) Please note the address of the closest structure or building to the manhole or cleanout. ***(Reported Location)***
8) The pictures should be submitted to the Public Works Supervisor or Sewer Video Operations Supervisor along with the ***Reported Location*** the same day.
9) The Public Works Supervisor or Sewer Video Operations Supervisor will then forward the pictures along with the signed ***SSO Check List for Line Maintenance*** to the Principle Engineering Inspector.
10) The Principal Engineering Inspector should insert the pictures on the **SSO Picture Form** and insert the required information. ***(Service Request Number, Address of Reported Location, Manhole number for overflowing manhole, Mini-system number for overflowing cleanout)***
11) The Principal Engineering Inspector will save an electronic copy of the SSO Picture Form with a file name of the Service Request Number.

SSO PICTURE FORM

SERVICE REQUEST NUMBER	MANHOLE OR MINI SYSTEM NUMBER	ADDRESS

PEI's Intials _____

Version 1

Appendix D Tables for Estimated SSO Flow Rates Out of Manholes and Cleanouts

TABLES FOR ESTIMATED SSO FLOW OUT OF MANHOLES

TABLE 'A'

ESTIMATED SSO FLOW OUT OF M/H WITH COVER IN PLACE

24" COVER

Height of spout above M/H rim **H** in inches	S S O FLOW **Q**		Min. Sewer size in which these flows are possible
	in gpm	in MGD	
1/4	1	0.001	
1/2	3	0.004	
3/4	6	0.008	
1	9	0.013	
1 1/4	12	0.018	
1 1/2	16	0.024	
1 3/4	21	0.030	
2	25	0.037	
2 1/4	31	0.045	
2 1/2	38	0.054	
2 3/4	45	0.065	
3	54	0.077	
3 1/4	64	0.092	
3 1/2	75	0.107	
3 3/4	87	0.125	
4	100	0.145	
4 1/4	115	0.166	
4 1/2	131	0.189	
4 3/4	148	0.214	
5	166	0.240	
5 1/4	185	0.266	
5 1/2	204	0.294	
5 3/4	224	0.322	6"
6	244	0.352	
6 1/4	265	0.382	
6 1/2	286	0.412	
6 3/4	308	0.444	
7	331	0.476	
7 1/4	354	0.509	
7 1/2	377	0.543	
7 3/4	401	0.578	8"
8	426	0.613	
8 1/4	451	0.649	
8 1/2	476	0.686	
8 3/4	502	0.723	
9	529	0.761	

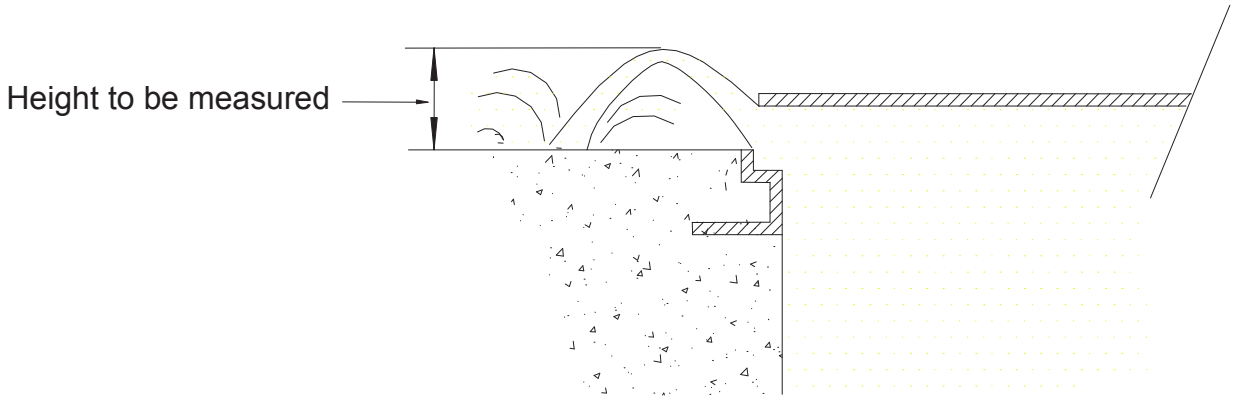
Disclaimer:
This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

The formula used to develop Table A measures the maximum height of the water coming out of the maintenance hole above the rim. The formula was taken from hydraulics and its application by A.H. Gibson (Constable & Co. Limited).

Example Overflow Estimation:

The maintenance hole cover is unseated and slightly elevated on a 24” casting. The maximum height of the discharge above the rim is 5 ¼ inches. According to Table A, these conditions would yield an SSO of 185 gallons per minute.

FLOW OUT OF M/H WITH COVER IN PLACE



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

TABLE 'B'

ESTIMATED SSO FLOW OUT OF M/H WITH COVER REMOVED

24" FRAME

Water Height above M/H frame **H** in inches	S S O FLOW **Q**		Min. Sewer size in which these flows are possible
	in gpm	in MGD	
1/8	28	0.04	
1/4	62	0.09	
3/8	111	0.16	
1/2	160	0.23	
5/8	215	0.31	6"
3/4	354	0.51	8"
7/8	569	0.82	10"
1	799	1.15	12"
1 1/8	1,035	1.49	
1 1/4	1,340	1.93	15"
1 3/8	1,660	2.39	
1 1/2	1,986	2.86	
1 5/8	2,396	3.45	18"
1 3/4	2,799	4.03	
1 7/8	3,132	4.51	
2	3,444	4.96	21"
2 1/8	3,750	5.4	
2 1/4	3,986	5.74	
2 3/8	4,215	6.07	
2 1/2	4,437	6.39	
2 5/8	4,569	6.58	24"
2 3/4	4,687	6.75	
2 7/8	4,799	6.91	
3	4,910	7.07	

Disclaimer:

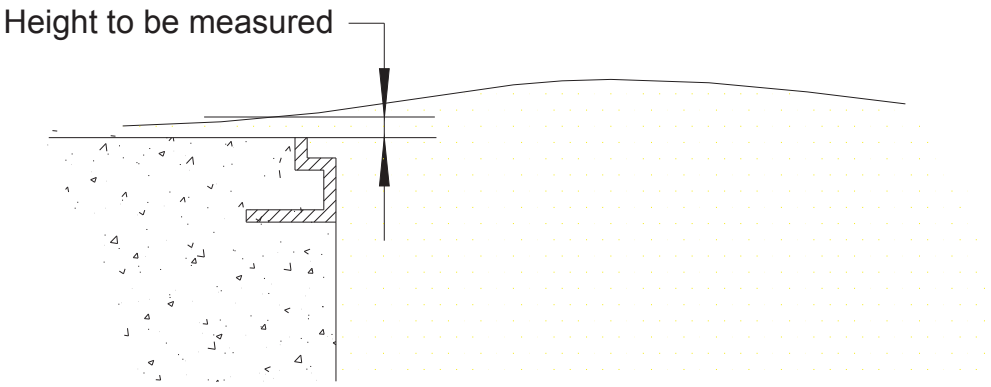
This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

The formula used to develop Table B for estimating SSO's out of maintenance holes without covers is based on discharge over curved weir -- bell mouth spillways for 2" to 12" diameter pipes. The formula was taken from hydraulics and its application by A.H. Gibson (Constable & Co. Limited).

Example Overflow Estimation:

The maintenance hole cover is off and the flow coming out of a 24″ frame maintenance hole at one inch (1") height will be approximately 799 gallons per minute.

FLOW OUT OF M/H WITH COVER REMOVED (TABLE "B")



This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

TABLE 'C'

ESTIMATED SSO FLOW OUT OF M/H PICK HOLE

Height of spout above M/H cover **H** in inches	SSO FLOW **Q** in gpm
1/8	1.0
1/4	1.4
3/8	1.7
1/2	1.9
5/8	2.2
3/4	2.4
7/8	2.6
1	2.7
1 1/8	2.9
1 1/4	3.1
1 3/8	3.2
1 1/2	3.4
1 5/8	3.5
1 3/4	3.6
1 7/8	3.7
2	3.9
2 1/8	4.0
2 1/4	4.1
2 3/8	4.2
2 1/2	4.3
2 5/8	4.4
2 3/4	4.5
2 7/8	4.6
3	4.7
3 1/8	4.8
3 1/4	4.9
3 3/8	5.0
3 1/2	5.1
3 5/8	5.2
3 3/4	5.3
3 7/8	5.4
4	5.5
4 1/8	5.6
4 1/4	5.6
4 3/8	5.7
4 1/2	5.8
4 5/8	5.9
4 3/4	6.0
4 7/8	6.0
5	6.1

Height of spout above M/H cover **H** in inches	SSO FLOW **Q** in gpm	
5 1/8	6.2	
5 1/4	6.3	
5 3/8	6.3	
5 1/2	6.4	
5 5/8	6.5	
5 3/4	6.6	
5 7/8	6.6	
6	6.7	
6 1/8	6.8	
6 1/4	6.8	
6 3/8	6.9	
6 1/2	7.0	← Unrestrained M/H cover will start to lift
6 5/8	7.0	
6 3/4	7.1	
6 7/8	7.2	
7	7.2	
7 1/8	7.3	
7 1/4	7.4	
7 3/8	7.4	
7 1/2	7.5	
7 5/8	7.6	
7 3/4	7.6	
7 7/8	7.7	
8	7.7	
8 1/8	7.8	
8 1/4	7.9	
8 3/8	7.9	
8 1/2	8.0	
8 5/8	8.0	
8 3/4	8.1	
8 7/8	8.1	
9	8.2	
9 1/8	8.3	
9 1/4	8.3	
9 3/8	8.4	
9 1/2	8.4	
9 5/8	8.5	
9 3/4	8.5	
9 7/8	8.6	
10	8.7	

Note: This chart is based on a 7/8 inch diameter pick hole

Disclaimer: This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example. Other Agencies may want to develop their own estimating tables.

Appendix E Checklists for SSO Reporting

SERVICE REQUEST CHECK LIST

YES	NO	N/A	
☐	☐	☐	Customer's Name
☐	☐	☐	Customer's Complete Address (No Abbreviations, Except in Directional)
☐	☐	☐	Problem Address (If different than caller address)
☐	☐	☐	City
☐	☐	☐	Zip Code
☐	☐	☐	Customer's Phone Number(s)
☐	☐	☐	Complete Customer Comments on problem having
☐	☐	☐	Sewer Basin (proper format - located on wall behind both computers)
☐	☐	☐	Map Page (Proper Format 46-Z13)
☐	☐	☐	Crew Dispatched to call
☐	☐	☐	Mini System Number
☐	☐	☐	Crew Arrival Time noted on request
☐	☐	☐	Complete Crew Comments
☐	☐	☐	Proper Code from Crew's Comments
☐	☐	☐	Closed Call (unless waiting for another crew)
☐	☐	☐	Did Crew talk with Homeowner/Business Owner?

Backup in Home/Business

☐	☐	☐	Were Pictures Taken? If so by whom?
☐	☐	☐	Was SERVPRO called? Who did you speak with? Time?

Broken Sewer Line

☐	☐	☐	Who is handling repair?

Cleanout Overflow

Overflow stopped at (time)?

Called into ADEM (Date & Time) *** Note these two are separate do not join together ***

Faxed ADEM & Health Department (Date & Time) *** Note (see above)***

WWTP Permit Number (located on wall behind computer monitor)

Called Wrong Utility

Company called? Who did you speak with?

GCP

Did crew discover grease or other debris/roots in line? Was Code changed?

MH Overflow

Overflow stopped at (time)?

Overflowing Manhole Number(s)?

Called into ADEM (Date & Time) *** Note these two are separate do not join together ***

Faxed ADEM & Health Department (Date & Time) *** Note (see above)***

WWTP Permit Number (located on wall behind computer monitor)

If line was Surcharging was it checked every 2 hours?

Date & Times Surcharge was checked

Overflow~BSL

Overflow stopped at (time)?

Overflowing Manhole Number(s)?

Called into ADEM (Date & Time) *** Note these two are separate do not join together ***

Faxed ADEM & Health Department (Date & Time) *** Note (see above)***

WWTP Permit Number (located on wall behind computer monitor)

TV Inspection Codes

Locate Manhole - Was Manhole Number listed?

SSO CHECK LIST FOR LINE MAINTENANCE

PUBLIC WORKS SUPERVISOR/ SEWER VIDEO OPERATIONS SUPERVISOR

Please verify that information is correct by placing a check in the box prior to each statement. If information is not correct make a note at the bottom of the next page and follow procedures as outlined in the SSORRP.

YES	NO	N/A	
			Service Request Number
			Date Reported
			Time SSO Began
			Time SSO Stopped
			Caller's Name
			Caller's Phone Number
			Reported Location *(Make sure that the reported location is not the caller's location unless they are the same.)*
			Street Address
			City
			Zip Code
			Collection System Permit
			Overflowing Manhole Number *(If overflow is from a cleanout, mini-system should be recorded.)*
			Municipality
			Basin
			Notification of Public
			Destination of Discharge
			Estimated Volume
			Discharge Source
			Discharge Cause
			Recent Weather

Service Request Number

YES	NO	N/A	
☐	☐	☐	Conditions Contributing to the Discharge
☐	☐	☐	Action Taken
☐	☐	☐	24 Hour Notice Faxed
☐	☐	☐	Date & Time
☐	☐	☐	Health Department/ Other

CORRECTIONS

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete unless noted above.

Signature _____ Date _____

5 DAY CHECK LIST FOR LINE MAINTENANCE

PRINCIPAL ENGINEERING INSPECTOR

Please verify that information is correct by placing a check in the box prior to each statement. If information is not correct make a note at the bottom of the next page. If a correction is required, the 5 day report should be corrected prior to submitting and procedures followed as outlined in the SSORRP.

YES	NO	N/A	
☐	☐	☐	Service Request Number ☐
☐	☐	☐	Date Reported
☐	☐	☐	Time SSO Began
☐	☐	☐	Time SSO Stopped
☐	☐	☐	Caller's Name
☐	☐	☐	Caller's Phone Number
☐	☐	☐	Reported Location *(Make sure that the reported location is not the caller's location unless they are the same.)*
☐	☐	☐	Street Address
☐	☐	☐	City
☐	☐	☐	Zip Code
☐	☐	☐	Collection System Permit
☐	☐	☐	Overflowing Manhole Number *(If overflow is from a cleanout, mini-system should be recorded.)*
☐	☐	☐	Municipality
☐	☐	☐	Basin
☐	☐	☐	Notification of Public
☐	☐	☐	Destination of Discharge
☐	☐	☐	Estimated Volume
☐	☐	☐	Discharge Source
☐	☐	☐	Discharge Cause
☐	☐	☐	Recent Weather

Service Request Number

YES	NO	N/A	
☐	☐	☐	Conditions Contributing to the Discharge
☐	☐	☐	Action Taken
☐	☐	☐	24 Hour Notice Faxed
☐	☐	☐	Date & Time
☐	☐	☐	Health Department/ Other

CORRECTIONS

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete unless noted above.

Signature _____ Date _____

SSO CHECK LIST FOR ADMINISTRATION

Please verify that information is correct by placing a check in the box prior to each statement. If information is not correct make a note at the bottom of the next page and follow procedures as outlined in the SSORRP.

YES	NO	N/A	
☐	☐	☐	Service Request Number ☐
☐	☐	☐	Date Reported
☐	☐	☐	Time SSO Began
☐	☐	☐	Time SSO Stopped
☐	☐	☐	Caller's Name
☐	☐	☐	Caller's Phone Number
☐	☐	☐	Reported Location *(Make sure that the reported location is not the caller's location unless they are the same.)*
☐	☐	☐	Street Address
☐	☐	☐	City
☐	☐	☐	Zip Code
☐	☐	☐	Collection System Permit
☐	☐	☐	Overflowing Manhole Number *(If overflow is from a cleanout, mini-system should be recorded.)*
☐	☐	☐	Municipality
☐	☐	☐	Basin *(Village - East or West)* *(Five Mile - Up or Down)* ***CIRCLE SELECTION***
☐	☐	☐	Notification of Public
☐	☐	☐	Destination of Discharge
☐	☐	☐	Estimated Volume
☐	☐	☐	Discharge Source
☐	☐	☐	Discharge Cause
☐	☐	☐	Recent Weather

Service Request Number

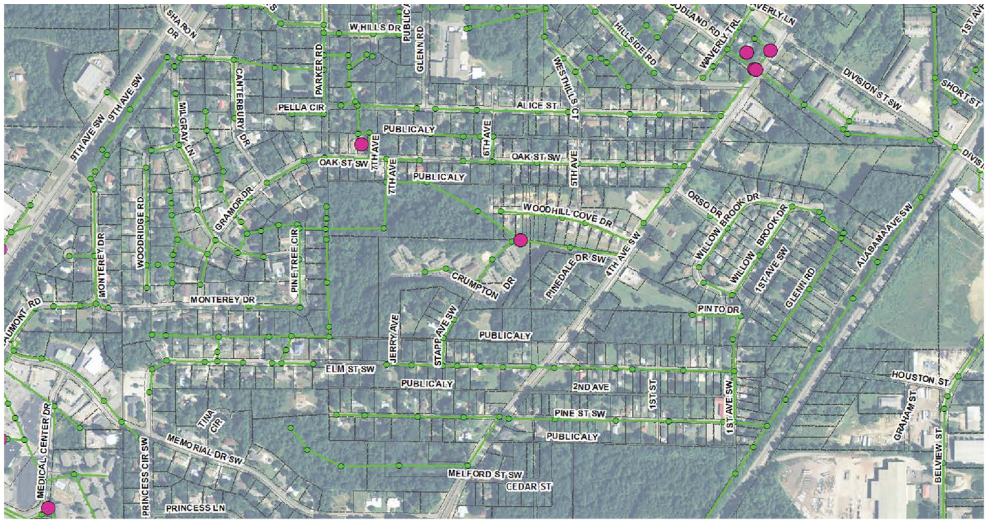
YES	NO	N/A	
☐	☐	☐	Conditions Contributing to the Discharge
☐	☐	☐	Action Taken
☐	☐	☐	24 Hour Notice Faxed
☐	☐	☐	Date & Time
☐	☐	☐	Health Department/ Other

CORRECTIONS

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete unless noted above.

Signature _____ Date _____

Operations


W HILLS DR
PELLA CIR
ALICE ST
OAK ST SW
WOODHILL COVE DR
MONTEREY DR
PINE TREE CIR
GRAMOR DR
WOODRIDGE RD
CANTERBURY DR
PARKER RD
GLENN RD
HILLSIDE RD
DIVISION ST SW
PINTO DR
ELM ST SW
2ND AVE
PINE ST SW
MEMORIAL DR SW
MELFORD ST SW
CEDAR ST
PRINCESS LN
HOUSTON ST
PUBLIC ALY
5TH AVE
4TH AVE SW
1ST AVE SW
CRUMPTON DR
PINEDALE DR SW
WILLOW BROOK DR
ORSO DR
GLENN RD
ALABAMA AVE SW
GRAHAM ST
BELVIEW ST
JERRY AVE
STAPP AVE SW
1ST ST
MEDICAL CENTER DR
PRINCESS CIR SW
LISA CIR

Pump Station Operations and Maintenance Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	1	Updated number of pump stations in JCESD collection system	7/11/18
1	Appendix A	Updated to reflect current pump stations	7/11/18
1	Appendix B	Updated to reflect current pump stations	7/11/18
1	Appendix C	Moved example pump station forms to new appendix	7/11/18
2	1	Updated Program Overview Section	2/2022
2	Appendix A	Updated to reflect current pump stations	2/2022

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Appendices

Appendix A List of Pump Stations Operated and Maintained by JCESD

Appendix B Detailed Pump Station Information

Appendix C Pump Station Inspection Forms

Tables

Table 1. Pump Station O&M Program Performance Metrics 9

Acronyms

CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
EAM	Enterprise asset management
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
KPI	Key performance indicator
O&M	Operations and maintenance
PM	Preventative maintenance
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
SOP	Standard operating procedure
WRF	Water Reclamation Facility

Pump Station Operations and Maintenance Program

Program Overview

Pump stations are critical components in a collection system that are used to facilitate wastewater flow downstream when the construction of a gravity sewer is not practical or possible due to elevation or terrain obstacles. Prior to unification of wastewater collection systems within Jefferson County's wastewater service area, the Jefferson County Environmental Services Department (JCESD) owned and operated 37 pump stations. However, through unification and years of other acquisitions, the County's responsibilities have grown to 178 collection system pump stations. A list of the pump stations within the JCESD collection system is provided in **Appendix A**.

The unification process allows JCESD to identify and make improvements to the collection system network, as a whole, to improve operational efficiency, while leveraging its specialized operation and maintenance knowledge on behalf of the partner municipalities. JCESD continues to identify opportunities to assume responsibility for additional pump stations and upgrade them to County standards or eliminate them, where possible, with gravity sewer. As of August 2021, JCESD is in the process of eliminating the following 2 collection system pump stations through assessment of the collection system as a whole:

- Powder Plant/I459-PS165
- Leeds City Hall -PS180

Purpose and Goals

The purpose of JCESD's Pump Station Operations and Maintenance (O&M) Program is to:

- Ensure pump stations operate as designed
- Increase dependability by identifying and providing necessary pump station maintenance before an operational issue occurs
- Provide emergency response in the event of a pump station failure and continue wastewater conveyance during power outages
- Improve the efficiency of the collection system network through pump station upgrades/improvements or elimination of a pump station through regionalization of sub systems

The goals of the **Pump Station O&M Program** are to:

- Minimize the frequency and volume of a sanitary sewer service interruption or sanitary sewer overflow (SSO)
- Protect public health, safety and welfare

Program Components and Approach

This program plan describes the following components of the JCESD **Pump Station O&M Program**:

- Routine inspection components and related standard operating procedures (SOPs)
- Comprehensive condition assessment efforts for all pump stations operated and maintained by JCESD
- Preventative and in-house maintenance capabilities
- The pump station capital improvement process
- An inventory of pump stations operated and maintained by JCESD

This Pump Station O&M Program plan also includes:

- Staffing and equipment resources
- Data management
- Equipment and tools
- Key performance indicators (KPIs) for tracking and documenting the performance and effectiveness of the **Pump Station O&M Program**

The successful implementation of JCESD's **Pump Station O&M Program** will allow JCESD to provide continuous service to its customers while minimizing sanitary sewer surcharging and overflows into structures and the environment.

For more information on security and emergency pump station operation procedures, see the **Contingency Planning Program** plan.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed SOPs and checklists for pump station inspection and preventive maintenance, pump station drawdown testing, and wastewater pump station standby generator preventive maintenance. These SOPs are provided in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook.

Procedures used when responding to and reporting SSOs are detailed in JCESD's **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan.

Pump station design and construction requirements are outlined in JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version). For more information on pump station design and construction requirements, see the **Engineering Program** plan.

Other CMOM Program plans that are referenced in the **Pump Station O&M Program** plan are as follows:

- CMOM Program Organization
- Contingency Planning Program

- Engineering Program
- Equipment and Supplies Management Program
- Financial Analysis Program
- CMOM Information Management Systems Program
- Safety Program
- Training Program

Staffing

An organizational chart for the JCESD Pump Station O&M Program (Division 7240) is provided the **CMOM Program Organization** plan. Positions within the group include:

- Water Reclamation Facility (WRF) Manager
- WRF Shop Supervisor
- WRF Plant Operator
- Electricians that are responsible for electrical maintenance
- Route Inspectors that perform daily pump station inspections and assist with maintenance of the pump station grounds
- Senior Maintenance and Maintenance Workers that are responsible for mechanical maintenance of the pump stations

The Pump Station O&M group is based at the Shades Valley Complex. This facility was upgraded in 1999 to house the additional staff required to handle the demands of the unified system.

To ensure the proper operation of the pumping system, O&M crews operate five days a week in eight-hour shifts. If required, work is completed using overtime. Two-person crews are typically used for routine O&M inspections and repairs. For projects requiring more than a two-person crew, a second crew is assigned to help.

Equipment and Tools

All pump station equipment, tools, and bulk inventory supplies, including backup pumps, generators, and confined space equipment, are stored at the Pump Station storage area located at the Shades Valley Complex, and staff has the equipment available to perform required maintenance activities.

See the **Equipment and Supplies Management Program** for additional details and inventories of the critical spare parts, equipment, and tools on hand.

Data Management

Pump operation information, such as daily pump run time records, is maintained in digital and paper format. The specific forms that are used by O&M personnel will be discussed in detail under the Program Implementation section of this document. In addition, hard copy pump station O&M manuals and plans, where available, are maintained at the Shades Valley complex for reference by the Pump Station O&M personnel.

The enterprise asset management (EAM) software program “Infor EAM” is used to track maintenance work orders. Work orders are generated by the WRF Manager for known and/or routine maintenance tasks. The first page from an example Infor EAM work order is provided in **Appendix C**. Completed work orders then serve as the maintenance logs for each pump station.

JCESD pump stations are equipped with a wireless monitoring and alarm system manufactured by MISSION Communications. These systems, which use cellular technology to communicate, monitor such functions as wet well level, pump run times, pump failure, and AC power failure, and will notify JCESD personnel in the event of a failure or alarm. The level control system provides real-time information that allows JCESD staff to respond to any issues in a timely manner.

For more information and details concerning the data management strategies and computerized maintenance management system (CMMS) used by JCESD, see the **CMOM Information Management Systems (IMS) Program** plan.

Program Implementation

JCESD's **Pump Station O&M Program** has been established with preventative maintenance (PM) as the guiding principle. Rather than solely reacting to equipment failures and station alarms, JCESD is actively seeking out potential issues at the pump stations they operate and addressing these issues before emergency conditions develop. The following sections describe in detail how JCESD's preventative maintenance program is implemented throughout the County.

Pump Station Design and Construction

JCESD compiled a comprehensive document that details the policies, procedures, design requirements, standard specifications and drawings for all pump stations constructed within the County. As stated previously, the **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version), provides streamlined guidance and uniform expectations to developers, contractors, and engineers for all new pumping station construction. A copy of the standard guidelines is available for download through the JCESD website**.**

Routine Inspections

As stated previously, JCESD owns and operates pumping stations located throughout the County's wastewater service area. A detailed summary of each pump station's components, including location, number and type of pumps, design conditions, and standby power, is included in **Appendix B**.

JCESD has established SOPs for their pump station inspection and preventative maintenance process (refer to the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook). The goal of the O&M program is to visit each pump station two times each week for operational and preventative maintenance purposes.

Eight inspection routes are completed on a weekly basis. There are two routes per region (Eastern, Southern, Western, and Central) and approximately twenty pump stations are visited per route. JCESD has developed and maintains a route inspection checklist for the operators to track the pumps stations that have been visited. Copies of the eight route inspection checklists are provided in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook.

Routine Weekly Pump Station Inspection Checklists are processed via mobile devices (smartphones). This provides real-time recording of the inspection and automated data transfer into the system. The

WRF Manager is made aware of any station problems via email from the reporting crew. JCESD also has SOPs and additional forms that operators must follow and complete for specific pump station components, such as mechanical and electrical systems. Additional information on these is provided in the following paragraphs.

Mechanical Systems

As part of the weekly inspections, operators are required to document the pump run times. Operators record readings from the elapsed time meters for all pumps in each pump station on the Pump Station O&M Daily Run Time Form (see **Appendix C**), which are ultimately used to schedule routine interval services such as bearing lubrication, seal inspection, or impeller inspection. The Daily Run Time Forms are turned in at the end of the month to the WRF Manager and are entered into the Infor EAM on a monthly basis.

Pump drawdown tests are performed on an "as needed" basis to determine or confirm the operating capacity of the installed pumps. Typically, the WRF Manager will make the determination on when these tests are performed. A copy of the JCESD Pump Station Drawdown Testing Procedure SOP is included in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook.

Generators and Electrical Systems

Backup generators are installed in approximately 65% of all the pump stations operated and maintained by JCESD (see **Appendix B** for details). All pump stations constructed after the unification process that will be operated and maintained by the County are required to have a backup generator or standby engine driven pump. This applies to pump stations constructed by the County or by a private developer.

All existing generators are inspected weekly as detailed on the Weekly Pump Station Inspection Check Off Sheet and are exercised with no load. On a semi-annual basis the generators are run under the full pump station load. The JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations Handbook** contains the Wastewater Pump Station Standby Generator Inspection and Preventative Maintenance SOP that documents the required inspections and frequency intervals for the generator components. It also contains a Standby Generator Inspection Check Off Sheet that must be completed by the operator when the generator inspection is performed and turned into the WRF Manager.

Prior to performing any inspections or maintenance on a generator, operators must complete lock out and tag out of the equipment to ensure their personal safety during the inspection. A copy of the Lockout/Tagout Procedure is provided in the **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook.

Condition Assessment

In late 2015, the County commissioned a survey and condition assessment of all the pump stations operated by JCESD. This survey enabled JCESD to evaluate and prioritize the needs of each station on a uniform basis and perform upgrades where they are needed the most. In addition, the overview enabled JCESD to determine if and where pump stations could be eliminated altogether with gravity sewer.

Through the routine inspection process and short-term repair program, JCESD is able to verify all of the pump stations are operable, as well as prioritize maintenance inspections and schedules. JCESD has prioritized pump station improvements based on the information collected during the condition assessment and will begin pump station improvement projects in late 2018.

Preventative and In-House Maintenance

Through routine inspections, unfavorable conditions or equipment issues are often identified that require maintenance. These may be issues that require immediate attention, or preventative maintenance items that require attention soon. When issues are discovered, operators typically:

- Notify the WRF Manager in the event of an emergency
- Address the required maintenance if it can be easily resolved and the tools are readily available
- Note the required maintenance on the route sheet that will be reported through the smart phone application and continue their inspections. In this situation, a work order will be generated, and personnel will be scheduled and dispatched to make the needed repairs. Completed maintenance and/or repairs are noted on subsequent Weekly Pump Station Inspection Check Off Sheets.

Unscheduled repair work is not considered an emergency repair when it is done in-house. Most unplanned repairs are discovered during routine inspections or by the Million telemetry system and can be resolved quickly. Of all the repairs JCESD handles, approximately 60% are unplanned, but have been able be addressed within the same week or, in some instances, the same day.

Work Order Process

Preventative maintenance work orders are generated for both scheduled and unscheduled maintenance items. Work orders are created on an "as needed" basis by the WRF Manager and assigned to the personnel or crew best suited to complete the required task. At the beginning of each month, the WRF Manager prints out all preventive maintenance work orders for the month and issues them to the assigned personnel.

Upon completing the required maintenance, the assigned personnel will fill out the work order and return the hard copy form to the WRF Manager. In addition, the assigned personnel will complete a Daily Maintenance Repair Report to track the maintenance performed on each piece of equipment in a pump station. The WRF Manager will review these two forms and close out the work order when the maintenance has been satisfactorily addressed. The WRF Manager is the only person authorized to close out work orders. Closed work orders and Daily Maintenance Repair Reports are entered into Infor EAM by available personnel as time allows, but ideally within 24 hours.

Mechanical Maintenance

All pumps are serviced based on manufacturer recommended maintenance intervals and equipment performance history. Minor pump and component repairs can be completed on-site at a given pump station. For more complex repairs, a pump can be taken out of service and brought to the mechanical shop at the Shades Valley Complex, Village Creek, Five Mile Creek, or Valley Creek maintenance shops for in-house maintenance. These service shops are fully equipped with most of the tools and parts

necessary for JCESD's maintenance needs. Spare and temporary pumps are available at the Shades Valley maintenance shop. Replaced components are also salvaged for reusable parts and materials.

Site Maintenance

The Pump Station O&M crews are also responsible for general maintenance of the pump station sites. This includes inspections and repairs to fences and other external station components, grass, landscaping, signage, and access roads or driveways. Routine site maintenance is completed as needed. Maintenance of the grounds is performed by contractors hired by JCESD.

Generator Maintenance

In-house generator maintenance is currently limited to oil/filter changes and belt replacements, and CAT generator service is contracted out. Generators are routinely inspected and exercised. The JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** handbook contains the Wastewater Pump Station Standby Generator Inspection and Preventative Maintenance SOP that documents the required inspections and frequency intervals for the generator components.

Pump Station Capital Improvements

The need for pump station capital improvements and large-scale maintenance projects are identified through routine inspections and reporting, component repair and maintenance history, pump run time, flow measuring, and JCESD Engineering assessment. Funding is set aside annually for this work. The design of major component upgrades or new station construction is performed by engineering firms by contract.

For more information on capital improvement planning, design, construction, and funding, see the JCESD **Engineering Program** and **Financial Analysis Program** plans.

Critical Repairs

Critical repairs are defined by JCESD as repairs necessary to address problems that increase risk of system failure or a danger to public health and safety. Examples of these types of problems include force main breaks, pump failures, and level control failures.

JCESD has open purchase orders in place with component vendors who can supply parts needed for in-house personnel to perform critical repairs.

Emergency Operation and Maintenance

Emergency Operation

In the event a pump station becomes inoperable due to a power or mechanical failure, JCESD is prepared to respond to restore service as quickly and efficiently as possible. Additional support crews are also available from Sewer Line Construction and Sewer Line Maintenance, if needed.

Please refer to the **Equipment and Supplies Management Program** and **Contingency Planning Program** for additional details on the available emergency response equipment and procedures.

Emergency Repairs

Emergency repairs are defined by JCESD as work that is not, or cannot be, done by in-house personnel. If contractors are required for structural, mechanical, or electrical issues, an expedited process is used to ensure the emergency is resolved in as short a time possible.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The **Pump Station O&M Program** performance measures established at JCESD are shown in **Table 1** on the following pages.

Table 1. Pump Station O&M Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
Pump Station Defects Identified	Value	Document the number and type of defects identified at pump stations during routine PM inspections or other emergency response exercises to pump stations	Track pump station defects in order to notify appropriate staff of emergency or maintenance improvements	Monthly
Odor complaints	Value	Document the number and types of odor complaints related to pump stations	Track odor complaints and notify appropriate staff of maintenance needs	Monthly
Number of pump stations inspected	Value	Document the number of pump station PM inspections performed each Month	Track performance and frequency of pump station inspections	Monthly
Routes Ran	Value	Document the number of specific station routes conducted during the month	Track performance and staff level abilities to perform the route work	Monthly
After Hours Calls	Value	Document the number and types of alarms and after-hours dispatched service requests	Track the number and types of calls to assess trending or problem areas	Monthly
Pumps Repaired	Value	Document the number and types of pumps repaired by month	Track the number of pumps repaired, assess staffing and costs	Monthly
Cuno Filters	Value	Document Cuno filter changes in stations using them	Track at which stations filters were changed, and what stations may need filter changes	Monthly
Stations PMs	Value	Document the number of preventative maintenance duties performed during routine station inspections	Track operational data retrieved in the inspections to generate work orders for the following month	Monthly
Generator Repairs	Value	Document type of maintenance and repair work performed on generators at pump stations	Track the generators serviced/repaired for trending and validate contractor maintenance work	Monthly

Performance Measure	Formula	Definition	Desired Result	Data Interval
Fuel Received at Pump Stations	Value	Document fuel delivery by vendors or fuel tank refills by in-house sources	Track fuel deliveries and amounts, and assess when next refueling is needed	Monthly
Plant Equipment	Value	Document inspections or repairs performed at the Scotts Branch pretreatment facility	Track inspection results and create work orders as needed	Monthly
Wetwells Cleaned	Value	Document station wet wells cleaned by Line Maintenance Division crews	Track the number of stations cleaned and provide data for routine scheduling work orders	Monthly
Station Upgrades	Value	Document all upgrades and specific types performed on stations and components	Track upgrades performed in all stations	Monthly
Station Cleanup	Value	Document cleaning activities on components inside and outside the facility	Track cleaning work performed and provide a better appearance to the public	Monthly
Electrical	Value	Document electrical work performed on station components	Track work orders issued to electrician	Monthly
Fuel Vault	Value	Document fuel vault sticking and/or inspections to assess consumption rate	Track fuel consumption and monitor levels for refilling	Monthly
Painting	Value	Document painting work performed to reduce corrosion or improve appearance	Track painting work performed in reporting period and assess if scheduled painting is needed	Monthly
Station Equipment Repaired	Value	Document repair work on all components (except pumps)	Track component repair and assess trending or problem areas	Monthly
Electricity – Total Cost	Value	Document total cost of electricity of all stations	Track monthly cost to provide an indication of station issues	Monthly

APPENDICES

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Appendix A List of Pump Stations Operated and Maintained by JCESD

PS001	ACTON ROAD	PS077	WYLAM	PS142	VINTAGE TRACE
PS002	ADAMSVILLE	PS078	WENONAH	PS144	LONG LEAF
PS003	BESSEMER HOSPITAL	PS079	DEAN DRIVE	PS145	BELMONT ROAD NO. 2
PS006	BRIGHTON	PS080	MINOR ROAD	PS146	DAY OPTOMETRY
PS007	BLUERIDGE	PS081	DON BERRI APARTMENTS	PS147	VINEYARDS
PS008	CORBET BRANCH NO. 1	PS082	K-MART	PS148	BIRMINGHAM RACE COURSE
PS009	CORBET BRANCH NO. 2	PS083	PAYNE ROAD	PS149	ROWAN SPRINGS
PS010	CUNNINGHAM CREEK NO. 1	PS085	BROOKWOOD DRIVE	PS150	EDGEWATER OAKS
PS011	CUNNINGHAM CREEK NO. 2	PS086	FIELDSTOWN ROAD	PS151	MEDICAL CENTER EAST
PS013	FIVE MILE CREEK WEST	PS087	WOODBROOK APARTMENTS	PS152	CROSSHAVEN
PS016	GARYWOOD	PS088	DAY STREET APARTMENTS	PS153	ROCKY RIDGE LANE
PS017	HALLS BRANCH	PS089	COTTAGES AT FIELDSTOWN	PS156	WATERMARK
PS018	I-59	PS090	SEVENTH AVENUE GRAYSVILLE	PS157	COLEMAN LAKES
PS019	LAKE STERLING	PS091	SECOND AVENUE GRAYSVILLE	PS158	WISTERIA TRACE
PS020	MAYS VILLAGE	PS092	SEVENTH STREET GRAYSVILLE	PS159	WEST SMITHFIELD
PS021	McADORY	PS093	THIRD STREET GRAYSVILLE	PS160	ELLISON STREET
PS022	PIPE SHOP	PS094	THIRD PLACE GRAYSVILLE	PS161	MARIANA STREET
PS023	MORGAN/GREENWOOD NO. 1	PS095	150 (JEFFERSON MEMORIAL)	PS162	LETSON FARMS
PS024	MORGAN/GREENWOOD NO. 2	PS096	WOOD TRACE	PS163	ARBORS
PS025	NEWFOUND NO. 1	PS097	MAGNOLIA TRACE	PS164	PARK WEST
PS026	NEWFOUND NO. 2	PS098	HOOVER HIGH SCHOOL	PS165	POWDER PLANT ROAD/I-459
PS027	OAKS DUPLEX	PS099	STADIUM TRACE PARKWAY	PS166	PADEN PARK
PS028	PATTON CREEK NO.1	PS100	150 WEST/I-459	PS167	MOUNTAIN VIEW
PS029	PATTON CREEK NO.2	PS101	JEFFERSON METROPOLITAN	PS168	POWDER PLANT ROAD/WEST
PS030	PINEWOOD	PS102	LAKE CREST	PS169	HAWKRIDGE
PS031	PLEASANT GROVE	PS103	TEA ROSE	PS170	BENT BROOK
PS034	RICE CREEK	PS104	MOSS LANE	PS171	HOPEWELL
PS035	RIVERCHASE	PS105	WILLOW LAKE DRIVE	PS174	BAINBRIDGE TRACE
PS037	TRUSSVILLE INDUSTRIAL PLANT #2	PS106	CHESWOOD	PS175	ALABAMA BOULEVARD
PS038	TRUSSVILLE NE	PS107	HOOVER METROPOLITAN	PS176	ORCHARD AVENUE
PS039	NORTHBROOK	PS108	PARKWOOD	PS177	GARDENDALE MEDICAL CTR
PS040	CEDAR CREEK TOWNHOMES	PS109	VALEWOOD CIRCLE	PS178	ASHTON WAY
PS041	SHERMAN OAKS	PS110	HIGHLAND	PS179	CAHABA VILLAGE
PS042	HIDDEN TRACE	PS111	HILLSHIRE	PS180	LEEDS CITY HALL
PS046	FOX HOLLIES	PS112	CHAPEL DRIVE NO. 1	PS182	SAVANNAH RIDGE SECTOR II
PS047	ALEMEDA	PS113	CHAPEL DRIVE NO. 2	PS183	VES TRACE MANOR
PS048	BELMAR	PS114	OAKWOOD AVENUE	PS184	DANA ROAD
PS049	MINOR PARKWAY	PS115	VAIL AVENUE	PS185	RICE CREEK SUBDIVISION
PS050	COLLEGEVILLE	PS116	WALKER AVENUE	PS186	GRUBBS AVENUE
PS051	DENNISON	PS117	MISSISSIPPI AVENUE	PS187	LOU GEORGE LOOP (TIMBERLEAF)
PS052	FAIRMOUNT	PS118	COOSA AVENUE	PS188	HADDON PLACE 1
PS053	GADSDEN HIGHWAY	PS119	PARKWAY	PS189	HADDON PLACE 2
PS054	GOODRICH	PS120	DUNNAVANT	PS190	ROSSER COVE
PS055	HARRIMAN	PS122	ASHVILLE ROAD	PS191	MCCALLA TRACE (GOOCHER ROAD)
PS057	LANCE WAY	PS123	DOVER DRIVE	PS192	DEERFOOT POINTE PS#1 (DEERFOOT DRIVE)
PS059	LEWISBURG NO. 1	PS124	GARDEN GROVE	PS193	DEERFOOT POINTE PS#2 (DEERFOOT COVE)
PS060	LEWISBURG NO. 2	PS125	SADLERS GAP	PS194	PUMPHOUSE VILLAGE PUMP STATION
PS061	MASON CITY	PS126	BRUMMIT HEIGHTS	PS195	BENT RIVER PHASE IV PART A (FORMERLY BENT RIVER PHASE IV)
PS062	McALPINE	PS127	SURREY OAK	PS196	FULTONDALE COMMERCIAL DEVELOPMENT
PS064	PENFIELD	PS128	MAGNOLIA RIDGE	PS197	THE SHOPS OF GRAND RIVER
PS065	REPUBLIC	PS129	ELLIS ROAD	PS198	MINOR COMMUN ITY SCHOOL
PS066	RIGGINS	PS130	SHOOK HILL	PS199	THE ARBORS AT ELLINGTON
PS067	ROBERTSFIELD	PS132	VISIONLAND	PS200	SHERIFF ACADEMY PUMP STATION
PS068	ROSEBUD	PS133	OAK GROVE	PS201	FLEMMING FARMS LIFT STA SB DVLPMNT CORP AL ENG CO INC
PS069	SANDUSKY	PS135	OVERTON ROAD NO. 1	PS202	LAKE WILBORN LIFT STATION
PS070	SEARS DRIVE	PS136	WELLINGTON PARK	PS203	MORGAN ROAD PLAZA
PS073	SUMMIT	PS138	OVERTON ROAD NO. 2	PS204	GRAND RIVER SOUTH PHASE I RESIDENTIAL DESIGN PACKAGE LEEDS,
PS074	TIN MILL ROAD	PS139	BROOKVIEW CHURCH	PS205	MCCALLA ELEMENTARY
PS075	VIRGINIANA	PS140	BELMONT ROAD NO. 1		
PS076	VULCAN	PS141	TRACE RIDGE		

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Appendix B Detailed Pump Station Information

PUMP STATION INFORMATION

11/12/2018

	ID	NAME	ADDRESS	CITY	# OF PUMPS	EACH PUMP			GPM	TDH	Basin	TYPE	BRAND	DISCHARGE	SBP	STANDBY POWER		FUEL SOURCE
						HP	VOLT	PHASE								RATING, KW	BRAND	
	168	Powder Plant Rd./West	650 Powder Plant Rd	BES	2	20	230/460	3	815	25'	Valley	Suction Lift	Gorman Rupp	8	YES	ST'BY PUMPING	Nissan	Propane
	165	Powder Plant Rd./459	2060 Powder Plant Rd	MCC	2	10	460	3	530	35'	Valley	Submersible	Flygt		YES	35	Onan	Ntl Gas
	194	Pump House Court	1562 PumpHouse Court	VESTH	2	15	240	3	100	144'	Cahaba	Submersible	KSB		YES	61	Kohler	Ntl Gas
	34	Rice Creek (Rice Creek Subdivision)	3150 Morgan Rd	BES	2	60	460	3	1000	102'	Shades	FS/Can	Fairbanks Morse	8	YES	100	Caterpillar	Diesel
	185	Rice Creek Lane (Savannah Ridge Sector)	2528 Rice Creek Lane	JEFF	2	6	240	3	96	186'	Shades	Sub	Flygt		YES	37	Kohler	Ntl Gas
	182	Ridgemont Drive	4340 Ridgemont Circle	JEFF	2	20	480	3	110	115	Cahaba	Sub	KSB		YES	60	Cummings	Ntl Gas
	35	Riverchase	1859 Data Dr	HVR	5	125	460	3	2325	100'	Cahaba	FS/Sub	Chicago	20	YES	425	Caterpillar	Ntl Gas
	190	Rosser Loop Road	4730 Rosser Loop Road	BES	2	10	460	3	100	94.9'	Valley	Submersible	Flygt		YES	35	Cummings	Ntl Gas
	125	Saddler Gap	910 Gadsden Hwy	BHAM	2	40	230/460	3	464	110'	Village	FS/Can	Fairbanks Morse	8	YES	100	Onan	Ntl Gas
	37	Trussville 2	7771 Meadowlark Dr	TVL	2	3	230/460	3	135	25.5'	Trussville	Suction Lift	Gorman Rupp	4	YES	25	Cummings	Diesel
	38	Trussville Northeast	4800 Cardinal St.	TVL	2	25	460	3	600	73'	Trussville	FS/Concrete	ITT	8	YES	100	Olympian	Ntl Gas
	183	Ves Trace	1991 Ves Trace	VESTH	2	3.7		1	60	30'	Cahaba	Submersible	ABS		YES	25	Katolight	Ntl Gas
	159	Westsmithfield	1548 Westsmithfield Rd	BHAM	2	11.3	240	3			Valley	Submersible	Barnes	4	YES		Kohler	Ntl Gas
HOOVER	95	150 (Jeff.Memorial)	2662 Highway 150	HV	2	25	230	3	200	67'	Shades	Submersible	Hydromatic	4 "	YES	ST'BY PUMPING		Diesel
	100	150 West/459	2385 Highway 150	HV	2	105	460	3	1400	143'	Valley	Submersible	ABS	12"	YES	ST'BY PUMPING		Diesel
	106	Chesswood	1647 Chesswood Cir. E.	HV	2	5	240	1	100	38'	Shades	Submersible	Ebara	4"	NO			
	98	Hoover H.S. (Mars Hill)	400 Mars Hill Road	HV	2	84	480	3	1000	166'	Shades	Submersible	ABS	12"	YES		Cummings	Ntl Gas
	107	Hoover Met.	100 Ben Chapman Drive	HV	2	20	480	3	149	75'	Shades	Submersible	Flygt		NO			
	102	Lakecrest	2485 Highway 150	HV	2	110	460	3	1700	113'	Shades	Submersible	ABS	12"	YES	ST'BY PUMPING		Ntl Gas
	97	Magnolia Trace	5400 Stadium Trace Dr.	HV	2	130	460	3	1600	161'	Shades	Submersible	ABS	12"	YES	ST'BY PUMPING		Diesel
	104	Moss Lane	3762 S. Shdescrest Rd.	HV	2	30	230	3	175		Shades	Submersible	Ebara		YES	150	Generac	Ntl Gas
	108	Parkwood	3329 Parkwood Rd.	HV	2	15	230/460	3	320	36'	Shades	FS/Can	Fairbanks Morse		YES	60	ONAN	Ntl Gas
	137	Southwood	3892 Parkwood Rd. SE	HV	2	14.3	240	3		210'	Shades	Submersible	ABS		NO			
	99	Stadium Trace Pkway	6201 Stadimum Trace Dr.	HV	2	130	460	3	1375	161'	Shades	Submersible	ABS	10"	YES	ST'BY PUMPING		Diesel
	103	Tearose	1511 Tearose Cir.	HV	2	3	230	3			Shades	Submersible	Ebara		NO			
	141	Trace Ridge Road	211 Trace Ridge Road	HV	2	5	230	3	48	122'	Shades	Submersible	Ebara	4"	YES		Generac	Ntl Gas
	109	Valewood Circle	1936 Valewood Cir.	HV	2	15	230	3	100	96'	Shades	Submersible	Ebara	4"	NO			
	105	Willow Lake Drive	5691 Willow Lake Dr.	HV	2	5	230	3	100		Shades	Submersible	Ebara	4"	NO			
	96	Wood Trace	2140 Woodstrace	HV	2	30	208	3	175	113'	Shades	Submersible	Ebara	4"	NO			
GARDENDALE	163	(The) Arbors	991 Wren Way	G'Dale	2	7.5	230	3	100	58'	Five Mile	Submersible	Flygt		YES	20	Onan	LP
	85	Brookwood Dr.	Brookwood Ct.	G'Dale	2	5	230	3	90	75'	Five Mile	Submersible	MYERS	3"	NO			
	89	Cottages At Fieldstown	1960 Fieldstow Rd.	G'Dale	2	25	230	3	500	77'	Five Mile	Suction Lift	Gorman Rupp		YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	146	Day Optometry	1500 Hwy. 31 N.	G'Dale	1	2	230	1			Five Mile	Submersible	MYERS		NO			
	88	Day Street Apartments	330 Day St. Unit 6	G'Dale	2	2	230	1	42	105'	Five Mile	Submersible	ABS	6"	NO			
	79	Dean Drive	0 Dean Dr.	G'Dale	2	7.5	230	3	120	45'	Five Mile	Suction Lift	Gorman Rupp	6"	YES	45	Generac	Ntl Gas
	81	Don Berri Apt.	0 Godwin Dr.	G'Dale	2	15	230	3	140	63'	Five Mile	Suction Lift	HYDROMATIC		YES	50	Caterpillar	Diesel
	86	Fieldstown Road	0 Fieldstown Road	G'Dale	2	30	230	3	250	155'	Five Mile	Suction Lift	SMITH&LOVELESS		NO			
	82	K - Mart	903 Decatur Hwy	G'Dale	2	40	230	3	800	70'	Five Mile	Suction Lift	HYDROMATIC	6"	YES		Caterpillar	
	80	Minor Road	617 Decatur Hwy	G'Dale	2	3	460	3	91	30'	Five Mile	Submersible	Flygt	4"	NO			
	83	Payne Rd.	200 Payne Rd.	G'Dale	2	5	240	3	100	40'	Five Mile	Submersible	KSB	4"	YES	35	Cummins	Ntl Gas
	147	Vineyards	813 Blackberry Grov	G'Dale	2	7.5	230	3	125	34'	Five Mile	Suction Lift	Gorman Rupp		YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	87	Woodbrooks Apt.	330 Woodbrook Dr.	G'Dale	2	5	230	3	120	45'	Five Mile	Suction Lift	Smith & Love	6"	NO			
TRUSSVILLE	40	Cedar Creek Townhomes	3690 Cedar Creek Cir.	T'Ville	2	7.5	240	3	165	37'	Trussville	Submersible	Flygt	4"	No			
	42	Hidden Trace	3446 Annette St.	T'Ville	2	15.0	240	3	80	85'	Trussville	Submersible	Yeoman	4"	Yes	60	Olympian	Ntl Gas
	41	Sherman Oaks	128 Redwood Dr.	T'Ville	2	3.0	230	1	38	80'	Trussville	Submersible	Flygt	3"	No			
	158	Wisteria Trace	5100 Wisterial Trace	T'Ville	2	10.0	240	3	80	100	Trussville	Submersible	Paco	4"	Yes	30	Olympian	Ntl Gas
GRAYSVILLE	91	2 nd Ave (G'ville Park)	2nd Ave. SW Unit J	G'ville	2	5.0	230	3	100	51'	P. Creek	Submersible	Hydromatic	3"	No			
	94	3rd Place NW & 1st Ave NW	160 3rd Place NW	G'ville	2	3.0	240	3	50	96'	P. Creek	Submersible	KSB	4"	Yes	30	Kohler	Ntl Gas
	93	3rd St. E & 2nd Ave NE	212 2nd Avenue NW	G'ville	2	15.0	230	3		125'	P. Creek	Submersible	KSB		Yes	60	Kohler	Ntl Gas
	90	7 th Ave & Main St.	773 1st Place SW	G'ville	2	7.5	240	3	90	107'	P. Creek	Submersible	Ebara	4"	No			
	92	7th Street No. East	60 7th St. No.East	G'ville	2	5.0	240	3	50	36'	P. Creek	Submersible	Hydromatic	3"	No			
HUEYTOWN	112	Chapel Drive #1	81 Chapel Dr.	H'Town	2	2.0	115	1	20	46'	Valley Creek	Submersible	ABS		No			
	113	Chapel Drive #2	100 Chapel Dr.	H'Town	2	7.5	220/440	3	120	64'	Valley Creek	FS/Can	S&L	4"	YES	45	Generac	Ntl Gas
	117	Mississippi Ave	2217 Mississippi Ave.	H'Town	2	7.5	220/440	3	350	35'	Valley Creek	FS/Can	S&L	4"	Yes	65	Onan	Ntl Gas
	114	Oakwood Ave.	427 Oakwood Ave.	H'Town	2	10.0	230/460	3	40	53'	Valley Creek	FS/Can	Fairbanks Morse	4"	YES	45	Generac	Ntl Gas
	115	Vail Ave.	Vail Ave.	H'Town	2	15.0	220/440	3	200	73'	Valley Creek	FS/Can	Fairbanks Morse	4"	No			
	116	Walker Ave.	134 Walker Ave.	H'Town	2	7.5	220/440	3	100	45'	Valley Creek	FS/Can	S&L	4"	Yes		Generac	Ntl Gas
HOMEWOOD	133	Oak Grove Road	401 Westwood Place	H'wood	2	2.0	230	1	25	75'	Shades	Submersible	Ebara	2"	No			
	47	Alemeda	Almenda Ave & 33rd St	B'ham	2	7.5	230	3	625	21'	Valley	FS/Can	Fairbanks Morse	4'	No			
	48	Belmar	520 Belmar Dr.	B'ham	2	7.5	230	3	125	26'	Five Mile	Suction Lift	Hydromatic 40MP	4'	Yes			
	148	B'ham Race Course	1000 John Rogers Dr.	B'ham	2	88	460	3	1275	138'	Village Cr.	Submersible	Flygt	8'	No			
	50	Collegeville	2901 Huntsville Road	B'ham	2	25	230	3	3650	19.5'	Village Cr.	FS/Concret	Worthington	12'	No			

	ID	NAME	ADDRESS	CITY	# OF PUMPS	EACH PUMP			GPM	TDH	Basin	TYPE	BRAND	DISCHARGE	SSP	STANDBY POWER		FUEL SOURCE
						HP	VOLT	PHASE								RATING, KW	BRAND	
JEFFERSON COUNTY	1	Acton	2421 Acton Rd	HVR	2	10	230	3	250	50'	Cahaba	FS/Can	Smith & Loveless	8	YES	100	Caterpillar	Diesel
	2	Adamsville	5004 Hazelwood Rd	ADVL	2	50	460	3	800	130'	Prudes	FS/Concrete	Chicago	12	YES	125	Caterpillar	Diesel
	175	Alabama Boulevard	530 Alabama Blvd	TVL	2	40	460	3	230	136'	Trussville	Submersible	Yeoman		YES	85	Cummins	Ntl Gas
	178	Ashton Way	5679 Ashton Way	MCC	2	5	460	3	100	42.4'	Valley	Submersible	Flygt	4	YES	60	Katolight	Ntl Gas
	174	Bainbridge Tr.	3779 Bainbridge Trace Dr	IROND	2	23	460	3	100	129	Shades	Submersible	Flygt	4	YES	60	Onan	Ntl Gas
	140	Belmont No. 1	3562 Belmont Rd	IROND	2	75	230/460	3	1300	170'	Shades	FS/Can	Fairbanks Morse	8	YES	400	Cummings	Ntl Gas
	145	Belmont No. 2	3553 Belmont Rd	IROND	2	25	230/460	3	1325	63'	Shades	FS/Can	Fairbanks Morse	8	YES	150	Cummings	Ntl Gas
	170	Bentbrook	4300 Pine Valley Drive	MCC	2	25	230/460	3	210	119'	Valley	Suction Lift	Gorman Rupp		YES	ST'BY PUMPING	Nissan	Ntl Gas
	195	Bent River	4308 Bent River Pkwy	BHAM	2	28	240	3	204	135	Cahaba	Submersible	KSB		YES	90	Kohler	Ntl Gas
	3	Bessemer Hospital	1005 Golf Course Rd	BES	2	15	240	3	350	50'	Valley	FS/Can	Chicago	8	YES	30	Caterpillar	Diesel
	7	Blue Ridge Blvd	Blue Ridge Blvd	HVR	2	40	480	3	500	87'	Cahaba	FS/Can	Smith & Loveless	10	YES	100	Cummings	Ntl Gas
	6	Brighton	Howard Street	BRIGHT	2	40	230/460	3	400	123'	Valley	FS/Can	Clow	6	YES	113	Kohler	Diesel
	139	Brookview Church	3691 Belmont Rd	IROND	2	60	230/460	3	800	152'	Shades	FS/Can	Fairbanks Morse	8	YES	230	Cummings	Ntl Gas
	179	Cahaba Village	3100 Cahaba Village Plaz	BHAM	2	6	460	3	75	84'	Cahaba	Submersible	Flygt		YES	45	Generac	Ntl Gas
	157	Coleman Lakes	5829 High Forest Dr.	MCC	2	40	460	3	220	125'	Valley	FS/Can	Fairbanks Morse	6	YES	100	Onan	Ntl Gas
	8	Corbet Branch #1	3300 Oakwood Rd	BHAM	2	50	460	3	700	135'	Village	FS/Can	Smith & Loveless	10	YES	80	Kohler	Diesel
	9	Corbet Branch #2	2289 Minor Pkwy	BHAM	2	40	460	3	700	101'	Village	FS/Can	Smith & Loveless	10	YES	60	Kohler	Diesel
	152	Crosshaven	3246 Midland Dr.	VESTH	2	40	460	3	600	92'	Cahaba	Suction Lift	Gorman Rupp	6	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	10	Cunningham Creek #1	2641 Potts Hollow Rd	BHAM	2	30	240	3	900	75'	Five Mile	FS/Can	Smith & Loveless	10	YES	60	Onan/Cumm	Diesel
	11	Cunningham Creek #2	1572 Red Hollow Rd	BHAM	2	100	460	3	2200	120'	Five Mile	FS/Can	Smith & Loveless	16	YES	175	Onan/Cumm	Diesel
	193	Deerfoot Cove	4684 Deerfoot Cove	JEFF	2	40	460	3	390	132	Turkey	Suction Lift	Gorman Rupp	4	YES	ST'BY PUMPING	Zenith	Ntl Gas
	192	Deerfoot Drive	6756 Deerfoot Drive	JEFF	2	5	460	3	100	36.1	Turkey	Submersible	Flygt	4	YES	35	Cummins	Ntl Gas
	150	Edgewater	7500 Arabia Ave.	JEFF	4	15	240	3	240	169.2'	Valley	Suction Lift	Gorman Rupp	6	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	199	Ellington (The Arbors at Ellington)	24 Park Road	JEFF	2	11	460	3	99	73'	Valley	Submersible	Flygt		YES	35	Cummins	Diesel
	160	Ellison	4935 Ellison Street N	JEFF	2	15	460	3	200	56'	Five Mile	Suction Lift	Gorman Rupp	4	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	13	Five Mile Creek West	5308 Freeman Rd	BES	4	130	480	3	3250	83'	Valley	Submersible	KSB	14	YES	350	Caterpillar	Diesel
	177	Gardendale Med Center	2257 Decatur Hwy	GDL	2	10	480	3	52	130'	Five Mile	Submersible	ABS	4	YES	60	Cummings	Ntl Gas
	16	Garywood	2733 Owen Circle	HYT	2	10	240	3	600	41'	Valley	FS/Concrete	Chicago	8	YES	50	Katolight	Diesel
	191	Goocher Road (McCalla Trace)	4685 Goocher Road	BES	4	40	480	3	450	155	Valley	FS/Can	Fairbanks Morse	4	YES		Cummins	Ntl Gas
	197	Grand River	1450 Grand River Pkwy N.	Leeds	2	40	460	3	450	62	Leeds	Suction Lift	Gorman Rupp	6	YES	ST'BY	GM	Ntl Gas
	186	Grubbs Avenue	173 Summit Blvd	GDL	2	3	480	3	56	38'	Five Mile	Submersible	KSB		YES	25	Kohler	Diesel
	189	Haddon Place (Haddon Place 2)	1443 Haddon Place	BES	2	10	230	3	48	111'	Shades	Submersible			YES		Cummins	Ntl Gas
	188	Haddon Trail (Haddon Place 1)	1309 Haddon Trail	BES	2	15	230	3	96	186'	Shades	Submersible	KSB		YES	35	Cummins	Ntl Gas
	17	Halls Branch	115 Green Ridge	BES	2	50	240	3	4050	36'	Valley	FS/Concrete	Chicago	14	NO			
	196	Hawkins Lane (Fultondale Commercial Dev.)	3000 Hawkins Lane	JEFF	2	10		3	100	53'	Five Mile	Submersible	KSB		YES	60	Katolight	Ntl Gas
	169	Hawkridge	3523 Harrier Rd	TVL	2	4	230	3	44	43'	Trussville	Submersible	ABS	4"	YES	25	Katolight	Ntl Gas
	110	Highland 2	0 Highland Drive	JEFF	2	40	460	3	350	131'	Cahaba	Suction Lift	Gorman Rupp	4	YES	ST'BY PUMPING		Ntl Gas
	111	Hillshire 2	809 Hillshire Drive	JEFF	2	40	460	3	350	133'	Cahaba	Suction Lift	Gorman Rupp	4	YES	ST'BY PUMPING		Ntl Gas
	171	Hopewell	3050 Headrick Rd (Unit 1)	BES	2	88	480	3	529	172'	Shades	Submersible	Flygt		YES	300	Cummings	Ntl Gas
	18	I-59	4190 Prince St	BES	2	20	240	3	442	80'	Valley	FS/Can	Smith & Loveless	6	YES	50	Cummings	Diesel
	57	Lance Way 2	303 Lance Way	JEFF	4	15	460	3	140	89'	Village	Suction Lift	Gorman Rupp	4	YES	100	Cummings	Ntl Gas
	19	Lake sterling	458 Cahaba River Rd	HVR	2	15	230	3	500	45'	Cahaba	Suction Lift	Gorman Rupp	6	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	162	Letson Farms	6327 N Clubview Cir	BES	2	5	480	3	93	50	Valley	Submersible	Ebara	3	YES	40	Olympian	Ntl Gas
	187	Lou George Loop (Timberleaf)	7249 Lou George Loop	JEFF	2	15	160	3	180	81'	Valley	Suction Lift	Gorman Rupp	4	YES	ST'BY PUMPING		Ntl Gas
	161	Mariana	4870 Mariana St N U1 35207	JEFF	2	15	460	3	200	81'	Five Mile	Suction Lift	Gorman Rupp	4	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	20	Mays Village	0 Mays Village Road	BES	2	15	240	3	220	60'	Shades	Suction Lift	Gorman Rupp	6	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	21	McAdory	6251 Eastern Valley Rd	MCC	4	15	460	3	180	168'	Valley	Suction Lift	Gorman Rupp	6	NO			
	151	Medical Center East	17 Medical Park East	BHAM	2	75	460	3	2000	97'	Village	Suction Lift	Gorman Rupp	10	YES	350	Onan	Diesel
	198	Minor Comm. School	3410 Minor School Rd	BHAM	2	5	460	3			Village	Submersible	KSB	4	YES	81	Kohler	
	49	Minor Parkway	2715 Docena Cut-Off Rd.	BHAM	4	200	460	3	4340	120'	Village	FS/Concrete	Morris	24	YES	1040	Caterpillar	Ntl Gas
	23	Morgan/Greenwood #1	5038 Pleasant Hill Rd	BES	4	60	460	3	1400	88'	Shades	Suction Lift	Gorman Rupp	10	YES	125	Cummings	Diesel
	24	Morgan/Greenwood #2	3696 Hill Top Rd	BES	4	60	460	3	1400	67'	Shades	Suction Lift	Gorman Rupp	10	YES	125	Cummings	Diesel
	167	Mountainview	2030 Winnepeg Cir	SHAN	2	14.1	240	3			Shades	Submersible	ABS		YES	35	Onan	Ntl Gas
	25	New Found Creek #1	4802 New Found Rd	GDL	3	100	460	3	1150	184'	Five Mile	FS/Concrete	Goulds	16	YES	400	Caterpillar	Ntl Gas
	26	New Found Creek #2	4791 New Found Rd	GDL	3	50	460	3	1350	89'	Five Mile	FS/Concrete	Morris	16	YES	255	Caterpillar	Ntl Gas
	39	Northbrook	1420 Northbrook Dr	GDL	2	2	230	3			Five Mile	Submersible	Ebara	2	NO			
	27	Oaks Duplex	30 Park Road	PL G	2	3	240	3			Valley	Submersible	Ebara	4	NO			
	153	Old Rocky Ridge Rd. (Rocky Ridge Lane)	2736 Old Rocky Ridge Rd	HVR	2	20	230/460	3	320	85'	Cahaba	Suction Lift	Gorman Rupp	6	YES	ST'BY PUMPING	Wisconsin	Ntl Gas
	176	Orchard Avenue	4371 Orchard Avenue	BES	2	40	230/460	3	550	82'	Shades	FS/Can	Fairbanks Morse		YES	100	Cummings	
	135	Overton Rd. #1	5830 Overton Rd	IROND	2	40	480	3	980	116'	Shades	FS/Can	Fairbanks Morse	10	YES	230	Cummings	Ntl Gas
	138	Overton Rd. #2	5550 Overton Rd	IROND	2	60	230/460	3	980	163'	Shades	FS/Can	Fairbanks Morse	10	YES	230	Cummings	Ntl Gas
	166	Paden Park	6324 Bay Dr	MCC	2	100	460	3	800	179'	Valley	FS/Can	USEMCO		YES	230	Cummings	Diesel
	164	Parkwest	Minor Parkway	JEFF	2	10	460	3	200	53'	Village	Submersible	Ebara	4	NO			
	28	Patton Creek #1 (150)	2920 Hwy 150	HVR	3	40	460	3	1000	85'	Cahaba	FS/Concrete	Chicago	10	YES	500	Caterpillar	Diesel
	29	Patton Creek #2	3989 Lorna Rd	HVR	3	20	460	3	325	78'	Cahaba	FS/Concrete	Chicago	10	YES	257	Caterpillar	Diesel
	30	Pinewood	1327 Atkins-Trimm	HVR	2	60	230	3	1400	34'	Cahaba	FS/Concrete	Chicago	12	YES	155	Caterpillar	Diesel
	22	Pipeshop	2115 Long 12th St. N.	BES	2	15	230/460	3	700	27'	Valley	FS/Can	Dakota	8	YES		Kohler	Ntl Gas
	31	Pleasant Grove	4924 Forest Rd	PL G	4	40	460	3	600	195'	Valley	FS/Can	Fairbanks(Dakota)	12	YES	125	Cummings	Diesel

	ID	NAME	ADDRESS	CITY	# OF PUMPS	EACH PUMP			GPM	TDH	Basin	TYPE	BRAND	DISCHARGE	SSP	STANDBY POWER		FUEL SOURCE
						HP	VOLT	PHASE								RATING, KW	BRAND	
BIRMINGHAM	51	Dennison	228 Dennison Ave	B'ham	2	3	230	3	75	26'	Valley Cr.	Suction Lift	Hydromatic	4'	No			
	52	Fairmont	2029N 41st Ct.	B'ham	2	10	230	3	525	50'	Five Mile	FS/Can	Fairbanks Morse	4'	No			
	53	Gadsden Highway	808 Gadsden Highway	B'ham	2	10	230	3	100	55'	Village Cr.	Suction Lift	Hydromatic	4"	No			
	54	Goodrich	Goodrich Drive	B'ham	2	15	480	3	645		Five Mile	Submersible	Barnes	4"	No			
	55	Harriman	4400 Shuttesworth Dr	B'ham	2	10	220/440	3	380	30'	Five Mile	FS/Can	F'banks/Clow	4"	No			
	56	Jackson Heights	2516 Tempest Dr	B'ham	2	7.5	230	3	300	45'	Valley Cr.	FS/Can	Worthington	6'	No			
	58	Larkway	1630 Madison Ave SW	B'ham	2	5	230/460	3	100	20'	Valley Cr.	FS/Can	Aurora	4'	No			
	59	Lewisburge #1	4570 Lewisburge Road	B'ham	2	20	230/460	3	250	65'	Five Mile	FS/Can	Clow	4'	No			
	60	Lewisburge #2	4140 Lewisburge Road	B'ham	2	20	230/460	3	400	60'	Five Mile	FS/Can	Clow	4'	No			
	61	Mason City	1449 Spaukling Road	B'ham	2	10	230/460	3	250	49'	Valley Cr.	FS/Can	Fairbanks Morse	4'	No			
	62	McAlpine	1031 Ave H	B'ham	2	20	460	3	2100	23.5'	Village Cr.	FS/Concret	ABS	8'	No			
	64	Penefield	Penefield Drive	B'ham	2	10	230	3	100	90'	Five Mile	FS/Can	F/M(Usemco)	4'	No			
	65	Republic	2225 Republic Drive	B'ham	2	15	230	3	1400	27'	Village Cr.	FS/Concret	Chicago	8'	No			
	66	Riggins	3177 N 44th Ct.	B'ham	2	15	460	3			Five Mile	Submersible	Barnes	4'	No			
	67	Robertsfield	1139 Robertfield Ind. Dr.	B'ham	2	7.5	230/460	3	85	30'	Village Cr.	FS/Can	Fairbanks Morse/S&L	4'	No			
	68	Rosebud	133 Rosebud Drive	B'ham	2	20	230/460	3	100	93'	Village Cr.	FS/Can	Aurora	3'	Yes		Caterpillar	Diesel
	69	Sandusky	301 Bibb Street	B'ham	2	10	230/460	3	125	60'	Village Cr.	FS/Can	Fairbanks	4'	No			
	70	Sears Drive	9317 Sears Drive	B'ham	2	7.5	240/440	3	125	47'	Village Cr.	Suction Lift	Hydromatic 40	4'	No			
	73	Summit	105 Summit Blvd	B'ham	2	25	460	3	325	149'	Cahaba	Submersible	Fairbanks Morse	4'	Yes	125	Onan	Diesel
	74	Tin Mill Road	701 Tin Mill Road	B'ham	2	7.5	230	3	350	48'	Valley Cr.	FS/Can	S&L	4'	No			
	75	Virginianna	9778 Virginianna	B'ham	2	15	230/460	3	100	70'	Five Mile	FS/Can	F/M(Usemco)	4'	No			
	76	Vulcan	3324 N 35 St	B'ham	2	5	230/460	3	380	20'	Village Cr.	FS/Can	Fair bank Morse	4'	No			
	78	Wenonah	2800 Wallace Cove Cir.	B'ham	2	7.5	208/230	3	225	50	Valley Cr.	FS/Can	F/M(Usemco)	6'	No			
	77	Wylam	5401 8th Avenue Wylam	B'ham	2	20	200	3	315	105'	Valley	FS/Can	Fairbanks Morse	6'	Yes	160	Caterpillar	Diesel
TARRANT	126	Brummit Heights	2095 Weatherly Heights	Tarrant	2	25	230/460	3	300	102'	Five Mile	Suction Lift	ITT Marlow		Yes	80	Cummins	Ntl Gas
LEEDS	122	Ashville Road	Cedar Grove Road	Leeds	1	10	460	3	690		Leeds	Submersible	Flygt	4'	No			
	180	Leeds City Hall	1430 9th Street S.E.	Leeds	1	2	230	1	14		Leeds	Submersible	Ebara	1 1/2'	No			
	118	Coosa Ave.	Coosa Avenue	Leeds	2	60	230/460	3	450	185'	Leeds	FS/Can	Fairbanks Morse	4'	YES	150	Generac	Ntl Gas
	123	Dover Circle	1198 Dover Drive	Leeds	2	7.5	208/230	1	360		Leeds	Suction Lift	ITT Marlow	4'	Yes	43.6	Onan	Ntl Gas
	120	Dunavant Rd.	Dunnavant Rd.	Leeds	2	5	230/460	3	80	50'	Leeds	Suction Lift	Fairbanks Morse	4'	No			
	119	Parkway Dr.	1200 Parkway Dr.	Leeds	2	7.5	230	3	450	35'	Leeds	Suction Lift	Fairbanks Morse	4'	Yes		Caterpillar	Diesel
	149	Rowan Spring	998 Rowan Springs Dr.	Leeds	2	7.5	230/460	3	200	27'	Leeds	Suction Lift	ITT Marlow	6'	Yes	35	Onan	Ntl Gas
BESSEMER	46	Fox Hollies	Sew Pump-Fox Hollies B	Bess	2	2	230/460	3	75	30'	Shades	Suction Lift	Fairbanks Morse	4"	No			
	101	Jeff Metro	7240 Jeff Metro Parkway	Bess	2	3	460	3	150	21'	Valley	Submersible	Flygt		Yes		Cummins	Ntl Gas
	142	Vintage Trace	5300 Eastern Valley Rd	Bess	2	15	230/460	3	200	71'	Valley	Suction Lift	Gorman Rupp	4"	Yes	ST'BY PUMPING	Wisconsin	Ntl Gas
	132	Visionland	5051 Prince St. P	Bess	2	71	460	3	517	193	Valley	Submersible	KSB		Yes	200	Onan	Ntl Gas
	156	WaterMark	4500 Katies Way	Bess	2	20	230/460	3	300	39.5'	Valley	Suction Lift	Gorman Rupp		Yes	ST'BY PUMPING	Wisconsin	Ntl Gas
VESTAVIA	144	Longleaf - Alt.	2001 Long Leaf Blvd.	V. Hillis	2	20	460	3	150	105'	Cahaba	Submersible	KSS		Yes		Kohler	Diesel
	128	Magnolia Ridge	2203 Magnolia Cove	Vestavia	2	15	230/460	3	150	85'	Cahaba	Submersible	Ebara	4	Yes	30	Generac	Ntl Gas
	127	Surrey Oaks	1801 Surrey Oaks W.	Vestavia	2	5	230	3	85	76'	Cahaba	Submersible	Ebara	4	No			
	136	Wellington	1708 Manchester Rd.	Vestavia	2	10	240	3	100		Cahaba	Submersible	Fairbanks Morse		No			
WARRIOR	184	Dana Drive	391 Dana Road	Warrior	2	10	460	3	227	37'	Warrior	Submersible	Ebara	4"	Yes	1250	Caterpillar	Ntl Gas
	129	Ellis Rd	9775 Ellis Rd.	Warrior	2	10	230/460	3	300	63'	Warrior	Suction Lift	Gorman Rupp	4"	Yes	35	Onan	Ntl Gas
PLEASANT GROVE	124	Garden Grove	93 Annie Ln.	P.G.	2	20	230/460	3	611	79	Valley	FS/Can	Smith&Loveless	4"	Yes		Onan	Ntl Gas
	143	P.G. Shopping Center	27 Park Rd.	P.G.	2	7.5	230	3			Valley	Submersible	Barnes		No			
MOUNTAIN BROOK	130	Shookhill	2821 Shookhill Circle	Mt. B.	2	10	230	3			Shades	Submersible	KSB/Flygt	6"	NO			

Appendix C Pump Station Inspection Forms

Example EAM Work Order

Infor EAM — Print Work Order

Work Order	79176	CHECK AC POWER	Scheduled Start	09/10/2015	
Created By	BENNETTK		Scheduled End Date		
Created	09/11/2015		Status	Released	
					Reprint
Parent WO			WO Type	CM	
Division	7313		Class		
	Pump Station O/M		Priority	1	
PM Schedule			Warranty		
Cost Code			Safety		
			Equipment Criticality		
Problem Code	ELEC		Assigned To	MARIANP	
	Electrical Problems		Reported By		
Project			Assigned By	BENNETTK	
			Multiple Equipment	No	
Standard WO			Date Started		
			Date Completed		
			Time Completed		

Equipment	7313-PATTON CREEK 1 (150)	Patton Creek #1 (150) Pump Station
	7313	Pump Station O/M
	ESPS	Environmental Services Pump Stations
	ENVSRVCS	Environmental Services: Jefferson County, Alabama
	JEFFCO (*)	Jefferson County, Alabama
Manufacturer		
Model		
Serial Number		
Location		

WO/PM Comments

BENNETTK [09/11/2015 07:30]:
DUE TO A MISSION COMMUNICATION ALARM, CHECK TO SEE IF AC POWER IS AVAILABLE.

Example Pump Station Run Time Form

JEFFERSON COUNTY ENVIRONMENTAL SERVICES
PUMPSTATION OPERATION AND MAINTENANCE

Station: _____ MONTH: _____

DAY OF MO.	TIME OF DAY	MINUTES OF OPERATION				INSP. BY	DAY OF MO.	TIME OF DAY	MINUTES OF OPERATION				INSP. BY
		PUMP#1	PUMP#2	PUMP#3	PUMP#4				PUMP#1	PUMP#2	PUMP#3	PUMP#4	
1							16						
2							17						
3							18						
4							19						
5							20						
6							21						
7							22						
8							23						
9							24						
10							25						
11							26						
12							27						
13							28						
14							29						
15							30						
							31						

DATE	MAINTENANCE & REPAIRS PERFORMED

Example Pump Station Inspection Checkoff Sheet

PUMP STATION INSPECTION CHECKOFF SHEET STATION: _____

D - Daily, W - Weekly, Q - Quarterly, Y - Yearly, SA - Semi Annually, AS - As Scheduled.

	MONTH	1	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
D	Record Pump Run Times																																
D	Check Pump Operations																																
D	Check Level Control Operation																																
D	Check Sump Operation																																
D	Check Dehumidifier																																
D	Check Seal Water Flow																																
D	Inspect Wet Well																																
D	Check Packing																																
W	Exercise Generator																																
W	Check Generator Fluids																																
Q	Grease Valves																																
Q	Service Vacuum System																																
Q	Services Bubbler System																																
Y	Change Generator Oil																																
Y	Grease Motors																																
AS	Clean Seal Water Filter																																
AS	Grease Pumps																																
SA	Turn Valves																																
	INITIAL ALL INSPECTION / SERVICE																																

	PUMP STATION REPAIR LOG		
	DATE	SIGNATURE	TASK PERFORMED

Example Pump Station Daily Maintenance Report

JEFFERSON COUNTY PUMP STATION MAINTENANCE
DAILY MAINTENANCE REPAIR REPORT

DATE:

PUMP METER TIME

PUMP#1_____

PUMP#2_____

STATION LOCATION: _____

MUNCIPALITY: _____

WORK PERFORMED:

PUMP #1 _____ MOTOR #1 _____ AMPS _____

PUMP #2 _____ MOTOR #2 _____ AMPS _____

PUMP _____ MOTOR #3 _____ VALVES: GATE __CHECK ___

SUMP PUMP _____ CONTROL PANEL _____ ELEVATOR _____

LEVEL CONTROL _____ GENERATOR: _____ VENT EXHAUST FAN: _____

GRINDER _____ MISC _____ SHOP _____

CLEANING_____ GRASS CUTTING_____ WETWELL_____

SPRAYING _____

PARTS USED:

_____

_____

_____

_____

_____

COMMENTS:

PERSONNEL

NAME:	TITLE:	HOURS
1.		
2.		
3.		
4.		

DAILY MAINT. LOG MP2 PPM

Pretreatment Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	2	Updated to reflect current number of monitored industrial facilities, significant industrial dischargers and landfills	May 2018
1	3	Updated to reflect current staffing	May 2018
1	5	Figure 1 updated to screenshot of current JCESD Pretreatment program webpage	May 2018
1	Appendix A	Updated to reflect current list of monitored industrial facilities	May 2018
1	Appendix B	Updated to reflect current Letter of Acceptance	May 2018
1	Appendix C	Updated to reflect current Chain of Custody form	May 2018
2	2	Updated the number of monitored industrial facilities within the JCESD service area and landfills	2/2022
2	Appendix A	Updated to reflect current list of monitored industrial facilities	2/2022
2	Appendix B	Updated to reflect current Letter of Acceptance	2/2022

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Acronyms

ADEM	Alabama Department of Environmental Management
AWPCA	Alabama Water Pollution Control Act
CFR	Code of Federal Regulations
CMOM	Capacity, Management, Operations, and Maintenance
CWA	Clean Water Act
DMR	Discharge monitoring report
FOG	Fats, oils, and grease
FSF	Food service facility
JCESD	Jefferson County Environmental Services Department
IMS	Information management system
LIMS	Laboratory information management system
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly owned treatment works
SID	State indirect discharge
SSO	Sanitary sewer overflow
WRF	Water Reclamation Facility

Pretreatment Program

Program Overview

The 1977 amendments to the Federal Clean Water Act (CWA) and the Federal Pretreatment Regulations in Code of Federal Regulations (CFR) Section 40 Part 403 require Publicly Owned Treatment Works (POTWs) that have significant industrial users to administer a local pretreatment program. This local program must control the discharge of pollutants to the public wastewater treatment system from industries so that the industrial discharges do not:

- Cause an interference with the operation of the wastewater collection system and water reclamation facility (WRF), including sludge disposal, or
- Pass through the WRF and cause violations of either the WRF's National Pollutant Discharge Elimination System (NPDES) Permit or the water quality standards of the receiving water body.

Jefferson County Environmental Services Department (JCESD) administers its Pretreatment Program under the regulatory authority of the Alabama Department of Environmental Management (ADEM). ADEM oversees the Alabama NPDES Program for industrial sources and the Pretreatment Program for significant indirect industrial sources. Under the NPDES program, industrial facilities are permitted to discharge stormwater and/or wastewater to surface waters of the state. Under the State Indirect Discharge (SID) program, industrial facilities are permitted to discharge to publicly or privately-owned wastewater treatment works.[1]

ADEM's Industrial Section is also responsible for performing on-site inspections of industrial facilities and industrial wastewater treatment systems; reviewing plans, reports, and applications pertaining to pollution prevention and design of wastewater treatment systems; and serving as a liaison between private citizens, municipalities, industrial facilities, and other governmental agencies in the investigation and resolution of environmental compliance problems and complaints.

Industrial facilities that meet the definition of a "Significant Industrial Discharger" or "Significant Industrial User" are required to apply for a SID permit through ADEM. A "Significant Industrial User" is defined in the **Jefferson County Sewer Use Administrative Ordinance**, adopted November 6, 2012, as follows:

> "Significant Industrial User" shall mean any Industrial User of the System that is subject to Categorical Pretreatment Standards and/or who has a discharge flow of 25,000 gallons or more per average work day, or has a flow greater than 5% of the flow in the County wastewater treatment facility providing treatment, or has in its wastewater toxic pollutants as defined herein or within the Act, or is found by the County, ADEM, or the EPA to have significant impact, either singly or in combination with other contributing industries, on the System, the quality of sludge, or effluent quality"

[1] http://www.adem.state.al.us/programs/water/industrial.cnt

ADEM's administrative code does not permit the agency to designate a local authority to enforce the Alabama Water Pollution Control Act (AWPCA) through the SID permit requirements; however, local POTW owners such as JCESD are still responsible for protecting the collection system and treatment facilities.

As of September 2021, there were 53 monitored industrial facilities within the JCESD service area, of which 25 are SID permitted, in addition to 9 landfills (see Significant Industrial User List in **Appendix A**). Most of these industries are well established and include, but are not limited to, manufacturers of metals, fire extinguishers, and pipe coatings; dairy, food, and soda production; breweries, uniform cleaners and bakeries. JCESD also receives occasional requests for a one-time discharge related to a distinct event (i.e., for a groundwater discharge in a remediation situation).

Purpose and Goals

The purpose of JCESD's **Pretreatment Program** is to:

- Prevent the introduction of pollutants into the sewer system that may interfere with the operation of the system or contaminate the resulting sludge
- Prevent the introduction of pollutants into the sewer system that will pass through the system, inadequately treated, into receiving waters or the atmosphere, or otherwise be incompatible with the sewer system
- Improve the opportunity to recycle and reclaim wastewaters and sludge from the sewer system
- Minimize the possibility of sanitary sewer overflows (SSOs)
- Calculate surcharge fees for administration of the Pretreatment Program and collection of revenue from industrial users for the transmission and treatment of industrial discharges

The goals of the **Pretreatment Program** are:

- Comply with all applicable State and Federal laws required by the CWA and the general Pretreatment Regulations (40 CFR, Part 403)
- Comply with all NPDES permit requirements

Program Components and Approach

This program plan describes the following components of the JCESD **Pretreatment Program**:

- The legal authority to administer and enforce the local pretreatment program
- The permit application process and industry inspection and sampling procedures that were developed to ensure compliance with the regulatory requirements for a local pretreatment program
- Enforcement mechanisms for response to instances of industrial noncompliance
- A list of significant industrial users

The successful implementation of JCESD's **Pretreatment Program**, required by Federal and State laws, enables JCESD to better control the high strength waste introduced into its collection system, and provides a mechanism to monitor and enforce controls needed to prevent sanitary sewer surcharging and overflows into structures and the environment.

Program Resources

Related CMOM Program Documents and Other References

Other CMOM Program plans that reference or are referenced in the **Pretreatment Program** plan are as follows:

- CMOM Information Management Systems Program
- CMOM Program Organization
- Corrosion Control Program
- Fats, Oils, & Grease (FOG) Management Program
- Legal Support Program
- Service Connection and Disconnection Program
- Water Quality Monitoring Program

Staffing

The JCESD Pretreatment Program is composed of an Environmental Coordinator, Sewer Service Supervisor, five Inspectors, and an Administrative Clerk. This department is also responsible for administration of the Fats, Oils, and Grease (FOG) Management Program (refer to the **FOG Management Program** for additional details).

While the staff time is divided between the Pretreatment and FOG Programs, this document focuses solely on the employees' pretreatment-related responsibilities, as detailed below:

- Calculate industry surcharges (fees) for sampling and analysis of their discharges by JCESD
- Assist with data entry related to calculation of the industry surcharges
- Review discharge applications and written requests and provide a written determination in response to these requests
- Maintain the comprehensive listing of industries monitored by JCESD
- Schedule and conduct inspections for industry sampling. Inspectors have industry-specific training and sample monitored industries twice a year
- Conduct groundwater monitoring well sampling throughout the County, landfill leachate sampling, and discharge sampling for the JCESD-owned waste water treatment facilities
- Complete source track-down, as needed, in the event of an illicit discharge

Data Management

Microsoft Excel is the primary tool used for Pretreatment Program data management. A list of the significant industrial users and landfills that are monitored by the Pretreatment Program (**Appendix A**) is maintained in a Microsoft Excel spreadsheet. In addition, an industry-specific spreadsheet is maintained for each Significant Industrial User that is monitored by JCESD. The spreadsheet is used to record sample parameter data and calculate averages in key sample categories.

Industries are also required to self-monitor and submit a Discharge Monitoring Report (DMR) to ADEM and JCESD monthly. ADEM receives an electronic copy, while JCESD receives hard copy DMRs. The data provided in each DMR are entered manually into the industry-specific files.

JCESD also maintains a surcharges database that is used to determine the fees each industry is charged for sampling and analysis, based on the average parameters calculated from sampling events and DMR data.

For more information on JCESD's Laboratory Information Management System (LIMS) and other data management strategies used by JCESD, see the **CMOM Information Management Systems (IMS) Program** plan.

Program Implementation

Legal Authority

JCESD has the legal authority necessary to regulate and enforce the connections to its sanitary sewer system, including industrial users. The legal authority is described in Article IV of the **Jefferson County Sewer Use Administrative Ordinance**, adopted November 6, 2012. In addition, JCESD is responsible for complying with all NPDES permit requirements, which are issued and enforced by ADEM.

Public Information

JCESD maintains a webpage with basic information on the Pretreatment Program as a means of public education. The webpage, shown in **Figure 1** on the following page, includes contact information for the department where the public can call with any questions pertaining to the Pretreatment Program.

SID Permit Applications

Industrial facilities that meet the definition of a "Significant Industrial Discharger" or "Significant Industrial User" are required to apply for a SID Permit through ADEM. The applicant is required to submit a completed application with an engineering report to ADEM, and a hard copy is also sent directly to JCESD. JCESD reviews the application package and coordinates directly with ADEM during the review process. Ultimately, JCESD provides ADEM with a written "Letter of Acceptance" that states whether JCESD will accept the proposed discharge and if there are any recommendations for special permit conditions. An example letter is provided in **Appendix B**. JCESD also coordinates with and provides approvals to ADEM on permit renewals.

Figure 1. JCESD Pretreatment Program Webpage

In addition to obtaining a SID permit, industrial users must also apply for an impact permit before connection and discharge to the JCESD system will be granted. For more information on the impact permit process and fees, see the **Service Connection and Disconnection Program** plan.

Industry Inspections and Sampling

ADEM is responsible for completing inspections of SID-permitted industries on an annual basis. ADEM utilizes standard forms for inspection and notification of violations that are available through its website (http://www.adem.alabama.gov/programs/water/waterforms.cnt).

In addition, JCESD samples the monitored industries a minimum of twice a year. A hard-copy chain of custody form is completed for each sample that is taken and accompanies the sample through the analysis process. A copy of the JCESD chain of custody form is provided in **Appendix C**.

Typically, the inspector will take a sample in the field at a designated sampling location, complete the chain of custody form, and deliver the sample and form to Barton Laboratory for analysis. Not all the parameters can be analyzed at Barton Laboratory and, when necessary, samples are sent to a contracted laboratory for further analysis. The sampling information is accessible through LIMS. Once the analysis is complete, chain of custody forms are returned to either the Environmental Coordinator or Sewer Service Supervisor and the sample data is input into the industry-specific spreadsheet file. This data is then used to calculate the industry surcharges (fees) for JCESD sampling and analysis.

Targeted investigations are also performed by Pretreatment Program staff to identify the root cause of observed pipe defects. As an example, the department is currently investigating possible sources of corrosion observed downstream of food service facilities (FSFs).

Enforcement

ADEM is primarily responsible for enforcement in the JCESD service area. ADEM will send a Notice of Violation to industrial users in violation of their SID permit limits or as the result of an illicit discharge. Also, in the event of a process upset or bypass, industrial users are required to notify JCESD so that the downstream wastewater treatment facility can prepare.

If JCESD receives any industry-related complaints or observes an obvious permit violation, the Environmental Coordinator will first talk with the offender and then contact ADEM to start the enforcement process. In addition, JCESD will send out a non-compliance letter to monitored industries when measured sample parameters are above required limits.

Per JCESD's NPDES Permit, the County is required to notify ADEM of SID discharges that have a disruptive impact on the collection system or WRF. A standardized reporting form is used for this type of notification.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and if not, what activities need to be adjusted to meet program goals.

The Pretreatment Program performance measures established at JCESD are shown in **Table 1**.

Table 1. Pretreatment Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
SID Permits Discharging to System	Number	Total Number and List of SID Permittees in each sewershed serving the treatment facilities	Maintain list of active SID Permittees, Location of Discharge, and compounds/quantities discharged	Annual
Industrial Inspection and Monitoring	Number of Events	Scheduled or reactive sampling events at industrial users to assess compliance with JCESD and ADEM discharge requirements, as well as assess impacts to collection and treatment system	Maintain documentation concerning the compliance of industrial users and monitor potential toxic or corrosive discharges	Annual
Industrial Users Enforcement	Annual	Document enforcement action by JCESD or ADEM or both concerning an industrial user discharging to the JCESD collection and treatment system	Maintain documentation of industrial users' discharges, particularly with respect to release of potential toxic or corrosive compounds	Annual

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APPENDICES

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Appendix A Monitored Industrial Facilities List (as of September 2021)

Industries

(Significant Industrial Discharger facilities shown in bold red font)

ADM c/o Emergency Response Services
Allied Energy
Aramark
Amerex Corporation
Avondale Brewing/Turner Key
Back Forty Brewing
Birmingham Coca-Cola Bottling
Birmingham Hide and Tallow
Qualawash
BNSF Railway c/o Ecova, Inc-MS 2181
Buffalo Rock Bottling Company
Cahaba Brewing
Chevron Bulk Terminal Birmingham
Cintas Corp.
Cowin Equipment Co., Inc.
CRB
Cummins Mid-South, LLC
Dread River Distilling
Evans Meats
Ghost Train Brewing
Good People Brewing
Golden Flake
Goldwire Chevron
Greystone Foods
Hanna Steel
Harsco Industrial IKG
Home Baking Company
Kaiser Industries
Kamtek, Inc.
Kent Corporation
L.B. FOSTER
M & B Metals
Max Coating
Mayfield Dairy Farms, Inc.
Milo's Tea Company, Inc.
Monday Night Brewing
Mrs. Stratton's Salads Inc.
Nutec Metal Finishing, LLC
Paramount Cleaners
Precoat
Progressive Metal Finishers, Inc. (Bill: Deaver Ind.)
Red Hill Brewing
Red Mount Brewing
Royal Cup
Scholar Craft Products, Inc.
Slag Heap Brewing
SRA / US Food Stock Yard of Birmingham (formerly Milner Milling (Grain Craft)
Target Container, Co.
Thompson Tractor Company, Inc.
Tractor Equipment Co.
Trim Tab Brewing Company
Truck Wash Management (formerly Turnipseed Truck Wash)
True Story Brewing
Unifirst
US Food Stock Yard of Birmingham
Ventura Foods Inc.
W.W. Williams

Landfills

Cedar Hill
Big Sky Landfill
Eastern Area Landfill
Green Mountain
New Georgia Landfill
Pineview Landfill
Star Ridge
Santek
Willow Ridge Landfill

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Appendix B Example Letter of Acceptance

JEFFERSON COUNTY COMMISSION

JAMES A. "JIMMIE" STEPHENS – PRESIDENT
LASHUNDA SCALES – PRESIDENT PRO TEMPORE
STEVE AMMONS
T. JOE KNIGHT
SHEILA TYSON

TONY PETELOS –
CHIEF EXECUTIVE OFFICER

ENVIRONMENTAL SERVICES

Office of

DAVID A. DENARD
Director of Environmental Services
Suite A-300
716 Richard Arrington, Jr. Blvd. N.
Birmingham, Alabama 35203
Telephone (205) 325-5979
Fax (205) 325-5981

LETTER OF ACCEPTANCE

DATE

Jefferson County Environmental Services Department
Barton Lab/Industrial Pretreatment
1290 Oak Grove Road
Homewood, Al 35209

RE: LETTER OF ACCEPTANCE FOR WASTEWATER DISCHARGE

This correspondence shall serve as a request for a "LETTER OF ACCEPTANCE" for permission to discharge the following wastewater generated by _____from the facility located at _____ to the Jefferson County sanitary sewer system:

Chemical Name #1 – _____

Chemical Name #2 – _____

Chemical Name #3 – _____

Chemical Name #4 – _____

We have enclosed a copy of a Material Safety Data Sheet for all chemicals and raw materials expected to be discharged in this wastewater.
This process wastewater is being generated from _____
_____

Our process wastewater ***will or will not*** receive any treatment prior to discharge to the sanitary sewer. [If there is any pretreatment, list here]. Approximate amount of discharge to sanitary sewer is _____ gallons per (day/week/month)

We understand that this "Letter of Acceptance" is issued to_____
for the specific chemicals listed above and discharged from _____to the sanitary sewer.
We also understand that any change in chemicals, volumes, and/or discharge pollutants must be approved by Jefferson County Industrial Pretreatment Office. We realize that the discharge of unapproved chemicals/pollutants or volumes may result in revocation of this "Letter of Acceptance and will require that the wastewater be sent off-site for disposal.

I am the person designated by _____to be responsible for compliance with the conditions outlined in this "Letter of Acceptance".

Sincerely,

cc: *President/Plant Manager of Company*

Xxx
Xxx

February 21, 2022

JEFFERSON COUNTY INDUSTRIAL PRETREATMENT PROGRAM

DISCHARGE APPROVED **DISCHARGE DENIED**

If approved, Jefferson County reserves the right to void or temporarily suspend this Letter of Acceptance at any time should this discharge cause a problem at the POTW or in the collection system.

_____

Signature/Title Date

[SUBMIT TWO ORIGINAL COPIES OF THIS DOCUMENT. THE COUNTY WILL SIGN, DATE AND SEAL BOTH ORIGINALS. ONE ORIGINAL WILL BE SENT BACK TO THE COMPANY. THE OTHER ORIGINAL WILL BE MAINTAINED IN COUNTY FILES.]

Appendix C Sample Collection Chain of Custody Form

Jefferson County Commission Environmental Services Department–Barton Laboratory

Industrial Pretreatment Sample Collection / Chain of Custody / Request for Analysis

Sample ID: Prudes Influent	Primary Measuring Device:
Sample Set-up Date: 3/28/17 Time: 0816	Sampler Type & ID#:
First/Start Sample Date: 3/28/17 Time: 0816	Flow Meter Type & ID#:
Last Sample Date: 3/29/17 Time: 0801	Sample Interval
Collection Date: 3/29/17 Time: 0810	Sample Type: Grab ↑ Composite ↑ {TVVC / TCVC / TCVV}
DAY 1: Weather Cloudy Crew: RLC	**DAY 2:** Weather Clear Crew: RLC
Sample Collected by: Rodney L. Currington	Date: 3/29/17 Time: 0810

Comments:

Sample Split? Yes ↑ No ↑ Facility Discharge-Gallons per day 24 hour:____ Instantaneous:_____ Time:_____

CHAIN OF CUSTODY

Barton Laboratory			Industry Split		
Relinquished by	Date	Time	Relinquished by	Date	Time
Received by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Relinquished by	Date	Time
Received by	Date	Time	Received by	Date	Time

MUST BE COMPLETED! Preservation Method: AX BX C D by WWTP ↑ / by Field Crew X↑ Time __ ____

REQUEST FOR ANALYSIS

☒	Analyte	Value	Units	PM	Analyst Name	
	pH grab		S.U.			Lab ↑ Field ↑
	pH composite		S.U.			Lab ↑ Field ↑
	BOD_5		mg/L			
	TSS		mg/L			
	COD		mg/L			
	NH_3-N		mg/L			
	Total-P		mg/L			
	Oil & Grease		mg/L			
	O&G non-Polar SGT-HEM		mg/L			
	TRC		mg/L			
	Aluminum, T					
X	Arsenic, T			C		
	Barium, T					
	Cadmium, T					
	Chromium, T					
	Cr Hexavalent					
	Copper, T					

PM = PRESERVATION METHOD:
A --Iced, 4° C.
B --H_2SO_4 to pH<2
C --HNO_3 to pH<2
D --NaOH to pH>11

☒	Analyte	Value	Units	PM	Analyst Name
	Iron, T				
	Lead, T				
	Lead, T Recov				
	Magnesium, T				
	Manganese, T				
	Mercury, T				
	Molybdenum,T				
	Nickel, T				
	Sodium, T				
	Silver, T				
	Tin, T				
	Zinc, T				
	Cyanide, T				
	Chloride, T				
	BTEX				

ANALYTICAL METHODS: R2=*EPA-600/4-79-020;* R3=*EPA Method 1664;* {##}=*EPA SW-846;* all others ref. *Standard Methods, 22nd Ed.* or later. DO, 4500-O C; Conductivity, 2510-B; pH, 4500-H^+ -B; BOD_5, 5210-B; $CBOD_5$, 5210-B; TSS, 2540-D; COD, 5220-D; TKN, *R2* 351.2; NH_3-N, 4500-NH_3-G; Total-P, 4500-P F; *ortho*-P, 4500-P F; TOC, 5310 B; Nitrate, 4500-NO3 H; Nitrite, 4500-NO_2 H; Turbidity, 2130 B; Hardness, 2340 C; Oil & Grease, *R3*, 1664; Mercury, 3112B {7471 B}. Lead or Silver, Total Recoverable {3005A},{200.7}; 3030-Fb, 3111-B,3113-B. TOTAL METALS--Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin,

C *20050414 AH, C:\Barton Forms\IPT Sample Collection, Chain of Custody*

Corrosion Control Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	1	Updated Table 1 to reflect current high-risk areas	7/23/18
1	3	Updated section on Shades Valley Transfer Phase 1 Project	7/23/18
2	3	Updated section on Scotts Branch pre-treatment facility	2/2022
2	3	Added section on Hoover Area Pump Stations Force Main Assessments, Odor and Corrosion Study	2/2022

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Acronyms

ARV	Air release valve
CCTV	Closed-circuit television
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
COF	Consequence of failure
CSSAP	Continuous Sewer System Assessment Program
GIS	Geographic Information System
GLPM	Gravity line preventive maintenance
H_2S	Hydrogen sulfide
HDPE	High density polyethylene
JCESD	Jefferson County Environmental Services Department
LOF	Likelihood of failure
NASSCO	National Association of Sewer Service Companies
NPDES	National Pollutant Discharge Elimination System
PACP	Pipeline Assessment and Certification Program
PVC	Polyvinyl chloride
SCADA	Supervisory Control and Data Acquisition
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
TVI	Television inspection
WRF	Water Reclamation Facility

Corrosion Control Program

Program Overview

Purpose and Goals

The purpose of the **Corrosion Control Program** is to identify and inspect infrastructure within Jefferson County's wastewater collection system that is corroded or at risk of corrosion, conduct defect analysis, and prioritize repairs and rehabilitation. This program will be conducted as part of the **Continuous Sewer System Assessment Program (CSSAP)**, described in the Jefferson County Environmental Services Department's (JCESD) **Engineering Program** plan. As part of the **CSSAP**, gravity sewers (pipes and manholes) will be assessed for defects. Additionally, the Corrosion Control Program will include the assessment of ductile iron pressure force main pipelines, air release valves (ARVs), and lift stations. Efforts will first be focused on priority areas where known or anticipated corrosion issues may have occurred, including corrosion related defects identified as part of the **CSSAP**. Areas of corrosion risk have also been identified downstream of industrial dischargers and restaurants, where corrosive materials are mingled with the sanitary sewer discharged from the premises, causing corrosion of the pipe inverts.

The goals of the **Corrosion Control Program** are to invest in activities that proactively identify corrosion sources in high potential areas and to initiate strategies to reduce the impacts of corrosion in the wastewater collection and conveyance system that would ultimately contribute to SSOs. In doing so, JCESD will improve overall compliance with its National Pollutant Discharge Elimination System (NPDES) permits by reducing the risk of sanitary sewer overflows (SSOs) resulting from the degradation of force main and gravity sewer pipes.

Infrastructure areas that may be considered high-risk areas for corrosion include those listed in **Table 1**.

Table 1. High Risk Areas for Corrosion

Corrosion Risk	Corrosion Type
Flat, low velocity/long retention time gravity sewers areas	Internal – Hydrogen Sulfide (H_2S) corrosion
Pump stations in sequence or having long periods between pumping intervals	Internal - H_2S corrosion
Turbulent areas, drop manholes, force mains, and force main discharge points	Internal - H_2S corrosion
Inverted siphon discharges	Internal - H_2S corrosion
Areas with chronic odor complaints	Internal - H_2S corrosion
Exposed metal pipes in streams	External – Corrosion
Pipes that cross major petroleum or gas transmission pipelines	External - Corrosion from stray currents
Restaurants/Industrial areas where corrosive discharges may occur	Internal - Acidic discharge corrosion

In addition to identifying high risk areas in the collection system for corrosion inspection, pipe material also needs to be considered in the prioritization process. Concrete and iron pipes, which are susceptible to H_2S-induced internal corrosion and acidic discharges from industrial sites, need to be evaluated before vitrified clay and plastic pipes [polyvinyl chloride (PVC) and high-density polyethylene (HDPE)] that are generally very resistant to hydrogen sulfide corrosion.

Program Components and Approach

This plan describes the components and approach to implementing a corrosion control program that involves assessment of gravity sewer pipelines and manholes, as well as force mains, lift stations, and ARVs. This plan includes a description of the following:

- Resources – Staffing and Equipment
- Tools for Implementation
- Assessment Strategies
- Prioritization process for addressing corrosion-related defects

From past experience and inspections of the wastewater collection and conveyance system, JCESD has identified hydrogen sulfide as the primary source of corrosion in force mains, gravity pipes, manholes, and appurtenances. More recently, JCESD has identified gravity pipeline corrosion due to chemical discharges in the wastewater collection system as a significant issue in specific locations. See the JCESD **Pretreatment Program** plan for more information on how JCESD monitors industrial dischargers for compliance with industrial wastewater discharges. The customer listed has an ADEM issued State Indirect Permit to discharge to the JCESD sanitary sewer system with specific constraints. Through the collaborative work of JCESD and ADEM, the State of Alabama has taken necessary enforcement action to require more pretreatment at this site. There are corrosion issues in the invert of the pipe requiring rehabilitation and replacement of pipe segments to eliminate the threat of SSOs.

JCESD has also observed invert corrosion issues in gravity sewers located downstream of fast food restaurants and is currently working to identify the source of the corrosion. The intention is for a more comprehensive policy to be adopted in order to eliminate this source from entering the sanitary sewer system, which will ultimately protect public assets.

Shades Valley Transfer Study and Rehabilitation

JCESD completed a study to identify corrosion issues in the Shades Valley Transfer, which is approximately 18 miles of sanitary sewer that provides wastewater service to portions of southeast Jefferson County, serving areas that include Irondale, Birmingham, West Bessemer, Mountain Brook, and Homewood. The corrosion control study performed by Tetra Tech included an assessment of 54- to 72-inch reinforced concrete pipe. The study included the identification of risk assessment priorities, focus areas to perform detailed corrosion inspections, and monitoring and testing of the Shades Valley Transfer for hydrogen sulfide. Data were collected to calibrate a computerized corrosion model to predict the useful life of the pipeline. Following the assessment, the remaining life was predicted for the Shades Valley Transfer based upon the structural and hydraulic integrity of the pipeline. (Also see **Shades Valley Transfer Study – Final Report**, April 2009, by Tetra Tech).

The study identified no structural deficiencies that required immediate repair, but there was approximately 4,360 feet of pipe located downstream of the Red Mountain Tunnel that needed to be rehabilitated. Additional recommendations included ongoing corrosion monitoring, additional flow monitoring, and SCADA improvements to monitor the hydraulic capacity.

The Shades Valley Transfer (SVT) Phase I project was completed 2012 that included rehabilitation of approximately 6,100 linear feet of 54-inch reinforced concrete pipe using the cured in place pipe method. This section of the SVT was located within the City of Bessemer and extended from Manhole 1012-199 to 1018-124.

With the decommissioning of the Scotts Branch pre-treatment facility, a pilot ferric chloride dosing system that includes a storage tank, pump and piping was constructed allowing dosing of the chemical into the industrial flow. Ferric chloride dosing demonstrated effective prevention of odors at the Scotts Branchy Facility and the limited formation of hydrogen sulfide upstream of the SVT further preventing accelerated deterioration of this critical transmission main. A permanent ferric chloride feed system was as part of the Cahaba Water Reclamation Facility (WRF) Sludge Transfer Force Main and Ferric Chloride Feed System Project. This project provided for installation of a force main to convey the waste active sludge (WAS) from the Cahaba WRF to the Al Seier Pump Station where the WAS is conveyed to the SVT and then to the Valley WRF. The ferric system constructed as part of this project replaced the pilot system at the Scotts Branch Facility. This system also provides corrosion protection for the SVT from the WAS conveyed as it creates conditions highly favorable to hydrogen sulfide generation.

Ongoing CCTV inspection of the SVT indicates that the overall condition of this critical asset is very poor. Exposed and/or corroded pipe reinforcement and failed gaskets are noted throughout. The ferric chloride will reduce the potential for ongoing corrosion. As part of previous studies, it was also recommended that the Morgan and Parkwood scrubbers also be rehabilitated. Full air handling capacity of the units should be restored along with the associated scrubbers to help reduce odor complaints. Long term monitoring of the SVT is recommended that would include installation of odor loggers along with mortar cubes to obtain data on the overall operational conditions within the main. This data would allow calculation of the rate of deterioration within the system and projected remain serve life.

Hoover Area Pump Stations Force Main Assessments, Odor and Corrosion Study

JCESD completed force main assessments and a Pump Station odor and corrosion study in the Hoover, Trace Crossing area. The area consists of the sewer basins contributing flow in the Trace Crossings area including the Stadium Trace, Hoover Met, Hoover Highschool, Magnolia Trace, Hwy150/I459, and Lake Crest Pump stations. The area has experienced odor complaints and corrosion of several force mains sections along the Lake Crest. The force main assessment consisted of excavation and ultrasonic testing of the Magnolia and Lake Crest Force mains. A project is designed to replace sections of the Lake Crest Force Main. Additional assessment of the Magnolia Trace force main was conducted with emerging technologies Xylem, SmartBall acoustic sensor and PipeDiver electromagnetic sensor runs. The PipeDiver assessments showed limited corrosion indicted wall loss in a few select locations. The assessment recommendation was to reassess the Magnolia Trace force main in 5 years to compare wall loss over time.

The Hoover Pump Station odor and corrosion study was completed with a corrosion model and report. A pilot study is planned to dose bauxite at the Stadium Trace Pump station to confirm chemical dosing will provide odor control and corrosion prevention for these area pump stations and force mains.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed Standard Operating Procedures (SOPs) for various Capacity, Management, Operations, and Maintenance (CMOM)-related job duties, including ARV inspection and maintenance. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Other CMOM program plans that are referenced and/or are related to the **Corrosion Control Program** plan include:

- CMOM Program Organization
- CSSAP, which is detailed in the Engineering Program plan
- Equipment and Supplies Management Program
- Gravity Line Preventive Maintenance Program
- Information Management Systems Program
- Pretreatment Program

JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) describes the requirements for new sewer design and construction.

Staffing

JCESD requires the careful coordination between the Line Maintenance and Pump Station Operation and Maintenance Divisions to execute a Corrosion Control Program, as each share responsibilities to operate and maintain the wastewater collection system. The Line Maintenance Division has responsibility for linear assets associated with the wastewater collection system, including gravity sewer manholes and associated items. The Pump Station Operation and Maintenance Division is responsible for maintenance of all pump stations, force mains, and air release valves in the wastewater collection system.

The two divisions coordinate efforts to assess the operation of pump stations, and to identify corrosion sources in the wastewater collection system under the direction of the Deputy Director and the Chief Civil Engineer overseeing the Line Maintenance and Pump Station Divisions. Each Division also coordinates with the Construction Division to perform repairs on defective sewer assets, unless the remedial action exceeds the capabilities of the JCESD resources (For more information, see the **CMOM Program Organization** plan).

Pump Station personnel identify operation and maintenance (O&M) related issues while performing routine pump station inspections and reactive maintenance and document observed corrosion and other issues that require additional attention. Line Maintenance personnel perform cleaning and inspection services for gravity sewer pipes, manholes, and pump station wet wells. Line Maintenance crews document all defects found in pipes and manholes for further evaluation.

JCESD Sewer Construction personnel may perform repair work on sewer mains with corrosion defects. Due to the nature and complexity of required repair work, sewer replacement and repairs that address defects caused by corrosive forces may be performed by contractors.

Program Implementation

Data Review Process to Identify Infrastructure Corrosion or at Risk of Corrosion

Activities to be considered for the identification of infrastructure corroded or at risk of corrosion include the following:

- Use of Geographic Information System (GIS), asset databases, and as-built drawings to identify assets with the following attributes:
    - Metallic and concrete gravity sewer pipe and manholes
    - Ductile Iron force mains and force main discharge points
    - Air release valves and combination air release valves
    - Exposed metallic or concrete pipes in creeks
    - Pipes that cross major petroleum or gas transmission pipelines
    - Pump stations
    - Drop manholes (Memphis Tee)
    - Manholes with structural defects susceptible to corrosion
- Review and document chronic odor complaints that are stored in the JCESD Customer Service and the Cityworks database records of service requests. Such areas will be flagged for corrosion inspection.
- Review subbasins where sewers have been internally inspected and coded with corrosion defects and utilize the linear asset data collected in executing the **Gravity Line Preventative Maintenance (GLPM) Program** to code and score corrosion defects for continuous identification of defective areas.
- Identify industrial areas where corrosive chemical discharges may be occurring or have occurred.
- Interview supervisors and field crews to identify chronic odor issues and areas of corrosion visually identified.
- Review flow monitoring data to identify pipe segments with low velocity/long retention time.
- Once assets are screened and listed for each identified Priority Area, proceed to the next step for inspection of infrastructure as part of the asset assessment strategy in the **CSSAP,** which is included in the **Engineering Program**, and **GLPM Program** plans.
- Assets identified with corrosion defects will be added to one of the following categories for the next steps of the Program:
    - Follow up inspections and monitoring for minor corrosion related defects
    - Maintenance performed on the asset to mitigate corrosion issues, which could include chemical addition to neutralize the pH or oxidize the wastewater, and minimize formation of septic environments

- Perform rehabilitation to line or coat the asset as a barrier to protect from corrosives and further damage to the asset
- Perform replacement of the asset if significant structural damage has occurred
- Where identified corrosion related issues can be linked to a particular source (industry, commercial, other), the source and lessons learned will be incorporated into the long-term solution to mitigate corrosives from being discharged to the sanitary sewer system (i.e., policies, regulations)

Prioritization and Corrosion Defect Analysis

Corrosion defects are analyzed to determine if the source of the corrosion is readily identified (i.e., hydrogen sulfide, other corrosive wastewater, or operations/maintenance related activities). This determination is based on the categories of deficiencies or defects identified, such as:

- Presence of hydrogen sulfide during inspections of manholes, gravity pipes, force mains, and pump stations, as identified by visual inspection or using a portable gas detector.
- Corrosion defects that are identified in areas with no presence of hydrogen sulfide will be investigated further to determine the source of the corrosion. This process will include identification of upstream industrial dischargers and review of Industrial Pretreatment waste sampling reports. Reports will be reviewed for low pH and the presence of potentially corrosive chemicals.
- Retention times of wastewater in wet wells may be a major component of hydrogen sulfide and slime build up that causes the generation of hydrogen sulfide gas. Operations and maintenance changes to reduce the impact of hydrogen sulfide gas on infrastructure will be evaluated.

Prioritization of repair of corrosion defects is an inclusive process that occurs in tandem with the **CSSAP,** as part of the **Engineering Program,** and the **Gravity Line Preventive Maintenance Program** processes. Corrosion defects and their severity provide for a condition score and form the basis for a subsequent risk ranking process of assets. Gravity sewers (pipe segments), force mains, and pump stations are assigned likelihood of failure (LOF) values and consequence of failure (COF) consideration. Corrective actions (repairs or rehabilitation) are then determined per the highest risk-based priority.

Inspection of Infrastructure at Risk of Corrosion

Manholes

Manhole condition assessments for those assets identified during the data review and risk identification step will be completed using inspection technologies such as visual and/or pole camera inspections.

In the field, the presence of hydrogen sulfide may initially be identified by its distinctive “rotten egg” sulfur odor. Rodding crews and Television Inspection (TVI) crews also carry portable gas detectors, which are used to alert staff of the presence of H_2S gas above preset concentration levels. The presence or absence of H_2S gaseous odors will be noted and reported to the Line Maintenance Supervisor for further consideration and assessment.

Manholes that have severely compromised structural integrity and that pose a hazard to personnel or threat to the public are reported to supervisors immediately (see example shown in Figure 1). Manhole corrective actions are documented by field crews and supervisors and entered into work orders. For more information on work orders and Cityworks, see the **CMOM Information Management Systems Program** plan.

Figure 1. Concrete Manhole Corrosion from H_2S Gas

Gravity Sewers

Pipe segments (manhole to manhole) or other areas identified as having high risk for corrosion have been included as priority areas in the **CSSAP** for asset condition assessments (see the description of the **CSSAP** in the **Engineering Program** plan for more information concerning practice and procedures for sewer system assessment). If not already included in previous assessment efforts, they will be inspected by Closed Circuit Television (CCTV) cameras and coded using the National Association of Sewer Service Companies' (NASSCO's) Pipeline Assessment and Certification Program (PACP) defect code format, including defects specifically related to corrosion.

If the areas have already been inspected, the previous CCTV inspection results will be reviewed to identify corrosion defects. The inspection results will be documented in accordance with the **CSSAP** described in the **Engineering Program** plan.

Figure 2. Ductile Iron Pipe H_2S Corrosion

The defects will be analyzed to establish a priority-based schedule of rehabilitation by methods appropriate for each area. Should CCTV inspection results indicate significant corrosion defects, the Supervisor overseeing the Line Maintenance Division will schedule a more frequent inspection in the corrosive area because of its susceptibility to corrosion.

The Supervisor may reduce the frequency of the accelerated inspections if subsequent inspections do not indicate a rapid rate of corrosion of the pipe.

Ductile Iron Force Mains and Force Main Discharge Points

Corrosion has not been a significant contributor to date of force main failures within the JCESD service area. SSOs have occasionally been caused by a failed ARV or a damaged cleanout.

Cleanouts have been installed on force mains in the past for maintenance purposes but have become a risk to JCESD as the above ground portions can be hit during mowing or other maintenance work, thus damaging the force main.

When a force main breaks because of a damaged cleanout, JCESD removes the cleanout and makes necessary repairs to the force main to eliminate the risk of future breaks and SSOs at that location. JCESD will continue to monitor SSO and force main maintenance records to document corrosion issues and adjust assessment plans accordingly.

Figure 3. Ductile Iron Pipe Invert Corrosion from Acidic Discharge

Pump Stations

JCESD's Asset Management Program Manager is assisting JCESD with performing condition assessments of its wastewater pump stations. The work being completed includes a visual inspection to evaluate the physical condition of each pump station to obtain adequate data to determine rehabilitation needs for the lift station. Pump drawdown tests are performed to assess the hydraulic performance of the pumps related to the design operating points. Electrical components are being assessed to document condition defects that require improvements. Wet well conditions are assessed to document observed corrosion effects of hydrogen sulfide gas on the concrete and steel components of the pump station.

Capital improvements are prepared for defective assets, in whole or in part, associated with each pump station and are ranked based on severity and risk to affect performance.

Air Release Valves

There are generally three types of ARVs:

- *Air Release Valve*: Includes slow air release function only; typically placed at intermediate high points along the force main
- *Air Vacuum Valve*: includes vacuum breaking and high-volume air release; typically located at absolute high points, where the HGL drops below the pipe and air must enter to eliminate vacuum conditions, and along force mains to facilitate proper filling
- *Combination Air Valve*: Includes slow release, vacuum breaking air release, high volume air release plus, in many cases, controlled air release

Internal corrosion of a metallic pipe can occur when a vacuum breaking ARV introduces air into the pipe. For this reason, metallic force mains should use air release-only ARVs wherever possible, especially where the pipe is not protected with a ceramic epoxy or equivalent liner. Additionally, external corrosion can occur inside the ARV vault as the air from the pipe is released. If the air contains hydrogen sulfide, the external wall of the pipe, the ARV itself, the saddle and isolation valve attaching the ARV to the pipe, the vault, and the vault cover may all become corroded over time.

Air valves are inspected periodically on a priority basis in areas where there is a history of pump station or force main issues. Maintenance information can be found in the ARV SOPs, which are included in JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Corrosion Control Provisions Included in New Sewer Design and Construction Guidelines

JCESD developed the **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) that defines design standards for new wastewater system appurtenances that minimize the risk of corrosion. JCESD has a minimum slope criterion for all new gravity sewer pipe that is intended to produce a minimum velocity in the system, so that solids will remain suspended in the wastewater stream and conditions that promote hydrogen sulfide gasses are not created. During design of a new gravity system, peak storm flows, as well as dry weather flows, are considered; however, there may be periods of extreme low flow conditions that promote hydrogen sulfide generation. When such cases cannot be avoided, design should include corrosion barriers to cementitious infrastructure and ductile iron pipe or consider alternative pipe and/or manhole coating materials.

JCESD has updated the specifications to include either Permox CTF or TNEMEC 431 interior liquid epoxy lining. These modified polyamine ceramic epoxy coatings are solids/abrasion resistant, specifically designed for wastewater applications, and provide resistance to hydrogen sulfide gas and subsequent pipe corrosion. JCESD has also expanded application for plastic pipes such as PVC and HDPE to help reduce pipe corrosion potential.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. They are designed to collect information that enable JCESD to determine if established goals and level of service are being met and if not, what activities need to be adjusted to meet program goals. **Table 2** summarizes the performance measures that have been established at JCESD.

Table 2. Corrosion Control Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
Pipe Corrosion Assessment	Value	Length of pipe inspected for corrosion.	# per month	Annual
Manhole Corrosion Assessment	Value	Number of manholes inspected for corrosion.	# per month	Annual

Fats, Oils & Grease (FOG) Management Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	Various	Verified/updated all website links in document	5/01/18
1	3	Updated staffing information	5/17/18
1	8	Updated FOG Education section	9/20/18
1	9	Updated Figure 2	5/25/18
1	Appendix D	Updated New FSF Permitting Guidelines	5/17/18
1	Appendix G	Updated List of Permitted FSFs	5/25/18
1	Appendix I	Updated Locations of Household Cooking Oil and Grease Recycling Centers	5/25/18
2	12	Updated Figure 3	2/2022
2	Appendix D	Updated New FSF Permitting Guidelines	2/2022
2	Appendix I	Updated Locations of Household Cooking Oil and Grease Recycling Centers	2/2022

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Appendix B Food Service Facility FOG Inspection Form

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Acronyms

BMP	Best management practice
CCTV	Closed-circuit television
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
CSSAP	Continuous Sewer System Assessment Program
FAQs	Frequently asked questions
FOG	Fats, oils, and grease
FSF	Food service facilities
GCD	Grease control device
GIS	Geographic Information System
GLPMP	Gravity Line Preventive Maintenance Program
GRD	Grease removal device
I/I	Infiltration and inflow
IMS	Information management system
JCDH	Jefferson County Department of Health
JCESD	Jefferson County Environmental Services Department
NCN	Non-compliance notification
NPDES	National Pollutant Discharge Elimination System
PM	Preventive maintenance
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility

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FOG Management Program

Program Overview

Purpose and Goals

The purpose of the Jefferson County Environmental Service Department (JCESD) **Fats, Oils, and Grease (FOG) Management Program** is to:

- Provide necessary resources and training to sustain the program
- Provide grease trap and interceptor design standards
- Regularly inspect grease traps and interceptors
- Maintain a current food service facility (FSF) inventory
- Establish FOG best management practices (BMPs)
- Provide a fair and credible enforcement component
- Administer a public education program for residential sources of FOG
- Keep FOG data current in the information management system (IMS) program

The goals of the **FOG Management Program** are to:

- Minimize FOG from entering the County sanitary sewer infrastructure in concentrations or rates that exceed those established by the County
- Preserve sewer capacity by minimizing FOG related flow obstructions
- Reduce or eliminate collection system surcharges and sanitary sewer overflows (SSOs) caused by FOG related flow obstructions
- Prevent FOG related maintenance and operational issues associated with sanitary sewer infrastructure, thereby reducing operational and maintenance costs

Program Components and Approach

The **FOG Management Program** includes a comprehensive system of administrative, management, regulatory oversight, and documentation activities. The program plan includes a description of each program element. In addition, the program includes procedures for inspection and compliance with JCESD design and construction standards.

Specifically, the following items are included in this program document, where appropriate:

- A description of the FOG Management Program, including but not limited to, a summary of the extent of FSFs and the County inspections protocols, including the frequencies and priorities of inspections
- Standard operating procedures, including procedures for identifying and permitting existing and new unpermitted facilities

- Key performance metrics for tracking and documenting the performance and effectiveness of the **FOG Management Program**, as well as fostering strategies to improve the **FOG Management Program**
- Data attributes for the **Sewer Mapping Program** (as described in the **Engineering Program** plan) to allow the FOG Management Program data to be compared in the JCESD computerized maintenance management system (CMMS) against other pertinent data, such as the occurrence of SSOs and permit violations
- Training program tailored to increase communication efficiency between sewer system operations and maintenance personnel and FOG Management Program personnel

SSOs present a major concern to wastewater agencies across the country and they can occur from individual causes or the synergistic interaction of multiple agents, such as FOG, roots, infrastructure defects, or extraneous flows. Sewers are designed to carry FOG, but there are many variables that can alter the initial design conveyance capacity of the sewer if sewer maintenance or FOG management is deficient. Although utilities across the United States differ on how FOG contributes to SSOs in their system, it is widely reported that FOG can be the most frequent sole or contributory cause of SSO events. Reports also indicate wet weather infiltration and inflow (I/I) may be a less frequent SSO cause, but it can be the greatest SSO volume impacting source.

The "root cause" of SSOs is difficult to accurately assess and, therefore, national reporting figures on the extent of FOG as the source of SSOs should be considered, with the understanding that methods of identifying the root cause will vary from surface level visual inspection to internal pipe inspections using closed circuit television (CCTV) inspection technology. Regardless of the actual percentage of direct or indirect causative impact that FOG has on SSOs, however, it is good practice to manage its introduction into the sewer system. This includes using FOG regulatory measures, especially downstream of heavy grease producing locations such as FSFs or localized areas of residential housing.

The **FOG Management Program** is intended to reduce the number of SSOs, contributing to compliance with JCESD's National Pollutant Discharge Elimination System (NPDES) permits. JCESD has the legal authority to implement and enforce the **FOG Management Program** to reach this goal through the **Jefferson County Sewer Use Administrative Ordinance**, described in the **Legal Support Program** plan.

Program Resources

Related CMOM Program Documents and Other References

The following Jefferson County Administrative Ordinances (current versions) are referenced in this Plan:

- Jefferson County Sewer Use Administrative Ordinance
- Jefferson County Sewer Use Charge Ordinance

JCESD developed standard operating procedures (SOP) for implementation of the FOG Management Program. This document [(**Fats, Oils & Grease (FOG) Program Food Service Establishment Inspection Training Guide and Standard Operating Procedures, February 2013**)], included as **Appendix A**, details

safety, equipment, inspection procedures and documentation, enforcement actions, and data management related to the program. A copy of the FOG Inspection form is included in **Appendix B**.

JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) describes the requirements for grease control devices.

Other CMOM Program plans that are referenced in the **FOG Management Program** plan are as follows:

- CMOM Program Organization
- Legal Support
- Customer Service
- Overflow Tracking
- Sanitary Sewer Overflow Response and Reporting Program (SSORRP)

Staffing

Currently, a nine-person staff supports the JCESD FOG Management Program and activities related to the Pretreatment Program, including one coordinator, one supervisor, five inspectors, a public relations coordinator, and an administrative clerk. While the JCESD Director has overall responsibility for the FOG Management Program, day-to-day activities of the program are supervised by the Environmental Coordinator (Barton Laboratory) and are executed by the Sewer Service Supervisor and five Sewer Service Inspectors. Outreach and community education are administered by the Public Relations Coordinator. Oversight of the FOG Management Program is provided by the Environmental Compliance Administrator.

For more information, see the FOG Management Program staffing chart in the **CMOM Organization Program** plan.

Information Management System

The databases used by the FOG Management Program are compatible with electronic data management systems used by other County Departments and Divisions, to allow for data sharing with other entities. Sharing of compatible information increases the communication value between the departments and provides a consistent focus on JCESD's goal of minimizing SSOs.

Identification of FSFs that are non-compliant with their FSF permit or the County FOG Regulations is provided to the Line Maintenance Division for evaluation and scheduling of sewer inspection and cleaning within the CMMS. Sewer lines downstream of these FSFs may be subject to an increased potential of FOG related blockages. Cleaning, maintenance, and CCTV activities in these areas should be scheduled more frequently until a sense of any impact is determined.

Strategies for further integration of FOG data into the CMMS are being evaluated, including incorporating the Grease Control Program database, inspection data, and work order preparation into the Cityworks CMMS system.

Program Implementation

FOG Characterization

An effective and efficient FOG Management Program must be based on a good understanding and knowledge of FOG sources and the extent of FOG related problems. JCESD completes a FOG characterization study on an annual basis to determine problem maintenance areas in the sanitary sewer system and the root causes of the problems, particularly if there is a pattern of higher than expected system surcharging or SSOs. The characterization study assists JCESD in determining the root causes that appear to be FOG-related and which FOG sources are the primary contributors to the issues.

FOG Sources

Major contributors to FOG in the JCESD sewer collection system are commercial establishments involved in food preparation. There are over 2,300 active FSFs in Jefferson County. Residential areas, particularly locations of high density housing and apartments, can also be significant FOG sources. JCESD's FOG Management Program includes strategies for addressing and minimizing, where possible, FOG contributions to the sanitary sewer system from both sources.

Food Service Facility FOG Management Requirements

All new FSFs that discharge FOG into the system are required to install, operate, and maintain properly sized grease control devices (GCDs), as indicated in the **Jefferson County Sewer Use Administrative Ordinance** and in accordance with all regulatory authorities having jurisdiction. New FSF construction includes remodels where plumbing is being re-worked, excavation is being performed on-site, or when there is a change in size or type of food preparation equipment. Existing FSFs may be required to modify existing grease control devices (GCDs), or to install new or additional GCDs.

Permits are required for all GCDs/GRDs in accordance with the process detailed in **Figure 1**. Permitting program documents, including FSF Permitting Frequently Asked Questions (FAQs), New FSF Permitting Guidelines, Grease Control Program Permit Application/Application for Exemption, and Grease Interceptor Cleaning Guidance, are included in **Appendix C** through **Appendix F**. A list of currently permitted FSFs is provided in **Appendix G**.

For more information on grease control permit requirements, see the **Jefferson County Sewer Use Administrative Ordinance**, Article VIII.A.

Grease Traps

Grease traps are required for each new and existing FSF if the service provided by the establishment includes food preparation, operation of a food grinder or an automatic dishwasher, as follows:

- Grease traps must have a capacity of not less than two (2) 1,000-gallon traps installed in series for a total capacity of 2,000 gallons;
- JCESD may approve the use of a single 1,000-gallon trap where site conditions prevent the installation of two 1,000-gallon traps in series; and
- JCESD may approve the use of a single 1,000-gallon trap for a FSF if it is demonstrated that a single 1,000-gallon trap can accommodate the nature of the food service provided.

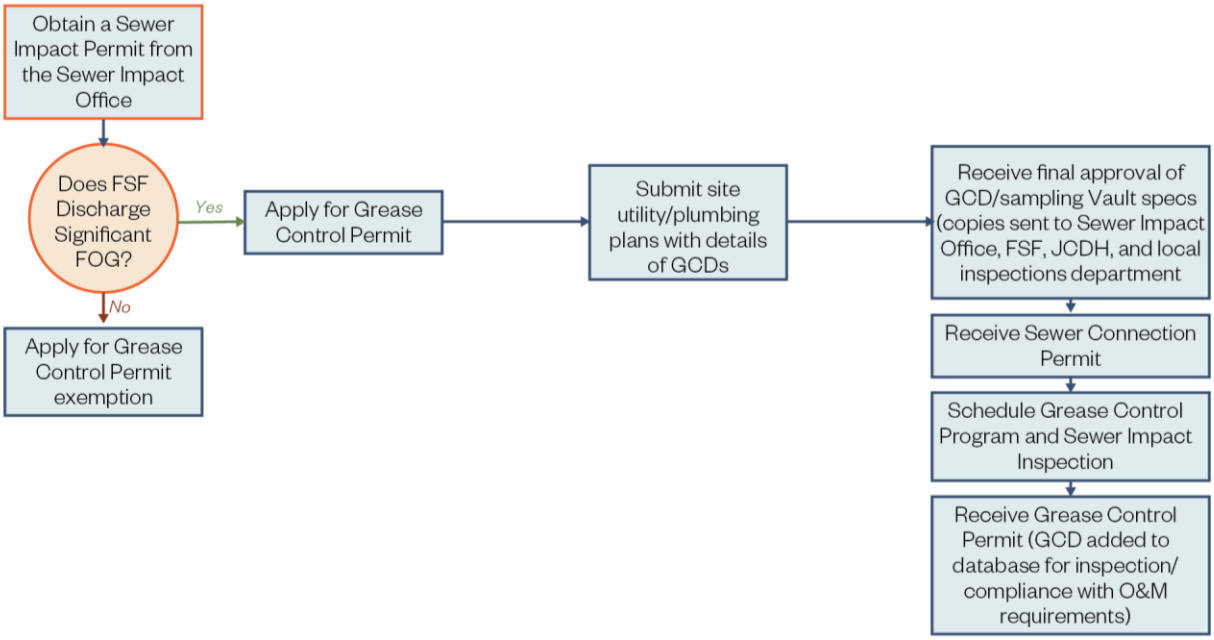


Figure 1. Grease Control Permit Process

Grease trap specifications can be obtained from the JCESD Grease Control Program website. If additional FSFs are added to an existing trap, a professional engineer must certify that the existing trap can properly function with the additional FOG loading.

For more information on grease trap requirements, see the **Jefferson County Sewer Use Administrative Ordinance**, Article VIII.A.2.a.

Grease Interceptors

Grease interceptors may be approved for use by the County for indoor installations if site conditions prevent the installation of outdoor grease traps, if the FSF operates infrequently, or if the facility is replacing an existing grease interceptor, provided that the FSF is not equipped with a dishwasher or a food waste grinder.

Grease interceptors must be sized in accordance with Plumbing and Drainage Institute Standard PDI-G101, Testing and Rating Procedure for Grease Interceptor with Appendix of Sizing and Installation Data.

Discharge of the following materials to an indoor grease interceptor is prohibited:

- Wastewater with a temperature higher than 140 degrees F
- Wastewater discharged from a dishwasher
- Acidic or caustic cleaners
- Wastewater discharged from a food waste grinder (disposal)

For more information on grease interceptor requirements, see the **Jefferson County Sewer Use Administrative Ordinance**, Article VIII.A.2.b.

Alternative Grease Removal Technologies

Alternative grease removal technologies may be approved by the County for the purpose of controlling FOG discharge into the sewer system in lieu of a standard grease interceptor or trap, if JCESD determines that the device employing such technology is at least as effective as a standard grease interceptor or trap. The approved device must be wired directly to a circuit breaker and must contain audio and visual alarms that can only be reset by opening and servicing the device.

The user must provide the following information to JCESD for the evaluation of the proposed technology:

- A design that is specific to the FSF submitting the information, prepared and certified by a professional engineer (the County will not consider a general proposal)
- Complete information regarding the performance of the technology and proof of effectiveness in removing FOG from the waste stream
- Specifications for maintenance service and frequency
- The manufacturer's installation and operation manuals

If the alternative technology is approved, the user must install and maintain the device in accordance with the manufacturer's installation and operation specifications. Maintenance must be performed at least as often as stipulated in the permit, even if the manufacturer specifies less frequent maintenance.

For more information on grease control permits requirements, see the **Jefferson County Sewer Use Administrative Ordinance**, Article VIII.A.2.c.

FOG Disposal Options

FSFs must ensure that all waste material removed from FOG traps and interceptors is disposed of in a manner that complies with all federal, state, and local statutes, rules, regulations, policies and ordinances.

All grease haulers must be licensed by the Jefferson County Department of Health (JCDH) and hold a Septic Tank Haulers Permit. Grease trap waste must not be combined with septic tank waste and transported to the disposal site as part of a mixed load. Discharge of mixed septage and waste grease loads are prohibited at he Village Creek Water Reclamation Facility (WRF) facility.

Grease manifests must accompany all grease interceptor and trap waste to the disposal site. The grease hauler must complete the middle portion of the grease disposal manifest and deliver the manifest to the disposal site for completion and return to the FSF. The waste hauler must also sign the transporter portion of the FOG manifest and leave a copy of the manifest with the owner or user of the FOG trap and/or interceptor. The FOG manifest must be presented to the disposal operator to complete and sign the disposal section, and one copy of the manifest must be left with the disposal site operator. Completed copies of the FOG manifests are reviewed by JCESD's FOG Management Program monthly.

Grease trap maintenance must include the following minimum services:

- Complete removal of all grease interceptor or trap contents, rather than skimming the top grease layer
- Thorough cleaning of the grease interceptor or trap to remove grease and scum from inner walls and baffles
- Filling cleaned interceptor or trap with cold potable water
- Completion of middle section of the grease disposal manifest form and delivery to waste disposal site along with the grease interceptor or trap waste

Top skimming, decanting, or back flushing of the grease interceptor or trap or its contents for reducing the volume of waste to be hauled is prohibited. Vehicles capable of separating water from grease must not discharge separated water into the grease trap or into the wastewater collection system.

Only grease collected in Jefferson County may be discharged at the Village WRF. Grease collected outside of Jefferson County must not be discharged at the Village WRF or at any other location in the Jefferson County sanitary sewer system. Grease disposal manifests must accompany all grease interceptor and trap waste and be delivered to the grease disposal site.

FSFs and the County are responsible for verifying that waste material removed from FOG traps and interceptors is disposed of in a manner that complies with the requirements of the County FOG Regulations. FSFs must have the FOG manifests available on site for inspection by the Compliance Inspector. Compliance Inspectors must check that the FOG manifest is completely filled out and it proves delivery by the transporter to an authorized disposal or processing facility. FOG manifests must be available for inspection for a period of three (3) years as specified by the **Jefferson County Sewer Use Administrative Ordinance** Article VIII.C.

Private Haulers Program

Any person or company engaged in the hauling of wastewater (either septic or grease) to the Jefferson County sanitary sewer system must have a current, valid certificate of competency from the JCDH and a license from the Alabama Onsite Wastewater Board. The discharge of hauled wastewater to the sanitary sewer system will not be permitted without such documentation of credentials.

Grease disposal and septage disposal is permitted at designated JCESD WRFs by purchase of a disposal ticket book from the JCESD Permitting and Inspections Office. Each ticket allows the disposal of 300 gallons of grease (or 250 gallons of septage) at the designated plants listed below.

- **Grease and Septage**: Village Creek WRF
- **Septage Only**: Valley Creek WRF

The County reserves the right to refuse any hauled wastewater when it will interfere with the effective operation of the system and /or treatment plant. The County may collect samples of each load of hauled wastewater to ensure compliance with guidelines and /or require the hauler to provide an analysis of the wastewater of any load prior to discharge. Mixed loads of grease trap waste and septage waste are not allowed.

The County maintains information related to grease hauler requirements and disposal options on the JCESD website: http://www.jeffcoes.org/Default.asp?ID=95.

Routine Food Service Facility Inspection

FSFs are inspected by JCESD annually at a minimum, in accordance with the process shown in **Figure 2** on the following page. Inspections follow the protocol detailed in the **Fats, Oils & Grease (FOG) Program Food Service Establishment Inspection Training Guide and Standard Operating Procedures**, dated February 2013 (**Appendix A**). A copy of the FOG Inspection form is included in **Appendix B**.

FOG Public Education

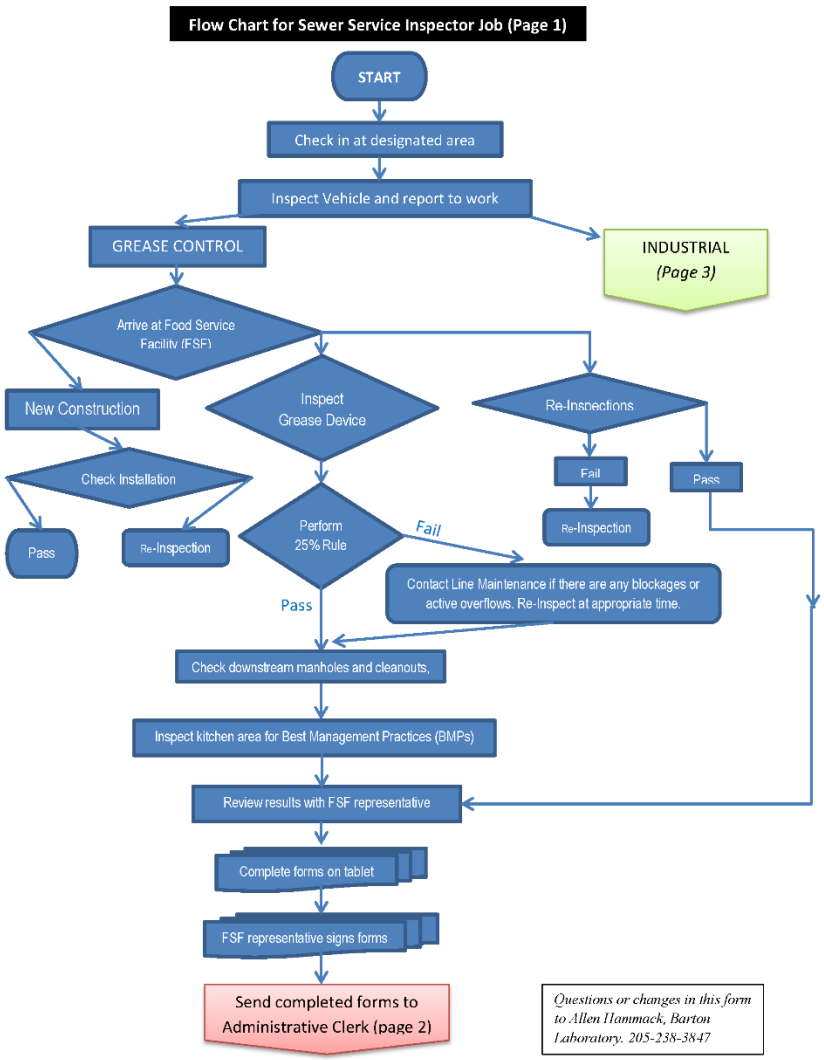
Food Service Facility Best Management Practice Education

Article VIII of the **Jefferson County Sewer Use Administrative Ordinance** requires proper disposal of FOG using BMPs. Specific BMPs regarding handling, storage, and disposal of FOG are detailed in the County FOG Regulations. Prohibited practices include pouring FOG down the drain, putting food scraps down the drain, or utilizing a hot water rinse for cooking implements, dishes, and pans to rinse FOG down the drain.

In addition, the JCESD FOG Management Program reduces the FOG discharge loading into the sewer system by educating FSFs on BMPs, which help reduce FOG entering the grease trap or interceptor. BMPs include the prohibition of certain practices; good housekeeping tips and pollution prevention; operation and maintenance procedures; and other practices established by FSF management.

JCESD's FSF FOG Management education campaign includes:

- Providing a checklist of BMPs with the FSF permit
- Providing posters/kitchen signage on BMPs and waste minimization practices
- Including a BMP checklist with the FSF Inspection Sheet for Compliance Inspectors to use
- Witnessing kitchen practices performed by FSF employees during inspection
- Dispensing of educational brochures (e.g., the County posters and brochures on proper grease management practices) to FSFs
- Dispensing of educational video to FSF Managers and requiring all employees to watch the video and be familiar with waste minimization practices
- Providing communications in multiple languages
- Reinforcing that specific BMPs are mandated by the County FOG Regulations



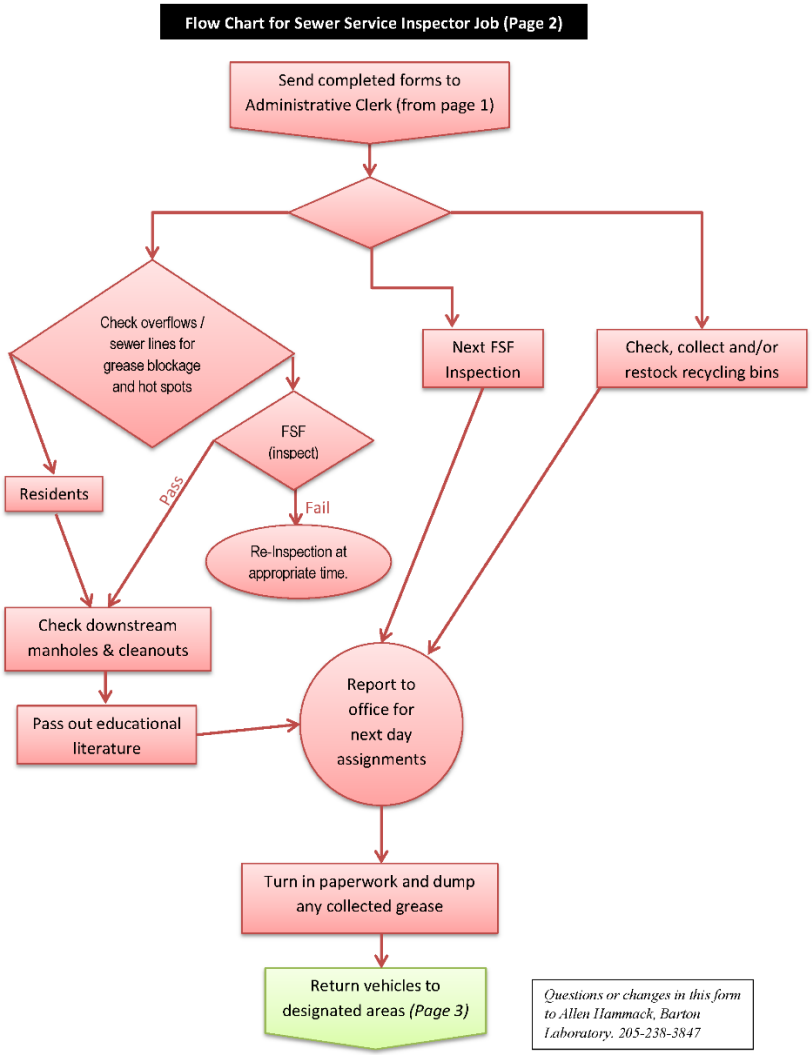


Figure 2. Food Service Facility Grease Removal Device Inspection Process

Residential FOG Public Outreach

Residential communities are also large contributors to SSOs related to FOG. JCESD recognizes that public education is a critical component of an effective FOG Management Program. JCESD produced (in 2007) a countywide public education campaign on grease management that received high accolades from the public and neighboring counties. JCESD developed brochures, posters, for its outreach campaign.

JCESD maintains public information on residential FOG management, including a description of the Household Grease Recycling Program and the location of residential grease recycling facilities, on the Jefferson County Website at http://www.jeffcoes.org/Sites/Jefferson_County_Environmental_Services/Documents/Locations%20of%20Household%20Cooking%20Oil%20and%20Grease%20Recycling%20Centers.pdf.

Annual public education campaigns have been initiated and will be expanded in the future. The JCESD residential FOG Management education campaign includes the following activities:

- Providing quarterly classes for FSF employees on BMPs
- Distributing educational brochures at municipal facilities and other County events (e.g., WEF brochure "Fat Free Sewers" on proper grease management practices at municipal bill payment locations and street fairs)
- Issuing periodic public service announcements (e.g., local newspapers, County web site, radio morning shows) prior to pending holidays to remind residents of proper grease management practices
- Providing educational brochures to apartment complexes (e.g., FOG letter, “Fat Free Sewers” brochure) after finding FOG immediately downstream of apartment connection
- FOG door hangers distributed to homes on block upstream of discovered FOG build up in County sewer
- Providing educational brochures (e.g., FOG BMP posters for posting around apartment complex) to apartment owners/managers. Information is provided in English and Spanish languages, as appropriate for the community

For more information on JCESD’s public education and information efforts, see the **Customer Service Program** plan.

Evaluation of FOG Locations Potentially Contributing to SSOs

Following the report of an SSO, a Line Maintenance crew responds to investigate the SSO and, accompanied by a Supervisor or Principal Engineering Inspector, determines the apparent cause of the blockage or overflow. When an SSO or blockage is determined to be FOG related, the Supervisor/Inspector notifies the FOG Management Program staff. A Sewer Service Inspector inspects the FSFs and grease control device(s) in the affected area and reviews their FOG manifests/cleaning records. If the SSO is not attributable to a FSF, JCESD personnel will alert the nearby public of the overflow in accordance with JCESD’s **SSORRP** plan, and personnel of the FOG Program will target the

area for receipt of educational materials. This notification system between Line Maintenance staff and FOG Program staff is essential to controlling FOG discharges.

Immediate inspections of FSFs and sewer lines downstream, and within approximately 1,500 to 2,000 linear feet of an SSO, are important for determining whether the root cause of the SSO was solely grease or if the grease accentuated a structure or maintenance defect. Videos from CCTV cameras can be invaluable in confirming the root cause and whether increased FSF inspection is necessary, if the enforcement component of the FOG Management Program should be pursued, and if County engineering should perform life cycle analysis on permanently correcting structural or maintenance defects in the pipe.

After a SSO investigation has been completed, FOG Management Program staff collect data related to the overflow for incorporation into an analysis spreadsheet. Using the support of JCESD's Geographical Information System (GIS) Specialist, the locations of the sewer "hot spots" are overlaid with FSF locations, which assist in identifying potential problem FSFs or possible sewer system deficiencies. JCESD utilizes this data to identify a connection between potential problem areas and FOG discharges, as recommended by the United States Environmental Protection Agency (USEPA). **Figure 3** on the following page shows a FOG-related SSO GIS analysis map.

Monthly meetings of relevant JCESD staff are held to discuss the overflow occurrences, the spill data analysis, and strategies for reduction. Analysis consists of mapping and plotting variables such as pipe size, rainfall, sewershed, drainage basin, cause, etc., reviewing GIS information, field data, and in many cases, potential impacts due to grease contributors.

A preliminary analysis of 2015 SSO data indicated that many of the FOG-related SSOs are associated with 8-inch lines, and multiple spills on the same line are near multi-family dwellings, such as apartment complexes. JCESD is continually focusing on the contribution of FOG from multi-family dwellings. The FOG public outreach and education program includes providing materials related to FOG prevention to apartment managers. JCESD has begun a more in-depth analysis of the relationship between number, volume, frequency of SSOs, and location of apartment complexes. JCESD has also mapped the location of SSOs near apartment complexes and overlaid them with sub-basins, sewersheds, and watersheds.

For more information on SSO occurrences in the Jefferson County service area, see the **Overflow Tracking Program** plan.

High Frequency Maintenance Inspections and Cleaning

As described in the **Gravity Line Preventive Maintenance Program (GLPMP)** plan, JCESD cleans and inspects portions of the sewer system each year through the **Continuous Sanitary Sewer Assessment Program (CSSAP)**. Specific lines in the system are cleaned more frequently than others based on frequency and cause of SSOs and other factors affecting maintenance.

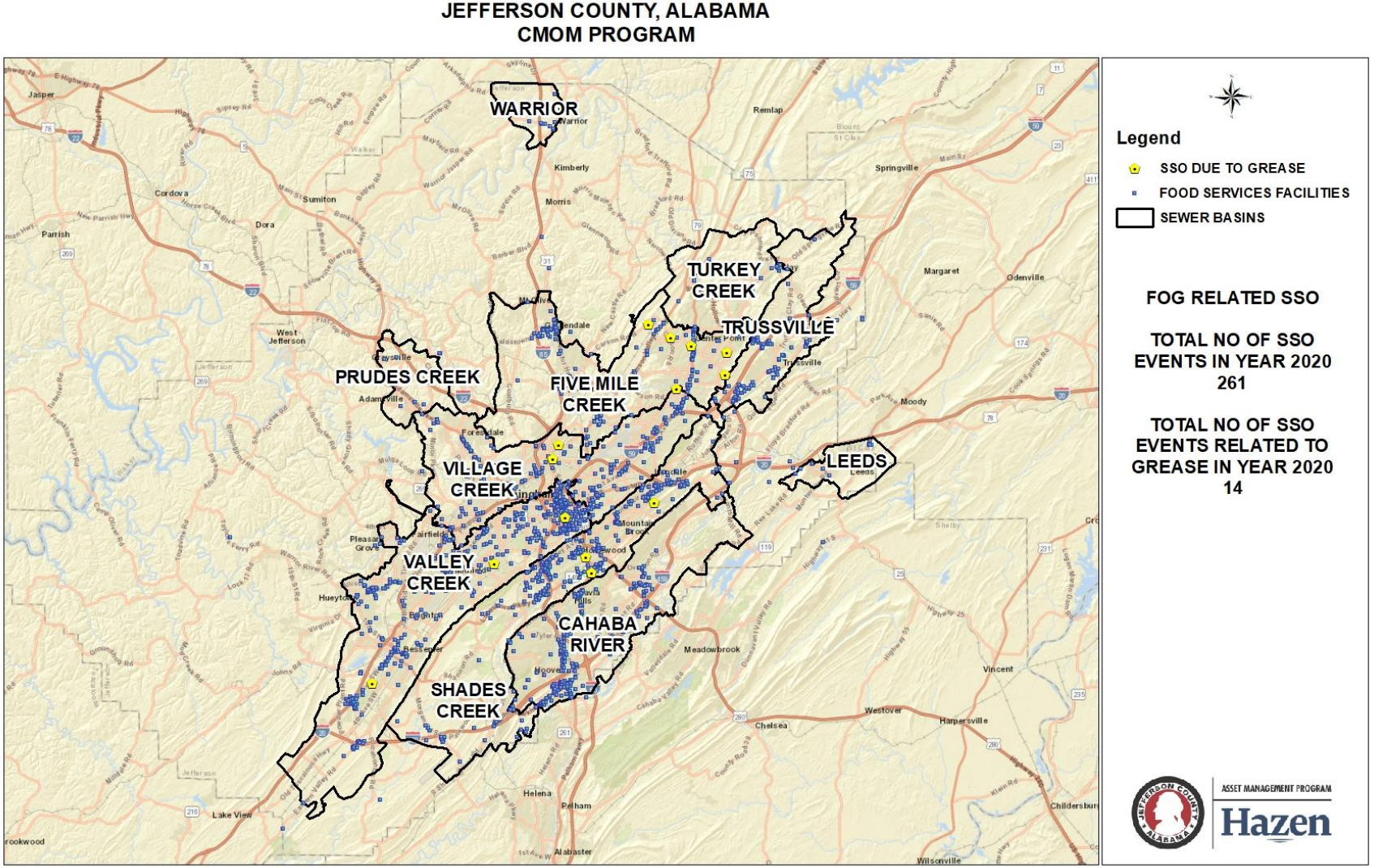


Figure 3. FOG-Related SSO GIS Analysis Map

Sewer segments with recurring SSOs and backups caused by residential FOG and non-compliant grease removal devices (GRDs) are cleaned at a higher frequency than others. A monthly preventive maintenance (PM) cleaning schedule has been created for these locations and sewer segments that have experienced overflow conditions in the past. A listing of these segments is included in **Appendix H**.

More information on line cleaning can be found in the **GLPMP** plan. For more information on the **CSSAP**, see the **Engineering Program** plan.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and if not, what activities need to be adjusted to meet program goals.

Table 1 provides the **FOG Management Program** performance metrics that have been established at JCESD.

Table 1. FOG Management Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
FSF Inspections	Value	Number of inspection performed	Value	Monthly /Annually	FOG Program
FSFs Permitting	Value	Number of new FSFs Permitted or re-purposed FSFs Permitted	Value	Monthly /Annually	FOG Program
Noncompliance Notices Issued and Resolved	Value	Number of Noncompliance Notices Issued and Resolved	Value	Monthly /Annually	FOG Program
SSOs due to FOG	Value	Number and percentage of SSOs due to FOG	Value	Monthly /Annually	FOG Program
SSOs due to FSF FOG	Value	Number and percentage of SSOs due to FSF FOG	Value	Monthly /Annually	FOG Program
SSOs due to household FOG	Value	Number and percentage of SSOs due to household FOG	Value	Monthly /Annually	FOG Program
FOG container distribution	Value	Number of residential FOG containers distributed	Value	Weekly	FOG Program
Residential FOG received	Value	Number of gallons of residential FOG received	Value	Weekly	FOG Program
Ratio of Inspectors to FSFs	Value	Number of Inspectors per total number of FSFs	Value	N/A	FOG Program

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APPENDICES

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Appendix A Fats, Oils & Grease (FOG) Program Food Service Establishment Inspection Training Guide and Standard Operating Procedures

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Fats, Oils & Grease (FOG) Program
Food Service Establishment Inspection Training Guide and Standard Operating Procedures

February 2013

This document is provided to the Jefferson County Environmental Services Department FOG Program Inspectors by the Asset Management Team to provide standard operating procedures and training in conducting inspections at food service establishments.

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Safety

Safety should be the first consideration when conducting food service establishment (FSE) FOG inspections. Inspectors will be exposed to a wide variety of conditions. Thus, it is important that the inspector take time to assess each condition so that safety and common sense are always considered. Below are some specific safety considerations.

Vehicles/Traffic: The FSE parking lot traffic can be dangerous due to motorists backing their vehicles out of parking spaces or driving through the parking lot. The inspector needs to be aware that the motorist has blind spot areas, and they are not expecting someone to be working or standing in a parking space or traffic area.
Another traffic safety consideration is when the inspector is pulling manhole covers on or near a street to check for FOG in the sewer system. The inspector must consider the traffic and road conditions to determine if the conditions are safe for a manhole cover to be removed. Some traffic and road conditions (i.e. heavy traffic, blind curve areas) will require additional vehicles and personnel to ensure safety for personnel and the motorists.

- At all times the inspector should wear a yellow or orange safety vest.
- The inspector's vehicle should be equipped with flashing lights on the top of the vehicle (or clearly visible), in addition to the regular vehicle flashers.
- The inspector should use orange road cones or clearly marked barricades to place in areas where trap or manhole inspections are being conducted.
- The inspector should have a flashlight for use as a motorist recognition indicator and for checking traps and sewers.

Confined Space Entry/Dangerous Gases: The inspector should never enter a manhole, nor should they allow their head/face area to be in close proximity to an open manhole. Grease Traps and sanitary sewers can have high levels of hydrogen sulfide, methane, and other dangerous gases that can be harmful or even fatal. If the inspector identifies problems in the sewer system, pumping station area or a grease trap, the inspector should contact trained maintenance personnel (approved or permitted confined space entry trained) to resolve the problem.

- The inspector should pull the manhole cover and allow some time for any concentrated gases to escape into the atmosphere before standing near the manhole or grease trap opening to conduct the inspection.

Safety Equipment: The inspector should have the following personal protective gear or equipment to prevent injuries while conducting FOG inspections:

- Steel Toed boots or shoes
- Gloves
- Orange or yellow safety vest
- Safety glasses or goggles
- Orange safety cones or clearly marked barricades
- Vehicle with flashing lights on top of vehicle (or clearly visible to other vehicles)
- Flashlight
- First Aid kit
- Sanitizer or alcohol wipes
- 1 gallon of clean water
- Paper towels

Pulling Grease Trap and Manhole Covers/Lids: The inspector should consider the weight of the manhole cover/lid, which can vary from 40 to 200 pounds depending on the type of lid. Proper posture and leverage need to be observed while pulling the manhole cover to prevent back, arm and neck injuries. The inspector should have proper equipment (manhole cover "pullers", pry bars, shovel, etc…) to remove the manhole cover. NEVER place your fingers or hand under a partially open manhole cover/lid, since the heavy cover/lid can slip, resulting in an injury to the inspector. The inspector should not wear jewelry (rings, watches, etc…) that could pinch or cause other injury to the inspector while pulling the manhole cover/lid. Also, the inspector needs to remember that any items (cell phones, pens, etc…) that are in their shirt pockets can easily fall into an open grease trap or sewer manhole.

Equipment

The inspector should have the following equipment available for use (Refer to "**SAFETY**" section; "**Safety Equipment**" for proper safety equipment):

- Digital Camera
- Sewer Plat (either hard copy or lap top GIS access)
- Street Map (Handy Map)
- Badge or visible ID
- Manhole cover/lid pullers, pry bars, or other manhole cover removal equipment
- Long blade shovel (will assist with some manhole cover removal and determining the grease layer depth in the trap)

- Hammer or small sledge hammer (will assist to loosen some manhole covers or clear asphalt or concrete from the lid)
- Wrench to open cleanouts
- Litmus paper, pH strips, or pH meter
- Notebook, or clipboard, and folder to keep forms/materials
- FSE forms/materials (inspection forms, enforcement forms, GI and GT handouts, GI and GT certification forms, other educational materials, etc…)
- Flashlight
- FOG and food solids depth indicators – even though the long blade shovel can assist in determining the depth of the top FOG layer, and an estimate of the food solids layer (2x FOG layer) can then be made, a precise measurement of both layers is sometimes needed. A wide diameter grease trap sampler or "sludge judge" can be used. Other devices that have been used are laser indicators and some have used a metal measuring tape to "feel" the bottom solids layer.

FOG DEFINED

There are two basic types of FOG (Fats, oils, and grease): Polar (vegetable/plant and animal based, and Non-Polar (Petroleum based). Another FOG category is Brown Grease and Yellow Grease. Brown grease is FOG that comes from the kitchen drains (sinks, floors, etc…). Yellow grease is the FOG that is removed from pans, woks, etc… and put in the grease recycle bin. The FSE FOG is defined as organic polar compounds derived from vegetable/plant and animal sources that are composed of long chain triglycerides. The FSE FOG is made up of fatty acids and a glycerol molecule. Technically defined as:

Triglyceride: 3 fatty acids and 1 glycerol

Diglyceride: 2 fatty acids and 1 glycerol

Monoglyceride: 1 fatty acid and 1 glycerol

There are hundreds of fatty acids (oleaic, stearic, palmitic, etc…) that combine to make certain triglycerides. The glycerol exists in natural oils as the base. Glycerol can be defined as a sweet, syrupy trihydroxy alcohol (1,2,3 Propanetriol), and is also referred to as glycerin. Remember that butter, lard, shortening, and cream, as well as the typical oils are considered FOG.

Inspectors should be aware that certain FOG types may not react the same in the trap or to treatment technologies. The reason for this is that some oils are saturated, and some are partially-hydrogenated oils. The partially hydrogenated oil is derived when hydrogen is injected into the oil to provide a longer shelf life. All of this is provided to make the inspector aware of the variety of FOG that may be encountered.

INSPECTIONS-STEP 1: RECONNAISSANCE/ VISUAL SURVEY

The inspector's first action is to conduct a visual survey of the FSE and the area near the FSE. This visual survey should include the following areas:

- Evidence of FOG spills, and pavement or concrete discoloration
- Evidence of construction activities, such as new pavement or parking lot repairs that lead to the kitchen area, sewer cleanouts, or the grease trap
- Cleanliness of the FSE area, including dumpster and recycle bin
- Missing or damaged sewer clean-out covers
- Outdoor mop sinks or "can" wash stations
- Vent hood area cleanliness
- Storm grates or storm drains with evidence of FOG discharge or mop water dumping
- Gutters or roof drain discharges. Are these connected to outdoor mop sinks or drains? Do they impact the hydraulic loading to the grease trap?
- Identify the location of the grease trap
- Downstream sewer line impacts as well as the correct manhole or sewer plat ID

Considerations on the time to conduct the FSE FOG inspections:

The inspector can conduct the visual survey and manhole survey work at most any time, however the inside FSE inspection and FSE manager/owner interview should consider the FSE's business. This would mean that the inspector makes efforts to not interrupt the FSE operation during the main lunch period (11:30 AM to 1:00 PM).

1. <u>Grease Recycle Bin areas</u>- If the grease recycle bin areas have spills, then there is a high probability that the grease trap or interceptor is not properly maintained. "First impressions of the appearance of the area can indicate how conscientious the FSE management is regarding grease control awareness". Notify the FSE owner or manager about the grease recycle bin problem (best to show them the problem), tell them to use dry clean up (oil absorb material, kitty litter, sand, etc…) to clean up the spill, and not to wash the area with water since this would cause a further stormwater impact. Notify the proper stormwater compliance personnel. Document on the inspection form if the FSE has a grease recycle bin. If no grease recycle bin is located, the inspector should ask the FSE owner/manager where yellow grease is disposed.

   To prevent potential problems with grease recycle bins being turned over and spilling the yellow grease:

   - Make sure the recycle bin is on level ground
   - Recommend that concrete curbs, metal poles or other device be placed between the grease recycle bin and the dumpster to prevent the garbage truck from accidentally overturning the recycle bin when they empty the dumpster.

2. <u>Construction activities, pavement or parking lot area disturbances</u>- The inspector should check the parking lot area for any pavement area disturbances that may indicate recent private sewer line replacement work was done, possibly due to FOG blockage issue.

3. <u>Missing or damaged sewer clean-out covers</u>- The inspector should check the FSE area for sewer clean-out covers. Normally, there is a sewer clean-out near the kitchen area for the kitchen wastewater sewer line. This can assist the inspector in identifying the location of the grease trap, if the trap manhole covers are buried underneath landscape materials or other debris. If the sewer clean-out covers are missing or damaged, then this needs to be noted on the inspection form and the FSE manager/owner needs to be notified to repair or replace the clean-out covers to prevent rainfall inflow and possible blockage from debris going into their private sewer system. See example pictures on next page.

4. Outdoor mop sinks or trash can wash stations- The inspector should identify any outdoor mop sinks or drains, especially those drains that are near the grease trap. Many FSEs have these outdoor drains connected to the kitchen wastewater sewer line or to the sanitary sewer line. If the mop sink or other drains are not covered to prevent rainfall inflow, then the rain water will go to the sanitary sewer, or worse the rain water will go to the grease trap, causing hydraulic overload. One of the worst instances is when a roof gutter or downspout discharges to an outdoor mop sink or drain that is connected to the trap. The inspector should note the problem and corrective action necessary on the inspection form and inform the FSE manager/owner about the problem. Rainfall inflow to the grease trap can cause a heavy FOG discharge to the sewer system, and any rainfall discharge to the sanitary sewer system is prohibited.

5. Storm grates or drains – The inspector should check the FSE area storm grates and drains for any FOG discharge impacts. This is especially critical if the inspector does not locate a grease recycle bin. Thus, if the FSE does not have an internal recycled grease storage tank, the yellow grease is likely either poured down the sanitary sewer or the storm water sewer. If the inspector identifies any discoloration of the pavement near a storm grate or there is FOG residue on the storm grate (especially if the residue is in the middle of the storm grate), then the inspector should see if any evidence exists in the storm sewer, or check any nearby streams, or ditch areas that the storm water sewer would discharge. Normally, a simple look at the slope of the land will lead you to the storm water discharge location. If a stormwater impact is identified, contact the stormwater enforcement personnel.

6. Vent Hood areas- The inspector should identify the location of the kitchen vent hoods and determine if there is a FOG discharge impact for the stormwater sewer or the sanitary sewer. When many FSEs clean their vent hood system, they hire a contractor that will use a product with either sodium hydroxide or potassium hydroxide (both with an alkaline pH range of 10 to 12 standard units). This high pH solution emulsifies the FOG and it is then washed from the vent hood system. The inspector should ask the FSE manager/owner how often the vent hood system is cleaned, and where is the alkaline wastewater disposed. In some cases, the FSE may have installed an automatic vent hood cleaning system. The inspector needs to make the FSE manager/owner aware that if the vent hood cleaning is too frequent (of course the FSE must clean the vent hoods for safety purposes and at the frequency designated by the Fire Dept.), then the high pH could cause the downstream sewer lines to form a soap-like product that can get extremely hard to remove. Remember, the way they use to make soap was to use chicken fat, lard or tallow and mix with lye or lime.

IMPORTANT- SEWER LINE IMPACTS/MANHOLE INSPECTIONS!

7. **Downstream Sewer Line Impacts / Manhole inspections-** The inspector should locate the immediate downstream public sewer manhole and check for FOG impacts, corrosion impacts, or any other blockages or obstruction due to paper towels, rags, gravel or other debris. Also, the inspector should check the manhole for any inflow/infiltration problems. In addition, the inspector should document any structural or flow issues, such as low slope that is allowing solids to deposit in invert, or a sewer discharge that flows into or at an angle to the main invert flow that causes a hydraulic dam effect. The inspector should remember to observe all safety guidelines during the manhole inspections. The three areas of the manhole that the inspector should use in describing the conditions in the manhole are: walls,

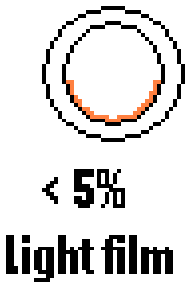
the invert (or area where the wastewater flows in the sewer) and the shelf (or the elevated, normally level, area above the invert).

FOG impacts: The inspector should review the sewer plat or GIS information to ensure that the correct manhole identification is made. The inspector should determine the severity of the FOG impact on the sewer system and document with a digital photo, and on the inspection form. **When the inspector identifies a sewer line/manhole as having heavy FOG, the inspector should report this immediately to be cleaned.** Also, a Noncompliance Notification should be issued to the FSE. Moderate or slight FOG should be reported by the inspector to sewer maintenance with a recommended "Clean by" date. In all cases, the inspector should conduct a manhole survey above the FSE immediate downstream manhole to determine if the FOG impact is coming from another source upstream. **Also, the inspector should continue to check downstream manholes to determine how far downstream the FOG impact is, and be able to report the completely affected sewer line segment information to the MMS President or Field Inspection Supervisor.** DON'T FORGET TO DOCUMENT WITH DIGITAL PHOTOS!

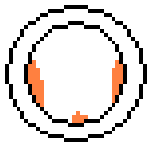
The inspector should consider the slope of the sewer system when conducting the manhole survey. An example would be a FSE that is on an elevated area, and they discharge to the sewer system that has a steep slope where the wastewater is flowing fast. In this case the FOG impacts may be 100 to 400 feet downstream, or in an area where the slope has diminished, where the wastewater flow rate is slower. Another reason to check additional downstream manholes is the temperature of the discharged FSE kitchen wastewater, which could be in the 120 to 150 degree F range. It takes time for the wastewater temperature to decrease, and once the temperature decreases then there is greater probability of FOG deposits in the sewer system.

Another situation where the inspector needs to have heightened awareness is when full service FSEs only have an under-the-sink grease trap or floor grease trap. In these cases, there is a high probability of FOG impact from the FSE, unless Best Management Practices (BMPs) are strictly observed. Also, areas below strip malls or multi-unit facilities should be thorough checked by the inspector.

The following FOG Impact ID system (light film, slight, moderate, heavy) can be used by the inspector to communicate the information to the sewer maintenance personnel.



Light Film on invert



FOG obstructing flow in invert and also FOG on the manhole shelf. Other heavy FOG pictures are provided.

Heavy FOG sewer impact examples:

FSE Downstream Manhole Survey: The inspector should remember to…

1. Follow all Safety Guidelines
2. Check the sewer plat or GIS to ensure the manhole and sewer line segments are properly identified
3. Take a digital photo of the FOG impact to the sewer system and properly label the picture with ID (Note: turn on the "date" designation option on your camera so the date will be displayed)
4. Check manholes upstream and downstream from the FSE, until the complete FOG impact area has been documented
5. Document the sewer line segment (manhole IDs) for reporting purposes
6. Immediately report heavy FOG impacts to sewer maintenance personnel with ID of sewer line segment that needs to be cleaned, and the nearest address. Report moderate FOG impacts with sewer line segment, nearest address and recommended "clean by" date.

Corrosion impacts: The average discharge pH from a FSE grease trap is approximately 5.0 standard units (this is an acidic discharge; based on a pH scale of 0 to 14 standard units, neutral pH is generally considered in the 6 to 9 range, with lower readings being acidic and higher readings being caustic). In some cases the FSEs that use high volumes of sugars (i.e. doughnut and bakery facilities) have observed discharge pH values as low as 1.2 standard units. The low pH readings can be due to several factors, which include: anaerobic conditions (septic) that lead to hydrogen sulfide generation which can form sulfuric acid; high sugar content of wastewater where the sugar acts as a catalyst in driving the pH down; cleaners; colas, carbonated drinks and coffee contribute to a low pH). Thus, the inspector should be aware of where sewer corrosion impacts can originate from commercial food service establishments (doughnut, bakeries, coffee shops, or any FSE that has a GI with a long retention time or it is not cleaned often enough), and that corrosion damage can occur in the sewer system due to sewer pumping station discharges where the wastewater is septic in the force main from the pump station and hydrogen sulfide is generated.

It may be difficult for the inspector to identify corrosion in the FSE's grease trap, but if severe pitting or concrete deterioration is noted then this needs to be addressed during the FSE manager/owner interview.

The inspector should document any corrosion impacts that are identified and report any severe corrosion to the sewer maintenance personnel. Below are a few examples of sewer corrosion:

Hydrogen sulfide damage in manhole

Concrete deterioration in invert below coffee shop

Grease trap baffle wall corrosion

8. Other Obvious Issues that can be encountered during the Visual Survey:

Grease Traps that are overflowing. This needs to be reported to the Health Department and Stormwater personnel. The FSE manager/owner needs to be immediately notified that the grease trap should be pumped as soon as possible.

Private Sewer Overflows at strip malls- The inspector needs to make the FSE manager/owner aware of problem, and request that any private plumbing company that cleans the private sewer lines should contact the sewer maintenance personnel to ensure that large amounts of FOG are not pushed into the downstream sewer system and cause another blockage. Also, the Health Dept. should be contacted, which in many cases will result in the closure of the FSE(s).

Trash issues should be reported to the Health and Stormwater Depts.

INSPECTIONS-STEP 2: GREASE TRAPS

The inspector should locate the grease trap during the visual survey portion of the inspection. It is best if the inspector goes to the FSE manager/owner prior to opening the grease trap to identify themselves and let the FSE manager/owner know that the FSE's grease trap is being inspected. At this time, the inspector should notify them that soon they will be returning to conduct a kitchen walk-through and provide educational materials and results of the inspection. Of course, when schools or manufacturing facilities are inspected, it is necessary to report to the front office prior to any visual survey or grease trap inspection activities.

Typical Grease Trap installation with two manhole access

Grease Traps are outdoor, in-ground tanks, which have the following standard tank capacities: 500, 750, 1000, 1500, 2000, 2500, and 3000 gallons. Most traps are concrete, with a few that are fiberglass or polyethylene. Some FSEs may have two or more grease traps in "series".

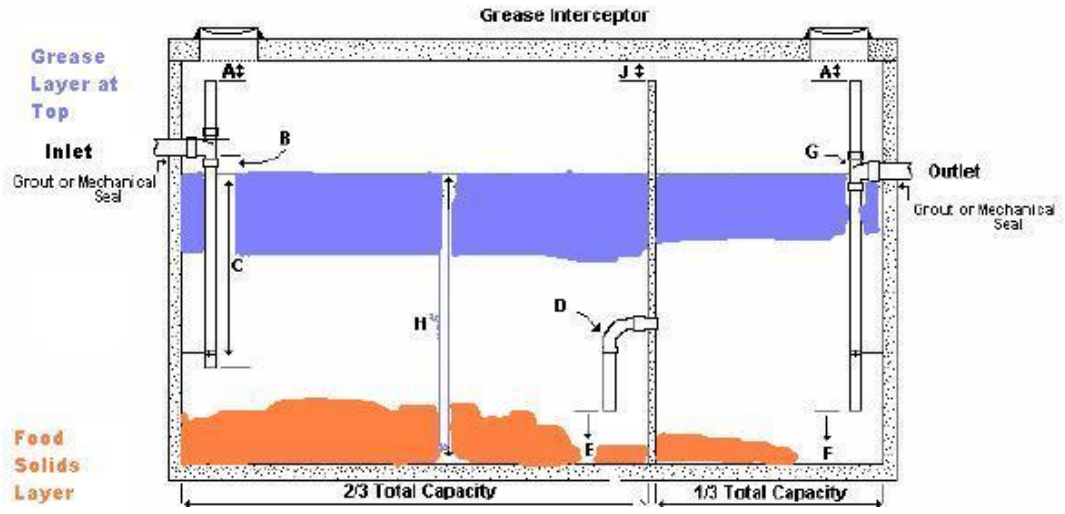
Two traps in series operation

How Grease Traps Work: Kitchen wastewater flows into the grease trap, the FOG waste will float or go to the top of the trap liquid level, and the food solids and other solids will go to the

bottom of the trap. The reason the FOG layer goes to the top of the trap liquid level is due to the density of FOG versus the density of water. Water is 8.34 pounds per gallon, and the fats, oils and grease densities are less than 8.34 pounds per gallon. Here are a few example FOG densities:

Peanut Oil	7.62
Olive Oil	7.66
Soybean Oil	7.73
Corn Oil	7.69
Cocoa Butter	8.04
Coconut Oil	7.67
Sesame Oil	7.66

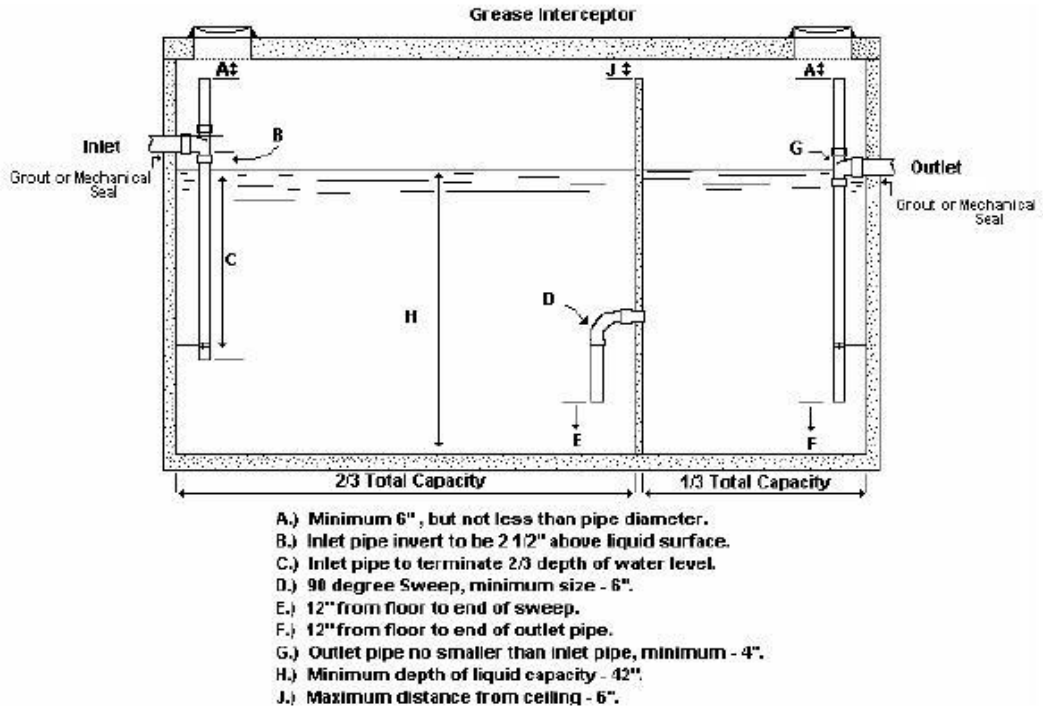
The key for proper grease trap operation is to have the proper sizing, configuration, components (inlet and outlet Ts), and maintenance. The grease trap is designed to allow for adequate detention time for the kitchen wastewater so the FOG can separate from the wastewater and be contained in the top layer.



Why a complete pump of the Grease Trap is necessary: Both the FOG layer and the food solids layer take up capacity in the trap. The food solids layer will normally be 1x to 2x the FOG layer depth. If the FSE prepares chicken, seafood or rice, the food solids layer will be 2x to 4x the FOG layer. Thus, short-circuiting of the grease trap can occur if the full contents of the trap are not pumped.

Diurnal Flow and Temperature: The inspector should understand that during certain times of the day the FSE will have more kitchen wastewater discharged to the trap. This may be more pronounced at full service FSEs that have a dishwasher connected to the grease trap, and they may be using the dishwasher continuously for several hours near the end of the work day. The dishwasher can have high temperatures (120 to 140 *F), and high flows that can impact the trap's FOG removal efficiency.

Grease Trap Location: The inspector should describe the location of the grease trap on the inspection form so future inspectors or other personnel will be aware of where the trap is located. The inspector can document with a photo, or if possible, record GPS coordinates.



Manhole Access: Hopefully, the grease trap has a two manhole access that allows visual inspection of the inlet and outlet Ts. In some cases, the grease trap may only have one access manhole, which may be located at the center of the trap or maybe over only the outlet T or the inlet T. If the trap only has one access manhole, the inspector should try to determine if there is still access to both chambers (inlet and outlet) for pumping/cleaning of complete contents. If there is no access to one of the chambers or there is difficulty in seeing the outlet T, then the inspector should issue a Noncompliance Notification (NCN) to the FSE to require a grease trap certification (to verify that the inlet and outlet Ts are visible and in proper working condition) be completed, submitted to the County, and corrective action taken to ensure proper access to all trap components.

Size of the Trap: The inspector should review the most recent grease waste hauler manifest, which should have the "gallons pumped" documented. If there are no records available, the inspector should use a measuring tape to calculate an approximate capacity. When the trap manhole covers/lids are pulled, the inspector can use the measuring tape to get an approximate length and wide of the trap. Then use a pole, sludge judge device, or measuring tape to get a liquid depth. To calculate the capacity of the trap use the following formula:

Length (ft) x Width (ft) x Depth (ft) = cubic ft. Multiply cubic ft by 7.481 to get gallons capacity.
Example: 8 ft x 4 ft x 4.25 ft = 136 cubic ft. 136 cu ft x 7.481 = 1,017 gallons (1000 gallons)

Inlet Ts: The inlet (or influent) T is critical for the following reasons:

- Prevent FOG layer from clogging the FSE discharge pipe
- Prevent the influent or inlet kitchen wastewater from disturbing or "knocking down" the FOG layer, which can cause FOG to short-circuit the trap.

The length of the inlet T is not as critical as the length of the outlet T, but should be an adequate length to be below the FOG layer. An inlet T length of 1/2 to 2/3 the trap liquid depth is acceptable.
The preferred material for the inlet T is a schedule 40 (or stronger) PVC pipe that is 4 inches or 6 inches. The inlet T should be sturdy, not loose. The outlet T is more critical than the inlet T, so the inspector should not confuse the length requirements or other requirements for the inlet T versus the outlet T (See outlet T information below).

Trash, Debris, Plastics in Grease Trap: The inspector should check the trap for any plastic bags, cans, stirrers, straws, or other debris. These materials can cause blockages in the FSE private sewer and in the trap, resulting in FSE sewer line back-ups or grease trap overflows. The inspector should document the types of debris in the trap, take a photo, and report this to the FSE manager/owner. The inspector should check the floor drains and mop sinks inside the FSE to make sure that all drains have secure screens to prevent trash/debris from entering the kitchen sewer line. The inspector should make the FSE manager/owner aware of the consequences (sewer back-ups, overflows) that can result if the floor drains do not have proper, secured screens/strainers. Also, the inspector should emphasize that the FSE manager/owner make FSE employees aware of not allowing any trash or debris to get into the floor drains or mop sinks.

Sanitary items in the Grease Trap: If the inspector identifies toilet paper, human waste, or other sanitary items in the grease trap, then it is likely that a bathroom is connected to the grease trap. The FSE manager/owner should be notified immediately to correct the problem by having the sanitary waste disconnected from the kitchen wastewater sewer line, and properly plumbed to the sanitary wastewater line. Allowing sanitary wastewater to get in the grease trap is not only a codes violation but will also cause hydraulic overload of the grease trap.

Plastic “pasta” bags, heavy FOG layer

No Inlet T! Also, straws, stirrers, trash

No Inlet T! Plastic bags, straws

Outlet Ts: The outlet (or effluent) T is one of the most critical components on the grease trap to prevent a FOG discharge from the trap. The outlet T:

- Should be made of schedule 40 PVC. No flexible materials (SD-35 plastic, aluminum, etc…are allowed, since these material will collapse under the pressure of the wastewater and FOG.
- Should be sturdy with nothing loose at the fitting.
- Should extend to within 12” to 15” of the trap tank bottom. (Do NOT approve an outlet T that is too close (< 12” from tank bottom) or too far (> 15” from the tank bottom) from the bottom of the trap. If the outlet T is too close to the tank bottom then clogging and back-ups can occur. If the outlet T is too far from the tank bottom then short-circuiting of the wastewater can occur.
- Should NOT be “U shaped” or “V shaped” baffle style that is connected to the wall of the grease trap. Eventually, the screws or nails that hold these type outlet baffles to the wall of the trap will come apart, allowing FOG to be discharged.

When inspecting the outlet T, check the inside of the outlet T to see if there is a significant amount of FOG inside the T. If there is a significant amount of FOG in the outlet T, then this could indicate that there is moderate to heavy FOG discharging from the trap. This could be due to hydraulic overload, lack of consistent maintenance, or poor grease trap design.

Below are a few example pictures of grease trap outlet Ts.

Example of clear water in outlet T (Good!)

Example of properly installed schedule 40 PVC Outlet T

Examples of FOG in outlet T that indicate FOG discharge to sewer system

No outlet T, even with additional baffle, FOG can be Discharged if there is no outlet T attached

Floating flexible plastic “U shaped” outlet T that has become dislodged from the trap wall.

No outlet T!

No outlet T located due to depth of FOG, no Grease trap maintenance! Noncompliance

This is an example of a grease trap that is not maintained. FOG is overflowing the top of the outlet T. In some cases, the top of the outlet T is too close to the liquid level and will allow FOG to overflow into the outlet pipe. Thus, the FSE should be required to extend the top of the outlet T pipe approximately 5 inches to prevent FOG overflowing the top. Of course, the extended outlet T top should not interfere with the opening and closing of the grease trap manhole lid. Also, another issue may be that the outlet T length is too long (less than 12" from the tank bottom). In some cases, the outlet T has been found to be only 2" from the tank bottom, which will result in a blockage and FOG/wastewater overflowing the top of the outlet T, or backing up in the FSE.

Baffle Wall or "mid-wall" baffle: The baffle wall is necessary to allow for the proper retention time for FOG to separate from the kitchen wastewater. Thus, on the inspection form, the inspector should refer to the area on the inlet side of the baffle wall as the grease trap inlet chamber and area on the outlet side of the baffle wall as the outlet chamber. The term "mid-wall baffle" is actually not correct, since the grease trap design should place the baffle wall at approximately 2/3 of the tank length (Inlet chamber = first 2/3 tank length, outlet chamber is final 1/3 of tank length). The inspector should make sure that the trap has been installed properly. If the inspector sees that the inlet T discharge pipe from the kitchen drains is partially underwater, or that the inlet chamber is only 1/3 the length of the grease

trap, and notes that the outlet T is approximately 3 inches above the wastewater/FOG layer, then the grease trap is probably installed backwards. Another indicator is if the FSE manager/owner complains of kitchen sewer line back-ups or slow drains.
Unless the grease trap is pumped during the inspector's visit, it will be difficult to identify the baffle wall type or condition. Thus, for FOG "hotspot" areas or sewer line segments with chronic FOG blockages or obstructions, the inspector can request that the FSE owner or manager contact their grease waste hauler company to schedule a time to pump the grease trap so the inspector can see the tank and its components. Sometimes, the inspector can identify if a baffle wall is in place, especially if one of the trap access manholes is over the baffle wall. As previously mentioned, the inspector should check for corrosion damage at the top of the baffle wall and visible portions of the trap walls.

Baffle Wall Sweeps or Ts: For all new FSEs or new grease trap installations at existing FSEs, the grease trap should have a 90 degree schedule 40 PVC sweep or T to prevent short-circuiting of the kitchen wastewater. The baffle wall sweep has proven to be very effective in increasing the retention time and preventing short-circuiting.

No baffle walls: In some cases the grease trap certification submittal or the inspector will identify that a particular FSE's grease trap does not have a baffle wall. This is probably a septic tank design. Of course, this is not good, but the inspector needs to document any downstream sewer problems and determine if the FSE is contributing FOG to the sewer system. If there is a history of FOG discharges or sewer system problems, then the FSE should be place on a compliance schedule to install a new grease trap.

Baffle Wall Types: There are several baffle wall designs. The County approved baffle wall design is a single hole in the baffle wall (and for new grease trap installations, must include the 90 degree schedule 40 PVC sweep or T). All other baffle wall designs (slit style opening) have proven to be not as efficient in retaining FOG in the trap. In particular, one baffle wall design, "hanging baffle wall" (or a baffle wall that is connected at the top of the trap and extends downward as a solid wall until it nears the bottom of the tank, at approximately 18" from the tank bottom the wall stops, allowing a large opening for kitchen wastewater to short-circuit to the outlet T) can cause FOG problems in the sewer system. Below are a few examples of baffle walls:

Single hole in baffle wall

Outlet chamber side view of PVC sweep (90 degree portion

Is on inlet chamber side)

Slit style baffle walls, are not as efficient as the single hole baffle wall design

Coloration of the Grease Trap FOG layer: The "normal" coloration of the FOG layer in the grease trap will be mixed or mottled color with various brown, cream, black colors visible. If the inspector notices that the FOG layer is a very consistent, smooth cream color, then there is a good possibility that the FSE employees are dumping yellow grease (or recycled grease) down the drains. Also, if the FOG layer has a dark liquid texture then this can indicate that the FSE employees are dumping yellow grease down the drain. However, if the FSE is using additives then this may cause the top FOG layer to be dark liquid as well. The inspector can check the pH of the liquid that may assist in determining if additives are used (example: pH result of the liquid is 10).

IMPORTANT: Are all kitchen sewer lines/fixtures connected to the grease trap? Believe it or not, one of the major problems encountered is not all of the kitchen waste lines are connected to the trap. If the FSE is maintaining the trap and all components are properly connected, but FOG is still problem in downstream sewer, then request that a dye test or other testing (CCTV) be conducted to verify all kitchen drain lines are connected to the trap. Many national franchise FSEs have been identified as having this problem (i.e. 3 compartment sink, pre-rinse sink to the dishwasher not connected to the trap).

Outdoor Grease Traps or Customized Traps: The inspector may identify some FSEs that have outdoor grease traps (small, "water meter" sized, in-ground traps) or FSEs with customized (50 gallon to 250 gallon) grease traps. FSE inspection experience indicates that the majority of these type devices do not control FOG discharges very well, and the inspector can expect to have FOG impacts in the downstream sewer lines. The problem is magnified if the FSE is a full service facility that serves chicken, rice, seafood, Mexican style, Chinese style, or buffet style foods. The inspector should document any downstream sewer line problems and conduct the inspection of the grease control equipment, as you would a grease trap inspection. Identify the inlet T, outlet T, baffle wall, any signs of corrosion, etc… The inspector should look for any signs of the outdoor grease trap or customized trap overflowing onto the pavement/parking lot area. The inspector should determine the FOG layer depth

and food solids depth to assess if pumping frequency is adequate. For small outdoor grease traps at a full service FSE, the frequency of pumping should be every 1 to 2 weeks, depending on the type of food served and the FSEs Best Management Practices (BMPs).

Under vault top, 250 gallon customized GI


Small 50 gallon outside floor trap

Small 30 gallon outside floor trap w/ heavy FOG, no Ts

Outside trap with lime covering top due to recent Overflow

Outside floor trap that has overflowed. Undersized for this FSE, need large grease trap. Inspector should check downstream sewer lines and issue a NCN to the FSE. Also, the inspector should contact the Health Dept and Stormwater personnel.

INSPECTIONS-STEP 3: INSIDE THE FSE

The inspector should have their County Identification Badge ready to be presented to the FSE manager/owner. Remember, the inspector should be as efficient as possible to limit the time that they are interrupting the FSE's business. Inspections should not be conducted during the busy lunch hour (11:30 am to 1:00 pm), unless there is a sewer back-up or other emergency condition that the inspector needs to relay to the FSE owner/mgr. The inspector should request to speak to the owner, and if they are not present, then request to speak to the manager in charge. If you speak to a FSE hostess/receptionist, the inspector should identify themselves, and let the hostess/receptionist know that you want a few minutes with the owner/manager to complete the sewer system fats, oils and grease inspection. The inspector should have FSE FOG educational materials (FSE FOG information folder, GI or GT maintenance handout, etc…) ready to show the FSE owner/mgr so the explanation of the reason for the FSE FOG inspection can easily be explained using the handout photos and information. The inspector should include in their opening statement that this inspection is not only due to prevention of sewer line blockages and sewer overflows, but also due to federal and state mandates regarding maintenance of the County sewer system. Remember, many FSE owners/mgrs will first think you are talking about yellow grease or the grease recycle bin. Thus, the need to have educational materials available is critical for a timely explanation of the reason for the inspection.

The inspector's opening statement can be something like this:

"Hello, I am _*(name)*_____ , an inspector for Jefferson County Environmental Services Department. We are conducting inspections of food service establishments to ensure that there is proper grease control equipment installed and maintained to prevent sewer system blockages and overflows. *(show the FSE owner/mgr pictures of overflows and grease trap (or grease interceptor) while explaining what the pictures represent).* I want to take a few minutes and conduct a walk-through of the kitchen area, provide you with some educational materials on Best Management Practices, proper maintenance on the grease trap (or grease interceptor), and provide to you a copy of the inspection form with findings of the fats, oils and grease inspection." *(If the inspector did not identify a grease trap outside the FSE, then the inspector may tell the FSE owner/mgr that* "an outdoor grease interceptor was not located. Do you know if you have a grease trap or a grease interceptor installed?" *(refer to educational materials photo).*

FSE Information: The inspector should have the following information included in the County FSE FOG inspection form:

- Verify FSE physical address
- Verify FSE mailing address
- FSE phone number (Email address, if available)
- FSE Contact Person Information (Owner is preferred, then manager. If the FSE is a franchise, then the inspector should get the corporate district or regional managers name, or the corporate environmental representatives name and contact information. If FSE is in a strip mall, the inspector should get the property manager's name or company name and contact information.)
- FSE Menu Items (Many times the FSE will have their menu posted on the front window of the facility. The inspector should take time to review menu items to check on high FOG potential items such as: chicken, wings, fish/seafood, bar-b-q, fries, hamburgers, meat and three dishes, buttered mushrooms, etc…)

Inspection Form: The inspector needs to write the information on the inspection form so that the FSE owner/manager can clearly read the information. Remember that the FSE owner/manager is not familiar with most of the abbreviations or acronyms (GI, GT, GCE, etc…), so the inspector should clearly (legibly) write information on the inspection form so the FSE owner/manager understands. Also, the inspection form information will have to be used for input into the database, so the inspector should include information that will track any noncompliance issues or the location of the grease control equipment. ALWAYS print name and sign the inspection form and leave the pink copy with the FSE owner/manager.

FSE Kitchen Walk-Through Inspection: The inspector should ask the FSE owner/mgr to provide a basic explanation of what food is prepared and how it is prepared. The inspector should listen to the FSE owner/mgr to ensure that they cover the high FOG potential foods in their menu. The inspector should document the following during the kitchen walk-through:

- Types and number of kitchen equipment
    - Fryers (ask the size of the fryer(s), and frequency that oil is changed in the fryers)
    - Stove
    - Woks
    - Tilt skillets (if present, is there a floor drain immediately below the tilt skillet? This can be high potential FOG discharge.)
    - Grill (compartment under grill to collect FOG and meat residue?)
    - 3 compartment sink
    - 2 compartment sink
    - Mop sink (any evidence of butter or other oils or fats being dumped?)
    - Floor sink
    - Hand sink

- Dishwasher

- **Floor Drains**
  - Number of floor drains
  - Covers or screens on floor drains are secure to prevent trash/debris (straws, plastic bags, stirrers, "red bull" cans, etc…) from causing sewer line blockages and overflows. **IMPORTANT! If plastic bags or other trash items are found in the trap, make sure that the FSE owner/manager is made aware that this can cause blockages in the FSE sewer line and problems in the trap.**
- Dish washing or dishwasher area
  - Use of 3 compartment sink (cleaning pans, pots, plates in sink? Are BMPs being observed?). Check nearby trash can to see if they are scraping food, FOG, etc… into the trash.
  - Dishwasher
    - Temperature setting (120 to 160 degree F is normal range)
    - Number of cycles per day?
    - When dishwasher is used the most? (normally used most during closing hours)
    - <u>Is dishwasher connected to the undersink Grease Trap?</u> If so, then the dishwasher should be removed from the grease trap due to causing hydraulic overload.
- Yellow Grease Recycling container
  - If the inspector was not able to locate the grease recycle bin during the visual survey, then the inspector should ask where the grease recycle bin is located. Some FSEs have installed the automated heated tank recycle oil systems that are inside the FSE.
  - If the FSE does not have a grease recycle bin for Yellow Grease and the FSE has fryers and other oils that are used, then this is major red flag that the FSE is dumping yellow grease into the sewer system.
- Additives (enzymes, "bacteria", acids, caustics, alcohols, ketones, surfactants, soaps, etc…)
  - Check for any additives in the kitchen area, especially under the 3 compartment sink.
  - Ask the FSE owner/manager if additives are used. Get the name of the product used.
  - If the FOG layer in the grease trap is liquid, and also may have coffee color, then this could indicate additives are used.
  - If heavy FOG impact is found in the downstream sewer lines and a NCN is issued, then the inspector needs to tell the FSE owner/manager of the FOG impact, and request that the additives not be used, explaining that most additives partially break down the FOG, allowing it to flow. However, as it dilutes and goes downstream in the sewer system it will re-congeal and cause problems.

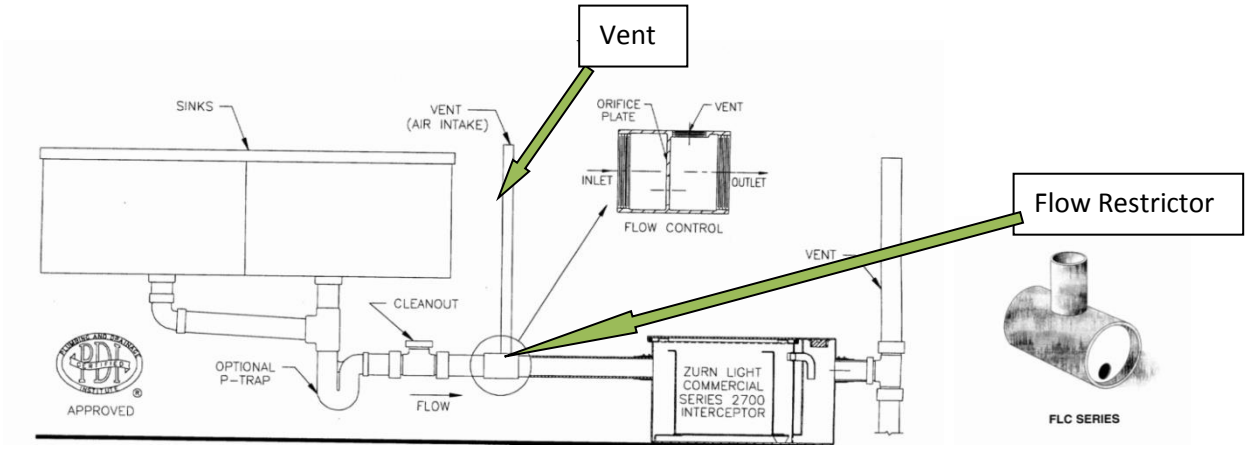
GREASE INTERCEPTORS

There are two basic types of indoor grease interceptors (GIs): Under-the-Sink Grease Interceptors and Floor Grease Interceptors.

Under-the-Sink Grease Interceptors: The sizing of the grease interceptor is based on the size of the flow restrictor. The first number (gallons per minute) is the size of the flow restrictor opening. The second number in the GI identification is the capacity of the tank in pounds. The second number or pounds capacity will always be double the gallons per minute or first number. Grease interceptor sizes have a wide range, including:

5 gallon per minute (gpm) / 10 pound (lb) capacity
7 gpm/14 lb
10 gpm/20 lb
15 gpm/30 lb
20 gpm/40 lb (County minimum acceptable size)
25 gpm/50 lb
35 gpm/70 lb
50 gpm/100 lb
100 gpm/200 lb
150 gpm/300 lb

The inspector needs to locate the flow restrictor if possible. Normally, the flow restrictor will be located a few inches to approximate 2 feet in front of the grease interceptor. Many times, but not always, it will have red colored metal pipe. It should have a vent pipe connection that should be visible on top of the flow restrictor portion. You should be able to see the vent pipe coming from the flow restrictor area. In some grease interceptors, the flow restrictor is in the front part of the grease interceptor box.



The inspector needs to verify the following when checking the grease interceptor:

- How often is the interceptor cleaned? Should be cleaned of completed contents every 2 weeks. Some FSEs will need to do more often.
- Who cleans the interceptor?

- Where is the interceptor waste disposed? If they put in trash or dumpster, is it in sealed bag or container to prevent leaching? If the FSE owner/mgr says they put the interceptor waste in the recycle oil bin, then the inspector needs to notify them that it is not proper disposal since some of the yellow grease may be used for animal feed additives or other products.
- Are records available of interceptor cleaning?
- Are there any signs of deterioration or severe rusting of the interceptor?
- Is there access to be able to remove the lid and clean the interceptor?
- Is the flow restrictor and vent pipe installed? If not, or cannot determine, then require that a grease interceptor certification be done to ensure all components are properly connected and working.
- Is a dishwasher connected to the interceptor? If yes, then the dishwasher will need to be removed from the interceptor. Grease interceptors were intended for single fixture units such as one grease interceptor on one 3 compartment sink.
- What is the size of the grease interceptor? There are two ways to determine the size:
    - The label on the outside of the grease interceptor at either the inlet or outlet tank side, or
    - The size of the grease interceptor will be labeled on the inside of the grease interceptor lid. This can be done by inspector but there will be odors associated with this, or request interceptor certification be completed.

Additives, with automated feed system, connected to the front of the Grease Interceptor (this one is located in parking garage below a FSE). Additives (acids, caustics, soaps, surfactants, enzymes, etc…) should never be allowed prior to a grease interceptor!

Grease interceptor with size label

Cut away view of plastic Grease Interceptor design with special inlet and outlet baffle. This is a 20 gpm / 40 pound GT and is approximately 15 inches deep, and 24 inches long.

Floor Grease Interceptors: Many of these in-floor grease interceptors were never designed to be installed in the floor, meaning the materials that they were constructed were not specified for in-floor installation. Thus, many of these start to rust and deteriorate. The inspector has to rely on the FSE records many times due to limited information. The floor interceptor is a device that is in-between an interceptor and a small interceptor in how it performs. Many times the floor interceptor design is similar to a miniature interceptor with inlet and outlet baffles and a mid-wall baffle. The size of the floor interceptor can be estimated by the inspector, or it should have a size label inside the top lid of the floor interceptor. The inspector should request that a grease interceptor certification be completed and that the inlet and outlet structures should be documented to at least ensure that the floor interceptor has a baffle system to prevent FOG from discharging.
Some FSEs have been known to use high temperature water to "wash out" the floor interceptor, which will lead to sewer line clogs.

NOTE ON FLOOR INTERCEPTORS- Many full service FSEs with floor interceptors have had downstream sewer FOG impacts! Thus, the inspector should have increased awareness to look in several downstream manholes for FOG impacts below FSEs with floor interceptors.

Floor Interceptor

Grease Control Equipment Certification or Verification of Components: For FSEs with chronic FOG discharge problems causing blockage or obstruction in the sanitary sewer system, the inspector should request that the grease trap (or grease interceptor) be pumped to check to make sure all components (inlet T, outlet T, baffle wall) are properly installed. The inspector should request that the FSE schedule the pumping of the grease interceptor (or grease trap) with the grease waste hauler company so that the County inspector can be present to verify the components are installed correctly. Also, the inspector should note if the grease waste hauler has access to all compartments to properly clean the trap.

INSPECTIONS-STEP 4: FSE OWNER/MANAGER INTERVIEW

Prior to the interview, the inspector should have the inspection form completed (legible, with no abbreviations so the FSE owner/manager can understand what is written), grease trap or grease interceptor maintenance handouts ready, and if necessary, any noncompliance notifications completed. The inspector should take a few minutes after the kitchen walk-through to complete the inspection form and have other materials ready. The inspector should remember to be as efficient as possible to limit the time the FSE owner/manager needs to spend with them. In some instances, the FSE employees will tell the inspector that the FSE owner or manager is not available or not in, and there is no manager on site at the moment. The inspector should ask the FSE employee when the FSE owner or manager will return so that the inspector can review the inspection findings with them.

Grease Trap and Grease Interceptor Cleaning/Pumping Records or Manifests

The inspector should ask the FSE owner/mgr for the records of the grease trap (or grease interceptor) pumping, cleaning or maintenance. The trap, or interceptor, pumping information should include:

- Generator information: FSE name and address
- Transporter information: Grease Waste Hauler (GWH) Company name, phone number, address, GWH employee name
    - Date pumped
    - Time pumped
    - Volume pumped (the inspector should be able to verify the size of the grease interceptor with this information. Important: some GWH companies may not list the volume pumped, but this is required for to identify if the grease trap or grease interceptor has had a complete pump of contents and the GWH knows the size of the trap or interceptor.)
- Disposal information: Location or site for final disposal of the FOG waste, name of facility treating the waste, date delivered.

If there are no significant problems identified, then the inspector should review the following with the FSE owner/manager

- grease interceptor or grease trap maintenance requirements,
- recordkeeping requirements, and
- Best Management Practices

If there are minor issues, such as “no maintenance records”, then the inspector should write “need to keep grease interceptor maintenance records onsite” on the inspection form. Other minor issues may include damaged or missing one sewer cleanout cover, and slight FOG around the yellow grease recycle bin.

INSPECTIONS-STEP 5: FOLLOW-UP ACTIONS / ENFORCEMENT ACTIONS

If the inspector identifies any significant problems, then an enforcement action notice or Noncompliance Notification (NCN) should be issued. The inspector should check the NCN, or notice, to ensure that date issued, date response due, and correct deficiency or problem are identified. The inspector should show the FSE owner/manager the NCN and specific problems identified. The inspector will need to provide details of the identified deficiency or problem (i.e. the outlet T is missing, showing the picture in the handout with the proper outlet T installed) for the FSE owner/manager so the problem can be corrected. Normally, NCNs are issued with a due date that is 30 days from the issue date. NCNs should be issued for any of the following significant deficiencies:

- Heavy to moderate FOG in downstream sewer system.
- Grease trap outlet T not attached, or outlet T is loose, allowing FOG discharge to the sewer system.
- FSE has no grease control equipment installed.
- Grease trap outlet T is not visible or accessible for inspection (due to single access manhole or outlet of trap not able to be viewed by inspector). This is particularly critical when the inspector finds heavy to moderate FOG in the downstream sewer line. The inspector should require that a grease trap certification be done to verify if there is an outlet T installed. The inspector should remember that sometimes the FOG layer can become so thick that it covers the top of the outlet T, or the outlet T may have a cap on it which is covered by FOG. The inspector should use their long blade shovel or manhole pullers to determine if the outlet T is covered by the FOG layer.
- The grease trap has signs of deterioration, or severe pitting of concrete.
- The grease trap FOG layer and food solids layer is greater than 25% of the total tank capacity. If the FOG layer is greater than 4 inches, indicates that normally the bottom food solids layer will be 4 to 8 inches deep, the trap needs to be pumped of complete contents. For some FSEs that serve chicken, fish, or rice the food solids layer can be 2 times to 4 times the FOG layer depth. The inspector should use best judgment and emphasize the need to have the trap on a regular complete pump schedule. Thus, if

pump records do not indicate regular pumping, then the inspector should issue the NCN.

If there are other deficiencies noted by the inspector, the inspector should mark all the deficiencies on the NCN. Again, the inspector should ask the FSE owner/manager if they understand the deficiencies/problems that have been identified, and that they understand that they should initiate corrective actions.

The inspector should have hard copies of all completed FSE inspection forms and enforcement notices or NCNs on file. Any digital photos taken should be properly identified and stored in the database or on the inspector's computer or on a CD. The inspection data should be entered into the database as soon as possible. The inspector should track all NCNs issued in order to ensure that a proper response has been received from the FSE.

If the FSE owner/manager does not respond to the initial enforcement action or NCN due date the inspector should conduct an onsite inspection with the FSE owner/manager to determine if any corrective action progress has been made. In some cases, the FSE may have already corrected the problem/deficiency, but simply did not contact the County.
If the inspector finds that no corrective action has been completed, then the inspector must follow the enforcement response plan protocol and report this to JCESD supervisor or FOG Program Coordinator. The JCESD supervisor or FOG Program Coordinator should determine the proper escalation in enforcement action. The escalation in enforcement action should consider the severity of the deficiency/problem (i.e. heavy FOG in the sewer line that is causing an obstruction), the chronic nature of the problem, and the FSE's history of noncompliance. The inspector must keep records (including the dates and FSE personnel involved) of all inspection and enforcement actions.

Communication with Sewer Maintenance: The inspector should make the sewer system maintenance personnel aware of any moderate to heavy FOG found during their FSE inspections. Also, the inspector should communicate with the sewer system maintenance personnel to be notified of any moderate to heavy sewer line FOG that they identify. If the inspector identifies slight to moderate FOG, or FOG blockage that is not critical but needs to be cleaned to prevent further problems, the inspector should provide the sewer line segment identification and a time frame for the sewer line segment to be cleaned (i.e. within next 4 weeks). The inspector should be familiar with the FOG "hotspot" areas and make extra efforts to identify any FSE that discharges FOG to the sewer system.

INSPECTIONS-STEP 6: DATA MANAGEMENT

The inspector must make sure that all FSE inspection forms and NCNs are filed for easy reference. Also, the inspector should ensure that the following information is input into the database.

- FSE name (sometimes the name changes but ownership does not)
- FSE address, zip code (be sure to ask for the physical address and the mailing address, and during later inspections make sure it is correct)
- FSE owner or manager name
- FSE phone number
- If a new FSE replaces an "out of business" FSE, be sure to document this in the new FSE file and the FSE that is out of business.
- Type of Grease Control Equipment
    - Grease Trap
    - Grease Interceptor
    - No Grease Control Equipment
- Size of Grease Interceptor or Grease Trap
- Location of Grease Interceptor or Grease Trap
- Frequency of cleaning or pumping the Grease Interceptor or Grease Trap
- Grease Waste Hauler used
- Dates for Grease Interceptor or Grease Trap Certification
    - Pass or Fail
    - If Fail, there should be correspondence on corrective action to be taken
- Inspection dates and findings
- Noncompliance Notifications-NCNs (or other enforcement actions) issue dates, due dates, deficiencies noted, and corrective action taken, as well as the completed date for corrective action.
- Sewer Plat ID (closest downstream manhole that the FSE discharges)
- REPORTS- A few of the reports that the inspector should be able to generate:
    - Listing of all active FSEs with FSE name, physical address, mailing address, contact name, phone number, Type and size of grease control equipment, grease waste hauler used
    - List of all inspections completed, with FSEs in alphabetical order, inspection date and findings
    - List of all NCNs, with FSEs in alphabetical order, issue date, response date, issued by (inspector), completed date, deficiency/problem ID, and corrective action taken
    - List of all Grease Control Equipment (interceptors and traps) Certifications completed, with certification date, grease waste hauler or plumber name, Pass or Fail, and if fail reason for failure and corrective action taken.

INSPECTIONS 7: RESIDENTIAL FOG

Discharge of FOG from houses, duplexes, apartments, mobile home parks, and public housing facilities can cause sewer line blockages and SSO events. Single family residences are less likely to cause FOG related sewer line blockages, than apartments, mobile home parks, or public housing facilities. The County inspectors need to communicate with the sewer maintenance personnel to identify the residential area FOG "hotspots" that have recurring or chronic FOG blockages in the sewer system. The inspector should have a "Residential Notification" that provides information, and contains pictures, to the residents about how FOG can cause sewer back-ups in private plumbing, and blockages and overflows in the County's sewer system. The "Residential Notification" should also include Best Management Practices for the residents to implement to prevent FOG discharges.

Apartment Inspections: Prior to going to the apartment complex, the inspector should collect historical sewer maintenance/sewer line cleaning information from the sewer maintenance section. This record of sewer line cleaning and maintenance will provide the inspector with information to share with the apartment owner or manager to show them the ongoing problem in the downstream sewer system from their facility.
The inspector should do recon of the area to identify the discharge point or sewer connection location of the apartment complex. There may be many connection points to the County sewer system, so the inspector should be sure to check any private manholes that the apartment complex has to try to identify if one particular unit of apartments is causing most of the problem. Also, apartment complexes may have heavy amounts of paper products, or rags, which are in the sewer system. Sometimes, FOG is identified as the primary cause of a blockage or SSO event, when it could be paper products or rags. The inspector should take photos to document any problems found in the sewer system. Following the recon of the area, the inspector should meet with the apartment owner or manager to collect contact information and number of apartment units, review the findings of the inspection, the sewer maintenance history, and provide "Residential Notifications" that are to be distributed to all tenants by the apartment owner or manager. Contact information should include: owner name, if applicable, management company name, street address, mailing address, phone number, and number of apartment units. This information will need to be recorded or input in the database so future tracking of any problems from this apartment complex can be documented. Also, the number of apartment units can be used to track the number of "Residential Notifications" that were distributed. The inspector should explain that if there are continued FOG discharges from the apartment that result in sewer line blockages or SSO events, that enforcement action and/or charges for sewer line cleaning may be initiated.
Public housing facility and mobile home park inspections would be similar to the apartment inspection protocol described above.

Single Family Residents: The sewer maintenance section should have door-hangers or notifications to provide to single family resident houses. If the FOG related problem in a particular area is chronic, then a mail out of the residential notifications should be done to the houses in that particular neighborhood. Also, an automated phone call system can be initiated to call residents in a particular area to make them aware of then need to control FOG discharges from their homes. Again, the County should track all notifications (door-hangers, letters, phone calls, etc…) made to residents to keep records of the number and areas that have been notified of the need for FOG control and best management practices to prevent FOG discharges.

***Inspectors should do recon of the particular residential neighborhood to determine if an individual is running a catering business or mobile food unit from their home.**

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Appendix B Food Service Facility FOG Inspection Form

Jefferson County Environmental Services Department

FOOD SERVICE FACILITY GREASE CONTROL INSPECTION FORM

PERMIT # : _____

Facility Name: _____ **Inspection Date:** _____

Facility Representative: _____ **Title:** _____

Phone: _____ **Owner/Regional Manager Name:** _____

Facility Address: _____ Mail Address: _____

_____ (if different) _____

Sewer ID: **Pump Station:** **GPS ID:**

___Initial Inspection ___Annual Inspection ___1st NOV Re-inspection ___2nd NOV Re-inspection ___3rd NOV Re-inspection

___New Construction Inspection ____Re-inspection (Other)_____

1.) Grease Trap? ____ Yes ____ No
(For #1, if "NO" then go to # 19)

2.) Trap Size(gallons): ____1000 ____1500 ____2000 ____3000
___Two Traps in series Other:_____

3.) Manhole Access:__1 __2 __3 __4 __5 __6 __7 __ 8 **4.)** Grease Layer Depth: ____ 1"-3" ____ 4"-6" ____ 6"-9" ___ >10"

5.) Influent T visible? ___Yes ___No **6.)** Influent T attached & in good condition: ____Yes ____No _____ Unknown

7.) Effluent T visible? ___Yes ___No **8.)** Effluent T attached & in good condition: ____Yes ____No _____ Unknown

9.) Mid - Wall Baffle visible? ____Yes ____No **10.)** Baffle Wall in good condition: ____Yes ____No ____Unknown

11.) Sample Vault/Port? _____ Yes _____No **12.)** Bacteria/Enzymes used:____Yes_____No

14.) Grease Trap Contractor/Hauler used: _____ **13.)** Product Name:_____

15.) Frequency Trap Cleaned: _____ **16.)** Complete Contents Pumped? ____Yes ____ No

17.) Records of Maintenance/Cleaning Available? ____ Yes ____ No **18.)** Last date cleaned:_____

19.) Grease Interceptor? ___Yes ___No **20.)** Location: __ Under sink interceptor __ Floor interceptor __ Outside "floor" int.

21.) Grease Interceptor flow-through rating / lb capacity: _____10 gpm/ 20 lb or < ____15 gpm/ 30 lb ____20 gpm/40 lb

____ 25 gpm / 50 lb _____ 35 gpm / 70 lb _____ 50 gpm / 100 lb ____Other:_____

22.) Other Interceptors? Location, Size._____

23.) Flow Restrictor Visible / In place? _____Yes _____No _____Undetermined ***(FSF must Verify / Install Flow Restrictor)***

24.) Grease Interceptor Hauler used: _____ **25.)** Bacteria/Enzymes used:___Yes___No

26.) Product Name:_____

27.) Frequency Interceptor is cleaned:_____ **27.)** Maintenance / Cleaning Records? _____ Yes _____ No

28.) Last Date Cleaned: _____ **29.)** Grease Interceptor comments/location waste disposed:_____

30.) Best Management Practices Implemented ___Yes ___No **31.)** Outside Recycle Bin ___Yes ___No

32.) Food Grinder on Sewer?____ Yes ____ No **33.)** Inside Recycle Oil System ___Yes __No

34.) Cleanout Covers missing or damaged? ___Yes ___No (# Cleanout covers missing: _____ damaged: _____)
(Facility needs to repair missing or damaged cleanout covers immediately)

35.) FOG impact at dumpster,recycle bin, storm sewer? ___Yes ___ No (if **Yes** give explanation below)

36.) Downstream Sewer: _____ Evidence of Grease in Manhole _____none_____slight _____moderate _____ heavy

Evidence of Grease in Sample Vault? ____Yes ___No. Manhole(s) ID with Grease:

37.) Picture ID:_____ // _____ of Trap _____ of downstream MH _____other:_____

38.) Inspection Results: _____PASS _____WARNING _____FAIL (Notice of Violation Issued)

Inspection results, comments:

Inspector Name: _____ **FSF Rep:** _____

Jefferson County Website for Food Service Facility info: www.jeffcoes.org (go to Customer Care, Commercial, Food Service)

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Appendix C Food Service Facility Permitting FAQs

Grease Control Program Frequently Asked Questions and Answers:

- **Is there grandfathering for existing food service facilities?**
  No, every food service facility (FSF) that discharges waste into the Jefferson county sanitary sewer system is required to obtain a Grease Control Program (GCP) Permit or an exemption from GCP Permit.

- **Are the training classes mandatory?**
  No, but they are highly recommended. The classes offer valuable training skills for managers and/or workers to help control the amounts of fats, oils, and grease being discharged from the FSF.

- **Can I clean the grease interceptor or trap at my food service facility?**
  Yes, however the Jefferson County Health Department requires a permit for anyone or any firm that pumps, transports, stores, treats, or disposes of grease septage.

- **Will I have to change the current grease trap or interceptor that is currently installed? If so, when is the deadline to accomplish this?**
  Existing FSFs may be required to modify existing grease control devises or install additional grease control devices. If modifications or additions are required you will have 30 days to submit an Action Plan from the initial inspection. The upgrades shall be in place 90 days from the approval of the Action Plan.

  What is the difference between grease traps and grease interceptors?
  The location and size. Both devices do the same thing – separate and retain free-floating oils and grease. The two terms can be used interchangeably. For Jefferson County's purposes grease interceptors are referred to as the small, in-floor or under-the-sink prefabricated steel units. Grease traps are the larger devices located outdoors that offer much longer hydraulic retention times.

- **Is a sample vault needed?**
  Yes, in all new construction and may be required to retrofit older establishments if deemed necessary. It should be located downstream of the last grease trap.

- **Are permits transferable?**
  No. Each time a FSF changes owners/operators a new permit must be applied for.

- **Must the permit be displayed?**
  No. It should be kept on file and presented at the inspector's request.

- **What is the difference between fryer oil and FOG?**
  FOG is animal fats, oils & grease used for the purpose of preparing foods or resulting from food preparation. Fryer Oil means oil that is used and/or reused in fryers for the preparation of foods such as fried chicken and French fries.

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NEW FOOD SERVICE FACILITY PERMITTING GUIDELINES

Listed below are guidelines for new food service facilities (FSFs) permitting with the Grease Control Program. New FSFs include new construction, remodels where plumbing is being reworked, excavation is being performed onsite or when there is a change in size or type of food preparation equipment.

1. Obtain a sewer impact permit from the Sewer Permitting and Inspection Office prior to issuance of a Grease Control Program Permit.

2. Apply for a Grease Control Program Permit or an Exemption from Permit Requirements. Remit applicable fees along with the application.

NUMBER OF DEVICES	FEES
1-5	$450.57
6-10	$750.91
11+	*

* Units in excess of 10 shall be assessed $750.91 plus $300.38 for each additional 5 units in excess of 10

3. Submit site utility and/or plumbing plans with details, size and location of the grease control device(s) and sampling vault(s), inclusive of locations for all sinks, dishwashers, sewer connections, etc. The grease control device(s) shall be sized in accordance with the rules and regulations set forth by the Jefferson County Sewer Use Administrative Ordinance.

4. Receive final approval of specifications for the grease control device(s) and sampling vault(s). Copies of the approval will be sent to the Sewer Impact Department, the FSFs, the Jefferson County Department of Health, and the local inspections department.

Approval must be obtained before (1) a Sewer Connection Permit is issued for new construction or (2) an Impact Permit is issued for remodels on existing structures. Please allow a 10 business day review period.

5. If applicable, receive a sewer connection permit before start of installation of the grease control device(s) and sampling vault(s).

4. Make an appointment for inspections from the Grease Control Program (205-238-3866 or 205-238-3876) and Sewer Impact (205-325-5801) to achieve approval on the installation of the grease control device(s) and sampling vault(s). Any work completed without prior notice shall be subject to a non-compliance fee.

5. Receive Grease Control Program Permit.

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Appendix E Grease Control Program Permit Application/Application for Exemption

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JEFFERSON COUNTY
ENVIRONMENTAL SERVICES DEPARTMENT
GREASE CONTROL PROGRAM
FOOD SERVICE FACILITY
GREASE CONTROL PROGRAM PERMIT APPLICATION

Facility Information

Facility Name: _____

Business License # _____ Tax ID # _____

Address: _____

Phone Number: _____

Facility Contact Name: _____

Position/Title: _____

Corporate Name: _____

Mailing Address: _____

Phone Number: _____

Food Service Activity

Provide a brief narrative of food service activity; list type of food served.

_____

_____

_____

_____

_____

Provide NAICS code for this facility [see NAICS code book]

Product or Service	NAICS Code	% of Activity

Describe operations which generate wastewater: _____

_____

_____

_____

For ESD Use Only

Date Received: _____ Check No. _____ New Construction: _____ On Septic: _____

Change of Ownership/Business: _____ Reviewed by: _____ Permit No. _____

Is wastewater discharge continuous [water left running] or batch [faucet turned on only when needed]?_____

Months of operation _____ Peak months _____

Days of operation _____ Open on holidays? _____

Total number of employees _____

Number of employees - Shift 1 _____Time _____ to _____

Number of employees - Shift 2 _____Time _____ to _____

Number of employees - Shift 3 _____Time _____ to _____

Total seating capacity _____ [from Sewer Impact Department]

List all major equipment used for food preparation; i.e. grills, fryers, dishwashers, etc.; list sizes and capacities when appropriate.

Equipment	Equipment

List all sinks, the number of compartments per sink, and their intended use; i.e. hand, pre-rinse, wash, sanitize, 2 compartments, etc.

Location	Number of Compartments	Intended Use	Size (gallons)
Example: Kitchen	4 compartment	Rinse, wash, sanitize	30 gallons

Describe any wastewater pretreatment systems in place [grease interceptor, grease trap or grease removal device]. _____

_____

_____

Provide information on each grease interceptor, grease trap or grease removal device.

Location	Size/Capacity	Manufacturer	Model #	Additional Information

Fryer Oil Maintenance [Fryer oil cannot be discharged to sanitary sewer.]

Do you have fryer oil? Yes / No [circle one] Amount: _____gallons

If answer is no, skip to section on grease interceptor or grease trap maintenance.

Describe how fryer oil is handled: _____

_____

_____

Fryer Oil Hauler:_____

Address:_____

_____

Contact_____ Telephone: _____

Fryer Oil Disposal Site: _____

Address: _____

_____

Contact: _____ Telephone: _____

Grease Interceptor or Trap Maintenance:

Grease Interceptor or Trap Waste Hauler:_____

Address:_____

_____

Contact_____ Telephone: _____

Grease Interceptor or Trap Waste Disposal Site: _____

Address: _____

_____

Contact: _____ Telephone: _____

Frequency of grease interceptor or trap maintenance: _____

Describe how grease interceptor or trap maintenance is performed: _____

_____

_____

_____

Does your company verify that all FOG wastes removed from your property are disposed of properly? Yes / No [circle one]

Water Account Numbers:

Name on Water Account: _____

Service Address: _____

_____

Billing Address [if different]: _____

_____

If your facility uses water from another source [well, etc.], describe: _____

_____

ATTACH A COPY OF YOUR MOST RECENT WATER BILL FOR THIS FACILITY.

Provide an up to date copy of indoor and outdoor plumbing plans. These plans should include the location of all water meters, sewer connections, floor drains, grease removal equipment, sinks, dishwashers, restrooms, etc. Blue prints are acceptable. A "to scale" hand drawn sketch may be acceptable in some cases.

AUTHORIZED REPRESENTATIVE STATEMENT

I, being duly authorized to sign this document, and in consideration for the granting of a Food Service Facility Grease Control Permit, do hereby agree to allow duly authorized employees of the Jefferson County Environmental Services Department the right to enter upon said company properties, without prior notification, for the purposes of inspection, observation, measurement, sampling, copying of records, photography, or testing.

Additionally, I agree to abide by all applicable provisions of the Jefferson County Grease Control Program.

I understand that failure to abide by the terms of this permit may be cause for disconnection of sewer service to the property authorized to discharge by this permit.

I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gathered the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant additional fees for submitting false information.

SIGNATURE: _____

PRINTED NAME: _____

TITLE: _____

DATE: _____

JEFFERSON COUNTY
ENVIRONMENTAL SERVICES DEPARTMENT
GREASE CONTROL PROGRAM
FOOD SERVICE FACILITY
APPLICATION FOR EXEMPTION FROM PERMIT REQUIREMENT

Facility Information

Facility Name: _____

Business License # _____ Tax ID # _____

Address: _____

Phone Number: _____

Facility Contact Name: _____

Position/Title: _____

Corporate Name: _____

Mailing Address: _____

Phone Number: _____

Food Service Activity

Provide a brief narrative of food service activity; list type of food served.

_____

_____

_____

_____

_____

Provide NAICS code for this facility [see NAICS code book]

Product or Service	NAICS Code	% of Activity

Describe operations which generate wastewater: _____

_____

_____

_____

For ESD Use Only

Date Received: _____ Check No. _____ New Construction: _____ On Septic: _____

Change of Ownership/Business: _____ Reviewed by: _____ Permit No. _____

Is wastewater discharge continuous [water left running] or batch [faucet turned on only when needed]?_____

Months of operation _____ Peak months _____

Days of operation _____ Open on holidays? _____

Total number of employees _____

Number of employees - Shift 1 _____Time _____ to _____

Number of employees - Shift 2 _____Time _____ to _____

Number of employees - Shift 3 _____Time _____ to _____

Total seating capacity _____ [from Sewer Impact Department]

List all major equipment used for food preparation; i.e. grills, fryers, dishwashers, etc.; list sizes and capacities when appropriate.

Equipment	Equipment

List all sinks, the number of compartments per sink, and their intended use; i.e. hand, pre-rinse, wash, sanitize, 2 compartments, etc.

Location	Number of Compartments	Intended Use	Size (gallons)
Example: Kitchen	4 compartment	Rinse, wash, sanitize	30 gallons

Water Account Numbers:

Name on Water Account: _____

Service Address: _____

_____

Billing Address [if different]: _____

_____

If your facility uses water from another source [well, etc.], describe: _____

_____

ATTACH A COPY OF YOUR MOST RECENT WATER BILL FOR THIS FACILITY.

Justification for Exemption

Use this space to provide further details to support request for exemption from Grease Control Program Permit requirements.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Provide an up to date copy of indoor and outdoor plumbing plans. These plans should include the location of all water meters, sewer connections, floor drains, grease removal equipment, sinks, dishwashers, restrooms, etc. Blue prints are acceptable. A "to scale" hand drawn sketch may be acceptable in some cases.

AUTHORIZED REPRESENTATIVE STATEMENT

I, being duly authorized to sign this document, and in consideration for the granting of an Exemption from the Food Service Facility Grease Control Permit program, do hereby agree to allow duly authorized employees of the Jefferson County Environmental Services Department the right to enter upon said company properties, without prior notification, for the purposes of inspection, observation, measurement, sampling, copying of records, photography, or testing.

Additionally, I agree to abide by all applicable provisions of the Jefferson County Grease Control Program.

I understand that any changes in food service activities which generate FOG will require notification of JCESD and may require a Grease Control Program Permit.

I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gathered the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

If an exemption has been falsely obtained, additional fees of $500 per group of 5 grease interceptors or traps will be assessed.

SIGNATURE: _____

PRINTED NAME: _____

TITLE: _____

DATE: _____

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How to Clean a Grease Interceptor

Why is it necessary to clean the grease interceptor?

Scheduled cleaning of the interceptor every 14 days is required by the Jefferson County Grease Control Ordinance #1778. Keeping the interceptor clean will prevent overflows and backups into food service facilities and residences. Frequent cleaning reduces odors, makes routine maintenance easier and reduces the amount of time it takes to clean the interceptor.

Suggested materials:

Large trash can
Several heavy duty trash bags (industrial strength lawn bags doubled) or
Many sealable containers (such as fryer oil jugs or pickle barrels)
Large screwdriver
Pry bar
Scraper
Scoop or small bucket
Wet/Dry vacuum
Rubber gloves
Safety glasses
Paper Towels

To Begin:

- Prepare the work area by clearing area of all material, debris and equipment that will not be needed in the cleaning of the grease interceptor.
- Line the trash cans with multiple trash bags or gather the containers with lids.
- Remove the lid of the grease interceptor. (Pay attention to how the parts are installed because an interceptor that is not assembled properly will cause a discharge of FOG into the sanitary sewer system which could result in an overflow).
- Begin removing contents of the interceptor by dipping with a bucket or scoop and/or vacuuming the contents with a wet dry vacuum into trash bags or containers with lids.
- Do not use: hot water, de-greasers or soaps to clean the interior parts of the interceptor.
- Scrape the inside walls and baffles.
- Flush screens to ensure movement of water through the device.
- Use dipper or vacuum to remove scrapings and other residue.
- Make sure that internal components are properly placed and seated.
- Replace lid
- Securely tie bag(s) or seal container so it does not leak.
- Place waste in dumpster in sealed container if it is less than 10 gallons; if it is more than 10 gallons contract with a grease hauler for pick up and disposal.
- Update maintenance records with amount removed and date in log book for inspectors review.

** **NOTE**: due to the strong odor that may be produced during cleaning, it is recommended scheduling grease interceptor maintenance during non-business hours. Always make sure the area is well ventilated when the interceptor is opened. Frequent cleaning will help to minimize the odor.

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Appendix G List of Permitted Food Service Facilities

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FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
10168	10th Avenue Deli	4500 Richard Arrington Jr Blvd	Birmikngham	AL	Pending
6280	117 Air Refueling Wing Dining Facility	5401 East Lake Blvd	Birmingham	AL	20180010
8717	1918 Catering	197 Vulcan Road	Homewood	AL	Pending
8990	19th Street Lounge	109 19Th Street North	Bessemer	AL	Pending
8972	2 Fish & 5 Loaves	3000 12Th Avenue North	Birmingham	AL	Pending
10050	20 59 Travel Center	3597 Jay Bird Road	Brighton	AL	Pending
7889	29- Seven, LLC/ Babalu & Jimmy Johns	2808 7Th Avenue South	Birmingham	AL	20183390
8535	3rd Avenue So Mixed Use Dev.	300 20th Street South	Birmingham	AL	20183720
8470	4 Seasons Bar & Grill	719 Graymont Avenue North	Birmingham	AL	Pending
8756	4th & North Cafe	2201 4th Avenue North	Birmingham	AL	20183786
10278	5 Points Bowling	1006 20Th Street South	Birmingham	AL	Pending
11465	6th Avenue Donuts	2109 6Th Avenue South	Birmingham	AL	Pending
10194	6th Avenue Meat & Fish Market	137 6Th Avenue S W	Birmingham	AL	Pending
10108	A Promise To Help	1624 Bessemer Road	Birmingham	AL	Pending
1841	A Social Affair/ Gourmet To Go	127 Oak St	Birmingham	AL	20180386
2731	AAA Convenience Store	3220 Morgan Rd	Bessemer	AL	EXEMPT
8954	Abhis	300 Summit Blvd	Birmingham	AL	Pending
1156	Abrams Elementary Child Nutrition Program	1200 23rd Street North	Bessemer	AL	20181366
3817	Acapulco Bar & Grill	430 Greensprings Hwy	Homewood	AL	20181161
1846	Acipco Employees Cafeteria	1501 31st Avenue North	Birmingham	AL	20180437
8514	Acton Road Daylight Donuts	2409 Acton Road	Vestavia Hills	AL	20183654
1111	Adamsville Elementary School	4600 Midway Road	Adamsville	AL	20180438
11375	Adger Grocery	7301 Johns Road	Adger	AL	Pending
5661	Advent Episcopal School	2017 6th Ave No	Birmingham	AL	20181719
8890	Agape Kingdom Kare	328 Robison Drive	Birmingham	AL	Pending
8612	Airport Mini Mart	4010 Messer Airport Hwy	Birmingham	AL	20183674
8450	Airport Store	3828 Messer Airport Hwy	Birmingham	AL	Pending
11494	Airport Store Cafe	720 39Th Street North	Birmingham	AL	Pending
8173	AKF Chevron	4101 3Rd Avenue South	Birmingham	AL	Pending
1319	Al's Deli & Grill	1629 10th Avenue South	Birmingham	AL	20180635
1558	Alabama Clinical Schools	1221 Alton Dr	Birmingham	NULL	20183103
5540	Alabama Dept of Corrections (B'ham CBF)	1216 25th Street No	Birmingham	AL	20181639
1228	Alabama School of Fine Arts	1800 8th Avenue North	Birmingham	AL	20180440
1858	Alabama Splash Adventure Employee Diner	5051 Prince St	Bessemer	AL	20183279
1857	Alabama Splash Adventure Funnel Cake House	5051 Prince St	Bessemer	AL	20182976
7235	Alabama Splash Adventure General's Diner	5051 Prince St	Bessemer	AL	20183175
1856	Alabama Splash Adventure Ricky's Backstage	5051 Prince St	Bessemer	AL	20182975
1554	Alabama Splash Adventure Surfside Grill	5051 Prince St	Bessemer	AL	20182973
8857	Alabama Waldorf School	5901 Crestwood Blvd	Birmingham	AL	EXEMPT
7868	Alagasco	20 Powell Avenue South	Birmingham	AL	Pending
1565	Alcohol & Drug Abuse Treatment (Pearson Hall)	2701 Jefferson Ave Sw	Birmingham	AL	20180442
1630	Alcohol & Drug Abuse Treatment Ctr. Olivias House	8017 2nd Ave	Birmingham	AL	20180443
7207	Alethia House- 5th Ave S	4246 5th Avenue S	Birmingham	AL	20183101
7208	Alethia House- Finley Ave W	135 Finley Avenue West	Birmingham	AL	20183085
8601	Alexander's Deli & Catering Colonnade Pkwy	3800 Colonnade Parkway	Birmingham	AL	Pending
3440	Alexanders Deli & Catering Shades Creek Pkwy	800 Shades Creek Pkwy	Homewood	AL	EXEMPT
11476	Alfredo's Pizza Cafe	803 Greensprings Highway	Homewood	AL	20183967
11407	All American Deli	3016 Corner Road	Birmingham	AL	Pending
1571	All Original Pizzeria, LLC.	4760 Eastern Vally Rd	Mccalla	AL	EXEMPT
1572	Allens Food Mart #11	2197 Eastern Valley Rd	Bessemer	AL	EXEMPT
11318	Allstate Quick Mart	7698 Hwy 78 W	Birmingham	AL	Pending
11395	AMC Vestavia 10	1911 Kentucky Avenue	Vestavia	AL	Pending
214	Amerex Corporation	7595 Gadsden Hwy	Trussville	AL	20180006
8005	America's Best Inn- West	6400 Kelco Place	Fairfield	AL	EXEMPT
11369	American Deli	1680 Montclair Road	Birmingham	AL	20183912
7309	American Deli Buffalo Wings	306 Oxmoor Road	Birmingham	AL	20183188
7848	American Deli-Bess Rd	1940 Bessemer Road	Birmingham	AL	20183322
5560	American Legion Post #347	5021 Gary Ave	Fairfield	AL	20182988
1204	American Legion Post 171	8325 1st Avenue, North	Birmingham	AL	EXEMPT
8104	American Legion Shades Valley Post #134	4 Hollywood Blvd	Birmingham	AL	20183563
3449	American Legion Tarrant #113	1135 Pinson St	Tarrant	AL	EXEMPT
8400	American Ranch House	1600 Pinson Valley Parkway	Tarrant	AL	Pending
3453	Amigos Mexican Grill	3659 Lorna Rd	Hoover	AL	20181503
7345	Another Broken Egg Cafe	2418 Montevallo Road	Mountain Brook	AL	20183075
3462	APCO Aramark Main Kitchen	600 18th St N	Birmingham	AL	20183041

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
10226	Apple Dumplin Bar	360 Palisades Blvd	Birmingham	AL	Pending
6220	Applebee's Grill & Bar- Fultondale	1250 Boots Blvd	Fultondale	AL	20183249
1005	Applebees Grill & Bar- Bessemer Rd	2246 Bessemer Road	Birmingham	AL	20181317
3465	Applebees Grill & Bar- Centerpoint	1600 Huffman Rd	Center Point	AL	20181106
1599	Applebees Grill & Bar- Trussville	4711 Norrel Dr	Trussville	AL	20181168
3463	Applebees Grill & Bar-Academy Ln	5050 Academy Ln	Bessemer	AL	20181167
3464	Applebees Grill & Bar-John Hawkins Pkwy	2933 John Hawkins Pky	Hoover	AL	20181156
677	Arbys #234 Montgomery Hwy	1482 Montgomery Hwy	Vestavia	AL	20180457
675	Arbys #268 7th Avenue So	2100 7th Ave S	Birmingham	AL	20180458
679	Arbys #306 Parkway East	9328 Parkway E	Birmingham	AL	20180459
672	Arbys #5512 Fieldstown Rd	544 Fieldstown Rd	Gardendale	AL	20180460
670	Arbys #5515 Forestdale Blvd	996 Forestdale Blvd	Birmingham	AL	20180461
680	Arbys #609 Crestwood Blvd	7735 Crestwood Blvd	Birmingham	AL	20180464
673	Arbys #6882 State Farm Pkwy	159 State Farm Pky	Birmingham	AL	20180473
683	Arbys #6913 Chalkville Mountain Rd	5984 Chalkville Mountain Rd	Birmingham	AL	20180474
686	Arbys #7118 Methodist Circle	3990 Methodist Cir	Bessemer	AL	20180475
684	Arbys #7139 GadsdenHwy	1668 Gadsden Hwy	Birmingham	AL	20181094
688	Arbys #7237 Lorna Rd	3775 Lorna Rd	Hoover	AL	20180477
678	Arbys #7448 28th Avenue So	1915 28th Ave S	Birmingham	AL	20180478
674	Arbys #7650 River Square Plaza	105 River Square Plz	Hueytown	AL	20180479
1061	Arbys #8005 Howel Street	227 Howell Street	Fultondale	AL	20180996
136	Arlington Historical House	331 Cotton Avenue	Birmingham	AL	20180555
7595	Arlington Rehabilitaion & Health Care Center	1020 Tuscaloosa Ave S W	Birmingham	AL	20183283
4441	Armed Forces Reserve Center	5300 57th Street North	Birmingham	AL	20122458
1782	Arrington Middle School	2101 Jefferson Ave Sw	Birmingham	AL	20182547
7676	Art Play Johnson House	1006 19th Street S	Birmingham	AL	EXEMPT
11509	Ash Restaurant	705 Oak Grove Road	Homewood	AL	Pending
10130	Ashley Mac's	2013 5Th Avenue North	Birmingham	AL	Pending
7622	Ashley Mac's Inc	3147 Green Valley Road	Vestavia Hills	AL	20183203
94	Ashville Road Church of Christ	1401 Ashville Road	Leeds	AL	EXEMPT
8728	Asian Cuisine	2539 John Hawkins Pkwy	Hoover	AL	Pending
8946	Asian Express	3501 Avenue E	Birmingham	AL	Pending
11426	Au Bon Pain	1201 11Th Avenue South	Birmingham	AL	Pending
3839	Auntie Annes Pretzels	2000 Riverchase Galleria	Birmingham	AL	EXEMPT
10309	Automatic Seafood	2824 5Th Avenue South	Birmingham	AL	Pending
7238	Avo/ Dram	2721 Cahaba Road	Mountain Brook	AL	20183044
11327	Avondale Brewing Co LLC	201 41St Street South	Birmingham	AL	Pending
10026	Avondale Common House	4100 3rd Avenue South	Birmingham	AL	20183852
3842	Avondale Elementary School	4000 8th Ct S	Birmingham	AL	20182544
8157	Avondale Hotbox @ Parkside	4036 5Th Avenue South	Birmingham	AL	20163662
10169	Avondale Mill House	101 42Nd Street South	Birmingham	AL	Pending
8501	Avondale Sunoco	300 41st Street South	Birmingham	AL	EXEMPT
348	B & A Warehouse-1st Ave So	1531 1st Ave S	Birmingham	AL	20180008
939	B & A Warehouse-5th Ave So	3700 5th Avenue South	Birmingham	AL	20181147
7653	B A P S South East	500 Biscayne Drive	Birmingham	AL	20183365
8558	B'ham Jeff Co Transit Authority #1	1735 Morris Avenue	Birmingham	AL	20153648
8559	B'ham Jeff Co Transit Authority #2	1801 Morris Avenue	Birmingham	AL	20153670
11359	Back Forty Beer Company	3201 1St Avenue North	Birmingham	AL	20183917
8557	Backyard Burgers	1428 Montgomery Hwy	Vestavia	AL	20183723
3849	Backyard Burgers "CLOSED"	1428 Montgomery Hwy	Vestavia	AL	20070483
10042	Baha Burger	3056 Healthy Way	Vestavia Hills	AL	Pending
8991	Baja California Cantina	961 Main Street	Birmingham	AL	Pending
10104	Baja Cantina & Grill #2	1694 Montgomery Hwy	Hoover	AL	Pending
213	Bakers Famous Pizza	757 Shades Mtn Plz	Hoover	AL	20180007
11464	Bald Rock Grill	7323 Parkway Drive	Leeds	AL	Pending
1883	Bama Hot Dogs	1613 Pinson Valley Pky	Tarrant	AL	20180484
8489	Bamboo on 2nd	2212 2nd Avenue North	Birmingham	AL	20183661
3855	Baptist Medical Ctr Princeton- Dietary	701 Princeton Ave Sw	Birmingham	AL	20180485
8435	Bar 31	1485 Montgomery Hwy	Vestavia	AL	20173636
8114	Barbeque Stop	6633 Old Springville Road	Pinson	AL	20183499
8955	Bare Naked Noodles	2204 Lakeshore Drive	Birmingham	AL	Pending
139	Barnes & Noble #2858	201 Summit Blvd	Birmingham	AL	EXEMPT
140	Barnes & Noble- Hoover	171 Main Street	Hoover	AL	EXEMPT
2022	Baron House of Hueytown	190 Brooklane Dr	Hueytown	AL	20181479
1887	Barrett School	7605 Division Ave	Birmingham	AL	20182543

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
8873	Barteco Homewood, LLC	1017 Oxmoor Road	Homewood	AL	20183894
8886	Basil	1101 Dunston Avenue	Birmingham	AL	Pending
6880	Baskin Robbins	2772 John Hawkins Pkwy	Birmingham	AL	Pending
4721	Bass Pro Shop-General Store	5000 Bass Pro Blvd	Leeds	AL	20182958
10307	Bayles Catering @ Woodlawn Kitchens	5831 1St Avenue North	Birmingham	AL	20183913
8900	BBB Homewood	1928 29Th Avenue South	Birmingham	AL	20183897
8294	BBVA Brock Center Cafe	701 32nd Street South	Birmingham	AL	Pending
8480	Beijing Express	3659 Lorna Road	Hoover	AL	20183610
1897	Bessemer Academy	1705 4th Ave Sw	Bessemer	AL	20180556
7469	Bessemer City High Concession	4950 Premiere Park Way	Bessemer	AL	EXEMPT
7468	Bessemer City High School	4950 Premiere Park Way	Bessemer	AL	20183142
8109	Bessemer City Middle School	100 High School Drive	Bessemer	AL	20183475
312	Bessemer Civic Center	1130 9th Avenue SW	Bessemer	AL	EXEMPT
141	Bessemer Cut-off Post 149 (American Legion)	1926 3rd Ave. N	Bessemer	AL	EXEMPT
10184	Bessemer Food Mart	1411 4Th Avenue	Bessemer	AL	Pending
7601	Best Western Gardendale	842 Thompson Street	Gardendale	AL	EXEMPT
7349	Best Western- Bessemer	5041 Academy Lane	Bessemer	AL	EXEMPT
2429	Best Western/Carlton Suites	140 State Farm Pky	Birmingham	AL	20171197
8695	Best Wing Deli	5017 Richard Arrington Blvd No	Birmingham	AL	20173727
4127	Best Wings & Deli- Carraway Blvd	2429 Carraway Blvd	Birmingham	NULL	20181064
8088	Bethel Baptist Church	1708 Spencer Avenue	Birmingham	AL	EXEMPT
2020	Bettola	2901 2nd Ave S	Birmingham	AL	20161165
8892	Big AL's Pasquales	5180 Old Springville Road	Pinson	AL	Pending
8224	Big B Foods/Egg House & Wing Stop	4019 Vanderbilt Road	Birmingham	AL	Pending
11372	Big Bad Breakfast	1926 29Th Avenue South	Birmingham	AL	Pending
11397	Big Daddy Ray's Hotdogs	2512 Walker Chapel Road	Fultondale	AL	Pending
8950	Big Mike Fish & Wings	3518 Huntsville Road	Bessemer	AL	Pending
11390	Big Sky Bread Company	1940 Stonegate Drive	Birmingham	AL	Pending
8693	Big Spoon Creamery	4000 3rd Avenue South	Birmingham	AL	20183796
2065	Billys Bar & Grill	2012 Cahaba Rd	Mountain Brook	NULL	20181283
877	Birmingham Botanical Gardens	2612 Lane Park Road	Birmingham	AL	20183021
8257	Birmingham Bread	2408 7th Avenue South	Birmingham	AL	20183669
7960	Birmingham City Hall	710 19th Street North	Birmingham	AL	20183369
1751	Birmingham City Jail	425 6th Ave S	Birmingham	AL	20180559
222	Birmingham Civil Rights	520 16th Street N	Birmingham	AL	EXEMPT
3168	Birmingham Cross Plex At Fair Park	2337 Bessemer Rd	Birmingham	AL	20173318
11425	Birmingham District Brewing Company	2201 2Nd Avenue South	Birmingham	AL	Pending
8699	Birmingham Doughnut Company, LLC	4244 3rd Avenue South	Birmingham	AL	20183806
2980	Birmingham Dreamland, Inc.	1427 14th Ave S	Birmingham	AL	20180560
7366	Birmingham Entertainment	2700 16th Street North	Birmingham	AL	Pending
2067	Birmingham Nursing & Rehab- Dugan Ave	1000 Dugan Ave	Birmingham	AL	20181697
2229	Birmingham Nursing & Rehab- Mary Vann Ln	733 Mary Vann Ln	Birmingham	AL	20182698
135	Birmingham Race Course	1000 John Rogers Drive	Birmingham	AL	20180009
7882	Birmingham Westin Hotel	2221 Richard Arrington Blvd No	Birmingham	AL	20183402
8757	Bistro Two Eighteen	218 20Th Street North	Birmingham	AL	Pending
7685	Bistro V	521 Montgomery Highway	Vestavia	AL	20183252
11460	BJCC Arena Club Lounge Bar L3	2100 Richard Arrington Blvd N	Birmingham	AL	Pending
2239	BJCC Arena Commissary Convention Complex	2100 Richard Arrington Blvd N	Birmingham	AL	20180481
10004	BKW In Foodmart	4109 Gary Avenue	Birmingham	AL	Pending
7839	Black Creek Park Concession	900 Yarbrough Road	Fultondale	AL	20183362
7222	Black Market Bar	3411 Colonnade Pkwy	Birmingham	AL	20183152
10254	Black Market Bar & Grill	1035 20Th Avenue South	Birmingham	AL	20183968
8632	Black Pearl Asian Cuisine	180 State Farm Parkway	Birmingham	AL	Pending
8101	Black Pearl Asian Cuisine	3439 Colonnade Pkwy	Birmingham	AL	20163452
8560	Black Sheep Kitchen	81 Church Street	Mountain Brook	AL	20173684
8076	Blackmon's Cafe	5620 Avenue J	Birmingham	AL	20133442
7204	Blackwell's Neighborhood Pub	3151 Green Valley Road	Vestavia	AL	20092985
2276	BLC Warming Kit (Childrens Harbor)	1600 6th Ave S	Birmingham	AL	EXEMPT
11398	Bloombox Foods @ Heat N Eat Healthy	2409 Acton Road	Birmingham	AL	Pending
8696	Blue Pacific/ Hoover Food Mart	3219 Lorna Road	Hoover	AL	20183803
10277	Blue Print on 3rd	3000 3Rd Avenue South	Birmingham	AL	Pending
11501	Blue Ridge Healthcare Birmingham	1028 Bessemer Road	Birmingham	AL	Pending
1971	Bluff Park Diner	591 Shades Crest Rd	Hoover	AL	20160565
3915	Bluff Park Elementary	569 Park Ave	Hoover	AL	20181007
8657	Bluff Park Ice Cream Shoppe	815 Shades Crest Road	Birmingham	AL	Pending

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
7627	Boatengs Cajun Creations Restaurant LLC	#2 19th Street North	Bessemer	AL	20173324
1159	Bob Sykes Bar B-Q, Inc.	1724 9th Avenue	Bessemer	AL	20180436
10191	Bogues Turnip Truck	3120 Clairmont Avenue	Birmingham	AL	Pending
7526	Bojangles #858 Montclair Road	1533 Montclair Road	Irondale	AL	20183177
7559	Bojangles #860 Eastern Valley Rd	4780 Eastern Valley Road	McCalla	AL	20183209
8064	Bojangles #901 Gadsden Hwy	1880 Gadsden Hwy	Trussville	AL	20183492
8144	Bojangles #922 Morris Avenue	1600 Morris Avenue	Fultondale	AL	20183483
8363	Bojangles #950 Montgomery Hwy	1548 Montgomery Highway	Hoover	AL	20183575
10228	Bon Appetit	2801 Hwy 280 South	Birmingham	AL	Pending
497	Bonefish Grill	3430 Galleria Circle	Hoover	AL	20180048
2285	Bongiorno Italian Restaurant	68-A Church St	Mountain Brook	AL	EXEMPT
913	Books A Million/Joe Muggs-Brookwood	757 Brookwood Village	Birmingham	AL	EXEMPT
915	Books A Million/Joe Muggs-Trussville	1624 Gadsden Hwy	Trussville	AL	EXEMPT
579	Books-A-Million/Joe Muggs- Fultondale	3429 Lowery Pkwy	Fultondale	AL	EXEMPT
8202	Boston Fish	4201 Richard Arrington Blvd	Birmigham	AL	Pending
8473	Boston Fish & Wings	144 6th Avenue SW	Birmingham	AL	20173606
7375	Boston Fish Supreme	1363 Bessemer Road	Birmingham	AL	20183113
853	Bottega Restaurant & Cafe	2240 Highland Ave S	Birmingham	AL	20180500
11329	Bouges Restaurant	3120 Clairmont Avenue	Birmingham	AL	Pending
1980	Boutwell Municipal Auditorium	1930 8th Ave N	Birmingham	AL	EXEMPT
1112	Bragg Middle School	840 Ash Avenue	Gardendale	AL	20180566
8339	Brava	321 20Th Street North	Birmingham	AL	Pending
10056	Bravo Bar & Grill	215 3Rd Avenue West	Birmingham	AL	Pending
8619	Bre's Restaurant & Catering	5204 Bessmer Super Hwy	Bessemer	AL	Pending
11368	Brennen's Irish Pub	1108 20Th Street South	Birmingham	AL	20183921
1982	Briarwood Christian School	2204 Briarwood Way	Birmingham	AL	20181420
7578	Brick & Tin- 20th St No	214 20th St N	Birmingham	AL	20183196
8197	Brick & Tin- Cahaba Rd	2901 Cahaba Road	Birmingham	AL	20183548
10220	Brick Top's	2800 Hwy 280	Homewood	AL	Pending
481	Bright Star Cafe	304 19th St N	Bessemer	AL	20180530
1113	Brighton School	3400 Brown Circle	Brighton	AL	20180567
2297	Brio Tuscan Grille	591 Brookwood Village Ln	Birmingham	AL	20180569
7814	Brito's Supermarket LLC #3	118 Greensprings Hwy	Homewood	AL	20163295
8404	Brixx Wood Fired Pizza	181 Main Street	Hoover	AL	20183616
2308	Brocks Gap Intermediate School	1730 Lake Cyrus Pky	Hoover	AL	20181008
8895	Brookdale Galleria Woods	3850 Galleria Woods Drive	Hoover	AL	20183950
325	Brookdale Place	400 University Park Dr	Birmingham	AL	20180356
8199	Brookdale Place University Park Health Care Center	501 University Park Drive	Birmingham	AL	20183615
1986	Brooklane Baptist Academy	160 Brooklane Dr	Hueytown	AL	20182337
1115	Brookville Elementary School	4275 Brookville School Road	Graysville	AL	20180571
2299	Brookwood Med Ctr: Main Cafe	2010 Brookwood Med. Cntr Dr.	Homewood	AL	20181164
1988	Brother Bryans Mission	1616 2nd Ave N	Birmingham	AL	20181577
190	Brown Derby	3630 6th Ave S	Birmingham	AL	20180172
5700	Brown Elementary School	4811 Court J	Birmingham	AL	20182542
8770	Brusco's New York Style Pizza & Subs	2516 Rocky Ridge Road	Vestavia Hills	AL	Pending
2305	Brusters Real Ice Cream	1008 Vestavia Pky	Vestavia	NULL	EXEMPT
10211	Bryant's Mobile Foods @ Home Style Kitchen	1901 2Nd Avenue North	Bessemer	AL	Pending
1993	BSC Catering Kitchen/Norton Court	900 Arkadelphia Rd	Birmingham	NULL	EXEMPT
11382	Buffalo Wild Wings	1416 4Th Avenue South	Birmingham	AL	Pending
7989	Buffalo Wild Wings- Gardendale	2505 Caufield Drive	Gardendale	AL	20183427
287	Buffalo Wild Wings- Hoover	2772 John Hawkins Pky	Hoover	AL	20180209
479	Buffalo Wild Wings- Trussville	5915 Trussville Crossing Pky	Birmingham	AL	20180548
236	Bumpers Billiards	2132 Lorna Ridge Lane	Hoover	AL	EXEMPT
4241	Bumpus Middle School	6055 Flemings Parkway	Hoover	AL	20181006
1711	Burger King #04431 Montgomery Hwy	1555 Montgomery Hwy	Hoover	AL	20181278
2314	Burger King #05120 Pinson Valley Pkwy	1500 Pinson Valley Pkwy	Tarrant	AL	20181281
2315	Burger King #05501 Parkway East	9528 Parkway E	Birmingham	AL	20181282
2241	Burger King #09834 Academy Dr	740 Academy Dr	Bessemer	AL	20181275
8130	Burger King #1069 6th Avenue So	1524 6th Ave South	Birmingham	AL	20183459
8137	Burger King #12003 Bessemer Rd	2229 Bessemer Road	Birmingham	AL	20183466
8134	Burger King #12295 Fulton Road	1701 Fulton Road	Fultondale	AL	20183463
8132	Burger King #12427 3rd Ave West	801 3rd Ave West	Birmingham	AL	20183461
1259	Burger King #16228 Wiebel Drive	100 Wiebel Drive	Midfield	AL	20182417
8133	Burger King #16437 Crestwood Blvd	7757 Crestwood Blvd	Birmingham	AL	20183462
8135	Burger King #17389 University Blvd	2700 University Blvd	Birmingham	AL	20183464

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
8138	Burger King #17921 Gadsden Hwy	1402 Gadsden Hwy	Birmingham	AL	20183467
8231	Burger King #19958 Allison Bonn Mem Dr	3016 Allison Bonnett Mem Drive	Hueytown	AL	20183502
8310	Burger King #20826 Fieldstown Rd	530 Fieldstown Road	Gardendale	AL	20183580
8136	Burger King #461 Oxmoor Rd	290 Oxmoor Road	Birmingham	AL	20183465
8131	Burger King #6305 Lloyd Noland Pkwy	3600 Lloyd Noland Pkwy	Fairfield	AL	20183460
8258	Burger King #8152 Chalkville Mtn Rd	5961 Chalkville Mt. Road	Birmingham	AL	20183541
7264	Burger King - The Grove - Hoover	Lot 1-B The Grove	Hoover	AL	Pending
7000	Burger King -Tannehill #17003	5001 Bond Blvd	Bessemer	AL	20182992
8853	Burger King Centerpoint Rd	4520 Centerpoint Road	Pinson	AL	20183849
8798	Burger King Forestdale	1484 Forestdale Blvd	Birmingham	AL	20183775
3043	Bush Hill Academy	901 16th St W	Birmingham	AL	20182552
11427	Busy Corner & Cheese	120 19Th Street North	Birmingham	AL	Pending
1154	C. F. Hard Elementary Child Nutrition Program	2801 Arlington Avenue	Bessemer	AL	20181363
7749	Cafe Castillo Tex Mex Grille (Inside Ashleys Furn)	4435 Galleria Blvd, Suite B	Hoover	AL	20163420
763	Cafe Dupont	113 20th St N	Birmingham	AL	20150261
1505	Cafe Iz #2514	2514 Rocky Ridge Rd	Birmingham	AL	20183119
4420	Cafe Iz #3325	3325 Rocky Ridge Road	Birmingham	AL	20182418
1720	Cafe On 1st "CLOSED"	8429 1st Ave N	Birmingham	AL	20070578
10131	Cahaba Breads & Bagels	408 Main Street	Trussville	AL	Pending
10188	Cahaba Heights Property	3029 Pump House Road	Birmingham	AL	Pending
6842	Cahaba Heights Sports Complex	4401 Dolly Ridge Road	Vestavia	AL	20182962
8702	Cahaba Ridge Retirement	3090 Healthy Way	Vestavia Hills	AL	20183736
10192	Cahaba River Catering	1901 6Th Avenue North	Birmingham	AL	Pending
8503	Cahaba River Health & Rehab, LLC	3070 Healthy Way	Vestavia Hills	AL	20183737
8491	Cahaba Village Ele. School	301 Parkway Drive	Trussville	AL	20183750
5960	Cahaba Village/ Newks Cafe/Nothing But Noodles	2800 Cahaba Village Plaza	Birmingham	AL	20181997
8528	Cajun Seafood House	2531 Rocky Ridge Road	Vestavia	AL	Pending
3918	Cajun Steamer Hoover	180 Main St	Hoover	AL	20180581
940	Cajun Steamer of Trussville, Inc.	5071 Pinnacle Sq	Birmingham	AL	20181012
8983	Cake Creations	1827 3Rd Avenue North	Bessemer	AL	Pending
8635	Cakes So Delicieux	122 River Square Plaza	Bessemer	AL	Pending
1723	California Pizza Kitchen-Summit Blvd	238 Summit Blvd	Birmingham	AL	20170582
242	Callahan Eye Foundation - Cafe 1720	1720 University Blvd	Birmingham	AL	EXEMPT
8832	Calvary Resurrection Christian Academy	356 Killough Springs Road	Birmingham	AL	Pending
11370	Canaan Land Learning Enrichment Center	2725 24Th Street S W	Birmingham	AL	Pending
11466	Cane Creek Donuts, LLC	313 Cane Creek Road	Warrior	AL	Pending
85	Canterbury United Methodist	350 Overbrook Road	Mountain Brook	AL	EXEMPT
885	Cantina	2901 2nd Ave S	Birmingham	AL	20180538
8306	Cantina On Wheels Commissary	4120 2nd Avenue South	Birmingham	AL	20153664
2392	Captain Ds #3314 Forestdale Blvd	1143 Forestdale Blvd	Birmingham	AL	20180877
2391	Captain Ds #3503 Bess Super Hwy	666 Bessemer Super Hwy	Fairfield	AL	20180880
2421	Captain Ds #3505 Crestwood Blvd	7718 Crestwood Blvd	Birmingham	AL	20181017
2422	Captain Ds #3512 Montgomery Hwy	1473 Montgomery Hwy	Vestavia	AL	20181015
2427	Captain Ds #3513 Parkway E	9973 Parkway E	Birmingham	AL	20181019
2423	Captain Ds #3515 16th Street So	514 16th St S	Birmingham	AL	20181020
2394	Captain Ds #3516 West Town Plz	560 West Town Plz	Bessemer	AL	20180878
2396	Captain Ds #3571 Decatur Hwy	1228 Decatur Hwy	Gardendale	AL	20180881
2424	Captain Ds #3592 Allison Bonn Mem Dr	3067 Allison Bonnet Mem Dr	Hueytown	AL	20180879
2426	Captain Ds #3598 Main St Trussville	407 Main St	Trussville	AL	20181021
7213	Captain Ds #3690 Ashville Rd	1817 Ashville Road	Birmingham	AL	20182982
2425	Captain Ds #3736 Finley Blvd	1725 Finley Blvd	Birmingham	AL	20180876
8398	Captain Ds #3787 Bessemer Rd	2259 Bessemer Road	Birmingham	AL	20183579
8723	Caregiving Kids Academy	1129 Springville Road	Birmingham	AL	Pending
4640	Carlile's BBQ	3511 6th Avenue, South	Birmingham	AL	20181294
7897	Carnation Buffet	5020 Academy Lane	Bessemer	AL	20183335
8039	Carrigans Public House	2430 Morris Avenue	Birmingham	AL	20183456
11496	Carson Food Mart	1300 Carson Road	Birmingham	AL	Pending
10252	Carson Village Convenience Store	408 Carson Road North	Birmingham	AL	Pending
7321	Carver High Concession Stands	5th Avenue North	Birmingham	AL	EXEMPT
5701	Carver High School	3900 24th Street No	Birmingham	AL	20182540
8849	Casa Fiesta	5084 Pinnacle Square	Trussville	AL	20183947
1234	Casa Fiesta	3417 Lowery Parkway	Fultondale	AL	20181519
10305	Caveat Coffee	2832 Linden Avenue	Homewood	AL	Pending
919	Cedar House Cafeteria	1001 Cedar Street	Tarrant	AL	20180332
968	Cedar Phoenician Club	301 Green Springs Ave South	Birmingham	AL	20160534

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960	Center of Excellence	1622 7th Avenue North	Bessemer	AL	20182297
1116	Center Point Elementary School	4801 Indian Trail	Birmingham	AL	20180586
7648	Center Point High School	2955 Jefferson Street Parkway	Birmingham	AL	20183288
2406	Center Point Park Main Concession	1000 Chalkville School Rd	Birmingham	AL	20183437
2405	Center Street Middle School	1832 Center Way S	Birmingham	AL	20172539
7823	Central Avenue Retail	2821 Central Avenue	Birmingham	AL	20183325
4063	Central Park Elementary	4915 Avenue Q	Birmingham	AL	20182538
7308	Chace Lake Station Bldg A/ First Watch #336	4741 Chace Circle	Hoover	AL	20183042
7310	Chace Lake Station Bldg B/Baha Burgers/ Taziki's	4745 Chace Circle	Hoover	AL	20183057
8266	Chace Landing Partners,LLC/ 5 Guys/Ashley Mac's	4730 Chace Lake Circle	Hoover	AL	20183533
1117	Chalkville Elementary School	940 Chalkville School Road	Birmingham,	AL	20180587
11412	Chalkville Shell	2143 Sweeney Hollow Road	Trussville	AL	Pending
7540	Changed Lives Christian Center	1308 26th Ave N	Birmingham	AL	20173157
590	Char House Foods	2520 4th Ave S	Birmingham	AL	20180242
8622	Charley's Philly Steaks	2000 Riverchase Galleria	Hoover	AL	20173873
11421	Charleys Philly Steaks	744 Brookwood Village	Homewood	AL	20183924
5760	Charlsie's Catering & Cakes	320 Fieldstown Road	Gardendale	AL	EXEMPT
10082	Chef Julia May Homestyle Kitchen	1901 2Nd Avenue North	Birmingham	AL	Pending
8040	Chef's Workshop	3439 Lorna Lane	Hoover	AL	20183428
512	Chen Express	221 Country Club Park	Birmingham	AL	20170132
8115	Chen Express II	3161 Green Valley Road	Birmingham	AL	20183470
951	Cherokee Bend Elementary School	4400 Fair Oaks Drive	Birmingham	AL	20170591
11409	Cherry Avenue Citgo	501 Forestdale Blvd	Birmingham	AL	Pending
2043	Cherry Hill Healthcare Center	1250 Jeff Germany Pkwy	Birmingham	AL	20182678
10224	Chester's Culinary Innovation Center	2037 Cahaba Road	Birmingham	AL	20183922
7245	Chevron Food Mart	490 Forestdale Blvd	Birmingham	AL	20172981
2046	Chez Fon Fon	2007 11th Ave S	Birmingham	AL	20181070
10225	Chick Fil a Distributing Point	1604 Pinson Valley Parkway	Tarrant	AL	Pending
10138	Chick Fil A Distributing Point	3633 Gary Avenue	Adamsville	AL	Pending
7253	Chick-Fil-A Ashville Rd	1808 Ashville Road	Leeds	AL	20183169
149	Chick-Fil-A - Parkway East	9345 Parkway East	Birmingham	AL	20180405
10014	Chick-Fil-A @ GHD	2501 Brooklane Drive	Hueytown	AL	Pending
1232	Chick-Fil-A at Eastwood Village #2229	1648 Montclair Road	Birmingham	AL	20181418
8591	Chick-Fil-A FSU #3339	513 Montgomery Hwy	Vestavia Hills	AL	20183739
8594	Chick-Fil-A FSU #3593	5646 & 5658 Grove Blvd	Birmingham	AL	20183763
4260	Chick-Fil-A Fultondale	215 Howell Street	Fultondale	AL	20181517
8654	Chick-Fil-A Highland Ave S	2000 Highland Avenue S	Birmingham	AL	20183770
244	Chick-Fil-A Jaxnco, LLC #211	211 Lakeshore Pky	Homewood	AL	20181069
243	Chick-Fil-A Jaxnco, LLC #746	746 Brookwood Vlg	Homewood	AL	20180133
574	Chick-Fil-A- 5th Ave No	1913 5th Ave. N	Birmingham	AL	20180194
5535	Chick-Fil-A- Bessemer	6000 Harris Lane	Bessemer	AL	20182800
294	Chick-Fil-A- Gardendale	385 Fieldstown Rd	Gardendale	AL	20180011
417	Chick-Fil-A- John Hawkins Pkwy	3020 John Hawkins Pkwy	Hoover	AL	20180192
436	Chick-Fil-A- Riverchase Galleria	2000 Riverchase Galleria	Hoover	AL	20170249
418	Chick-Fil-A- Trussville	5886 Trussville Crossings Pkwy	Birmingham	AL	20180012
448	Chick-Fil-A-Montgomery Hwy	1609 Montgomery Hwy	Hoover	AL	20180193
8646	Chicken Salad Chick Galleria	3780 Riverchase Village	Hoover	AL	20183733
8392	Chicken Salad Chick- 29th Ave So	1830 29th Avenue South	Birmingham	AL	20183593
8430	Chicken Salad Chick- 7th Ave So	2118 7th Avenue So	Birmingham	AL	20183632
11334	Childcare Heaven Development Center	2508 9Th Avenue North	Birmingham	AL	Pending
107	Children's Hospital	1600 7th Ave. S	Birmingham	AL	20181295
8606	Children's Lighthouse Hoover	4731 Chace Circle	Hoover	AL	20183693
150	Childrens Fresh Air Farm	501 Park Ave	Birmingham	AL	20180049
1223	Chilis #1507	203 Howell Street	Fultondale	AL	20181108
784	Chilis Grill & Bar # 701 Gadsden Hwy	1676 Gadsden Hwy	Trussville	AL	20180256
785	Chilis Grill & Bar #392 State Farm Pkwy	209 State Farm Pkwy	Homewood	AL	20180257
10171	Chill	3066 Healthy Way	Birmingham	AL	20183914
8335	China Bistro	160 Main Street	Hoover	AL	20173585
191	China East Restaurant	1151 Huffman Rd	Birmingham	AL	20180164
493	China King	4760 Eastern Valley Rd	Mccalla	AL	20180361
218	China Kitchen Caldwell Dr	437 Caldwell Drive	Warrior	AL	20180014
8902	China Kitchen Old Springville Rd	5108 Old Springville Road	Pinson	AL	20183847
2053	China Luck	4502 Center Point Rd	Pinson	AL	20180593
2054	China Master Express	1801 4th Ave S	Birmingham	AL	20180596
921	China Moon	3312 Clairmont Ave	Birmingham	AL	20180330

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5940	China Palace	1930 Edwards Lake Rd	Birmingham	AL	20181857
1691	China Sea	3102 Allison Bonnet Memorial D	Hueytown	AL	20181237
3783	China Wok Brookwood	730 Brookwood Vlg	Homewood	AL	20180807
8082	China Wok H Inc- Bessemer	3979 Parkwood Road	Bessemer	AL	20183432
8722	Chipotle Mexican Grill	3220 Morrow Road	Trussville	AL	20183765
113	Chipotle Mexican Grill- Hoover	1759 Montgomery Hwy	Hoover	AL	20180875
8976	Chocolata	1927 2Nd Avenue North	Birmingham	AL	Pending
1742	Chocolate Biscuit Tearoom	335 Main St	Trussville	AL	EXEMPT
7904	Chongwah Express: Wok & Roll	7201 Aaron Aronov Drive	Fairfield	AL	20183416
2059	Chop Suey Inn	813 Greensprings Hwy	Homewood	AL	20181105
7651	Chow Tyme Grill & Buffett	1668 Montgomery Hwy	Hoover	AL	20183289
999	Chris Z's Inc.	2808 University Blvd.	Birmingham	AL	20180715
2442	Chuck E Cheese	500 Olde Town Rd	Vestavia	AL	20180599
7543	Church of the Highlands	4700 Highlands Way	Birmingham	AL	EXEMPT
7830	Church Street Coffee & Books	81 Church Street	Mountain Brook	AL	EXEMPT
2411	Churchs Fried Chicken #1042 Bessemer Hwy	5410 Bessemer Hwy	Midfield	AL	20180601
3926	Churchs Fried Chicken #1136 3rd Ave W	1145 3rd Ave W	Birmingham	AL	20180602
2448	Churchs Fried Chicken #1209 Vanderbilt Rd	4009 Vanderbilt Rd	Birmingham	NULL	20180603
2450	Churchs Fried Chicken #142 Jefferson Ave SW	3052 Jefferson Ave SW	Birmingham	AL	20180605
941	Churchs Fried Chicken #215 1st Ave No	7529 1st Avenue North	Birmingham	AL	20180508
2522	Churchs Fried Chicken #233 Parkway E	9929 Parkway E	Birmingham	AL	20180608
2451	Churchs Fried Chicken #237 Carolina Ave	1801 Carolina Ave	Bessemer	AL	20180609
2523	Churchs Fried Chicken #4707 Allison Bonn Mem	794 Allison-Bonnett Mem Drive	Dolomite	AL	20180610
2408	Churchs Fried Chicken #5403 3rd Ave No	824 3rd Ave N	Birmingham	AL	20180612
2409	Churchs Fried Chicken #9923 Forestdale Blvd	1428 Forestdale Blvd	Birmingham	AL	20180600
5724	Chuy's	216 Summit Blvd	Birmingham	AL	20182919
8921	Cici's Pizza #902 Montgomery Hwy	1851 Montgomery Hwy	Hoover	AL	20183946
10035	CiCi's Pizza Greensprings	808 Green Springs Hwy	Birmingham	AL	20183878
8707	Cici's Pizza Trussville Crossing Pkwy	5915 Trussville Crossings Pkwy	Trussville	AL	20183837
10084	Cinco De Mayo Mexican Grill	1408 Hueytown Road	Hueytown	AL	Pending
151	Cindys Cinnamon Rolls	267 A Riverchase Galleria	Hoover	AL	EXEMPT
11373	Circle K	2921 Morgan Road	Birmingham	AL	Pending
11352	Circle K Store #6733	1250 Columbiana Road	Birmingham	AL	20183920
2460	City Park	4671 Carnegie Ave	Fairfield	AL	EXEMPT
2533	Civic Center Health & Rehab. (Northport Health)	1201 22nd St N	Birmingham	AL	20181737
2535	Classic BBQ	1732 15th St N	Bessemer	AL	20180617
409	Classic Cafe	4600 East Lake Blvd	Birmingham	AL	20180472
2464	Clay Chalkville Football- Band Boosters	6623 Roe Chandler Rd	Pinson	AL	20182799
1121	Clay Chalkville High School	6623 Roe Chandler Road	Pinson	AL	20180619
1120	Clay Chalkville Middle School	6700 Trussville Clay Road	Clay	AL	20180620
435	Clay Chalkville MS Fieldhouse	6700 Trussville Clay Road	Trussville	AL	EXEMPT
7255	Clay Commons	6723 Deerfoot Parkway	Pinson	AL	20183092
1118	Clay Elementary School	6745 Old Springville Road	Clay	AL	20180621
7936	Cloray's Cafe	2530 9th Avenue North	Bessemer	AL	20133476
8772	CLRS LLC/ Sneaky Petes	3401 Shades Crest Road	Hoover	AL	Pending
7731	Club M	521 3rd Avenue West	Birmingham	AL	Pending
2475	Coldstone Creamery	1430 Gadsden Hwy	Trussville	AL	EXEMPT
1063	Colonial Properties/5GuysFam Burgers & Cocina Sup	2101 6th Avenue No Ste 750	Birmingham	AL	20173094
7450	Columbia Cottage Assisted Living	3776 Crosshaven Drive	Birmingham	AL	20183093
826	Comedy Club	1818 Data Drive	Hoover	AL	20180303
7426	Comfort Inn & Suites Norrell Drive	4740 Norrell Drive	Trussville	AL	EXEMPT
7495	Comfort Inn Airport	4965 Montevallo Road	Birmingham	AL	EXEMPT
11489	Comida Mexicana Ebenezer, LLC	10 14Th Street North	Bessemer	AL	Pending
4520	Comm Kit of B'ham- Grace	5712 1st Ave N	Birmingham	AL	20140626
11316	Commit Coffee	210 22Nd Street South	Birmingham	AL	Pending
2551	Community Kitchens Of B'ham	1024 12th Street South	Birmingham	AL	20142979
866	Concordia Beneficial Society	3400 1st Ave N	Birmingham	AL	EXEMPT
8573	Consider It Joy Baker	759 Shades Mountain Plaza	Hoover	AL	20183715
832	Consult America Cottage Hill / Caregivers of P G	700 1st Ave.	Pleasant Grove	AL	20180627
238	Continental Bakery/Chez Lulu	1909 Cahaba Rd	Birmingham	AL	EXEMPT
10003	Cookie Destiny	2341 John Hawkins Pkwy	Hoover	AL	Pending
11515	Cookie Fix	1941 Hoover Court	Hoover	AL	Pending
8828	Cookie Fix	2854 18Th Street	Birmingham	AL	Pending
7538	Cooper Green Homes Daycare Center	1501 Arthur Shores Drive	Birmingham	AL	20183679
8967	Coopers Corner	2001 Tom Williams Way	Birmingham	AL	Pending

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8362	Cornerstone Middle School	959 Huffman Road	Birmingham	AL	20183647
6540	Cornerstone Schools of Alabama	116 55th Street North	Birmingham	AL	20183089
11484	Corporate Caterers Birmingham	748 Shades Mountain Plaza	Birmingham	AL	Pending
7257	Corry's	1800 24th Street SW	Birmingham	AL	20123087
7512	Costas Famous BBQ	613 Old Springville Road	Birmingham	AL	20183141
2708	Costas Famous BBQ Express	215 Lakeshore Parkway	Birmingham	AL	20181242
2570	Costas Mediterranean Cafe Lorna Road	3443 Lorna Rd	Hoover	AL	20181381
2710	Costas Mediterranean Cafe Trussville Crossings	5891 Trussville Crossings Pky	Birmingham	AL	20181762
2711	Costco Wholesale #362	3650 Galleria Cir	Hoover	AL	20180630
269	Country Club of Birmingham	3325 Country Club Road	Birmingham	AL	20180041
7347	Country Inn & Suites Academy Ct	4985 Academy Court	Bessemer	AL	EXEMPT
10132	Country Inn & Suites by Radisson	4400 Colonnade Pkwy	Birmingham	AL	EXEMPT
6240	Country Inn & Suites Wildwood Cir N	485 Wildwood Cir N	Homewood	AL	EXEMPT
8966	County Creek Food Mart	1301 Short Creek Road	Mulga	AL	Pending
8938	Courthouse Cafe	1729 5Th Avenue North	Birmingham	AL	Pending
10276	Courtyard Birmingham Hoover	1824 Montgomery Highway South	Hoover	AL	20183892
1093	Courtyard by Marriott - Birmingham Colonnade	4300 Colonnade Pkwy	Birmingham	AL	20180632
2718	Courtyard By Marriott @ UAB	1820 5th Ave S	Birmingham	AL	20183038
389	Courtyard by Marriott Roosevelt Blvd	3651Roosevelt Blvd.	Birmingham	AL	20180509
580	Courtyard By Marriott Shades Creek Pkwy	500 Shades Creek Pky	Birmingham	AL	20183010
8914	Courtyard Oyster Bar & Grill	5961 Chalkville Mountain Lane	Trussville	AL	Pending
8951	Covenant Classical School & Daycare	6590 Husky Pkwy	Trussville	AL	EXEMPT
2579	Covenant Classical School Daycare	5390 Magnolia Trace	Hoover	AL	EXEMPT
8301	Covenant Classical School Homewood	151 Covenant Way	Birmingham	AL	EXEMPT
8265	Covenant Classical School Trace Crossings	5390 Magnolia Place	Birmingham	AL	Pending
2719	Covenant Place Of Gardendale	1409 Thompson Circle	Gardendale	AL	20182377
1222	Covenant Presbyterian Church	65 Old Montgomery Highway	Birmingham	AL	EXEMPT
8589	Coyote Drive-In Theatre	6200 Grand River Blvd	Leeds	AL	20183726
1106	Cracker Barrel #237 Fieldstown Rd	901 Fieldstown Road	Gardendale	AL	20180496
1105	Cracker Barrel #301 Academy Lane	5040 Acadamy Lane	Bessemer	AL	20180492
1103	Cracker Barrel #368 Norrell Road	4710 Norrell Road	Trussville	AL	20180491
1102	Cracker Barrel #580 Colonnade Pkwy	3415 Colonnade Parkway	Birmingham	AL	20180497
2724	Creative Montessori School	1650 28th Ct S	Homewood	AL	EXEMPT
10106	Crestline Bagel Co.	4117 Crosshaven Drive	Vestavia	AL	EXEMPT
8659	Crestline Bagel Co. Central	2120 Columbiana Road	Vestavia Hills	AL	20183701
514	Crestline Bagel Inc	66 Church St	Mountain Brook	AL	EXEMPT
582	Crestline Elementary School	3785 Jackson Boulevard	Mountain Brook	AL	20171151
2584	Crestwood Coffee Company	5512 Crestwood Blvd	Birmingham	AL	EXEMPT
8809	Crestwood Pharmacy & Soda Fountain	5502 Crestwood Blvd	Birmingham	AL	Pending
11490	Crossroads Grocery	3495 Warrior Jasper Road	Warrior	AL	Pending
8871	Customs Cafe	1845 Montgomery Hwy	Hoover	AL	Pending
2591	D & W Convenience Store	3340 Wilson Rd	Birmingham	AL	20180641
11361	D's Tamales To Go, Inc.	2012 Magnolia Avenue	Birmingham	AL	Pending
11478	Daily Donuts	6736 Deerfoot Pkway	Pinson	AL	Pending
1086	Dairy Queen Cahaba Heights Rd	3134 Cahaba Heights Road	Birmingham	AL	20180531
1085	Dairy Queen Chalkville Mtn Rd	5969 Chalkville Mountain Road	Birmingham	AL	20180532
8028	Dairy Queen Gardendale	383 Fieldstown Road	Gardendale	AL	20183413
482	Dairy Queen Hueytown	1349 Hueytown Rd	Hueytown	AL	20180046
8652	Dairy Queen Morgan Road	2924 Morgan Road	Bessemer	AL	20183795
8775	Dairy Queen Palisades	384 Palisades Blvd	Birmingham	AL	20183799
2596	Dales Southern Grill	1843 Montgomery Hwy	Hoover	AL	20100643
11500	Danny's Deli	4000 Avenue I Ensley	Birmingham	AL	Pending
11419	Dave & Buster's	2700 Riverchase Galleria #151	Hoover	AL	Pending
216	Daves Bakery	1819 29th Ave. S	Homewood	AL	20180015
2738	Dawsons Burger, Wings & Fries	1619 4th Ave N	Birmingham	AL	20070644
11470	Daylight Donuts	6200 Grand River Pkwy	Leeds	AL	Pending
11379	Daylight Donuts	4514 Pinson Blvd	Pinson	AL	Pending
8235	Daylight Donuts Allison Bonnett Mem Dr	2910 Allison Bonnet Mem Drive	Hueytown	AL	20183512
8494	Daylight Donuts Forestdale Blvd	1544 Forestdale Blvd	Birmingham	AL	20183663
8667	Daylight Donuts Parkway Drive	7480 Parkway Drive	Leeds	AL	20183752
8036	Days Inn Birmingham	1485 Montgomery Highway	Birmingham	AL	EXEMPT
8070	Days Inn Fultondale	616 Decatur Highway	Fultondale	AL	EXEMPT
2602	Deer Valley Elementary School	4990 Deer Valley Pkwy	Hoover	AL	20181004
4860	Deerman's BBQ	2444 Palamino Lane	Adamsville	AL	20172918
11510	Delicious Wings	6805 1St Avenue North	Birmingham	AL	Pending

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8401	Delta Blues	1318 Cobb Lane	Birmingham	AL	20163712
2605	Demetris Barbecue	1901 28th Ave S	Birmingham	AL	20180645
7644	Denny's 8621	224 Daniel Payne Drive	Birmingham	AL	20183323
7527	Department of Youth Services-Vacca Campus	8950 Roebuck Blvd	Birmingham	AL	20183246
2650	Devincis Pizza	2707 18th St S	Homewood	AL	20171219
10139	Diablo's Southwest Grill	4867 Promenade Pkwy	Bessemer	AL	20183918
8684	Dinner	73 Church Street	Mountain Brook	AL	20183741
719	Diplomat Deli	1413 Montgomery Hwy	Vestavia	AL	EXEMPT
1226	Dish'N It Out, LLC.	1111 Dunston Avenue	Birmingham	AL	EXEMPT
11364	District 9 Events, LLC	1927 4Th Avenue North	Bessemer	AL	Pending
6300	Diversicare of Bessemer	820 Golf Course Road	Bessemer	AL	20182923
8812	Domestique Coffee	3017 6Th Avenue South	Birmingham	AL	Pending
7957	Domino's Pizza 23rd Street So	726 23rd Street South	Birmingham	AL	20183363
4740	Domino's Pizza Fairfield	7201 Aaron Aronov Drive	Fairfield	AL	EXEMPT
2974	Dominos Pizza #5381 Greensprings Hwy	430 Greensprings Hwy	Homewood	NULL	EXEMPT
577	Dominos Pizza #5844 Cahaba Heights Rd	3135 Cahaba Heights Rd	Birmingham	AL	EXEMPT
560	Dominos Pizza Bessemer	3979 Parkwood Rd	Bessemer	AL	EXEMPT
10218	Dominos Pizza Ford Pkwy	5031 Ford Parkway	Bessemer	AL	Pending
578	Dominos Pizza Forestdale	1535 Forestdale Blvd	Birmingham	AL	EXEMPT
5620	Dominos Pizza Fultondale	1710 Decatur Highway	Fultondale	AL	EXEMPT
522	Dominos Pizza Hoover	3659 Lorna Rd	Hoover	AL	EXEMPT
2973	Dominos Pizza Hueytown	269 Forest Rd	Hueytown	AL	EXEMPT
499	Dominos Pizza Leeds	7709 Parkway Drive	Leeds	AL	EXEMPT
4189	Dominos Pizza Montclair Rd	1506 Montclair Rd	Birmingham	AL	EXEMPT
739	Dominos Pizza Old Springville Rd	2446 Old Springville Road	Birmingham	AL	EXEMPT
644	Dominos Pizza Trussville	445 Main St	Trussville	AL	EXEMPT
2663	Dominos Pizza Vestavia	2304 Columbiana Rd	Vestavia	AL	EXEMPT
665	Dominos Pizza Warrior	110 5th St E	Warrior	AL	EXEMPT
6480	Donald Elementary School	715 Valley Rd	Fairfield	AL	20182897
732	Donatos Pizza	629 Montgomery Hwy	Vestavia	AL	EXEMPT
7955	Donut Joe's Gardendale	1021 Main Street	Gardendale	AL	20183400
340	Doodle's Sorbets and Ices	3238 Cahaba Heights Road	Birmingham	AL	EXEMPT
8978	Dorothy's Fame Learning Academy	910 20Th Street Ensley	Birmingham	AL	Pending
1837	Doubletree Hotel Birmingham	808 20th St S	Birmingham	AL	20181057
11381	Downtown Shell	100 4Th Avenue North	Birmingham	AL	Pending
11488	Dread River Distilling/Event Center	2400 7Th Avenue South	Birmingham	AL	Pending
7760	Dream Cakes	960 Oxmoor Road	Homewood	AL	EXEMPT
10286	Dreamland BBQ	19 West Oxmoor Road	Homewood	AL	20183978
8881	Dreams Kitchen	1515 Pearson Avenue	Birmingham	AL	Pending
11486	Dreams Kitchen	1515 Pearson Avenue	Birmingham	AL	Pending
7301	Drury Inn & Suites	160 State Farm Parkway	Homewood	AL	EXEMPT
8958	Dunkin Donuts	1820 Gadsden Hwy	Birmingham	AL	Pending
8140	Dunkin Donuts #2 Cane Creek Rd	309 Cane Creek Road	Warrior	AL	20163477
8072	Dunkin Donuts Brookwood Blvd	505 Brookwood Blvd	Homewood	AL	20173551
7724	Dunkin Donuts Eastern Valley Rd	2178 Eastern Valley Road	Bessemer	AL	20173255
7510	Dyrons Low Country	121 Oak Street	Birmingham	AL	20183149
11323	E & K Food Mart Inc	4012 Lloyd Noland Pkwy	Birmingham	AL	Pending
10227	E J Sports Bar & Grill	4000 Bessemer Super Hwy	Birmingham	AL	Pending
2674	E.P.I.C. Elementary School	1000 10th Ave S	Birmingham	AL	20172549
2983	Eagles Cafe	2610 16th St N	Birmingham	AL	20070651
8290	East 59 Coffee Shop	7619 1St Avenue North	Birmingham	AL	Pending
2675	East Bham Christian School- (CLOSED)	5600 1st Ave N	Birmingham	AL	NONE
777	East Buffet	5978 Chalkville Mountain Road	Birmingham	AL	20180262
118	East Glen, LLC	53 Medical Park Drive East	Birmingham	AL	20180510
2677	East Lake Superette Texaco	421 Oporto Madrid Blvd North	Birmingham	AL	20180652
569	East Of The Mississippi	3103 Ensley Ave.	Birmingham	AL	20180179
8909	East West Birmingham	2306 2nd Avenue North	Birmingham	AL	20183853
2987	Eastview Healthcare Center	7755 4th Ave S	Birmingham	AL	20172821
10146	Eastwood Plaza	7845 Crestwood Blvd	Birmingham	AL	Pending
8981	Eastwood Shell/ Chesters Chicken	7801 Crestwood Blvd	Birmingham	AL	Pending
11511	Eats Highland	2608 Highland Avenue	Birmingham	AL	Pending
10300	Edgar's Bakery	156 Main Street	Trussville	AL	20183966
8372	Edgars Bakery 20th Street	505 20th Street North	Birmingham	AL	20183621
597	Edgars Bakery Colonnade Pkwy	3407 Colonnade Parkway	Birmingham	AL	20180402
596	Edgars Bakery Hoover	180 Main St W	Hoover	AL	EXEMPT

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3292	Edgemont Town Center	437 Greensprings Hwy	Homewood	AL	20171243
10024	Edgewater Oaks Facility	796 Lannie Bonner Circle	Birmingham	AL	Pending
4621	Edgewood Creamery	936 Oxmoor Road	Homewood	AL	EXEMPT
942	Edgewood Elementary School	901 College Avenue	Homewood	AL	20181152
8588	Edible Arrangements	4441 Ceeekside Ave	Hoover	AL	EXEMPT
8762	Edible Arrangements	1477 Gadsden Hwy	Trussville	AL	EXEMPT
10101	Edwards Lake Office	3220 Edwards Lake Parkway	Trussville	AL	Pending
715	Egg Roll Express	100 Bessemer Hwy	Midfield	AL	20180498
11337	Eight Degrees Fahrenheit	2772 John Hawkins Pkwy	Birmingham	AL	Pending
8456	Einstein Brothers Bagels	1716 9th Avenue South	Birmingham	AL	Pending
7819	EL Barrio Restaurant	2211 2nd Avenue North	Birmingham	AL	20183340
1550	EL Cazador Edwards Lake Rd	1930 Edwards Lake Rd	Birmingham	AL	20181288
831	EL Cazador Foods Montclair Rd	1540 Montclair Road	Birmingham	AL	20180536
10153	EL Cazador Mexican Grill	1846 Ashville Road	Leeds	AL	20183881
7453	EL Chile	273 West Valley Avenue	Homewood	AL	20183173
10284	EL Machetes	591 Allison Bonnet Mem Drive	Hueytown	AL	Pending
2686	EL Mercado - Deli/Bakery	2085 Colonial Drive	Hoover	AL	20181598
642	EL Pablano Mexican Restaurant	2499 Rocky Ridge Road	Birmingham	AL	20180219
8658	EL Potrillo Mexican Restaurant	1618 Pinson Valley Parkway	Birmingham	AL	20173863
2739	EL Sol Cantina & Taqueria	328 Valley Ave	Birmingham	AL	20181360
8451	EL Super Taco Mexicano	3947 Pinson Valley Pkwy	Birmingham	AL	20183748
7631	EL Taco Loco	702 Valley Avenue	Birmingham	AL	20183230
10009	EL Vaquero	2801 7Th Avenue South	Birmingham	AL	Pending
1420	EL Vecino Mexican Super Grill	1492 Forestdale Blvd	Birmingham	AL	20180661
10001	EL ZunZun Restaurant	4105 Crosshaven Drive	Vestavia	AL	20183907
10251	Elite Nutrition/Fit Five Meals	1841 Montgomery Hwy South	Hoover	AL	EXEMPT
7205	Elmcroft of Grayson Valley	2366 Old Springville Road	Birmingham	AL	20182984
10152	Elmwood Shell	345 6Th Avenue S W	Birmingham	AL	Pending
10122	Elyton Hotel Main Kitchen	1928 1St Avenue North	Birmingham	AL	Pending
3153	Embassy Suites Homewood	2300 Woodcrest Place	Homewood	AL	20160663
7502	Embassy Suites Hoover	2960 John Hawkins Parkway	Hoover	AL	20183147
11503	Empire	100 3Rd Avenue North	Birmingham	AL	Pending
8626	Empire Hotel	1928 1st Avenue North	Birmingham	AL	20183885
2806	Ensley Seafood Ensley Ave	3100 Ensley 5 Pts West Ave	Birmingham	AL	20180854
798	Ensley Seafood Express Carson Road	2161 Carson Rd	Birmingham	AL	20180306
8302	Episcopal Church of the Ascension	1912 Canyon Road	Birmingham	AL	EXEMPT
1123	Erwin Intermediate School	528 23rd Avenue N.W.	Birmingham	AL	20180666
1124	Erwin Middle School	532 23rd Avenue N.W.	Birmingham	AL	20180667
10292	Eternal Life International Ministries Site II	816 Earline Street	Birmingham	AL	Pending
10002	Eugene's Hot Chicken	2268 9Th Avenue North	Birmingham	AL	20183970
11473	Eurest Dining @ Encompass Health	9001 Liberty Parkway	Birmingnam	AL	Pending
393	Eurest Dining @ Regions ROC	2090 Parkway Office Cir.	Birmingham	AL	20180016
7229	Event Center @ Watermark Place	4500 Katies Way	Bessemer	AL	20182987
8971	Events At Haven	2515 6Th Avenue South	Birmingham	AL	Pending
8791	Everyday Food Mart & Cafe	3015 Columbiana Road	Vestavia Hills	AL	20183831
2816	Exotic Wings & Things Centerpoint Pkwy	1254 Centerpoint Pky	Birmingham	AL	20180668
2817	Exotic Wings & Things Greensprings Ave	208 Greensprings Ave	Birmingham	AL	20160669
3165	Exotic Wings & Things Pinson Valley Pkwy	4567 Pinson Valley Pky	Birmingham	AL	20180670
8766	Fair Haven Retirement Community Bldg A	1424 Montclair Road	Birmingham	AL	20183962
8768	Fair Haven Retirement Community Bldg K	1424 Montclair Road	Birmingham	AL	20183963
8767	Fair Haven Retirement Community Bldg L	1424 Montclair Road	Birmingham	AL	20183964
2821	Fairfield H S Football	610 Valley Rd	Fairfield	AL	20173286
3171	Fairfield High School	610 Valley Rd	Fairfield	AL	20182898
10102	Fairfield Inn & Suites	3930 Colonnade Parkway	Birmingham	AL	Pending
4787	Fairfield Inn & Suites by Marriott	4980 Academy Court	Bessemer	AL	EXEMPT
8681	Fairfield Inn & Suites Marriott	1795 Morris Avenue	Fultondale	AL	EXEMPT
571	Fairfield Seafood	3710 Richard Scrushy Parkway	Fairfield	AL	20170178
10242	Fairfield Shell	6620 Aaron Aronov Drive	Fairfield	AL	Pending
3174	Fairhaven-Meth Home For Aging	1424 Montclair Rd	Birmingham	AL	20180672
2824	Fairview Health & Rehab Ctr	1028 Bessemer Rd	Birmingham	AL	20182637
8841	Faith Academy Daycare & School, Inc.	1723 3Rd Avenue North	Bessemer	AL	Pending
8846	Falafel Cafe	401 19th Street South	Birmingham	AL	20183882
8625	Family Affair	234 8Th Avenue West	Birmingham	AL	Pending
589	Famous Freds	1615 Montgomery Hwy	Hoover	AL	20180336
8523	Fancy's on 5th	416 41St Street South	Birmingham	AL	20183754

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8478	Fantasyland Restaurant	4545 Bessemer Super Highway	Bessemer	AL	20183605
10063	Farm Burger	707 Richard Arrington Blvd So	Birmingham	AL	20183943
2930	Farmers Basket	2000 Riverchase Galleria	Hoover	AL	20181315
11492	Fat Mamas Lunch Box	5422 1St Avenue North	Birmingham	AL	Pending
1299	FDSK German Club	2318 2nd Avenue North	Birmingham	AL	EXEMPT
8602	Feast & Forest	212 24Th Street North	Birmingham	AL	20183682
10115	Fero	1821 2Nd Avenue North	Birmingham	AL	Pending
795	Fifes Restaurant	2321 4th Ave N	Birmingham	AL	20180499
8953	Fire Wok	2300 Centerpoint Pkwy	Birmingham	AL	Pending
416	Firebirds Rocky Mountain Grill	191 Main St	Hoover	AL	20180017
11507	Firefighter Hounds	1214 Decatur Hwy	Fultondale	AL	Pending
119	Firehouse Subs Cahaba River Rd	4704 Cahaba River Road	Birmingham	AL	EXEMPT
748	Firehouse Subs Gadsden Hwy	1483 Gadsden Hwy	Birmingham	AL	EXEMPT
7801	Firehouse Subs Lowery Pkwy	3477 Lowery Parkway	Fultondale	AL	EXEMPT
7878	Firehouse Subs Main St Hoover	181 Main Street	Hoover	AL	EXEMPT
943	Firehouse Subs Montgomery Hwy	623 Montgomery Highway	Vestavia Hills	AL	EXEMPT
8670	Firehouse Subs Promenade Pkwy	4867 Promenade Pkwy	Bessemer	AL	EXEMPT
7525	First Baptist Church of Birmingham	2209 Lakeshore Drive	Birmingham	AL	20183227
929	Fish & Wings	2233 10th Ave	Bessemer	AL	20180553
2840	Fish Market Restaurant	612 22nd St S	Birmingham	AL	20181110
2841	Fitzgerald Deli	2601 Carson Rd	Birmingham	AL	EXEMPT
8043	Five	744 29Th Street South	Birmingham	AL	20183411
7647	Five Guys Burgers & Fries	3345 Lowery Pkwy	Fultondale	AL	20173228
1230	Five Guys Famous Burgers and Fries	5084 Pinnacle Square	Trussville	AL	20171060
8211	Five Star Concessions	100 Grandview Place	Birmingham	AL	Pending
3191	Five Star Event Catering	6079 Barber Motorsports Pkwy	Leeds	AL	20181427
134	Flemings Prime Steakhouse	103 Summit Blvd	Birmingham	AL	20180018
8365	Florentine Building	2101 2nd Ave North	Birmingham	AL	20183598
8160	Food Bar, LLC	3154 Cahaba Heights Village	Birmingham	AL	20183486
317	Food Giant #3 Hueytown Plaza	145 Hueytown Plz	Hueytown	AL	20180019
7466	Food Giant #410 Centerpoint Pkwy	1675 Centerpoint Parkway	Birmingham	AL	20183123
315	Food Giant #5 19th Street North	700 19th St N	Bessemer	AL	20170021
314	Food Giant #6 Hwy 75 Pinson	6662 Hwy 75	Pinson	AL	20180022
10065	Food Outlet	7309 Crestwood Blvd	Birmingham	AL	Pending
7813	FOP B'ham Lodge #1	2988 Winewood Road	Birmingham	AL	20183414
8837	Fords Sports Bar	1205 Lake Drive S E	Bessemer	AL	20173851
7935	Forest Hill Adult/Child Center	6701 Forest Drive	Fairfield	AL	Pending
3012	Forest Hill School	7000 Grasselli Rd	Fairfield	AL	20182899
8741	Formosa Chinese Restaurant	2109 Lorna Ridge Lane	Birmingham	AL	Pending
8669	Foxs Pizza Den- Trussville	199 Beechnut Street	Trussville	AL	20183734
8697	Frank House Golf Course	801 Golf Course Road	Bessemer	AL	20173758
3491	Fraternal Order Of Eagles	145 Persimmon St	Birmingham	AL	20181761
8940	Freddy's	2251 Highland Avenue South	Birmingham	AL	Pending
10248	Freddy's Frozen Custard & Steakburgers	5634 Grove Blvd	Hoover	AL	Pending
8256	Fresco	3144 Cahaba Heights Village	Birmingham	AL	20183557
10247	Fresh Value	700 19Th Street North	Bessemer	AL	Pending
8243	Fried Green Tomato's	1615 Montgomery Hwy	Hoover	AL	20183591
10189	Frios Trussville	5431 Patrick Way	Trussville	AL	Pending
8610	Front Porch	2301 Grand Avenue	Hoover	AL	20183826
871	Frontera Grill	5974 Chalkville Mountain Rd	Birmingham	AL	20180502
7371	Frontera Grill	5651 Grove Blvd	Hoover	AL	20183136
11402	Frutta Bowls	225 Summit Blvd	Birmingham	AL	Pending
11502	Fry Daddy's	2012 Magnolia Avenue South R I	Birmingham	AL	Pending
11469	Fuji Hibachi Express	790 Montgomery Hwy	Vestavia	AL	Pending
323	Full Moon Bar B Q 25th St	525 25th St S	Birmingham	AL	20180166
10282	Full Moon Bar B Que Chalkville Mtn Rd	5980 Chalkville Mountain Rd	Trussville	AL	Pending
322	Full Moon Bar-B-Que Patton Chapel Rd	2000 Patton Chapel Rd	Hoover	AL	20181062
7364	Full Moon BBQ McCalla	3228 Lorna Road	Hoover	AL	20183088
321	Full Moon BBQ Valley Ave	337 Valley Ave	Birmingham	AL	20181063
5360	Full Moon BBQ Walker Chapel Rd	1428 Walker Chapel Rd	Fultondale	AL	20182922
221	Fultondale Bakery	1214 Decatur Hwy	Fultondale	AL	EXEMPT
1238	Fultondale Concession Stand - Athletic Complex	951 Hubbard Lane	Fultondale	AL	EXEMPT
944	Fultondale Concession Stand - Football	951 Hubbard Lane	Fultondale	AL	EXEMPT
1125	Fultondale Elementary School	950 Central Avenue	Fultondale	AL	20180682
1127	Fultondale High School	1450 Carson Road North	Birmingham	AL	20180683

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270	Funtime Skate Center	3508 Decatur Hwy	Fultondale	AL	EXEMPT
8977	G'Waynes Place	2905 27Th Street North	Birmingham	AL	Pending
289	Gabriels Spirited Cafe	3706 Lorna Road	Birmingham	AL	20180343
11345	Galleria Chevron	2963 Highway 150	Birmingham	AL	Pending
3028	Galleria Woods Retirement Community	3850 Galleria Woods Dr	Hoover	AL	20181380
3720	Galley & Garden	2220 Highland Ave South	Birmingham	AL	20181742
10295	Garage At Midtown	420 Richard Arrington Jr Blvd	Birmingham	AL	20183905
592	Garage Cafe, Inc.	2304 10th Terrace S	Birmingham	AL	EXEMPT
668	Garcias Grill Inc	4350 Pinson Valley Pky	Birmingham	AL	20181368
3628	Garden Inn Birmingham	7901 Crestwood Blvd	Irondale	AL	EXEMPT
7515	Gardendale Band Boosters	P O Box 185	Gardendale	AL	20183210
10127	Gardendale Chevron	1130 Decatur Hwy	Birmingham	AL	Pending
3037	Gardendale Christian Academy	1800 Decatur Hwy	Gardendale	AL	20181937
1128	Gardendale Elementary School	860 Bauer Lane	Gardendale	AL	20180684
3032	Gardendale High School	800 Main St	Gardendale	AL	20183190
8152	Gardendale Retail Building	521 Fieldstown Road	Gardendale	AL	20173480
3033	Gardendale Senior Citizen Cntr	861 Main St	Gardendale	AL	EXEMPT
7451	Gateway	5201 Airport Highway	Birmingham	AL	20183112
10140	Gemutlichkeit, LLC dba Brat Brot	2910 6Th Avenue South	Birmingham	AL	20183944
3946	Georges Lebanese Restaurant	44 Greensprings Hwy	Homewood	AL	20180685
8628	Georgia Road Lounge	6420 Georgia Road	Birmingham	AL	Pending
3039	Gianmarcos Restaurant	721 Broadway St	Homewood	AL	20180686
10107	Gil's Place	504 17Th Street Ensley	Birmingham	AL	Pending
159	Gilchrist	2805 Cahaba Rd	Mountain Brook	AL	20180326
3880	Giuseppes Cafe	925 8th St S	Birmingham	AL	20182969
3042	Glen Iris Elementary School	1115 11th St S	Birmingham	AL	20172551
3513	Glen Oaks School	1301 Highland Dr	Fairfield	AL	20182901
10223	Godfather's Pizza	231 State Farm Parkway, St 101	Birmingham	AL	Pending
3518	Golden Corral #726	1185 Center Point Pky	Birmingham	AL	20180689
8343	Golden Corral #743	3117 Lorna Blvd	Hoover	AL	20183561
543	Golden Dragon	2227 Bessemer Rd	Birmingham	AL	20180114
11380	Golden Flake Snack Foods	1 Golden Flake Drive	Birmingham	AL	Pending
2118	Golden Living Center Riverchase	2500 Riverhaven Dr	Hoover	AL	20181537
3053	Golden Rule BBQ (CLOSED)	744 29th St S	Birmingham	AL	20070692
3519	Golden Rule BBQ Hoover	1571 Montgomery Hwy	Hoover	AL	20180690
833	Golden Rule BBQ of Irondale	2505 Crestwood Blvd	Irondale	AL	20180352
3520	Golden Rule BBQ Trussville	120 Chalkville Rd S	Trussville	AL	20181468
524	Golden Temple Cafe	1901 11th Ave S	Birmingham	AL	EXEMPT
494	Golden Wok	1421 Forestdale Blvd	Birmingham	AL	20180412
8682	Good Pizza Tyme	734 Graymont Avenue	Birmingham	AL	Pending
8703	Goodtymz Lounge	1521 3Rd Avenue West	Birmingham	AL	Pending
11332	Gorditas Mary	3833 East Lake Blvd	Birmingham	AL	Pending
933	Gordos Market	433 Valley Ave	Birmingham	AL	20180514
7969	Grace's Kitchen	2831 9th Avenue North	Bessemer	AL	20183396
8250	Grand Bohemian Hotel	2655 Lane Park Road	Mountain Brook	AL	20183692
11371	Grannys Kitchen	8236 Rugby Avenue	Birmingham	AL	Pending
3061	Grantswood Community School	5110 Grantswood Rd	Birmingham	AL	20182986
407	Grayson Valley Country Club	2201 Grayson Valley Drive	Birmingham	AL	20180068
3064	Graysville Senior Citizen	171 2nd St SW	Graysville	AL	20182991
11491	Graysville Softball Complex	930 6Th Street N E	Birmingham	AL	Pending
10058	Great American Cookie	741 Brookwood Village	Birmingham	AL	EXEMPT
3948	Great American Cookie Company Galleria	2000 Riverchase Galleria	Hoover	AL	EXEMPT
3533	Great American Cookies Trussville	5024 Pinnacle Sq	Trussville	AL	EXEMPT
11363	Great Harvest Bread Co. Restaurant	218 Main Street	Trussville	AL	Pending
3347	Great Wall Chinese Restaurant	706 Valley Ave	Homewood	AL	20180696
3534	Great Wraps	2000 Riverchase Galleria	Hoover	AL	20180697
5303	Greater Shiloh Missionary Baptist Church	2135 Jefferson Avenue Sw	Birmingham	AL	EXEMPT
7484	Green Acres 1st Ave No	8500 B 1st Ave N	Birmingham	AL	20183144
8773	Green Acres 20th St Ensley	913 20th Street Ensley	Birmingham	AL	20183842
3536	Green Acres Cafe (The Original) 29th Ave No	2724 29th Avenue North	Birmingham	AL	20181467
3067	Green Acres Cafe - Center Point	2405 Center Point Pkwy	Birmingham	NULL	20090698
447	Green Acres Cafe 4th Ave No	1705 4th Ave N	Birmingham	AL	20180295
459	Green Acres Cafe Irondale	1819 Crestwood Blvd	Irondale	AL	20180296
3069	Green Acres School	1220 67th Street Ensley	Birmingham	AL	20183054
108	Green Valley Drug	1915 Hoover Court	Hoover	AL	EXEMPT

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3657	Green Valley Elementary	3200 Old Columbiana Rd	Hoover	AL	20181003
8166	Green Valley Health & Rehabilitation, LLC	575 Southland Drive	Hoover	AL	20183583
11362	Green Valley Shell	3181 Green Valley Road	Birmingham	AL	Pending
3073	Greenbriar At The Altamont	2831 Highland Ave	Birmingham	AL	20182697
8502	Greenbriar on Hanover	39 Hanover Circle	Birmingham	AL	20183783
8299	Greensprings Corp/ Mi Pueblo	216 Greensprings Hwy	Birmingham	AL	20153559
11415	Greensprings Shell	250 Greensprings Highway	Birmingham	AL	Pending
1157	Greenwood Elementary Child Nutrition Program	5012 Roselyn Road	Bessemer	AL	20181364
1129	Gresham School	2650 Gresham Drive	Birmingham	AL	20180702
7713	Grill On The Green	8920 Roebuck Blvd	Birmingham	AL	20183276
8468	Grille 29 Restaurant	719 Shades Creek Parkway	Homewood	AL	20183676
7254	Guadalajara	1800 Ashville Road	Leeds	AL	20183146
10301	Guadalajara Grill	3470 Galleria Circle	Hoover	AL	Pending
8319	Gulf Seafood Market	815 Greensprings Highway	Birmingham	AL	20183586
906	Gus Hot Dogs 4th Ave No	1915 4th Ave N	Birmingham	AL	20180313
2904	Gus Hot Dogs Brooklane Dr	224 Brooklane Dr	Hueytown	AL	20181200
8161	Gus Hot Dogs Church Street	71 Church Street	Mountain Brook	AL	20183493
7842	Gus Hot Dogs Rex Lane	14 Rex Lane	Adamsville	AL	20183385
583	Guthries 4th Ave So	1801 4th Ave S	Birmingham	AL	20180183
8485	Guthries No Chalkville Rd	1104 North Chalkville Road	Trussville	AL	20183619
8655	Guthries of Homewood	341 Palisades Blvd	Birmingham	AL	20183753
2908	Gwin Elementary School	1580 Patton Chapel Rd	Hoover	AL	20181002
412	Gyros Cafe	5614 Chalkville Mt Rd	Birmingham	AL	20180043
3885	Haagen-dazs	2000 Riverchase Galleria	Hoover	AL	EXEMPT
873	Habaneros Mexican Grill Gadsden Hwy	1477 Gadsden Hwy	Birmingham	AL	20180505
870	Habaneros Mexican Grill Montgomery Hwy	1601 Montgomery Hwy	Hoover	AL	20180487
869	Habaneros Mexican Grill Odum Rd	835 Odum Rd	Gardendale	AL	20180501
7/25/1914	Habaneros Mexican Grill Promenade Pkwy	4863 Promenade Pkwy	Bessemer	AL	20182238
751	Hall Kent Elementary School	213 Hall Avenue	Homewood	AL	20180401
3887	Hamburger Heaven Crestwood Blvd	1703 Crestwood Blvd	Birmingham	AL	20180710
121	Hamburger Heaven Decatur Hwy	1301 Decatur Hwy	Gardendale	AL	20180419
3207	Hamburger Heaven Oxmoor Blvd	180 Oxmoor Blvd	Homewood	AL	20182677
7493	Hampton Inn & Suites Hoover	4520 Galleria Blvd	Hoover	AL	EXEMPT
4300	Hampton Inn & Suites Irondale	3930 Grantsmill Road	Irondale	AL	EXEMPT
584	Hampton Inn Bessemer	4910 Civic Ln	Bessemer	AL	EXEMPT
10121	Hampton Inn Colonnade Pkwy	3400 Colonnade Pkwy	Birmingham	AL	Pending
8261	Hampton Inn Fultondale	1716 Fulton Road	Fultondale	AL	Pending
7299	Hampton Inn Homewood	30 State Farm Parkway	Homewood	AL	EXEMPT
7410	Hampton Inn Leeds	310 Rex Lake Road	Leeds	AL	EXEMPT
7419	Hampton Inn Trussville	1940 Edwards Lake Road	Trussville	AL	EXEMPT
240	Handsome Brutes Social Club	2020 Avenue D	Ensley	AL	20120335
8823	Hannon Group, Inc dba Quorum Video Conferencing	2325 Morris Avenue	Birmingham	AL	Pending
86	Hard Park - City of Bessemer	2701 Carolina Terrace	Bessemer	AL	EXEMPT
7323	Hardees #1392 Montgomery Hwy	1449 Montgomery Hwy	Vestavia Hills	AL	20183030
8364	Hardees Parkway East	9400 Parkway East	Birmingham	AL	20183589
7214	Hardees Restaurants #1362 Ashville Rd	1824 Ashville Road	Leeds	AL	20183215
3684	Hardees Restaurants #1373 Bess Super Hwy	611 Bessemer Super Hwy	Midfield	AL	20180718
3679	Hardees Restaurants #1374 Oxmoor Blvd	228 Oxmoor Blvd	Homewood	AL	20181640
3208	Hardees Restaurants #1376 Chalkville Rd S	111 Chalkville Rd S	Trussville	AL	20180711
3685	Hardees Restaurants #1402 Airport Hwy	5113 Airport Hwy	Birmingham	AL	20180719
3686	Hardees Restaurants #1447 Highway 75	6670 Highway 75	Pinson	AL	20180720
3678	Hardees Restaurants #1469 Sweeney Hollow Rd	2146 Sweeney Hollow Rd	Birmingham	AL	20180713
3677	Hardees Restaurants #1473 Cane Creek Rd	280 Cane Creek Road	Warrior	AL	20182965
3681	Hardees Restaurants #1471 Decatur Hwy	1616 Decatur Hwy	Fultondale	AL	20180721
565	Harry & Billies Lounge	1203 9th Ave N	Bessemer	AL	EXEMPT
7769	Hayes K-8 School	505 43Rd Steet North	Birmingham	AL	20183375
3574	Healthsouth Lakeshore Rehab Hospital	3800 Ridgeway Dr	Homewood	AL	20182966
1092	Healthy Connections, Inc.	2409 Acton Road	Vestavia Hills	AL	20170723
10099	Heat N Eat Healthy	2409 Acton Road	Birmingham	AL	Pending
10100	Heat Pizza Bar	2839 7Th Avenue South	Birmingham	AL	Pending
3692	Hemphill School	1240 Cotton Ave Sw	Birmingham	AL	20182517
10093	Hero Doughnuts	3027 Central Avenue	Homewood	AL	20173895
4920	Hewitt Trussville High School	6450 Husky Parkway	Trussville	AL	20181484
7506	Hewitt Trussville Middle School	5275 Trussville Clay Road	Trussville	AL	20183261
8196	Hewitt Trussville Stadium	6345 Husky Parkway	Trussville	AL	20183628

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8505	Hickory Tavern	595 Brookwood Village	Homewood	AL	20183624
11504	Higher Ground Coffee	4248 Cahaba Heights Court	Vestavia Hills	AL	Pending
7594	Highland Center for Nursing & Rehab	2625 Laurel Oaks Road	Bessemer	AL	20183267
10080	Highland Food	2125 Highland Avenue	Birmingham	AL	Pending
3221	Highland Park & Golf	3300 Highland Ave S	Birmingham	AL	20183000
3223	Highlands Bar & Grill	2011 11th Ave S	Birmingham	AL	20181109
5462	Hill Crest Hospital	6869 5th Avenue South	Birmingham	AL	20182960
8674	Hill Elementary School	507 3rd Street North	Birmingham	AL	Pending
8479	Hill Student Center	1400 University Blvd	Birmingham	AL	20183609
1130	Hillview Elementary School	1520 Cherry Avenue	Birmingham	AL	20180726
7298	Hilton Garden Inn Homewood	520 Wildwood Circle	Homewood	AL	20183317
6180	Hilton Garden Inn Trussville	3230 Edwards Lake Parkway	Trussville	AL	20183556
11499	His Kids Academy	2200 Alton Road	Birmingham	AL	Pending
10148	Hissho Sushi @ Western Supermarket	3350 Morgan Drive	Birmingham	AL	Pending
948	Historic Rucker Place, LLC.	1804 12th Avenue South	Birmingham	AL	20160734
11336	Holiday Bowl	4321 Bessemer Super Hwy	Birmingham	AL	Pending
6142	Holiday Inn - Hoover	2901 John Hawkins Pkwy	Hoover	AL	20183067
7283	Holiday Inn BHMLS	492 Wildwood North Circle	Birmingham	AL	20183232
7346	Holiday Inn Express Bessemer	5001 Academy Lane	Bessemer	AL	EXEMPT
10120	Holiday Inn Express Fultondale	1701 Main Street	Fultondale	AL	EXEMPT
7424	Holiday Inn Express Trussville	5911 Valley Road	Trussville	AL	EXEMPT
11384	Holiday Inn Express- Bham I-65	320 Commons Drive	Birmingham	AL	Pending
8634	Holler and Dash	2801 18Th Street South	Birmingham	AL	20183809
11396	Hollywood Grill	1011 9Th Avenue S W	Birmingham	AL	Pending
4129	Holy Family Ele / High School	1916 19th Street Ensley	Birmingham	AL	20103207
11506	Home 2 Suites	3289 Lowery Parkway	Fultondale	AL	Pending
8796	Home 2 Suites By Hilton	3920 Colonnade Pkwy	Birmingham	AL	Pending
245	Home Plate Diner Inc.	2780 Allison Bonnett Mem. Dr	Hueytown	AL	20180044
8835	Homestead Village- A	5444 Patrick Way	Trussville	AL	20173869
8861	Homestead Village- B Shops	5466 Patrick Way	Trussville	AL	20173890
8863	Homestead Village- C Shops	5445 Patrick Way	Trussville	AL	20183961
8864	Homestead Village- E Shops	5431 Patrick Way	Trussville	AL	20183871
8516	Hometown Oriental Supermarket & Mr. Chen's	808 Greenspings Hwy	Homewood	AL	20183680
11457	Homewood Athletic Complex Main Concession Stand	121 West Oxmoor Road	Homewood	AL	Pending
11458	Homewood Athletic Complex Medium Concession Stand	121 West Oxmoor Road	Homewood	AL	Pending
11456	Homewood Athletic Complex-Multi Sport Concession	123 W Oxmoor Road	Homewood	AL	Pending
8169	Homewood Community Center	1632 Oxmoor Road	Birmingham	AL	20183550
7475	Homewood Diner	162 Oxmoor Road	Homewood	AL	20133138
7654	Homewood Gourmet	1919 28th Ave South	Homewood	AL	20183234
3232	Homewood High Baseball	1901 So Lakeshore Dr	Homewood	AL	EXEMPT
753	Homewood High School	1901 S. Lakeshore Drive	Homewood	AL	20180398
3233	Homewood High Softball	1901 So Lakeshore Dr	Homewood	AL	EXEMPT
10061	Homewood Market Table	1830 29Th Avenue South	Homewood	AL	20183866
752	Homewood Middle School	395 Mecca Avenue	Homewood	AL	20180400
3235	Homewood Senior Center	816 Oak Grove Rd	Homewood	AL	EXEMPT
7293	Homewood Soccer Park Phase II	1800 South Lakeshore Drive	Homewood	AL	EXEMPT
8304	Homewood Suites- U. A. B.	1016 20Th Street South	Birmingham	AL	20183772
3237	Honey Baked Ham Company	7001 Crestwood Blvd	Birmingham	AL	EXEMPT
7474	Honey Baked Hams	601 Montgomery Hwy	Vestavia	AL	EXEMPT
7902	Hong Kong City	873 Dennison Ave Sw	Birmingham	AL	20183334
3892	Hong Kong Restaurant	1817 Pinson Valley Pkwy	Tarrant	AL	20181369
454	Hong Kong Seafood	1101 3rd Ave. West	Birmingham	AL	20181538
8905	Hooper City Market	3853 4Th Street West	Birmingham	AL	Pending
1006	Hooters of Homewood	1278 Oak Grove Road	Homewood	AL	20180528
936	Hooters of Trussville	1917 Edwards Lake Rd	Birmingham	AL	20180333
7483	Hoover Christian School	2113 Old Rocky Ridge Road	Hoover	AL	EXEMPT
484	Hoover Country Club Grill	3140 Club Dr	Hoover	AL	20180526
3244	Hoover High School	1000 Buccaneer Dr	Hoover	AL	20181005
3246	Hoover HS Football-Home Stand	1000 Buccaneer Dr	Hoover	AL	20183126
10161	Hoover Met Commissary	100 Ben Chapman Drive	Hoover	AL	Pending
3250	Hoover Senior Center	400 Municipal Drive	Hoover	AL	EXEMPT
3251	Hoover Softball Asso. Con	3468 Chapel Ln	Hoover	AL	20183603
7854	Host International/ Birmingham Airport	5900 Messer Airport Hwy	Birmingham	AL	20183602
145	Hot & Hot Fish Club	2180 11th Ct S	Birmingham	AL	20180069

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8745	Hot Spot	1143 Huffman Road	Birmingham	AL	20183746
10283	Hotel Indigo- IHG	1023 20Th Street South	Birmingham	AL	Pending
8533	Huddle House	409 Warrior Jasper Road	Warrior	AL	20183675
4107	Hudson K-8 School	3300 Shuttlesworth Dr	Birmingham	AL	20182970
11349	Hueytown Chevron	3030 Allison Bonnett Mem Dr	Birmingham	AL	Pending
1131	Hueytown Elementary School	112 Forest Road	Hueytown	AL	20180731
1132	Hueytown Middle School	701 Sunrise Boulevard	Hueytown	AL	20180733
1926	Hueytown Pop N Snack	3057 Allison Bonnet Memorial D	Hueytown	AL	EXEMPT
7743	Hueytown Senior Citizen Building	2500 Brooklane Drive	Hueytown	AL	EXEMPT
1542	Huffman Academy	1212 Cheyenne Blvd.	Birmingham	AL	20182588
8357	Huffman Baptist Church	700 Huffman Road	Birmingham	AL	EXEMPT
3382	Huffman High School	950 Springville Road	Birmingham	AL	20182557
3383	Huffman Middle School	517 Huffman Rd	Birmingham	AL	20180735
4115	Hunan Garden (PPS)	1851 Montgomery Hwy S	Birmingham	AL	20180736
771	Hunan Wok	429 Green Springs Hwy	Homewood	AL	20180371
4220	Hungry Howie's Pizza & Subs-11th Ave S	1501 11th Avenue S	Birmingham,	AL	EXEMPT
8562	Hungry Howie's- Montg.Hwy	1777 Montgomery Hwy	Hoover	AL	20163704
8729	Hwy 55 Burger Shakes & Fries	8525 Whitfield Avenue	Leeds	AL	20183958
10222	Hwy 55 Burgers Shakes & Fries	3230 Galleria Circle	Hoover	AL	Pending
1585	Hyatt Place- Hoover	2980 John Hawkins Pky	Hoover	AL	EXEMPT
550	Hyatt Regency Birmingham- The Wynfrey Hotel	1000 Riverchase Galleria	Birmingham	AL	20180111
8911	I Brew Ramen & Sushi	1909 11Th Avenue South	Birmingham	AL	Pending
10268	I Love Bacon	2001 Tom Williams Way	Birmingham	AL	Pending
8889	Icehouse	2708 Culver Road	Mountainbrook	AL	Pending
4118	Ichiban Japanese Restaurant- CLOSED	620 Old Towne Rd	Vestavia	AL	20151599
7457	Icing on the Cookie, LLC	2907 Central Avenue	Homewood	AL	20143495
1500	Iguana Grill	2085 Colonial Dr	Birmingham	AL	20181597
8293	Ihop #2125 Hoover	2730 John Hawkins Pkwy	Hoover	AL	20183633
767	Ihop #4418 Homewood	221 State Farm Pky	Homewood	AL	20180416
515	Ihop #4472 Crestwood	7748 Crestwood Blvd	Birmingham	AL	20170131
10317	Ikko Ramen Sushi Tea	1909 11Th Avenue South	Birmingham	AL	Pending
3387	Inglenook School K-8	4120 Inglenook St	Birmingham	AL	20182558
11518	Innova Coffee	4700 Colonnade Place	Birmingham	AL	Pending
8373	Insomnia Cookies	1919 11Th Avenue South	Birmingham	AL	20183581
7467	Integrity Christian Academy	216 Roebuck Drive	Birmingham	AL	20173110
7896	Iron City Live Inc.	513 22Nd Street South	Birmingham	AL	20173424
958	Irondale BP	5400 Beacon Drive	Irondale	AL	20180739
491	Irondale Cafe	1906 1st Ave N	Irondale	AL	20180210
8264	Irondale Chevron	1804 Crestwood Blvd	Birmingham	AL	20183538
7496	Irondale Community School	225 16th St S	Birmingham	AL	20183124
1503	Irondale Middle School	6200 Old Leeds Rd	Birmingham	AL	20180741
445	Irondale MS Concess.	6200 Old Leeds Road	Irondale	AL	EXEMPT
781	Irondale Senior Center	5313 Beacon Drive	Irondale	AL	EXEMPT
10117	Ironstone Pizza Hoover	3780 Riverchase Village	Hoover	AL	20183969
8653	Ironstone Pizza Vestavia	632 Montgomery Hwy	Vestavia Hills	AL	20173776
8692	Izumi Japanese Cuisine	1619 Ashville Road	Leeds	AL	20183780
11385	J & C Seafood & Asian Food, Inc.	1944 Hoover Court	Hoover	AL	20183945
3314	J J Wings Fairfield	900 Milstead Rd	Fairfield	AL	20173003
10088	J Wing #2	1011 9Th Ave S W	Bessemer	AL	20183865
8204	J Wings Fultondale	1709 Decatur Highway	Fultondale	AL	Pending
11521	J Wings Fultondale Mobile	1709 Decatur Highway	Fultondale	AL	Pending
3316	J. Alexanders	3320 Galleria Cir	Hoover	AL	20181290
8565	Jack Brown's Beer & Burger Joint	2811- 7Th Avenue South	Birmingham	AL	20183681
11357	Jacks	2600 Morgan Road	Bessemer	AL	Pending
204	Jacks #1 19th St South	2831 19th St S	Homewood	AL	20180065
193	Jacks #134 Louisa St	219 Louisa St	Warrior	AL	20180060
194	Jacks #144 Veterans Mem Dr	5701 Veterans Mem. Dr.	Adamsville	AL	20180042
195	Jacks #145 Park Rd	27 Park Rd	Pleasant Grove	AL	20180061
196	Jacks #146 Walker Chapel Rd	201 Walker Chapel Rd	Fultondale	AL	20180058
197	Jacks #162 19th St North	1800 19th St N	Bessemer	AL	20180063
198	Jacks #165 Pinson Valley Pkwy	2890 Pinson Valley Pkwy	Birmingham	AL	20180057
199	Jacks #166 Lorna Rd	2429 Lorna Road	Birmingham	AL	20180064
200	Jacks #167 Gadsden Hwy	1460 Gadsden Hwy	Trussville	AL	20180056
201	Jacks #168 Crestwood Blvd	1724 Crestwood Blvd	Birmingham	AL	20180059
202	Jacks #174 Centerpoint Rd	4474 Centerpoint Rd	Pinson	AL	20180055

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203	Jacks #210 Mount Olive Rd	2259 Mount Olive Road	Gardendale	AL	20180062
112	Jacks #218 Allison Bonn Mem Dr	2715 Allison Bonnett Mem. Dr.	Hueytown	AL	20180544
7804	Jacks #238 Chalkville Rd	5711 Chalkville Road	Birmingham	AL	20183351
8515	Jacks #257 Fieldstown Rd	425 Fieldstown Road	Gardendale	AL	20183653
8752	Jacks #264 Pkway Dr	7530 Parkway Drive	Leeds	AL	20183779
10312	Jacks Family Restaurant LP	4941 Civic Lane	Bessemer	AL	Pending
7252	Jacks Hamburgers (Corporate) Oxmoor Rd	124 West Oxmoor Road	Homewood	AL	EXEMPT
7428	Jackson Olin High School -Concession Stand	1300 Avenue F	Birmingham	AL	EXEMPT
1511	Jackson-Olin High School	1300 Avenue F	Birmingham	AL	20182560
342	Jacksons Bar & Bistro	1831 28th St S	Homewood	AL	20180053
7872	Jade Garden	760 Academy Drive	Bessemer	AL	20173359
8547	Jake's Cafe	3075 John Hawkins Pkwy	Hoover	AL	20183744
10230	Jake's Cafe	4764 Eastern Valley Road	McCalla	AL	Pending
1512	Jalisco Mexican Restaurant	325 Walker Chapel Rd	Fultondale	AL	20180744
8710	James Rushton Early Learning & Fam Success Center	5512 1St Avenue South	Birmingham	AL	20183888
8912	Janoob, Inc	600 20Th Street Ensley	Birmingham	AL	Pending
6882	Jasmine's Cafe	134 Avenue U	Birmingham	AL	20182977
4134	Jasons Deli Brookwood	583 Brookwood Village	Birmingham	AL	20181220
8771	Jasons Deli Hoover	3032 John Hawkins Pkwy	Hoover	AL	Pending
825	Jasper House	2112 Avenue H	Birmingham	AL	20180746
10204	JCCEO Elyton Child Dev Center	432 Center Street North	Birmingham	AL	Pending
7429	JCCEO Head Start -St Joseph's	1105 30th Street Ensley	Birmingham	AL	20183090
7427	JCCEO Head Start- Arrington	300 8th Avenue West	Birmingham	AL	20183078
7231	JCCEO Head Start- Centerpoint	2209 Centerpoint Parkway	Birmingham	AL	20182994
8899	JCCEO Head Start- Erwin	528 23Rd Avenue N W	Birmingham	AL	Pending
7663	JCCEO Head Start- Fairmont	4217 Lewisburg Road	Birmingham	AL	20183257
7661	JCCEO Head Start- Festival	6701 Crestwood Blvd	Birmingham	AL	20183214
7772	JCCEO Head Start- Kingston Center	801 46Th Street North	Birmingham	AL	20183319
7217	JCCEO Head Start- Sherman Heights	2000 Pleasant Hill Rd	Birmingham	AL	20183016
7664	JCCEO Head Start- West Center	1712 3rd Ave Sw	Birmingham	AL	20183223
1150	JCCLC East- Kitchen Closed	50 Long Street	Birmingham,	AL	20161092
4043	JCIB Middle Grades Programme	805 7th Ave	Pleasant Grove	AL	20180903
3331	Jeff. County Youth Detention Center	140 2nd Ct N	Birmingham	AL	20181505
1519	Jefferson Christian Academy	1500 Heritage Place Dr	Irondale	AL	20172968
3389	Jefferson County Jail 21st St No	809 21st St No	Birmingham	AL	20183201
5480	Jefferson County Jail- Bessemer	1822 2nd Ave No	Bessemer	AL	20183024
570	Jennie's Sandwich Shop	331 4th Ave N	Bessemer	AL	20180489
8544	Jersey Mike's Subs Mt Brook	3150 Overton Road	Mountain Brook	AL	20153649
7476	Jersey Mikes Subs Hoover	1851 Montgomery Hwy	Hoover	AL	20123154
1524	Jessies Place of the Jimmie Hale Mission	2305 5th Ave N	Birmingham	AL	EXEMPT
8455	Jets Pizza	4730 Chace Circle	Hoover	AL	20183677
562	Jewels	1918 3rd Ave N	Birmingham	AL	EXEMPT
110	Jim Davenports' Pizza Palace	2837 Cahaba Road	Birmingham	AL	EXEMPT
862	Jim N Nicks 11th Ave So	1908 11th Ave S	Birmingham	AL	20180656
863	Jim N Nicks Gadsden Hwy	1660 Gadsden Hwy	Trussville	AL	20180749
864	Jim N Nicks Montgomery Hwy	1810 Montgomery Hwy	Birmingham	AL	20180750
861	Jim N Nicks Odum Rd	915 Odum Rd	Gardendale	AL	20180841
865	Jim N Nicks Oxmoor Rd	220 West Oxmoor Road	Homewood	AL	20181214
392	Jimmie Hale Mission	3420 2nd Ave. N	Birmingham	AL	20180418
8338	Jimmy John's (Corp Serg Enterprises Inc.)	323 20Th Street North	Birmingham	AL	EXEMPT
7781	Jimmy John's Gourmet Sandwiches 11th Ave So	1919 11Th Avenue South	Birmingham	AL	EXEMPT
7767	Jimmy John's Gourmet Sandwiches Chace Cir	4730 Chace Circle	Hoover	AL	EXEMPT
8084	Jimmy Johns Colonnade Pkwy	3411 Colonnade Parkway	Birmingham	AL	EXEMPT
8419	Jimmy Johns Kentucky Ave	1919 Kentucky Ave	Birmingham	AL	EXEMPT
8474	Jimmy Johns Medford Dr	5250 Medford Drive	Hoover	AL	EXEMPT
8240	Jimmy's Hotdogs & Burgers	3425 6Th Ave South	Birmingham	AL	20183510
3393	Jinsei	1830 29th Ave S	Birmingham	AL	20180752
8117	Jo Jo's On Broadway	903 Broadway Street	Birmingham	AL	Pending
11399	Joel's Pinson Valley Parkway	4437 Pinson Valley Parkway	Birmingham	AL	Pending
10212	Joel's Vestavia	633 Montgomery Highway	Vestavia Hills	AL	20183900
220	Joels Restaurant	312 Main Street	Trussville	AL	20180527
3399	John Carroll H S/ Christian Catering	300 Lakeshore Parkway	Birmingham	AL	20183211
185	John's Gus Hot Dogs, LLC	5415 Beacon Dr	Irondale	AL	20180023
10077	Johnny Bruscos NY Style Pizza	2341 John Hawkins Pkwy	Birmingham	AL	Pending
8498	Johnny Rays BBQ- Colonnade	3431 Colonnade Pkwy	Birmingham	AL	20183625

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576	Johnny Rockets Birmingham	331 Summit Blvd	Birmingham	AL	20180176
8471	Johnny's Restaurant	2902 18Th Street North	Homewood	AL	Pending
926	Johns City Diner	112 Richard Arrington Blvd	Birmingham	AL	20180594
7462	Jones Valley K-8 School	2000 31st Street SW	Birmingham	AL	20183315
1152	Jonesboro Elementary Child Nutrition Program	125 Owen Avenue	Bessemer	AL	20181259
3409	Jubilee Joes Seafood Restaurant	2341 John Hawkins Pky	Hoover	AL	20160757
11354	Jungs Enterprise dba Sumo Jap Steakhouse & Sushi	151 Main Street	Hoover	AL	20183906
11513	Just Gyros	1020 Decatur Highway	Gardendale	AL	Pending
8970	K & D Stop and Shop	820 Overton Avenue	Birmingham	AL	Pending
8944	K & M Food Mart LLC	4100 Messer Airport Hwy	Birmingham	AL	Pending
8673	K's Wing Master	1860 Centerpoint Pkwy	Birmingham	AL	20183708
8300	Kamtek Cosma International	1595 Sterilite Drive	Birmingham	AL	EXEMPT
8754	Kat's Kreations	1204 Centerpoint Parkway	Birmingham	AL	Pending
410	Kathy G & Co., Inc.	11 West Park Cir	Birmingham	AL	20180070
8596	Katie's Plate	4500 Montevallo Road	Birmingham	AL	20183742
7436	Kaylyn's	306 18th Street North	Bessemer	AL	20103120
1961	Kelly's Cajun Grill	2000 Riverchase Galleria	Birmingham	AL	20180561
11377	Kemps Kitchen	1423 Gadsden Hwy	Trussville	AL	Pending
11343	Ken 1 BBQ	4818 Pinson Valley Pkwy	Pinson	AL	Pending
7249	Kentucky Fried Chicken #03 Ashville Rd	1816 Ashville Road	Leeds	AL	20183006
702	Kentucky Fried Chicken #730 9th Ave No	1818 9th Ave N	Bessemer	AL	20170761
707	Kentucky Fried Chicken #731 20th St Ensley	1800 20th St Ensley	Birmingham	AL	20170771
704	Kentucky Fried Chicken #732 Bess Rd	1928 Bessemer Rd	Birmingham	AL	20170760
706	Kentucky Fried Chicken #733 Carraway Blvd	1217 Carraway Blvd	Birmingham	AL	20170768
711	Kentucky Fried Chicken #734 Crestwood Blvd	7909 Crestwood Blvd	Birmingham	AL	20170766
709	Kentucky Fried Chicken #735 Centerpt Rd	1653 Center Point Rd	Birmingham	AL	20180767
703	Kentucky Fried Chicken #737 Aaron Aronov Dr	7159 Aaron Aronov Dr	Fairfield	AL	20170769
712	Kentucky Fried Chicken #738 Forestdale Blvd	1229 Forestdale Blvd	Birmingham	AL	20170764
708	Kentucky Fried Chicken #739 Fieldstown Rd	531 Fieldstown Rd	Gardendale	AL	20180762
705	Kentucky Fried Chicken #740 Greensprings Hwy	828 Green Springs Hwy	Birmingham	AL	20170770
710	Kentucky Fried Chicken #741 Allison Bonn Mem Dr	3065 Allison Bonnett Dr.	Hueytown	AL	20170763
713	Kentucky Fried Chicken #752 Gadsden Hwy	1674 Gadsden Hwy	Birmingham	AL	20170765
588	Kesslers Pharmacy	1152 East Lake Blvd	Tarrant	AL	EXEMPT
10201	Kid Zone Christian Academy	750 Allison Bonnett Mem Drive	Birmingham	AL	Pending
8838	Kidz Learning Center	413 8Th Avenue North	Birmingham	AL	Pending
8297	Kinfolk Kitchen	708 29Th Street South	Birmingham	AL	20183659
8858	King Buffet	1074 Forestdale Blvd	Birmingham	AL	Pending
10219	King Buffet	7845 Crestwood Blvd	Birmingham	AL	Pending
7406	Kings Wings	733 9th Avenue North	Bessemer	AL	20183107
766	Klinglers European Bakery & Deli	621 Montgomery Hwy	Vestavia Hills	AL	EXEMPT
950	Knesseth Israel Congregation	3100 Overton Road	Birmingham	AL	EXEMPT
10275	Kome	3076 John Hawkins Parkway	Hoover	AL	Pending
293	Konomi	5870 Trussville Crossing Blvd	Birmingham	AL	20180026
8891	Koo Koo's Fish Market	1840 Centerpoint Pkwy	Birmingham	AL	20183948
10176	Kool Konez	2178 Eastern Valley Road	Birmingham	AL	Pending
8649	Kool Korner Sandwiches	1360 Montgomery Hwy	Vestavia Hills	AL	Pending
10313	Krispy Crunchy Chicken	2501 Avenue E	Birmingham	AL	Pending
822	Krispy Kreme Birmingham	8601 1st Ave N	Birmingham	AL	EXEMPT
8598	Krispy Kreme Hoover	1990 New Patton Chapel Road	Hoover	AL	Pending
905	Krystal #01 Pinson St	1212 Pinson St	Tarrant	AL	20180317
896	Krystal #02 Crestwood Blvd	1810 Crestwood Blvd	Irondale	AL	20180316
901	Krystal #08 Montgomery Hwy	1576 Montgomery Hwy	Hoover	AL	20180321
902	Krystal #09 Main St	1119 Main St	Gardendale	AL	20180320
904	Krystal #12 Acton Rd	2419 Acton Rd	Birmingham	AL	20180318
1003	Krystal Restaurant Forest Rd	219 Forest Road	Hueytown	AL	20180423
1002	Krystal Restaurant Service Rd	5975 Service Road	Birmingham	AL	20180422
465	Kudzoo Cafe	2630 Cahaba Road	Birmingham	AL	20180029
10119	Kumo Sushi and Asian	835 Odum Road	Gardendale	AL	20183954
8988	Kwik Mart	100 Park Road	Pleasant Grove	AL	Pending
3572	La Brisa	2341 John Hawkins Pky	Hoover	AL	20181285
10298	La Calle	5915 Trussville Crossing Pkwy	Trussville	AL	20183951
8737	La Nueva Michoacana	104 Greensprings Hwy	Birmingham	AL	20183745
3571	La Paz	99 Euclid Ave	Birmingham	AL	20181240
8185	La Perla Nayarita Chalkville Mtn Rd	5712 Chalkville Mountain Road	Birmingham	AL	20183508
8734	La Perla Nayarita Greensprings Hwy	150 Greensrpings Hwy	Birmingham	AL	20183887

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769	La Perla Taqueria & Carniceria	1516 9th Ave N	Bessemer	AL	20180264
11423	La Piramide Mexican Restaurant	412 Main Street	Warrior	AL	Pending
8680	La Quinta Inn & Suites	1207 Boots Blvd	Fultondale	AL	Pending
10048	La Rueda	520 Decatur Highway	Gardendale	AL	Pending
8534	La Sabrosita Lorna Rd	3702 Lorna Road	Birmingham	AL	EXEMPT
8546	La Sabrosita West Valley Ave	191 West Valley Ave	Homewood	AL	Pending
11319	La Sirena	6233 Blocton Avenue	Birmingham	AL	Pending
8425	Laborers In Christ	2708 Temple Drive	Birmingham	AL	EXEMPT
1010	LaFiesta Mexican Restaurant of Bham, Inc.	1941-A Hoover Court	Hoover	AL	20180655
4720	Lakeshore Foundation Dormitory	3850 Ridgeway Drive	Homewood	AL	20181256
1817	Landrys Seafood House	139 State Farm Pky	Homewood	AL	20181102
8584	Lane Park Retail- Bldg A/ Western Market	1000 Jemison Lane	Birmingham	AL	20183721
8585	Lane Park Retail- Bldg B	2525 Lane Park Road	Mountain Brook	AL	Pending
8586	Lane Park Retail- Bldg C	2525 Lane Park Road	Mountain Brook	AL	20183722
184	Laneys Restaurant	7601 Parkway Dr	Leeds	AL	20180325
10052	Lawson State Academic Success Center	3008 Wilson Road S W	Birmingham	AL	20183925
3579	Lawson State Bessemer Campus-Kitchen	1100 9th Ave Sw	Bessemer	AL	20181316
8153	Lawson State Comm College/ Culinary School	3060 Wilson Road S W	Birmingham	AL	20183509
1820	Lawson State Leon Kennedy Center	3060 Wilson Rd	Birmingham	AL	20181504
8119	Le Vian Grill & Bar	2236 Magnolia Avenue South	Birmingham	AL	Pending
8309	Lee Seafood	6805 1St Avenue North	Birmingham	AL	20173544
7218	Leeds Civic Center/ Nutrition Center	1000 Park Dr	Leeds	AL	EXEMPT
816	Leeds Elementary School	950 Ashville Road	Leeds	AL	20180345
4941	Leeds High School	7160 Coosa Avenue	Leeds	AL	20180779
3583	Leeds High School Athletic Fld	1771 Whitmire Street	Leeds	AL	20183122
7773	Leeds Memorial Park Concessions	590 Helen Street	Leeds	AL	20183441
4940	Leeds Middle School	8404 Greenwave Drive	Leeds,	AL	20180780
8519	Leeds Primary School	991 Park Drive	Leeds	AL	20183755
3585	Leeds Youth Sports Inc	300 Parkway Dr	Leeds	AL	NONE
4042	Legacy Health & Rehab at Pleasant Grove	30 7th St	Pleasant Grove	AL	20172457
1241	Legion Field Stadium	400 Graymont Avenue West	Birmingham	AL	20180781
1004	Levite Jewish Community Center	3960 Montclair Road	Birmingham	AL	EXEMPT
6581	Life Time Fitness- Bistro	3051 Healthy Way Drive	Vestavia Hills	AL	20183439
6582	Life Time Fitness- Life Cafe	3051 Healthy Way Drive	Vestavia Hills	AL	20183440
10087	Lily Grove Missionary Baptist Church	1409 20Th Street North	Birmingham	AL	Pending
11474	Lin's Buffet	1074 Forestdale Blvd	Birmingham	AL	Pending
1135	Lipscomb Elementary School	5605 10th Street	Lipscomb	AL	20180785
7740	Little Caesars Weaver Ave	8901 Weaver Avenue	Leeds	AL	EXEMPT
10033	Little Caesars 1st Ave North	7630 1St Avenue North	Birmingham	AL	20183861
10038	Little Caesars Academy Drive	760 Academy Drive	Bessemer	AL	EXEMPT
10037	Little Caesars Cane Creek Rd	313 Cane Creek Road	Warrior	AL	EXEMPT
10029	Little Caesars Centerpt Pkwy	1189 Center Point Pkwy	Birmingham	AL	EXEMPT
10039	Little Caesars Cross Haven Dr	3900 Cross Haven Drive	Cahaba Heights	AL	20183859
10028	Little Caesars E Ave West	4608 E Ave West	Birmingham	AL	20183860
10034	Little Caesars Fieldstown Rd	439 Fieldstown Road	Gardendale	AL	EXEMPT
10031	Little Caesars Forest Road	215 Forest Road	Hueytown	AL	EXEMPT
10027	Little Caesars Forestdale Blvd	1421 Forestdale Blvd	Birmingham	AL	20183858
10036	Little Caesars Highway 75	6662 Highway 75	Pinson	AL	20183857
10040	Little Caesars Lorna Road	3305 Lorna Road	Hoover	AL	EXEMPT
10032	Little Caesars Pinson Valley Pkwy	2060 Pinson Valley Pkwy	Tarrant	AL	20183856
10030	Little Caesars W Valley Ave	406 W Valley Avenue	Birmingham	AL	20183855
803	Little Savannah	3811 Clairmont Avenue	Birmingham	AL	20160265
8418	Liv Parkside- DO NOT SEND NOTICE FOR 2018	1701 1St Avenue South	Birminghanm	AL	Pending
10314	Lo Lo's BBQ	4350 3Rd Ct South	Birmingham	AL	Pending
11461	Local Taco	3419 Colonnade Pkwy	Birmingham	AL	Pending
3758	Logans Roadhouse #397 John Hawkins Pkwy	2740 John Hawkins Pkwy	Hoover	AL	20180793
126	Logans Roadhouse #423 Pinnacle Square	5071 Pinnacle Square	Trussville	AL	20180359
4983	Logans Roadhouse #475 Bond Blvd	5000 Bond Blvd	Bessemer	AL	20183017
4480	Logans Roadhouse #479 Lowery Pkwy	3387 Lowery Parkway	Fultondale	AL	20181677
2011	Los Amigos	3324 Clairmont Ave	Birmingham	AL	20181160
8324	Los Arcos Parkway East	9417 Parkway East	Birmingham	AL	Pending
8051	Los Arcos Restaurant LLC Crestwood Blvd	7001 Crestwood Blvd	Birmingham	AL	20183506
3762	Los Compadres	308 Oxmoor Rd	Homewood	AL	20150801
1421	Los Juane's Mexican Restaurant	401 19th Street South	Birmingham	AL	20180802
8548	Los Pedros	3305 Lorna Road	Hoover	AL	20183953

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
10079	Los Rancheros Mexican Grill	2531 Rocky Ridge Road	Birmingham	AL	Pending
8952	Los Rancheros Mexican Grill	1420 Forestdale Blvd	Birmingham	AL	Pending
8432	Los Reyes Mexican Grill LLC	821 Allison Bonnett Drive	Hueytown	AL	20183651
8551	Los Sombreros	5031 Ford Parkway	Bessemer	AL	Pending
10162	Los Valedores	4244 3Rd Avenue South	Birmingham	AL	Pending
3763	Louis Pizitz Middle School	2020 Pizitz Dr	Vestavia	AL	20181458
7616	Louises Cakes N Things, Inc	1694 Montgomery Hwy Ste 150	Hoover	AL	EXEMPT
7637	Love Lady Center	7916 2nd Avenue South	Birmingham	AL	20153200
8842	Lovejoy Daycare #2	6513 2Nd Avenue South	Birmingham	AL	Pending
8760	Lucky Panda Asian Kitchen	3014 Allison Bonnett Mem Dr	Hueytown	AL	20183808
2176	Lucys Coffee & Tea	2007 University Blvd	Birmingham	AL	EXEMPT
10012	Luxe Ultra Lounge	300 24Th Street South	Birmingham	AL	Pending
11406	M & AM Discount Food Inc	508 Jefferson Blvd	Tarrant	AL	Pending
10217	M & K One Stop	5317 Veterans Memorial Pkwy	Birmingham	AL	Pending
541	M & M B B Q	3921 1st Ave N	Birmingham	AL	20180175
11324	Machetes Mexican Restaurant	591 Allison Bonnett Mem Dr	Birmingham	AL	Pending
2182	Macs One Stop	400 19th St S	Birmingham	AL	20181058
5680	Mafiaozas	2 Dexter Avenue	Birmingham	AL	20182877
10160	Magic City Crabs	1700 Pearson Avenue S W	Birmingham	AL	Pending
3778	Magic City Grill Fairfield Il	4610 Gary Ave	Fairfield	AL	20171758
11383	Magic City Grill Holiday Bowl	4321 Bessemer Super Highway	Bessemer	AL	Pending
645	Magic City Grille	2201 3rd Ave N	Birmingham	AL	20180394
11413	Magic City Grille	500 Brooklane Drive	Birmingham	AL	Pending
10209	Magic City Krabs	1700 Pearson Avenue	Birmingham	AL	Pending
11317	Magic City Snowball	1515 Pearson Avenue	Birmingham	AL	Pending
8538	Magic City Sweet Ice	715 Oak Grove Road	Homewood	AL	Pending
559	Magic Muffins	3150 Overton Rd	Birmingham	AL	20180108
7783	Magic Wok	401 19Th Street South	Birmingham	AL	20183282
355	Magnificent Cakes	5117 Crowley Dr	Irondale	AL	EXEMPT
789	Magnolia Cafe	4704 Cahaba River Rd	Birmingham	AL	20180268
8457	Magnolia Place Elementary School	Hidden Way Lane	Trussville	AL	Pending
2994	Magnolia Ridge	420 Dean Dr	Gardendale	AL	20171217
3779	Main Moon Chinese Restaurant	737 9th Ave N	Bessemer	AL	20181228
313	Majestic Catering Services	2420 Morgan Rd	Bessemer	AL	20180072
2186	Makarios Kabobs & Grill	940 20th St S	Birmingham	AL	20181170
8205	Maki Fresh	420 20Th Street North	Birmingham	AL	20183535
2188	Manchu Wok #2021	2000 Riverchase Galleria	Hoover	AL	20181344
4141	Mandarin House	1550 O Montgomery Hwy	Hoover	AL	20171342
8469	Mango Tango	5850 Valley Road	Trussville	AL	20183728
308	Manor Catering	8912 4th Ave South	Birmingham	AL	20180027
10315	Marble King	430 41St Street South	Birmingham	AL	Pending
8092	Marco's Pizza Braddock Dr	1960 Braddock Drive	Hoover	AL	20163479
8833	Marco's Pizza Main Street	300 Main Street	Trussville	AL	20183777
8041	Margaret & Bakery	1421 Forestdale Blvd	Birmingham	AL	EXEMPT
548	Marilyns Deli & Dogs	715 18th St N	Birmingham	AL	20170112
7916	Marketplace Building #1	2301 Richard Arrington Blvd No	Birmingham	AL	20183404
7917	Marketplace Building #2	2311 Richard Arrington Blvd No	Birmingham	AL	20183405
319	Martas Bakery	3936 Crosshaven Dr	Birmingham	AL	20182137
2196	Martha Gaskins Middle School	200 Dalton Rd	Birmingham	AL	20182565
11459	Marty's Burger Bar	5415 Beacon Drive	Birmingham	AL	Pending
598	Martys	1813 10th Ct S	Birmingham	AL	EXEMPT
8825	Mary's Carry Out	1509 Jackson Blvd	Birmingham	AL	20173827
7613	Mary's Kitchen & Catering	1200 Hall Avenue South	Bessemer	AL	20123274
8677	Mas Flavor	2801 7Th Avenue South	Homewood	AL	Pending
8566	Masaman Thai Kitchen	790 Montgomery Hwy	Vestavia	AL	20183685
10045	Mason Dixon Bakery & Bistro	1017 Oxmoor Road	Birmingham	AL	20183893
3794	Matthew Bar & Grill	2208 Morris Ave	Birmingham	AL	20153189
7449	Mazin Inc	2805 Dartmouth Avenue	Bessemer	AL	20183129
1136	McAdory Elementary School	6251 Eastern Valley Road	Bessemer	AL	20180808
7636	McAdory High Culinary Arts Bldg	4800 Mcadory School Road	McCalla	AL	20183192
1138	McAdory High School	4800 McAdory School Road	McCalla	AL	20180809
7201	McAdory Middle School	5450 Yellow Jacket Blvd	McCalla	AL	20183171
7393	McAdory Middle School Concession	5450 Yellow Jacket Blvd	Bessemer	AL	EXEMPT
8627	McAllisters Deli	1801 4Th Ave South	Birmingham	AL	20183761
8819	McAllisters Deli #1075 St Farm Pkwy	350 State Farm Parkway	Birminghamn	AL	20183760

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6350	McAllisters Deli Promenade Pkwy	4977 Promenade Parkway	Bessemer	AL	20173131
8279	McDonalds #10174 Phillips Dr	11 Phillips Drive	Midfield	AL	20183526
8915	McDonalds #10329 Pinson Valley Pkwy	2116 Pinson Valley Parkway	Tarrant	AL	20183838
370	McDonalds #10584 Chalkville Rd	1111 Chalkville Rd	Trussville	AL	20180150
8273	McDonalds #10666 Bessemer Hwy	2201 Bessemer Highway	Birmingham	AL	20183520
8877	McDonalds #11406 Montgomery Hwy	1731 Montgomery Hwy	Hoover	AL	20183789
2204	McDonalds #11543 Jaybird Rd	3633 Jaybird Rd	Bessemer	AL	20181206
8272	McDonalds #11598 Finley Blvd	1700 Finley Blvd	Birmingham	AL	20183519
7918	McDonalds #11899 Greenmor Dr	1195 Greenmor Dirve	Bessemer	AL	20183342
8267	McDonalds #12085 Acton Rd	2427 Acton Road	Vestavia	AL	20183514
3809	McDonalds #12105 Dennison Ave SW	801 Dennison Ave Sw	Birmingham	AL	20181205
8277	McDonalds #12617 Grants Mill Rd	734 Grants Mill Road	Birmingham	AL	20183524
8880	McDonalds #13516 12th Avenue Norwood	3013 12Th Avenue North	Birmingham	AL	20173792
2205	McDonalds #1388 9th Ave No	911 9th Ave N	Bessemer	AL	20181204
3802	McDonalds #15347 Hwy 151	6639 Hwy 151	Pinson	AL	20181428
180	McDonalds #15999 Cane Creek Rd	100 Cane Creek Rd	Warrior	AL	20180216
8270	McDonalds #1756 Montclair Rd	1569 Montclair Road	Birmingham	AL	20183517
3803	McDonalds #19231 State Farm Pkwy	241 State Farm Pky	Homewood	AL	20181203
8282	McDonalds #1926 1st Ave No	5904 1St Avenue North	Birmingham	AL	20183529
8876	McDonalds #1941 26th Street	3220 26Th Street North	Birmingham	AL	20173788
8269	McDonalds #1946 8th Ave So	2733 8Th Avenue South	Birmingham	AL	20183516
8879	McDonalds #2017 Montgomery Hwy	707 Montgomery Hwy	Vestavia	AL	20173791
8278	McDonalds #2090 Lomb Ave	732 Lomb Avenue	Birmingham	AL	20183525
8275	McDonalds #25372 Greensprings Hwy	818 Greensprings Highway	Birmingham	AL	20183522
178	McDonalds #27687 Eastern Valley Rd	4746 Eastern Valley Rd	McCalla	AL	20180217
8268	McDonalds #3040 Centerpoint Rd	1907 Centerpoint Road	Birmingham	AL	20183515
8271	McDonalds #31194 5th Ave So	1501 5Th Avenue South	Birmingham	AL	20183518
6000	McDonalds #33062 Howell St	227 Howell St	Fultondale	AL	20182317
8276	McDonalds #3468 Montgomery Hwy	1547 Montgomery Highway	Hoover	AL	20183523
8916	McDonalds #449 Avenue E	3520 Avenue E Ensley	Birmingham	AL	20183839
8875	McDonalds #6985 Forestdale Blvd	1309 Forestdale Blvd	Birmingham	AL	20183787
8280	McDonalds #7143 Gadsden Hwy	218 Gadsden Highway	Birmingham	AL	20183527
8878	McDonalds #7637 AllisonBon.Mem Dr	3069 Allison Bonnett Mem Dr	Hueytown	AL	20183790
8274	McDonalds #7827 Decatur Hwy	1017 Decatur Highway	Gardendale	AL	20183521
331	McDonalds #8245 Edwards Lake Rd	1960 Edwards Lake Rd	Trussville	AL	20180158
8434	McDonalds Academy Dr	765 Academy Drive	Bessemer	AL	20183592
8317	McDonalds Ashville Rd	1809 Ashville Road	Leeds	AL	20183784
8292	McDonalds Medford Dr	5170 Medford Drive	Hoover	AL	20183582
3812	Mcwane Science Center	200 19th St N	Birmingham	AL	20170813
11320	Mealfit	3660 Grandview Pkwy	Birmingham	AL	Pending
11365	Meals By Misty	108 Watterson Pkwy	Trussville	AL	Pending
318	Medical West	995 9th Avenue SW	Bessemer	AL	20180039
2214	Mellow Mushroom	1200 20th St S	Birmingham	AL	20170815
8249	Melt Food Truck, LLC	4105 4Th Avenue South	Birmingham	AL	20183555
11411	Mercedes Benz of Birmingham	750 Mercedes Way	Birmingham	AL	Pending
11331	Merkle Hollis Stillery	3151 Green Valley Road	Birmingham	AL	Pending
8407	Merry Cheese Crisps	3145 Pipeline Road	Birmingham	AL	20183836
10135	Metro Diner	1088 Montgomery Hwy	Vestavia	AL	Pending
10183	Mexican Ebenezer	10 14Th Street North	Bessemer	AL	Pending
11333	Mexican Food Truck	5118 Pinson Valley Pkwy	Birmingham	AL	Pending
10128	Mi Ranchito	1680 Montclair Rd	Birmingham	AL	Pending
8934	Miami Fusion Cafe	2015 5Th Avenue North	Birmingham	AL	20183886
8845	Michael's Steaks and Seafood	1903 29Th Avenue South	Homewood	AL	20183846
1209	Microtel Inn & Suites Jackson Dr	500 Jackson Drive	Hoover	AL	EXEMPT
7460	Microtel Inn & Suites Odum Rd	850 Odum Road	Gardendale	AL	EXEMPT
976	Midfield Elementary School	417 Parkwood Street	Midfield	AL	20180390
975	Midfield High School	1600 High School Drive	Midfield	AL	20180389
11485	Mile End Deli	1701 1st Avenue South	Birmingham	AL	Pending
561	Miles College Cafeteria	5500 Myron Massey Blvd	Fairfield	AL	20180109
2224	Miles College Concession Stand	5500 Myron Massey Blvd	Fairfield	AL	20173226
8968	Millennium Mini Mart	1 Rev Abraham Woods Jr Blvd	Birmingham	AL	Pending
8730	Millie Ray's Rolls	2912 Rev Abraham Woods Jr Blvd	Birmingham	AL	EXEMPT
231	Milos - Trussville	5887 Trussville Crossings Pky	Trussville	AL	20180080
232	Milos 19th St So	401 19th St S	Birmingham	AL	20180083
230	Milos Academy Dr	757 Academy Drive	Bessemer	AL	20180079

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235	Milos E J Oliver Blvd	6600 E J Oliver Blvd	Fairfield	AL	20180078
229	Milos Fieldstown Rd	604 Fieldstown Rd	Gardendale	AL	20180076
788	Milos Forestdale Blvd	1120 Forestdale Blvd	Birmingham	AL	20180411
226	Milos Gadsden Hwy	209 Gadsden Hwy	Birmingham	AL	20180077
234	Milos Montclair Rd	1530 Montclair Rd	Birmingham	AL	20180082
227	Milos Montgomery Hwy	1455 Montgomery Hwy	Vestavia	AL	20180084
233	Milos St Farm Pkwy	208 State Farm Pky	Homewood	AL	20180081
2228	Mings Garden	1046 Main St	Gardendale	AL	20180820
714	Minit Man #101 Shell	609 Allison-Bonnet Mem Dr	Dolomite	AL	EXEMPT
3971	Minitman #109 Deli	2178 Eastern Valley Rd	Bessemer	AL	EXEMPT
3973	Minor Community School	3006 Cora Ave	Birmingham	AL	20183072
4148	Minor Elementary School	2425 Avenue S	Birmingham	AL	20182566
1143	Minor High School	2285 Minor Parkway	Adamsville	AL	20180822
1224	Minor High School Concession	2285 Minor Parkway	Adamsville	AL	20102798
8592	Miss Dots	49 Church Street	Mountain Brook	AL	20183668
504	Miss Myras Pit Bar-B-Que	3278 Cahaba Heights Road	Birmingham	AL	20180515
10067	Mixx Bar & Grill	700 9Th Street North	Hueytown	AL	Pending
8126	Mizu Japanese Steakhouse	1483 Gadsden Highway	Birmingham	AL	20183469
11414	Mobile Gas Station	2258 Bessemer Super Highway	Birmingham	AL	Pending
1158	Moe's Original BBQ	731 29th Street South	Birmingham	AL	20180446
8222	Moe's Original BBQ	2520 Rocky Ridge Road	Birmingham	AL	20183540
8108	Moe's Original BBQ Trussville, LLC	163 Main Street	Trussville	AL	20183530
11367	Moe's Southwest Grill Gardendale	655 Fieldstown Road	Gardendale	AL	20183923
7994	Moes Original BBQ Hoover	181 Main Street	Hoover	AL	20183558
734	Moes Southwest Grill Hwy 280 E	2737 Hwy 280 E	Mountain Brook	AL	20180638
4152	Moes Southwest Grill Lorna Rd	3670 Lorna Rd	Hoover	NULL	20181377
3978	Moes Southwest Grill Montgomery Hwy	716 Montgomery Hwy	Vestavia	AL	20181378
3979	Moes Southwest Grill St Farm Pkwy	231 State Farm Pky	Homewood	NULL	20181379
217	Moes Southwest Grill Trussville Crossings	5870 Trussville Crossings Pky	Birmingham	AL	20180524
11418	Mom's Basement	4411 3Rd Avenue South	Birmingham	AL	Pending
5000	Momma Goldberg's Deli 18th Street So	2829 18Th Street South	Birmingham	AL	EXEMPT
7832	Momma Goldberg's Deli Frank Street	4170 Frank Street	Trussville	AL	EXEMPT
533	Moms Deli	1101 4th Ave N	Bessemer	AL	20180116
8765	Montclair Early Learning Center, LLC	1415 52Nd Street South	Birmingham	AL	20183798
246	Montgomery Grocery & Deli	3148 33 Rd Terrace North	Birmingham	AL	20180387
3983	Moon Star	191 W. Valley Avenue	Birmingham	AL	20181103
8016	Mooyah Burgers & Fries Colonnade Pkwy	3439 Colonnade Parkway	Birmingham	AL	20183391
8247	Mooyah Burgers, Fries, Shakes 7th Ave So	2112 7Th Ave South	Birmingham	AL	20183554
10049	More Chicken & Fish	3420 Avenue E	Birmingham	AL	Pending
11325	Morgans Cafe	1205 Lake Drive S E	Birmingham	AL	Pending
1681	Morningside of Vestavia Hills	2435 Columbiana Rd	Vestavia	AL	20181957
8982	Moss Rock Tacos & Tequila	616 Preserve Pkwy	Hoover	AL	Pending
3996	Mountain Brook Club	19 Beechwood Rd	Mountain Brook	AL	20181073
8422	Mountain Brook Community Church	3001 Hwy 280 E.	Birmingham	AL	EXEMPT
4169	Mountain Brook Creamery	2715 Cahaba Rd	Mountain Brook	AL	EXEMPT
955	Mountain Brook Elementary School	3020 Cambridge Road	Mountain Brook	AL	20170825
954	Mountain Brook Junior High School	205 Overbrook Road	Mountain Brook	AL	20170827
4145	Mountain View Baptist Church/ School	5568 Chalkville Mt. Rd	Birmingham	AL	20181222
8820	Mountain View Resorts, LLC	260 Goodwin Crest Drive	Birmingham	AL	20183794
6760	Mountaintop Community Life Center	225 Centerview Drive	Vestavia	AL	EXEMPT
8552	Mr. Chen's Authentic Chinese Cooking Gadsden Hwy	1423 Gadsden Hwy	Birmingham	AL	20183644
6920	Mr. Chen's Authentic Chinese Cooking Hoover	1917 Hoover Court	Hoover	AL	20183009
7867	Mr. Sharks Fish & Chicken Greensprings	254 Greensprings Hwy	Birmingham	AL	20173349
8210	Mr. Sharks Fish & Chicken Montgomery Hwy	1837 Montgomery Hwy	Hoover	AL	20173537
557	Mr. Wangs Restaurant	217 Lakeshore Parkway	Homewood	AL	20180106
8220	Mrs. B's Downtown, LLC	328 16Th Street North	Birmingham	AL	Pending
8289	Mrs. Deannas Kindergarten Daycare	3102 Allison Bonnet Memorial D	Hueytown	AL	EXEMPT
3999	Mt Royal Towers	300 Royal Towers Dr	Birmingham	AL	20182817
8724	Mt. Canaan Full Gospel Church	2725 24Th Street S W	Birmingham	AL	Pending
10013	Mt. Sinai Missionary Baptist Church	500 Carter Avenue	Bessemer	AL	EXEMPT
742	Mudtown Eat & Drink	3144 Green Valley Road	Birmingham	AL	20110292
7792	Mug Shots Grill & Bar	1919 Kentucky Avenue	Vestavia Hills	AL	20183422
7746	Mundo Latino	821 Graymont Avenue West	Birmingham	AL	Pending
4005	Munoz Mexican Grill Pinson	6662 Hwy 75	Pinson	AL	20181421
7348	Munoz Mexican Grill Trussville	7268 Gadsden Highway	Trussville	AL	20183104

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10243	Murphy Express	918 Allison Bonnett Mem Drive	Hueytown	AL	20183910
8887	My Sweet Bakery	7070 Aaron Aronov Drive	Fairfield	AL	Pending
5382	N E Miles Jewish Day School	4000 Montclair Road	Birmingham	AL	EXEMPT
737	Nabeels Imported Foods Deli	1706 Oxmoor Rd	Homewood	AL	20180403
730	Najis Restaurant	166 West Valley Avenue	Birmingham	AL	20180529
8764	Neacy's Family Childcare Center	520 4Th Avenue North	Birmingham	AL	Pending
8520	Negro Southern League Museum	120 16Th Street South	Birmingham	AL	20153640
8992	Neighborhood Deli	3201 26Th Street North	Birmingham	AL	20183848
10083	Nelchie's Cajun Cuisine Catering	1621 Ashville Road	Leeds	AL	Pending
11408	Nelms Pharmacy	115 Watterson Pkwy	Trussville	AL	Pending
925	Nelson Bros. Cafe	312 17th St N	Birmingham	AL	20180829
4013	New China Buffet #3	7307 Crestwood Blvd	Birmingham	AL	20182037
272	New China Hoover	2142 Tyler Rd	Hoover	AL	20180040
7988	New China One, Inc	357 Walker Chapel Road	Fultondale	AL	20183377
8482	New China Pleasant Grove	27 Park Road	Pleasant Grove	AL	Pending
4014	New China Way	5220 Oporto Madrid Blvd	Birmingham	AL	20181482
593	New Chinatown	1020 20th Street S	Birmingham	AL	20180223
4015	New Hope Christian School	1740 Cleburn Ave SW	Birmingham	AL	20182739
3727	New Merkle Senior Center	4405 Dolly Ridge Rd	Birmingham	AL	EXEMPT
8146	New Pilgrim Pavilion	708 Goldwire Place S W	Birmingham	AL	EXEMPT
192	New York Pizza	1010 Oxmoor Rd	Homewood	AL	20182996
8402	Newks Eatery	3780 Riverchase Village	Hoover	AL	20183637
7849	Newks Express Cafe - Vestavia Hills	612 Montgomery Hwy #110	Vestavia Hills	AL	20183380
959	Newks Express Cafe- R. Arrington Blvd	611 Richard Arrington Blvd. S.	Birmingham	AL	20181034
1100	Niki's Finley Avenue, Inc.	233 Finley Avenue West	Birmingham	AL	20180471
1607	Nikis Seafood Restaurant	1101 2nd Ave N	Birmingham	AL	20180831
10237	Nikki Land Learning Center Church of Love DC	1212 Centerpoint Parkway	Birmingham	AL	Pending
8638	Ninja Japanese Sushi & Steak House	4847 Promenade Pkwy	Bessemer	AL	Pending
10057	Nita's Griddle House	1291 Centerpoint Parkway	Birmingham	AL	20183940
10112	Noah's Event Venue	2501 International Park Place	Birmingham	AL	Pending
8423	Nori Thai and Sushi	4704 Cahaba River Road	Birmingham	AL	20183588
1144	North Highland Elementary	2021 29th Avenue, North	Hueytown	AL	20180833
8139	North Hill Nursing & Rehab	200 N Pine Hill Road	Birmingham	AL	20183532
3593	Northside Pool Room CLOSED	2719 29th Ave N	Birmingham	AL	20070842
1614	Northway Health & Rehab LLC	1424 25th St N	Birmingham	AL	20181481
8537	Norwood Elementary School	3136 Norwood Blvd	Birmingham	AL	20183687
8829	Nothing Bundt Cakes	3780 Riverchase Village	Hoover	AL	20183778
10073	Nothing But Noodles	2800 Cahaba Village Plaza	Birmingham	AL	Pending
3598	O' Carrs Deli	2909 18th St S	Birmingham	AL	20163180
8675	O' Carrs Restaurant	214 18Th Street North	Birmingham	AL	20173829
1624	O' Charleys #305 Fulton Rd	1709 Fulton Rd	Fultondale	AL	20180844
3601	O' Charleys #506 Wildwood Pkwy	109 Wildwood Pky	Homewood	AL	20180845
7389	O'Henry's Coffees- Brookwood	569 Brookwood Village	Birmingham	AL	EXEMPT
8165	O'Henry's Coffees-Highland Ave	2915 Highland Avenue	Birmingham	AL	EXEMPT
912	O'Henrys Coffees- 18th Street So	2831 18th Street S	Homewood	AL	EXEMPT
883	Oak Hill Bar & Grill	2835 18th Street S	Birmingham	AL	20180353
5461	Oak Knoll Health & Rehabilitation	824 6th Ave West	Birmingham	AL	20181741
1619	Oak Trace Care & Rehab Center	325 Selma Rd	Bessemer	AL	20181818
8424	Oaks On Parkwood #2 The Orchard	2575 Laurel Oak Drive	Bessemer	AL	20183587
7259	Oaks On Parkwood/ The Lodge	2651 Laurel Oaks Drive	Bessemer	AL	20183023
10008	Oasis Child Care & Enrichment	2129 Centerpoint Pkwy	Birmingham	AL	Pending
3599	Ocean/26	1218 20th St S	Birmingham	AL	20180849
10072	Octane Coffee & Bar	2821 Central Avenue	Birmingham	AL	Pending
8103	Octane Coffee Bar	2221 Richard Arrington Blvd No	Birmingham	AL	EXEMPT
7855	Oh Yes Wings	1844 Bessemer Road	Birmingham	AL	20183313
7863	Okinawa Sushi & Hibachi Steakhouse	148 Wildwood Parkway	Homewood	AL	20183336
586	Olexas Cafe	2838 Culver Road	Mountain Brook	AL	20180392
11497	Olipita Mediterranean & American Grill	837 Park Road	Pleasant Grove	AL	Pending
7461	Oliver Elementary School	6871 6th Ct South	Birmingham	AL	20183316
10158	Olivia's Transit Cafe	1701 Morris Avenue North	Birmingham	AL	Pending
10196	Ollie Irene	75 Church Street	Birmingham	AL	Pending
8973	Omar Discount Market LLC	1531 12Th Court North	Birmingham	AL	Pending
7968	On Tap Sports Cafe- Fultondale	1600 Main Street	Fultondale	AL	20183387
8567	On Tap Sports Cafe- Galleria Circle	3340 Galleria Circle	Hoover	AL	20183694
516	On Tap Sports Cafe-Lakeview	737 29th St S	Birmingham	AL	20170714

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3607	On The House Breakfast (The Tutwiler Hotel)	2021 Park Pl N	Birmingham	AL	EXEMPT
10136	One Pratt Community Center	Dugan Avenue & Hibernian St	Birmingham	AL	Pending
11454	Ono Poke'	934 Oxmoor Road	Birmingham	AL	Pending
3609	Open Door Cafe (CLOSED)	1115 Dunston Ave	Birmingham	AL	20070850
669	Organic Harvest	1580 Montgomery Hwy	Hoover	AL	20183645
9998	Organically Yours, LLC	7627 1St Avenue North	Birmingham	AL	Pending
10075	Oromia Discount Market	5500 Avenue D	Birmingham	AL	Pending
7614	Oscar's At the Museum	2000 8th Avenue North	Birmingham	AL	20183254
1639	Ossie Ware Mitchell School	501 81st St S	Birmingham	AL	20162570
3611	Oteys	224 Country Club Park	Mountain Brook	AL	20181067
3613	Our Lady Of Sorrows School	1720 Oxmoor Rd	Homewood	AL	20181099
1640	Our Place	1218 Main St	Gardendale	AL	20181425
1641	Ousler Sandwiches	2814 Cahaba Rd	Mountain Brook	AL	EXEMPT
8636	Outback Steak House #1256 Galleria Cir	3440 Galleria Circle	Birmingham	AL	20183774
3616	Outback Steak House #1265 Fulton Rd	1725 Fulton Rd	Fultondale	AL	20181162
8318	Ovenbird Restaurant	2810 3Rd Avenue South	Birmingham	AL	20183667
7455	Overtime Bar	100 Frankfurt Circle	Birmingham	AL	20133156
7753	Oxmoor K-8 School	3600 Sydney Drive	Birmingham	AL	20183418
735	Oxmoor Mini Mart	39 West Oxmoor	Birmingham	AL	EXEMPT
8031	Oxmoor Valley Community Center	1992 Wenonah Oxmoor Road	Birmingham	AL	EXEMPT
3619	P F Changs	233 Summit Blvd	Birmingham	AL	20180853
3621	Pablo's Restaurant & Cantina- Colonnade Pkwy	3439 Colonnade Pky	Birmingham	AL	20180856
1647	Pablo's Restaurant & Cantina- John Hawkins Pkwy	2760 John Hawkins Pkwy	Hoover	AL	20161341
1648	Pacific Seafood	6021 1st Ave N	Birmingham	AL	20170857
1080	Paine Primary/Intermediate School	7500 Gadsden Highway	Trussville	AL	20181226
292	Palace Chinese	5899 Trussville Crossing Pky	Birmingham	AL	20180354
8095	Paletas Lichita LLC	277 West Valley Avenue	Birmingham	AL	EXEMPT
11387	Panaderia Uruapan	406 West Valley Avenue	Homewood	AL	Pending
10250	Pancho's Mexican Grill	1676 Montclair Road	Birmingham	AL	20183957
1652	Panda Chinese Food	6662 Highway 75	Pinson	NULL	20180859
11479	Panda Express	1465 Gadsden Highway	Trussville	AL	Pending
8540	Panda Express Restaurant	3780 Lorna Road	Hoover	AL	20183735
10262	Pandy's Sno Biz	8670 Hwy 31 North	Birmingham	AL	Pending
1653	Panera Bread #790 Summit Blvd	137 Summit Blvd	Birmingham	AL	EXEMPT
3623	Panera Bread #804 Main St Hoover	161 Main St	Hoover	AL	EXEMPT
1654	Panera Bread #809 Montgomery Hwy	700 Montgomery Hwy	Vestavia	AL	EXEMPT
10016	Panera Bread Hoover	1800 Riverchase Road	Hoover	AL	20183908
1047	Papa John's #1268 Forest Rd	266 Forest Road	Hueytown	AL	EXEMPT
1049	Papa John's #1498 11th Ave So	1429 11th Avenue, S.	Birmingham	AL	EXEMPT
1048	Papa John's #1647 Chalkville Rd	1118 N. Chalkville Road	Trussville	AL	EXEMPT
1057	Papa John's #1937 Montgomery Hwy	1615 Montgomery Hwy	Hoover	AL	EXEMPT
1041	Papa John's #291 Centerpoint Pkwy	2505 Center Point Pkwy	Birmingham	AL	EXEMPT
1095	Papa John's #3419 Palamino Lane	2476 Palamino Lane	Adamsville	AL	EXEMPT
1043	Papa John's #368 Montgomery Hwy	736 Montgomery Highway	Vestavia	AL	EXEMPT
1042	Papa John's #542 Parkway East	9109 Parkway East	Birmingham	AL	EXEMPT
1044	Papa John's #591 Montevallo Rd	4500 Montevallo Road	Birmingham	AL	EXEMPT
1045	Papa John's #787 Aaron Aronov Dr	6501 Aaron Aronov Dr.	Fairfield	AL	EXEMPT
1046	Papa John's #976 Decatur Hwy	426 Decatur Highway	Gardendale	AL	EXEMPT
8511	Papa John's - Lake Dr S E	1201 Lake Drive S E	Bessemer	AL	20183673
8532	Papa Murphy's Take N Bake Pizza Medford Dr	5250 Medford Drive	Hoover	AL	Pending
8711	Papa Murphys Pizza	655 Fieldstown Road	Gardendale	AL	EXEMPT
8645	Papa Murphys Pizza	1725 Decatur Hwy	Fultondale	AL	EXEMPT
8417	Papa Murphys Take N Bake Pizza Hueytown	3014 Allison Bonnet Mem. Drive	Hueytown	AL	Pending
7577	Papa Murphys Take N Bake Pizza Montgomery Hwy	1580 Montgomery Highway	Vestavia	AL	EXEMPT
8011	Papa Sal's	6726 Old Springville Road	Pinson	AL	Pending
538	Pappas Delicious Foods	1066 Montgomery Hwy	Birmingham	AL	EXEMPT
8568	Paradise Biryani Pointe	1841 Montgomery Hwy	Birmingham	AL	Pending
10273	Paradise Chow By Martys	1813 10Th Court South	Birmingham	AL	Pending
8158	Paramount Bar	200 North 20Th Street	Birmingham	AL	20183494
8574	Park Crest Event Facility	2034 Little Valley Road	Hoover	AL	20183751
4184	Parker High School	400 Abraham Woods Jr. Blvd	Birmingham	AL	20182571
8177	Parker High School Concession	400 Abraham Woods Jr Blvd	Birmingham	AL	EXEMPT
7448	Parkside Cafe	4036 5th Avenue South	Birmingham	AL	EXEMPT
8689	Parkside Hilton Garden Inn & Home 2 Suites	250 18Th Street South	Birmingham	AL	20183864
11417	Parkway East Retail Center	9324 Parkway East	Birmingham	AL	Pending

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1663	Pasquales	215 Fieldstown Rd	Gardendale	AL	20181343
8824	Pastry Art Bake Shoppe	1917 29Th Avenue South	Birmingham	AL	20183771
1/10/1924	Patchwork Retail Venture, LLC Shop C	3060 Healthy Way	Vestavia Hills	AL	20183801
8777	Patchwork Retail Venture, LLC Shop D	3066 Healthy Way	Vestavia Hills	AL	20183802
8778	Patchwork Retail Venture, LLC Shop E	3036 Healthy Way	Vestavia Hills	AL	20183828
10296	Patriot Park Pool	816 Oak Grove Road	Homewood	AL	Pending
8761	Patty Cake Academy	2148 Carson Road	Birmingham	AL	EXEMPT
219	Pauls Hot Dogs & Grill	5950 Chalkville Road	Birmingham	AL	20180542
802	Paw Paw Patch	410 Green Springs Hwy	Birmingham	AL	20180344
8590	Pazzo Big Slice Pizza	1678 Montgomery Hwy	Hoover	AL	20183658
4540	Peace Baptist Church - Riley	3600 Jefferson Avenue Sw	Birmingham	AL	EXEMPT
8901	Peace Missionary Baptist Church	1300 10Th Street	Birmingham	AL	Pending
8781	Peachtree Senior Living	3743 Eagle Drive	Trussville	AL	20183896
3637	Peking Wok	3421 South Shades Crest road	Hoover	AL	20181254
8550	Perfect Note	1845 Montgomery Hwy S	Hoover	AL	20163757
1676	Peyton Place	718 Graymont Ave N	Birmingham	AL	20181202
3641	Peyton Place Phase II (CLOSED)	234 8th Ave W	Birmingham	AL	NONE
128	Phillips Academy School	2316 7th Avenue N	Birmingham	AL	20180546
8484	Pho Pho Japanese & Sushi Bar	1025 20Th Street South	Birmingham	AL	Pending
8539	Pieology Pizzeria	325 Summit Blvd	Birmingham	AL	20183666
8701	Pies & Pints	125 20Th Street South	Birmingham	AL	20183844
262	Piggly Wiggly #211 Montgomery Hwy	3000 Montgomery Highway	Birmingham	AL	20180252
10215	Piggly Wiggly #269 River Run Dr	3800 River Run Drive	Birmingham	AL	Pending
8647	Piggly Wiggly #270 Church Street	41 Church Street	Mountain Brook	AL	20183702
3872	Piggly Wiggly Deli #260 Clairmont Ave	3314 Clairmont Ave	Birmingham	AL	20181096
1910	Piggly Wiggly Deli Caldwell Dr	415 Caldwell Dr	Warrior	AL	20180869
1913	Piggly Wiggly- Deli/Bakery #295 Deerfoot Pkwy	6730 Deerfoot Pky	Pinson	AL	20180870
8099	Pilot Travel Center #602	224 Daniel Payne Drive	Birmingham	AL	20183472
1145	Pinson Valley High School	6895 North 75 Highway	Pinson	AL	20180872
1918	Pinson Valley Elementary School	4200 School Dr	Pinson	AL	20180873
90	Pinson Valley High School -Concess	4200 School Drive	Pinson	AL	EXEMPT
4125	Pinson Valley Hs Football	6895 Highway 75	Pinson	AL	NONE
8993	Piper and Leaf Tea Co.	5363 1St Avenue North	Birmingham	AL	Pending
4240	Pita Cafe/BNTI, Inc.	2801 John Hawkins Pkwy	Birmingham	AL	20180883
470	Pita Loco, L.L.C.	2000 Second Ave. N	Birmingham	AL	20180551
648	Pita Stop Cafe	1106 12th Street S	Birmingham	AL	20181429
7572	Pita Stop Express	3908 Crosshaven Drive	Vestavia Hills	AL	20183238
8448	Pizitz Food Hall	1821 2Nd Avenue North	Birmingham	AL	20183956
11431	Pizza Hut #1036 Bessemer Rd	2145 Bessemer Road	Bessemer	AL	20183941
11471	Pizza Hut #1050 Greensprings Hwy	437 Greensprings Hwy	Birmingham	AL	Pending
11432	Pizza Hut #1060 Montevallo Rd	4500 Montevallo Road	Irondale	AL	20183942
11434	Pizza Hut #1080 8th St Bessemer	829 8Th Street North	Bessemer	AL	20183927
11435	Pizza Hut #1090 Forestdale Blvd	1315 Forestdale Blvd	Birmingham	AL	20183928
11436	Pizza Hut #1101 Lorna Road	3748 Lorna Road	Birmingham	AL	20183929
11437	Pizza Hut #1103 Allison Bonnet Mem Dr	3029 Allison Bonnett Mem Drive	Hueytown	AL	20183930
11438	Pizza Hut #1104 Fieldstown Rd	596 Fieldstown Road	Gardendale	AL	20183931
11439	Pizza Hut #1107 Greenmor Drive	1263 Greenmor Drive	Bessemer	AL	20183932
11517	Pizza Hut #1768	1110 N Chalkville Road	Trussville	AL	Pending
11441	Pizza Hut #1822 Cane Creek Road	294 Cane Creek Road	Warrior	AL	20183934
11442	Pizza Hut #4202 Centerpoint Pkwy	2346 Centerpoint Pkwy	Birmingham	AL	20183935
11443	Pizza Hut #4203 Parkway East	9170 Parkway East	Birmingham	AL	20183936
11444	Pizza Hut #4208 Green Valley Rd	3173 Green Valley Road	Birmingham	AL	20183937
11445	Pizza Hut #4213 5th Avenue South	2016 5Th Avenue South	Birmingham	AL	20183938
11446	Pizza Hut #4214 John Hawkins Pkwy	2312 John Hawkins Pkwy	Hoover	AL	20183939
11433	Pizza Hutt #1051 Dennison Ave SW	873 Dennison Avenue S W	Birmingham	AL	20183926
10089	Pizzeria GM	600 Oak Grove Road	Birmingham	AL	Pending
10105	Planet Nutrition, Inc.	7274 Gadsden Hwy	Trussville	AL	Pending
8639	Planet Smoothie	1701 1 st Avenue South	Birmingham	AL	EXEMPT
4126	Planet Smoothie Galleria	2000 Riverchase Galleria	Hoover	AL	EXEMPT
4037	Planet Smoothie Hwy 280	2737 Hwy 280	Mountain Brook	AL	20070900
1701	Platinum Of Birmingham Bar	821 2nd Ave N	Birmingham	AL	20070901
1146	Pleasant Grove Elementary School	601 Park Road	Pleasant Grove	AL	20180902
7958	Pleasant View Baptist Church	9000 17Th Avenue North	Birmingham	AL	EXEMPT
7829	Pollo Lucas	3305 Lorna Road	Hoover	AL	20173743
4045	Pop Donuts	1819 Centerpoint Pky	Center Point	AL	20183474

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4046	Popeyes Chicken & Biscuit #13 Airport Hwy	4020 Airport Hwy	Birmingham	AL	20180905
1927	Popeyes Chicken & Biscuit #14 9th Ave Bessemer	932 9th Ave	Bessemer	AL	20180906
1928	Popeyes Chicken & Biscuit #15 11th Ct W	725 11th Ct W	Birmingham	AL	20180907
4047	Popeyes Chicken & Biscuit #16 Bessemer Rd	2233 Bessemer Rd	Birmingham	AL	20180908
1237	Popeyes Chicken & Biscuit #52 Finley Blvd	1717 Finley Blvd North	Birmingham	AL	20180910
4048	Popeyes Chicken & Biscuit #53 Palisades Blvd	361 Palisades Blvd	Birmingham	AL	20180909
11505	Popeyes Chicken Centerpoint- NEW	1845 Centerpoint Pkwy	Birmingham	AL	Pending
7807	Popeyes Louisiana Kitchen Centerpoint Pkwy	1845 Centerpoint Pkwy	Birmingham	AL	20173309
8843	Pops Neighborhood Grill	1207 20Th Street South	Birmingham	AL	20183835
10234	Porky's Pride Smokehouse	2755 Stonefield Drive	Fultondale	AL	Pending
8188	Post Office Pies	215 41St Street South	Birmingham	AL	20183534
8521	Pranzo Commissary	3232 11Th Avenue North	Birmingham	AL	20183807
8536	Pranzo- Concord Center	2100 3Rd Avenue North	Birmingham	AL	EXEMPT
8440	Preschool Partners	4447 Montevallo Road	Birmingham	AL	EXEMPT
8980	Prime Time Shaved Ice	148 Brooklane Drive	Hueytown	AL	Pending
4051	Prince Of Peace School: Christian Catering Co.	4650 Preserve Parkway	Hoover	AL	20181216
4052	Princeton Elementary School	1425 2nd Ave W	Birmingham	AL	20182574
10110	Providence Christian Ministries	3619 2Nd Place West	Birmingham	AL	Pending
4900	Publix #1059 Montclair Rd	1325 Montclair Road	Birmingham	AL	20180032
255	Publix #1065 Hueytown	3014 Allison Bonnett Mem Dr	Hueytown	AL	20180035
256	Publix #1069 Old Springville Rd	5150 Old Springville Road	Pinson	AL	20180031
257	Publix #1082 Gadsden Hwy	7272 Gadsden Hwy	Trussville	AL	20180033
258	Publix #1085 Overton Rd	3141 Overton Rd	Mtn.Brook	AL	20180036
4560	Publix #1200 Colonial Promenade	4965 Colonial Promenade	Bessemer	AL	20181485
8332	Publix #1206 Fieldstown Rd	655 Fieldstown Road	Gardendale	AL	20183595
4820	Publix #1207 Montgomery Hwy	1584 Montgomery Highway	Hoover	AL	20182237
8708	Publix #1512 20th Street So	230 20Th Street South	Birmingham	AL	20183810
8774	Publix #1545 Healthy Way	3040 Healthy Way	Vestavia Hills	AL	20183762
466	Publix #165 Greensprings Hwy	411 Green Springs Hwy	Homewood	AL	20180038
467	Publix #839 John Hawkins Pkwy	2343 John Hawkins Pkwy	Hoover	AL	20180034
251	Publix #842 Montgomery Hwy	784 Montgomery Hwy	Vestavia	AL	20180037
8806	Publix McCalla HV Warehouse	7200 Jefferson Metro. Parkway	McCalla	AL	20183854
1935	Purple Onion Greensprings Hwy	479 Greensprings Hwy	Homewood	AL	20180911
8939	Purple Onion Hueytown	3044 Allison Bonnet Mem Drive	Hueytown	AL	Pending
1936	Purple Onion Montgomery Hwy	1551 Montgomery Hwy	Hoover	AL	20171383
4054	Putnam Middle School	1757 Montclair Rd	Birmingham	AL	20182575
8390	Quality Inn Academy Lane	5021 Academy Lane	Bessemer	AL	EXEMPT
8298	Quality Inn Norrell Dr	4730 Norrell Drive	Trussville	AL	EXEMPT
947	Quality Inn/Suites Kilgore Mem Dr	3910 Kilgore Memorial Drive	Birmingham	AL	EXEMPT
1753	Que Huong Vietnamese Resturant	430 Greensprings Hwy	Homewood	AL	20180918
8263	Quick Shop #20	1500 Lakeshore Pkwy	Birmingham	AL	EXEMPT
7612	Raceway #6816 19th St No	1823 19th Street North	Bessemer	AL	20183217
7931	Raceway #6823 Hueytown	802 Allison Bonnet Mem Dr	Heuytown	AL	Pending
7579	Raceway 6870	2460 Pinson Valley Parkway	Birmingham	AL	20183764
8245	Rafiki's Grill	367 Valley Avenue	Birmingham	AL	Pending
2093	Raggedy Anns Country Cafe	1030 4th Ave N	Bessemer	AL	20180925
790	Railroad Cafe	1205 Lake Dr	Bessemer	AL	20081144
7564	Railroad Park	1600 1st Avenue South	Birmingham	AL	EXEMPT
10280	Rails and Ales	1210 6Th Street	Leeds	AL	Pending
11512	Rally's #4176 NEW OWNER	2400 Centerpoint Pkwy	Birmingham	AL	Pending
849	Rallys #4174 1st Ave No	4030 1st Ave N	Birmingham	AL	20170276
838	Rallys #4175 31st St SW	1420 31st St SW	Birmingham	AL	20170286
848	Rallys #4176 Centerpoint Pkwy	2400 Centerpoint Pkwy	Center Point	AL	20170283
843	Rallys #4183 Lomb Ave SW	636 Lomb Ave Sw	Birmingham	AL	20170278
841	Rallys #4185 12th Ave No	2520 12th Ave N	Birmingham	AL	20170284
840	Rallys #4186 9th Ave No	1601 9th Ave N	Bessemer	AL	20170285
852	Rallys #4187 1st Ave No	7736 1st Ave N	Birmingham	AL	20170291
837	Rallys #4188 Wiebel Dr	86 Wiebel Dr	Midfield	AL	20170287
1770	Ramsey High School	1800 13th Ave S	Birmingham	AL	20182576
8472	Ranch House & Makarious Kabob & Grill, LLC	2931 Columbiana Road	Birmingham	AL	20183607
498	Ranellis Deli #2	1225 20th St S	Birmingham	AL	EXEMPT
7668	Rave Motion Pictures Patton Creek #15	4450 Creekside Ave	Hoover	AL	EXEMPT
7669	Rave Motion Pictures- Vestavia	1911 Kentucky Ave	Vestavia	AL	EXEMPT
8605	Real & Rosemary	1922 29Th Avenue South	Homewood	AL	20183700
2096	Red Lantern	311 Main St	Trussville	AL	20181470

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8360	Red Lobster #0046 Montgomery Hwy	1030 Montgomery Highway	Vestavia Hills	AL	20183572
8361	Red Lobster #6376 Roosevelt Boulevard	3525 Roosevelt Boulevard	Birmingham	AL	20183573
910	Red Mountain Coffee Roasters	14 West Oxmoor Road	Birmingham	AL	EXEMPT
8059	Red Mountain Expresso	2601 18Th Street	Birmingham	AL	Pending
791	Red Pearl Restaurant	243 West Valley Ave	Homewood	AL	20180269
127	Red Robin Gourmet Burgers	5029 Pinnacle Square	Trussville	AL	20180420
8882	Red Roof Inn- Montg. Hwy	1466 Montgomery Hwy	Birmingham	AL	Pending
8897	Red Roof Plus Irondale	1813 Crestwood Blvd	Birmingham	AL	Pending
10172	Red Sea Ethiopian Mediterranean Restaurant	22 Greensprings Hwy	Birmingham	AL	20183889
554	Regency Retirement Village	285 West Oxmoor	Birmingham	AL	20180115
756	Regions Eurest Dining	201 Milan Parkway	Birmingham	AL	20170288
174	Regions Executive Dining Room	1900 5th Avenue N	Birmingham	AL	20180244
8086	Regions Field	1400 1St Avenue South	Birmingham	AL	20183453
1034	Regions Harbert Plaza	1901 6th Ave. No.	Birmingham	AL	20183114
8732	Repiccis Italian Ice	100 Ben Chapman Drive	Hoover	AL	Pending
1183	Residence Inn	2725 John Hawkins Parkway	Hoover	AL	20181720
7274	Residence Inn B'ham Downtown @ UAB	821 20th Street South	Birmingham	AL	20183071
7300	Residence Inn By Marriott	50 State Farm Parkway	Homewood	AL	EXEMPT
11475	Retail Tenant Building	158 Main Street	Trussville	AL	Pending
8738	Revelator Coffee	291 Rele Street	Mountain Brook	AL	Pending
8316	Revelator Coffee Company	1826 3 rd Avenue	Birmingham	AL	20153597
11341	Revelator Roastery	730 1St Avenue North	Birmingham	AL	Pending
8209	Reyes Pizza Ice Cream & More	5415 Beacon Drive	Birmingham	AL	EXEMPT
1781	Rib-It-Up	830 1st Ave N	Birmingham	AL	20070927
549	Rickey Js Bakery	6408 Old Springville Rd	Clay	AL	EXEMPT
7216	Rittenhouse Senior Living of Hoover	570 Southland Drive	Birmingham	AL	20182978
8081	River Fish Market	1928 Vanderbilt Road	Birmingham	AL	20173444
8786	River Highlands	1851 Data Drive	Hoover	AL	20183805
717	Roadside Bar-B-Que	7303 1st Ave. N	Birmingham	AL	20170222
7858	Robbie's Miracle Christian Academy	970 Forestdale Blvd	Birmingham	AL	EXEMPT
754	Robert Waldrop Stadium	266 Snow Drive	Homewood	AL	20180399
860	Roberts Cuisine/Audreys	10-A 6th Avenue S	Birmingham	AL	20141457
2121	Robinson Elementary School	8400 1st Ave S	Birmingham	AL	20182578
2122	Robinson School	305 61st St	Fairfield	AL	20182900
10267	Robinwood Chevron	2525 Pinson Valley Pkwy	Birmingham	AL	Pending
8201	Rock & Roll Sushi	5078 Pinnacle Square	Birmingham	AL	Pending
8587	Rock & Roll Sushi	4441 Creekside	Hoover	AL	Pending
11335	Rocky Ridge Chevron	2544 Rocky Ridge Road	Birmingham	AL	Pending
1944	Rocky Ridge Concession A	2649 Old Rocky Ridge Rd	Hoover	AL	20173617
2124	Rocky Ridge Concession B	2649 Old Rocky Ridge Rd	Hoover	AL	20173618
2125	Rocky Ridge Ele School	2876 Old Rocky Ridge Rd	Birmingham	AL	20181001
1946	Rocky Ridge Retirement Residence	3517 Lorna Rd	Birmingham	AL	20170929
656	Roebuck Elks Lodge #2123	804 Gadsden Hwy	Birmingham	AL	20180930
8449	Rogue Tavern	2312 2Nd Avenue North	Birmingham	AL	Pending
111	Rojo	2921 Highland Avenue	Birmingham	AL	20180338
10311	Roll It Up	5621 Grove Blvd	Birmingham	AL	Pending
1950	Roller Motion Skate Center Inc	2474 Morgan Rd	Bessemer	AL	EXEMPT
276	Roly Poly - Downtown	313 20th St N	Birmingham	AL	EXEMPT
449	Roly Poly Main St	180 Main St	Hoover	AL	EXEMPT
11355	Roly Poly- Homewood	2910 18Th Street South	Homewood	AL	EXEMPT
2132	Romanos Macaroni Grill	241 Summit Blvd	Birmingham	AL	20180933
8444	Romans Nightclub Bar & Grill	700 Valley Avenue	Birmingham	AL	Pending
10147	Root To Tail	2031 Cahaba Road	Mountain Brook	AL	Pending
8868	Rosewood Hall- NEW	2850 19Th Street South	Birmingham	AL	Pending
414	Ross Bridge Resort	4000 Grand Avenue	Hoover	AL	20180162
10274	Rougaroux	817 39Th Street South	Birmingham	AL	Pending
8328	Rowe's Service Station	4100 4Th Avenue South	Birmingham	AL	20163631
8965	RRIC Dippin Dots	4700 Sicard Hollow Road	Vestavia Hills	AL	Pending
695	Ruby Tuesday #2615 Galleria	2000 Riverchase Galleria	Hoover	AL	20180378
693	Ruby Tuesday #3651 Chalkville Mtn Rd	5957 Chalkville Mtn Rd	Trussville	AL	20180376
692	Ruby Tuesday #4912 Academy Dr	808 Academy Dr	Bessemer	AL	20180381
7775	Rubys Cafe	7763 2nd Avenue South	Birmingham	AL	Pending
1148	Rudd Middle School	4526 Rudd School Drive	Pinson	AL	20180935
2138	Ruffner Ball Park / Irondale Concession Stand	301 Ruffner Rd	Irondale	AL	EXEMPT
7040	Rusty's Barbeque	7484 Parkway Drive	Leeds	AL	20182997

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8124	Ruths Cafe	4012 24th Street North	Birmingham	AL	20183547
2139	Ruths Chris Steakhouse	2300 Woodcrest Pl	Birmingham	AL	20181175
988	Rutledge Middle School	1221 8th Street	Midfield	AL	20180388
10306	RX Lounge	1023 20Th Street South	Birmingham	AL	Pending
2251	Sabor Latino	112 Greensprings Hwy	Homewood	AL	20180936
464	Safari Cafe	2630 Cahaba Road	Birmingham	AL	20180030
8604	Saigon Noodle House	3719 3rd Avenue South	Birmingham	AL	20163703
8366	Saint Mark United Methodist Church	2901 Columbiana Road	Birmingham	AL	EXEMPT
8855	Sakura Japanese Sushi Steak House	156 River Square Plaza	Hueytown	AL	20173899
2316	Salem's Diner	2913 18th St S	Birmingham	NULL	20182999
11450	Saltgrass Steak House	2943 John Hawkins Parkway	Hoover	AL	Pending
10187	Salvation Army	2015 26Th Avenue North	Birmingham	AL	20183959
277	Salvation Army 11th Ave No	2130 11th Ave. N	Birmingham	AL	20170160
7210	Salvation Army Shuttlesworth Dr	1401 Shuttlesworth Drive	Birmingham	AL	20183002
759	Salvatores Pizza & Pasta Montgomery Hwy	1594 Montgomery Hwy	Hoover	AL	20161059
11508	Samford Dining	800 Lakeshore Drive	Birmingham	AL	Pending
8349	Samford University Baseball Concession	800 Lakeshore Drive	Birmingham	AL	20183569
8352	Samford University Beeson Ctr- Sodexo	800 Lakeshore Drive	Birmingham	AL	20183566
7368	Samford University Field House	869 Montague Drive	Birmingham	AL	EXEMPT
8350	Samford University Football Concession	800 Lakeshore Drive	Birmingham	AL	20183568
8477	Samford University Sodexo Einstein's	800 Lakeshore Drive	Birmingham	AL	20183629
8351	Samford University The Rotunda- Sodexo	800 Lakeshore Drive	Birmingham	AL	20183567
500	Sammys Sandwich Shop	4921 Airport Hwy	Birmingham	AL	20182017
2323	Sams Cafe "CLOSED"	1431 Old Finley Ave	Birmingham	AL	20070939
396	Sams Club #4724 Hwy 150	3053 Hwy 150	Hoover	AL	20180205
395	Sams Club #4817 Trussville Crossings Pkwy	5940 Trussville Crossing Pkwy	Birmingham	AL	20180206
406	Sams Club #8212 Kilgore Memorial Pkwy	3900 Kilgore Memorial Pkwy	Irondale	AL	20180207
405	Sams Club #8247 Lakeshore Pkwy	201 Lakeshore Pkwy	Homewood	AL	20180208
1733	Sams Deli & Grill	932 Oxmoor Rd	Homewood	AL	20070940
698	Sams Super Sandwiches	2812 18th St S	Birmingham	AL	EXEMPT
8593	Samurai Japan	700 Montgomery Hwy	Vestavia	AL	20183671
1736	San Antonio Grill	4760 Eastern Valley Rd	Mccalla	AL	20181501
8894	Sandella's / Jamba Juice	710 13Th Street South	Birmingham	AL	Pending
1738	Sanpeggios Pizza Gadsden Hwy	7270 Gadsden Hwy	Trussville	AL	EXEMPT
2334	Sanpeggios Pizza So Shades Crest Rd	3435 South Shades Crest Road	Hoover	AL	20181258
599	Sarris Restaurant	600 31st St N	Birmingham	AL	20180191
11339	Satellite	200 41St Street	Birmingham	AL	Pending
249	Satterfields Restaurant	3161 Cahaba Heights Rd	Vestavia	AL	20180159
11340	Saturn	200 41St Street South	Birmingham	AL	Pending
260	Savages Bakery	2916 18th St S	Birmingham	AL	EXEMPT
8408	Save A Lot Food Stores	873 Dennison Avenue	Birmingham	AL	EXEMPT
10129	Save More & Grill	700 Brooklane Drive	Hueytown	AL	Pending
8676	Savoie Catering LLC	3625 8Th Avenue South	Birmingham	AL	20183731
7513	Saw's BBQ Inc	1008 Oxmoor Road	Birmingham	AL	20183159
7793	Saw's Juke Joint	1115 Dunston Avenue	Birmingham	AL	20183373
7977	Saw's Soul Kitchen	215 41St Street South	Birmingham	AL	20183833
10170	Saw's WAS Commissary Restaurant	1154 11Th Avenue South	Birmingham	AL	20183955
1007	Scott's Koney's	2021 3rd Avenue South	Birmingham	AL	20181013
10177	Scotts Boston Fish & Wings	5005 Jefferson Avenue	Birmingham	AL	Pending
7324	Seafood & Chicken Box	5954 Chalkville Mountain Road	Trussville	AL	20183128
8002	Seasons 52 #4525	245 Summit Blvd	Birmingham	AL	20183445
2338	Seattle Drip Coffee Company "CLOSED"	2601 18th Street	Birmingham	AL	NONE
11321	Seeds Coffee	2808 7Th Ave South	Birmingham	AL	Pending
385	Sela's Solutions & Sales	1941 Hoover Ct	Hoover	AL	20170174
2340	Self Health Care & Rehab Center	131 East Crest Road	Hueytown	AL	20181284
2341	Seoul	430 Greensprings Hwy	Homewood	AL	20161371
8898	Serendipity	1500 1St Avenue North	Birmingham	AL	20183952
755	Shades Cahaba Elementary School	3001 Independence Drive	Homewood	AL	20180397
2342	Shades Mountain Elem. School	2250 Sumpter St	Hoover	AL	20180997
2343	Shades Mtn Ball Park (lower)	1211 AL Seier Rd	Hoover	AL	20163219
2156	Shades Mtn Ball Park (main)	1211 AL Seier Rd	Hoover	AL	20163218
2344	Shades Mtn Independent Church/School	2281 Old Tyler Rd	Hoover	AL	20183004
3921	Shades Valley Fball Soccer Con	6100 Old Leeds Rd	Irondale	AL	EXEMPT
2158	Shades Valley High Baseball	6100 Old Leeds Rd	Irondale	AL	EXEMPT
1149	Shades Valley High School	6100 Old Leeds Road	Irondale	AL	20180944

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
11422	Shake Shack	200 Summit Blvd	Birmingham	AL	Pending
263	Shangri-La Restaurant	4500 Montevallo Road	Birmingham	AL	20180190
8997	Sharecropper, LLC	75 Church Street	Mountainbrook	AL	20183879
7239	Sharks Fish & Chicken 1st Ave No	7700 1st Ave N	Birmingham	AL	20173064
8834	Sharks Fish & Chicken 3rd Ave West	812 3 rd Avenue West	Birmingham	AL	Pending
8087	Sharks Fish & Chicken 9th Ave No	1400 9Th Avenue North	Bessemer	AL	20153497
11487	Shell Food Mart	1831 18Th Avenue North	Bessemer	AL	Pending
8187	Shepherd of the Valley Presbyterian Church	5081 Eastern Valley Road	McCalla	AL	EXEMPT
8984	Shepherd's Fold, Inc	507 Whitmore Drive	Birmingham	AL	20183843
2357	Sheraton Bham Hotel/Casey's Sports/Ballroom	2101 Richard Arrington Jr Blvd	Birmingham	AL	20180948
7824	Sherry's	5800 Valley Road	Birmingham	AL	20183331
10111	Sheza Food Mart	1101 4Th Avenue North	Birmingham	AL	Pending
7549	Shipley Donuts	2050 Greenvale Road	Hoover	AL	20183155
10279	Shoney's	1234 Boots Blvd	Fultondale	AL	Pending
11416	Shoney's Food Truck	3339 Lowery Pkwy	Birmingham	AL	Pending
446	Shonos Restaurant	1843 Montgomery Hwy	Hoover	AL	20181148
1035	Shooters	821 Allison Bon. Mem. Dr.	Hueytown	AL	20181150
10205	Shooters Grille	1561 Montgomery Highway	Hoover	AL	Pending
8513	Shrimp Basket Irondale	7756 Crestwood Blvd	Birmingham	AL	20183652
8799	Shrimp Basket of Gardendale	550 Fieldstown Road	Gardendale	AL	20183767
8577	Shrimp Basket of Homewood Inc	801 Greensprings Hwy	Birmingham	AL	20183717
8850	Shu Shop	1820 3Rd Avenue North	Birmingham	AL	Pending
8831	Shug's Place	5031 Ford Parkway	Bessemer	AL	Pending
8611	Side Bar	2929 7Th Avenue South	Birmingham	AL	Pending
805	Silver Coin India Grill	3321 Lorna Road	Hoover	AL	20180383
2372	Silvertron Cafe	3813 Clairmont Ave	Birmingham	AL	20181195
2384	Simmons Middle School	1575 Patton Chapel Rd	Hoover	AL	20181000
7580	Sitar Indian Restaurant	729 20th Street South	Birmingham	AL	20123348
2375	Skate Station Of Trussville	411 Watterson Ln	Trussville	AL	EXEMPT
8793	Sky Zone Trampoline Park	1694 Montgomery Hwy	Hoover	AL	Pending
10186	Sleek	1005 20Th Street South	Birmingham	AL	Pending
6320	Sleep Inn	1259 Greenmor Drive	Bessemer	AL	EXEMPT
10145	Slice Pizza & Brew	3104 Timberlake Drive	Vestavia	AL	Pending
7694	Slice Pizzeria	725 29th Street South	Birmingahm	AL	20113302
2388	Smith Middle School	1124 Five Mile Rd	Birmingham	AL	20182579
765	Smokehouse Restaurant	348 Finley Ave	Birmingham	AL	20180297
11393	Smokey's	5060 Academy Lane	Birmingham	AL	Pending
11378	Smokin Hot Sports Grill	6530 Pocahontas Road	Birmingham	AL	Pending
10025	Smoothie King	3056 Healthy Way	Vestavia	AL	EXEMPT
11520	Smoothie King	420 Greensprings Highway	Birmingham	AL	Pending
932	Smoothie King (Nola Nutrition, Inc.)	1926 28th Avenue S	Birmingham	AL	EXEMPT
723	Snapper Grabbers Seafood Mkt	521 Montgomery Hwy	Vestavia	AL	20183845
969	Sneaky Pete's 6th Ave So	3505 6th Avenue South	Birmingham	AL	20170754
1008	Sneaky Pete's Fairfield	7070 Aaron Aronov Drive	Fairfield	AL	20180554
10263	Sneaky Pete's Ford Pkwy	5036 Ford Pkwy	Birmingham	AL	Pending
2483	Sneaky Petes #3 Hoover	1550 Montgomery Hwy	Hoover	AL	20181370
2481	Sneaky Petes Forestdale Blvd	1570 Forestdale Blvd	Birmingham	AL	20181480
8808	Sneaky Petes Gadsden Hwy	7200 Gadsden Hwy	Trussville	AL	20183867
8042	Sneaky Petes Gardendale	439 Fieldstown Road	Gardendale	AL	20183435
476	Sneaky Petes Hot Dogs Culver Rd	2716 Culver Road	Mountain Brook	AL	20180185
477	Sneaky Petes Hot Dogs Greensprings	70 Greensprings Hwy	Homewood	AL	20180186
475	Sneaky Petes Hot Dogs Oxmoor Cir	240 Oxmoor Circle	Homewood	AL	20180187
8660	Sneaky Petes of Bessemer	1730 4Th Ave	Bessemer	AL	20183740
664	Sneaky Petes Park Place	1905 Park Place	Birmingham	AL	20180952
440	Social Security Admin. Ctr	1200 8th Ave. N	Birmingham	AL	20181977
10259	SoHo Square (North Building)	1831 28Th Ave S	B'ham, AL	AL	Pending
10041	Soiree Event Gallery	2132 Lorna Ridge Lane	Hoover	AL	Pending
830	Sol Azteca	1360 Montgomery Hwy	Vestavia	AL	20180915
998	Sol's Sandwich Shop and Deli	2 20th Street N	Birmingham	AL	20102257
2491	Sols Hot Dogs	3002 12th Ave N	Birmingham	AL	20140961
8406	Something Sweet	4913 5Th Avenue South	Birmingham	AL	Pending
501	Sonic Drive In Montclair Rd	1353 Montclair Road	Birmingham	AL	20180126
10144	Sonic Drive In of Adamsville	143 Foust Court	Birmingham	AL	20183874
10143	Sonic Drive In of Bessemer	732 Academy Drive	Bessemer	AL	20183872
10142	Sonic Drive In of Fairfield	6625 Aaron Aronov Drive	Fairfield	AL	20183875

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10141	Sonic Drive In of Hueytown	3040 Allison Bonett Mem Drive	Hueytown	AL	20183876
511	Sonic Drive In Parkway Dr Leeds	7701 Parkway Dr	Leeds	AL	20180125
510	Sonic Drive In Valley Ave	313 Valley Ave	Birmingham	AL	20180124
502	Sonic Drive-In Main St Trussville	308 Main St	Trussville	AL	20180127
509	Sonic Drive-In Parkway East	9829 Parkway E	Birmingham	AL	20180123
10164	Sorayahs Kitchen	541 Graymont Avenue W	Birmingham	AL	20173880
2493	South Hampton Elementary School	565 Sheridian Rd	Birmingham	AL	20182580
6580	South Haven Health & Rehabilitation LLC	3141 Old Columbiana Road	Hoover	AL	20182820
3161	South Health and Rehab	1220 17th St S	Birmingham	AL	20182277
2640	South Shades Crest Elementary	3770 South Shades Crest Rd	Hoover	AL	20180999
517	Southeast Meat & Vegetable, Inc.	1751 Pinson Valley Parkway	Tarrant	AL	EXEMPT
8118	Southern Caribbean	1316 Bessemer Road	Birmingham	AL	Pending
11522	Southern Company Cafeteria	3535 Colonnade Pkwy	Birmingham	AL	Pending
11493	Southern Diner	67 6Th Avenue South	Birmingham	AL	Pending
456	Southern Foodservice Mgmt	15 20th Street South	Birmingham	AL	20180189
10241	Southern Sisters Cafe	1221 Alliance Road	Birmingham	AL	Pending
8122	Southern Style Cafe	400 Pinson Valley Parkway	Birmingham	AL	Pending
8476	Spare Time Entertainment	3600 Roosevelt Blvd	Birmingham	AL	20183719
411	Speedys Mexican Foods	275 Forest Rd	Hueytown	AL	20180595
1553	Splash Adventure Candy Shop	5051 Prince St	Bessemer	AL	EXEMPT
3828	Splash Adventure Mama Lizetti's	5051 Prince St	Bessemer	AL	EXEMPT
1555	Splash Adventure Pepsi Corner/ Soft Serve	5051 Prince St	Bessemer	AL	EXEMPT
1552	Splash Adventure The Tavern & Deli	5051 Prince St	Bessemer	AL	EXEMPT
7582	Sportsters Bar & Grill	242 Forest Road	Hueytown	AL	20183262
4982	Spring Gardens Nutrition Center	201 Spring Gardens Road	Birmingham	AL	20181678
7499	Springhill Suites	3950 Colonnade Pkwy	Birmingham	AL	EXEMPT
7895	Springhill Suites (Marriott)	2024 4Th Avenue South	Birmingham	AL	Pending
8262	Sprouts Farmers Market Medford Dr	5250 Medford Drive	Hoover	AL	20183634
8508	Sprouts Farmers Market Montgomery Hwy	1031 Montgomery Hwy	Vestavia Hills	AL	20183690
2515	St Aloysius Catholic School	751 Academy Dr	Bessemer	NULL	20182357
2607	St Vincents Hospital	810 St Vincents Dr	Birmingham	AL	20150975
2517	St Vincents Hospital East	50 Medical Park Dr E	Birmingham	AL	20183063
5463	St. Barnabas School Lunch Program	7901 1St Ave North	Birmingham	AL	20181817
2610	St. Francis Xavier School	2 Xavier Cir	Birmingham	AL	EXEMPT
2611	St. Martins In The Pines Retir	4941 Montevallo Rd	Birmingham	AL	20181419
3934	St. Martins In The Pines, Apts	4941 Montevallo Rd	Birmingham	AL	20183083
11429	St. Matthews Baptist Church	200 6Th Street	Docena	AL	Pending
2613	St. Paul United Meth Ch-Comm	1500 6th Ave N	Birmingham	AL	EXEMPT
8698	St. Theresa Catholic Church	8101 3rd Avenue	Leeds	AL	Pending
8431	Starbucks Building Shell	659 Fieldstown Road	Gardendale	AL	EXEMPT
1167	Starbucks Coffee #13779 Montclair Rd	1658 Montclair Road	Birmingham	AL	EXEMPT
2789	Starbucks Coffee #3453 Gadsden Hwy	1420 Gadsden Hwy	Trussville	AL	EXEMPT
2623	Starbucks Coffee #6964 John Hawkins Pkwy	3032 John Hawkins Pkwy	Hoover	AL	EXEMPT
8920	Starbucks Coffee #732668 Lakeshore Pkwy	279 Lakeshore Pkwy	Birmingham	AL	EXEMPT
10051	Starbucks Coffee #733358 Cross Plex Blvd	2401 Cross Plex Blvd	Birmingham	AL	EXEMPT
807	Starbucks Coffee #8396 Munger Bldg	1927 11th Ave S	Birmingham	AL	EXEMPT
811	Starbucks Coffee #8418 Cahaba Rd	2738 Cahaba Rd	Mountain Brook	AL	EXEMPT
810	Starbucks Coffee #8488 Galleria	3000 Riverchase Galleria	Hoover	AL	EXEMPT
2788	Starbucks Coffee #8560 Montgomery Hwy	700 Montgomery Hwy	Vestavia	AL	EXEMPT
2622	Starbucks Coffee #9587 Cahaba Heights Rd	3134 Cahaba Heights Rd	Vestavia	AL	EXEMPT
11346	Starbucks Coffee Messer Airport Hwy	5900 Messer Airport Hwy	Birmingham	AL	Pending
4821	Starbucks Coffee Montgomery Hwy	1582 Montgomery Highway	Hoover	AL	EXEMPT
8493	Starbucks Medford Dr	5180 Medford Dr	Hoover	AL	EXEMPT
2790	Starz Karaoke Lounge	710 Valley Ave	Birmingham	AL	EXEMPT
455	State Farm Regional Office	100 State Farm Parkway	Birmingham	AL	20180188
8488	Station 121	2000 2Nd Avenue South	Birmingham	AL	20183657
8233	Steak & Shake	1817 Montgomery Hwy South	Birmingham	AL	20173834
774	Steak Out	1717 28th Ave. S	Birmingham	AL	20180408
8322	Steel City Bar & Grill- Airport	5000 Richard Arrington Blvd No	Birmingham	AL	20173553
11514	Steel City Bar & Grill- Airport-NEW	5000 Richard Arrington Blvd No	Birmingham	AL	Pending
11463	Steel City Pops Cookie Kitchen	2900 Crescent Avenue	Birmingham	AL	Pending
8578	Steel City Seafood LLC	1301 Pinson Street	Tarrant	AL	20153686
8344	Stix Restaurant Galleria Circle	3250 Galleria Circle	Hoover	AL	20183560
1399	Stix Restaurant Lowery Pkwy	3405 Lowery Parkway	Fultondale	AL	20181578
7972	Stoisor Realties, LLC	1820 Gadsden Highway	Trussville	AL	20183417

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2631	Stop N Shop Square Deli	1200 14th St Ensley	Birmingham	AL	20082857
740	Su's Brunch	2 Metroplex Dr	Birmingham	AL	20183008
11498	Subway	1909 5Th Avenue North	Birmingham	AL	Pending
10244	Subway	643 Pleasant Grove Road	Pleasant Grove	AL	Pending
2890	Subway #10981 Dennison Ave SW	849 Dennison Ave Sw	Birmingham	AL	EXEMPT
2882	Subway #11377 Montgomery Hwy	678 Montgomery Hwy	Vestavia	AL	EXEMPT
2747	Subway #12859 19th St So	401 19th St S	Birmingham	AL	EXEMPT
2798	Subway #17582 Bessemer Rd	2213 Bessemer Rd	Birmingham	AL	EXEMPT
2761	Subway #1835 Valley Ave	423 Valley Ave	Birmingham	AL	EXEMPT
301	Subway #2018 Huffman Rd	433 Huffman Rd	Birmingham	AL	EXEMPT
2762	Subway #21102 Princeton Ave	701 Princeton Ave	Birmingham	AL	EXEMPT
2635	Subway #22980 Bessemer Hwy	133 Bessemer Super Hwy	Midfield	AL	EXEMPT
2748	Subway #27114 10th Ave So	1321 10th Ave S	Birmingham	AL	EXEMPT
2746	Subway #2793 Lorna Rd	3305 Lorna Rd	Hoover	NULL	EXEMPT
2891	Subway #28531 Eastern Valley Rd	4760 Eastern Valley Rd	Bessemer	AL	EXEMPT
2749	Subway #29147 Columbiana Rd	2972 Columbiana Rd	Vestavia	AL	EXEMPT
850	Subway #29169 Cane Creek Rd	290 Cane Creek Rd	Warrior	AL	EXEMPT
2750	Subway #30798 Walker Chapel Rd	1329 Walker Chapel Rd	Fultondale	AL	EXEMPT
8949	Subway #3112	1518 9Th Avenue West	Bessemer	AL	Pending
296	Subway #32512 Deerfoot Pkwy	6723 Deerfoot Pkwy	Clay	AL	EXEMPT
2751	Subway #32941 Richard Arrington Blvd No	2105 Richard Arrington Blvd No	Birmingham	AL	EXEMPT
2752	Subway #34716 Franfurt Cir	100 Frankfurt Cir	Birmingham	NULL	EXEMPT
2991	Subway #3483 Allison Bonnett Mem Dr	810 Allison Bonnett Memorial D	Hueytown	AL	EXEMPT
2884	Subway #36014 19th St No	2510 19th St N	Hueytown	AL	EXEMPT
298	Subway #3648 Centerpoint Rd	2103 Centerpoint Rd	Birmingham	AL	EXEMPT
8747	Subway #3814	2803 Pinson Valley Pkwy	Birmingham	AL	EXEMPT
2754	Subway #38652 20th St So	803 20 St S	Birmingham	NULL	EXEMPT
8746	Subway #4282 Bankhead Hwy	1200 Bankhead Hwy West	Birmingham	AL	EXEMPT
2894	Subway #43050 Montclair Rd	1600 Montclair Rd	Birmingham	AL	EXEMPT
8811	Subway #46968	619 20Th Street South	Birmingham	AL	Pending
7593	Subway #48483 Higrove Pkwy	1101 Higrove Parkway	Leeds	AL	EXEMPT
297	Subway #4873 Montevallo Rd	4500 Montevallo Rd	Birmingham	AL	EXEMPT
2886	Subway #5538 Crestwood Blvd	5506 Crestwood Blvd	Birmingham	AL	EXEMPT
2799	Subway #5635 28th Ave So	1919 28th Ave S	Homewood	AL	EXEMPT
295	Subway #6252 Edwards Lake Rd	1930 Edwards Lake Rd	Trussville	AL	EXEMPT
505	Subway #6507 Pinson Valley Pkwy	1505 Pinson Valley Pkwy	Tarrant	AL	EXEMPT
2888	Subway #7649 Forestdale Blvd	1145 Forestdale Blvd	Birmingham	AL	EXEMPT
1203	Subway #7797 Lakeshore Pkwy	221 Lakeshore Pkwy	Birmingham	AL	EXEMPT
2744	Subway #7964 Montgomery Hwy	1594 Montgomery Hwy	Hoover	NULL	EXEMPT
488	Subway (Circle K) Tallapoosa St	1700 Tallapoosa St	Birmingham	AL	EXEMPT
2743	Subway - Hoover	2304 John Hawkins Pky Ste 106B	Hoover	AL	EXEMPT
7373	Subway 9th Ave No	1518 9th Ave N	Bessemer	AL	EXEMPT
8687	Subway Cahaba River Rd	4851 Cahaba River Road	Birmingham	AL	Pending
8057	Subway Camp Coleman Rd	4643 Camp Coleman Road	Trussville	AL	EXEMPT
7980	Subway Crestwood Blvd	1628 Crestwood Blvd	Birmingham	AL	EXEMPT
300	Subway Hwy 75 So	6662 Hwy 75 S	Pinson	AL	EXEMPT
486	Subway Lake Dr	1205 Lake Dr	Bessemer	AL	EXEMPT
487	Subway Odum Rd	841 Odum Rd	Gardendale	AL	EXEMPT
274	Subway Pleasant Grove	27 Park Rd	Pleasant Grove	AL	EXEMPT
2759	Subway Sandwiches & Salads	3155 Green Valley Rd	Birmingham	AL	EXEMPT
2892	Subway Sandwiches & Salads	3382 Morgan Dr	Vestavia	AL	EXEMPT
267	Subway Veterans Mem Dr	4024 Veterans Memorial Drive	Adamsville	AL	EXEMPT
8098	Suki Hana	3000 Riverchase Galleria	Hoover	AL	20183455
3937	Summers Landing/ Magnolia Village	424 Dean Ln	Gardendale	AL	20181218
2763	Summit Club/ City Club of Birmingham	1901 6th Ave N	Birmingham	AL	20180695
7790	Summit Retail Center II	250 Summit Blvd	Birmingham	AL	20183304
7794	Summit Retail Center III	105 Summit Blvd	Birmingham	AL	20183305
5727	Summit Retail Center VI/Flip Burger Boutique	220 Summit Blvd	Birmingham	AL	20172920
2764	Sun Valley Elementary School	1010 18th Ave Nw	Birmingham	AL	20182581
6680	Sunrise Ridge of AL, LLC	7868 Gasden Highway	Trussville	AL	20172917
523	Super Bowl Restaurant	4416 Pinson Valley Pky	Birmingham	AL	20180129
10285	Super Moon Food Mart	311 Valley Road	Fairfield	AL	Pending
8600	Super Ofertas	406 West Valley Ave	Birmingham	AL	20183688
8027	Sur La Table - The Summit	115 Summit Blvd	Birmingham	AL	20183415
647	Surin Of Thailand	64 Church St	Mountain Brook	AL	20180248

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2772	Surin West	1918 11th Ave S	Birmingham	AL	20180795
8010	Sushi Village	7001 Crestwood Blvd	Birmingham	AL	20183399
11462	Sushi Village Fieldstown Rd	592 Fieldstown Road	Gardendale	AL	20183977
8810	Swamp Monster BBQ	1843 Montgomery Hwy	Hoover	AL	Pending
8238	Swanson's	1109 1St Street Pratt City	Birmingham	AL	Pending
8246	Sweet Cherry Yogurt	2000 Riverchase Galleria	Hoover	AL	EXEMPT
7725	Sweet Tea Kitchen	2205 3rd Avenue South	Birmingham	AL	20183287
8975	Switchyard	1401 1St Avenue South	Birmingham	AL	20183949
10255	T Bone Steak Inc	1017 20Th Street South	Birmingham	AL	Pending
8374	T-Mobile Call Center	820 Tom Martin Drive	Birmingham	AL	20183584
8785	Taboon Noon O Kabab	1550 Montgomery Highway	Hoover	AL	20173773
365	Taco Bell #029110 Parkway E	9509 Parkway E	Birmingham	AL	20180089
376	Taco Bell #029111 Forestdale Blvd	1101 Forestdale Blvd	Birmingham	AL	20180086
359	Taco Bell #029112 Palisades Blvd	381 Palisades Blvd	Birmingham	AL	20180103
366	Taco Bell #029114 Pinson Valley Pkwy	1801 Pinson Valley Pkwy	Tarrant	AL	20180095
8492	Taco Bell #029120 Ashville Rd	1801 Ashville Road	Leeds	AL	20183711
354	Taco Bell #029121 Lakeshore Pkwy	213 Lakeshore Pkwy	Birmingham	AL	20180099
349	Taco Bell #029127 Cane Creek Rd	260 Cane Creek Rd	Warrior	AL	20180093
364	Taco Bell #029130 Hwy 75	6651 Hwy 75	Pinson	AL	20180096
375	Taco Bell #029135 Bess Super Hwy	2300 Bessemer Super Hwy	Birmingham	AL	20180088
372	Taco Bell #029140 Fieldstown Rd	523 Fieldstown Rd	Gardendale	AL	20180085
379	Taco Bell #029141 Allison Bonnett Mem Dr	3064 Allison Bonnett Mem Dr	Hueytown	AL	20180097
368	Taco Bell #029142 No Chalkville Mtn Rd	1106 North Chalkville Mtn Road	Trussville	AL	20180094
352	Taco Bell #029153 Montgomery Hwy	1821 Montgomery Hwy	Hoover	AL	20180098
380	Taco Bell #029154 9th Ave No	710 9th Ave N	Bessemer	AL	20180092
7335	Taco Bell #029166 Bond Blvd	5050 Bond Blvd	Bessemer	AL	20183294
7567	Taco Bell #029168 Montclair Rd	1541 Montclair Road	Birmingham	AL	20183260
8213	Taco Bell #030296 Morris Ave	1611 Morris Avenue	Fultondale	AL	20183620
8221	Taco Bell #030297 7th Ave So	2124 7 th Avenue South	Birmingham	AL	20183613
259	Taco Casa	125 Wildwood Pky	Homewood	AL	20180341
8739	Taco Mama	327 Summit Blvd	Birmingham	AL	20183749
7853	Taco Mama	63 Church Street	Mountain Brook	AL	20183496
8599	Taco Mama Edgewood, LLC	1014 Oxmoor Road	Homewood	AL	20183696
10175	Taco N Madre	702 Valley Avenue	Birmingham	AL	Pending
11388	Taco Tech	2409 Acton Road	Vestavia	AL	20183972
7382	Taipei 101 Sushi & Asian Bistro	471 Greensprings Hwy	Homewood	AL	20173139
3144	Taj India Restaurant	2226 Highland Ave	Birmingham	AL	20180989
8561	Takasaki	1679 Centerpoint Pkwy	Birmimgham	AL	20163695
8162	Takoyaki Restaurant, LLC	4774 Eastern Valley Road	McCalla	AL	20183482
10053	Tamale Queen/ Snowies Shaved Ice	2755 Stonefield Drive	Fultondale	AL	Pending
11322	Taqueria Cebollitas & Mexican Restaurant	520 Decaturhwy	Birmingham	AL	Pending
7923	Taqueria Mexicana La Herradura	348 Finley Avenue	Birmingham	AL	20163426
3147	Taqueria Mexico	3724 Lorna Rd	Hoover	AL	20180991
7805	Taqueria Tafoya	9917 Parkway East	Birmingham	AL	20183296
3149	Target Store T-1773 Gadsden Hwy	1654 Gadsden Hwy	Birmingham	AL	20180993
130	Target Store T-2355 Lowery Pkwy	3489 Lowery Parkway	Fultondale	AL	20181014
3148	Target Store T-2375 Promenade Pkwy	4889 Promenade Parkway	Bessemer	AL	20180992
7893	Target Store T-2796 Brookwood Village	531 Brookwood Village	Birmingham	AL	20183410
7247	Target StoreT-2503 Grove Blvd	5561 Grove Blvd	Hoover	AL	20183049
1097	Tarrant Elementary School	1269 Portland Street	Tarrant	AL	20181039
1099	Tarrant Intermediate School	#1 Wildcat Drive	Tarrant	AL	20181038
6980	Tarrant Middle/High School	91 Black Creek Road	Tarrant	AL	20183069
3302	Tarrant Senior Center	1232 Faye Dr	Tarrant	AL	EXEMPT
2859	Taste Of Thailand	3321 Lorna Rd	Hoover	AL	20181024
10149	Tasty Jamaica Mobile	4407 Gary Avenue	Fairfield	AL	Pending
11374	Tavern on 1st	2320 1St Avenue North	Birmingham	AL	Pending
961	Taziki's Inc. Colonnade Pkwy	3439 Colonnade Pkwy	Birmingham	AL	20180545
1062	Taziki's Inc. Hwy 280	2737 Highway 280	Mountain Brook	AL	20181027
6820	Taziki's Restaurant 18th Street So	301 18Th Street South	Birmingham	AL	20182998
655	TCBY	1919 28th St S	Birmingham	AL	EXEMPT
7841	Tecate Bar & Grill	612 Montgomery Hwy	Birmigham	AL	20183378
881	Teds Old Hickory Restaurant	328 12th St S	Birmingham	AL	20181030
7981	Temple of Truth Apostolic Church	505 15Th Place S W	Birmingham	AL	EXEMPT
7516	Teriyaki Express	780 Brookwood Village	Homewood	AL	20183235
3333	Terrace Oaks Care & Rehab Cntr	4201 Bessemer Hwy	Bessemer	AL	20182967

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11344	Tetos Mexican Restaurant	2508 Morgan Road	Birmingham	AL	20183915
11468	Thai Basil and Sushi	445 Main Street	Trussville	AL	Pending
10126	The 3 Brothers	4300 East Lake Blvd	Birmingham	AL	Pending
8464	The Abbey Coffee Shop	131 41St Street South	Birmingham	AL	EXEMPT
10020	The Alabama Biscuit Company	1821 2Nd Ave North	Birmingham	AL	Pending
1578	The Altamont School	4801 Altamont Rd	Birmingham	AL	20181837
186	The Attic-BSC	900 Arkadelphia Road	Birmingham	AL	EXEMPT
11404	The Battery	2201 2Nd Avenue South	Birminghamn	AL	Pending
720	The Break Restaurant/Billiards	1001 20th St S	Birmingham	AL	20180239
8818	The Bright Star Catering Company	312 19Th Street North	Bessemer	AL	20183782
7268	The Cajun Cleaver	2341 John Hawkins Pkwy	Hoover	AL	20183053
11389	The Central Club	8310 Side Track	Leeds	AL	Pending
2921	The Cheesecake Factory	236 Summit Blvd	Birmingham	AL	20181032
346	The Club	#1 Robert S. Smith Drive	Birmingham	AL	20180213
11401	The Corner	430 Fieldstown Road	Gardendale	AL	Pending
187	The Court @ BSC	900 Arkadelphia Road	Birmingham	AL	20170212
2725	The Crestwood Tavern	5500 Crestwood Blvd	Birmingham	AL	EXEMPT
8943	The East	3431 Colonnade Pkwy	Birmingham	AL	Pending
7658	The Edge 12	7001 Crestwood Blvd	Birmingham	AL	EXEMPT
11358	The Essential	2018 Morris Avenue	Birmingham	AL	Pending
8454	The Filling Station	5524 Crestwood Blvd	Birmingham	AL	20163656
8893	The Finley Center/Hoover Sports Center	1000 R V Trace	Hoover	AL	20173840
8194	The First Watch Restaurant, Inc. #389	700 Montgomery Hwy	Vestavia Hills	AL	20183549
483	The Fish Market	1681 Montgomery Hwy	Hoover	AL	20180173
7219	The Foundry	608 18th Street N	Bessemer	AL	20183084
8129	The Fresh Market	549 Brookwood Village	Birmingham	AL	20183513
8862	The Fresh Market	5485 Patrick Way	Trussville	AL	20173832
11449	The Fresh Squeeze	316 18Th Street North	Birmingham	AL	Pending
643	The Furnace	309 28th St N	Birmingham	AL	20180415
8336	The Grill In Midfield	1429 Woodward Road	Midfield	AL	20173604
7392	The Grove Shopping Center (Bldg A)	5619 Grove Blvd	Hoover	AL	20103058
7391	The Grove Shopping Center (Bldg D)	5519 Grove Blvd	Hoover	AL	20173059
3066	The Happy Catering Company	225 Oxmoor Cir	Birmingham	AL	20181345
453	The Harbert Center	2019 4th Ave. N	Birmingham	AL	20180024
8025	The Heavenly Donut Co	4911 Cahaba River Road	Birmingham	AL	20183446
7620	The Hollywood, LLC/ Over Easy	400 Hollywood Blvd	Birmingham	AL	20183237
3351	The J Clyde	1312 Cobb Ln	Birmingham	AL	20143172
10235	The Landing Bar and Grill	5216 Messer Airport Highway	Birmingham	AL	Pending
11420	The Lumbar	2821 2Nd Avenue South	Birmingham	AL	Pending
490	The Lunch Box Express	1719 27th Ter S	Homewood	AL	EXEMPT
11376	The Mill	2000 19Th Street North	Birmingham	AL	Pending
8908	The Mixx Bar and Grill	700 9Th Street North	Birmingham	AL	Pending
7667	The New York Butcher Shoppe	3158 Cahaba Heights Village Rd	Birmingham	AL	EXEMPT
1628	The Olive Branch	3236 Cahaba Heights Rd	Vestavia	AL	20181047
4119	The Olive Garden #1050 Galleria Cir	3450 Galleria Cir	Hoover	AL	20181286
667	The Olive Garden #1123 Crestwood Blvd	7701 Crestwood Blvd	Birmingham	AL	20180272
7688	The Olive Garden #1879 Roosevelt Blvd	3555 Roosevelt Blvd	Birmingham	AL	20183270
659	The Original Pancake House	1931 11th Ave S	Birmingham	AL	20180435
8870	The Palace	610 3Rd Avenue West	Birmingham	AL	20183811
8022	The Parish Seafood & Oyster House	1911 Gadsden Highway	Trussville	AL	Pending
1281	The Pit BBQ, Inc.	2820 R. Arrington Jr. Blvd N.	Birmingham	AL	20181048
8397	The Red Cat	2901 2Nd Avenue South	Birmingham	AL	EXEMPT
8616	The Red Cat #2	1701 1St Ave South	Birmingham	AL	EXEMPT
558	The Redmont Hotel	2101 5th Ave. N.	Birmingham	AL	20170107
11394	The Refinery	728 29Th Street South	Birmingham	AL	Pending
7899	The Ridge Eat & Drink	3325 Rocky Ridge Plaza	Birmingham	AL	Pending
8466	The Saturn	200 41St Street South	Birmingham	AL	EXEMPT
8640	The Shoppes @ Vestavia Hills	1031 Montgomery Hwy	Vestavia Hills	AL	20183691
7519	The Shops of Grand River	6200 Grand River Blvd	Leeds	AL	20183233
8998	The Store #16	6663 Old Tuscaloosa Hwy	McCalla	AL	20183911
8913	The Summit Slub Bar	1901 6Th Avenue North	Birmingham	AL	Pending
11403	The Theodore	3211 2nd Avenue South	Birmingham	AL	Pending
7302	The Three Eared Rabbit	209 Main Street	Trussville	AL	EXEMPT
11482	The Three Earred Rabbit	8101 Parkway Drive	Leeds	AL	Pending
11338	The Tutwiler Bar & Grill	2021 Park Place	Birmingham	AL	Pending

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
7687	The Venue at the Bridge	100 Lexington Avenue	Birmingham	AL	Pending
333	The Village Tavern, Inc.	101 Summit Blvd	Birmingham	AL	20180362
8790	The Waites	707 Richard Arrington Blvd So	Birmingham	AL	20173891
7735	The Whole Scoop	3421 South Shades Crest Rd	Hoover	AL	EXEMPT
93	The Wine Loft	2200 1st Ave N	Birmingham	AL	EXEMPT
8154	The Wing Cafe	7521 Parkway Drive	Leeds	AL	20173473
8617	Thomas Jefferson Tower	1631 2nd Avenue North	Birmingham	AL	20183766
8017	Tide & Tiger	409 Graymont Avenue West	Birmingham	AL	20183386
4783	Tienda Carneceria Fiesta	1575 Center Point Parkway	Center Point	AL	20181518
11472	Tillies Southern Kitchen	3094 Allison Bonnet Mem Drive	Hueytown	AL	Pending
8184	Tillman Levenson Food Service Factory Buildout	113 12th Street North	Birmingham	AL	20183655
8073	Tin Roof	2709 7th Ave South	Birmingham	AL	20183713
8884	TK Chicken	1516 9Th Avenue North	Bessemer	AL	Pending
11452	Today Care Children's Center	1200 Rev Abraham Woods Drive	Birmingham	AL	Pending
1160	Tomek's	2320 2nd Avenue North	Birmingham	AL	20183199
8918	Top Golf Birmingham, LLC	12Th Ave N& 24Th	Birmingham	AL	20183883
8960	Top That Grill/ Boston Fish Supreme	5005 Jefferson Avenue S W	Birmingham	AL	Pending
2965	Top That Grille II Bessemer Rd	1371 Bessemer Rd	Birmingham	AL	20071051
8579	Tortugas Pizza @ Railroad Park	1304 2nd Ave So	Birmingham	AL	20173862
520	Tortugas, Inc.	2801 John Hawkins Pkwy	Hoover	AL	20180245
2971	Town Village Vestavia Hills	2385 Dolly Ridge Rd	Birmingham	AL	20181071
7905	Towne Place Suites	500 Wildwood Circle	Homewood	AL	EXEMPT
3075	Trace Crossing Elementary	5454 Learning Ln	Birmingham	AL	20180998
11516	Tracy's Tressutr	816 Florentine Drive	Birmingham	AL	Pending
8529	Trader Joe's #737	205 Summit Blvd	Birmingham	AL	20183665
8663	Trattoria Centrale	207 20Th Street North	Birmingham	AL	Pending
11428	Tre Luna Catering	2513 5Th Avenue South	Birmingham	AL	Pending
8190	Tropical Grill	2149 Bessemer Road	Birmingham	AL	Pending
10043	Tropicaleo	4426 4Th Avenue South	Birmingham	AL	20183965
6100	Trussville Baseball	421 Pumphouse Road	Trussville	AL	20182177
1339	Trussville Civic Center	5381 Trussville-Clay Road	Trussville	AL	20181078
6121	Trussville Girls Softball	201 Pumphouse Rd	Trussville	AL	20182178
11477	Trussville Health and Rehab	119 Watterson Parkway	Trussville	AL	20183960
3669	Trussville Senior Citizen Ctr	504 Cherokee Dr	Trussville	AL	EXEMPT
7464	Trussville Stadium 16	5895 Trussville Crossings Pkwy	Trussville	AL	EXEMPT
6135	Trussville United Soccer	11 Palm Street	Trussville	AL	20172179
3094	Trussville Youth Football Conc	4551 Riverbend Road	Trussville	AL	20182180
2431	Tuggle Hill K-5 School	412 12th Ct N	Birmingham	AL	20182582
8874	Tuk Tuk	2131 7Th Avenue South	Birmingham	AL	20183971
8438	Twin Peaks	4330 Creekside Ave	Hoover	AL	20183638
8631	Twisted Root Burger Company	2501 Rocky Ridge Road	Birmingham	AL	20183747
10151	Two Fat Men Catering, Inc.	5084 Pinnacle Square	Birmingham	AL	Pending
8023	UAB Abroms Engel Inst. for the Visual Arts	1221 10th Avenue So	Birmingham	AL	20173507
10271	UAB Arena Stand	617 13Th Street So	Birmingham	AL	Pending
3949	UAB Bartow Arena #221	617 13th St S	Birmingham	NULL	EXEMPT
2269	UAB Commons	900 16th St South	Birmingham	NULL	20180625
7675	UAB Einstein's	1714 9th Ave S	Birmingham	AL	EXEMPT
485	UAB Highlands	1201 11th Avenue South	Birmingham	AL	20181010
3100	UAB Hospital / West Pav/ Jeff Towers	619 18th St S	Birmingham	AL	20181081
7684	UAB National Alumni Society Building	1301 10th Ave S	Birmingham	AL	EXEMPT
8305	UAB North Pavilion Food Court	1802 6th Avenue South	Birmingham	AL	20183565
7810	UAB School of Nursing	1701 University Blvd	Birmingham	AL	EXEMPT
7221	UAB Sterne Library Starbuck's	917 13th Street South	Birmingham	AL	EXEMPT
286	Uncle Sam's BBQ (SWH Inc.)	3043 Allison Bonnet Mem. Dr.	Hueytown	AL	20181169
8603	University Mexican Grill	2009 University Blvd	Birmingham	AL	20183768
8763	Urban Air	800 Greensprings Hwy	Homewood	AL	Pending
11353	Urban Air Tutwiler	3695 Roosevelt Blvd	Trussville	AL	20183916
7568	Urban Cookhouse	2846 18th St S	Homewood	AL	20173204
8058	Urban Cookhouse Crestline	212 Country Club Park	Mountainbrook	AL	20173489
8718	Urban Cookhouse Federal Reserve, LLC	1801 5th Avenue North	Birmingham	AL	20183797
10167	Urban Cookhouse/ Farm Bowl & Juice Co	1920 29Th Avenue Soth	Birmingham	AL	Pending
3715	Urban Ministry, Inc.	1229 Cotton Ave Sw	Birmingham	AL	20181603
8370	Urban Pops	2760 John Hawkins Pkwy	Hoover	AL	EXEMPT
10246	Urban Smoke	258 Forest Road	Hueytown	AL	Pending
7215	V A Hospital	700 19th Street S	Birmingham	AL	20183259

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
4142	V I P	1232 Erie St	Birmingham	AL	20171146
8942	Valley Food and Feed	2060 Montevallo Road	Birmingham	AL	Pending
3718	Valley Mart Mexican Restaurant	5118 Pinson Valley Pky	Birmingham	AL	20183091
10202	Valley Shell	700 Valley Avenue	Birmigham	AL	Pending
10303	Value Fresh Foods	1433 Woodward Road	Midfield	AL	Pending
8217	Vecchio Pizzaria and Marcato	610 Preserve Parkway	Hoover	AL	EXEMPT
10090	Vesta Apartments	2173 Highland Avenue South	Birmingham	AL	Pending
302	Vestavia Bowl Snack Bar	1429 Montgomery Hwy	Vestavia	AL	20180494
320	Vestavia Country Club-Banquet	400 Beaumont Dr	Vestavia	AL	20180535
3114	Vestavia Elementary-East	2109 Tyson Dr	Vestavia	AL	20181459
3723	Vestavia Elementary-West	1965 Merryvale Rd	Vestavia	AL	20181084
3116	Vestavia Hills Elem.-Central	1289 Montgomery Highway	Vestavia	AL	20181462
2249	Vestavia Hills Elementary Cahaba Heights	4401 Dolly Ridge Rd	Birmingham	AL	20181461
3117	Vestavia Hills High School	2235 Limerock Road	Vestavia	AL	20181460
10208	Viet Kitchen	2000 Riverchase Galleria	Hoover	AL	Pending
8525	Villa Italian Kitchen	2000 Riverchase Galleria	Hoover	AL	20183646
8769	Vinnie Baggs Restaurant	1006 Oxmoor Road	Birmingham	AL	Pending
7782	Vino	1930 Cahaba Road	Mountain Brook	AL	20183329
391	Vulcan Park Foundation	1701 Valley View Drive	Birmingham	AL	EXEMPT
3127	W. J. Christian Elementary School	725 Mountain Dr	Birmingham	AL	20182583
450	W.T. Restaurant & Lounge	820 9th St. N	Bessemer	AL	20170417
623	Waffle House #1033 Gadsden Hwy	1440 Gadsden Hwy	Birmingham	AL	20180228
5180	Waffle House #1093 Ashville Rd	1850 Ashville Road	Leeds	AL	20181087
617	Waffle House #1340 Academy Ln	5010 Academy Ln	Bessemer	AL	20180235
614	Waffle House #1443 Walker Chapel Rd	1334 Walker Chapel Rd	Fultondale	AL	20180225
5800	Waffle House #1843 Centerpoint Rd	4688 Center Point Road	Pinson	AL	20183127
7645	Waffle House #1908 Bess Super Hwy	636 Bessemer Super Hwy	Fairfield	AL	20183298
7835	Waffle House #1939 - UAB Parking Deck	1801 4th Avenue South	Birmingham	AL	20183361
7887	Waffle House #1961 Centerpoint Pkwy	2208 Centerpoint Parkway	Birmingham	AL	20183368
7922	Waffle House #1970 9th Ave No	931 9Th Avenue North	Bessemer	AL	20183397
7862	Waffle House #1985 20th St So	1034 20Th Street South	Birmingham	AL	20183421
625	Waffle House #208 Crestwood Blvd	1833 Crestwood Blvd	Irondale	AL	20180226
8312	Waffle House #2131 Allison Bonnet Mem Dr	938 Allison Bonnet Mem Drive	Hueytown	AL	20183627
8553	Waffle House #2181 Valley Ave	316 Valley Avenue	Birmingham	AL	20183699
624	Waffle House #406 Montgomery Hwy	1535 Montgomery Hwy	Birmingham	AL	20180227
619	Waffle House #664 Columbiana Rd	3023 Columbiana Rd	Vestavia	AL	20180232
622	Waffle House #724 Parkway E	9227 Parkway E	Birmingham	AL	20180229
621	Waffle House #756 No Chalkville Rd	1128 North Chalkville Rd	Trussville	AL	20180230
615	Waffle House #867 Fieldstown Rd	500 Fieldstown Rd	Gardendale	AL	20180233
616	Waffle House #882 Methodist Cir	3998 Methodist Cir	Bessemer	AL	20180234
8919	Waffle House John Hawkins Pkwy	2535 John Hawkins Pkwy	Hoover	AL	Pending
8159	Wagon Wheel	1424 1St Ave North	Bessemer	AL	20183601
8075	Wal-Mart Neighborhood Market #3184 Lorna Rd	3320 Lorna Road	Hoover	AL	20183454
401	Wal-Mart Store #1158 Hackworth Rd	2473 Hackworth Rd	Adamsville	AL	20180196
400	Wal-Mart Store #1201 Odum Rd	890 Odum Road	Gardendale	AL	20180201
399	Wal-Mart Store #1229 John Hawkins Pkwy	2780 John Hawkins Pkwy	Hoover	AL	20180203
398	Wal-Mart Store #1481 Lakeshore Pkwy	209 Lakeshore Pkwy	Homewood	AL	20180202
1078	Wal-Mart Store #1711 Montclair Rd	1600 Montclair Road	Birmingham	AL	20180674
397	Wal-Mart Store #2713 Trussville Pkwy	5919 Trussville Pkwy	Trussville	AL	20180204
963	Wal-Mart Store #4504 Palisades Blvd	312 Palisades Blvd	Birmingham	AL	20180495
967	Wal-Mart Store #4580 Montgomery Hwy	1300 Montgomery Highway	Vestavia Hills	AL	20180513
394	Wal-Mart Store #5100 Centerpoint Rd	1916 Centerpoint Rd	Birmingham	AL	20180199
404	Wal-Mart Store #762 Parkway E	9248 Parkway E	Birmingham	AL	20180198
402	Wal-Mart Store #764 Academy Dr	750 Academy Dr	Bessemer	AL	20180197
6260	Wal-Mart Supercenter #4497 Garywood Dr	1007 Red Farmer Drive	Hueytown	AL	20182757
7250	Wal-Mart Supercenter #562 Whitfield Ave	8551 Whitfield Ave	Leeds	AL	20183026
6841	Wald Park Sports Complex	1973 Merryvale Road	Vestavia	AL	20182961
827	Wall Street Deli #3	535 21st Street South	Birmingham	AL	20180311
828	Wall Street Deli #6/Sneaky Pete's	701 Princeton Ave Sw	Birmingham	AL	20180312
451	Wallace Lounge	308 19th St	Birmingham	AL	20180218
10068	Walts Organic Gourmet Popcorn	1450 Beauty Circle	Birmingham	AL	Pending
11483	Wanted Dogs	9263 Highway 79	Pinson	AL	Pending
10098	WAS Commissary Kitchen	1154 11Th Avenue South	Birmingham	AL	Pending
8348	WAS's Commissary / Saws Street Kitchen	1000 28Th Street North	Birmingham	AL	20163716
10071	Wasabi Juans	3732 Lorna Road	Hoover	AL	Pending

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
7267	Washington K-8 School	115 4th Ave S	Birmigham	AL	20183095
11342	Washington Outreach Ministries	1823 20Th Street Ensley	Birmingham	AL	Pending
11424	Wayback Burgers	1801 4Th Avenue South	Birmingham	AL	20183974
10213	Wayne's Hotdogs	1142 3rd Avenue West	Birmingham	AL	20173884
429	Wendys #1658 Chalkville Rd N	1101 Chalkville Rd N	Trussville	AL	20180799
4079	Wendys #369 Bankhead Hwy W	901 Bankhead Hwy West	Birmingham	AL	20181090
8181	Wendys 7th Ave So	2327 7Th Avenue South	Birmingham	AL	20183552
419	Wendys Academy Drive	800 Academy Dr	Bessemer	AL	20180839
424	Wendys Bessemer Hwy	104 Bessemer Hwy	Midfield	AL	20180837
422	Wendys Fulton Ave	1009 Fulton Ave	Gardendale	AL	20180363
427	Wendys Hwy 280	2727 Hwy 280	Mountain Brook	AL	20180840
428	Wendys Montgomery Hwy	1791 Montgomery Hwy	Hoover	AL	20180834
425	Wendys Morgan Rd	2931 Morgan Rd	Bessemer	AL	20180835
423	Wendys Parkway East	9870 Parkway East	Birmingham	AL	20180798
434	Wendys State Farm Pkwy	213 State Farm Pkwy	Homewood	AL	20180838
433	Wendys Valley Ave	345 Valley Ave	Birmingham	AL	20180797
4502	Wenonah H S Football Stadium	2800 Wilson Road Sw	Birmingham	AL	EXEMPT
132	Wenonah High School	2800 Wilson Road SW	Birmingham	AL	20181068
7629	West End Academy	1840 Pearson Avenue	Birmingham	AL	20183194
6862	West Homewood Conc. #1	121 Oxmoor Road	Homewood	AL	20183012
208	Western Market Highland Ave	2230 Highland Avenue	Birmingham	AL	20181557
209	Western Supermarket #6-Deli Morgan Dr	3350 Morgan Dr	Vestavia	AL	20181558
1151	Westhills Elementary Child Nutrition Program	710 Glenn Road	Bessemer	AL	20181260
7915	Westin Restaurant	2221 Richard Arrington Blvd No	Birmingham	AL	20183403
8661	Whataburger #896 Trussville	5931 Trussville Crossings Pkwy	Trussville	AL	20183706
8662	Whataburger #920 Fultondale	1601 Main Street	Fultondale	AL	20183707
10203	Which Wich	2101 7Th Avenue S	Birmingham	AL	Pending
10150	Whistling Table	3916 Clairmont Avenue	Birmingham	AL	Pending
8052	Whitehouse Restaurant	9830 Highway 31	Warrior	AL	20183419
6800	Who Doesn't Like Cake	2466 Old Springville Road	Birmingham	AL	EXEMPT
3274	Whole Foods Market Cahaba Village Plz	3100 Cahaba Village Plz	Birmingham	AL	20181224
8554	Whole Foods Market Riverchase Village	3780 Riverchase Village	Hoover	AL	20183697
3279	Wilkerson Middle School	116 11th Court N	Birmingham	AL	20182586
460	Williams Sonoma	214 Summit Blvd	Birmingham	AL	EXEMPT
4093	Wilson Florist & Gifts Wedding Chapel	1328 Main St	Gardendale	AL	EXEMPT
10047	Winewood Shell	3901 Pinson Valley Parkway	Birmingham	AL	20183870
8524	Wing A Fish LLC	5116 Old Springville Road	Pinson	AL	20183660
10310	Wing It	690 9Th Avenue S W	Bessemer	AL	Pending
591	Wing It Centerpoint Pkwy	1671 Centerpoint Pkwy	Center Point	AL	20180182
8555	Wing It Lorna Rd	3305 Lorna Road	Hoover	AL	20183641
566	Wing It Western Hills Mall	27 Western Hills Mall	Fairfield	AL	20180181
11453	Wing Out	122 River Square Plaza	Hueytown	AL	Pending
10229	Wing Out	14 Greensprings Hwy	Birmingham	AL	Pending
8582	Wing Out Avenue V	1806 Avenue V	Birmingham	AL	Pending
8200	Wing Out Parkway East	9201 Parkway East	Birmingham	AL	Pending
8996	Wing Town	1620 Forestdale Plaza	Birmingham	AL	20183850
1236	Wing Zone	1694 Montgomery Hwy	Hoover	AL	20132057
3277	Wings & More Wings (CLOSED)	3519 Huntsville Ave	Bessemer	NULL	20071119
663	Wings & Rings	301 Oporto Madrid Blvd	Birmingham	AL	20180305
8683	Wings & Stuff	4012 Richard M Scrushy Pkwy	Fairfield	AL	Pending
7911	Wings & Teriyaki	734 Graymont Ave #C	Birmingham	AL	20183337
8206	Wings Heaven	5605 E J Oliver Blvd	Fairfield	AL	20183542
4100	Wings Plus #2 Bess Rd	2231 Bessemer Rd	Birmingham	AL	20181121
8580	Wings Plus #4 Parkway East	9525 Parkway East	Birmingham	AL	20183830
7270	Wings Plus #5 Shades Mtn Plaza	755 Shades Mountain Plaza	Hoover	AL	20183216
7225	Wings Plus #6 Montclair Rd	1680 Montclair Road Ste 1100	Birmingham	AL	20183202
3291	Wings Plus Phillips Dr	18 Phillips Drive	Midfield	AL	20181107
10256	Wings R King 1St Avenue North	6805 1St Avenue North	Birmingham	AL	Pending
8679	Wings R King 31St Street S W	1500 31St Street S W	Birmingham	AL	20183738
8797	Wings R King Beacon Drive	5429 Beacon Drive	Birmingham	AL	Pending
7327	Wings R King East Lake Blvd	3833 East Lake Blvd	Birmingham	AL	20183050
11451	Wings R Kings Arkedelphia Road	1137 Arkedelphia Road	Birmingham	AL	20183973
7331	Wings Sports Grill- Patton Creek	4445 Creekside Ave	Hoover	AL	20173036
889	Winn Dixie #405 Bess Rd	2220 Bessemer Road	Birmingham	AL	20180433
888	Winn Dixie #435 Montevallo Rd	4476 Montevallo Rd	Birmingham	AL	20180431

FSFID	FSFNAME	FSFADDRESS	FSFCITY	FSFSTATE	PERMITNO
890	Winn Dixie #458 Decatur Hwy	1721 Decatur Highway	Fultondale	AL	20180427
891	Winn Dixie #461 Main St	465 Main St	Trussville	AL	20180434
892	Winn Dixie #500 Centerpoint Rd	4701 Centerpoint Rd	Pinson	AL	20180430
893	Winn Dixie #517 Cross Haven Dr	3925 Cross Haven Dr	Birmingham	AL	20180432
884	Winn Dixie #595 Morgan Rd	2910 Morgan Rd	Bessemer	AL	20180428
8651	Wintzell's Oyster House	3339 Lowery Parkway	Fultondale	AL	20183725
532	Wok Cuisine (PPS)	3039 Allison Bonnet Dr	Hueytown	AL	20180117
7757	Wok Express	3150 Overton Road	Birmingham	AL	20183275
10165	Woodburys Food for the Soul Catering	113 12Th Street North	Birmingham	AL	Pending
8618	Woodland Park Christian Learning Center	1800 Martin Luther King Jr Dr	Birmingham	AL	Pending
8644	Woodlawn Cycle Cafe	5530 1St Avenue South	Birmingham	AL	Pending
3414	Woodlawn High School	5620 1st Ave N	Birmingham	AL	20182587
7233	Woodrow Hall	5504 1st Avenue N	Birmingham	AL	20173074
3957	Woodward Shell Inc.	5430 Woodward Road	Midfield	AL	20181123
8150	World of Wings	1000 14Th Street South	Birmingham	AL	20183490
7271	Wylam K-8 School	701 Erie Street	Wylam	AL	20183193
11495	Wylam Mini Mart	4800 8Th Avenue	Wylam	AL	Pending
8979	Xclusive Lounge & Night Club	930 5Th Avenue North	Birmingham	AL	Pending
780	Yehman Caribbean Restaurant	1623 4th Ave. N	Birmingham	AL	20160270
7869	Yellow Bicycle Catering	195 Vulcan Road	Homewood	AL	20183429
8581	Yemens Kabob House	5005 Richard Arrington Bldv No	Birmingham	AL	Pending
8356	Yo' Mama's Restaurant	2328 2nd Ave N	Birmingham	AL	20173570
1545	Yoe Express	1919 28th Ave S	Homewood	AL	20181225
7353	Yogurt Mountain Cahaba Village Plaza	3000 Cahaba Village Plaza	Mountain Brook	AL	EXEMPT
7786	Yogurt Mountain Gadsden Hwy	1644 Gadsden Highway	Trussville	AL	EXEMPT
8314	Yogurt Mountain Gardendale	521 Fieldstown Road	Gardendale	AL	EXEMPT
10081	Your Pie	3735 Corporate Woods Drive	Birmingham	AL	Pending
7877	YoYo Donuts	1919 28th Avenue South	Homewood	AL	20183350
5/22/1909	Yu Ki Japanese Restaurant	2760 John Hawkins Pky	Hoover	AL	20181128
6201	Yu's Garden Chinese Restaurant	7268 Gasden Hwy	Trussville	AL	20183039
10318	Yum Ya I Thia	2131 7Th Avenue South	Birmingham	AL	Pending
7381	YWCA Interfaith Shelter	5916 1st Avenue South	Birmingham	AL	20183096
8069	Z N Mart	1200 14 Street South	Bessemer	AL	20173433
6080	Z's Restaurant	104 17Th Street North	Birmingham	AL	EXEMPT
11467	Zaties Southern Cuisine	1805 Centerpoint Pkwy	Birmingham	AL	20183975
3434	Zaxbys #676 Bell Hill Rd	4815 Bell Hill Rd	Bessemer	AL	20182197
3432	Zaxbys Academy Dr	804 Academy Dr	Bessemer	AL	20181130
6740	Zaxbys Allison Bonnett Mem Dr	2880 Allison Bonnett Mem Dr	Hueytown	AL	20183086
8439	Zaxbys Bearden Ct	3201 Bearden Court	Vestavia	AL	20183642
5120	Zaxbys John Hawkins Pkwy	2735 John Hawkins Parkway	Birmingham	AL	20182397
7272	Zaxbys Montclair Rd	1548 Montclair Road	Birmingham	AL	20183045
10291	Zaxbys Montgomery Hwy	1304 Montgomery Hwy	Vestavia Hills	AL	20183901
10290	Zaxbys Morris Ave	1725 Morris Avenue	Fultondale	AL	20183902
133	Zaxbys Morrow Rd	3270 Morrow Road	Birmingham	AL	20180512
10297	Zaxbys Odum Rd	885 Odum Road	Gardendale	AL	20183903
1783	Zaxbys Palisades Blvd	282 Palisades Blvd	Birmingham	AL	20181721
3433	Zaxbys Trussville Crossings Blvd	5881 Trussville Crossings Blvd	Birmingham	NULL	20181129
8641	Zime	1150 10Th Ave So	Birmingham	AL	Pending
3437	Zoes Kitchen #100 5th Ave No	1819 5th Ave N	Birmingham	AL	20181133
1784	Zoes Kitchen #103 Summit Blvd	323 Summit Blvd	Birmingham	AL	20181131
1785	Zoes Kitchen #104 Country Club Park	225 Country Club Park	Mountain Brook	AL	20181132
468	Zoes Kitchen #106 Main St	180 Main St	Hoover	AL	20180543
3438	Zoes Kitchen #110 29th Ave So	1830 29th Ave S	Homewood	NULL	20181176
7812	Zoes Kitchen #135 Montgomery Hwy	700 Montgomery Highway	Vestavia Hills	AL	20183379
8969	Zong's Goodfreinds Chinese & Seafood LLC	1720 Dennison Avenuw S W	Birmingham	AL	20183898
8690	Zula's Cafe	2125 Higland Avenue	Birmingham	AL	Pending
851	Zydeco	2001 15th Ave S	Birmingham	AL	EXEMPT

Appendix H High Frequency FOG-Related Line Maintenance Locations

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BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
CAH	4018	GP004018-027652	MH004018-068627-127	MH004018-068676-126	8	DUCTILE_IRON	251.09
CAH	4018	GP004018-027680	MH004018-068923-172	MH004018-069022-171	8	DUCTILE_IRON	213.71
CAH	4018	GP004018-027776	MH004018-069697-014	MH004018-069749-013	10	CLAY	251.05
CAH	4018	GP004018-027778	MH004018-069743-021	MH004018-069779-012	10	CIP/DIP	396.40
CAH	4018	GP004018-340650	MH004018-305672-0226	MH004018-305671-0225	10	DUCTILE_IRON	117.00
CAH	4018	GP004018-027693	MH004018-069090-167	MH004018-069133-163	8	DUCTILE_IRON	214.95
CAH	4018	GP004018-036386	MH004018-069850-009	MH004018-069878-008	18	CIP/DIP	102.62
CAH	4018	GP004018-027662	MH004018-068680-175	MH004018-068760-174	8	CIP	172.80
CAH	4018	GP004018-027682	MH004018-068973-169	MH004018-069049-168	8	DUCTILE_IRON	216.99
CAH	4018	GP004018-027655	MH004018-068676-126	MH004018-068707-125	8	DUCTILE_IRON	258.78
CAH	4018	GP004018-036388	MH004018-069908-003	MH004018-070005-002	18	CIP/DIP	427.85
CAH	4018	GP004018-027678	MH004018-068876-122	MH004018-068939-121	8	DUCTILE_IRON	114.50
CAH	4018	GP004018-027784	MH004018-069834-059	MH004018-069815-058	10	DUCTILE_IRON	182.46
CAH	4018	GP004018-365287	MH004018-069815-058	MH004018-305674-0227	8	DUCTILE_IRON	76.33
CAH	4018	GP004018-027779	MH004018-069749-013	MH004018-069779-012	10	IRON	120.59
CAH	4018	GP004018-027658	MH004018-068577-099	MH004018-068731-096	10	IRON	386.55
CAH	4018	GP004018-027656	MH004018-068606-129	MH004018-068716-124	8	DUCTILE_IRON	280.83
CAH	4018	GP004018-027666	MH004018-068769-095	MH004018-068803-094	8	IRON	71.38
CAH	4018	GP004018-340647	MH004018-305669-0223	MH004018-069917-053	10	DUCTILE_IRON	251.99
CAH	4018	GP004018-027664	MH004018-068731-096	MH004018-068769-095	8	CLAY	95.22
CAH	4018	GP004018-027660	MH004018-068732-098	MH004018-068700-097	8	CLAY	90.11
CAH	4018	GP004018-027657	MH004018-068707-125	MH004018-068716-124	8	DUCTILE_IRON	310.83
CAH	4018	GP004018-027737	MH004018-069478-040	MH004018-069486-039	10	DUCTILE_IRON	108.51
CAH	4018	GP004018-027740	MH004018-069486-039	MH004018-069501-038	10	DUCTILE_IRON	131.06
CAH	4018	GP004018-340648	MH004018-305670-0224	MH004018-305669-0223	10	DUCTILE_IRON	293.34
CAH	4018	GP004018-027677	MH004018-068838-173	MH004018-068923-172	8	DUCTILE_IRON	213.72
CAH	4018	GP004018-027667	MH004018-068716-124	MH004018-068816-123	8	DUCTILE_IRON	202.44
CAH	4018	GP004018-036366	MH004018-069460-041	MH004018-069478-040	8	CLAY	85.80
CAH	4018	GP004018-340649	MH004018-305671-0225	MH004018-305670-0224	10	DUCTILE_IRON	306.20
CAH	4018	GP004018-027647	MH004018-068573-128	MH004018-068627-127	8	DUCTILE_IRON	154.89
CAH	4018	GP004018-027676	MH004018-068803-094	MH004018-068912-079	8	IRON	298.19
CAH	4018	GP004018-027687	MH004018-069067-170	MH004018-069090-167	8	CIP	224.01
CAH	4018	GP004018-027673	MH004018-068816-123	MH004018-068876-122	8	DUCTILE_IRON	159.06
CAH	4018	GP004018-027675	MH004018-068843-080	MH004018-068912-079	8	DUCTILE_IRON	197.15
CAH	4018	GP004018-027694	MH004018-069117-077	MH004018-069150-076	8	IRON	244.22
CAH	4018	GP004018-027788	MH004018-069812-011	MH004018-069840-010A	12	CIP/DIP	194.33
CAH	4018	GP004018-028000	MH004018-069917-053	MH004018-069878-008	10	DUCTILE_IRON	271.45
CAH	4018	GP004018-027690	MH004018-069040-078	MH004018-069117-077	8	IRON	331.19
CAH	4018	GP004018-027782	MH004018-069779-012	MH004018-069812-011	12	CIP/DIP	170.42
CAH	4018	GP004018-036381	MH004018-069847-010	MH004018-069850-009	18	CIP/DIP	21.51
CAH	4018	GP004018-340651	MH004018-305674-0227	MH004018-305672-0226	10	DUCTILE_IRON	102.72
CAH	4018	GP004018-027659	MH004018-068700-097	MH004018-068731-096	8	CLAY	308.75
CAH	4018	GP004018-036387	MH004018-069878-008	MH004018-069908-003	18	CIP/DIP	125.49
CAH	4018	GP004018-358248	MH004018-323909-0233	MH004018-305675-0228	10	DUCTILE_IRON	134.33
CAH	4018	GP004018-027669	MH004018-068760-174	MH004018-068838-173	8	CIP	171.17
CAH	4018	GP004018-027686	MH004018-069049-168	MH004018-069090-167	8	DUCTILE_IRON	160.79
CAH	4018	GP004018-027684	MH004018-069022-171	MH004018-069067-170	8	CIP	237.98
CAH	4018	GP004018-340652	MH004018-305675-0228	MH004018-305674-0227	10	DUCTILE_IRON	233.97
CAH	4018	GP004018-036380	MH004018-069840-010A	MH004018-069847-010	12	CIP/DIP	48.03
CAH	4018	GP004018-438567	MH004018-068939-121	MH004018-324549-0252	8	DUCTILE_IRON	100.27
CAH	4018	GP004018-355691	MH004018-321355-0231	MH004018-305677-0230	8	IRON_PVC	87.82
CAH	4018	GP004018-340654	MH004018-305676-0229	MH004018-305670-0224	8	IRON_PVC	214.91
CAH	4018	GP004018-340655	MH004018-305677-0230	MH004018-305676-0229	8	IRON_PVC	92.23
CAH	4018	GP004018-027681	MH004018-068912-079	MH004018-427687-078A	8	IRON	208.37
CAH	4018	GP004018-475695	MH004018-427687-078A	MH004018-069040-078	8	IRON	123.00
CAH	5006	GP005006-029488	MH005006-063892-080J	MH005006-063626-080B	8	CLAY	379.73
CAH	5006	GP005006-029469	MH005006-062988-070	MH005006-062993-069	8	CIP	82.10
CAH	5006	GP005006-029470	MH005006-062993-069	MH005006-063027-068	8	CIP	57.85
CAH	5006	GP005006-029490	MH005006-063429-080	MH005006-063402-076	8	CIP	39.30
CAH	5006	GP005006-035270	MH005006-063404-077	MH005006-063402-076	8	CLAY	199.43
CAH	5006	GP005006-029518	MH005006-064342-080M	MH005006-064225-080K	6	CLAY	359.03
CAH	5006	GP005006-029489	MH005006-063626-080B	MH005006-063498-080A	8	CLAY	168.34
CAH	5006	GP005006-029477	MH005006-063402-076	MH005006-063244-075	8	CLAY	221.58
CAH	5006	GP005006-029276	MH005006-062757-059	MH005006-062682-058	8	CIP	222.34
CAH	5006	GP005006-034759	MH005006-063468-077B	MH005006-063404-077	4	IRON	203.93
CAH	5006	GP005006-029471	MH005006-063027-068	MH005006-062934-067	8	CIP	213.15
CAH	5006	GP005006-029472	MH005006-062934-067	MH005006-062827-066	8	CIP	221.81
CAH	5006	GP005006-029512	MH005006-064225-080K	MH005006-063892-080J	8	CLAY	402.41
CAH	5006	GP005006-035269	MH005006-063498-080A	MH005006-063429-080	8	CLAY	189.60
CAH	5009	GP005009-029291	MH005009-064536-084	MH005009-064332-083	8	CIP/DIP	365.60

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
CAH	5009	GP005009-029290	MH005009-064604-084A	MH005009-064536-084	8	DUCTILE_IRON	109.38
FIV	2002	GP002002-207448	MH002000-184958-1119	MH002002-184957-0086	8	DUCTILE_IRON	360.26
FIV	2002	GP002002-055271	MH002002-013423-033	MH002002-013421-032	8	CLAY	200.32
FIV	2002	GP002002-055270	MH002002-013427-033A	MH002002-013423-033	8	CLAY	244.57
FIV	2002	GP002002-018417	MH002002-013238-038	MH002002-424386-036A	8	DIP/CLAY	372.20
FIV	2002	GP002002-018416	MH002002-013094-040	MH002002-013238-038	8	CLAY	332.68
FIV	2002	GP002002-018160	MH002002-012965-042	MH002002-013094-040	8	CLAY	323.92
FIV	2002	GP002002-018166	MH002002-013095-041	MH002002-013094-040	8	DIP/CLAY	386.59
FIV	2002	GP002002-018163	MH002002-012956-049	MH002002-012965-042	8	CLAY	400.22
FIV	2002	GP002002-018162	MH002002-012964-050	MH002002-012965-042	8	CLAY	399.79
FIV	2002	GP002002-018151	MH002002-013153-037	MH002002-013247-036	8	CLAY	188.41
FIV	2002	GP002002-473059	MH002002-424386-036A	MH002002-013247-036	8	CLAY	77.03
FIV	2002	GP002002-018415	MH002002-013421-032	MH002002-013458-021	8	CLAY	70.26
FIV	2002	GP002002-207134	MH002002-184650-0071	MH002002-184651-0062	8	DUCTILE_IRON	135.53
FIV	2002	GP002002-055753	MH002002-013098-043	MH002002-013094-040	8	CLAY	197.53
FIV	2002	GP002002-055755	MH002002-013101-044	MH002002-013098-043	8	CLAY	266.62
FIV	2002	GP002002-018165	MH002002-013244-039	MH002002-013238-038	8	CLAY	399.77
FIV	2002	GP002002-018152	MH002002-013429-034	MH002002-013427-033A	8	CLAY	176.80
FIV	2002	GP002002-055272	MH002002-013247-036	MH002002-013340-035	8	CLAY	175.09
FIV	2002	GP002002-055273	MH002002-013340-035	MH002002-013421-032	8	DIP/CLAY	151.99
FIV	2002	GP002002-207456	MH002002-184960-0082	MH002002-184965-0081	8	DUCTILE_IRON	229.80
FIV	2002	GP002002-207455	MH002002-184965-0081	MH002002-184961-0080	8	DUCTILE_IRON	237.56
FIV	2002	GP002002-207454	MH002002-184961-0080	MH002002-184962-0070	8	DUCTILE_IRON	147.56
FIV	2002	GP002002-207453	MH002002-184962-0070	MH002002-184963-0069	8	DUCTILE_IRON	181.15
FIV	2002	GP002002-207452	MH002002-184963-0069	MH002002-184966-0068	8	DUCTILE_IRON	232.24
FIV	2002	GP002002-207451	MH002002-184966-0068	MH002002-184964-0067	8	DUCTILE_IRON	232.41
FIV	2002	GP002002-207450	MH002002-184964-0067	MH002002-184645-0057	8	DUCTILE_IRON	20.43
FIV	2002	GP002002-207129	MH002002-184646-0058	MH002002-184645-0057	8	DUCTILE_IRON	324.71
FIV	2002	GP002002-207130	MH002002-184647-0059	MH002002-184646-0058	8	DUCTILE_IRON	78.50
FIV	2002	GP002002-207131	MH002002-184644-0060	MH002002-184647-0059	8	DUCTILE_IRON	247.83
FIV	2002	GP002002-207132	MH002002-184643-0061	MH002002-184644-0060	8	DUCTILE_IRON	281.14
FIV	2002	GP002002-207133	MH002002-184651-0062	MH002002-184643-0061	8	DUCTILE_IRON	164.00
FIV	2002	GP002002-207446	MH002002-184956-0085	MH002002-184643-0061	8	DUCTILE_IRON	401.10
FIV	2002	GP002002-207447	MH002002-184957-0086	MH002002-184956-0085	8	DUCTILE_IRON	191.36
FIV	2002	GP002002-207144	MH002002-184662-0063	MH002002-184643-0061	8	DUCTILE_IRON	279.72
FIV	2002	GP002002-207145	MH002002-184661-0064	MH002002-184662-0063	8	DUCTILE_IRON	104.38
FIV	2002	GP002002-207146	MH002002-184660-0065	MH002002-184661-0064	8	DUCTILE_IRON	201.77
FIV	2002	GP002002-207147	MH002002-184659-0066	MH002002-184660-0065	8	DUCTILE_IRON	130.87
FIV	2003	GP002003-055310	MH002003-429306-028A3	MH002003-429305-028A2	8	UNK	290.00
FIV	2003	GP002003-055304	MH002003-012968-028A	MH002003-013076-028	8	CIP	291.68
FIV	2005	GP002005-017901	MH002005-012619-077Q	MH002005-012618-077P	8	DUCTILE_IRON	289.81
FIV	2005	GP002005-017902	MH002005-012618-077P	MH002005-012571-077O	8	IRON	243.23
FIV	2005	GP002005-017903	MH002005-012571-077O	MH002005-012552-077N	8	IRON	61.20
FIV	2005	GP002005-018428	MH002005-012552-077N	MH002005-012553-077M	8	DUCTILE_IRON	221.83
FIV	2005	GP002005-018427	MH002005-012554-077L	MH002005-012555-077K	8	DUCTILE_IRON	30.28
FIV	2005	GP002005-018429	MH002005-012553-077M	MH002005-012554-077L	8	DUCTILE_IRON	79.56
FIV	2018	GP002018-016749	MH002018-007248-052C	MH002018-007277-052B	8	CIP	117.10
FIV	2018	GP002018-016745	MH002018-007016-052G	MH002018-007098-052F	8	CIP	145.81
FIV	2018	GP002018-016746	MH002018-007098-052F	MH002018-007156-052E	8	CIP	158.84
FIV	2018	GP002018-055688	MH002018-006373-052O	MH002018-006462-052N	8	CIP	114.17
FIV	2018	GP002018-016748	MH002018-007196-052D	MH002018-007248-052C	8	CIP	123.12
FIV	2018	GP002018-055689	MH002018-006462-052N	MH002018-006564-052M	8	CIP	137.36
FIV	2018	GP002018-055696	MH002018-006896-052I	MH002018-007016-052G	8	CLAY	280.81
FIV	2018	GP002018-389928	MH002018-352390-052I4	MH002018-352389-052I3	6	PVC	336.04
FIV	2018	GP002018-055687	MH002018-006265-052P	MH002018-006373-052O	8	CIP	180.58
FIV	2018	GP002018-055695	MH002018-006803-052K	MH002018-006896-052I	8	CIP	240.63
FIV	2018	GP002018-107723	MH002018-098348-052I2	MH002018-098347-052I1	8	CIP	94.13
FIV	2018	GP002018-055694	MH002018-006664-052T	MH002018-006803-052K	8	CIP	274.66
FIV	2018	GP002018-107722	MH002018-006765-052J	MH002018-098348-052I2	8	CIP	151.39
FIV	2018	GP002018-107724	MH002018-006610-052L	MH002018-098350-052L1	8	CIP	186.10
FIV	2018	GP002018-107721	MH002018-098347-052I1	MH002018-006896-052I	8	CLAY	156.89
FIV	2018	GP002018-107725	MH002018-098350-052L1	MH002018-006765-052J	8	CIP	199.44
FIV	2018	GP002018-055690	MH002018-006564-052M	MH002018-006610-052L	8	CIP	186.24
FIV	2018	GP002018-389927	MH002018-352389-052I3	MH002018-098347-052I1	8	CLAY	176.00
FIV	2018	GP002018-016747	MH002018-007156-052E	MH002018-007196-052D	8	CIP	83.69
FIV	2025	GP002025-012760	MH002025-007972-061	MH002025-007966-060	8	CLAY	190.99
FIV	2025	GP002025-012995	MH002025-007964-063	MH002025-007960-062	8	CLAY	311.30
FIV	2025	GP002025-012996	MH002025-007769-067	MH002025-007964-063	8	CLAY	316.10
FIV	2025	GP002025-012987	MH002025-007777-069	MH002025-007769-067	8	CLAY	173.73
FIV	2025	GP002025-012758	MH002025-007960-062	MH002025-007966-060	8	DUCTILE_IRON	154.65

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
FIV	2025	GP002025-012986	MH002025-007730-068	MH002025-007769-067	8	CLAY	71.23
FIV	2026	GP002026-013084	MH002026-005087-075	MH002026-004983-074	8	CLAY	239.37
FIV	2026	GP002026-013144	MH002026-004807-094	MH002026-004806-093	8	CLAY	322.49
FIV	2026	GP002026-013085	MH002026-005191-076	MH002026-005087-075	8	CLAY	249.41
FIV	2026	GP002026-013091	FT002026-013559	MH002026-005191-076	6	CLAY	238.67
FIV	2026	GP002026-013165	MH002026-004994-099	MH002026-004943-098	8	IRON	142.47
FIV	2026	GP002026-114755	FT002026-013557	MH002026-004983-074	8	PVC	61.68
FIV	2026	GP002026-013166	MH002026-005002-101	MH002026-004994-099	8	CLAY	174.23
FIV	2026	GP002026-013163	MH002026-004943-098	MH002026-004886-097	8	CLAY	150.64
FIV	2026	GP002026-013236	MH002026-004806-093	MH002026-004629-092	8	CLAY	359.15
FIV	2026	GP002026-013145	MH002026-004935-094A	MH002026-004807-094	8	CLAY	365.34
FIV	2029	GP002029-013803	MH002036-384709-005A	MH002029-010449-298	8	DUCTILE_IRON	271.96
FIV	2029	GP002029-427367	MH002036-010387-005	MH002036-384709-005A	8	CLAY	57.00
FIV	2029	GP002029-013723	MH002029-012331-082	MH002029-012516-081	8	CLAY	344.13
FIV	2029	GP002029-013707	MH002029-012115-084	MH002029-012224-083	8	CLAY	193.22
FIV	2029	GP002029-013696	MH002029-011790-086	MH002029-011891-085	8	CLAY	176.34
FIV	2029	GP002029-013698	MH002029-011837-101	MH002029-011949-100	8	CLAY	245.38
FIV	2029	GP002029-013802	MH002029-010420-294	MH002029-010428-293	8	CIP	222.99
FIV	2029	GP002029-013463	MH002029-010449-298	MH002029-010541-291	8	CIP	365.93
FIV	2029	GP002029-013699	MH002029-011891-085	MH002029-012115-084	8	CIP	401.48
FIV	2029	GP002029-013522	MH002029-012241-097	MH002029-012338-096	8	CLAY	200.74
FIV	2029	GP002029-013517	MH002029-012177-098	MH002029-012241-097	8	CLAY	88.40
FIV	2029	GP002029-013515	MH002029-012125-099	MH002029-012177-098	8	CLAY	106.91
FIV	2029	GP002029-013529	MH002029-012624-088	MH002029-012528-087	8	CIP	506.12
FIV	2029	GP002029-016422	MH002029-010501-297	MH002029-010417-296	8	CIP	149.91
FIV	2029	GP002029-016421	MH002029-010417-296	MH002029-010420-294	8	CIP	398.40
FIV	2029	GP002029-013712	MH002029-012224-083	MH002029-012331-082	8	CLAY	197.85
FIV	2029	GP002029-013801	MH002029-010351-295	MH002029-010420-294	8	CLAY	150.77
FIV	2029	GP002029-013527	MH002029-012528-087	MH002029-012516-081	10	CLAY	191.09
FIV	2029	GP002029-016423	MH002036-010294-001	MH002029-010417-296	8	CIP	411.45
FIV	2029	GP002029-013701	MH002029-011949-100	MH002029-012125-099	8	CLAY	421.83
FIV	2030	GP002030-013994	MH002030-011556-017	MH002030-011429-016	8	CLAY	217.84
FIV	2030	GP002030-013919	MH002030-011661-021	MH002030-011469-020	8	CLAY	293.19
FIV	2030	GP002030-014001	MH002030-011699-018	MH002030-011556-017	8	CLAY	258.55
FIV	2030	GP002030-013915	MH002030-011429-016	MH002030-011438-010	8	CLAY	258.94
FIV	2030	GP002030-013987	MH002030-011290-011	MH002030-011438-010	8	CIP	183.95
FIV	2030	GP002030-094520	FT002030-007479	MH002030-011469-020	8	PVC	169.70
FIV	2030	GP002030-013988	MH002030-011474-023	MH002030-011469-020	8	CLAY	221.38
FIV	2030	GP002030-013918	MH002030-011438-010	MH002030-011478-008	8	CIP	221.04
FIV	2030	GP002030-013991	MH002030-011478-008	MH002030-011530-007A	8	CIP	213.19
FIV	2030	GP002030-013993	MH002030-011530-007A	MH002030-011549-007	8	IRON	30.40
FIV	2030	GP002030-013998	MH002030-011621-009	MH002030-011478-008	8	CLAY	249.27
FIV	2030	GP002030-013695	FT002030-000198	MH002029-011837-101	0	UNK	150.00
FIV	2030	GP002030-014002	MH002030-107907-009A	MH002030-011621-009	8	CLAY	144.32
FIV	2030	GP002030-013920	MH002030-011779-022	MH002030-011661-021	8	CLAY	206.08
FIV	2030	GP002030-013916	MH002030-011449-019	MH002030-011429-016	8	CLAY	279.68
FIV	2030	GP002030-013917	MH002030-011469-020	MH002030-011449-019	8	CLAY	349.46
FIV	2031	GP002031-038094	MH002031-015113-169	MH002031-015115-168	8	CLAY	93.95
FIV	2031	GP002031-038093	MH002031-015115-168	MH002031-015153-167	8	CLAY	110.91
FIV	2031	GP002031-021143	MH002031-015166-167A	MH002031-015153-167	8	CLAY	163.79
FIV	2031	GP002031-021142	MH002031-015153-167	MH002031-015179-166	8	CLAY	95.33
FIV	2034	GP002034-014503	MH002034-008714-050	MH002034-008797-048	8	CONCRETE	140.11
FIV	2034	GP002034-014496	MH002034-008207-072	MH002034-008439-070	8	CIP	413.41
FIV	2034	GP002034-014542	MH002034-008329-069A	MH002034-008437-069	8	CIP	166.27
FIV	2034	GP002034-014544	MH002034-008437-069	MH002034-008441-068	8	CONCRETE	176.54
FIV	2034	GP002034-014552	MH002034-008783-049	MH002034-008797-048	8	CIP	230.12
FIV	2034	GP002034-014553	MH002034-008797-048	MH002034-008799-047	8	CIP	338.30
FIV	2034	GP002034-014495	MH002034-008439-070	MH002034-008437-069	8	CONCRETE	159.45
FIV	2036	GP002036-014875	MH002036-010221-002	MH002036-010294-001	8	CIP	388.97
FIV	2036	GP002036-014872	MH002036-010224-003	MH002036-010221-002	8	CIP	213.39
FIV	2036	GP002036-014884	MH002036-010424-006	MH002036-010387-005	8	CLAY	161.97
FIV	2042	GP002042-006149	MH002042-006262-089	MH002042-006329-088	8	CLAY	146.19
FIV	2042	GP002042-006146	MH002042-006028-092	MH002042-006082-091	8	CLAY	121.18
FIV	2042	GP002042-006147	MH002042-006082-091	MH002042-006162-090	8	CLAY	139.93
FIV	2042	GP002042-006148	MH002042-006162-090	MH002042-006262-089	8	CLAY	172.31
FIV	2042	GP002042-006144	MH002042-005959-095	MH002042-005989-094	8	CLAY	75.52
FIV	2042	GP002042-006145	MH002042-005989-094	MH002042-006028-092	8	CLAY	102.33
FIV	2042	GP002042-006143	MH002042-005889-096	MH002042-005959-095	8	CLAY	254.64
FIV	2043	GP002043-006509	MH002043-003760-131	MH002043-003796-130	8	CLAY	100.15
FIV	2043	GP002043-006316	MH002043-003973-139	MH002043-003972-135	8	CLAY	143.34

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
FIV	2043	GP002043-006516	MH002043-003964-129	MH002043-003974-128	8	CLAY	172.52
FIV	2043	GP002043-026772	MH002043-003762-132	MH002043-003760-131	8	CLAY	222.80
FIV	2043	GP002043-006515	MH002043-003972-135	MH002043-003974-128	8	CLAY	169.65
FIV	2043	GP002043-006514	MH002043-003971-140	MH002043-003973-139	8	CLAY	348.61
FIV	2043	GP002043-006511	MH002043-003796-130	MH002043-003964-129	8	CLAY	403.17
FIV	2044	GP002044-006667	MH002044-005759-008	MH002044-005764-007	8	CLAY	265.20
FIV	2044	GP002044-006666	MH002044-005758-010	MH002044-005759-008	8	CLAY	223.83
FIV	2044	GP002044-075931	MH002044-073511-006	MH002044-005750-005	8	CLAY	31.71
FIV	2044	GP002044-075930	MH002044-005764-007	MH002044-073511-006	8	CLAY	143.05
FIV	2044	GP002044-006662	MH002044-005702-015	MH002044-005737-014	8	CLAY	68.15
FIV	2044	GP002044-006663	MH002044-005737-014	MH002044-005750-005	8	CLAY	78.81
FIV	2044	GP002044-006654	MH002044-005527-016A	MH002044-430336-016A1	8	CLAY	246.43
FIV	2044	GP002044-006661	MH002044-005592-016	MH002044-005702-015	8	CLAY	372.11
PRU	10001	GP010001-010260	MH010001-014221-104	MH010001-014143-102	12	DUCTILE_IRON	299.26
PRU	10001	GP010001-010261	MH010001-014243-105	MH010001-014221-104	12	DUCTILE_IRON	79.29
PRU	10001	GP010001-010189	MH010001-012291-079	MH010001-012421-078	8	CLAY	315.06
PRU	10001	GP010001-009590	MH010001-012084-081	MH010001-012158-080	8	CLAY	228.57
PRU	10001	GP010001-009589	MH010001-011996-082	MH010001-012084-081	8	CLAY	233.71
PRU	10001	GP010001-010190	MH010001-012158-080	MH010001-012291-079	8	CLAY	241.54
PRU	10001	GP010001-009591	MH010001-012421-078	MH010001-012464-077	8	CLAY	224.47
PRU	10004	GP010004-010147	MH010004-017120-033A	MH010004-017085-032	8	DUCTILE_IRON	118.14
PRU	10004	GP010004-010146	MH010004-017158-033	MH010004-017120-033A	8	CIP	100.82
PRU	10004	GP010004-009964	MH010004-017147-034	MH010004-017158-033	8	CLAY	70.05
PRU	10004	GP010004-009963	MH010004-017153-035	MH010004-017147-034	8	CIP	214.86
PRU	10005	GP010005-009848	MH010005-008303-057A	MH010005-008304-057	8	CLAY	175.10
PRU	10005	GP010005-009847	MH010005-008432-058	MH010005-008303-057A	8	CLAY	234.26
PRU	10005	GP010005-009850	MH010005-008478-055	MH010005-008433-054	8	CLAY	51.08
PRU	10005	GP010005-009849	MH010005-008304-057	MH010005-008433-054	8	CLAY	205.57
SHD	9000	GP009000-093464	MH009000-086799-039	MH009000-086798-038	8	DUCTILE_IRON	58.40
SHD	9000	GP009000-093465	MH009000-086800-040	MH009000-086799-039	8	DUCTILE_IRON	302.25
SHD	9003	GP009003-407527	FT009003-088150	MH009003-080851-065	8	CLAY	6.00
SHD	9003	GP009003-085504	MH009003-081027-051B	MH009003-081007-051A	8	CLAY	160.61
SHD	9003	GP009003-111979	MH009003-080972-082	MH009003-101880-081A	8	IRON	124.83
SHD	9003	GP009003-111978	MH009003-101879-080A	MH009003-080847-080	8	DUCTILE_IRON	333.11
SHD	9003	GP009003-078877	MH009003-101878-079A	MH009003-080930-079	8	DUCTILE_IRON	186.79
SHD	9003	GP009003-086184	MH009003-081056-011	MH009003-081053-010	8	CLAY	265.19
SHD	9003	GP009003-078822	MH009003-080800-059	MH009003-080797-058	8	CLAY	12.54
SHD	9003	GP009003-085505	FT009003-006322	MH009003-081027-051B	8	CLAY	168.07
SHD	9003	GP009003-090206	MH009003-080847-080	MH009003-080845-075	8	DUCTILE_IRON	320.10
SHD	9003	GP009003-078878	FT009003-006317	MH009003-080955-096	0	UNK	106.68
SHD	9003	GP009003-078870	MH009003-080916-049	MH009003-080867-048	8	CLAY	299.28
SHD	9003	GP009003-111980	MH009003-101880-081A	MH009003-080965-081	8	DUCTILE_IRON	216.82
SHD	9003	GP009003-078823	MH009003-080797-058	MH009003-080790-055	8	CLAY	169.43
SHD	9003	GP009003-078813	MH009003-080954-094	MH009003-080946-092	8	CLAY	105.12
SHD	9003	GP009003-090208	MH009003-080982-083	MH009003-080972-082	8	IRON	46.91
SHD	9003	GP009003-078855	MH009003-080844-064	MH009003-080829-062	8	CLAY	104.26
SHD	9003	GP009003-085503	MH009003-081007-051A	MH009003-080999-051	8	CLAY	204.59
SHD	9003	GP009003-078872	MH009003-080782-056	MH009003-080790-055	8	IRON	33.14
SHD	9003	GP009003-078818	MH009003-080896-087	MH009003-080901-086	8	DUCTILE_IRON	98.10
SHD	9003	GP009003-078817	MH009003-080894-088	MH009003-080896-087	8	CLAY	126.98
SHD	9003	GP009003-078821	MH009003-080868-077	MH009003-080846-076	8	DUCTILE_IRON	182.72
SHD	9003	GP009003-078857	MH009003-080874-066	MH009003-080844-064	8	CLAY	225.60
SHD	9003	GP009003-111977	MH009003-080965-081	MH009003-101879-080A	8	DUCTILE_IRON	181.67
SHD	9003	GP009003-078853	MH009003-080829-062	MH009003-080816-061	8	CLAY	192.37
SHD	9003	GP009003-078815	MH009003-080918-090	MH009003-080888-089	8	CLAY	172.89
SHD	9003	GP009003-078856	MH009003-080851-065	MH009003-080844-064	8	CLAY	184.19
SHD	9003	GP009003-078850	MH009003-080930-079	MH009003-080900-078	8	DUCTILE_IRON	176.43
SHD	9003	GP009003-078852	MH009003-080816-061	MH009003-080804-060	8	CLAY	196.91
SHD	9003	GP009003-280817	MH009003-248394-084A	MH009003-080905-084	8	DUCTILE_IRON	34.60
SHD	9003	GP009003-090209	MH009003-080905-084	MH009003-080900-078	8	DUCTILE_IRON	176.72
SHD	9003	GP009003-078814	MH009003-080935-091	MH009003-080918-090	8	CLAY	128.74
SHD	9003	GP009003-078816	MH009003-080888-089	MH009003-080894-088	8	CLAY	399.32
SHD	9003	GP009003-078819	MH009003-080901-086	MH009003-080900-078	8	DUCTILE_IRON	23.26
SHD	9003	GP009003-078831	MH009003-080999-051	MH009003-080970-050	8	CLAY	141.75
SHD	9003	GP009003-078851	MH009003-080804-060	MH009003-080800-059	8	CLAY	231.74
SHD	9003	GP009003-078868	MH009003-080855-047	MH009003-080838-046	8	CLAY	112.27
SHD	9003	GP009003-078873	MH009003-080743-057	MH009003-080782-056	8	CLAY	164.43
SHD	9003	GP009003-088241	MH009003-081101-015	MH009003-081098-014	8	DUCTILE_IRON	9.30
SHD	9003	GP009003-090204	MH009003-080846-076	MH009003-080833-074	8	DUCTILE_IRON	162.55
SHD	9003	GP009003-086185	MH009003-081098-014	MH009003-081057-012	8	CLAY	244.54

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
SHD	9003	GP009003-086186	MH009003-081057-012	MH009003-081056-011	8	CLAY	231.33
SHD	9003	GP009003-078812	MH009003-080979-095	MH009003-080954-094	8	CLAY	187.00
SHD	9003	GP009003-088240	MH009003-081160-015A	MH009003-081101-015	8	DUCTILE_IRON	313.01
SHD	9003	GP009003-078811	MH009003-080955-096	MH009003-080979-095	8	CLAY	316.74
SHD	9003	GP009003-090203	MH009003-080845-075	MH009003-080833-074	8	DUCTILE_IRON	236.79
SHD	9003	GP009003-078874	MH009003-080677-057A	MH009003-080743-057	8	CLAY	412.47
SHD	9003	GP009003-078871	MH009003-080970-050	MH009003-080916-049	8	CLAY	381.11
SHD	9003	GP009003-078849	MH009003-080946-092	MH009003-080894-088	8	CLAY	299.36
SHD	9003	GP009003-078869	MH009003-080867-048	MH009003-080855-047	8	CLAY	111.64
SHD	9003	GP009003-078854	MH009003-080822-063	MH009003-080829-062	8	CLAY	100.25
SHD	9003	GP009003-078820	MH009003-080900-078	MH009003-080868-077	8	DUCTILE_IRON	190.68
SHD	9003	GP009003-078848	MH009003-080944-093	MH009003-080946-092	8	CLAY	211.58
SHD	9004	GP009004-078881	MH009004-080761-001B	MH009004-080785-001A	12	CLAY	178.29
SHD	9004	GP009004-078880	MH009004-080785-001A	MH009004-080836-001	12	CLAY	379.43
SHD	9005	GP009005-078949	MH009005-079953-088	MH009005-080020-087	8	CLAY	354.09
SHD	9005	GP009005-078989	MH009005-080705-004	MH009005-080687-003	8	CLAY	156.21
SHD	9005	GP009005-079049	MH009005-101882-019A	MH009005-080689-019	8	CLAY	123.78
SHD	9005	GP009005-078927	MH009005-080795-024	MH009005-366152-022A1	8	CIP/DIP	198.00
SHD	9005	GP009005-078961	MH009005-080054-086	MH009005-080125-085	8	CLAY	233.78
SHD	9005	GP009005-078929	MH009005-080681-018	MH009005-080675-016	8	CLAY	395.63
SHD	9005	GP009005-078948	MH009005-080020-087	MH009005-080054-086	8	CLAY	163.14
SHD	9005	GP009005-078950	MH009005-079880-091	MH009005-079917-090	8	CLAY	146.74
SHD	9005	GP009005-079046	MH009005-080727-005A	MH009005-080722-005	8	CIP	153.03
SHD	9005	GP009005-078925	MH009005-080843-026	MH009005-080817-025	8	IRON	197.06
SHD	9005	GP009005-079043	FT009005-006301	MH009005-080705-004	8	CLAY	115.00
SHD	9005	GP009005-078959	MH009005-079937-089	MH009005-079953-088	8	IRON	51.27
SHD	9005	GP009005-078923	MH009005-080895-029	MH009005-080872-027	8	CLAY	155.51
SHD	9005	GP009005-078951	MH009005-079833-091A	MH009005-079880-091	8	CLAY	159.01
SHD	9005	GP009005-085744	MH009005-080927-029B	MH009005-080902-029A	8	DUCTILE_IRON	177.68
SHD	9005	GP009005-404971	MH009005-366152-022A1	MH009005-285189-022A	8	CIP/DIP	127.63
SHD	9005	GP009005-085746	MH009005-080928-029D	MH009005-080927-029B	8	IRON_PVC	177.38
SHD	9005	GP009005-079045	FT009005-006310	MH009005-080767-002	8	CLAY	172.99
SHD	9005	GP009005-085743	MH009005-080902-029A	MH009005-080895-029	8	DUCTILE_IRON	173.36
SHD	9005	GP009005-078917	MH009005-080694-020	MH009005-080689-019	8	CLAY	47.45
SHD	9005	GP009005-078943	MH009005-079917-090	MH009005-079937-089	8	IRON	29.91
SHD	9005	GP009005-078960	FT009005-006213	MH009005-079953-088	0	UNK	227.88
SHD	9005	GP009005-078988	MH009005-080767-002	MH009005-080720-001	8	CLAY	338.20
SHD	9005	GP009005-078991	MH009005-080665-006	MH009005-080687-003	8	CLAY	163.73
SHD	9005	GP009005-078999	MH009005-080675-016	MH009005-080647-015	8	CIP	260.60
SHD	9005	GP009005-078940	MH009005-426933-0138	MH009005-080694-020	8	CLAY	38.47
SHD	9005	GP009005-079002	MH009005-080737-005B	MH009005-080727-005A	8	CLAY	236.33
SHD	9005	GP009005-078928	MH009005-080748-022	MH009005-426933-0138	8	CLAY	280.01
SHD	9005	GP009005-079001	MH009005-080768-023	MH009005-080748-022	8	CLAY	170.00
SHD	9005	GP009005-079044	FT009005-006305	MH009005-080705-004	8	CLAY	131.34
SHD	9005	GP009005-085745	MH009005-080943-029C	MH009005-080927-029B	8	DUCTILE_IRON	75.97
SHD	9005	GP009005-078924	MH009005-080872-027	MH009005-080843-026	8	DUCTILE_IRON	198.42
SHD	9005	GP009005-078942	MH009005-080689-019	MH009005-080681-018	8	CLAY	174.55
SHD	9005	GP009005-078990	MH009005-080722-005	MH009005-080705-004	8	CIP	313.09
SHD	9005	GP009005-079047	FT009005-006308	MH009005-080722-005	8	CLAY	183.91
SHD	9005	GP009005-085747	MH009005-080951-029E	MH009005-080928-029D	8	PVC	201.33
SHD	9005	GP009005-078992	MH009005-080627-007	MH009005-080665-006	8	CLAY	408.23
SHD	9005	GP009005-320487	MH009005-285189-022A	MH009005-080748-022	8	CIP/DIP	115.00
SHD	9005	GP009005-078926	MH009005-080817-025	MH009005-080795-024	8	IRON	108.25
SHD	9006	GP009006-090558	MH009006-080059-080	MH009006-080128-079	12	CLAY	200.25
SHD	9006	GP009006-090559	MH009006-080058-081	MH009006-080059-080	12	CLAY	72.86
SHD	9006	GP009006-079113	MH009006-080193-070	MH009006-080210-066	12	CLAY	167.06
SHD	9006	GP009006-090557	MH009006-080128-079	MH009006-080154-078	12	CLAY	110.23
SHD	9006	GP009006-079118	MH009006-080210-066	MH009006-080244-062	12	IRON	329.64
SHD	9006	GP009006-090556	MH009006-080154-078	MH009006-080193-070	12	CIP	218.56
SHD	9006	GP009006-087676	MH009006-080057-072	MH009006-080193-070	8	CLAY	355.09
SHD	9008	GP009008-079416	MH009008-080962-051	MH009008-080961-050	8	CLAY	106.42
SHD	9008	GP009008-079377	MH009008-081208-004C	MH009008-081220-004B	8	DUCTILE_IRON	284.53
SHD	9008	GP009008-261923	MH009008-232690-486	MH009008-081151-485	8	CIP/DIP	19.39
SHD	9008	GP009008-090083	MH009008-080914-030A	MH009008-080922-030	10	DUCTILE_IRON	64.23
SHD	9008	GP009008-090082	MH009008-080885-035B	MH009008-080877-035	8	DUCTILE_IRON	70.79
SHD	9008	GP009008-090241	MH009008-080882-039	MH009008-080892-038	8	CIP	65.70
SHD	9008	GP009008-079376	MH009008-081220-004B	MH009008-365511-004A1	8	DUCTILE_IRON	320.00
SHD	9008	GP009008-079422	FT009008-006316	MH009008-080961-050	0	UNK	111.26
SHD	9008	GP009008-086793	MH009008-081087-485DD	MH009008-081118-485CC	8	DUCTILE_IRON	291.06
SHD	9008	GP009008-079378	MH009008-081205-012	MH009008-081214-010	8	DUCTILE_IRON	141.25

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
SHD	9008	GP009008-079397	MH009008-080873-034	MH009008-080889-033	8	CIP/DIP	93.28
SHD	9008	GP009008-112343	MH009008-081297-003	MH009008-102640-002A	10	DUCTILE_IRON	54.62
SHD	9008	GP009008-079373	MH009008-081242-005A	MH009008-081253-005	8	DUCTILE_IRON	144.20
SHD	9008	GP009008-079694	MH009008-081000-485H	MH009008-080950-485G	8	DUCTILE_IRON	351.24
SHD	9008	GP009008-079695	MH009008-080950-485G	MH009008-080952-485F	8	CIP/DIP	29.47
SHD	9008	GP009008-079372	MH009008-081253-005	MH009008-081281-004	8	DUCTILE_IRON	360.37
SHD	9008	GP009008-084265	MH009008-081315-002	FT009008-006417	8	DUCTILE_IRON	27.04
SHD	9008	GP009008-079309	MH009008-080992-052	MH009008-080962-051	8	CIP/DIP	222.87
SHD	9008	GP009008-090087	MH009008-080898-032	MH009008-080919-031	8	DUCTILE_IRON	183.99
SHD	9008	GP009008-090088	MH009008-080959-029	MH009008-080938-028	8	DUCTILE_IRON	345.23
SHD	9008	GP009008-090516	MH009008-081167-487	MH009008-232690-486	8	OTH	198.82
SHD	9008	GP009008-079371	MH009008-081281-004	MH009008-081297-003	8	DUCTILE_IRON	101.09
SHD	9008	GP009008-086763	MH009008-081128-485AA	MH009008-081151-485	8	DUCTILE_IRON	134.82
SHD	9008	GP009008-079379	MH009008-081200-013	MH009008-081205-012	8	DUCTILE_IRON	102.69
SHD	9008	GP009008-079383	MH009008-081161-482A	MH009008-081172-482	8	IRON	150.49
SHD	9008	GP009008-079390	MH009008-080808-042	MH009008-080848-041	10	CIP/DIP	307.79
SHD	9008	GP009008-079393	MH009008-081015-485I	MH009008-081000-485H	8	DUCTILE_IRON	348.36
SHD	9008	GP009008-090080	MH009008-080877-035	MH009008-080914-030A	10	DUCTILE_IRON	272.79
SHD	9008	GP009008-079424	MH009008-232689-050B	MH009008-080961-050	0	UNK	159.23
SHD	9008	GP009008-079219	MH009008-081095-485A1	MH009008-081107-485A	8	DUCTILE_IRON	155.38
SHD	9008	GP009008-079696	MH009008-080983-485E	MH009008-081019-485D	8	CIP/DIP	135.93
SHD	9008	GP009008-079221	MH009008-081131-483	MH009008-081172-482	8	DUCTILE_IRON	313.94
SHD	9008	GP009008-079380	MH009008-081175-013A	MH009008-081200-013	8	DUCTILE_IRON	212.83
SHD	9008	GP009008-090085	MH009008-080889-033	MH009008-080898-032	8	CIP/DIP	103.60
SHD	9008	GP009008-079367	MH009008-081172-482	MH009008-081202-012A	8	DUCTILE_IRON	199.29
SHD	9008	GP009008-079385	MH009008-081072-482C	MH009008-081112-482B	8	IRON	401.20
SHD	9008	GP009008-079399	MH009008-081202-012A	MH009008-081205-012	8	DUCTILE_IRON	136.59
SHD	9008	GP009008-090239	MH009008-080912-037	MH009008-080924-036	8	DUCTILE_IRON	108.59
SHD	9008	GP009008-079389	MH009008-080848-041	MH009008-080860-035A	8	CIP/DIP	110.13
SHD	9008	GP009008-086764	MH009008-081107-485A	MH009008-081128-485AA	8	DUCTILE_IRON	249.63
SHD	9008	GP009008-079396	MH009008-080886-485M	MH009008-080904-485L	8	CIP/DIP	79.04
SHD	9008	GP009008-079382	MH009008-081111-015	MH009008-081162-014	8	DUCTILE_IRON	403.52
SHD	9008	GP009008-086310	MH009008-081019-485D	MH009008-081029-485C	8	DUCTILE_IRON	42.09
SHD	9008	GP009008-079398	MH009008-080952-485F	MH009008-080983-485E	8	CIP/DIP	322.47
SHD	9008	GP009008-079394	MH009008-080926-485J	MH009008-080950-485G	8	CIP/DIP	361.42
SHD	9008	GP009008-404330	MH009008-365511-004A1	MH009008-081257-004A	8	DUCTILE_IRON	99.60
SHD	9008	GP009008-090081	MH009008-080860-035A	MH009008-080877-035	8	CIP/DIP	147.31
SHD	9008	GP009008-090511	MH009008-081214-010	FT009008-006424	8	DUCTILE_IRON	27.90
SHD	9008	GP009008-079423	MH009008-080961-050	MH009008-080960-049	8	CLAY	115.89
SHD	9008	GP009008-090238	MH009008-080924-036	MH009008-080885-035B	8	CIP	342.53
SHD	9008	GP009008-090084	MH009008-080922-030	MH009008-080938-028	10	DUCTILE_IRON	64.91
SHD	9008	GP009008-079375	MH009008-081257-004A	MH009008-081281-004	8	DUCTILE_IRON	152.29
SHD	9008	GP009008-086794	MH009008-081118-485CC	MH009008-081124-485BB	8	DUCTILE_IRON	91.33
SHD	9008	GP009008-079374	MH009008-081228-006	MH009008-081242-005A	8	DUCTILE_IRON	220.09
SHD	9008	GP009008-079420	FT009008-006314	MH009008-080962-051	0	UNK	99.53
SHD	9008	GP009008-090240	MH009008-080892-038	MH009008-080912-037	8	CIP	102.44
SHD	9008	GP009008-079395	MH009008-080904-485L	MH009008-080926-485J	8	CIP/DIP	210.43
SHD	9008	GP009008-079384	MH009008-081112-482B	MH009008-081161-482A	8	DUCTILE_IRON	343.98
SHD	9008	GP009008-112344	MH009008-102640-002A	MH009008-081315-002	10	DUCTILE_IRON	289.82
SHD	9008	GP009008-079381	MH009008-081162-014	MH009008-081175-013A	8	DUCTILE_IRON	190.23
SHD	9008	GP009008-090242	MH009008-080862-040	MH009008-080882-039	10	CIP/DIP	189.43
SHD	9008	GP009008-090086	MH009008-080919-031	MH009008-080922-030	8	DUCTILE_IRON	28.65
SHD	9009	GP009009-079786	MH009009-079835-474	MH009009-079922-473	8	CLAY	273.15
SHD	9009	GP009009-079741	MH009009-079859-480	MH009009-079826-479	8	CIP/DIP	112.74
SHD	9009	GP009009-080090	MH009009-079467-485	MH009009-079532-483	8	CLAY	197.66
SHD	9009	GP009009-079752	MH009009-079230-489	MH009009-079287-488	8	CLAY	170.87
SHD	9009	GP009009-463848	MH009009-415750-480A1	MH009009-079859-480	8	IRON	269.64
SHD	9009	GP009009-090468	MH009009-077780-295	MH009009-077847-294	8	CIP	270.81
SHD	9009	GP009009-087933	MH009009-079032-492	MH009009-079115-491	8	CLAY	199.67
SHD	9009	GP009009-079959	MH009009-080318-057	MH009009-084777-056A	8	CLAY	232.56
SHD	9009	GP009009-085947	MH009009-080094-471	MH009009-080155-056	8	CLAY	199.05
SHD	9009	GP009009-080088	MH009009-079532-483	MH009009-079603-482	8	CIP	274.14
SHD	9009	GP009009-079787	MH009009-079922-473	MH009009-080006-472	8	CLAY	401.43
SHD	9009	GP009009-087167	MH009009-078063-279	MH009009-078104-278	8	CLAY	105.72
SHD	9009	GP009009-079744	MH009009-079850-476	MH009009-079835-474	8	CIP/DIP	96.87
SHD	9009	GP009009-089827	MH009009-077975-288	MH009009-078013-282	8	CLAY	271.82
SHD	9009	GP009009-090467	MH009009-077847-294	MH009009-077848-293	8	CIP	109.72
SHD	9009	GP009009-089828	MH009009-077953-289	MH009009-077975-288	8	CLAY	104.51
SHD	9009	GP009009-079751	MH009009-079178-489A	MH009009-079230-489	8	CLAY	150.23
SHD	9009	GP009009-079753	MH009009-079287-488	MH009009-079335-487	8	CLAY	204.37

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
SHD	9009	GP009009-080086	MH009009-079685-481	MH009009-079780-478	8	CLAY	340.18
SHD	9009	GP009009-087922	MH009009-078044-280	MH009009-078063-279	8	CIP	113.23
SHD	9009	GP009009-087169	MH009009-078013-282	MH009009-078038-281	8	DUCTILE_IRON	87.99
SHD	9009	GP009009-080089	MH009009-079575-484	MH009009-079532-483	8	CLAY	172.92
SHD	9009	GP009009-100062	FT009009-007962	MH009009-079780-478	6	PVC	161.64
SHD	9009	GP009009-090470	MH009009-077769-299	MH009009-077780-295	8	CIP/DIP	23.16
SHD	9009	GP009009-087930	MH009009-078831-514	MH009009-078845-513	8	CLAY	68.34
SHD	9009	GP009009-079969	MH009009-077906-279B	MH009009-077924-279A	8	CIP	69.15
SHD	9009	GP009009-080087	MH009009-079603-482	MH009009-079685-481	8	CIP	349.53
SHD	9009	GP009009-089833	MH009009-077962-283	MH009009-078013-282	8	DIP/CLAY	216.63
SHD	9009	GP009009-087923	MH009009-078038-281	MH009009-078044-280	8	CLAY	51.71
SHD	9009	GP009009-087945	MH009009-078845-513	MH009009-078913-493	8	CLAY	178.89
SHD	9009	GP009009-087168	MH009009-077924-279A	MH009009-078063-279	8	CIP	267.01
SHD	9009	GP009009-079700	MH009009-080006-472	MH009009-080094-471	8	CLAY	351.17
SHD	9009	GP009009-087934	MH009009-079115-491	MH009009-079178-489A	8	CLAY	199.66
SHD	9009	GP009009-079743	MH009009-079827-477	MH009009-079850-476	8	CLAY	29.46
SHD	9009	GP009009-079755	MH009009-079335-487	MH009009-079445-486	8	CLAY	395.19
SHD	9009	GP009009-080101	MH009009-102013-480A	MH009009-415750-480A1	8	CLAY	354.00
SHD	9009	GP009009-079707	MH009009-079780-478	MH009009-079827-477	8	CLAY	269.68
SHD	9009	GP009009-087935	MH009009-429404-492A1	MH009009-079032-492	8	CLAY	259.03
SHD	9009	GP009009-087944	MH009009-078913-493	MH009009-078928-492A	8	CLAY	32.48
SHD	9009	GP009009-089834	MH009009-077913-285	MH009009-077947-284	8	CLAY	104.11
SHD	9009	GP009009-091422	MH009009-084777-056A	MH009009-080155-056	8	CLAY	17.46
SHD	9009	GP009009-079742	MH009009-079826-479	MH009009-079827-477	8	CLAY	149.15
SHD	9009	GP009009-079754	MH009009-079445-486	MH009009-079467-485	8	CLAY	81.58
SHD	9009	GP009009-079698	MH009009-079521-484A	MH009009-079575-484	8	CLAY	227.08
SHD	9009	GP009009-089835	MH009009-077947-284	MH009009-077962-283	8	CLAY	32.70
SHD	9009	GP009009-087171	MH009009-077918-286	MH009009-077913-285	8	CLAY	42.27
SHD	9009	GP009009-087170	MH009009-077883-287	MH009009-077918-286	8	CIP	146.42
SHD	9013	GP009013-086998	MH009013-077788-033B	MH009013-077808-033A	8	CIP	199.71
SHD	9013	GP009013-084748	FT009013-005839	MH009013-077751-035A	8	CONCRETE	154.47
SHD	9013	GP009013-080437	MH009013-077968-102	MH009013-077952-014	8	CLAY	209.67
SHD	9013	GP009013-080448	MH009013-077991-013A	MH009013-078100-013	8	CLAY	391.40
SHD	9013	GP009013-080441	MH009013-077952-014	MH009013-077991-013A	10	CLAY	147.98
SHD	9013	GP009013-086989	MH009013-077751-035A	MH009013-077774-033C	8	CIP	211.33
SHD	9013	GP009013-086990	MH009013-077774-033C	MH009013-077788-033B	8	CIP	136.90
SHD	9014	GP009014-086433	MH009014-077205-107	MH009014-077218-106	8	CLAY	145.12
SHD	9014	GP009014-080529	MH009014-101959-034A	MH009014-077851-034	8	CLAY	285.35
SHD	9014	GP009014-080486	MH009014-077851-034	MH009014-077856-033	8	CLAY	59.34
SHD	9014	GP009014-080471	MH009014-077367-096	MH009014-077303-095	8	CIP	565.17
SHD	9014	GP009014-080558	MH009014-077357-102	MH009014-077377-085A	8	CLAY	124.34
SHD	9014	GP009014-080560	MH009014-077270-104	MH009014-077305-103	8	OTH	163.45
SHD	9014	GP009014-080559	MH009014-077305-103	MH009014-077357-102	8	CLAY	402.94
SHD	9014	GP009014-080561	MH009014-077243-105	MH009014-077270-104	8	CLAY	148.12
SHD	9014	GP009014-080567	MH009014-077218-106	MH009014-077243-105	8	CLAY	177.43
SHD	9014	GP009014-086432	MH009014-101931-107A	MH009014-077205-107	8	CLAY	177.20
SHD	9014	GP009014-080485	MH009014-077856-033	MH009014-077860-031	8	CIP	398.60
SHD	9014	GP009014-080568	MH009014-077303-095	MH009014-077189-092	8	CLAY	404.25
SHD	9028	GP009028-081952	MH009028-076568-013B	MH009028-076563-013A	10	OTH	19.49
SHD	9028	GP009028-081953	MH009028-097826-013C	MH009028-076568-013B	10	OTH	278.73
SHD	9028	GP009028-081951	MH009028-076563-013A	MH009028-076564-013	10	OTH	263.96
SHD	9028	GP009028-081944	MH009028-076540-017B	MH009028-076550-017A	10	CONCRETE	200.20
SHD	9028	GP009028-081948	MH009028-076550-017A	MH009028-076563-013A	10	CONCRETE	43.91
SHD	9041	GP009041-087467	MH009041-074889-046C	MH009041-074872-046B	8	CIP	111.49
SHD	9041	GP009041-087468	MH009041-074943-046D	MH009041-074889-046C	8	CLAY	190.10
SHD	9041	GP009041-087466	MH009041-074872-046B	MH009041-074855-046A	8	CIP	211.29
SHD	9044	GP009044-085675	MH009044-073963-010C	MH009044-073939-010B	8	CLAY	311.04
SHD	9044	GP009044-085674	MH009044-073992-010D	MH009044-073963-010C	8	CLAY	235.06
SHD	9052	GP009052-084294	MH009052-082970-203	MH009052-082969-202	10	CLAY	254.86
SHD	9052	GP009052-084926	MH009052-083146-150	MH009052-083154-149	8	CLAY	316.02
SHD	9052	GP009052-087252	MH009052-083154-149	MH009052-083155-148	8	CLAY	102.57
SHD	9052	GP009052-084311	MH009052-082966-208	MH009052-082965-207	8	CLAY	226.70
SHD	9052	GP009052-475511	MH009052-427500-205A	MH009052-082968-205	8	CLAY	46.95
SHD	9052	GP009052-084310	MH009052-082967-209	MH009052-082966-208	8	CLAY	362.08
SHD	9052	GP009052-090788	MH009052-083045-199	MH009052-083043-198	8	DUCTILE_IRON	242.68
SHD	9052	GP009052-090786	MH009052-083043-198	MH009052-083044-197	8	CLAY	145.92
SHD	9052	GP009052-090787	MH009052-083044-197	MH009052-083027-195	8	CLAY	288.74
SHD	9052	GP009052-084312	MH009052-082965-207	MH009052-082964-206	8	CLAY	189.06
SHD	9052	GP009052-084313	MH009052-082964-206	MH009052-427500-205A	8	CLAY	109.65
SHD	9052	GP009052-084293	MH009052-082972-204	MH009052-082970-203	8	CLAY	413.76

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
SHD	9052	GP009052-087091	MH009052-083025-194	MH009052-083024-193	8	CLAY	240.05
SHD	9052	GP009052-087092	MH009052-083027-195	MH009052-083025-194	8	CLAY	109.56
SHD	9052	GP009052-087090	MH009052-083024-193	MH009052-083023-192	8	CLAY	344.22
SHD	9052	GP009052-087120	FT009052-112169	MH009052-083027-195	8	CLAY	365.00
SHD	9052	GP009052-087275	MH009052-083099-036	MH009052-083109-033	8	DUCTILE_IRON	147.24
SHD	9052	GP009052-087276	MH009052-083100-037	MH009052-083099-036	8	DUCTILE_IRON	42.79
SHD	9052	GP009052-087277	MH009052-083118-038	MH009052-083100-037	8	DUCTILE_IRON	326.68
SHD	9052	GP009052-086230	MH009052-083117-034	MH009052-083109-033	8	TRUSS	100.61
SHD	9052	GP009052-086231	MH009052-083114-035	MH009052-083117-034	8	TRUSS	165.18
SHD	9052	GP009052-085784	MH009052-083164-070	MH009052-083194-068	0	UNK	210.53
SHD	9052	GP009052-085783	MH009052-083196-069	MH009052-083194-068	8	DUCTILE_IRON	234.23
SHD	9052	GP009052-085782	MH009052-083194-068	MH009052-083209-067	0	UNK	78.59
SHD	9052	GP009052-084928	MH009052-083209-067	MH009052-083283-066	0	UNK	331.47
SHD	9052	GP009052-084927	MH009052-083283-066	MH009052-083293-065	0	UNK	97.54
SHD	9052	GP009052-086988	MH009052-083293-065	MH009052-083306-064	0	UNK	30.63
TRS	6002	GP006002-156689	MH006002-140600-0421	MH006002-140601-0420	8	DUCTILE_IRON	203.56
TRS	6002	GP006002-156688	MH006002-140601-0420	MH006003-086753-064	8	DUCTILE_IRON	192.06
TRS	6003	GP006003-194360	MH006003-173113-0124	MH006003-173114-0123	8	DUCTILE_IRON	330.52
TRS	6003	GP006003-022627	MH006003-013404-018L	MH006003-013478-018K	10	DUCTILE_IRON	162.05
TRS	6003	GP006003-021647	MH006003-013834-018G	MH006003-013912-018F	12	DUCTILE_IRON	363.44
TRS	6003	GP006003-194363	MH006003-173116-0121	MH006003-173117-0120	8	DUCTILE_IRON	280.90
TRS	6003	GP006003-194359	MH006003-173112-0125	MH006003-173113-0124	8	DUCTILE_IRON	156.23
TRS	6003	GP006003-022860	MH006003-013478-018K	MH006003-013524-018J	10	DUCTILE_IRON	89.28
TRS	6003	GP006003-194367	MH006003-173119-0118	MH006003-173120-0117	8	DUCTILE_IRON	251.03
TRS	6003	GP006003-194620	MH006003-173389-0105	MH006003-173121-0104	8	DUCTILE_IRON	262.20
TRS	6003	GP006003-194358	MH006003-173111-0126	MH006003-173112-0125	8	DUCTILE_IRON	170.31
TRS	6003	GP006003-022474	MH006003-013163-018N	MH006003-013236-018M	10	DUCTILE_IRON	176.41
TRS	6003	GP006003-022582	MH006003-013021-018O	MH006003-013163-018N	10	DUCTILE_IRON	384.74
TRS	6003	GP006003-194362	MH006003-173115-0122	MH006003-173116-0121	8	DUCTILE_IRON	149.14
TRS	6003	GP006003-194361	MH006003-173114-0123	MH006003-173115-0122	8	DUCTILE_IRON	180.07
TRS	6003	GP006003-093681	MH006003-086757-063	MH006003-086760-062	8	DUCTILE_IRON	200.50
TRS	6003	GP006003-021648	MH006003-013912-018F	MH006003-013977-018E1	12	DUCTILE_IRON	384.46
TRS	6003	GP006003-021645	MH006003-013627-018I	MH006003-013722-018H	12	DUCTILE_IRON	350.67
TRS	6003	GP006003-093682	MH006003-086753-064	MH006003-086757-063	8	DUCTILE_IRON	176.69
TRS	6003	GP006003-194364	MH006003-173117-0120	MH006003-173118-0119	8	DUCTILE_IRON	273.81
TRS	6003	GP006003-093680	MH006003-086760-062	MH006003-013021-018O	8	DUCTILE_IRON	130.32
TRS	6003	GP006003-022859	MH006003-013524-018J	MH006003-013627-018I	12	DUCTILE_IRON	350.12
TRS	6003	GP006003-194366	MH006003-173120-0117	MH006003-173121-0104	8	DUCTILE_IRON	63.91
TRS	6003	GP006003-022628	MH006003-013353-018P	MH006003-013404-018L	8	DUCTILE_IRON	382.25
TRS	6003	GP006003-194365	MH006003-173118-0119	MH006003-173119-0118	8	DUCTILE_IRON	250.36
TRS	6003	GP006003-021646	MH006003-013722-018H	MH006003-013834-018G	12	DUCTILE_IRON	349.30
TRS	6003	GP006003-022583	MH006003-013236-018M	MH006003-013404-018L	10	DUCTILE_IRON	368.98
TUR	7001	GP007001-023130	FT007001-000013	MH007001-000875-038	8	CLAY	250.61
TUR	7001	GP007001-100181	MH007001-090699-133	MH007001-090691-131	8	DUCTILE_IRON	44.00
TUR	7001	GP007001-022994	MH007001-000564-098	MH007001-000565-096	8	IRON	292.17
TUR	7001	GP007001-025171	MH007001-000567-099O	MH007001-000550-099A	8	DUCTILE_IRON	174.75
TUR	7001	GP007001-037791	MH007001-000543-099T	MH007001-000554-099R	8	DUCTILE_IRON	174.57
TUR	7001	GP007001-023058	MH007001-000566-117	MH007001-000570-116	8	CLAY	172.34
TUR	7001	GP007001-023105	MH007001-000689-127	MH007001-000674-126	8	TRUSS	119.35
TUR	7001	GP007001-023114	MH007001-000715-129	MH007001-000708-128	8	TRUSS	189.85
TUR	7001	GP007001-037776	MH007001-000507-099K	MH007001-000512-099J	8	DUCTILE_IRON	152.95
TUR	7001	GP007001-100170	MH007001-090691-131	MH007001-000566-117	8	DUCTILE_IRON	215.83
TUR	7001	GP007001-023018	MH007001-000692-121	MH007001-000690-073	8	TRUSS	135.29
TUR	7001	GP007001-037777	MH007001-000529-099F	MH007001-000526-099E	8	DUCTILE_IRON	121.11
TUR	7001	GP007001-023022	MH007001-000663-124	MH007001-000702-123	8	TRUSS	312.64
TUR	7001	GP007001-023003	MH007001-000608-103	MH007001-000604-102	8	CLAY	163.20
TUR	7001	GP007001-037790	MH007001-000505-119C	MH007001-000513-119B	8	PVC	171.77
TUR	7001	GP007001-037778	MH007001-000522-099H	MH007001-000529-099F	8	PVC	111.40
TUR	7001	GP007001-037800	MH007001-000516-099N	MH007001-000514-099M	8	DUCTILE_IRON	67.71
TUR	7001	GP007001-023050	MH007001-000536-119	MH007001-000563-118	8	IRON	401.70
TUR	7001	GP007001-037787	MH007001-000524-119D	MH007001-000523-119A	8	DUCTILE_IRON	76.68
TUR	7001	GP007001-023128	MH007001-000856-037	MH007001-000851-036	8	CLAY	103.35
TUR	7001	GP007001-022999	MH007001-000565-096	MH007001-000583-093	8	CLAY	230.85
TUR	7001	GP007001-023111	MH007001-000708-128	MH007001-000702-123	8	DUCTILE_IRON	262.99
TUR	7001	GP007001-098212	MH007001-090268-099Y	MH007001-090269-099X	8	DUCTILE_IRON	139.42
TUR	7001	GP007001-023008	MH007001-000622-092	MH007001-000649-074	8	CLAY	294.17
TUR	7001	GP007001-023019	MH007001-000694-122	MH007001-000692-121	8	DUCTILE_IRON	97.19
TUR	7001	GP007001-101046	MH007001-090697-136	MH007001-090696-135	8	DUCTILE_IRON	225.16
TUR	7001	GP007001-023102	MH007001-000674-126	MH007001-000663-124	8	TRUSS	141.69
TUR	7001	GP007001-023053	MH007001-000636-125	MH007001-000663-124	8	TRUSS	236.70

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
TUR	7001	GP007001-022998	MH007001-000577-115	MH007001-000581-105	8	DUCTILE_IRON	121.45
TUR	7001	GP007001-037780	MH007001-000512-099J	MH007001-000515-099I	8	DUCTILE_IRON	207.57
TUR	7001	GP007001-037784	MH007001-000538-099C	MH007001-000546-099B	8	DUCTILE_IRON	146.33
TUR	7001	GP007001-023129	MH007001-000875-038	MH007001-000856-037	8	CLAY	376.54
TUR	7001	GP007001-037799	MH007001-000514-099M	MH007001-000512-099J	8	DUCTILE_IRON	93.10
TUR	7001	GP007001-022997	MH007001-000570-116	MH007001-000577-115	8	DUCTILE_IRON	396.67
TUR	7001	GP007001-023098	MH007001-000644-076	MH007001-000671-075	8	CLAY	231.07
TUR	7001	GP007001-023066	MH007001-000581-105	MH007001-000593-104	8	CLAY	310.85
TUR	7001	GP007001-037783	MH007001-000542-099G	MH007001-000529-099F	8	PVC	275.97
TUR	7001	GP007001-023131	MH007001-000879-039	MH007001-000875-038	8	CLAY	73.84
TUR	7001	GP007001-023014	MH007001-000680-071	MH007001-000666-070	8	TRUSS	110.90
TUR	7001	GP007001-023016	MH007001-000685-072	MH007001-000680-071	8	DUCTILE_IRON	49.33
TUR	7001	GP007001-023005	MH007001-000583-093	MH007001-000622-092	8	CLAY	323.82
TUR	7001	GP007001-023007	MH007001-000619-077	MH007001-000644-076	8	CLAY	279.71
TUR	7001	GP007001-023017	MH007001-000690-073	MH007001-000685-072	8	TRUSS	271.83
TUR	7001	GP007001-023023	MH007001-000702-123	MH007001-000694-122	8	TRUSS	134.12
TUR	7001	GP007001-023097	MH007001-000649-074	MH007001-000666-070	8	CLAY	172.92
TUR	7001	GP007001-023099	MH007001-000671-075	MH007001-000649-074	8	CLAY	249.46
TUR	7001	GP007001-037775	MH007001-000502-099L	MH007001-000507-099K	8	DUCTILE_IRON	145.26
TUR	7001	GP007001-037785	MH007001-000546-099B	MH007001-000550-099A	8	DUCTILE_IRON	92.44
TUR	7001	GP007001-037786	MH007001-000523-119A	MH007001-000536-119	8	PVC	219.13
TUR	7001	GP007001-037789	MH007001-000513-119B	MH007001-000523-119A	8	PVC	229.23
TUR	7001	GP007001-098210	MH007001-090269-099X	MH007001-090270-099W	8	DUCTILE_IRON	239.29
TUR	7001	GP007001-023071	MH007001-000593-104	MH007001-000608-103	8	CLAY	264.27
TUR	7001	GP007001-023001	MH007001-000595-101	MH007001-000584-100	8	CLAY	161.20
TUR	7001	GP007001-110481	MH007001-101360-077A	MH007001-000619-077	8	CLAY	124.27
TUR	7001	GP007001-023000	MH007001-000584-100	MH007001-000564-098	8	CLAY	248.00
TUR	7001	GP007001-025175	MH007001-000552-099S	MH007001-000554-099R	8	DUCTILE_IRON	126.50
TUR	7001	GP007001-023002	MH007001-000604-102	MH007001-000595-101	8	CLAY	165.78
TUR	7001	GP007001-022995	MH007001-000563-118	MH007001-000570-116	8	CLAY	62.85
TUR	7001	GP007001-037788	MH007001-000525-119E	MH007001-000524-119D	8	PVC	85.40
TUR	7001	GP007001-098213	MH007001-090266-099AA	MH007001-090267-099Z	8	DUCTILE_IRON	304.83
TUR	7001	GP007001-023054	MH007001-000548-115B	MH007001-000547-115A	8	CLAY	285.11
TUR	7001	GP007001-101045	MH007001-090698-134	MH007001-090699-133	8	DUCTILE_IRON	299.02
TUR	7001	GP007001-101047	MH007001-090696-135	MH007001-090698-134	8	DUCTILE_IRON	300.83
TUR	7001	GP007001-098214	MH007001-090267-099Z	MH007001-090268-099Y	8	DUCTILE_IRON	150.84
TUR	7001	GP007001-023132	MH007001-000881-040	MH007001-000879-039	8	CLAY	264.87
TUR	7001	GP007001-025174	MH007001-000554-099R	MH007001-000572-099Q	8	DUCTILE_IRON	312.16
TUR	7003	GP007003-094110	MH007003-086486-059R1	MH007003-086485-059R	8	DUCTILE_IRON	190.94
TUR	7003	GP007003-108038	MH007003-098604-059V	MH007003-098603-059U	8	DUCTILE_IRON	247.23
TUR	7003	GP007003-094113	MH007003-086497-059R4	MH007003-086494-059R3	8	DUCTILE_IRON	62.84
TUR	7003	GP007003-094111	MH007003-086489-059R2	MH007003-086486-059R1	8	DUCTILE_IRON	107.25
TUR	7003	GP007003-094150	MH007003-086505-059R5	MH007003-086497-059R4	8	DUCTILE_IRON	274.71
TUR	7003	GP007003-108043	MH007003-098612-059K	MH007003-001853-059J	8	DUCTILE_IRON	175.62
TUR	7003	GP007003-094112	MH007003-086494-059R3	MH007003-086489-059R2	8	DUCTILE_IRON	144.45
TUR	7003	GP007003-345456	MH007003-309517-0291	MH007003-309516-0290	8	PVC	283.99
TUR	7003	GP007003-108039	MH007003-098605-059W	MH007003-098604-059V	8	DUCTILE_IRON	195.82
TUR	7003	GP007003-094114	MH007003-086499-059S	MH007003-086485-059R	8	DUCTILE_IRON	298.54
TUR	7003	GP007003-108046	MH007003-098616-059M	MH007003-098613-059L	8	DUCTILE_IRON	103.77
TUR	7003	GP007003-037172	MH007003-001825-059I	MH007003-001823-059D	8	DUCTILE_IRON	265.85
TUR	7003	GP007003-037278	MH007003-001732-059P	MH007003-001745-059O	8	DUCTILE_IRON	98.65
TUR	7003	GP007003-037279	MH007003-001745-059O	MH007003-001825-059I	8	DUCTILE_IRON	399.62
TUR	7003	GP007003-108037	MH007003-098603-059U	MH007003-086508-059T	8	DUCTILE_IRON	169.66
TUR	7003	GP007003-023670	MH007003-000983-020	MH007003-000985-019	8	CLAY	244.74
TUR	7003	GP007003-108045	MH007003-098614-059N	MH007003-098613-059L	8	DUCTILE_IRON	223.52
TUR	7003	GP007003-023669	MH007003-000973-021	MH007003-000983-020	8	CLAY	113.73
TUR	7003	GP007003-108041	MH007003-098607-059Y	MH007003-098606-059X	8	DUCTILE_IRON	71.90
TUR	7003	GP007003-108044	MH007003-098613-059L	MH007003-098612-059K	8	DUCTILE_IRON	242.74
TUR	7003	GP007003-094151	MH007003-086508-059T	MH007003-086499-059S	8	DUCTILE_IRON	314.22
TUR	7003	GP007003-094109	MH007003-086485-059R	MH007003-001722-059Q	8	DUCTILE_IRON	98.59
TUR	7003	GP007003-037173	MH007003-001853-059J	MH007003-001825-059I	8	DUCTILE_IRON	98.40
TUR	7003	GP007003-037168	MH007003-001722-059Q	MH007003-001732-059P	8	DUCTILE_IRON	139.65
TUR	7003	GP007003-023671	MH007003-000985-019	MH007003-000994-018	8	CLAY	232.55
TUR	7003	GP007003-023666	MH007003-000963-022	MH007003-000973-021	8	CLAY	153.10
TUR	7003	GP007003-108042	MH007003-098608-059R6	MH007003-086505-059R5	8	DUCTILE_IRON	324.08
TUR	7003	GP007003-108040	MH007003-098606-059X	MH007003-098605-059W	8	DUCTILE_IRON	67.48
TUR	7003	GP007003-345457	MH007003-309518-0292	MH007003-309517-0291	8	PVC	68.54
TUR	7003	GP007003-037169	MH007003-001849-059E	MH007003-001823-059D	8	DUCTILE_IRON	97.29
TUR	7004	GP007004-024042	MH007004-002845-066	MH007004-002796-065	8	CLAY	218.98
TUR	7004	GP007004-024081	MH007004-002987-071	MH007004-002930-070	8	IRON	203.50

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
TUR	7004	GP007004-024033	MH007004-002796-065	MH007004-002795-064	8	CLAY	95.85
TUR	7004	GP007004-024064	MH007004-002929-072	MH007004-002930-070	8	CLAY	189.73
TUR	7004	GP007004-024034	MH007004-002794-075	MH007004-002797-074	8	CLAY	170.44
TUR	7004	GP007004-024054	MH007004-002894-067	MH007004-002845-066	8	CLAY	119.92
TUR	7004	GP007004-024059	MH007004-002910-069	MH007004-002894-067	8	CLAY	75.23
TUR	7004	GP007004-024065	MH007004-002930-070	MH007004-002910-069	8	CLAY	118.41
TUR	7004	GP007004-024063	MH007004-002866-073	MH007004-002929-072	8	CLAY	187.40
TUR	7004	GP007004-024060	MH007004-002915-068	MH007004-002894-067	8	CLAY	145.44
TUR	7004	GP007004-024035	MH007004-002797-074	MH007004-002796-065	8	CLAY	201.97
VAL	1001	GP001001-071868	MH001001-071184-078	MH001001-071168-076	8	PVC	158.56
VAL	1001	GP001001-071869	MH001001-071195-079	MH001001-071184-078	8	PVC	214.17
VAL	1001	GP001001-125629	MH001001-114622-0103	MH001001-114623-0102	8	IRON_PVC	163.25
VAL	1001	GP001001-125630	MH001001-114623-0102	MH001001-114624-0098	8	PVC	177.15
VAL	1001	GP001001-071873	MH001001-071204-075	MH001001-071185-074	8	IRON	86.28
VAL	1001	GP001001-125948	MH001001-114951-0112	MH001001-114635-0110	8	PVC	261.51
VAL	1001	GP001001-125958	MH001001-115260-0121	MH001001-115261-0120	8	PVC	97.08
VAL	1001	GP001001-071870	MH001001-071197-080	MH001001-071195-079	8	PVC	123.87
VAL	1001	GP001001-125314	MH001001-114632-0096	MH001001-114631-0095	8	PVC	224.59
VAL	1001	GP001001-125627	MH001001-114621-0104	MH001001-114622-0103	8	PVC	162.16
VAL	1001	GP001001-125633	MH001001-114942-0107	MH001001-114943-0106	8	IRON_PVC	211.97
VAL	1001	GP001001-125945	MH001001-114948-0115	MH001001-114949-0114	8	PVC	287.69
VAL	1001	GP001001-125959	MH001001-115261-0120	MH001001-115262-0119	8	PVC	137.43
VAL	1001	GP001001-125947	MH001001-114950-0113	MH001001-114951-0112	8	DUCTILE_IRON	81.77
VAL	1001	GP001001-126264	MH001001-115289-091	MH001001-115290-090	8	DUCTILE_IRON	86.80
VAL	1001	GP001001-070494	MH001001-071065-080C	MH001001-071048-080B	8	PVC	137.84
VAL	1001	GP001001-071860	MH001001-071090-032L	MH001001-071096-032K	8	PVC	62.37
VAL	1001	GP001001-070498	MH001001-071125-083	MH001001-071099-082	8	PVC	394.13
VAL	1001	GP001001-070495	MH001001-071069-080D	MH001001-071065-080C	8	PVC	33.68
VAL	1001	GP001001-125636	MH001001-114635-0110	MH001001-114940-0109	8	PVC	126.82
VAL	1001	GP001001-125960	MH001001-115262-0119	MH001001-114945-0118	8	IRON_PVC	180.75
VAL	1001	GP001001-070458	MH001001-071084-080E	MH001001-071069-080D	8	PVC	152.12
VAL	1001	GP001001-125946	MH001001-114949-0114	MH001001-114950-0113	8	PVC	150.62
VAL	1001	GP001001-126263	MH001001-115288-092	MH001001-115289-091	8	PVC	85.98
VAL	1001	GP001001-070493	MH001001-071048-080B	MH001001-071043-080A	8	PVC	42.74
VAL	1001	GP001001-125312	MH001001-114624-0098	MH001001-114633-0097	8	DUCTILE_IRON	70.98
VAL	1001	GP001001-125943	MH001001-114946-0117	MH001001-114947-0116	8	IRON_PVC	138.10
VAL	1001	GP001001-071867	MH001001-071168-076	MH001001-071145-073	8	IRON	282.04
VAL	1001	GP001001-125942	MH001001-114945-0118	MH001001-114946-0117	8	PVC	119.86
VAL	1001	GP001001-125313	MH001001-114633-0097	MH001001-114632-0096	8	PVC	107.78
VAL	1001	GP001001-125634	MH001001-114941-0108	MH001001-114942-0107	8	IRON_PVC	135.75
VAL	1001	GP001001-125635	MH001001-114940-0109	MH001001-114941-0108	8	PVC	138.41
VAL	1001	GP001001-071871	MH001001-071194-077	MH001001-071168-076	8	PVC	178.30
VAL	1001	GP001001-125631	MH001001-114944-0105	MH001001-114630-0094	8	IRON_PVC	132.18
VAL	1001	GP001001-071866	MH001001-071145-073	MH001001-071096-032K	8	PVC	332.96
VAL	1001	GP001001-071872	MH001001-071185-074	MH001001-071145-073	8	PVC	169.65
VAL	1001	GP001001-070497	MH001001-071099-082	MH001001-071091-081	8	PVC	121.60
VAL	1001	GP001001-126265	MH001001-115290-090	MH001001-115269-089	8	PVC	112.99
VAL	1001	GP001001-125315	MH001001-114631-0095	MH001001-114630-0094	8	PVC	147.00
VAL	1001	GP001001-125625	MH001001-114626-0100	MH001001-114625-0099	8	PVC	153.23
VAL	1001	GP001001-125624	MH001001-114627-0101	MH001001-114626-0100	8	PVC	113.90
VAL	1001	GP001001-125637	MH001001-114634-0111	MH001001-114635-0110	8	PVC	177.22
VAL	1001	GP001001-125944	MH001001-114947-0116	MH001001-114948-0115	8	IRON_PVC	242.58
VAL	1001	GP001001-070492	MH001001-071043-080A	MH001002-071039-001	8	CONCRETE	68.01
VAL	1001	GP001001-125626	MH001001-114625-0099	MH001001-114624-0098	8	DUCTILE_IRON	84.47
VAL	1001	GP001001-125632	MH001001-114943-0106	MH001001-114944-0105	8	IRON_PVC	212.49
VAL	1001	GP001001-070496	MH001001-071091-081	MH001001-071069-080D	8	PVC	254.21
VAL	1002	GP001002-072132	CO001002-025641	MH001002-070772-056	8	IRON	43.35
VAL	1002	GP001002-063995	MH001002-071051-023	MH001002-071034-022	8	UNK	151.46
VAL	1002	GP001002-063928	MH001002-346630-046A	MH001002-070709-046	8	CLAY	400.01
VAL	1002	GP001002-063998	MH001002-071022-013	MH001002-071029-012	8	UNK	94.89
VAL	1002	GP001002-064001	MH001002-070968-019	MH001002-070981-018	8	UNK	125.10
VAL	1002	GP001002-076345	MH001002-070573-047D	MH001002-070583-047C	8	IRON	143.68
VAL	1002	GP001002-070526	MH001002-070673-047A7	MH001002-070670-047A6	8	PVC	300.28
VAL	1002	GP001002-063990	MH001002-071100-026	MH001002-071089-025	8	CIP	183.57
VAL	1002	GP001002-070374	MH001002-070450-147	MH001002-070537-146	8	PVC	442.56
VAL	1002	GP001002-076344	MH001002-070583-047C	MH001002-070600-047B	8	IRON	124.24
VAL	1002	GP001002-070373	MH001002-070405-148	MH001002-070450-147	8	PVC	244.87
VAL	1002	GP001002-077168	MH001002-070033-060V	MH001002-070055-060U	8	IRON	208.35
VAL	1002	GP001002-063993	MH001002-071078-024A	MH001002-071064-024	8	CIP	351.98
VAL	1002	GP001002-076343	MH001002-070600-047B	MH001002-070623-047A	8	IRON	222.81

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1002	GP001002-070520	MH001002-070634-041A4	MH001002-070667-041A3	8	TRUSS	227.91
VAL	1002	GP001002-063949	MH001002-070772-056	MH001002-070794-055	8	CLAY	102.18
VAL	1002	GP001002-064000	MH001002-071000-020	MH001002-070981-018	8	UNK	160.86
VAL	1002	GP001002-063955	MH001002-070906-052	MH001002-070914-051	8	UNK	105.57
VAL	1002	GP001002-070440	MH001002-070224-060Q	MH001002-070294-060P	8	IRON	352.10
VAL	1002	GP001002-063996	MH001002-071034-022	MH001002-071014-010	8	UNK	126.78
VAL	1002	GP001002-071977	MH001002-070789-041A1	MH001002-070799-041A	8	DUCTILE_IRON	43.56
VAL	1002	GP001002-063933	MH001002-070797-041	MH001002-070796-040	8	CIP	154.50
VAL	1002	GP001002-063987	MH001002-071014-010	MH001002-071005-009	8	UNK	150.48
VAL	1002	GP001002-070522	MH001002-070654-047A3	MH001002-070638-047A2	8	PVC	130.13
VAL	1002	GP001002-070515	MH001002-070479-060J	MH001002-070545-060I	8	TRUSS	292.90
VAL	1002	GP001002-099962	MH001002-090505-151	MH001002-090506-150	8	DUCTILE_IRON	153.43
VAL	1002	GP001002-072130	MH001002-070728-067	MH001002-070777-066	8	CLAY	329.17
VAL	1002	GP001002-063952	MH001002-070849-065	MH001002-070831-064	8	CLAY	206.57
VAL	1002	GP001002-070457	MH001002-071173-025B	MH001002-071120-025A	8	CIP	226.79
VAL	1002	GP001002-063994	MH001002-071064-024	MH001002-071051-023	8	UNK	254.93
VAL	1002	GP001002-070507	MH001002-070409-060M2	MH001002-070412-060M1	8	IRON	301.06
VAL	1002	GP001002-063947	MH001002-070803-058	MH001002-070794-055	8	CIP	172.30
VAL	1002	GP001002-099964	MH001002-090504-152	MH001002-090505-151	8	DUCTILE_IRON	88.10
VAL	1002	GP001002-099960	MH001002-090506-150	MH001002-070373-149	8	DUCTILE_IRON	41.62
VAL	1002	GP001002-064004	MH001002-070980-015	MH001002-070996-011	8	UNK	219.41
VAL	1002	GP001002-382568	MH001002-070652-047	MH001002-346630-046A	8	CLAY	66.94
VAL	1002	GP001002-063997	MH001002-071016-014	MH001002-071022-013	8	UNK	247.07
VAL	1002	GP001002-070770	MH001002-070549-047F	MH001002-070592-047E	8	PVC	299.85
VAL	1002	GP001002-070454	MH001002-070799-041A	MH001002-070797-041	8	TRUSS	252.05
VAL	1002	GP001002-070768	MH001002-070615-047A1	MH001002-070623-047A	8	PVC	76.14
VAL	1002	GP001002-073902	MH001002-070055-060U	MH001002-070085-060T	8	IRON	228.36
VAL	1002	GP001002-070523	MH001002-070678-047A4	MH001002-070654-047A3	8	PVC	214.22
VAL	1002	GP001002-070439	MH001002-070294-060P	MH001002-070339-060O	8	IRON	349.61
VAL	1002	GP001002-099963	MH001002-090502-153	MH001002-090504-152	8	DUCTILE_IRON	124.43
VAL	1002	GP001002-063932	MH001002-070768-042	MH001002-070796-040	8	CLAY	131.65
VAL	1002	GP001002-070518	MH001002-070726-041A2	MH001002-070789-041A1	8	TRUSS	398.65
VAL	1002	GP001002-070375	MH001002-070537-146	MH001002-070549-047F	8	PVC	93.69
VAL	1002	GP001002-063988	MH001002-071005-009	MH001002-070994-008	8	UNK	57.35
VAL	1002	GP001002-063930	MH001002-070727-045	MH001002-070737-044	8	CLAY	93.95
VAL	1002	GP001002-063999	MH001002-070981-018	MH001002-070967-017	8	UNK	120.54
VAL	1002	GP001002-070443	MH001002-070139-060S	MH001002-070173-060R	8	IRON	152.75
VAL	1002	GP001002-070441	MH001002-070201-060R1	MH001002-070224-060Q	8	IRON	124.86
VAL	1002	GP001002-063931	MH001002-070737-044	MH001002-070741-043	8	CLAY	170.45
VAL	1002	GP001002-070519	MH001002-070667-041A3	MH001002-070726-041A2	8	TRUSS	400.39
VAL	1002	GP001002-070438	MH001002-070339-060O	MH001002-070365-060N	8	IRON	355.96
VAL	1002	GP001002-071857	MH001002-071188-025C	MH001002-071173-025B	8	PVC	61.48
VAL	1002	GP001002-070521	MH001002-070638-047A2	MH001002-070615-047A1	8	PVC	176.91
VAL	1002	GP001002-064006	MH001002-071029-012	MH001002-070996-011	8	UNK	312.60
VAL	1002	GP001002-064005	MH001002-070996-011	MH001002-071014-010	8	UNK	177.23
VAL	1002	GP001002-070516	MH001002-070545-060I	MH001002-070587-060H	8	TRUSS	294.90
VAL	1002	GP001002-070503	MH001002-070441-060K	MH001002-070479-060J	8	IRON	229.36
VAL	1002	GP001002-070442	MH001002-070173-060R	MH001002-070201-060R1	8	IRON	124.00
VAL	1002	GP001002-064003	MH001002-070974-016	MH001002-070980-015	8	UNK	349.58
VAL	1002	GP001002-072131	MH001002-070777-066	MH001002-070831-064	8	CLAY	249.49
VAL	1002	GP001002-064002	MH001002-070967-017	MH001002-070974-016	8	UNK	369.32
VAL	1002	GP001002-070505	MH001002-070411-060M	MH001002-070442-060L	8	IRON	141.72
VAL	1002	GP001002-063926	MH001002-070724-048	MH001002-070741-043	8	CLAY	177.06
VAL	1002	GP001002-063925	MH001002-070666-049	MH001002-070724-048	8	CLAY	397.92
VAL	1002	GP001002-070455	MH001002-070805-041B	MH001002-070799-041A	8	TRUSS	346.89
VAL	1002	GP001002-063948	MH001002-070794-055	MH001002-070821-054	8	CLAY	147.63
VAL	1002	GP001002-063956	MH001002-070914-051	MH001002-070944-050	8	UNK	137.73
VAL	1002	GP001002-063954	MH001002-070897-053	MH001002-070906-052	8	CLAY	98.65
VAL	1002	GP001002-063953	MH001002-070821-054	MH001002-070897-053	8	CLAY	377.18
VAL	1002	GP001002-063929	MH001002-070709-046	MH001002-070727-045	8	CLAY	87.20
VAL	1002	GP001002-072128	MH001002-070412-060M1	MH001002-070411-060M	8	IRON	40.80
VAL	1002	GP001002-063934	MH001002-070796-040	MH001002-070793-039	8	CIP	359.23
VAL	1002	GP001002-063991	MH001002-071120-025A	MH001002-071089-025	8	CIP	168.74
VAL	1002	GP001002-073901	MH001002-070085-060T	MH001002-070139-060S	8	IRON	283.00
VAL	1002	GP001002-070504	MH001002-070442-060L	MH001002-070441-060K	8	IRON	120.21
VAL	1002	GP001002-070525	MH001002-070670-047A6	MH001002-070677-047A5	8	PVC	72.52
VAL	1002	GP001002-076342	MH001002-070592-047E	MH001002-070573-047D	8	IRON	335.71
VAL	1002	GP001002-110153	MH001002-346631-153A	MH001002-090502-153	8	DUCTILE_IRON	69.70
VAL	1002	GP001002-070508	MH001002-070368-060M3	MH001002-070409-060M2	8	DUCTILE_IRON	284.99
VAL	1002	GP001002-070506	MH001002-070365-060N	MH001002-070412-060M1	8	IRON	216.16

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1002	GP001002-070524	MH001002-070677-047A5	MH001002-070678-047A4	8	PVC	100.47
VAL	1002	GP001002-063927	MH001002-070741-043	MH001002-070768-042	8	CLAY	145.88
VAL	1002	GP001002-063992	MH001002-071089-025	MH001002-071078-024A	8	CIP	216.60
VAL	1002	GP001002-064007	MH001002-070831-064	MH001002-070803-058	8	CLAY	400.29
VAL	1002	GP001002-077221	MH001002-071059-021	MH001002-071000-020	8	UNK	405.19
VAL	1002	GP001002-063989	MH001002-071118-027	MH001002-071100-026	8	CLAY	307.76
VAL	1002	GP001002-076462	MH001002-070373-149	MH001002-070405-148	8	DUCTILE_IRON	229.38
VAL	1003	GP001003-126267	MH001003-115580-101	MH001003-115581-100	8	PVC	94.52
VAL	1003	GP001003-070392	MH001003-072026-042A2	MH001003-072048-042A1	8	TRUSS	119.58
VAL	1003	GP001003-125968	MH001003-115271-095	MH001003-115272-094	8	DUCTILE_IRON	175.16
VAL	1003	GP001003-070384	MH001003-072162-042A12	MH001003-072168-042A11	8	TRUSS	254.80
VAL	1003	GP001003-070395	MH001003-072092-042A14	MH001003-072106-042A13	8	PVC	74.88
VAL	1003	GP001003-125966	MH001001-115269-089	MH001003-115270-096	8	DUCTILE_IRON	124.72
VAL	1003	GP001003-126268	MH001003-115581-100	MH001003-115582-098	8	DUCTILE_IRON	320.02
VAL	1003	GP001003-073027	MH001003-072048-042A1	MH001003-072050-042A	8	IRON	156.60
VAL	1003	GP001003-070391	MH001003-072005-042A3	MH001003-072026-042A2	8	TRUSS	271.55
VAL	1003	GP001003-125973	MH001003-115276-090	MH001003-115263-089	8	DUCTILE_IRON	158.77
VAL	1003	GP001003-125970	MH001003-115273-093	MH001003-115274-092	8	DUCTILE_IRON	120.86
VAL	1003	GP001003-126269	MH001003-115583-099	MH001003-115582-098	8	PVC	203.87
VAL	1003	GP001003-125972	MH001003-115275-091	MH001003-115276-090	8	DUCTILE_IRON	89.15
VAL	1003	GP001003-126271	MH001003-115584-097	MH001003-115276-090	8	DUCTILE_IRON	81.79
VAL	1003	GP001003-070394	MH001003-072101-042A8	MH001003-072110-042A7	8	TRUSS	111.25
VAL	1003	GP001003-125971	MH001003-115274-092	MH001003-115275-091	8	DUCTILE_IRON	130.90
VAL	1003	GP001003-070383	MH001003-072165-042A15	MH001003-072162-042A12	8	PVC	180.08
VAL	1003	GP001003-126270	MH001003-115582-098	MH001003-115584-097	8	PVC	170.79
VAL	1003	GP001003-070386	MH001003-072161-042A10	MH001003-072110-042A7	8	TRUSS	218.61
VAL	1003	GP001003-070389	MH001003-072074-042A5	MH001003-072012-042A4	8	PVC	405.47
VAL	1003	GP001003-070393	MH001003-072097-042A9	MH001003-072101-042A8	8	TRUSS	228.18
VAL	1003	GP001003-125967	MH001003-115270-096	MH001003-115271-095	8	DUCTILE_IRON	162.15
VAL	1003	GP001003-070388	MH001003-072098-042A6	MH001003-072048-042A1	8	TRUSS	331.39
VAL	1003	GP001003-125969	MH001003-115272-094	MH001003-115273-093	8	DUCTILE_IRON	174.28
VAL	1003	GP001003-070387	MH001003-072110-042A7	MH001003-072098-042A6	8	TRUSS	99.50
VAL	1003	GP001003-070382	MH001003-072147-042A16	MH001003-072165-042A15	8	PVC	99.69
VAL	1003	GP001003-070385	MH001003-072168-042A11	MH001003-072161-042A10	8	IRON	94.01
VAL	1003	GP001003-070390	MH001003-072012-042A4	MH001003-072005-042A3	8	PVC	120.95
VAL	1003	GP001003-070396	MH001003-072106-042A13	MH001003-072162-042A12	8	PVC	190.75
VAL	1004	GP001004-130455	MH001004-346633-006A1A	MH001004-071170-006	8	PVC	106.84
VAL	1004	GP001004-077299	MH001004-070983-006A17	MH001004-071020-006A15	8	TRUSS	300.27
VAL	1004	GP001004-071322	MH001004-071142-015	MH001004-071097-014	8	IRON	260.23
VAL	1004	GP001004-077296	MH001004-071020-006A15	MH001004-071063-006A13	8	TRUSS	299.28
VAL	1004	GP001004-077289	MH001004-071036-006A5	MH001004-071066-006A4	8	TRUSS	248.21
VAL	1004	GP001004-064076	MH001004-071170-006	MH001004-071172-003A	8	CLAY	58.18
VAL	1004	GP001004-064073	MH001004-071220-008	MH001004-071138-007	8	CLAY	400.20
VAL	1004	GP001004-064075	MH001004-071138-007	MH001004-071152-006A	8	CLAY	159.79
VAL	1004	GP001004-077302	MH001004-070907-006A21	MH001004-070947-006A20	8	TRUSS	301.62
VAL	1004	GP001004-074214	MH001004-070898-006A22	MH001004-070907-006A21	8	IRON	124.78
VAL	1004	GP001004-064070	MH001004-071245-011	MH001004-071241-010	8	CLAY	122.37
VAL	1004	GP001004-077287	MH001004-071074-006A3	MH001004-071098-006A2	8	IRON	160.33
VAL	1004	GP001004-126262	MH001004-115287-099	MH001001-115288-092	8	PVC	137.97
VAL	1004	GP001004-064068	MH001004-071308-013	MH001004-071260-012	8	CLAY	308.93
VAL	1004	GP001004-071323	MH001004-071162-016	MH001004-071142-015	8	CLAY	167.57
VAL	1004	GP001004-077301	MH001004-070947-006A20	MH001004-070983-006A17	8	TRUSS	299.75
VAL	1004	GP001004-071324	MH001004-071182-017	MH001004-071162-016	8	CLAY	148.38
VAL	1004	GP001004-382570	MH001004-071152-006A	MH001004-346633-006A1A	8	PVC	20.53
VAL	1004	GP001004-380330	MH001004-344390-099A	MH001004-115287-099	8	PVC	46.83
VAL	1004	GP001004-064071	MH001004-071241-010	MH001004-071240-009	8	IRON	100.91
VAL	1004	GP001004-070753	MH001004-070880-006A11	MH001004-070904-006A10	8	TRUSS	301.19
VAL	1004	GP001004-074213	MH001004-070950-006A19	MH001004-070960-006A18	8	TRUSS	130.34
VAL	1004	GP001004-077294	MH001004-070951-006A9	MH001004-070939-006A8	8	TRUSS	62.05
VAL	1004	GP001004-077300	MH001004-070960-006A18	MH001004-070983-006A17	8	TRUSS	303.09
VAL	1004	GP001004-130456	MH001004-346632-006A1B	MH001004-346633-006A1A	8	PVC	132.83
VAL	1004	GP001004-077288	MH001004-071066-006A4	MH001004-071074-006A3	8	IRON	205.67
VAL	1004	GP001004-071321	MH001004-071276-019	MH001004-071215-018	8	CLAY	365.68
VAL	1004	GP001004-064072	MH001004-071240-009	MH001004-071220-008	8	CLAY	131.71
VAL	1004	GP001004-077295	MH001004-070995-006A16	MH001004-071020-006A15	8	TRUSS	322.18
VAL	1004	GP001004-077303	MH001004-070934-006A23	MH001004-070947-006A20	8	TRUSS	60.88
VAL	1004	GP001004-077291	MH001004-070972-006A7	MH001004-071004-006A6	8	TRUSS	246.03
VAL	1004	GP001004-077298	MH001004-071033-006A14	MH001004-071063-006A13	8	TRUSS	299.10
VAL	1004	GP001004-071325	MH001004-071215-018	MH001004-071182-017	8	CLAY	199.72
VAL	1004	GP001004-077297	MH001004-071063-006A13	MH001004-071074-006A3	8	IRON	165.88

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1004	GP001004-077293	MH001004-070904-006A10	MH001004-070939-006A8	8	TRUSS	300.11
VAL	1004	GP001004-077290	MH001004-071004-006A6	MH001004-071036-006A5	8	TRUSS	247.30
VAL	1004	GP001004-077292	MH001004-070939-006A8	MH001004-070972-006A7	8	TRUSS	249.80
VAL	1004	GP001004-070754	MH001004-070869-006A12	MH001004-070880-006A11	8	TRUSS	75.43
VAL	1004	GP001004-073171	MH001004-071098-006A2	MH001004-071106-006A1	8	IRON	105.27
VAL	1004	GP001004-064074	MH001004-071097-014	MH001004-071138-007	8	CLAY	319.98
VAL	1004	GP001004-064069	MH001004-071260-012	MH001004-071245-011	8	CLAY	117.49
VAL	1004	GP001004-382569	MH001004-071106-006A1	MH001004-346632-006A1B	8	PVC	89.96
VAL	1004	GP001004-126266	MH001004-115291-100	MH001003-115580-101	8	PVC	119.74
VAL	1006	GP001006-075574	MH001006-065908-188	MH001006-065962-186	8	CLAY	114.33
VAL	1006	GP001006-064296	MH001006-066820-123E	MH001006-066736-123D	8	UNK	252.77
VAL	1006	GP001006-075571	MH001006-066024-193	MH001006-098788-192	8	CLAY	198.12
VAL	1006	GP001006-064300	MH001006-066476-124	MH001006-066350-123	8	CLAY	349.24
VAL	1006	GP001006-075572	MH001006-066053-194	MH001006-066024-193	8	CLAY	188.03
VAL	1006	GP001006-107939	MH001006-098789-184A	MH001006-066117-184	8	PVC	20.72
VAL	1006	GP001006-064188	MH001006-066736-123D	MH001006-066574-123C	8	UNK	220.55
VAL	1006	GP001006-064297	MH001006-066590-125	MH001006-066476-124	8	CLAY	302.83
VAL	1006	GP001006-107937	FT001007-011601	MH001006-066002-114	8	PVC	157.50
VAL	1006	GP001006-064243	MH001006-066574-123C	MH001006-066478-123B	8	UNK	174.22
VAL	1006	GP001006-064308	MH001006-066939-123F	MH001006-066820-123E	8	UNK	265.96
VAL	1006	GP001006-064302	MH001006-066478-123B	MH001006-066390-123A	8	UNK	376.56
VAL	1006	GP001006-064301	MH001006-066390-123A	MH001006-066350-123	8	UNK	169.62
VAL	1006	GP001006-064298	MH001006-066729-126	MH001006-066590-125	8	CLAY	297.65
VAL	1006	GP001006-107935	MH001006-065962-186	MH001006-065988-185	8	PVC	58.51
VAL	1006	GP001006-075570	MH001006-065988-185	MH001006-066117-184	8	CLAY	400.94
VAL	1006	GP001006-107938	MH001006-098788-192	MH001006-098789-184A	8	PVC	392.14
VAL	1007	GP001007-064425	MH001007-067957-087	MH001007-067903-081	8	UNK	194.44
VAL	1007	GP001007-051334	MH001007-059468-131	MH001007-059557-130	8	CIP	159.46
VAL	1007	GP001007-064432	MH001007-067547-081A	MH001007-067903-081	8	CIP	488.55
VAL	1007	GP001007-064426	MH001007-068037-084	MH001007-067903-081	8	CIP	343.59
VAL	1007	GP001007-064419	MH001007-068044-089	MH001007-068003-088	8	UNK	172.18
VAL	1007	GP001007-064423	MH001007-068134-090	MH001007-068003-088	8	UNK	342.84
VAL	1007	GP001007-064431	MH001007-067399-082	MH001007-067547-081A	8	CIP	477.36
VAL	1007	GP001007-064424	MH001007-068003-088	MH001007-067957-087	8	UNK	183.68
VAL	1007	GP001007-064402	MH001007-068245-090A	MH001007-068134-090	8	UNK	321.41
VAL	1007	GP001007-064403	MH001007-068175-092	MH001007-068134-090	8	UNK	162.48
VAL	1007	GP001007-064393	MH001007-067505-047	MH001007-067301-043	8	UNK	464.49
VAL	1007	GP001007-108000	FT001007-011639	MH001007-067221-083	8	PVC	92.37
VAL	1007	GP001007-064421	MH001007-068085-085	MH001007-068037-084	8	UNK	170.84
VAL	1007	GP001007-064394	MH001007-067752-049	MH001007-067505-047	8	UNK	490.26
VAL	1007	GP001007-064430	MH001007-067221-083	MH001007-067399-082	8	UNK	371.33
VAL	1007	GP001007-064428	MH001007-067903-081	MH001007-067752-049	8	UNK	394.92
VAL	1008	GP001008-051482	MH001008-059508-004	MH001008-059497-002	8	CLAY	147.10
VAL	1008	GP001008-051684	MH001008-059371-007	MH001008-059416-006	8	CLAY	160.27
VAL	1008	GP001008-051481	MH001008-059418-009	MH001008-059497-002	8	CIP	318.43
VAL	1008	GP001008-062872	MH001008-059591-005	MH001008-059508-004	8	CLAY	100.73
VAL	1008	GP001008-051634	MH001008-059820-084	MH001008-059694-077	8	CLAY	409.65
VAL	1008	GP001008-051682	MH001008-059416-006	MH001008-059497-002	8	CLAY	160.25
VAL	1008	GP001008-051632	MH001008-059694-077	MH001008-059549-001	8	DIP/CLAY	380.37
VAL	1008	GP001008-051589	MH001008-059379-019	MH001008-059389-014	8	UNK	111.64
VAL	1008	GP001008-051590	MH001008-059389-014	MH001008-059418-009	8	UNK	6.35
VAL	1008	GP001008-051685	MH001008-059335-008	MH001008-059371-007	8	CLAY	138.82
VAL	1008	GP001008-051683	MH001008-059497-002	MH001008-059549-001	8	CIP	223.73
VAL	1009	GP001009-064751	MH001009-069666-073A	MH001009-069668-073	8	UNK	108.12
VAL	1009	GP001009-064760	MH001009-069674-071	MH001009-069741-070	10	CIP	300.72
VAL	1009	GP001009-064754	MH001009-429420-071A1	MH001009-069674-071	8	UNK	155.00
VAL	1009	GP001009-064771	MH001009-069783-089	MH001009-069809-069	8	CIP	280.58
VAL	1009	GP001009-064859	MH001009-069757-090	MH001009-069783-089	8	CIP	202.09
VAL	1009	GP001009-107983	MH001009-350470-089A	MH001009-069783-089	8	PVC	58.19
VAL	1009	GP001009-064774	MH001009-069833-092	MH001009-069783-089	8	UNK	234.95
VAL	1009	GP001009-064749	MH001009-069635-107	MH001009-069644-106	8	IRON	29.70
VAL	1009	GP001009-064857	MH001009-069711-091	MH001009-069757-090	8	CLAY	227.86
VAL	1009	GP001009-064735	MH001009-069582-109	MH001009-069605-108	8	IRON	239.01
VAL	1009	GP001009-064759	MH001009-069681-105	MH001009-069702-104	8	UNK	166.76
VAL	1009	GP001009-064757	MH001009-069644-106	MH001009-069681-105	8	IRON	207.44
VAL	1009	GP001009-064729	MH001009-069497-075	MH001009-069544-074	10	UNK	205.77
VAL	1009	GP001009-107986	MH001009-098578-069A	MH001009-069809-069	8	CLAY	133.57
VAL	1009	GP001009-064746	MH001009-069605-108	MH001009-069635-107	8	IRON	113.09
VAL	1009	GP001009-107985	FT001009-011630	MH001009-098578-069A	8	CLAY	108.00
VAL	1009	GP001009-107961	MH001009-387909-113A	MH001009-069479-113	8	PVC	187.00

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1009	GP001009-064858	MH001009-069725-103	MH001009-069776-102	8	DUCTILE_IRON	419.54
VAL	1009	GP001009-071311	MH001009-069776-102	MH001009-350469-067A	8	DUCTILE_IRON	296.77
VAL	1009	GP001009-064767	MH001009-069784-068	MH001009-069795-067	8	UNK	62.85
VAL	1009	GP001009-064768	MH001009-069741-070	MH001009-069795-067	10	UNK	216.86
VAL	1009	GP001009-064770	MH001009-350469-067A	MH001009-069795-067	8	CLAY	81.31
VAL	1009	GP001009-064772	MH001009-069795-067	PS001009-000217	10	UNK	62.71
VAL	1009	GP001009-387687	MH001009-069809-069	MH001009-069795-067	8	CLAY	132.66
VAL	1009	GP001009-064731	MH001009-069537-112	MH001009-069582-109	8	UNK	195.42
VAL	1009	GP001009-064727	MH001009-069479-113	MH001009-069537-112	8	UNK	194.03
VAL	1009	GP001009-064775	MH001009-069792-093	MH001009-069833-092	8	PVC	298.43
VAL	1009	GP001009-064736	MH001009-069544-074	MH001009-069610-071A	8	UNK	195.06
VAL	1009	GP001009-064752	MH001009-069668-073	MH001009-069671-072	10	UNK	48.46
VAL	1009	GP001009-064762	MH001009-069702-104	MH001009-069725-103	8	DUCTILE_IRON	298.91
VAL	1009	GP001009-064764	MH001009-069765-111	MH001009-069678-110	4	IRON	352.47
VAL	1009	GP001009-073894	MH001009-069734-095	MH001009-069754-094	8	PVC	39.12
VAL	1009	GP001009-064755	MH001009-069671-072	MH001009-069674-071	10	UNK	116.18
VAL	1009	GP001009-064756	MH001009-069678-110	MH001009-069644-106	8	IRON	291.02
VAL	1009	GP001009-064778	MH001009-069927-097	MH001009-069833-092	8	UNK	446.79
VAL	1009	GP001009-064733	MH001009-069595-074B	MH001009-069559-074A	8	UNK	253.93
VAL	1009	GP001009-073895	MH001009-069754-094	MH001009-069792-093	8	PVC	249.19
VAL	100S	GP00100S-100099	MH00100S-091349-070	MH00100S-091348-069	8	DUCTILE_IRON	396.43
VAL	100S	GP00100S-100133	MH00100S-090656-083	MH00100S-090647-064	8	DUCTILE_IRON	150.53
VAL	100S	GP00100S-100080	MH00100S-090647-064	MH00100S-091343-063	8	DUCTILE_IRON	100.09
VAL	100S	GP00100S-100081	MH00100S-091343-063	MH00100S-091341-062	8	DUCTILE_IRON	258.00
VAL	100S	GP00100S-100128	MH00100S-090654-087	MH00100S-090653-086	8	DUCTILE_IRON	165.41
VAL	100S	GP00100S-071315	MH00100S-070255-009P	MH00100S-070219-009O	8	CLAY	177.89
VAL	100S	GP00100S-070517	MH00100S-070283-009R	MH00100S-070293-009Q	8	IRON	169.87
VAL	100S	GP00100S-100077	MH00100S-091340-061	MH00100S-091339-060	8	DUCTILE_IRON	257.57
VAL	100S	GP00100S-112071	MH00100S-070320-009S	MH00100S-090650-067	8	DUCTILE_IRON	259.61
VAL	100S	GP00100S-100113	MH00100S-090648-065	MH00100S-090647-064	8	DUCTILE_IRON	357.55
VAL	100S	GP00100S-111742	MH00100S-102002-077	MH00100S-102003-076	8	DUCTILE_IRON	256.93
VAL	100S	GP00100S-100070	MH00100S-091337-058	MH00100S-091327-057	8	DUCTILE_IRON	279.23
VAL	100S	GP00100S-100120	MH00100S-090651-081	MH00100S-091338-059	8	DUCTILE_IRON	200.12
VAL	100S	GP00100S-100075	MH00100S-091339-060	MH00100S-091338-059	8	DUCTILE_IRON	143.20
VAL	100S	GP00100S-100130	MH00100S-090655-085	MH00100S-090657-084	8	DUCTILE_IRON	379.38
VAL	100S	GP00100S-100140	MH00100S-090659-089	MH00100S-090658-088	8	DUCTILE_IRON	240.28
VAL	100S	GP00100S-100119	MH00100S-090652-082	MH00100S-090651-081	8	DUCTILE_IRON	202.36
VAL	100S	GP00100S-071316	MH00100S-070293-009Q	MH00100S-070255-009P	8	IRON	203.92
VAL	100S	GP00100S-100114	MH00100S-090650-067	MH00100S-090649-066	8	DUCTILE_IRON	196.82
VAL	100S	GP00100S-111741	MH00100S-102001-078	MH00100S-102002-077	8	DUCTILE_IRON	204.35
VAL	100S	GP00100S-100138	MH00100S-090658-088	MH00100S-091338-059	8	DUCTILE_IRON	286.91
VAL	100S	GP00100S-100079	MH00100S-091341-062	MH00100S-091340-061	8	DUCTILE_IRON	195.69
VAL	100S	GP00100S-100132	MH00100S-090657-084	MH00100S-090656-083	8	DUCTILE_IRON	400.13
VAL	100S	GP00100S-100115	MH00100S-090649-066	MH00100S-090648-065	8	DUCTILE_IRON	363.48
VAL	100S	GP00100S-111743	MH00100S-102003-076	MH00100S-091327-057	8	DUCTILE_IRON	126.46
VAL	100S	GP00100S-111739	MH00100S-070219-009O	MH00100S-090660-090	8	IRON	376.88
VAL	100S	GP00100S-100139	MH00100S-090660-090	MH00100S-090659-089	8	DUCTILE_IRON	202.52
VAL	100S	GP00100S-100069	MH00100S-091338-059	MH00100S-091337-058	8	DUCTILE_IRON	315.11
VAL	100S	GP00100S-100097	MH00100S-091348-069	MH00100S-091327-057	8	DUCTILE_IRON	228.91
VAL	100S	GP00100S-100060	MH00100S-091327-057	MH00100S-091328-056	8	DUCTILE_IRON	267.99
VAL	100S	GP00100S-100106	MH00100S-090645-079	MH00100S-091343-063	8	DUCTILE_IRON	120.35
VAL	100S	GP00100S-100129	MH00100S-090653-086	MH00100S-090655-085	8	DUCTILE_IRON	330.95
VAL	100S	GP00100S-100105	MH00100S-090646-080	MH00100S-090645-079	8	DUCTILE_IRON	228.15
VAL	1012	GP001012-065293	MH001012-065648-142H	MH001012-065615-142G	0	UNK	81.90
VAL	1012	GP001012-065201	MH001012-065578-158E	MH001012-065576-158A	8	UNK	211.59
VAL	1012	GP001012-065249	MH001012-064754-048A	MH001012-064908-048	20	UNK	359.14
VAL	1012	GP001012-065258	MH001012-065411-142F	MH001012-196845-142A2	8	UNK	317.95
VAL	1012	GP001012-065275	MH001012-065750-158I	MH001012-065672-158H	8	CLAY	167.41
VAL	1012	GP001012-065277	MH001012-065812-158M	MH001012-065846-158L	8	CLAY	212.35
VAL	1012	GP001012-069129	MH001012-065608-175	MH001012-065562-174	12	CIP	233.95
VAL	1012	GP001012-071981	FT001012-110874	MH001012-065365-143C	12	CLAY	235.00
VAL	1012	GP001012-071980	MH001012-065506-160	MH001012-065441-159	16	DUCTILE_IRON	231.76
VAL	1012	GP001012-065278	MH001012-065866-158J	MH001012-065750-158I	8	CLAY	378.29
VAL	1012	GP001012-065300	MH001012-065522-158B	MH001012-065576-158A	8	CLAY	121.43
VAL	1012	GP001012-065247	MH001012-064528-084A	MH001012-064734-084	20	UNK	448.92
VAL	1012	GP001012-210064	MH001012-065615-142G	MH001012-187890-142F1	8	UNK	355.48
VAL	1012	GP001012-065302	MH001012-064734-084	MH001012-064754-048A	20	UNK	28.39
VAL	1012	GP001012-065202	MH001012-065577-158F	MH001012-065578-158E	8	UNK	99.67
VAL	1012	GP001012-065273	MH001012-065672-158H	MH001012-065576-158A	8	CLAY	233.27
VAL	1012	GP001012-065279	MH001012-065846-158L	MH001012-065869-158K	8	CLAY	224.45

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1012	GP001012-065306	MH001012-065869-158K	MH001012-065866-158J	8	CLAY	18.16
VAL	1012	GP001012-069118	MH001012-065562-174	MH001012-065506-160	12	CIP	248.40
VAL	1012	GP001012-065204	MH001012-065645-158G	MH001012-065577-158F	8	UNK	203.18
VAL	1012	GP001012-065276	MH001012-065769-158N	MH001012-065812-158M	8	UNK	89.80
VAL	1012	GP001012-210065	MH001012-187890-142F1	MH001012-065411-142F	8	UNK	217.00
VAL	1013	GP001013-382887	MH001013-064277-001A	MH001013-346949-001	8	UNK	62.35
VAL	1013	GP001013-065485	MH001013-063163-020	MH001013-063066-019	18	UNK	218.48
VAL	1013	GP001013-203255	MH001013-180765-032A	MH001013-064554-032	8	CIP	431.22
VAL	1013	GP001013-065502	MH001013-424286-024A	MH001013-063464-024	8	CLAY	305.22
VAL	1013	GP001013-472955	MH001013-063795-025	MH001013-424286-024A	8	CLAY	280.00
VAL	1013	GP001013-071270	MH001013-346949-001	MH001012-064528-084A	8	UNK	478.29
VAL	1013	GP001013-065508	MH001013-063971-011	MH001013-063997-001B	18	UNK	46.13
VAL	1013	GP001013-065529	MH001013-064554-032	MH001013-064426-030	10	CLAY	433.67
VAL	1013	GP001013-065531	MH001012-424410-032B2	MH001013-064554-032	8	CIP	116.00
VAL	1013	GP001013-473484	MH001013-064680-033	MH001012-424410-032B2	8	UNK	258.37
VAL	1013	GP001013-071261	MH001013-064254-029	MH001013-063942-028	8	UNK	495.88
VAL	1013	GP001013-065500	MH001013-063511-013	MH001013-063698-012	18	UNK	341.95
VAL	1013	GP001013-065498	MH001013-063637-027	MH001013-063553-026	8	CLAY	240.27
VAL	1013	GP001013-065532	MH001013-064785-035	MH001013-064680-033	8	CIP	382.44
VAL	1013	GP001013-065337	MH001013-063276-017	MH001013-063511-013	18	UNK	390.57
VAL	1013	GP001013-065486	MH001013-063272-021	MH001013-063163-020	8	UNK	261.10
VAL	1013	GP001013-065535	MH001013-064916-035A	MH001013-064785-035	8	UNK	379.69
VAL	1013	GP001013-065516	MH001013-063997-001B	MH001013-064277-001A	18	CLAY	419.34
VAL	1013	GP001013-065494	MH001013-063443-016	MH001013-063528-015	8	UNK	140.05
VAL	1013	GP001013-065505	MH001013-063942-028	MH001013-063637-027	8	UNK	478.28
VAL	1013	GP001013-065506	MH001013-063698-012	MH001013-063971-011	24	CIP	432.83
VAL	1013	GP001013-071262	MH001013-064426-030	MH001013-064254-029	10	CIP	499.88
VAL	1013	GP001013-065487	MH001013-063066-019	MH001013-063276-017	18	UNK	318.62
VAL	1013	GP001013-065537	MH001013-065001-036A	MH001013-064785-035	8	CLAY	399.02
VAL	1013	GP001013-065503	MH001013-063830-039	MH001013-063637-027	8	UNK	479.60
VAL	1013	GP001013-065521	MH001013-064221-031	MH001013-064426-030	8	UNK	470.11
VAL	1013	GP001013-065496	MH001013-063553-026	MH001013-063464-024	8	CLAY	239.15
VAL	1013	GP001013-065528	MH001013-428151-032B1A	MH001013-064554-032	8	CLAY	291.00
VAL	1013	GP001013-381928	MH001013-064677-036	MH001013-064785-035	8	UNK	310.30
VAL	1013	GP001013-065495	MH001013-063528-015	MH001013-063511-013	8	UNK	60.17
VAL	1013	GP001013-065544	MH001013-064655-037	MH001013-064677-036	0	UNK	58.82
VAL	1013	GP001013-065509	MH001013-064015-040	MH001013-063830-039	8	UNK	429.69
VAL	1013	GP001013-065491	MH001013-063464-024	MH001013-429351-021B	8	CIP	312.09
VAL	1014	GP001014-065712	MH001014-064122-065	MH001014-064082-064	8	UNK	81.82
VAL	1014	GP001014-065711	MH001014-064082-064	MH001014-063804-063	8	CLAY	408.71
VAL	1014	GP001014-065670	MH001014-065035-041	MH001014-064851-040	8	CLAY	429.71
VAL	1014	GP001014-065706	MH001014-063625-059	MH001014-063529-058	8	UNK	239.95
VAL	1014	GP001014-065698	MH001014-064851-040	MH001014-064829-039	8	UNK	50.63
VAL	1014	GP001014-370736	MH001014-335758-035B	MH001014-110465-035A	8	UNK	63.10
VAL	1014	GP001014-065697	MH001014-064829-039	MH001014-064624-038	8	CIP	480.23
VAL	1014	GP001014-121473	MH001014-110465-035A	MH001014-064234-035	8	UNK	173.82
VAL	1014	GP001014-121472	MH001014-064389-036	MH001014-335758-035B	8	UNK	235.60
VAL	1014	GP001014-065707	MH001014-063715-061	MH001014-063625-059	8	CLAY	237.51
VAL	1014	GP001014-065724	MH001014-064894-042	MH001014-064851-040	8	UNK	112.50
VAL	1014	GP001014-065699	MH001014-065034-043	MH001014-064894-042	8	UNK	326.14
VAL	1014	GP001014-065725	MH001014-064122-065	MH001014-064154-037	8	UNK	439.22
VAL	1014	GP001014-065691	MH001014-064180-028	MH001014-064130-026	8	UNK	100.53
VAL	1014	GP001014-077144	MH001014-063400-071	MH001014-063529-058	8	UNK	99.71
VAL	1014	GP001014-065696	MH001014-064624-038	MH001014-064389-036	8	UNK	483.17
VAL	1014	GP001014-065709	MH001014-063804-063	MH001014-063715-061	8	CIP	239.40
VAL	1014	GP001014-065726	MH001014-064154-037	MH001014-064389-036	8	UNK	39.15
VAL	1014	GP001014-065692	MH001014-064234-035	MH001014-335760-028A1	8	UNK	136.50
VAL	1014	GP001014-065690	MH001014-064130-026	MH001014-064074-024	8	UNK	108.93
VAL	1014	GP001014-370738	MH001014-335760-028A1	MH001014-064180-028	8	UNK	10.06
VAL	1015	GP001015-065788	MH001015-420876-021B	MH001015-065825-021	8	UNK	219.67
VAL	1015	GP001015-469612	MH001015-065931-023	MH001015-420876-021B	8	UNK	160.11
VAL	1015	GP001015-065796	MH001015-065874-036	MH001015-066034-035	8	UNK	455.01
VAL	1015	GP001015-065797	MH001015-066034-035	MH001015-065931-023	10	UNK	425.21
VAL	1015	GP001015-205495	MH001015-182684-035A	MH001015-066034-035	8	UNK	258.54
VAL	1015	GP001015-436968	MH001015-395270-035B	MH001015-182684-035A	6	CLAY	401.68
VAL	1015	GP001015-065800	MH001015-066000-049	MH001015-066146-048	8	CIP	454.77
VAL	1015	GP001015-205494	MH001015-066146-048	MH001015-182684-035A	8	CIP	225.38
VAL	1015	GP001015-065803	MH001015-066250-057	MH001015-430119-048A	8	UNK	237.98
VAL	1016	GP001016-069044	MH001016-066311-001	MH001015-066250-057	8	UNK	259.30
VAL	1016	GP001016-446255	MH001016-402319-0104	MH001016-402318-0102	8	DUCTILE_IRON	94.06

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1016	GP001016-446262	MH001016-402324-0103	MH001016-402318-0102	8	DUCTILE_IRON	167.07
VAL	1016	GP001016-446254	MH001016-402317-0097	MH001016-402316-0096	8	DUCTILE_IRON	75.91
VAL	1016	GP001016-446253	MH001016-402316-0096	MH001016-402315-0095	8	DUCTILE_IRON	121.46
VAL	1016	GP001016-446252	MH001016-402315-0095	MH001016-402314-0094	8	DUCTILE_IRON	140.39
VAL	1016	GP001016-446259	MH001016-402322-0100	MH001016-402321-0099	8	DUCTILE_IRON	47.39
VAL	1016	GP001016-446251	MH001016-402314-0094	MH001016-402313-0093	8	DUCTILE_IRON	187.24
VAL	1016	GP001016-446250	MH001016-402313-0093	MH001016-402312-0092	8	DUCTILE_IRON	71.03
VAL	1016	GP001016-446249	MH001016-402312-0092	MH001016-402311-0091	8	DUCTILE_IRON	79.86
VAL	1016	GP001016-446248	MH001016-402311-0091	MH001016-402310-0090	8	DUCTILE_IRON	132.12
VAL	1016	GP001016-471528	MH001016-422470-0105	MH001016-402329-0082	8	PVC	135.93
VAL	1016	GP001016-446570	MH001016-402330-0083	MH001016-402329-0082	8	DUCTILE_IRON	77.95
VAL	1016	GP001016-446571	MH001016-402331-0084	MH001016-402330-0083	8	DUCTILE_IRON	161.17
VAL	1016	GP001016-446260	MH001016-402323-0101	MH001016-402322-0100	8	DUCTILE_IRON	166.98
VAL	1016	GP001016-446261	MH001016-402318-0102	MH001016-402323-0101	8	DUCTILE_IRON	116.14
VAL	1016	GP001016-446572	MH001016-402332-0085	MH001016-402331-0084	8	DUCTILE_IRON	167.28
VAL	1016	GP001016-446573	MH001016-402333-0086	MH001016-402332-0085	8	DUCTILE_IRON	154.60
VAL	1016	GP001016-446574	MH001016-402334-0087	MH001016-402333-0086	8	DUCTILE_IRON	134.04
VAL	1016	GP001016-446575	MH001016-402335-0088	MH001016-402334-0087	8	DUCTILE_IRON	300.77
VAL	1016	GP001016-446257	MH001016-402320-0098	MH001016-402313-0093	8	DUCTILE_IRON	371.96
VAL	1016	GP001016-446258	MH001016-402321-0099	MH001016-402320-0098	8	DUCTILE_IRON	200.96
VAL	1016	GP001016-065842	MH001016-402309-0089	MH001016-067089-045	8	UNK	136.31
VAL	1016	GP001016-446247	MH001016-402310-0090	MH001016-067020-046	8	DUCTILE_IRON	15.62
VAL	1016	GP001016-065873	MH001016-067089-045	MH001016-335756-044A	8	UNK	319.78
VAL	1016	GP001016-228306	MH001016-402326-0079	MH001016-202615-043A	8	UNK	274.92
VAL	1016	GP001016-370734	MH001016-335756-044A	MH001016-066752-044	8	UNK	194.03
VAL	1016	GP001016-065840	MH001016-066550-043	MH001016-066393-042	8	UNK	502.93
VAL	1016	GP001016-228307	MH001016-202615-043A	MH001016-066550-043	8	UNK	146.27
VAL	1017	GP001017-065875	MH001017-422976-008A	MH001017-066348-008	8	UNK	83.60
VAL	1017	GP001017-065884	MH001017-066348-008	MH001017-066540-007	8	CLAY	416.32
VAL	1017	GP001017-065880	MH001017-066474-004	MH001017-066431-002	8	UNK	119.53
VAL	1017	GP001017-065878	MH001017-066431-002	MH001017-066396-001	8	UNK	93.84
VAL	1017	GP001017-069091	MH001017-066396-001	MH001012-066335-169C	8	UNK	201.01
VAL	1017	GP001017-065881	MH001017-066492-001A	MH001017-066396-001	10	UNK	280.74
VAL	1017	GP001017-065890	MH001017-066754-013	MH001017-066492-001A	10	UNK	347.29
VAL	1017	GP001017-065892	MH001017-066862-014	MH001017-066754-013	10	UNK	243.55
VAL	1017	GP001017-065893	MH001017-066884-015	MH001017-066862-014	10	UNK	50.96
VAL	1017	GP001017-065882	MH001017-066503-005	MH001017-066474-004	8	UNK	28.81
VAL	1017	GP001017-065883	MH001017-066540-007	MH001017-066503-005	8	UNK	169.19
VAL	1017	GP001017-065897	MH001017-067085-014A	MH001017-066862-014	8	UNK	395.32
VAL	1017	GP001017-065901	FT001017-004744	MH001017-429975-014B	8	UNK	547.75
VAL	1017	GP001017-065898	MH001017-067164-016	MH001017-066884-015	10	UNK	558.92
VAL	1017	GP001017-065899	MH001017-067206-017	MH001017-067164-016	10	UNK	181.95
VAL	1017	GP001017-065900	MH001017-067245-018	MH001017-067206-017	10	UNK	177.24
VAL	1018	GP001018-065937	MH001018-066757-029C	MH001018-066641-029B	8	CLAY	328.00
VAL	1018	GP001018-066013	MH001018-066641-029B	MH001018-066534-029A	8	CLAY	318.72
VAL	1018	GP001018-066020	MH001018-066697-029I	MH001018-066815-029F	8	CLAY	243.00
VAL	1018	GP001018-066028	MH001018-066815-029F	MH001018-066936-029E	8	CLAY	285.97
VAL	1018	GP001018-386410	MH001018-066845-086	MH001018-066802-084	8	CIP	155.23
VAL	1018	GP001018-065998	MH001018-066454-082	MH001018-066351-081	8	CLAY	399.01
VAL	1018	GP001018-065980	MH001018-343757-008B	MH001018-065964-008	8	UNK	497.49
VAL	1018	GP001018-065993	MH001018-066358-039	MH001018-066385-037	8	UNK	146.04
VAL	1018	GP001018-065933	MH001018-066721-070A	MH001018-066693-070	8	UNK	86.46
VAL	1018	GP001018-380007	MH001018-066748-072	MH001018-344072-070B	8	CLAY	26.04
VAL	1018	GP001018-065992	MH001018-066384-028	MH001018-066334-027	8	UNK	284.17
VAL	1018	GP001018-066004	MH001018-066493-038	MH001018-066455-036	8	UNK	131.27
VAL	1018	GP001018-066000	MH001018-066385-037	MH001018-066455-036	8	UNK	138.12
VAL	1018	GP001018-065990	MH001018-066325-041	MH001018-066343-040	6	UNK	77.58
VAL	1018	GP001018-379691	MH001018-343755-006A1	MH001018-065791-006	8	IRON	34.93
VAL	1018	GP001018-066003	FT001018-011610	MH001018-066493-038	8	UNK	111.32
VAL	1018	GP001018-066010	MH001018-066458-076	MH001018-066568-074	8	CLAY	173.93
VAL	1018	GP001018-065923	MH001018-066417-039A	MH001018-066358-039	8	UNK	92.30
VAL	1018	GP001018-066021	MH001018-066842-073	MH001018-066748-072	8	CLAY	288.22
VAL	1018	GP001018-071282	MH001018-066728-069A	MH001018-066749-069	0	UNK	42.09
VAL	1018	GP001018-069128	MH001018-065701-001	MH001012-065608-175	12	CIP	362.78
VAL	1018	GP001018-066034	MH001018-067025-029K	MH001018-066936-029E	8	UNK	349.43
VAL	1018	GP001018-412327	MH001018-372869-045A	MH001018-066598-045	8	CLAY	157.00
VAL	1018	GP001018-070828	MH001018-066598-045	MH001018-066559-044	8	UNK	189.40
VAL	1018	GP001018-065942	MH001018-066923-102	MH001018-066749-069	8	CIP	329.23
VAL	1018	GP001018-065967	MH001018-066399-078	MH001018-066446-077	8	CLAY	144.20
VAL	1018	GP001018-065966	MH001018-066179-005A	MH001018-066047-005	8	UNK	360.38

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1018	GP001018-066006	MH001018-066514-080	MH001018-066401-079	8	CLAY	362.99
VAL	1018	GP001018-065924	MH001018-066446-077	MH001018-066458-076	8	CLAY	26.53
VAL	1018	GP001018-065987	FT001018-004714	MH001018-066259-043	6	UNK	90.00
VAL	1018	GP001018-075525	MH001018-066513-049	MH001018-066343-040	8	CLAY	469.66
VAL	1018	GP001018-065988	MH001018-066259-043	MH001018-066278-042	6	UNK	91.36
VAL	1018	GP001018-066016	MH001018-066704-075	MH001018-066568-074	8	CLAY	434.14
VAL	1018	GP001018-065975	MH001018-065719-002	MH001018-065701-001	12	CIP	66.64
VAL	1018	GP001018-065991	MH001018-066343-040	MH001018-066358-039	8	UNK	75.44
VAL	1018	GP001018-066032	MH001018-066949-092	MH001018-066842-073	8	CLAY	265.86
VAL	1018	GP001018-065976	MH001018-065791-006	MH001018-065719-002	12	DUCTILE_IRON	383.91
VAL	1018	GP001018-066009	MH001018-066559-044	MH001018-066417-039A	8	UNK	324.68
VAL	1018	GP001018-066015	MH001018-066518-096	MH001018-066686-095	8	CLAY	391.08
VAL	1018	GP001018-065914	MH001018-065964-008	MH001018-343756-006A	12	DUCTILE_IRON	236.36
VAL	1018	GP001018-065915	MH001018-066047-005	MH001018-065879-003	8	UNK	488.14
VAL	1018	GP001018-065919	MH001018-066216-047	MH001018-066277-046	6	UNK	155.06
VAL	1018	GP001018-065994	MH001018-066351-081	MH001018-066401-079	8	CLAY	120.19
VAL	1018	GP001018-076286	MH001018-066913-087	MH001018-066845-086	8	UNK	78.83
VAL	1018	GP001018-066040	MH001018-066997-029J	MH001018-067087-029G	8	UNK	267.97
VAL	1018	GP001018-065977	FT001018-004681	MH001018-065701-001	6	CLAY	410.16
VAL	1018	GP001018-066022	MH001018-066686-095	MH001018-066854-094	8	CLAY	301.98
VAL	1018	GP001018-066002	MH001018-066401-079	MH001018-066458-076	8	CLAY	146.94
VAL	1018	GP001018-066007	MH001018-066534-029A	MH001018-066415-029	8	CLAY	338.57
VAL	1018	GP001018-065936	MH001018-344072-070B	MH001018-066721-070A	8	CLAY	106.59
VAL	1018	GP001018-379692	MH001018-343756-006A	MH001018-343755-006A1	12	DUCTILE_IRON	208.70
VAL	1018	GP001018-065926	MH001018-066405-051	MH001018-066486-050	8	UNK	336.01
VAL	1018	GP001018-065943	MH001018-066936-029E	MH001018-066757-029C	8	CIP	329.36
VAL	1018	GP001018-066001	MH001018-066455-036	MH001018-066384-028	8	UNK	144.81
VAL	1018	GP001018-065997	MH001018-066403-083	MH001018-066454-082	8	CLAY	124.99
VAL	1018	GP001018-075520	MH001018-066749-069	MH001018-066677-068	8	UNK	181.96
VAL	1018	GP001018-065984	FT001018-004709	MH001018-066211-048	6	UNK	137.03
VAL	1018	GP001018-065935	MH001018-066568-074	MH001018-066748-072	8	CIP	315.45
VAL	1018	GP001018-076282	MH001018-066794-071	MH001018-066721-070A	8	UNK	137.09
VAL	1018	GP001018-075519	MH001018-066693-070	MH001018-066677-068	8	UNK	66.77
VAL	1018	GP001018-065989	MH001018-066278-042	MH001018-066325-041	6	UNK	60.27
VAL	1018	GP001018-065918	MH001018-066211-048	MH001018-066216-047	6	UNK	206.68
VAL	1018	GP001018-071184	MH001018-066305-052	MH001018-066405-051	0	UNK	78.66
VAL	1018	GP001018-066024	MH001018-066866-029D	MH001018-066757-029C	8	CIP	362.18
VAL	1018	GP001018-076284	MH001018-066802-084	MH001018-066794-071	0	UNK	29.30
VAL	1018	GP001018-065978	MH001018-065879-003	MH001018-065719-002	8	UNK	501.09
VAL	1018	GP001018-065920	MH001018-066277-046	MH001018-066278-042	6	UNK	92.18
VAL	1019	GP001019-066139	MH001019-067219-001A	MH001019-067153-001	8	CLAY	295.86
VAL	1019	GP001019-066138	MH001019-067171-002	MH001019-067153-001	10	UNK	68.44
VAL	1019	GP001019-249756	MH001019-207088-001C	MH001019-067219-001A	8	CLAY	240.22
VAL	1019	GP001019-070831	MH001019-067496-048	MH001019-338636-044A	10	CIP	421.67
VAL	1019	GP001019-374570	MH001019-338636-044A	MH001019-067356-044	8	UNK	30.00
VAL	1019	GP001019-069047	MH001019-067153-001	MH001018-067092-058A	10	UNK	185.51
VAL	1019	GP001019-249755	MH001019-067356-044	MH001019-207088-001C	8	CLAY	245.53
VAL	1028	GP001028-076240	MH001031-053473-091	MH001031-053497-067	8	UNK	302.31
VAL	1029	GP001029-060945	MH001029-044868-040G	MH001029-044916-040F	8	CLAY	193.84
VAL	1029	GP001029-089336	MH001029-074894-0174	MH001029-045278-037C	8	PVC	147.59
VAL	1029	GP001029-077365	MH001030-074831-0083	MH001029-074832-0179	8	DUCTILE_IRON	122.31
VAL	1029	GP001029-067415	MH001029-055159-062A	MH001029-055052-062	8	CLAY	182.82
VAL	1029	GP001029-070159	MH001029-053654-164	MH001029-053815-163	8	CLAY	304.79
VAL	1029	GP001029-394088	FT001029-083991	MH001029-357510-009L	8	PVC	93.00
VAL	1029	GP001029-077361	MH001029-074838-0182	MH001029-074837-0181	8	DUCTILE_IRON	83.63
VAL	1029	GP001029-077364	MH001029-074832-0179	MH001029-074833-0178	8	DUCTILE_IRON	177.44
VAL	1029	GP001029-060946	MH001029-044875-040H	MH001029-044868-040G	8	CLAY	34.36
VAL	1029	GP001029-081903	MH001029-087257-037E1	MH001029-045150-037E	8	CLAY	125.00
VAL	1029	GP001029-062738	MH001029-045272-037B	MH001029-045271-037A	8	CLAY	167.87
VAL	1029	GP001029-070158	MH001029-053592-165	MH001029-053654-164	8	CLAY	106.56
VAL	1029	GP001029-070116	MH001029-055098-009D	MH001029-055097-009C	8	CLAY	204.07
VAL	1029	GP001029-393767	MH001029-357509-009K	MH001029-054768-009J	8	PVC	122.00
VAL	1029	GP001029-058461	MH001029-045247-041	MH001029-045201-040	8	CLAY	204.54
VAL	1029	GP001029-076234	MH001029-053902-162	MH001029-054196-161	8	CLAY	396.94
VAL	1029	GP001029-070112	MH001029-054443-014B	MH001029-054452-014A	8	DUCTILE_IRON	281.91
VAL	1029	GP001029-070120	MH001029-054767-009I	MH001029-054976-009F	8	CLAY	298.92
VAL	1029	GP001029-310903	MH001029-053859-019B	MH001029-275605-019A1	8	CLAY	193.73
VAL	1029	GP001029-067505	MH001029-054900-064	MH001029-055052-062	8	CLAY	174.62
VAL	1029	GP001029-075442	MH001029-054063-028	MH001029-054295-027	8	CIP	290.51
VAL	1029	GP001029-091613	MH001029-087258-037E2	MH001029-087257-037E1	8	PVC	125.00

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1029	GP001029-076988	MH001029-055095-009B	MH001029-055096-009A	8	CLAY	249.63
VAL	1029	GP001029-067431	MH001029-055320-063	MH001029-055159-062A	8	CLAY	194.62
VAL	1029	GP001029-070114	MH001029-053908-019E	MH001029-053859-019B	8	CLAY	257.06
VAL	1029	GP001029-076236	MH001029-053920-088	MH001029-054135-087	8	CLAY	225.49
VAL	1029	GP001029-067395	MH001029-054533-026	MH001029-054544-025	8	CIP	312.97
VAL	1029	GP001029-067490	MH001029-054452-014A	MH001029-429450-014A1	8	DUCTILE_IRON	100.00
VAL	1029	GP001029-067404	MH001029-054681-011	MH001029-054837-010	8	CLAY	171.22
VAL	1029	GP001029-067485	MH001029-054387-057	MH001029-054514-056	8	CLAY	194.36
VAL	1029	GP001029-070111	MH001029-054448-014C	MH001029-054452-014A	8	DUCTILE_IRON	103.89
VAL	1029	GP001029-070117	MH001029-054963-009H	MH001029-054975-009G	8	CLAY	253.13
VAL	1029	GP001029-070115	MH001029-055099-009E	MH001029-055098-009D	8	CLAY	361.35
VAL	1029	GP001029-310904	MH001029-275605-019A1	MH001029-053806-019A	8	CLAY	173.38
VAL	1029	GP001029-067500	MH001029-054702-065	MH001029-054900-064	8	CLAY	325.48
VAL	1029	GP001029-077357	MH001029-074839-0175	MH001029-074894-0174	8	DUCTILE_IRON	235.71
VAL	1029	GP001029-062737	MH001029-045271-037A	MH001029-045283-037	8	CLAY	54.59
VAL	1029	GP001029-076212	MH001029-054434-016	MH001029-054584-015	8	CLAY	203.37
VAL	1029	GP001029-067425	MH001029-053784-029	MH001029-054063-028	8	CIP	385.95
VAL	1029	GP001029-070118	MH001029-054975-009G	MH001029-054976-009F	8	CLAY	248.64
VAL	1029	GP001029-090253	MH001029-086006-037A1	MH001029-045271-037A	8	PVC	32.35
VAL	1029	GP001029-060947	MH001029-044834-040I	MH001029-044875-040H	8	CLAY	263.39
VAL	1029	GP001029-060938	MH001029-045163-040A	MH001029-045201-040	8	CLAY	99.72
VAL	1029	GP001029-067494	MH001029-054563-054	MH001029-054689-053	8	CLAY	143.95
VAL	1029	GP001029-060941	MH001029-045080-040C	MH001029-045120-040B	8	CLAY	221.55
VAL	1029	GP001029-067487	MH001029-045977-030	MH001029-054544-025	8	CLAY	75.03
VAL	1029	GP001029-060948	MH001029-044805-040J	MH001029-044834-040I	8	CLAY	95.28
VAL	1029	GP001029-070113	MH001029-053907-019F	MH001029-053908-019E	8	CLAY	157.94
VAL	1029	GP001029-076214	MH001029-054344-018	MH001029-054435-017	8	CLAY	96.54
VAL	1029	GP001029-076237	MH001029-054135-087	MH001029-054168-086	8	CLAY	108.78
VAL	1029	GP001029-070842	FT001029-004278	MH001029-053859-019B	8	UNK	166.15
VAL	1029	GP001029-054358	MH001029-045831-032	MH001029-045832-031	8	CLAY	76.60
VAL	1029	GP001029-091616	FT001029-104151	MH001029-086006-037A1	6	UNK	110.00
VAL	1029	GP001029-060949	MH001029-044890-040K	MH001029-044916-040F	8	DUCTILE_IRON	58.14
VAL	1029	GP001029-054233	MH001029-045270-038	MH001029-045283-037	8	CLAY	172.41
VAL	1029	GP001029-054235	MH001029-045283-037	MH001029-045305-036	8	CLAY	87.55
VAL	1029	GP001029-056619	MH001029-045150-037E	MH001029-045266-037D1	8	CLAY	327.51
VAL	1029	GP001029-067492	MH001029-054572-014	MH001029-406150-0184	8	CLAY	169.57
VAL	1029	GP001029-076235	MH001029-054196-161	MH001029-054135-087	8	CLAY	180.96
VAL	1029	GP001029-077359	MH001029-074836-0180	MH001029-074835-0176	8	DUCTILE_IRON	206.02
VAL	1029	GP001029-076239	MH001031-053497-067	MH001031-053558-066	8	UNK	220.67
VAL	1029	GP001029-058462	MH001029-045413-042	MH001029-045337-041A	8	CLAY	218.40
VAL	1029	GP001029-067489	MH001029-054336-055	MH001029-054563-054	8	CLAY	265.38
VAL	1029	GP001029-076987	MH001029-054837-010	MH001029-055096-009A	8	CLAY	377.17
VAL	1029	GP001029-077360	MH001029-074837-0181	MH001029-074836-0180	8	DUCTILE_IRON	62.76
VAL	1029	GP001029-062740	MH001029-045266-037D1	MH001029-045274-037D	8	PVC	86.58
VAL	1029	GP001029-077358	MH001029-074835-0176	MH001029-074839-0175	8	DUCTILE_IRON	72.33
VAL	1029	GP001029-058463	MH001029-045337-041A	MH001029-045247-041	8	CLAY	195.77
VAL	1029	GP001029-070121	MH001029-054976-009F	MH001029-055097-009C	8	CLAY	181.75
VAL	1029	GP001029-060939	MH001029-045023-040B1	MH001029-045120-040B	8	CLAY	239.48
VAL	1029	GP001029-076211	MH001029-054437-016A	MH001029-054434-016	8	CLAY	238.73
VAL	1029	GP001029-076989	MH001029-055097-009C	MH001029-055095-009B	8	CLAY	378.16
VAL	1029	GP001029-067491	MH001029-054584-015	MH001029-054572-014	8	CLAY	463.15
VAL	1029	GP001029-060940	MH001029-045120-040B	MH001029-045163-040A	8	CLAY	120.24
VAL	1029	GP001029-067400	MH001029-054544-025	MH001029-054681-011	8	CIP	164.56
VAL	1029	GP001029-060943	MH001029-044956-040E	MH001029-045023-040B1	8	CLAY	215.10
VAL	1029	GP001029-060944	MH001029-044916-040F	MH001029-044956-040E	8	CLAY	91.56
VAL	1029	GP001029-077363	MH001029-074833-0178	MH001029-074834-0177	8	DUCTILE_IRON	200.44
VAL	1029	GP001029-070160	MH001029-053815-163	MH001029-053902-162	8	CLAY	163.80
VAL	1029	GP001029-067495	MH001029-054514-056	MH001029-054689-053	8	CLAY	388.79
VAL	1029	GP001029-070119	MH001029-054768-009J	MH001029-054767-009I	8	CLAY	184.50
VAL	1029	GP001029-067479	MH001029-054282-018A	MH001029-054344-018	8	CLAY	73.94
VAL	1029	GP001029-054232	MH001029-045201-040	MH001029-045270-038	8	CLAY	212.00
VAL	1029	GP001029-067481	MH001029-054356-058	MH001029-054387-057	8	IRON	44.71
VAL	1029	GP001029-060942	MH001029-045007-040D	MH001029-045080-040C	8	CLAY	362.73
VAL	1029	GP001029-076213	MH001029-054435-017	MH001029-054434-016	8	CLAY	119.12
VAL	1029	GP001029-062739	MH001029-045278-037C	MH001029-045272-037B	8	CLAY	284.30
VAL	1029	GP001029-062736	FT001029-104152	MH001029-045271-037A	6	CLAY	136.91
VAL	1029	GP001029-067422	MH001029-053813-089	MH001029-053920-088	8	CLAY	168.86
VAL	1029	GP001029-054363	MH001029-045832-031	MH001029-045977-030	8	CLAY	206.76
VAL	1029	GP001029-394087	MH001029-357510-009L	MH001029-357509-009K	8	PVC	306.00
VAL	1029	GP001029-077362	MH001029-074834-0177	MH001029-074835-0176	8	DUCTILE_IRON	219.66

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1029	GP001029-067394	MH001029-054295-027	MH001029-054533-026	8	CIP	279.13
VAL	1029	GP001029-089335	MH001029-045274-037D	MH001029-074894-0174	8	PVC	67.15
VAL	1029	GP001029-067508	MH001029-054554-066	MH001029-054702-065	8	CLAY	244.98
VAL	1030	GP001030-067571	MH001030-052244-012	MH001030-052414-011	8	UNK	250.11
VAL	1030	GP001030-067578	MH001030-052414-011	MH001030-052607-010	8	UNK	345.99
VAL	1030	GP001030-067584	MH001030-052796-006	MH001030-052983-005	8	UNK	255.09
VAL	1030	GP001030-067580	MH001030-052561-009	MH001030-052683-008	8	UNK	249.71
VAL	1030	GP001030-067581	MH001030-052607-010	MH001030-052784-007	8	UNK	253.03
VAL	1030	GP001030-067582	MH001030-052683-008	MH001030-052784-007	8	UNK	221.60
VAL	1030	GP001030-077366	MH001030-074830-0084	MH001030-074831-0083	8	DUCTILE_IRON	330.53
VAL	1030	GP001030-067583	MH001030-052784-007	MH001030-052796-006	8	UNK	48.77
VAL	1031	GP001031-074891	MH001031-051705-020	MH001031-051895-019	8	UNK	256.00
VAL	1031	GP001031-067621	MH001031-052657-007A	MH001031-052654-007	8	UNK	150.06
VAL	1031	GP001031-074894	MH001031-052145-018	MH001031-052415-017	8	UNK	397.77
VAL	1031	GP001031-067593	MH001031-052667-016	MH001031-052663-015	8	UNK	193.25
VAL	1031	GP001031-076238	MH001031-053488-060	MH001031-053477-059	8	CLAY	363.90
VAL	1031	GP001031-071756	MH001031-051429-024B	MH001031-051715-024A	8	UNK	387.92
VAL	1031	GP001031-067590	MH001031-051706-024	MH001031-051705-020	8	UNK	64.62
VAL	1031	GP001031-067605	MH001031-053480-058	MH001031-053485-055	8	CLAY	170.14
VAL	1031	GP001031-067611	MH001031-051686-022	MH001031-051693-021	8	UNK	322.65
VAL	1031	GP001031-067619	MH001031-052577-008	MH001031-052654-007	8	CLAY	109.30
VAL	1031	GP001031-067592	MH001031-052277-010	MH001031-052451-009	8	CLAY	229.90
VAL	1031	GP001031-109404	MH001031-051693-021	MH001031-099678-020A	8	UNK	114.53
VAL	1031	GP001031-067610	MH001031-051678-023	MH001031-051686-022	8	UNK	322.99
VAL	1031	GP001031-074892	MH001031-051895-019	MH001031-052145-018	8	UNK	306.65
VAL	1031	GP001031-067591	MH001031-051715-024A	MH001031-051706-024	8	UNK	375.48
VAL	1031	GP001031-070300	MH001031-053716-055A	MH001031-053485-055	8	UNK	339.80
VAL	1031	GP001031-067603	MH001031-053477-059	MH001031-053480-058	8	CLAY	327.68
VAL	1031	GP001031-070157	MH001031-053558-066	MH001029-053592-165	8	UNK	81.85
VAL	1031	GP001031-109405	MH001031-099678-020A	MH001031-051705-020	8	UNK	234.67
VAL	1031	GP001031-067622	MH001031-052663-015	MH001031-052657-007A	8	UNK	234.00
VAL	1031	GP001031-067616	MH001031-052451-009	MH001031-052577-008	8	CLAY	268.52
VAL	1031	GP001031-067620	MH001031-052654-007	MH001031-052652-006	8	CLAY	66.01
VAL	1031	GP001031-071755	MH001031-051400-024C	MH001031-051706-024	8	UNK	409.16
VAL	1032	GP001032-070982	MH001032-052944-037A	MH001032-052921-037	8	UNK	27.19
VAL	1032	GP001032-067722	MH001032-052487-046	MH001032-052492-045	8	IRON	319.75
VAL	1032	GP001032-067664	MH001032-052071-072	MH001032-052314-071	8	CLAY	263.14
VAL	1032	GP001032-067754	MH001032-052009-055	MH001032-052323-054	8	UNK	398.01
VAL	1032	GP001032-067700	MH001032-051859-067	MH001032-051951-066	8	UNK	158.05
VAL	1032	GP001032-067697	MH001032-051825-062	MH001032-051884-061	8	UNK	105.40
VAL	1032	GP001032-067691	MH001032-051735-076	MH001032-051730-075	8	UNK	190.74
VAL	1032	GP001032-067715	MH001032-052352-058	MH001032-052423-053	8	UNK	243.17
VAL	1032	GP001032-067712	MH001032-052335-063	MH001032-052352-058	8	UNK	260.75
VAL	1032	GP001032-067705	MH001032-051936-051	MH001032-052088-050	8	UNK	100.00
VAL	1032	GP001032-067716	MH001032-052323-054	MH001032-052423-053	8	UNK	150.99
VAL	1032	GP001032-067662	MH001032-052184-049	MH001032-052289-048	8	UNK	146.96
VAL	1032	GP001032-067665	MH001032-052314-071	MH001032-052467-070	8	IRON	213.76
VAL	1032	GP001032-067695	MH001032-051750-074	MH001032-051853-073	8	CLAY	224.47
VAL	1032	GP001032-067709	MH001032-052042-060	MH001032-052213-059	8	UNK	198.26
VAL	1032	GP001032-076203	MH001032-052506-043	MH001032-052540-042A	8	IRON	86.81
VAL	1032	GP001032-067692	MH001032-051732-069	MH001032-051749-068	8	UNK	180.41
VAL	1032	GP001032-067727	MH001032-052922-014B	MH001032-052929-014	10	CLAY	303.67
VAL	1032	GP001032-067693	MH001032-051730-075	MH001032-051750-074	8	CLAY	201.13
VAL	1032	GP001032-067721	MH001032-052384-047	MH001032-052487-046	8	UNK	151.44
VAL	1032	GP001032-067661	MH001032-052088-050	MH001032-052184-049	8	UNK	151.14
VAL	1032	GP001032-067677	MH001032-051909-056	MH001032-052009-055	8	UNK	149.29
VAL	1032	GP001032-067696	MH001032-051749-068	MH001032-051859-067	8	UNK	262.85
VAL	1032	GP001032-070980	MH001032-052492-045	MH001032-052502-044A	8	IRON	231.96
VAL	1032	GP001032-070983	MH001032-052945-037B	MH001032-052944-037A	10	IRON	161.04
VAL	1032	GP001032-067725	MH001032-052921-037	MH001032-052922-014B	10	CLAY	58.32
VAL	1032	GP001032-067713	MH001032-052213-059	MH001032-052352-058	8	UNK	198.88
VAL	1032	GP001032-067666	MH001032-052467-070	MH001032-052487-046	8	IRON	271.13
VAL	1032	GP001032-076201	MH001032-052502-044A	MH001032-052505-044	8	IRON	65.92
VAL	1032	GP001032-067720	MH001032-052423-053	MH001032-052487-046	8	UNK	237.41
VAL	1032	GP001032-067660	MH001032-411604-072A	MH001032-052071-072	8	CLAY	100.00
VAL	1032	GP001032-459700	MH001032-051853-073	MH001032-411604-072A	8	CLAY	224.85
VAL	1032	GP001032-108993	MH001032-052163-064	MH001032-099675-063A	8	UNK	98.20
VAL	1032	GP001032-108994	MH001032-099675-063A	MH001032-052335-063	8	UNK	224.07
VAL	1032	GP001032-067704	MH001032-051884-061	MH001032-052042-060	8	UNK	198.63
VAL	1032	GP001032-067706	MH001032-051951-066	MH001032-052163-064	8	UNK	152.42

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1032	GP001032-108992	MH001032-099674-042	MH001032-052921-037	8	CLAY	99.48
VAL	1032	GP001032-067699	MH001032-051837-052	MH001032-051936-051	8	UNK	146.89
VAL	1032	GP001032-070984	MH001032-052424-044B	MH001032-052502-044A	8	IRON	145.35
VAL	1032	GP001032-067714	MH001032-052289-048	MH001032-052384-047	8	UNK	199.83
VAL	1032	GP001032-108991	MH001032-052540-042A	MH001032-099674-042	8	CLAY	451.53
VAL	1032	GP001032-076204	MH001032-052505-044	MH001032-052506-043	8	IRON	208.67
VAL	1032	GP001032-067676	MH001032-051822-057	MH001032-051909-056	8	UNK	99.58
VAL	1042	GP001042-059163	MH001042-057673-027J	MH001042-328390-027I1	8	UNK	172.10
VAL	1042	GP001042-059262	MH001042-099657-027L1	MH001042-057925-027L	8	CLAY	355.41
VAL	1042	GP001042-059161	MH001042-057925-027L	MH001042-057674-027K	8	CLAY	400.02
VAL	1042	GP001042-059175	MH001042-058132-027T	MH001042-058028-027S	8	CLAY	224.26
VAL	1042	GP001042-059264	MH001042-328389-027P1	MH001042-058024-027P	8	CLAY	147.84
VAL	1042	GP001042-059162	MH001042-057674-027K	MH001042-057673-027J	8	CLAY	158.77
VAL	1042	GP001042-073821	MH001042-058126-027V1	MH001042-058127-027V	8	CLAY	97.19
VAL	1042	GP001042-077123	MH001042-058028-027S	MH001042-000004-027R	8	CIP	195.93
VAL	1042	GP001042-059174	MH001042-058127-027V	MH001042-058132-027T	8	CLAY	109.86
VAL	1042	GP001042-073822	MH001042-058150-027V2	MH001042-058126-027V1	8	CLAY	133.00
VAL	1042	GP001042-059234	MH001042-328391-027T2	MH001042-058132-027T	8	CLAY	174.78
VAL	1042	GP001042-077358	MH001042-000004-027R	MH001042-000005-027Q	8	CLAY	22.33
VAL	1042	GP001042-363687	MH001042-328390-027I1	MH001042-057558-027I	8	UNK	26.58
VAL	1042	GP001042-059178	MH001042-057934-027O	MH001042-057924-027N	8	CLAY	134.53
VAL	1042	GP001042-059263	MH001042-328720-027N1	MH001042-057924-027N	8	CLAY	316.22
VAL	1042	GP001042-059170	MH001042-057669-027M	MH001042-057673-027J	8	CLAY	160.27
VAL	1042	GP001042-059177	MH001042-058024-027P	MH001042-057934-027O	8	CLAY	229.16
VAL	1042	GP001042-059169	MH001042-057924-027N	MH001042-057669-027M	8	CLAY	458.60
VAL	1042	GP001042-059176	MH001042-000005-027Q	MH001042-058024-027P	8	CLAY	161.36
VAL	1042	GP001042-059179	MH001042-058151-027U	MH001042-058132-027T	0	UNK	43.94
VAL	1043	GP001043-059327	MH001043-058386-092A	MH001043-058517-092	8	UNK	212.28
VAL	1043	GP001043-059377	MH001043-060087-029	MH001043-060202-028	6	UNK	235.82
VAL	1043	GP001043-109882	MH001043-060024-023	MH001043-099717-022A	8	UNK	138.26
VAL	1043	GP001043-059396	MH001043-060148-025	MH001043-060099-024	8	UNK	49.40
VAL	1043	GP001043-059363	FT001043-004476	MH001043-060024-023	6	UNK	134.35
VAL	1043	GP001043-109878	MH001043-060200-027	MH001043-099714-026B	8	CLAY	71.01
VAL	1043	GP001043-059340	MH001043-058810-086	MH001043-058802-085	8	CLAY	499.20
VAL	1043	GP001043-059333	MH001043-058522-091	MH001043-058600-090	8	UNK	196.02
VAL	1043	GP001043-059370	MH001043-099715-034A	MH001043-060139-034	6	UNK	133.88
VAL	1043	GP001043-109885	MH001043-059799-021	MH001043-099719-020A	8	UNK	32.64
VAL	1043	GP001043-059341	MH001043-058802-085	MH001043-058798-084A	8	CLAY	501.85
VAL	1043	GP001043-363690	MH001042-328393-027T4	MH001042-328392-027T3	8	UNK	163.30
VAL	1043	GP001043-059395	MH001043-060120-026	MH001043-060099-024	8	CLAY	141.22
VAL	1043	GP001043-059326	MH001043-058637-093	MH001043-058517-092	8	CLAY	188.80
VAL	1043	GP001043-109879	MH001043-099714-026B	MH001043-060120-026	8	UNK	118.44
VAL	1043	GP001043-059365	MH001043-059909-022	MH001043-059799-021	6	UNK	355.95
VAL	1043	GP001043-059309	MH001043-058481-083I	MH001043-058392-083D	8	CIP	373.23
VAL	1043	GP001043-059342	MH001043-058798-084A	MH001043-058799-084	8	UNK	79.14
VAL	1043	GP001043-110208	MH001043-100120-024A	MH001043-060099-024	8	CLAY	148.98
VAL	1043	GP001043-059367	MH001043-059673-020	MH001043-059706-019	6	UNK	158.92
VAL	1043	GP001043-059339	MH001043-058756-086A	MH001043-058810-086	8	UNK	99.49
VAL	1043	GP001043-059334	MH001043-058600-090	MH001043-058618-089	8	UNK	245.00
VAL	1043	GP001043-059375	MH001043-059999-031	MH001043-060120-026	6	UNK	230.50
VAL	1043	GP001043-059307	MH001043-058100-083F	MH001043-058187-083E	8	CIP	203.49
VAL	1043	GP001043-059306	MH001043-099654-083M	MH001043-058100-083F	8	CIP	240.74
VAL	1043	GP001043-363689	MH001042-328392-027T3	MH001042-328391-027T2	8	UNK	12.47
VAL	1043	GP001043-059325	MH001043-423848-093A	MH001043-058637-093	8	UNK	178.12
VAL	1043	GP001043-059328	MH001043-058517-092	MH001043-058522-091	8	UNK	341.01
VAL	1043	GP001043-059379	MH001043-060202-028	MH001043-060200-027	6	UNK	86.07
VAL	1043	GP001043-109886	MH001043-099719-020A	MH001043-059673-020	8	UNK	294.26
VAL	1043	GP001043-109863	MH001043-099656-083K	MH001043-058100-083F	8	CIP	83.34
VAL	1043	GP001043-109866	MH001043-099658-083J1	MH001043-058661-083	8	CLAY	209.94
VAL	1043	GP001043-059330	MH001043-058358-096	MH001043-058360-095	8	UNK	382.01
VAL	1043	GP001043-059324	MH001043-058638-094	MH001043-058637-093	8	CLAY	224.42
VAL	1043	GP001043-109865	MH001043-058791-083J	MH001043-099658-083J1	8	CIP	298.13
VAL	1043	GP001043-059378	MH001043-060205-030	MH001043-060202-028	6	UNK	385.46
VAL	1043	GP001043-059331	MH001043-099653-095A	MH001043-058360-095	8	CLAY	278.21
VAL	1043	GP001043-059329	MH001043-328394-027T5	MH001042-328393-027T4	8	UNK	401.44
VAL	1043	GP001043-059308	MH001043-058187-083E	MH001043-058392-083D	8	CIP	406.22
VAL	1043	GP001043-109883	MH001043-099717-022A	MH001043-059909-022	8	UNK	215.25
VAL	1043	GP001043-059335	MH001043-058618-089	MH001043-058606-088	8	CLAY	435.00
VAL	1043	GP001043-059371	MH001043-060139-034	MH001043-059984-033	6	CLAY	396.08
VAL	1043	GP001043-059332	MH001043-058360-095	MH001043-058522-091	8	CLAY	324.64

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1043	GP001043-059343	MH001043-058799-084	MH001043-058791-083J	8	CLAY	241.49
VAL	1044	GP001044-059479	MH001044-059253-009A	MH001044-059250-009	8	UNK	64.62
VAL	1044	GP001044-059456	MH001044-059552-067	MH001044-059514-066	8	UNK	123.71
VAL	1044	GP001044-059490	MH001044-059491-056	MH001044-059493-055	8	UNK	76.80
VAL	1044	GP001044-059511	MH001044-059354-028	MH001044-059291-027	8	UNK	126.67
VAL	1044	GP001044-059482	MH001044-059180-005	MH001044-059179-004	8	UNK	118.22
VAL	1044	GP001044-059487	MH001044-059161-002	MH001044-059129-001	8	UNK	106.87
VAL	1044	GP001044-059519	MH001044-059341-032	MH001044-059372-031	8	UNK	162.55
VAL	1044	GP001044-059515	MH001044-059467-036	MH001044-059482-035	8	UNK	164.10
VAL	1044	GP001044-059495	MH001044-059816-040	MH001044-059660-039	8	CLAY	398.74
VAL	1044	GP001044-059474	MH001044-059447-043	MH001044-059369-042	8	UNK	232.17
VAL	1044	GP001044-059491	MH001044-059493-055	MH001044-059398-054	8	UNK	205.53
VAL	1044	GP001044-059452	MH001044-059514-066	MH001044-059451-064	8	UNK	114.69
VAL	1044	GP001044-059496	MH001044-059850-063	MH001044-059801-062	8	UNK	104.99
VAL	1044	GP001044-059498	MH001044-059645-060	MH001044-059683-059	8	UNK	66.08
VAL	1044	GP001044-059516	MH001044-059482-035	MH001044-059403-034	8	UNK	155.55
VAL	1044	GP001044-059492	MH001044-059398-054	MH001044-059373-053	8	CLAY	136.44
VAL	1044	GP001044-059494	MH001044-059898-041	MH001044-059816-040	8	CLAY	264.72
VAL	1044	GP001044-059475	MH001044-059369-042	MH001044-059313-013	8	UNK	111.34
VAL	1044	GP001044-059493	MH001044-059373-053	MH001044-059383-045	8	UNK	216.36
VAL	1044	GP001044-059502	MH001044-059721-061	MH001044-059613-058	8	CLAY	197.10
VAL	1044	GP001044-059480	MH001044-059250-009	MH001044-059181-008	8	UNK	156.06
VAL	1044	GP001044-059497	MH001044-059801-062	MH001044-059721-061	8	CLAY	208.80
VAL	1044	GP001044-059523	MH001044-059331-026	MH001044-059242-010	8	UNK	201.85
VAL	1044	GP001044-059481	MH001044-059181-008	MH001044-059180-005	8	UNK	457.69
VAL	1044	GP001044-059507	MH001044-059526-047	MH001044-059425-046	8	UNK	212.99
VAL	1044	GP001044-059501	MH001044-059443-057	MH001044-059398-054	8	CLAY	227.59
VAL	1044	GP001044-059522	MH001044-059372-031	MH001044-059308-012	8	UNK	194.59
VAL	1044	GP001044-059499	MH001044-059683-059	MH001044-059613-058	8	UNK	182.82
VAL	1044	GP001044-059518	MH001044-059377-033	MH001044-059341-032	8	UNK	72.31
VAL	1044	GP001044-059478	MH001044-059388-044	MH001044-059369-042	8	UNK	80.14
VAL	1044	GP001044-059513	MH001044-059392-030	MH001044-059354-028	8	UNK	137.54
VAL	1044	GP001044-059488	MH001044-059187-003	MH001044-059161-002	8	UNK	61.93
VAL	1044	GP001044-059505	MH001044-059621-049	MH001044-059575-048	8	UNK	85.28
VAL	1044	GP001044-059453	MH001044-059451-064	MH001044-059400-022	8	UNK	181.24
VAL	1044	GP001044-059486	MH001044-059179-004	MH001044-059161-002	8	UNK	62.72
VAL	1044	GP001044-059514	MH001044-059412-037	MH001044-059467-036	8	UNK	203.86
VAL	1044	GP001044-059520	MH001044-059660-039	MH001044-059530-038	8	CLAY	399.78
VAL	1044	GP001044-059477	MH001044-059383-045	MH001044-059388-044	8	UNK	135.69
VAL	1044	GP001044-059517	MH001044-059403-034	MH001044-059372-031	8	UNK	71.26
VAL	1044	GP001044-059484	MH001044-059229-006	MH001044-059180-005	8	UNK	107.41
VAL	1044	GP001044-059485	MH001044-059224-014A	MH001044-059315-014	8	UNK	172.21
VAL	1044	GP001044-059510	MH001044-059328-029	MH001044-059354-028	8	UNK	99.40
VAL	1044	GP001044-059506	MH001044-059575-048	MH001044-059526-047	8	UNK	83.51
VAL	1044	GP001044-059476	MH001044-059425-046	MH001044-059383-045	8	UNK	95.91
VAL	1044	GP001044-059500	MH001044-059613-058	MH001044-059443-057	8	CLAY	346.26
VAL	1044	GP001044-059483	MH001044-059214-007	MH001044-059229-006	8	UNK	76.46
VAL	1044	GP001044-059521	MH001044-059530-038	MH001044-059482-035	8	UNK	88.07
VAL	1044	GP001044-059509	MH001044-059292-029A	MH001044-059328-029	8	UNK	122.63
VAL	1044	GP001044-059512	MH001044-059291-027	MH001044-059331-026	8	UNK	106.67
VAL	1047	GP001047-059793	MH001047-054018-231	MH001047-054022-230	8	TRUSS	200.83
VAL	1047	GP001047-059789	MH001047-053468-236	MH001047-053423-235	8	CIP	105.03
VAL	1047	GP001047-059829	MH001047-054022-230	MH001047-053870-228	8	CIP	166.15
VAL	1047	GP001047-059828	MH001047-053872-229	MH001047-053870-228	8	TRUSS	417.87
VAL	1047	GP001047-059832	MH001047-053870-228	MH001047-053648-227	8	TRUSS	351.82
VAL	1047	GP001047-073763	MH001047-053841-233B	MH001047-053682-233A	8	TRUSS	297.71
VAL	1047	GP001047-059792	MH001047-054087-230A	MH001047-054022-230	8	IRON	133.97
VAL	1047	GP001047-059790	MH001047-053423-235	MH001047-053651-234	8	CIP	368.76
VAL	1047	GP001047-224135	MH001047-200045-0279	MH001047-200044-0278	8	PVC	107.30
VAL	1047	GP001047-380648	MH001047-344710-201B5	FT001047-080150	4	CLAY	227.41
VAL	1047	GP001047-073762	MH001047-053682-233A	MH001047-053652-233	8	IRON	46.97
VAL	1047	GP001047-073759	MH001047-053651-234	MH001047-053652-233	8	CLAY	357.88
VAL	1047	GP001047-380649	MH001047-344709-201B6	MH001047-344710-201B5	4	CLAY	173.69
VAL	1047	GP001047-224134	MH001047-200046-0280	MH001047-200045-0279	8	PVC	280.00
VAL	1047	GP001047-059791	MH001047-054019-232	MH001047-054018-231	8	TRUSS	323.64
VAL	1053	GP001053-060628	MH001053-048325-018	MH001053-048309-017	8	CIP	179.86
VAL	1053	GP001053-060627	MH001053-048155-019	MH001053-048325-018	8	CLAY	254.48
VAL	1053	GP001053-060625	MH001053-048563-007D	MH001053-048531-007C	8	CLAY	369.25
VAL	1053	GP001053-060622	MH001053-048588-007G	MH001053-048563-007D	8	CLAY	248.50
VAL	1053	GP001053-060621	MH001053-048610-007H	MH001053-048588-007G	8	CLAY	164.71

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1053	GP001053-060617	MH001053-047945-020	MH001053-048155-019	8	CLAY	292.36
VAL	1053	GP001053-076148	MH001053-047529-035A	MH001053-047540-035	8	CLAY	168.22
VAL	1059	GP001059-061354	MH001059-056236-107	MH001059-056180-104A	8	CLAY	241.83
VAL	1059	GP001059-061344	MH001059-056037-118	MH001059-055958-117	8	CONCRETE	265.36
VAL	1059	GP001059-073113	MH001059-055574-144	MH001059-055569-077	8	CLAY	291.60
VAL	1059	GP001059-061378	MH001059-055815-114	MH001059-056051-103	8	CONCRETE	338.53
VAL	1059	GP001059-061338	MH001059-055289-076	MH001059-055568-075	8	CLAY	349.62
VAL	1059	GP001059-061359	MH001059-056497-096	MH001059-056506-095	8	CONCRETE	399.18
VAL	1059	GP001059-061355	MH001059-056180-104A	MH001059-056135-104	8	CONCRETE	223.66
VAL	1059	GP001059-061333	MH001059-055315-064	MH001059-055578-063	8	CLAY	458.89
VAL	1059	GP001059-061326	MH001059-055578-063	MH001059-055449-062	8	CLAY	208.13
VAL	1059	GP001059-061320	MH001059-055569-077	MH001059-055568-075	8	CLAY	289.93
VAL	1059	GP001059-061342	MH001059-055830-120	MH001059-055920-116	8	IRON	158.17
VAL	1059	GP001059-061380	MH001059-056135-104	MH001059-056051-103	8	CONCRETE	411.62
VAL	1059	GP001059-061339	MH001059-055742-120C	MH001059-055726-120B	8	CLAY	179.61
VAL	1059	GP001059-061451	MH001059-056220-110	MH001059-056280-109	8	CONCRETE	91.54
VAL	1059	GP001059-073280	MH001059-056511-093A	MH001059-056518-093	8	CONCRETE	254.01
VAL	1059	GP001059-061353	MH001059-056280-109	MH001059-056236-107	8	CLAY	197.56
VAL	1059	GP001059-061340	MH001059-055726-120B	MH001059-055854-120A1	8	CIP/DIP	223.96
VAL	1059	GP001059-061319	MH001059-055269-078	MH001059-055569-077	8	CLAY	368.36
VAL	1059	GP001059-061364	MH001059-056506-095	MH001059-056509-094	8	CONCRETE	139.80
VAL	1059	GP001059-061377	MH001059-055876-115	MH001059-055815-114	8	CONCRETE	377.85
VAL	1059	GP001059-061376	MH001059-055920-116	MH001059-055876-115	8	CONCRETE	222.26
VAL	1059	GP001059-061325	MH001059-055634-070	MH001059-055578-063	8	CLAY	126.16
VAL	1059	GP001059-061345	MH001059-055958-117	MH001059-055920-116	8	CONCRETE	180.75
VAL	1059	GP001059-061365	MH001059-056518-093	MH001059-056517-090	8	CONCRETE	140.13
VAL	1059	GP001059-061379	MH001059-056051-103	MH001059-056021-099	8	CONCRETE	148.85
VAL	1059	GP001059-061321	MH001059-055568-075	MH001059-055571-072A	8	CLAY	120.13
VAL	1059	GP001059-061343	MH001059-056122-119	MH001059-056037-118	8	CONCRETE	116.33
VAL	1059	GP001059-073279	MH001059-056509-094	MH001059-056511-093A	8	CONCRETE	146.50
VAL	1060	GP001060-061622	MH001060-050246-014I	MH001060-050488-014G	8	CLAY	382.01
VAL	1060	GP001060-061604	MH001060-050488-014G	MH001060-050593-014E	8	CLAY	187.39
VAL	1060	GP001060-061621	MH001060-050020-014J	MH001060-050246-014I	8	CLAY	457.99
VAL	1060	GP001060-061605	MH001060-050709-014F	MH001060-050593-014E	8	CLAY	296.60
VAL	1063	GP001063-061962	MH001063-049896-005D	MH001063-049975-005C	8	CIP	140.15
VAL	1063	GP001063-061968	MH001063-049663-006B	MH001063-049786-006A	8	PVC	277.29
VAL	1063	GP001063-132676	MH001063-120713-005A2	MH001063-120712-005A1	8	CLAY	290.72
VAL	1063	GP001063-076755	MH001063-049786-006A	MH001063-050063-006	8	CLAY	220.72
VAL	1063	GP001063-061973	MH001063-050264-005	MH001063-050438-004	8	CLAY	255.36
VAL	1063	GP001063-061954	MH001063-049484-005I	MH001063-049701-005H	8	CLAY	402.05
VAL	1063	GP001063-132681	MH001063-049509-006D	MH001063-120714-006C1	8	PVC	144.17
VAL	1063	GP001063-132675	MH001063-050063-006	MH001063-120713-005A2	8	CLAY	80.87
VAL	1063	GP001063-132674	MH001063-120712-005A1	MH001063-050264-005	8	DUCTILE_IRON	16.85
VAL	1063	GP001063-132690	MH001063-121027-001B	MH001063-050575-001	8	DUCTILE_IRON	146.25
VAL	1063	GP001063-132680	MH001063-120714-006C1	MH001063-049559-006C	8	PVC	89.93
VAL	1063	GP001063-061958	MH001063-049762-005G1	MH001063-049821-005G	8	CLAY	38.45
VAL	1063	GP001063-061961	MH001063-049797-005E	MH001063-049896-005D	6	CLAY	96.22
VAL	1063	GP001063-061971	MH001063-121020-006A1	MH001063-050063-006	8	CLAY	247.50
VAL	1063	GP001063-061955	MH001063-049701-005H	MH001063-429449-005G4	8	CLAY	75.65
VAL	1063	GP001063-061963	MH001063-049975-005C	MH001063-050264-005	8	DIP/CLAY	380.60
VAL	1063	GP001063-061967	MH001063-049559-006C	MH001063-049663-006B	8	PVC	75.52
VAL	1063	GP001063-061957	MH001063-049707-005G2	MH001063-049762-005G1	8	PVC	125.09
VAL	1063	GP001063-061959	MH001063-049821-005G	MH001063-049896-005D	8	CIP	56.61
VAL	1063	GP001063-061960	MH001063-049740-005F	MH001063-049797-005E	6	CLAY	52.08
VAL	1063	GP001063-132689	MH001063-050438-004	MH001063-121027-001B	8	CLAY	115.19
VAL	1063	GP001063-061956	MH001063-049748-005G3	MH001063-049707-005G2	8	PVC	37.18
VAL	1063	GP001063-076972	MH001063-049280-005J	MH001063-049484-005I	8	CLAY	353.37
VAL	1063	GP001063-132682	MH001063-120715-006D1	MH001063-049509-006D	8	PVC	148.52
VAL	1064	GP001064-076060	MH001064-051609-064	MH001064-051453-063	12	IRON	324.37
VAL	1064	GP001064-076058	MH001064-051833-064A	MH001064-051609-064	8	CLAY	354.50
VAL	1064	GP001064-076054	MH001064-051826-066	MH001064-051609-064	12	CLAY	365.19
VAL	1064	GP001064-076055	MH001064-051935-067	MH001064-051826-066	12	CLAY	215.90
VAL	1064	GP001064-076056	MH001064-051862-068	MH001064-051826-066	12	CLAY	107.27
VAL	1064	GP001064-076061	MH001064-051522-063A	MH001064-051453-063	10	CLAY	145.81
VAL	1065	GP001065-062143	MH001065-051811-007	MH001065-051759-006	10	CLAY	149.60
VAL	1065	GP001065-062154	MH001065-092198-015A1	MH001065-051842-015	8	CLAY	126.57
VAL	1065	GP001065-062145	MH001065-051665-005	MH001065-051603-002	10	CLAY	140.17
VAL	1065	GP001065-062162	MH001065-051855-015B	MH001065-051847-015A	8	CLAY	263.56
VAL	1065	GP001065-062155	MH001065-051842-015	MH001065-051940-014	8	CLAY	182.98
VAL	1065	GP001065-062153	MH001065-051888-010	MH001065-051811-007	10	CLAY	174.37

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1065	GP001065-062146	MH001065-051603-002	MH001065-051564-001	10	CLAY	121.59
VAL	1065	GP001065-062163	MH001065-051847-015A	MH001065-051842-015	8	CLAY	318.65
VAL	1065	GP001065-062144	MH001065-051759-006	MH001065-051665-005	10	CLAY	90.89
VAL	1065	GP001065-062156	MH001065-051940-014	MH001065-051888-010	10	CLAY	147.70
VAL	1065	GP001065-076053	MH001065-051564-001	MH001064-051522-063A	10	CLAY	54.75
VAL	1065	GP001065-062161	MH001065-051866-015C	MH001065-051855-015B	8	CIP	384.32
VAL	1065	GP001065-062158	MH001065-051959-016	MH001065-051940-014	10	CLAY	71.70
VAL	1070	GP001070-074282	MH001070-044115-015B	MH001070-044110-015A	8	CLAY	89.12
VAL	1070	GP001070-072841	MH001070-044327-015F	MH001070-044110-015A	8	CLAY	338.33
VAL	1070	GP001070-074280	MH001070-044060-015C1	MH001070-044086-015C	8	CLAY	62.44
VAL	1070	GP001070-062605	MH001070-044058-016	MH001070-044110-015A	8	CLAY	158.88
VAL	1070	GP001070-074281	MH001070-044086-015C	MH001070-044115-015B	8	CLAY	171.60
VAL	1070	GP001070-074278	MH001070-044110-015A	MH001070-044168-015	8	PVC	10.47
VAL	1070	GP001070-062607	MH001070-044168-015	MH001070-044268-014	8	CLAY	134.69
VAL	1076	GP001076-072570	MH001076-042098-005G1	MH001076-042254-005G1A	12	CLAY	324.46
VAL	1076	GP001076-109512	MH001076-042504-005E	MH001076-099445-005D1	8	IRON	270.77
VAL	1076	GP001076-063328	MH001076-042771-005C1	MH001076-042897-005C	16	CLAY	337.91
VAL	1076	GP001076-109052	MH001076-099393-005G3B	MH001076-041913-005G3	8	CLAY	264.25
VAL	1076	GP001076-109045	MH001076-041796-005G2	MH001076-099389-005G1B	8	CLAY	250.78
VAL	1076	GP001076-063204	MH001076-042349-005H	MH001076-042431-005G	8	CLAY	176.72
VAL	1076	GP001076-075227	MH001076-042945-005B	MH001076-043086-005A	16	CLAY	286.03
VAL	1076	GP001076-072571	MH001076-042254-005G1A	MH001076-042431-005G	12	CIP	324.95
VAL	1076	GP001076-109050	MH001076-099391-005G3A1	MH001076-041913-005G3	8	CLAY	242.58
VAL	1076	GP001076-063212	MH001076-090917-005I	MH001076-042349-005H	8	CLAY	180.30
VAL	1076	GP001076-075228	MH001076-042897-005C	MH001076-042945-005B	16	CLAY	25.28
VAL	1076	GP001076-063188	MH001076-041678-005G6	MH001076-041722-005G5	0	UNK	78.18
VAL	1076	GP001076-063329	MH001076-042520-005F	MH001076-042771-005C1	16	CLAY	315.17
VAL	1076	GP001076-109051	MH001076-041596-005G7	MH001076-099393-005G3B	8	CLAY	247.96
VAL	1076	GP001076-075229	MH001076-099442-005B1	MH001076-042945-005B	8	CLAY	149.85
VAL	1076	GP001076-063207	MH001076-041722-005G5	MH001076-041768-005G4	8	CLAY	14.08
VAL	1076	GP001076-063246	MH001076-041913-005G3	MH001076-042098-005G1	12	CLAY	345.51
VAL	1076	GP001076-063233	MH001076-042817-005D	MH001076-042897-005C	8	CLAY	168.15
VAL	1076	GP001076-063278	MH001076-041411-005G9	MH001076-041722-005G5	8	CLAY	511.53
VAL	1076	GP001076-063247	MH001076-334792-005G3A	MH001076-041913-005G3	8	UNK	375.00
VAL	1076	GP001076-063232	MH001076-042431-005G	MH001076-042520-005F	12	CLAY	167.58
VAL	1076	GP001076-109049	MH001076-041768-005G4	MH001076-099391-005G3A1	8	CLAY	88.79
VAL	1076	GP001076-109513	MH001076-099445-005D1	MH001076-042817-005D	8	CLAY	265.87
VAL	1076	GP001076-109046	MH001076-099389-005G1B	MH001076-042098-005G1	8	CIP	262.29
VAL	1078	GP001078-071643	MH001078-036523-086B	MH001078-036520-086	8	CLAY	244.11
VAL	1078	GP001078-071644	FT001114-001889	MH001078-036523-086B	8	CLAY	40.62
VAL	1080	GP001080-063624	MH001080-043647-065	MH001080-043720-064	8	CLAY	221.16
VAL	1080	GP001080-063626	MH001080-043837-063A	MH001080-043787-061	10	CLAY	72.84
VAL	1080	GP001080-072691	MH001080-042715-030	MH001080-042546-029	10	CLAY	179.49
VAL	1080	GP001080-063585	MH001080-042286-027	MH001080-042193-026	10	CLAY	227.33
VAL	1080	GP001080-063628	MH001080-043631-060	MH001080-043554-059	10	CLAY	243.28
VAL	1080	GP001080-095522	MH001080-087829-030C	MH001080-042715-030	10	CLAY	307.51
VAL	1080	GP001080-063627	MH001080-043787-061	MH001080-043631-060	10	CLAY	195.72
VAL	1080	GP001080-063582	MH001080-043092-034	MH001080-043057-033	10	CLAY	55.91
VAL	1080	GP001080-063581	MH001080-043185-036	MH001080-043092-034	10	CIP	176.25
VAL	1080	GP001080-063633	MH001080-043377-037	MH001080-043185-036	10	CIP	350.00
VAL	1080	GP001080-072684	MH001080-043330-067A	MH001080-043371-067	8	CLAY	266.11
VAL	1080	GP001080-075211	MH001080-043057-033	MH001080-042928-031	10	CLAY	138.99
VAL	1080	GP001080-063630	MH001080-043468-058	MH001080-043377-037	10	CLAY	174.36
VAL	1080	GP001080-063583	MH001080-042546-029	MH001080-042408-028	10	CLAY	154.49
VAL	1080	GP001080-063614	MH001080-043896-068	MH001080-043837-063A	10	DIP/CLAY	92.60
VAL	1080	GP001080-063584	MH001080-042408-028	MH001080-042286-027	10	CLAY	170.29
VAL	1080	GP001080-095560	MH001080-043720-064	MH001080-087851-063B	8	CLAY	273.21
VAL	1080	GP001080-063613	MH001080-044010-068A	MH001080-043896-068	10	CLAY	137.30
VAL	1080	GP001080-063629	MH001080-043554-059	MH001080-043468-058	10	CLAY	240.60
VAL	1080	GP001080-095521	MH001080-042928-031	MH001080-087829-030C	10	CLAY	14.75
VAL	1080	GP001080-063623	MH001080-043514-066	MH001080-043647-065	8	CLAY	382.60
VAL	1080	GP001080-063622	MH001080-043371-067	MH001080-043514-066	8	DUCTILE_IRON	404.05
VAL	1082	GP001082-058622	MH001082-036003-008A	MH001082-035984-008	8	UNK	297.53
VAL	1082	GP001082-058623	MH001082-288069-007B	MH001082-287764-007B1	8	CLAY	322.44
VAL	1082	GP001082-323058	MH001082-035984-008	MH001082-288069-007B	8	CLAY	101.28
VAL	1082	GP001082-323057	MH001082-287764-007B1	MH001082-035972-007	8	CLAY	127.09
VAL	1082	GP001082-058618	MH001082-035571-009C	MH001082-035576-009A	8	CLAY	533.94
VAL	1090	GP001090-056425	MH001090-036473-012A	MH001090-036739-012	12	CLAY	442.93
VAL	1090	GP001090-073418	MH001090-037506-051A	MH001090-037746-051	8	CLAY	439.83
VAL	1090	GP001090-056436	MH001090-037306-066	MH001090-037424-065A	8	CLAY	18.35

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1090	GP001090-078036	MH001090-037772-067	MH001090-037474-065	8	UNK	258.71
VAL	1090	GP001090-103958	MH001090-037424-065A	MH001090-037474-065	8	CLAY	30.28
VAL	1090	GP001090-073419	MH001090-037474-065	MH001090-037506-051A	8	CLAY	15.40
VAL	1091	GP001091-100321	MH001091-041305-019	MH001091-091385-014A	8	CLAY	242.82
VAL	1091	GP001091-074035	MH001091-041427-022	MH001091-091388-020B	8	CLAY	169.93
VAL	1091	GP001091-100322	MH001091-091385-014A	MH001091-041300-014	8	CLAY	107.54
VAL	1091	GP001091-100325	MH001091-041307-021	MH001091-091388-020B	6	CLAY	123.18
VAL	1091	GP001091-106011	MH001091-041300-014	MH001091-096702-011A	8	CLAY	175.07
VAL	1091	GP001091-074034	MH001091-041304-020	MH001091-041305-019	8	CLAY	137.83
VAL	1091	GP001091-106016	MH001091-095898-011B	MH001091-096702-011A	8	CLAY	33.02
VAL	1091	GP001091-072343	MH001091-041062-011	MH001091-040816-008	8	CLAY	316.79
VAL	1091	GP001091-056564	MH001091-041494-024	MH001091-041426-023	8	CLAY	103.62
VAL	1091	GP001091-100326	MH001091-091388-020B	MH001091-041304-020	8	CLAY	63.43
VAL	1091	GP001091-106012	MH001091-096702-011A	MH001091-041062-011	8	CLAY	165.46
VAL	1091	GP001091-056565	MH001091-041426-023	MH001091-041427-022	8	CLAY	128.16
VAL	1091	GP001091-056555	MH001091-041495-026	MH001091-041494-024	8	CLAY	171.92
VAL	1092	GP001092-075334	MH001092-041335-018	MH001092-041158-017	8	DUCTILE_IRON	308.32
VAL	1092	GP001092-071031	MH001092-041507-036	MH001092-041461-020	8	IRON	36.20
VAL	1092	GP001092-056640	MH001092-041460-021	MH001092-041461-020	8	CIP	340.24
VAL	1092	GP001092-078644	MH001092-041378-018C	MH001092-041441-018B	8	CLAY	297.20
VAL	1092	GP001092-075337	MH001092-041441-018B	MH001092-041355-018A	8	CLAY	120.14
VAL	1092	GP001092-075335	MH001092-041463-019	MH001092-041335-018	8	DUCTILE_IRON	124.72
VAL	1092	GP001092-071030	MH001092-041669-036A	MH001092-041507-036	8	CLAY	262.55
VAL	1092	GP001092-078524	MH001092-041092-055A	MH001092-041147-055	8	CLAY	178.96
VAL	1092	GP001092-056641	MH001092-041461-020	MH001092-041463-019	8	CIP	163.45
VAL	1092	GP001092-071034	MH001092-041585-022	MH001092-041463-019	8	CLAY	164.46
VAL	1092	GP001092-056646	MH001092-041054-016	MH001092-040965-015	8	CLAY	127.56
VAL	1092	GP001092-056645	MH001092-041158-017	MH001092-041054-016	8	CLAY	143.34
VAL	1092	GP001092-056639	MH001092-041322-021A	MH001092-041460-021	8	DUCTILE_IRON	239.56
VAL	1092	GP001092-071037	MH001092-041702-026	MH001092-041585-022	8	CIP	148.18
VAL	1092	GP001092-075336	MH001092-041355-018A	MH001092-041335-018	8	CLAY	9.20
VAL	1092	GP001092-078643	MH001092-041349-018D	MH001092-041378-018C	8	CLAY	55.18
VAL	1092	GP001092-071033	MH001092-041701-037	MH001092-041669-036A	8	CIP	52.31
VAL	1092	GP001092-071035	MH001092-041513-023	MH001092-041585-022	8	IRON	263.77
VAL	1093	GP001093-097809	MH001093-089990-030A1	MH001093-040891-030	8	CLAY	33.33
VAL	1093	GP001093-303859	MH001093-269520-028A	MH001093-040595-027	8	CLAY	348.90
VAL	1093	GP001093-056671	MH001093-040595-027	MH001093-040439-026	8	CLAY	183.74
VAL	1093	GP001093-097808	MH001093-040804-030A	MH001093-089990-030A1	8	CLAY	178.08
VAL	1093	GP001093-078380	MH001093-040704-031	MH001093-040804-030A	8	CLAY	265.63
VAL	1093	GP001093-303858	MH001093-040891-030	MH001093-269520-028A	8	CLAY	55.71
VAL	1093	GP001093-056672	MH001093-040439-026	MH001093-040309-024	8	CLAY	200.59
VAL	1095	GP001095-056747	MH001095-039379-040	MH001095-039194-039	8	CLAY	170.11
VAL	1095	GP001095-056726	MH001095-038982-036	MH001095-038711-035	8	CLAY	437.49
VAL	1095	GP001095-078369	MH001095-039030-034A	MH001095-038977-034	8	CLAY	248.55
VAL	1095	GP001095-078367	MH001095-039194-039	MH001095-039148-034B	8	CLAY	41.48
VAL	1095	GP001095-056727	MH001095-038711-035	MH001095-038977-034	8	CLAY	220.46
VAL	1095	GP001095-078368	MH001095-039148-034B	MH001095-039030-034A	8	CLAY	209.27
VAL	1096	GP001096-105542	MH001096-036660-019O	MH001096-096606-019M2	8	DUCTILE_IRON	136.89
VAL	1096	GP001096-309927	FT001096-057430	MH001096-096607-019O1	8	PVC	124.51
VAL	1096	GP001096-056848	MH001096-096607-019O1	MH001096-036660-019O	8	CLAY	37.98
VAL	1096	GP001096-056837	MH001096-036570-019P	MH001096-036660-019O	8	CLAY	190.32
VAL	1101	GP001101-057333	MH001101-040782-009E	MH001101-040745-009D	8	CLAY	26.41
VAL	1101	GP001101-057292	MH001101-043405-098	MH001101-043409-097A	8	CLAY	246.10
VAL	1101	GP001101-057288	MH001101-100233-102A	MH001101-043838-102	8	CIP	353.00
VAL	1101	GP001101-074526	MH001101-041443-073	MH001101-041442-009H3	8	CIP	267.07
VAL	1101	GP001101-109975	MH001101-100234-104A	MH001101-043977-104	8	CIP	242.33
VAL	1101	GP001101-057332	MH001101-040971-009F	MH001101-040782-009E	8	CLAY	257.23
VAL	1101	GP001101-074523	MH001101-041446-072	MH001101-041561-071	8	CLAY	155.11
VAL	1101	GP001101-422887	MH001101-380550-0256	MH001101-400389-0254	8	CIP	251.28
VAL	1101	GP001101-073285	MH001101-044098-104B	MH001101-043977-104	8	CLAY	202.62
VAL	1101	GP001101-057270	MH001101-043505-099	MH001101-043411-097	8	CLAY	161.10
VAL	1101	GP001101-110290	MH001101-040659-009C	MH001101-100162-009A1	8	CLAY	129.54
VAL	1101	GP001101-057267	MH001101-043977-104	MH001101-043838-102	8	CLAY	150.67
VAL	1101	GP001101-057329	MH001101-041162-009H	MH001101-041145-009G1	8	CLAY	14.13
VAL	1101	GP001101-057339	MH001101-100192-009M1	MH001101-041563-009M	0	UNK	67.84
VAL	1101	GP001101-057328	MH001101-041191-009I	MH001101-041162-009H	8	CLAY	116.28
VAL	1101	GP001101-057342	MH001101-041527-009J1	MH001101-041265-009J	6	CLAY	180.68
VAL	1101	GP001101-057326	MH001101-041369-009L	MH001101-041321-009K	8	CLAY	132.97
VAL	1101	GP001101-436651	MH001101-380551-0252	MH001101-041446-072	8	CLAY	100.00
VAL	1101	GP001101-057327	MH001101-041321-009K	MH001101-041191-009I	10	CLAY	295.99

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1101	GP001101-422888	MH001101-380549-0255	MH001101-400389-0254	8	CLAY	206.66
VAL	1101	GP001101-057293	MH001101-043409-097A	MH001101-043411-097	8	CLAY	296.45
VAL	1101	GP001101-057343	MH001101-041265-009J	MH001101-041191-009I	6	CLAY	323.82
VAL	1101	GP001101-057331	MH001101-041104-009G	MH001101-040971-009F	8	CLAY	399.47
VAL	1101	GP001101-057269	MH001101-043727-100	MH001101-043505-099	8	CLAY	336.62
VAL	1101	GP001101-110291	MH001101-100162-009A1	MH001101-040227-009A	8	CLAY	339.05
VAL	1101	GP001101-057289	MH001101-043730-101	MH001101-043727-100	8	CLAY	198.79
VAL	1101	GP001101-057330	MH001101-041145-009G1	MH001101-041104-009G	8	CLAY	303.60
VAL	1101	GP001101-444007	MH001101-041442-009H3	MH001101-400389-0254	8	DUCTILE_IRON	83.34
VAL	1101	GP001101-057334	MH001101-040745-009D	MH001101-040659-009C	8	CLAY	163.36
VAL	1101	GP001101-074525	MH001101-041443-073	MH001101-041446-072	8	CLAY	140.93
VAL	1101	GP001101-057340	MH001101-041563-009M	MH001101-041321-009K	6	CLAY	382.30
VAL	1101	GP001101-109974	MH001101-043981-105	MH001101-100234-104A	8	CIP	278.82
VAL	1101	GP001101-057268	MH001101-043838-102	MH001101-043727-100	8	CLAY	160.70
VAL	1102	GP001102-073604	MH001102-044030-061	MH001102-044028-060	8	CIP	191.08
VAL	1102	GP001102-073605	MH001102-044028-060	MH001102-044022-059	8	CIP	404.01
VAL	1102	GP001102-320809	MH001102-043741-047	MH001102-285514-046A	8	CLAY	257.17
VAL	1102	GP001102-073639	MH001102-044018-056	MH001102-044012-055	8	CLAY	81.08
VAL	1102	GP001102-073634	MH001102-043749-048	MH001102-043750-044	8	CLAY	122.08
VAL	1102	GP001102-073609	MH001102-044091-074	MH001102-044008-075	8	CLAY	101.74
VAL	1102	GP001102-073633	MH001102-043744-045	MH001102-043750-044	8	CLAY	39.91
VAL	1102	GP001102-057529	MH001102-285514-046A	MH001102-043745-046	8	CLAY	85.65
VAL	1102	GP001102-073606	MH001102-044022-059	MH001102-044018-056	8	CIP	133.53
VAL	1102	GP001102-057530	MH001102-043745-046	MH001102-043744-045	8	CLAY	45.48
VAL	1102	GP001102-073638	MH001102-044008-075	MH001102-044012-055	8	CIP	176.88
VAL	1102	GP001102-057531	MH001102-043756-051	MH001102-043755-050	8	CLAY	142.56
VAL	1102	GP001102-073629	MH001102-043751-049	MH001102-043749-048	8	CLAY	112.16
VAL	1102	GP001102-057532	MH001102-043755-050	MH001102-043751-049	8	CLAY	399.32
VAL	1107	GP001107-058034	MH001107-035234-024	MH001107-035237-023	8	CLAY	297.46
VAL	1107	GP001107-058069	MH001107-035604-015	MH001107-035804-014	12	CLAY	254.11
VAL	1107	GP001107-058041	MH001107-035602-015A	MH001107-035604-015	8	CLAY	33.92
VAL	1107	GP001107-075022	FT001107-001676	MH001107-035232-025	8	UNK	144.99
VAL	1107	GP001107-069165	MH001107-036004-073	MH001082-036003-008A	8	UNK	246.05
VAL	1107	GP001107-058040	MH001107-035585-016	MH001107-035602-015A	8	CLAY	545.05
VAL	1107	GP001107-058032	MH001107-035232-025	MH001107-035234-024	8	CLAY	182.58
VAL	1107	GP001107-058037	MH001107-035428-018	MH001107-035604-015	12	CLAY	259.79
VAL	1112	GP001112-133012	MH001112-121351-017A	MH001112-031632-017	8	DUCTILE_IRON	40.83
VAL	1112	GP001112-100441	MH001112-030573-037	MH001112-030794-036	12	CLAY	512.15
VAL	1112	GP001112-058331	MH001112-031332-030	MH001112-031362-028	8	PVC	29.81
VAL	1112	GP001112-072990	MH001112-031258-029	MH001112-031362-028	12	CLAY	177.22
VAL	1112	GP001112-058330	MH001112-031307-031	MH001112-031332-030	8	PVC	179.64
VAL	1112	GP001112-058329	MH001112-031269-032	MH001112-031307-031	8	CIP	109.23
VAL	1112	GP001112-058328	MH001112-031190-032A	MH001112-031269-032	8	CIP	130.49
VAL	1112	GP001112-058327	MH001112-031011-032B	MH001112-031190-032A	8	CIP	489.16
VAL	1112	GP001112-074160	MH001112-031632-017	MH001112-031556-016	8	CLAY	118.51
VAL	1112	GP001112-100412	MH001112-423861-0073	MH001112-030967-035	12	CLAY	270.32
VAL	1112	GP001112-475534	MH001112-030794-036	MH001112-423861-0073	12	CLAY	221.83
VAL	1114	GP001114-058458	MH001114-035917-051	MH001114-036080-050	8	CLAY	173.02
VAL	1114	GP001114-058449	FT001114-001888	MH001114-036521-040	8	CLAY	16.39
VAL	1114	GP001114-058434	FT001114-001698	MH001114-035355-062	8	CLAY	159.32
VAL	1114	GP001114-058429	MH001114-035919-058	MH001114-035917-051	8	CLAY	194.96
VAL	1114	GP001114-058457	MH001114-036080-050	MH001114-036471-049	8	CLAY	355.55
VAL	1114	GP001114-072946	MH001114-036915-031	MH001114-036912-030A	8	CLAY	47.21
VAL	1114	GP001114-058455	MH001114-036913-030	MH001114-036909-029	8	CLAY	25.28
VAL	1114	GP001114-058428	MH001114-036471-049	MH001114-036686-048	8	CLAY	167.16
VAL	1114	GP001114-058470	MH001114-036920-032	MH001114-036915-031	8	CLAY	143.46
VAL	1114	GP001114-058430	MH001114-035721-058A	MH001114-035919-058	8	CLAY	289.50
VAL	1114	GP001114-058435	MH001114-304727-062A	MH001114-035355-062	8	CLAY	161.41
VAL	1114	GP001114-073235	MH001114-036503-033	MH001114-036915-031	8	CLAY	344.24
VAL	1114	GP001114-058433	MH001114-035355-062	MH001114-035357-061	8	CLAY	550.69
VAL	1114	GP001114-072945	MH001114-036912-030A	MH001114-036913-030	8	CLAY	99.41
VAL	1116	GP001116-077215	MH001116-072607-131	MH001116-072623-130	8	IRON	233.12
VAL	1116	GP001116-077836	MH001116-072638-112	MH001116-072639-111	8	IRON	120.28
VAL	1116	GP001116-077837	MH001116-072639-111	MH001116-072610-110	10	DUCTILE_IRON	179.20
VAL	1116	GP001116-077828	MH001116-072653-133	MH001116-072677-132	8	IRON	158.15
VAL	1116	GP001116-077811	MH001116-072626-059	MH001116-072620-058	8	IRON	94.91
VAL	1116	GP001116-071019	MH001116-072629-060	MH001116-072626-059	8	IRON	89.70
VAL	1116	GP001116-077832	MH001116-072652-116	MH001116-072648-115	10	DUCTILE_IRON	244.89
VAL	1116	GP001116-077825	MH001116-072677-132	MH001116-072649-129	8	DUCTILE_IRON	294.59
VAL	1116	GP001116-071050	MH001116-072647-062	MH001116-072635-061	8	IRON	219.19

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VAL	1116	GP001116-076308	MH001116-072551-107	MH001116-072502-004	10	DUCTILE_IRON	400.29
VAL	1116	GP001116-077827	MH001116-072623-130	MH001116-072649-129	8	IRON	220.28
VAL	1116	GP001116-077838	MH001116-072648-115	MH001116-072639-111	10	DUCTILE_IRON	100.64
VAL	1116	GP001116-139389	MH001116-126463-107A	MH001116-072551-107	10	DUCTILE_IRON	348.67
VAL	1116	GP001116-077840	MH001116-072575-114	MH001116-072612-113	8	IRON	395.16
VAL	1116	GP001116-077824	MH001116-072701-134	MH001116-072677-132	8	DUCTILE_IRON	292.40
VAL	1116	GP001116-077831	MH001116-072658-117	MH001116-072652-116	8	IRON	37.15
VAL	1116	GP001116-077833	MH001116-072610-110	MH001116-072584-108	10	DUCTILE_IRON	278.86
VAL	1116	GP001116-139388	MH001116-072584-108	MH001116-126463-107A	10	DUCTILE_IRON	119.42
VAL	1116	GP001116-077216	MH001116-072606-051	MH001116-072590-050	8	DUCTILE_IRON	219.74
VAL	1116	GP001116-077839	MH001116-072612-113	MH001116-072638-112	8	IRON	237.79
VAL	1116	GP001116-077826	MH001116-072649-129	MH001116-072667-128	8	IRON	247.76
VAL	1116	GP001116-071020	MH001116-072635-061	MH001116-072629-060	8	IRON	205.50
VAL	1128	GP001128-070655	MH001128-072905-068	MH001128-072906-067	8	DUCTILE_IRON	77.21
VAL	1128	GP001128-070658	MH001128-072920-063	MH001128-072923-062	8	DUCTILE_IRON	350.55
VAL	1128	GP001128-073029	MH001128-072926-016	MH001128-072929-015	8	DUCTILE_IRON	301.92
VAL	1128	GP001128-077701	MH001128-072906-067	MH001128-072907-066	8	DUCTILE_IRON	72.47
VAL	1128	GP001128-070683	MH001128-072916-020	MH001128-072918-019	8	DUCTILE_IRON	109.12
VAL	1128	GP001128-070659	MH001128-072923-062	MH001128-072928-061	8	DUCTILE_IRON	351.45
VAL	1128	GP001128-073030	MH001128-072921-017	MH001128-072926-016	8	DUCTILE_IRON	366.14
VAL	1128	GP001128-070657	MH001128-072915-064	MH001128-072920-063	8	DUCTILE_IRON	349.91
VAL	1128	GP001128-070660	MH001128-072928-061	MH001128-072931-014	8	DUCTILE_IRON	131.74
VAL	1128	GP001128-073031	MH001128-072919-018	MH001128-072921-017	8	DUCTILE_IRON	361.96
VAL	1128	GP001128-070656	MH001128-072912-065	MH001128-072915-064	8	DUCTILE_IRON	349.32
VAL	1128	GP001128-077702	MH001128-072907-066	MH001128-072912-065	8	DUCTILE_IRON	347.69
VAL	1128	GP001128-073032	MH001128-072918-019	MH001128-072919-018	8	DUCTILE_IRON	364.36
VAL	1128	GP001128-073028	MH001128-072929-015	MH001128-072931-014	8	DUCTILE_IRON	35.61
VIL	3001	GP003001-047452	MH003001-022251-059H	MH003001-022415-059G	8	CLAY	205.68
VIL	3001	GP003001-048014	MH003001-024289-372	MH003001-024221-360	8	IRON	253.26
VIL	3001	GP003001-047454	MH003001-022562-059F	MH003001-022747-059E	8	CLAY	337.13
VIL	3001	GP003001-048010	MH003001-024194-359A	MH003001-023981-359	8	IRON	358.85
VIL	3001	GP003001-047455	MH003001-022747-059E	MH003001-022844-059D1	8	IRON	173.62
VIL	3001	GP003001-047456	MH003001-022844-059D1	MH003001-022907-059D	8	CLAY	135.83
VIL	3001	GP003001-047453	MH003001-022415-059G	MH003001-022562-059F	8	CLAY	270.33
VIL	3001	GP003001-048009	MH003001-024221-360	MH003001-024194-359A	8	IRON	36.71
VIL	3001	GP003001-048045	MH003001-024342-361	MH003001-024221-360	8	CLAY	173.62
VIL	3001	GP003001-047451	MH003001-022222-059I	MH003001-022251-059H	8	CLAY	35.80
VIL	3002	GP003002-054000	MH003002-020739-025A	MH003002-020660-025	8	CLAY	160.24
VIL	3002	GP003002-047435	MH003002-019504-046B	MH003002-019457-046A	8	CLAY	151.09
VIL	3002	GP003002-047379	MH003002-021783-003N	MH003002-021831-003M	8	CLAY	99.19
VIL	3002	GP003002-047212	MH003002-020546-024	MH003002-020370-022	8	CLAY	307.16
VIL	3002	GP003002-091311	MH003002-019409-046	MH003002-019435-045A	8	CIP	61.00
VIL	3002	GP003002-096277	MH003002-019457-046A	MH003002-019435-045A	8	PVC	59.12
VIL	3002	GP003002-047199	MH003002-020267-023	MH003002-020370-022	8	IRON	145.18
VIL	3002	GP003002-047377	MH003002-021496-003P	MH003002-021602-003O	8	CIP	245.67
VIL	3002	GP003002-053999	MH003002-020767-026	MH003002-020739-025A	8	CLAY	74.22
VIL	3002	GP003002-047378	MH003002-021602-003O	MH003002-021783-003N	8	CIP	278.32
VIL	3002	GP003002-047209	MH003002-020977-028	MH003002-020821-027	8	CLAY	349.89
VIL	3002	GP003002-047406	MH003002-021684-009G	MH003002-021573-009F	8	CLAY	244.85
VIL	3002	GP003002-047450	MH003002-022106-059J	MH003001-022222-059I	8	IRON	191.55
VIL	3002	GP003002-047405	MH003002-021689-009H	MH003002-021684-009G	8	IRON	79.18
VIL	3002	GP003002-047429	MH003002-019435-045A	MH003002-019478-045	8	CIP	183.58
VIL	3002	GP003002-047407	MH003002-021573-009F	MH003002-021430-009E	8	CLAY	213.74
VIL	3002	GP003002-047210	MH003002-020821-027	MH003002-020767-026	8	CLAY	107.60
VIL	3002	GP003002-047409	MH003002-021368-009D	MH003002-021263-009C	8	CLAY	134.99
VIL	3002	GP003002-047401	FT003002-000587	MH003002-021263-009C	8	UNK	104.71
VIL	3002	GP003002-047408	MH003002-021430-009E	MH003002-021368-009D	8	CLAY	94.83
VIL	3002	GP003002-047402	MH003002-021263-009C	MH003002-021260-009B	8	CLAY	145.31
VIL	3002	GP003002-047211	MH003002-020660-025	MH003002-020546-024	8	CLAY	187.92
VIL	3002	GP003002-052926	MH003002-019478-045	MH003002-019593-039	8	CLAY	286.42
VIL	3002	GP003002-047434	FT003002-004883	MH003002-019504-046B	8	CLAY	237.82
VIL	3003	GP003003-096342	MH003003-088819-187A	MH003003-020713-187	8	IRON	106.72
VIL	3003	GP003003-047208	MH003003-020930-029	MH003002-020977-028	8	CLAY	211.50
VIL	3003	GP003003-047321	MH003003-022600-019	MH003003-022418-018	8	CLAY	254.69
VIL	3003	GP003003-047330	MH003003-022140-013	MH003003-022297-010	8	IRON	323.35
VIL	3003	GP003003-047333	MH003003-022544-011	MH003003-022297-010	8	CLAY	382.57
VIL	3003	GP003003-047329	MH003003-022030-014	MH003003-022140-013	8	CLAY	230.50
VIL	3003	GP003003-047323	MH003003-022417-017	MH003003-022289-016	8	CLAY	199.91
VIL	3003	GP003003-047322	MH003003-022418-018	MH003003-022417-017	8	CLAY	330.01
VIL	3003	GP003003-047213	MH003003-020210-199	MH003003-020416-198	8	CLAY	323.32

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VIL	3003	GP003003-047222	MH003003-020713-187	MH003003-020887-186	8	CLAY	328.60
VIL	3003	GP003003-096341	MH003003-020587-188	MH003003-088819-187A	8	IRON	89.75
VIL	3003	GP003003-047214	MH003003-020416-198	MH003003-020587-188	8	CLAY	259.91
VIL	3004	GP003004-047052	MH003004-022563-034	MH003004-022783-033	8	CLAY	417.37
VIL	3004	GP003004-047056	MH003004-022885-032	MH003004-022920-031	8	CLAY	279.90
VIL	3004	GP003004-047055	MH003004-022783-033	MH003004-022885-032	8	CONCRETE	397.46
VIL	3004	GP003004-047050	MH003004-022404-035	MH003004-022563-034	8	CLAY	211.95
VIL	3004	GP003004-047044	MH003004-022474-033B	MH003004-022501-033A	8	CLAY	332.77
VIL	3004	GP003004-047053	MH003004-022501-033A	MH003004-022783-033	8	CLAY	377.93
VIL	3004	GP003004-047049	MH003004-022527-045	MH003004-022563-034	8	CLAY	252.32
VIL	3005	GP003005-095060	MH003005-088531-131	MH003005-088537-130	8	DUCTILE_IRON	107.17
VIL	3005	GP003005-095062	MH003005-088533-133	MH003005-088532-132	8	DUCTILE_IRON	265.44
VIL	3005	GP003005-095061	MH003005-088532-132	MH003005-088531-131	8	DUCTILE_IRON	39.18
VIL	3005	GP003005-104741	MH003005-096203-140	MH003005-096202-139	8	DUCTILE_IRON	247.86
VIL	3005	GP003005-105935	MH003005-096200-136	MH003005-088531-131	8	DUCTILE_IRON	212.99
VIL	3005	GP003005-095065	MH003005-088538-129	MH003005-088536-128	8	DUCTILE_IRON	69.84
VIL	3005	GP003005-118269	MH003005-096202-139	MH003005-107904-138	8	DUCTILE_IRON	155.76
VIL	3005	GP003005-095059	MH003005-088537-130	MH003005-088536-128	8	DUCTILE_IRON	46.22
VIL	3005	GP003005-118270	MH003005-107904-138	MH003005-096201-137	8	DUCTILE_IRON	224.28
VIL	3005	GP003005-094566	MH003005-086233-127	MH003005-086222-125	8	DUCTILE_IRON	213.75
VIL	3005	GP003005-095050	MH003005-088536-128	MH003005-086233-127	8	DUCTILE_IRON	332.50
VIL	3005	GP003005-104745	MH003005-096201-137	MH003005-096200-136	8	DUCTILE_IRON	44.54
VIL	300E	GP00300E-097261	MH00300E-089632-018A	MH00300E-031316-018	8	CIP	198.66
VIL	300E	GP00300E-042554	MH00300E-031280-019B	MH00300E-031287-019A	8	CLAY	230.53
VIL	300E	GP00300E-097260	MH00300E-031301-019	MH00300E-089632-018A	8	CLAY	371.59
VIL	300E	GP00300E-042555	MH00300E-031287-019A	MH00300E-031301-019	8	CLAY	441.73
VIL	300S	GP00300S-049105	MH00300S-032866-034	MH00300S-032621-034A	8	CLAY	259.98
VIL	300S	GP00300S-049094	MH00300S-032892-035	MH00300S-032866-034	12	CLAY	64.59
VIL	300S	GP00300S-049102	MH00300S-032348-047A	MH00300S-032334-047A1	8	CLAY	226.46
VIL	300S	GP00300S-049103	MH00300S-032334-047A1	MH00300S-032328-047	8	CLAY	405.59
VIL	300S	GP00300S-049117	MH00300S-032683-043	MH00300S-032949-040	8	CLAY	344.13
VIL	300S	GP00300S-049115	MH00300S-032954-040B	MH00300S-426443-0218	8	CIP	267.49
VIL	3013	GP003013-054170	MH003013-035188-029	MH003013-034718-028	10	CLAY	603.93
VIL	3013	GP003013-098298	MH003013-035309-009B	MH003013-090097-009A2	8	CLAY	346.92
VIL	3013	GP003013-098299	MH003013-090097-009A2	MH003013-034756-009A	8	CLAY	347.97
VIL	3013	GP003013-098302	MH003013-035667-009C	MH003013-090099-009B1	8	CLAY	140.00
VIL	3013	GP003013-041281	MH003013-035272-030	MH003013-035188-029	10	CLAY	122.50
VIL	3013	GP003013-098303	MH003013-090099-009B1	MH003013-035309-009B	8	CLAY	297.06
VIL	3015	GP003015-049875	MH003015-327439-PROPOSED	MH003015-034945-011D	8	CLAY	223.42
VIL	3015	GP003015-049876	MH003015-034945-011D	MH003015-035008-011C	8	CLAY	216.47
VIL	3016	GP003016-052595	MH003016-027949-094C	MH003016-027846-094B	8	CLAY	243.05
VIL	3016	GP003016-048521	MH003016-027808-078	MH003016-027736-066A1	8	CLAY	399.31
VIL	3016	GP003016-048496	MH003016-027392-096	MH003016-099846-065A1	8	CLAY	350.91
VIL	3016	GP003016-051771	MH003016-027838-094E	MH003016-027840-094D	8	CIP/DIP	148.25
VIL	3016	GP003016-051767	MH003016-027583-094F2	MH003016-027649-094F1	8	CLAY	153.29
VIL	3016	GP003016-048494	MH003016-027348-098	MH003016-027384-097	8	CLAY	104.82
VIL	3016	GP003016-051768	MH003016-027649-094F1	MH003016-027746-094F	8	CLAY	109.60
VIL	3016	GP003016-048546	MH003016-027882-078A	MH003016-027808-078	8	CLAY	243.15
VIL	3016	GP003016-051772	MH003016-027840-094D	MH003016-027949-094C	8	CLAY	160.66
VIL	3016	GP003016-053053	MH003016-027902-079	MH003016-027882-078A	8	CLAY	101.34
VIL	3016	GP003016-048493	MH003016-027072-099	MH003016-027348-098	8	CLAY	281.98
VIL	3016	GP003016-048541	MH003016-027846-094B	MH003016-027771-094	8	CLAY	98.38
VIL	3016	GP003016-048548	MH003016-027976-080	MH003016-027902-079	8	CLAY	263.08
VIL	3016	GP003016-051769	MH003016-027746-094F	MH003016-027838-094E	8	CLAY	199.91
VIL	3018	GP003018-041106	MH003018-029967-005S	MH003018-030050-005I	8	CLAY	137.18
VIL	3018	GP003018-041127	MH003018-030330-005T	MH003018-030546-005K	8	CLAY	190.85
VIL	3018	GP003018-041109	MH003018-030169-005G	MH003018-030225-005F	8	CLAY	158.22
VIL	3018	GP003018-041124	MH003018-030361-005U	MH003018-030565-005M	8	CLAY	362.20
VIL	3018	GP003018-041126	MH003018-030264-005Q	MH003018-030169-005G	8	CLAY	242.26
VIL	3018	GP003018-041120	MH003018-030822-005N	MH003018-030854-005L	8	CIP	256.36
VIL	3018	GP003018-041140	MH003018-030656-005X	MH003018-030945-005A	0	UNK	348.16
VIL	3018	GP003018-041119	MH003018-030875-005V	MH003018-030822-005N	8	CLAY	104.70
VIL	3018	GP003018-041123	MH003018-030295-005R	MH003018-030080-005H	8	CLAY	154.12
VIL	3018	GP003018-041117	MH003018-030248-005W	MH003018-030549-005O	8	CIP	474.00
VIL	3018	GP003018-041129	MH003018-030174-005P	MH003018-030244-005E	8	CLAY	79.63
VIL	3018	GP003018-041118	MH003018-030549-005O	MH003018-030822-005N	8	CLAY	335.97
VIL	3018	GP003018-041113	MH003018-030808-005C	MH003018-030947-005B	8	CLAY	269.96
VIL	3018	GP003018-041128	MH003018-030546-005K	MH003018-030839-005J	8	CIP	298.47
VIL	3018	GP003018-041112	MH003018-030627-005D	MH003018-030808-005C	8	CLAY	212.28
VIL	3018	GP003018-041108	MH003018-030080-005H	MH003018-030169-005G	8	CLAY	317.10

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VIL	3018	GP003018-041110	MH003018-030225-005F	MH003018-030244-005E	8	CLAY	114.57
VIL	3018	GP003018-041122	MH003018-030839-005J	MH003018-030808-005C	8	CIP	259.27
VIL	3018	GP003018-041125	MH003018-030565-005M	MH003018-030854-005L	8	CLAY	333.76
VIL	3018	GP003018-041111	MH003018-030244-005E	MH003018-030627-005D	8	CLAY	434.54
VIL	3018	GP003018-041121	MH003018-030854-005L	MH003018-030839-005J	8	CIP	292.16
VIL	3018	GP003018-041107	MH003018-030050-005I	MH003018-030080-005H	8	CLAY	257.01
VIL	3020	GP003020-048582	MH003020-027436-056	MH003020-027440-054	8	CLAY	197.63
VIL	3020	GP003020-048580	MH003020-027052-058	MH003020-027222-057	8	CLAY	239.34
VIL	3020	GP003020-048558	MH003020-026535-062J	MH003020-026615-062I	8	CLAY	144.49
VIL	3020	GP003020-048856	MH003020-026418-062M	MH003020-026450-062L	8	DUCTILE_IRON	114.31
VIL	3020	GP003020-048853	MH003020-025742-062P	MH003020-025972-062O	8	CLAY	348.84
VIL	3020	GP003020-048557	MH003020-025807-062S	MH003020-026121-062R	8	CLAY	300.07
VIL	3020	GP003020-048855	MH003020-026287-062N	MH003020-026418-062M	8	CLAY	113.19
VIL	3020	GP003020-048581	MH003020-027222-057	MH003020-027436-056	8	CLAY	236.33
VIL	3020	GP003020-048573	MH003020-027098-063	MH003020-027244-062	8	CLAY	240.85
VIL	3020	GP003020-048584	MH003020-027244-062	MH003020-027470-061	8	CLAY	334.54
VIL	3020	GP003020-048566	MH003020-026653-062H	MH003020-026673-062G	8	CLAY	93.95
VIL	3020	GP003020-091435	MH003020-026688-062F	MH003020-084787-062E1	8	CLAY	110.07
VIL	3020	GP003020-048567	MH003020-026673-062G	MH003020-428211-062F1	8	CLAY	179.47
VIL	3020	GP003020-048858	MH003020-026436-062K	MH003020-026535-062J	8	CLAY	134.01
VIL	3020	GP003020-048555	MH003020-025512-062U	MH003020-025621-062T	8	CLAY	109.85
VIL	3020	GP003020-048586	MH003020-027574-060	MH003020-027576-059	8	CLAY	37.90
VIL	3020	GP003020-048857	MH003020-026450-062L	MH003020-026436-062K	8	CLAY	97.13
VIL	3020	GP003020-048852	MH003020-025481-062Q	MH003020-025742-062P	8	CLAY	239.38
VIL	3020	GP003020-048583	MH003020-027440-054	MH003020-027566-053	8	DIP/CLAY	144.96
VIL	3020	GP003020-048859	MH003020-026121-062R	MH003020-026436-062K	8	CLAY	273.62
VIL	3020	GP003020-048579	MH003020-027286-055	MH003020-027440-054	8	CLAY	150.57
VIL	3020	GP003020-048587	MH003020-027576-059	MH003020-027566-053	8	CLAY	189.44
VIL	3020	GP003020-048854	MH003020-025972-062O	MH003020-026287-062N	8	DUCTILE_IRON	249.21
VIL	3020	GP003020-048559	MH003020-026615-062I	MH003020-026688-062F	8	CLAY	236.07
VIL	3020	GP003020-048564	MH003020-027105-062B	MH003020-027182-062A	8	CLAY	209.54
VIL	3020	GP003020-091436	MH003020-084787-062E1	MH003020-026910-062E	8	CLAY	94.84
VIL	3020	GP003020-048556	MH003020-025621-062T	MH003020-025807-062S	8	CLAY	174.05
VIL	3022	GP003022-096257	MH003022-029478-015	MH003022-088736-014A	8	CLAY	233.89
VIL	3022	GP003022-042930	MH003022-030517-001	MH00300E-030513-125G	8	CLAY	180.27
VIL	3022	GP003022-042759	MH003022-088751-002A	MH003022-030358-002	8	CLAY	319.65
VIL	3022	GP003022-325927	MH003023-290629-003A3	MH003022-088737-003A2	8	DUCTILE_IRON	359.47
VIL	3022	GP003022-042757	MH003022-030358-002	MH003022-030517-001	8	CLAY	199.83
VIL	3022	GP003022-096261	MH003022-088737-003A2	MH003022-088738-003A1	8	CLAY	211.37
VIL	3022	GP003022-096259	MH003022-029922-003A	MH003022-088737-003A2	8	CLAY	53.99
VIL	3022	GP003022-096262	MH003022-088738-003A1	MH003022-030353-003	8	CIP	226.51
VIL	3022	GP003022-042758	MH003022-030353-003	MH003022-030358-002	8	CLAY	177.86
VIL	3022	GP003022-053738	MH003022-029274-015B	MH003022-029382-015A	8	CLAY	168.10
VIL	3022	GP003022-042760	MH003022-030346-004	MH003022-030353-003	8	CLAY	376.05
VIL	3022	GP003022-053737	MH003022-029382-015A	MH003022-029478-015	8	CLAY	173.22
VIL	3022	GP003022-096258	MH003022-088736-014A	MH003022-029801-014	8	CLAY	226.79
VIL	3022	GP003022-051809	MH003022-029209-015C	MH003022-029274-015B	8	DUCTILE_IRON	82.42
VIL	3022	GP003022-042879	MH003022-029917-009	MH003022-029922-003A	8	CLAY	278.47
VIL	3023	GP003023-099056	MH003023-028613-027	MH003023-089823-026B	8	CLAY	276.72
VIL	3023	GP003023-042792	MH003023-028756-026	MH003023-028787-025	8	CLAY	42.48
VIL	3023	GP003023-042533	MH003023-028304-029	MH003023-028439-028	8	CLAY	438.29
VIL	3023	GP003023-133005	MH003023-029842-004	MH003023-121348-003	8	CLAY	48.80
VIL	3023	GP003023-042842	MH003023-029802-031	MH003023-030167-030	8	CLAY	409.52
VIL	3023	GP003023-042787	MH003023-028439-028	MH003026-028680-033	8	UNK	320.22
VIL	3023	GP003023-473599	MH003023-425077-005A	MH003023-029740-005	8	CLAY	56.50
VIL	3023	GP003023-053729	MH003023-029740-005	MH003023-029842-004	8	CLAY	222.85
VIL	3023	GP003023-042789	MH003023-028439-028	MH003023-028613-027	8	CIP	434.07
VIL	3023	GP003023-053735	MH003023-030001-002	MH003023-030172-001	8	CLAY	328.64
VIL	3023	GP003023-107931	MH003023-121348-003	MH003023-030001-002	8	CIP	325.32
VIL	3023	GP003023-053734	MH003023-030167-030	MH003023-030172-001	8	CIP	44.31
VIL	3023	GP003023-099057	MH003023-089823-026B	MH003023-028756-026	8	CLAY	185.77
VIL	3023	GP003023-042793	MH003023-028787-025	MH003023-028811-024	8	CLAY	65.46
VIL	3023	GP003023-042791	MH003023-089122-026A	MH003023-028756-026	8	CLAY	239.38
VIL	3023	GP003023-042788	MH003023-089123-028A	MH003023-028439-028	8	CLAY	239.80
VIL	3024	GP003024-045394	MH003024-026211-135	MH003024-026364-134	12	CLAY	449.41
VIL	3024	GP003024-045383	MH003024-026091-138	MH003024-026364-134	24	CLAY	279.19
VIL	3024	GP003024-045387	MH003024-026364-134	MH003024-026770-131	24	CLAY	454.98
VIL	3024	GP003024-112420	MH003024-025867-137	MH003024-102706-136A	8	CLAY	440.16
VIL	3024	GP003024-045388	MH003024-026770-131	MH003024-027104-130	18	CONCRETE	380.34
VIL	3053	GP003053-095687	MH003053-087959-070C	MH003053-034422-070B	8	CLAY	26.50

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
VIL	3053	GP003053-045152	MH003053-034515-069A1	MH003053-034542-069	8	CLAY	22.94
VIL	3053	GP003053-045151	MH003053-034482-070	MH003053-034515-069A1	8	CLAY	32.93
VIL	3053	GP003053-095684	MH003053-034037-070E	MH003053-087958-070D	8	CLAY	247.04
VIL	3053	GP003053-095686	MH003053-087958-070D	MH003053-087959-070C	8	CLAY	234.67
VIL	3053	GP003053-095688	MH003053-034422-070B	MH003053-087960-070A	8	CLAY	168.36
VIL	3053	GP003053-095689	MH003053-087960-070A	MH003053-034482-070	8	CLAY	43.26
VIL	3065	GP003065-290407	MH003065-027435-050R	MH003065-256710-050Q1	8	CLAY	89.13
VIL	3065	GP003065-053395	MH003065-026964-050M	MH003065-027019-050L	8	CLAY	73.35
VIL	3065	GP003065-053406	MH003065-027073-050K	MH003065-026925-050F	8	CLAY	150.60
VIL	3065	GP003065-053404	MH003065-026755-050H	MH003065-026891-050G	8	CLAY	304.11
VIL	3065	GP003065-040858	MH003065-027061-050N	MH003065-026964-050M	8	CLAY	118.18
VIL	3065	GP003065-053408	MH003065-026891-050G	MH003065-026925-050F	8	CLAY	46.50
VIL	3065	GP003065-053407	MH003065-027019-050L	MH003065-026925-050F	8	CLAY	106.42
VIL	3065	GP003065-290408	MH003065-256710-050Q1	MH003065-027262-050Q	8	CLAY	82.89
VIL	3065	GP003065-053397	MH003065-027070-050P	MH003065-027019-050L	8	CLAY	80.39
VIL	3069	GP003069-039778	MH003077-413512-0057	MH003077-413513-0056	8	DUCTILE_IRON	331.08
VIL	3071	GP003071-040402	MH003071-020670-004B	MH003071-020846-004A	6	CLAY	249.51
VIL	3071	GP003071-040468	MH003071-020846-004A	MH003071-020986-004	6	CLAY	333.74
VIL	3072	GP003072-040188	MH003072-020819-026A	MH003072-020820-026	8	IRON	15.56
VIL	3072	GP003072-040215	MH003072-020191-010	MH003072-020037-008	8	CLAY	410.43
VIL	3072	GP003072-040200	MH003072-020371-022	MH003072-020606-021	10	CLAY	399.75
VIL	3072	GP003072-054115	MH003071-253189-026C	MH003072-020820-026	8	CIP	486.50
VIL	3072	GP003072-040189	MH003072-020820-026	MH003072-020680-023	8	CIP	314.89
VIL	3072	GP003072-052507	MH003071-088530-021B	MH003072-020819-026A	8	CIP	421.60
VIL	3072	GP003072-040204	MH003072-020213-016	MH003072-020191-010	8	CLAY	110.40
VIL	3072	GP003072-040203	MH003072-020237-017	MH003072-020213-016	8	CLAY	104.40
VIL	3072	GP003072-040221	MH003072-020606-021	MH003072-020548-019	12	CIP	203.97
VIL	3072	GP003072-040474	FT003072-000551	MH003071-020670-004B	6	CLAY	158.84
VIL	3072	GP003072-040199	MH003072-020146-022A	MH003072-020371-022	10	CLAY	383.73
VIL	3074	GP003074-040020	MH003074-019694-016	MH003074-019794-015	10	CLAY	272.23
VIL	3074	GP003074-040019	MH003074-019660-016A	MH003074-019694-016	10	CLAY	178.28
VIL	3074	GP003074-040015	MH003074-019754-017B	MH003074-019678-017A	8	IRON	213.28
VIL	3074	GP003074-040018	MH003074-019678-017A	MH003074-019660-016A	8	IRON	33.26
VIL	3074	GP003074-040016	MH003074-019654-017	MH003074-019660-016A	10	IRON	48.05
VIL	3074	GP003074-040021	MH003074-019794-015	MH003074-019738-012	18	IRON	379.60
VIL	3087	GP003087-038831	MH003087-016680-311	MH003087-016636-304	8	CLAY	159.33
VIL	3087	GP003087-038853	MH003087-016464-292	MH003087-016465-291	8	CLAY	161.32
VIL	3087	GP003087-038835	MH003087-016675-306A	MH003087-016637-306	8	CLAY	231.65
VIL	3087	GP003087-038844	MH003087-016525-303	MH003087-016465-291	8	CLAY	163.31
VIL	3087	GP003087-038852	MH003087-016462-293	MH003087-016464-292	8	CLAY	396.78
VIL	3087	GP003087-038828	MH003087-016874-312A	MH003087-016868-312	8	CLAY	32.36
VIL	3087	GP003087-038851	MH003087-016456-295	MH003087-016462-293	8	CLAY	220.93
VIL	3087	GP003087-038836	MH003087-016799-307B	MH003087-016719-307A	8	CLAY	206.84
VIL	3087	GP003087-038850	MH003087-016457-298	MH003087-016456-295	8	CIP	196.88
VIL	3087	GP003087-038842	MH003087-016636-304	MH003087-016536-303A	8	CLAY	178.42
VIL	3087	GP003087-038846	MH003087-016563-299	MH003087-016457-298	8	CLAY	260.36
VIL	3087	GP003087-038843	MH003087-016536-303A	MH003087-016525-303	8	CLAY	17.68
VIL	3087	GP003087-038839	MH003087-016671-307	MH003087-016637-306	8	CLAY	149.41
VIL	3087	GP003087-038849	MH003087-016562-294	MH003087-016462-293	8	CLAY	178.15
VIL	3087	GP003087-038838	MH003087-016719-307A	MH003087-016671-307	8	CLAY	170.07
VIL	3087	GP003087-038830	MH003087-016868-312	MH003087-016680-311	8	CLAY	378.93
VIL	3087	GP003087-038837	MH003087-016614-307C	MH003087-016719-307A	8	CLAY	321.52
VIL	3087	GP003087-038829	MH003087-016818-313	MH003087-016868-312	8	CLAY	341.55
VIL	3087	GP003087-038845	MH003087-016465-291	MH003087-016463-290	8	CLAY	196.73
VIL	3088	GP003088-038201	MH003088-014581-038	MH003088-014675-037	8	CIP	381.44
VIL	3088	GP003088-038205	MH003088-014910-031	MH003088-014916-028A	8	CLAY	142.38
VIL	3088	GP003088-038206	MH003088-014916-028A	MH003088-014928-028	8	CLAY	398.40
VIL	3088	GP003088-038253	MH003088-014573-039	MH003088-014675-037	8	CLAY	203.37
VIL	3088	GP003088-038258	MH003088-014518-039A	MH003088-014573-039	8	CLAY	97.62
VIL	3088	GP003088-038250	MH003088-014713-029	MH003088-014928-028	8	CLAY	326.27
VIL	3088	GP003088-038204	MH003088-014859-034	MH003088-014910-031	8	CLAY	257.58
VIL	3088	GP003088-038255	MH003088-014675-037	MH003088-014859-034	8	CLAY	331.12
VIL	3088	GP003088-038257	MH003088-014469-043	MH003088-014518-039A	8	CLAY	108.82
WAR	11001	GP011001-011287	MH011001-000175-044C	MH011001-000183-044B	8	DUCTILE_IRON	221.28
WAR	11001	GP011001-011194	MH011001-000203-073	MH011001-000199-072	8	CIP	226.94
WAR	11001	GP011001-011315	MH011001-000223-047	MH011001-000218-040	12	DUCTILE_IRON	194.24
WAR	11001	GP011001-011186	MH011001-000174-081	MH011001-000176-080	8	CIP	349.17
WAR	11001	GP011001-011214	MH011002-000180-001	MH011001-000181-086	10	CIP	246.92
WAR	11001	GP011001-011321	MH011001-000233-049	MH011001-000223-047	12	CLAY	265.83
WAR	11001	GP011001-011290	MH011001-000183-044B	MH011001-000186-044	8	DUCTILE_IRON	29.69

BASIN	SUBBASIN	ASSETID	USMH_ASSETID	DSMH_ASSETID	DIAMETER (IN)	MATERIAL	LENGTH (LF)
WAR	11001	GP011001-011166	MH011001-000173-046	MH011001-000182-045	8	DUCTILE_IRON	232.98
WAR	11001	GP011001-011167	MH011001-000182-045	MH011001-000187-043	8	DUCTILE_IRON	43.62
WAR	11001	GP011001-011289	MH011001-000186-044	MH011001-000187-043	8	DUCTILE_IRON	188.46
WAR	11001	GP011001-011316	MH011001-000218-040	MH011001-000222-039	12	DUCTILE_IRON	171.28
WAR	11001	GP011001-011277	MH011001-000181-086	MH011001-000191-084	10	CIP	373.68
WAR	11001	GP011001-011195	MH011001-000199-072	MH011001-000196-071	8	CIP	204.27
WAR	11001	GP011001-037538	MH011001-000165-044D	MH011001-000170-PROPOSED	8	DUCTILE_IRON	8.90
WAR	11001	GP011001-011185	MH011001-000172-082	MH011001-000174-081	8	CIP	220.32
WAR	11001	GP011001-037587	MH011001-000161-044F	MH011001-000163-044E	8	DUCTILE_IRON	300.03
WAR	11001	GP011001-037537	MH011001-000170-PROPOSED	MH011001-000175-044C	8	DUCTILE_IRON	118.58
WAR	11001	GP011001-037554	MH011001-000163-044E	MH011001-000165-044D	8	DUCTILE_IRON	12.26
WAR	11001	GP011001-037588	MH011001-000156-044G	MH011001-000161-044F	8	DUCTILE_IRON	243.63
WAR	11002	GP011002-011239	MH011002-000104-049	MH011002-000111-048	8	CIP	349.58
WAR	11002	GP011002-011219	MH011002-000129-034	MH011002-000130-033	8	CIP	112.54
WAR	11002	GP011002-011231	MH011002-000108-045	MH011002-000109-044	8	DUCTILE_IRON	127.78
WAR	11002	GP011002-011227	MH011002-000109-044	MH011002-000114-043	12	DUCTILE_IRON	169.55
WAR	11002	GP011002-011223	MH011002-000120-031	MH011002-000117-030	8	DUCTILE_IRON	86.71
WAR	11002	GP011002-011224	MH011002-000117-030	MH011002-000115-029	8	CIP	103.09
WAR	11002	GP011002-011229	MH011002-000113-042	MH011002-000116-040	12	DUCTILE_IRON	253.42
WAR	11002	GP011002-011226	MH011002-000116-040	MH011002-000115-029	12	DUCTILE_IRON	34.93
WAR	11002	GP011002-011243	MH011002-000123-028	MH011002-000124-027	12	CIP	143.30
WAR	11002	GP011002-011278	MH011002-000106-060	MH011002-000109-044	8	CIP	201.90
WAR	11002	GP011002-011385	MH011002-000119-041	MH011002-000118-041A	8	CIP	92.29
WAR	11002	GP011002-011241	MH011002-000112-047	MH011002-000110-046	12	CIP	135.54
WAR	11002	GP011002-011236	MH011002-000101-053	MH011002-000103-051	8	CIP	228.28
WAR	11002	GP011002-011232	MH011002-000097-056	MH011002-000098-055	8	CIP	194.94
WAR	11002	GP011002-011233	MH011002-000098-055	MH011002-000099-054	8	CIP	165.20
WAR	11002	GP011002-011238	MH011002-000102-050	MH011002-000104-049	8	CIP	97.02
WAR	11002	GP011002-011270	MH011002-000095-057	MH011002-000096-057A	8	CIP	38.87
WAR	11002	GP011002-011276	MH011002-000118-041A	MH011002-000116-040	12	CIP	38.86
WAR	11002	GP011002-011217	MH011002-000133-036	MH011002-000132-035	8	CIP	91.59
WAR	11002	GP011002-011218	MH011002-000132-035	MH011002-000129-034	8	CIP	74.47
WAR	11002	GP011002-011213	MH011002-000169-002	MH011002-000180-001	10	CIP	222.06
WAR	11002	GP011002-011228	MH011002-000114-043	MH011002-000113-042	12	DUCTILE_IRON	16.03
WAR	11002	GP011002-011237	MH011002-000103-051	MH011002-000102-050	8	CIP	320.94
WAR	11002	GP011002-011222	MH011002-000122-038	MH011002-000120-031	8	CIP	24.33
WAR	11002	GP011002-094718	MH011002-000099-054	MH011002-087675-053B	8	CIP	125.68
WAR	11002	GP011002-011220	MH011002-000130-033	MH011002-000128-032	8	CIP	215.35
WAR	11002	GP011002-011230	MH011002-000128-032	MH011002-000120-031	8	CIP	435.80
WAR	11002	GP011002-011225	MH011002-000115-029	MH011002-000123-028	8	CIP	279.86
WAR	11002	GP011002-011221	MH011002-000121-039	MH011002-000122-038	8	CIP	107.06
WAR	11002	GP011002-011240	MH011002-000111-048	MH011002-000112-047	10	CIP	180.13
WAR	11002	GP011002-011216	MH011002-000134-037	MH011002-000133-036	8	CIP	107.20
WAR	11002	GP011002-011242	MH011002-000110-046	MH011002-000108-045	8	DUCTILE_IRON	106.66
WAR	11002	GP011002-011271	MH011002-000096-057A	MH011002-000097-056	8	CIP	144.11

Appendix I Locations of Household Cooking Oil and Grease Recycling Centers (as of May 2018)

Locations of Household Cooking Oil and Grease Recycling Centers

Adamsville Pharmacy
3633 Gray Avenue
Adamsville, AL 35005

Birmingham Botanical Gardens
2612 Lane Park Road
Birmingham, AL 35223

Bessemer Fire Station # 3
2316 Morgan Road
Bessemer, AL 35022

Bessemer Fire Station #4
495 Flint Hill Road
Bessemer, AL 35022

Bessemer Recycling Center
1601 1st Avenue North
Bessemer, AL 35020

Center Point Satellite Courthouse
2651 Center Point Parkway
Birmingham, AL 35215

Gardendale Fire Station #1
1811 Decatur Hwy.
Gardendale, AL 35071

Graysville Fire Station # 2
1200 1st Avenue SE
Graysville, AL 35073

Homewood City Works building:
187 Citation Court
Homewood, AL 35209

Hueytown City Hall
1318 Hueytown Road
Hueytown, AL 35023

Jefferson County re-fueling station
2420 8th Avenue North
Birmingham, AL 35203

Keep Birmingham Beautiful Office
4721 Avenue W
Birmingham, AL 35208

Leeds Fire Station #2
8475 1st Avenue SE
Leeds, AL 35094

Legion Field Stadium – Lot M
400 Graymont Avenue
Birmingham, AL 35204

Midfield Fire Station
704 Dr. Martin Luther King Jr. Dr.
Midfield, AL 35228

North Smithfield Greenleaf Heights
4635 North Smithfield Drive
Birmingham, AL 35207

Pinson Rock School Recycling Center
4509 Center Point Road
Pinson, AL 35126

Tarrant City Hall
1604 Pinson Valley Parkway
Tarrant, AL 35217

Trussville Fire Station #1
131 Main Street
Trussville, AL 35173

Trussville Fire Station #2
7317 Roper Road
Trussville, AL 35173

Trussville Fire Station #3
8160 Gadsden Highway
Trussville, AL 35173

UAB Campus
620 11th St. South.
Birmingham, AL 35233

Vestavia Hills
3400 Chestnut Ridge Lane
Vestavia Hills, AL 35216

Guidelines for household cooking oil and grease recycling:

- **Edible oil products ONLY (cooking oil or grease)**
- **Allow oil to cool before pouring into container**
- **Pick up one of our free containers (available at each location) or use your own with a sealed lid; NO GLASS please!**
- **No fuel or motor oil will be accepted**
- **Any questions about the recycling program, please call 205-238-3876**

Service Connection and Disconnection Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	3	Modified Impact database reference	11/28/2018
1	4	Added text to describe county-specific permitting	11/28/2018
1	5	Added text to describe county-specific permitting	11/28/2018
1	7	Updated language to reflect current BWWB customer handling	11/28/2018
1	Appendix H	Inserted updated Sewer Impact Permit example	11/28/2018
1	Appendix H	Added BWWB private meter reporting form	11/28/2018
2	3	Updated section with Accela Permit System	2/2022
2	4	Deleted bonding language	2/2022
2	App B	Updated with newest permit example	2/2022
2	App D	Updated with newest permit example	2/2022
2	App E	Updated with newest permit example	2/2022
2	App F	Updated with newest permit example	2/2022
2	App G	Updated with newest permit example	2/2022
2	App H	Updated with newest permit example	2/2022

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Acronyms

CMOM	Capacity, Management, Operations, and Maintenance
GIS	Geographic Information System
I/I	Infiltration and inflow
JCESD	Jefferson County Environmental Services Department
KPI	Key performance indicator
SSO	Sanitary sewer overflow
TVI	Television Inspection

Service Connection and Disconnection Program

Program Overview

Purpose and Goals

The purpose of Jefferson County Environmental Services Department's (JCESD) **Sewer Connection and Disconnection Program** is to:

- Maintain strict control over the introduction of sewage flow into the sewer system from new construction and repaired or replaced service lines
- Enroll new customers into JCESD's billing system
- Provide plan review, inspection, core-tapping, and private meter adjustments

The goals of the **Sewer Connection and Disconnection Program** are to:

- Establish standards and ensure that these standards and other requirements for new services and service line construction, whether public or private, are met
- Minimize the quantity of infiltration and inflow (I/I) entering the collection system
- Review designs in a consistent manner and follow protocols for inspection, start-up, testing, and approving new construction and repaired service connections
- Provide core-tapping services for new connections into JCESD sanitary sewer mains
- Monitor when services are disconnected from the sanitary sewer system and ensure disconnections are completed in compliance with all requirements

Program Components and Approach

Components of the **Service Connection and Disconnection Program** are related to the following:

- New Sanitary Sewer Connections
- Sanitary Sewer Service Line Repairs
- Sanitary Sewer Service Line Disconnections
- Sanitary Sewer Main Taps
- Lateral Locates
- Private Meter Adjustments

The **Service Connection and Disconnection Program** includes a comprehensive system of legal authority, administrative, management, and documentation activities. The following program elements are described in this program plan:

- A summary of the legal authority that provides the basis for JCESD's sewer connection and disconnection initiatives
- A discussion of the requirements and work processes associated with each of the program elements
- A description of the staffing requirements needed to implement each initiative
- Key performance indicators (KPIs) for tracking and documenting the performance and effectiveness of the **Service Connection and Disconnection Program**

Quality sanitary service line and sewer connection designs and construction keep the costs and issues associated with operations, maintenance, and construction to a minimum. Awareness of new customers and diligent review of disconnections will enable staff to ensure that the County is properly billing its customer base and receiving the funds necessary to sustain its assets and overall system performance.

Program Resources

Related CMOM Program Documents and Other References

Other CMOM Program plans that reference, or are referenced in, the **Service Connection and Disconnection Program** plan are as follows:

- CMOM Information Management Systems Program
- CMOM Program Organization
- Contingency Planning Program
- Customer Service Program
- Engineering Program (Capacity Assurance Plan)
- Financial Analysis Program
- Legal Support Program
- Line Locate Program

Staffing

The Sewer Impact Division personnel, including a Chief Civil Engineer, Senior Engineering Inspectors, Sewer Service Inspectors, a Tap Operator, Accounting Assistants, and Administrative Assistants, perform the majority of the work associated with the service connection and disconnection permits, plan reviews, inspections, sewer main taps, and private meter adjustments (For more information, see the **CMOM Program Organization** plan).

Personnel from the Sewer Construction Administration and Line Maintenance Divisions are responsible for identifying and marking the locations of sewer mains in the field. The Television Inspection (TVI) Division is responsible for locating sewer connections in the field. For more information, refer to the **Line Locate Program**.

Data Management

JCESD staff previously entered and maintained sewer connection-related information, tied to street addresses, in the the Accela Permitting System. JCESD personnel also use a geographic information system (GIS) based mapping and system inventory to access sewer line record plan information.

Program Implementation

Legal Authority

JCESD has the legal authority necessary to regulate and enforce the connections to its sanitary sewer system, including residential and commercial customers, satellite systems, and industrial users. The legal authority is described in the following:

- Jefferson County Sewer Use Administrative Ordinance
- Jefferson County Sewer Use Charge Ordinance
- Commercial and Residential Sanitary Sewer System Design and Construction Manual (current version)
- Capacity Assurance Plan (included in the Engineering Program)
- Commercial Project Checklist
- Contracts, service agreements, and other legally binding documents

See the **Engineering Program** plan for more information on the County's sanitary sewer design requirements, construction standards and specifications, and approved materials. See the **Financial Analysis Program** and **Legal Support Program** plans for more information on permit and inspection fees and JCESD's sanitary sewer billing system.

New Connections

JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) describes the requirements for new sewer construction, including:

- Policies and procedures
- Sewer Impact Permit process
- Sanitary Sewer Connection Permit process and fee schedule
- Sanitary Sewer Tap Fees to Existing Sewers fee schedule
- Commercial development drawing requirements

- Construction specifications
- Material specifications
- Testing and inspection requirements
- Standard details

Sewer Impact and Sewer Connection Permits are required for connection to any portion of the County sanitary sewer system, whether the area served is incorporated or unincorporated, including all municipalities served by the County sanitary sewer system. The calculations associated with the permit fees are delineated in the **Jefferson County Sewer Use Charge Ordinance**. A copy of the Sewer Impact Permit application and an example Sewer Impact Permit are provided in **Appendix A** and **Appendix B**, respectively.

Typically, a licensed plumber or contractor submits a Sewer Impact Permit application and a site utility plan for new connections. Drawings are not required for residential developments. Once the Sewer Impact Division staff has reviewed and accepted the permit application and plans, a Sewer Impact Permit is issued.

A Sewer Connection Permit application and fee must be obtained by a State licensed master plumber. A Sewer Connection Permit must be issued by ESD before any excavation for the installation of a service line or connection begins. A copy of the Sanitary Sewer Connection Permit application and an example Sanitary Sewer Connection Permit are provided in **Appendix C** and **Appendix D**, respectively. Once the Sanitary Sewer Connection Permit is approved, excavation can begin, the service line installation starts, and an inspection of the connection is then scheduled.

Once the new connection has passed inspection, the Supervising Inspector closes the permits and coordinates with sewer billing to establish a new sewer billing account with the applicable local water company. See the **Financial Analysis Program** and **Legal Support Program** plans for more information on billing.

Service Line Connection Repair or Replacement

JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) describes the requirements for sewer connection repairs, including:

- Policies and procedures
- Sewer Impact Permit process (if required)
- Sanitary Sewer Repair Permit process and fee schedule
- Construction specifications
- Material specifications
- Testing and inspection requirements
- Standard details

Only a Sewer Impact Permit is required if the property is already connected to the sewer system and the work being performed is the addition of plumbing fixtures or restaurant equipment and/or seating, and no work is required on the service line. The calculation associated with the Sewer Impact Permit fee is delineated in the **Jefferson County Sewer Use Charge Ordinance**.

A Sanitary Sewer Repair Permit application and fee must be obtained by a State licensed master plumber and a Sanitary Sewer Permit must be issued by ESD before any excavation for the repair of a service line or connection is started. A copy of the Sanitary Sewer Repair Permit application and an example Sanitary Sewer Repair Permit are provided in **Appendix C** and **Appendix E**, respectively. An inspection of the repair work is scheduled before the work is completed.

Once the sewer connection repair has passed inspection, the Supervising Inspector closes the permit(s) and enters all relevant information into the Sewer Impact Database.

Service Line Disconnection

When a building is being demolished, JCESD requires the sewer service line to be disconnected before any work commences. If a building is being torn down, relocated, or other reason that would require the service line to be disconnected from the internal plumbing, the service line must be disconnected as close to the main sewer as possible.

JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version) includes a standard detail for disconnection at the main sewer; however, in some cases this is not feasible. If the main sewer is located under a roadway or sidewalk, the disconnection may occur outside the road or sidewalk, provided that no defects are left in the remaining portion of the service line. In such cases, the location of the disconnection will be determined by the Sewer Service Inspector on a case by case basis.

A Sanitary Sewer Disconnection Permit to disconnect and plug the sewer must be obtained by a licensed demolition contractor, a General Contractor or State licensed master plumber, and an inspection must be made by a County Sewer Service Inspector at the time of discontinuance. Copies of the Sanitary Sewer Disconnection Permit (Plug) application and an example permit are provided in **Appendix C** and **Appendix F**, respectively. The fee schedule is listed in the **Jefferson County Sewer Use Charge Ordinance** (current version).

If the demolition contractor damages the service line or main sewer, the contractor will be required to retain a licensed plumber or approved contractor to make the necessary repairs.

Sewer Taps

As stated in JCESD's **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version), Section 5.2.4:

> "All taps to manholes and pipes shall be machine-made taps. Work shall be performed by the ESD staff or by a contractor approved by the ESD."

The actual tapping and connection to the existing County-maintained sewer system is performed by the County's tapping crew, unless written approval for a County-approved contractor to perform the tap is obtained.

An excavation for a sewer tap is made by a plumbing contractor only after a Sanitary Sewer Tap Permit application and fees have been submitted and approved, and the County's tapping crew and inspector have been scheduled to be onsite. The excavation is required to be sufficiently large enough to give ample working room for the tapping crew. The plumbing contractor is solely responsible for safety and conformance with any applicable safety regulations. If the County's tapping crew or County Sewer Service Inspector feels the excavation is unsafe, the plumbing contractor must take the necessary measures to improve the trench conditions to the satisfaction of the County Sewer Service Inspector. The connection must be left visible for inspection after the tap is made, and no backfilling of the connection can be started until the connection has been inspected and approved by the Sewer Service Inspector.

Full requirements for sewer taps and the schedule for sewer tap fees are provided in the **Commercial and Residential Sanitary Sewer System Design and Construction Manual** (current version). Copies of the Sanitary Sewer Tap Permit application and an example permit are provided in **Appendix C** and **Appendix G**, respectively.

Sewer Main and Service Line (Lateral) Locates

Providing sewer main and lateral location information is an important function of JCESD that ultimately protects the public from serious risk or injury and minimizes interruptions to the performance of its underground assets that may result in sanitary sewer overflows (SSOs). In many instances, JCESD is asked to aid licensed plumbers who are hired to repair service lines for private property owners and residents.

For more information on sewer main and service line locate requests, see the **Line Locate Program** plan.

Private Meter Program

As shown in the screen capture[1] in **Figure 1**, JCESD's Private Meter Program allows for the installation of a private meter on a water service line at a residence or business. Although primarily used for recording the amount of water used for irrigation, private meters may also measure water use for any fixtures, equipment, or systems that do not discharge wastewater to the sanitary system. Residences or business that install a private meter have an opportunity to have their sewer use fee reduced in proportion with the actual amount of water discharged to the wastewater system. Sewer fees are typically calculated based on water consumption only, which may be disproportionate when large volumes of water are used for irrigation, etc.

[1] http://www.jeffcoes.org/Default.asp?ID=35&pg=PRIVATE+METERS

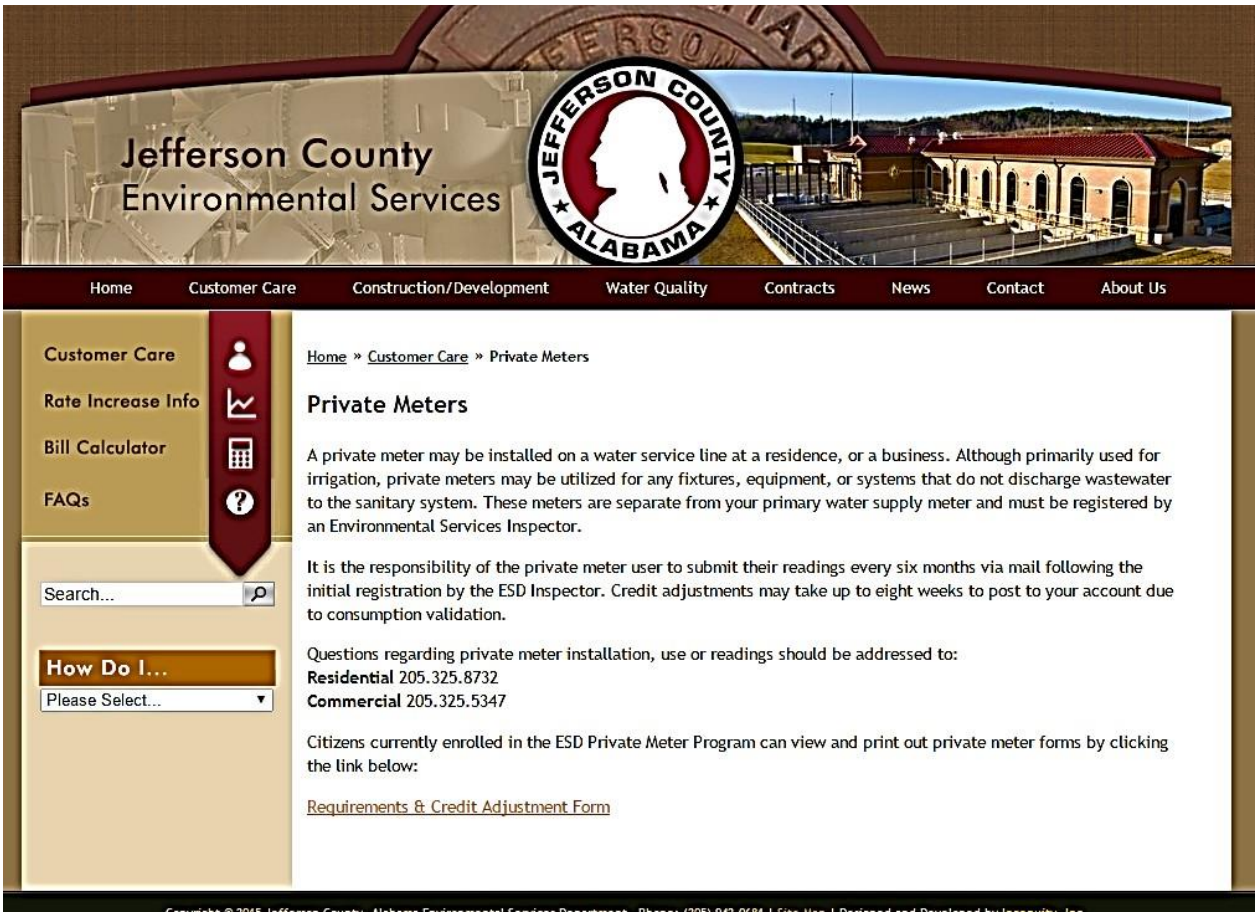

Figure 1. JCESD Private Meter Webpage

Private Meter Program requirements and forms are provided in **Appendix H**. After installation, the customer must register the private meter with the JCESD Sewer Impact Office. Birmingham Water Works Board (BWWB) customers are handled by BWWB and must register private meters with BWWB Customer Relations. It is the responsibility of the private meter user to submit their readings every six months via mail following the initial registration by the ESD Inspector. Credit adjustments with local water systems are coordinated by Sewer Impact Office staff and may take 8 to 12 weeks to post to the customer's account.

For more information on the Private Meter Program and billing rate adjustment process, see the **Financial Analysis Program** and **Legal Support Program** plans**.**

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and if not, what activities need to be adjusted to meet program goals.

The **Service Connection and Disconnection Program** performance measures established at JCESD are shown in **Table 1**.

Table 1. Service Connection and Disconnection Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
New Service Connections	Value	New sewer service request applications and installations	Value	Monthly/Annual	Impact
Sewer Disconnections	Value	Applications for sewer service termination	Value	Monthly/Annual	Impact
Sewer Taps	Value	Requests for new sewer taps to existing sewer system	Value	Monthly/Annual	Impact
Private Meter Requests	Value	Requests for private meter installation	Value	Monthly/Annual	Impact

APPENDICES

Appendix A Sewer Impact Permit Application

WORKSHEET FOR IMPACT FEES
JEFFERSON COUNTY ENVIRONMENTAL SERVICES
716 RICHARD ARRINGTON, JR. BLVD. NORTH SUITE A300
BIRMINGHAM, ALABAMA 35203 (205) 325-5138
THIS IS NOT A PERMIT

DATE: ___/___/_____ (MM/DD/YEAR)

MUNICIPALITY: _____ ZIP: _____

SITE ADDRESS: _____

_____

OWNER: _____

CONTRACTOR: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

AREA CODE & PHONE #: _____

LEGAL DESCRIPTION:

LOT: _____ BLOCK: _____

SURVEY: _____

PARCEL I.D.: _____

SECTION: _____ TWSP: _____ RANGE: _____

TYPE OF OCCUPANCY: (Please Check All That Apply)

- ☐ RESIDENTIAL
- ☐ COMMERCIAL
- ☐ INDUSTRIAL
- ☐ NEW BUILDING
- ☐ BUILDING ADDITION
- ☐ REMODEL
- ☐ SEPTIC TANK CONVERSION

FIXTURE TYPE	TOTAL #
WATER CLOSETS/TOILETS	
BATH TUBS	
SHOWERS	
LAVATORIES	
SINKS	
URINALS	
WASHING MACHINES	
DISHWASHERS	
GARBAGE GRINDERS	
RESTAURANTS:	
SEATS	
CONSUMPTIONS	
DUMPSTER	
OTHER	
_____	
FIXTURES 1/4 VALUE	
FLOOR DRAINS	
DRINKING FOUNTAINS	
SUMPS-PUMPS-EJECTORS	
CONDENSATE DRAINS	
TOTAL FIXTURES:	
LESS CREDITS	
IMPACT#/INSPECTOR	

TOTAL FEE DUE: $ _____

Appendix B Example Sewer Impact Permit

JEFFERSON COUNTY ENVIRONMENTAL SERVICES SEWER IMPACT PERMIT

716 Richard Arrington Jr. Blvd N Suite A-300
Birmingham, AL 35203

Impact Permit No:	**0117095**
Issued By:	WORMSBYS
Approved By:	BENSONC
Date:	09/29/2021

Site Address:	413 EDGELAND PL		
City:	BIRMINGHAM		
County:	Jefferson	**Zip:**	35209
Applicant:	TWIN CONSTRUCTION		
Address:	2907 CENTRAIL AVE SUITE 105		
City:	HOMEWOOD		
State:	AL	**Zip:**	35209
Owner:			
Address:			
City:			
State:		**Zip:**	

Legal Description (List only the lot or lots on which the building is situated):

Lot:	
Block:	008
Survey:	EDGEWOOD HGLDS 29-13-3
Qtr:	3.00
Section:	13
Township:	29
Range:	
P.I.N.:	2900133008004000
Type of Occupancy:	Residential
	Remodel

Fixture Description	# Fixtures
Toilets/Water Closets	6
Bath Tubs	5
Showers	1
Lavatories	7
Sinks	3
Washing Machines	2
Dishwashers	1
Garbage Grinders	1
Other 1/4	1
Total Equivalent Fixtures:	**26.25**
Equivalent fixture Removal Credit:	**9**
Total Fee:	**$5,632.30**

This permit is for the discharge impact on the Jefferson County Sanitary Sewer Collection System measured using a fixture count. This is not a permit to install plumbing fixtures. A separate plumbing permit must be obtained from the proper jurisdiction.

Failure to comply with any term or condition herein may result in the permittee being denied future permits.

I HEREBY CERTIFY AND AFFIRM THAT ALL INFORMAITON GIVEN HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

Julie Jurotich

Signature of Owner or Contractor

Julie Jurotich

Print Name

Comments and Conditions:
Basin: Shades
Other Comments: LESS CREDIT OF 9 PER AO. PAID WITH CHECK # 1256. OTHER 1/4 ICE MAKER.

ATTENTION! -- THIS IS NOT A SEWER CONNECTION PERMIT. A SEPARATE PERMIT MUST BE OBTAINED TO INSTALL OR REPAIR A SEWER SERVICE LINE, OR MAKE CONNECTION TO A SANITARY SEWER MAIN. Upon installation of fixtures and/or stubouts for fixtures permitted, the abovesigned shall immediately notify the County (205-325-5138) and hereby authorize the County to inspect the premises for conformity with this impact permit. Any installed fixtures and/or stubouts for fixtures, including restaurant and bar seats, in excess of those permitted upon time of inspection shall be assessed at double the standard fixture rate. If failure to make payment hereunder results in legal action, the abovesigned agrees to pay all costs and reasonable attorneys fees of such legal action.

To obtain a full refund of this impact fee, you must surrender the Receipt and ALL copies of this Permit issued at time of purchase.

Appendix C Sanitary Sewer Connection, Repair, Tap, and Plug Permit Application

JEFFERSON COUNTY ESD IMPACT DIVISION
716 RICHARD ARRINGTON BOULEVARD NORTH - SUITE A300
BIRMINGHAM, ALABAMA 35203
PHONE: (205) 325-5138

WORKSHEET FOR SEWER CONNECTION PERMITS

(PLUMBERS ARE REQUIRED TO SECURE EXCAVATION PERMITS FROM PROPER JURISDICTIONS WHEN ENTERING ROAD RIGHTS OF WAY! NOTE THAT LACK OF EXCAVATION PERMIT MAY VOID INSPECTION!)

IMPACT # _____ APPROVED BY: _____ DATE: _____

ADDRESS: _____

CITY / STATE / ZIP: _____

SURVEY: _____

PARCEL ID NUMBER : _____

OWNER: _____

DEMOLITION CONTRACTOR: _____

PLUMBING CONTRACTOR: _____

MASTER PLUMBER'S NAME: _____

CONTRACTOR ADDRESS: _____

CITY / STATE / ZIP: _____

CONTRACTOR TELEPHONE: _____

TYPE OF PERMIT NEEDED:

Upon signature below, the plumbing company agent affirms acquisition of all municipal excavation and state right of way permits required on site.

_____

SEWER REPAIR _____

SEWER CONNECTION _____

SEWER TAP _____

SEWER PLUG _____

TOTAL PERMIT COST $_____

Appendix D Example Sanitary Sewer Connection Permit

SEWER CONNECTION PERMIT
Jefferson County, AL
Environmental Services Department
716 Richard Arrington Jr Blvd N
Suite A-300
(205) 325-5138

Sewer Permit No: ENVCON-21-0195
Impact Permit No: 0117096
Issued By: WORMSBYS
Approved By: WORMSBYS
Date: 09/29/2021

Connection Address: 3429 LORNA RD HOOVER **Zip Code:** 35216
County: Jefferson
Legal Description:
Lot: **Block:** **Survey:** JACK'S
Qtr: **Section:** **Township:** **Range:**
P.I.D.:

Plumber

Name: James Pickle
Company Name: Pickle Plumbing
Address: Po Box 95
City: Brookside **State:** AL **Zip Code:** 35036
Phone: 2057896269
Masters Plumber's Card No.: MP1241PL

Sewer Connection Fees:

Sewer Connection	$72.56
Total Amount Due:	$72.56

Comments:
FEE PAID WITH CASH.
Basin - Cahaba River

- *Note: Disconnection Permits can be purchased by a Master Plumber, General Contractor, or a Demolition Contractor.*
- *If a sewer tap is required, contact Jefferson County Sewer Permitting and Inspections office 24 hours in advance.*
- *Excavation Permit required if digging in Public Right-of-Way.*
- *This permit authorizes the permittee to excavate, install, repair, or connect a single sewer service line from a new or existing building or home at the connection address stated herein directly to a sewer main located on an adjacent public sanitary sewer easement. This permit does not authorize the permittee or any other person to enter upon, disturb, or perform said work upon adjacent private property.*

I HEREBY CERTIFY AND AFFIRM THAT ALL INFORMATION GIVEN HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

James Pickle
Signature of Plumber

James Pickle
Print Name

Appendix E Example Sanitary Sewer Repair Permit

SEWER REPAIR PERMIT
Jefferson County, AL
Environmental Services Department
716 Richard Arrington Jr Blvd N
Suite A-300
(205) 325-5138

Sewer Permit No: ENVCON-21-0194
Impact Permit No: 112459
Issued By: WORMSBYS
Approved By: WORMSBYS
Date: 09/27/2021

Connection Address: 4900 EAST LAKE BLVD BIRMINGHAM **Zip Code:** 35217

County: Jefferson

Legal Description:

Lot: **Block:** **Survey:** The Alpha Charlie

Qtr: **Section:** **Township:** **Range:**

P.I.D.: 012300084002001002

Plumber

Name: Rex Latta

Company Name: Latta Plumbing Service Inc

Address: 333 Decatur Highway

City: Gardendale **State:** AL **Zip Code:** 35071

Phone: 2053336445

Masters Plumber's Card No.: MPG1897PL

Sewer Connection Fees:

Sewer Repair	$72.56
Total Amount Due:	$72.56

Comments:
PAID WITH CHECK #1234
This permit is issued conditionally subject to party providing proof of The Grease Control Permit before operating said business and/or connecting to the sanitary sewer [site utility plans must be provided at this time if applicable]
Basin - Five Mile Creek

- *Note: Disconnection Permits can be purchased by a Master Plumber, General Contractor, or a Demolition Contractor.*
- *If a sewer tap is required, contact Jefferson County Sewer Permitting and Inspections office 24 hours in advance.*
- *Excavation Permit required if digging in Public Right-of-Way.*
- *This permit authorizes the permittee to excavate, install, repair, or connect a single sewer service line from a new or existing building or home at the connection address stated herein directly to a sewer main located on an adjacent public sanitary sewer easement. This permit does not authorize the permittee or any other person to enter upon, disturb, or perform said work upon adjacent private property.*

I HEREBY CERTIFY AND AFFIRM THAT ALL INFORMATION GIVEN HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

Rex Latta
Signature of Plumber

Rex Latta
Print Name

Appendix F Example Sanitary Sewer Disconnection (Plug) Permit

SEWER DISCONNECTION PERMIT
Jefferson County, AL
Environmental Services Department
716 Richard Arrington Jr Blvd N
Suite A-300
(205) 325-5138

Sewer Permit No: ENVCON-21-0196
Impact Permit No: 0117096
Issued By: WORMSBYS
Approved By: WORMSBYS
Date: 09/29/2021

Connection Address: 3429 LORNA RD HOOVER **Zip Code:** 35216
County: Jefferson
Legal Description:
Lot: **Block:** **Survey:** JACK'S
Qtr: **Section:** **Township:** **Range:**
P.I.D.:

Plumber

Name: James Pickle
Company Name: Pickle Plumbing
Address: Po Box 95
City: Brookside **State:** AL **Zip Code:** 35036
Phone: 2057896269
Masters Plumber's Card No.: MP1241PL

Sewer Connection Fees:

Sewer Disconnect	$36.29
Total Amount Due:	$36.29

Comments:
PAID WITH CASH
Basin - Cahaba River

- *Note: Disconnection Permits can be purchased by a Master Plumber, General Contractor, or a Demolition Contractor.*
- *If a sewer tap is required, contact Jefferson County Sewer Permitting and Inspections office 24 hours in advance.*
- *Excavation Permit required if digging in Public Right-of-Way.*
- *This permit authorizes the permittee to excavate, install, repair, or connect a single sewer service line from a new or existing building or home at the connection address stated herein directly to a sewer main located on an adjacent public sanitary sewer easement. This permit does not authorize the permittee or any other person to enter upon, disturb, or perform said work upon adjacent private property.*

I HEREBY CERTIFY AND AFFIRM THAT ALL INFORMATION GIVEN HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

James Pickle
Signature of Plumber

James Pickle
Print Name

Appendix G Example Sanitary Sewer Tap Permit

SEWER TAP PERMIT
Jefferson County, AL
Environmental Services Department
716 Richard Arrington Jr Blvd N
Suite A-300
(205) 325-5138

Sewer Permit No: ENVCON-21-0197
Impact Permit No: 0117096
Issued By: WORMSBYS
Approved By: WORMSBYS
Date: 09/29/2021

Connection Address: 3429 LORNA RD HOOVER **Zip Code:** 35216
County: Jefferson
Legal Description:
Lot: **Block:** **Survey:** JACK'S
Qtr: **Section:** **Township:** **Range:**
P.I.D.: .

Plumber

Name: James Pickle
Company Name: Pickle Plumbing
Address: Po Box 95
City: Brookside **State:** AL **Zip Code:** 35036
Phone: 2057896269
Masters Plumber's Card No.: MP1241PL

Sewer Connection Fees:

Sewer Tap	$217.69
Total Amount Due:	$217.69

Comments:
PAID WITH CASH.
Basin - Cahaba River

- *Note: Disconnection Permits can be purchased by a Master Plumber, General Contractor, or a Demolition Contractor.*
- *If a sewer tap is required, contact Jefferson County Sewer Permitting and Inspections office 24 hours in advance.*
- *Excavation Permit required if digging in Public Right-of-Way.*
- *This permit authorizes the permittee to excavate, install, repair, or connect a single sewer service line from a new or existing building or home at the connection address stated herein directly to a sewer main located on an adjacent public sanitary sewer easement. This permit does not authorize the permittee or any other person to enter upon, disturb, or perform said work upon adjacent private property.*

I HEREBY CERTIFY AND AFFIRM THAT ALL INFORMATION GIVEN HEREIN IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

James Pickle
Signature of Plumber

James Pickle
Print Name

Appendix H Private Meter Program Information

Jefferson County Environmental Services

Private Meter Requirements

Private meters are secondary water meters that are permanently installed on the water line by the customer, at the owners' expense, to measure non-sewer uses such as lawn irrigation systems, pools, etc. (Note: portable meters that screw onto the end of hose bib or faucet are not allowed.)

After installation, the meter must be registered by a Jefferson County Environmental Services Sewer Service Inspector. The meter credit will start from the initial reading of the meter at the time of inspection. Credit is not retroactive. It is the responsibility of the homeowner, or business owner to inform Jefferson County of a private meter installation and request an inspection on that meter.

It is the responsibility of the homeowner, or business owner to read the meter and submit the reading on the proper private meter form to the Jefferson County Environmental Services Department, located at 716 Richard Arrington, Jr. Boulevard North - Suite A-300, Birmingham, Alabama 35203.

The homeowner, or business owner, or person responsible for reading the meter must be present at the time of registration.

The applicable form that is to be submitted must be filled out completely in order to be processed properly. Failure to do so may result in the form being returned to you for completion. Readings should be submitted every 6 months, but not more frequently than every 6 months. A processing fee shall be administered at each submission. This processing fee will be deducted from credit issuance. Do not send cash or check for this fee. Please allow 12 weeks to credit your Water Works account.

Note: All residential (single family dwellings) are normally charged at 85% of their consumption. Those who choose to register a private meter will be charged at the 100 % rate, but will receive an adjustment for the amount of water use through the private meter at their respective intervals of submission. Also note: Each time service is transferred the private meter must be registered to receive credit.

Please call the Sewer Impact Office at 205-325-5801 for initial registration.

Jefferson County Environmental Services

Jefferson County Environmental Services Department

Private Meter Reporting Form

Please complete form in its entirety and allow 12 weeks for your account credit

Mail To: Sewer Impact Office
716 Richard Arrington, Jr. Boulevard North
Suite A-300
Birmingham, Alabama 35203

(PLEASE DO NOT MAIL WITH WATER BILL)
Phone: 325-8732--Residential
Phone: 325-5347--Commercial

From:

NAME: _____ DAYTIME PHONE: _____

BUSINESS NAME: _____

ADDRESS: _____

CITY: _____ ZIP CODE: _____

NAME OF WATER PROVIDER: _____

WATER/SEWER BILL ACCOUNT # _____

PRIVATE METER # _____

PRESENT METER READING (GAL-CF) _____

PREVIOUS METER READING (GAL-CF) _____

NET (GAL-CF) _____

The above figures are for the period between the dates of:

_____ AND _____
Month / Day / Year Month / Day / Year

PLEASE SUBMIT A READING EVERY SIX MONTHS & BE SURE TO INCLUDE ALL NUMBERS EXACTLY AS INDICATED ON YOUR PRIVATE METER DIAL/FACEPLATE WITH RESPECT TO ANY FIXED ZEROS. CREDITS ARE LIMITED TO ONE RETROACTIVE YEAR PER THE JEFFERSON COUNTY SEWER USE ORDINANCE, AND PURSUANT TO ALABAMA STATE LAW.

Birmingham Water WORKS
...For YOU!

Private Meter Reporting Form

Please complete this form in its entirety and allow 8 to12 weeks for your account to be processed.

Mail To: Birmingham Water Works
Customer Relations Department
P.O. Box 830110
Birmingham, Alabama 35283-0110
205 244-4000

(PLEASE DO NOT MAIL WITH WATER AND SEWER BILL)

NAME: _____ DATE: _____

COMPANY NAME: _____

ACCOUNT NUMBER: _____ PHONE#: _____

ADDRESS: _____

CITY: _____ ZIP CODE: _____

PRIVATE METER#: _____

CURRENT METER READ DATE: _____ CURRENT READING (A): _____

PREVIOUS METER READ DATE: _____ PREVIOUS READING (B): _____

Is Private Meter Units in "Gallons" ☐ Gallons
Or "Cubic Feet" (select) → ☐ Cubic Feet

Total Volume:
(A) minus (B): _____

Adjustment Calculation = 100 Cubic Feet x Rate (or) $ _____
= Gallons / 748.1 x Rate

_____
Customer Signature

Rate subject to change each calendar year

748.1 is conversion of gallons to hundred cubic feet (cu. ft.)

PLEASE SUBMIT A READING EVERY SIX MONTHS & BE SURE TO INCLUDE ALL NUMBERS EXACTLY AS INDICATED ON YOUR PRIVATE METER DIAL/FACEPLATE WITH RESPECT TO ANY FIXED ZEROS. CREDITS ARE LIMITED TO ONE RETROACTIVE YEAR PER THE JEFFERSON COUNTY SEWER USE ORDINANCE, AND PURSUANT TO ALABAMA STATE LAW. UPON EACH SEMI-ANNUAL OR ANNUAL PERIOD, CUSTOMER SHOULD MAIL THIS COMPLETED FORM TO BIRMINGHAM WATER WORKS AT THE ADDRESS ABOVE. **IT IS THE CUSTOMER'S SOLE RESPONSIBILITY TO SUBMIT THE FORM WITHIN A 12 MONTH PERIOD TO RECEIVE AN ADJUSTMENT (No Exceptions).**

3600 First Avenue North, P.O. Box 830110, Birmingham, AL 35283-0110, Phone 205-244-4000 Website www.bwwb.org

Line Locate Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	3	Updated Figure 1 to reflect current work flow	6/26/18
1	4	Updated Figure 2 with JCESD Line Location webpage	4/30/18
1	App A	Replaced Sanitary Sewer Main Locate Request Form with current version	7/10/18
2	3	Updated Alabama 811 language	2/2022
2	6	Updated Figure 2	2/2022
2	7	Updated Table 1	2/2022
2	9	Updated Table 2	2/2022
2	App A	Updated Appendix A title and updated with the current form	2/2022
2	App B	Updated Appendix B with current information	2/2022

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Appendix B Example Locate and Mark Service Lateral Sewer Service Request

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Acronyms

CCTV	Closed-circuit television
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
GIS	Geographic Information System
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
KPI	Key performance indicator
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
TVI	Television inspection

Line Locate Program

Program Overview

Purpose and Goals

The purpose of the **Line Locate Program** is to:

- Receive, record, and respond to sewer main and service connection location requests

The goals of the **Line Locate Program** are to:

- Provide information, as accurately as possible, on the location of the County's sanitary sewer mains for designers, contractors, plumbers, private property owners, and residents associated with related infrastructure work
- Assist plumbers, contractors, and private property owners in identifying the locations of privately-owned sanitary sewer service lateral connections to the County's sewer mains

Program Components and Approach

The Jefferson County Environmental Services Department (JCESD) **Line Locate Program** primarily addresses the following types of requests:

- Planning-level location requests
- Sewer line location requests made prior to excavation
- Service line location requests made by plumbers, contractors, and private property owners

For more information on sanitary sewer planning and design requirements, see the **Engineering Program** plan. For more information on service connections, see the **Service Connection and Disconnection Program**.

The **Line Locate Program** includes a comprehensive system of administrative, management, and documentation activities. The following program components are described in this program plan:

- The ways in which requests for line locations are submitted to JCESD
- Methods used by JCESD personnel to identify and provide information on the locations of sewer mains and connections
- Key performance indicators (KPIs) for tracking and documenting the performance and effectiveness of the **Line Locate Program** initiatives

Providing sewer main location information is a critical function of JCESD that ultimately protects the public from serious risk or injury, and minimizes interruptions to the performance of its underground assets that may result in sanitary sewer overflows (SSOs). JCESD is a member of the Alabama 811 one-call utility locating service. JCESD provides assistance with sewer forcemain locate services. All other mainline locates are handled by a Contractor working for JCESD in coordination with 811. Sanitary sewer service laterals are owned and maintained by the individual property owner, thus are not included in this program.

This program provides a vital service to designers, utilities, contractors, plumbers, private property owners, and residents.

For more information on the services provided by JCESD Surveying personnel to locate and verify discrepancies in GIS attributes, see the **Engineering Program** plan.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed standard operating procedures (SOPs) for various CMOM-related job duties. Copies of the internal inspection via closed-circuit television (CCTV) equipment-related SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations.**

For more information on Safety Training Resources, see the **Safety Program** plan.

Other CMOM Program plans that reference or are referenced in the **Line Location Program** plan are as follows:

- CMOM Program Organization
- Customer Service Program
- Engineering Program
- CMOM Information Management Systems (IMS) Program
- Legal Support Program
- Safety Program
- Service Connection and Disconnection Program

Staffing

Requests for sewer main tee locations that are faxed or emailed to JCESD are received and processed by the Office of Engineering Inspection. Some plumbers and contractors email the Office of Engineering Inspection or Sewer Impact Division staff directly. On occasion, request forms that are submitted at the Customer Service counter are processed by Administration staff.

Requests for sewer mains to be marked in the field are processed by an independent contractor working in coordination with 811 under direction of JCESD

Requests for the location of sewer lateral tee location may be made in person at the Mapping Division Counter, through emails or phone calls, or through the JCESD website. Mapping Division personnel, who report to the Chief Civil Engineer overseeing the Mapping and Plans Review Division, will provide available as-built information where lateral stations are documented. If as-built information is not available, the Mapping Division will contact the Television Inspection (TVI) via Line Maintenance Dispatch Division to locate and mark the sewer lateral tee connection to the main line in the field.

Figure 1 shows the process flow diagram for receiving and addressing requests for sewer service lateral locations.

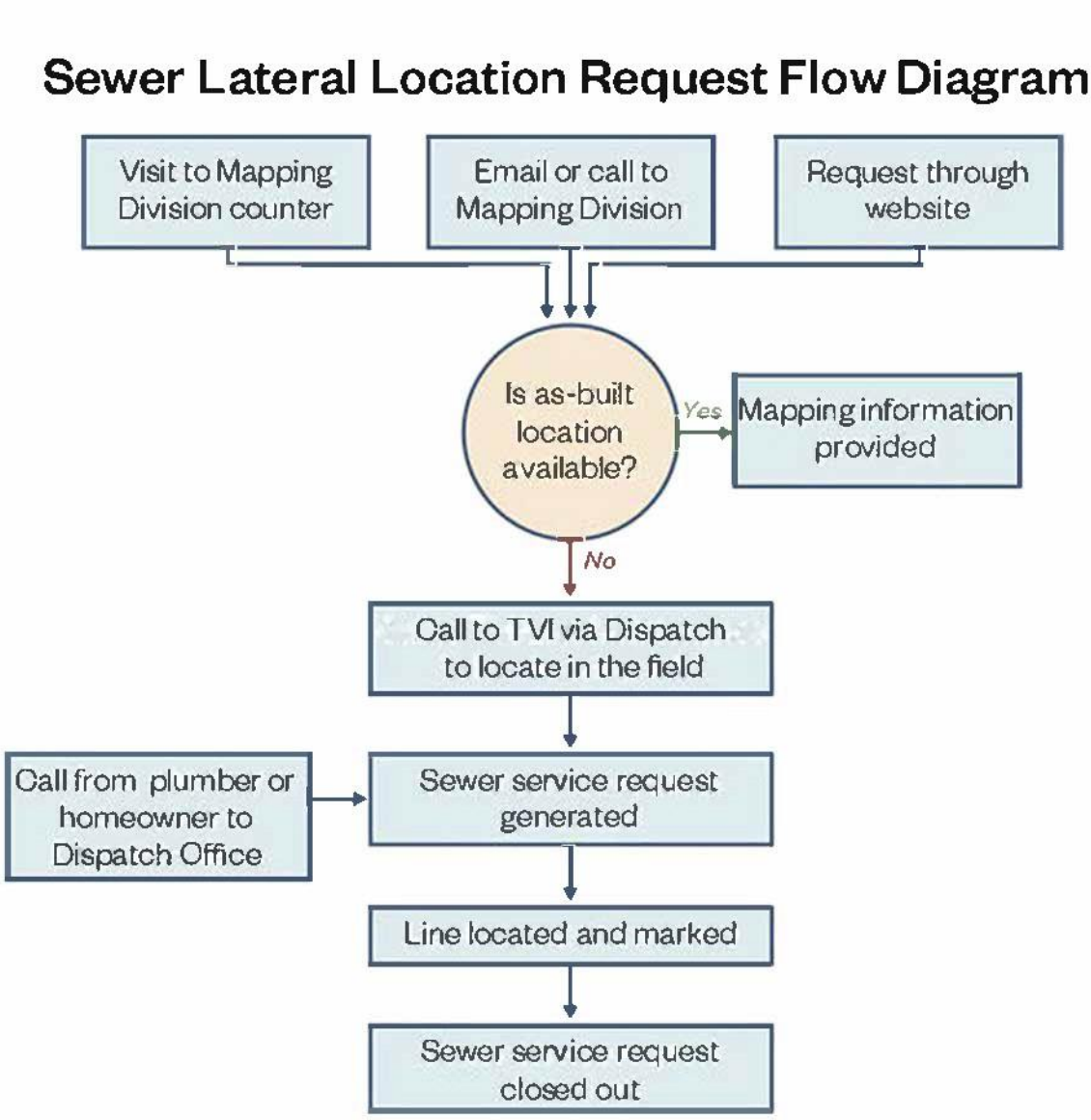

Figure 1. Sewer Lateral Location Request Flow Diagram

Data Management

Sanitary Sewer Mainline Lateral Tee Location Request Forms and verbal requests for lateral tee locations are not tracked.

Service requests to locate sewer lateral tee connections in the field are entered into the Cityworks computerized maintenance management system (CMMS). Work orders are generated by field crews once the work associated with the line location work is completed (i.e., TVI inspection and any necessary line maintenance work to find a service connection).

For more information on Cityworks, see the **CMOM Information Management Systems Program** plan.

Program Implementation

Sewer Main Location Requests Prior to Excavation

As shown in **Figure 2**, JCESD's website provides information on Sewer Main Line Lateral Tee Locate requests. The public can request that a sewer lateral tee connection be located prior to excavation by completing a Jefferson County Locate Request Form (see **Appendix A**) and faxing the form to (205) 325-5698 or emailing it to sewerlocate@jccal.org. All requests for this type of line locating, including calls to the 24-hour Emergency Contact telephone number, are routed to the Office of Engineering Inspection.

Figure 2. JCESD Sewer Line Location Webpage

JCESD staff give a verbal disclaimer for all line locations provided: "This is what our records indicate. We have received these records from other parties. We cannot guarantee this information."

Planning-Level Service Line Location Requests

Requests for service line location information that are not urgent are frequently received and processed by Sewer Impact Division personnel. These requests may be made in writing, via a phone call, or through an email. Some of these requests are made in person at the Mapping Division Counter in the County Courthouse and are handled by available staff.

If as-built location information is available for a sewer lateral connection, the requester will be provided with the upstream manhole station, downstream manhole station, and lateral station. A GIS Plan view or record plan and profile sheet may be printed out and given to the customer for a fee, if requested.

For more information on the County's public records policy, see the **Legal Support Program** plan.

Sewer Connection Locations Identified by TVI Inspection

As detailed in **Table 1**, JCESD receives a high volume of service requests for locating service lines utilizing TVI Inspection. The majority of these calls are made by plumbers. In addition, requests to locate sewer connections to the main line may be initiated by the Mapping Division.

Table 1. Number of Service Requests for Locating Service Lines, January 2015 – August 2021

Year	2015	2016	2017	2018	2019	2020	2021
Month	Number of Service Requests for Service Line Locates						
January	22	19	24	20	12	8	18
February	12	28	20	22	18	12	20
March	21	19	22	23	16	4	22
April	22	20	22	18	16	5	20
May	14	18	13	20	12	13	8
June	15	11	23	13	10	9	12
July	8	13	14	9	17	17	16
August	11	12	17	22	15	12	2
September	23	25	20	15	18	12	-
October	15	23	21	7	15	15	-
November	9	12	18	12	8	14	-
December	19	9	15	8	12	18	-
Total	**191**	**209**	**229**	**189**	**169**	**139**	**118**

An example Service Line Location Service Request is provided in **Appendix B**.

For more information on how the service requests are received and responded to, see the **Customer Service Program**.

Sewer Service Requests (work orders) for locating service lines via CCTV inspection are routed to the TVI Sewer Video Operations Supervisor, who schedules the inspection work. Although TVI crews' schedules are priority-driven, in most cases the location inspection can be completed within a 2-week period. Priority is given to customers experiencing a service disruption. For more information on how the inspection is performed, see the **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

The TVI Sewer Video Operations Supervisor is responsible for providing the location information to the requestor. The field crew completes the work order and turns it in to the Dispatch office. A Dispatcher will close out the service request.

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

Data currently tracked include the following:

- Number of Sewer Main Lateral Tee Connection Locate Request forms received per month
- Number of TVI-related line locate requests received per month
- Average time to complete service line tee connection locate sewer service requests

In most cases, and depending on TVI crews' schedule priorities, sewer lateral tee connection location requests are targeted to be completed within a 2-week period.

The success and effectiveness of these efforts can be evaluated by reviewing the following:

- How many sewer lateral tee connections are located via as-constructed drawing
- How many service connections are located via CCTV inspection
- How many non-urgent location requests are processed

The **Line Locate Program** performance measures established at JCESD are shown in **Table 2**.

Table 2. Line Locate Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval	JCESD Group
Sewer Lateral Connection Locate Prior to Construction Requests	Value	Number of Requests made for Sewer Lateral Connection Location prior to construction activity in vicinity of Sewer Assets	Value	Monthly	Mapping/Television Inspection
Sewer Lateral Connection Locates Prior to Construction Response	Value	Response time to locate and close out requests for Sewer Lateral Connection Locate prior to Construction > 48 hours	0	Monthly	Mapping/Television Inspection
Sewer Lateral Connection Locate Requests for Planning	Value	Number of requests made for Sewer Lateral Connection Location during planning for construction activity	Value	Monthly	Mapping/Television Inspection

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APPENDICES

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Appendix A Sanitary Sewer Line Request Form

JEFFERSON COUNTY ENVIRONMENTAL SERVICES DEPARTMENT

SANITARY SEWER SERVICE LINE LOCATE REQUEST FORM

Name: _____

Address: _____

City: _____

Zip code: _____

PHONE: _____

Plumber Name: _____

Reason for Request: _____

_____

JEFFERSON COUNTY ENVIRONMENTAL SERVICES DEPARTMENT
OFFICE OF SEWER CONSTRUCTION
PHONE: 205.369.1665
FAX: 205.325.5698
EMAIL: SEWERLOCATE@JCCAL.ORG

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Appendix B Example Locate and Mark Service Lateral Sewer Service Request

Jefferson County, Alabama
Environmental Services Department
Sewer Service Request

Request Number: 1075498	**Map Page:** 30-N11	**Service Priority:** Medium
Code: Locate Service Line	**Description:** Locate and Mark Service Lateral	**Associated WO Number:**
Problem Address: 700 FULTON AVE, TARRANT 35217		
Resolution: Work Order Created		
Date / Time Reported: 7/24/2021 2:44:15 PM	**Date Submitted:**	**Tile No.:** FIVE MILE CREEK
Intitiated By: Oden, Janice M	**Dispatched To:** Clark, Andrew L	**Date Dispatched:** 7/26/2021 7:49:58 AM
Submitted To:		**Number of Calls:** 1

Customer Call #	First Name	Last Name	Address		Apt. #
1077266	MACK	DEE	103 WILKES ROAD		
Business Name					
BLUE WAVE PLUMBING					
City	**Zip**	**Home Phone**	**Work Phone**	**Other Phone**	**Date & Time Of Call**
MIDFIELD	35228				7/24/2021 2:41:40 PM
Customer Email			**Cell Phone**		
			205-281-5529		

Closed By: Oden, Janice M	**Closed Date/Time:** 7/27/2021 11:58:36 AM
Was Customer Contacted? N	**Name of Customer Contacted:**

Customer Comments: LOCATE & MARK THE HOMEOWNER'S SERVICE LINE AND CHECK ITS CONDITION.
Location Details:
Problem Details:

Custom Fields

Custom Field Names	Custom Field Value

Existing Service Request Comments:
By Oden, Janice M: 7/27/2021 11:58:26 AM
CREW 190 CLARK ON 07/26/2021
CAMERA DOWNSTREAM 577FT (2014-076-2014-075) MAIN OKAY AND FLOWING. MARKED AND LOCATED THE TAP.

Maintenance

Gravity Line Preventative Maintenance Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	4	Updated Table 1 to reflect current staffing	7/11/18
1	8	Updated Table 2 to reflect current equipment use	7/11/18
1	15	Added acoustic inspection section	5/17/18
2	2	Updated the miles of sewer	2/2022
2	4	Updated Table 1 to reflect current staffing	2/2022
2	-	Changed the language “electronic tablet” to cell phone throughout	2/2022

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Acronyms

ADEM	Alabama Department of Environmental Management
AWPCA	Alabama Water Pollution Control Act
CCTV	Closed-circuit television
CEO	Construction Equipment Operator
CMMS	Computerized maintenance management software
CMOM	Capacity, Management, Operations, and Maintenance
CSSAP	Continuous Sewer System Assessment Program
FOG	Fats, oils, and grease
GIS	Geographic Information System
GLPMP	Gravity Line Preventative Maintenance Program
gpm	Gallons per minute
HEO	Heavy Equipment Operator
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
LF	Linear feet
MH	Manhole
NASSCO	National Association of Sewer Service Companies
NPDES	National Pollutant Discharge Elimination System
OEM	Original equipment manufacturer
OSARP	Ongoing Sewer Assessment and Rehabilitation Program
PACP	Pipeline Assessment and Certification Program
psi	Pounds per square inch
PTO	Power take-off
QA/QC	Quality assurance and quality control
SL-RAT	Sewer Line Rapid Assessment Tool
SOP	Standard operating procedure
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
TVI	Television Inspection
WRF	Water Reclamation Facility

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Gravity Line Preventative Maintenance Program

Program Activities

Purpose and Goals

The ultimate goal of the **Gravity Line Preventive Maintenance Program (GLPMP)** is to support the Jefferson County Environmental Services Department's (JCESD) ongoing compliance efforts with its National Pollutant Discharge Elimination System (NPDES) permits and the Alabama Water Pollution Control Act (AWPCA) and the Federal Clean Water Act. Under the Code of Alabama 1975 AWPCA, as amended, the WATER DIVISION – WATER QUALITY PROGRAM, Volume I, Division 335-6, Section 335-6-6-.12, Conditions Applicable to all NPDES Permits, established, among other provisions, a requirement to provide proper operation and maintenance. The provision in subparagraph (e) reads as follows:

> (e) Proper Operation and Maintenance - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities only when necessary to achieve compliance with the conditions of the permit.

By implementing a program that locates and removes roots, debris, fats, oils, and grease (FOG), and repairs damaged pipe and manholes, JCESD will maintain the capacity of its collection system; minimize system surcharges, building backups, and sanitary sewer overflows (SSOs); and ensure the sustainability of the gravity system infrastructure.

Program Components and Approach

The **GLPMP** is a compilation of activities that incorporate preventive maintenance concepts to locate and address defects in the JCESD collection system, such as pipe obstructions and defects that may lead to blockages and pipe collapses that have the potential to cause collection system surcharges, backups or SSOs. The **GLPMP** plays an important role in maintaining system capacity by outlining a framework for clearing obstructions and identifying potential condition problems requiring rehabilitation or replacement, in addition to maintaining the capacity of the sewer system and preventing overflows.

This program is designed to improve operation, efficiency, and effectiveness of the sewer system; maintain the integrity of the sewer gravity lines and manholes; and reduce or prevent sewer overflows and other performance exceptions caused by system deficiencies. GLPMP activities will also help extend the life of the gravity collection system and assist JCESD in planning for capital improvements to focus operations and capital investments in higher risk areas first.

Key components of the **GLPMP** include:

- Pipe cleaning and debris removal
- Root control
- TV inspection
- Acoustic testing to determine the degree of pipe obstruction prior to cleaning
- Manhole raising and manhole cover and lid repair and replacement
- Certain pipeline point repairs

As of February 2022, JCESD's collection system consisted of approximately 3,113 miles of gravity sewers as described in JCESD's **CMOM Program Organization** plan. JCESD maintains gravity sewers throughout its entire service area. Typically, JCESD crews clean 6-inch to 15-inch diameter sewers and inspect pipe up to 18-inch diameter. However, JCESD crews are equipped with machines that are capable of cleaning up to 36-inch diameter pipe and internally inspecting up to 24-inch diameter pipe. For larger diameter pipes or pipe segments that experience high flows or are located in densely trafficked areas, JCESD may contract out cleaning and inspection services.

The JCESD **Continuous Sewer System Assessment Program (CSSAP)**, described in the **Engineering Program** plan, is a key element of assessing the sanitary sewer collection system to identify defects that could contribute to backups and SSOs. That program, along with the **Ongoing Sewer Assessment and Rehabilitation Plan (OSARP)** will provide the justification to prioritize GLPMP efforts.

Program Resources

Related CMOM Program Documents and Other References

JCESD has developed standard operating procedures (SOPs) for sewer line maintenance and inspection that reflect industry best practice protocols adopted by the organization. These documents are designed to promote similar operation practices between crews using similar equipment, improved effectiveness, and more uniform data collection. Copies of the SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations.**

JCESD field personnel are an integral part of SOP development. SOPs are developed using a consensus-based process designed to introduce new technology and/or best practice methods by engaging operators to think through various operational issues and make recommendations on how best to accomplish them safely and effectively. Through this process, SOPs become a tool linked into the training program to hone skills of current personnel, provide a standard means to cross train personnel functions, and help formalize on-the-job training when onboarding new personnel.

Successfully engaging field personnel in this process increases safety awareness, improves operational efficiency and effectiveness, and broadens the ability to adopt new technologies. JCESD will continue to develop and refine SOPs and written work process documentation for the processes used in sewer line maintenance and inspection.

Policies and procedures observed when responding to and reporting SSOs are detailed in JCESD's **Sanitary Sewer Overflow Response and Reporting Program (SSORRP)** plan. For more information on gravity line maintenance-related safety issues, see the **Safety Program** plan.

Other CMOM Program plans that reference or are referenced in the **Gravity Line Preventive Maintenance Program** plan are as follows:

- CMOM Information Management Systems (IMS) Program
- CMOM Program Organization
- Customer Service Program
- Contingency Planning Program
- Corrosion Control Program
- Engineering Program (includes CSSAP description)
- Equipment and Supplies Program
- Fats, Oils, and Grease (FOG) Management Program
- Line Locate Program
- Maintenance of Way Program
- Pretreatment Program
- Service Connection and Disconnection Program
- Training Program

Staffing

JCESD staff assigned to various divisions are responsible for gravity sewer line maintenance, pipeline and manhole inspection, acoustic testing, manhole raising, and some pipe point repairs, as follows:

- Chief Civil Engineers assigned to Division 7100 administer the Line Maintenance and Construction activities.
- Day-to-day operations of the Line Maintenance crews are led by the Sewer Maintenance Supervisor in Division 7250.
- Day-to-day operations of the Construction crews are led by the Sewer Construction/Maintenance Supervisor in Division 7230.
- Gravity line preventive maintenance work is performed by staff in Division 7252 Village Line Maintenance, 7253 Shades Line Maintenance, and Division 7270 TV Inspection.

For more information on the divisions involved with the **GLPMP** initiatives, see the Organizational Charts provided in the **CMOM Program Organization** plan.

Staff positions within Line Maintenance and Construction are shown in **Table 1**.

Table 1. Line Maintenance and Construction Positions

Line Maintenance	Construction
Chief Civil Engineer (Division 7100)	Chief Civil Engineer (Division 7100)
Sewer Maintenance Superintendent	Sewer Construction Maintenance Supervisor
Sewer Maintenance/Construction Supervisor	Administrative Clerk
Administrative Clerk	Construction Supervisor
Planner/Scheduler	Construction Equipment Operator
Communications Operator III	Heavy Equipment Operator
Communications Operator II	Bridge Maintenance Worker
Principal Engineering Inspector	Truck Driver
Sewer Service Inspector	Skilled Laborer
Public Works Supervisor	Laborer III
Construction Equipment Operator (CEO)	Laborer II
Heavy Equipment Operator (HEO)	
Sewer Video Operations Supervisor	
Video Equipment Technician	
Sewer Line Video Supervisor	
Sewer Line Video Specialist	
Skilled Laborer	
Labor Supervisor	
Laborer III	
Laborer II	

Line Maintenance and Construction crews operate five days a week in eight-hour shifts. If required, work is completed after regular business hours or during weekends using overtime.

Line Maintenance and Construction staff are located in separate facilities to provide a high level of coverage and Department management within the County. The JCESD administrative offices (Division 7100) are located in the Jefferson County Courthouse, 716 Richard Arrington Jr. Blvd North, Birmingham. The administrative functions for JCESD are performed in this office, which houses the Deputy Directors and Chief Engineers responsible for the Line Maintenance and Construction Divisions.

Line Maintenance and Construction personnel are located at two facilities, the Shades Valley Complex (Oak Grove Road, Birmingham, AL 35209) and the Village Creek Water Reclamation Facility (WRF) Facility (Pleasant Hill Road, Birmingham, AL 35244).

Shades Valley Complex

The Line Maintenance Division Administration personnel (Division 7250) are located at the Shades Valley Complex (1295 Oak Grove Road). This group is responsible for oversight of the Village Line Maintenance and Shades Line Maintenance field activities, Television Inspection (TVI), Call Center and Dispatch staff and operation, and SSO reporting and tracking.

As a general rule, Shades Line Maintenance personnel (Division 7253, 1299 Oak Grove Road) are responsible for pipe cleaning, service request response, manhole cover/frame maintenance, and backup and SSO response for the southern and eastern portions of the JCESD service area.

The Shades Line Maintenance yard includes a dedicated building with offices for the field Supervisor and staff. Hydraulic cleaners and portable equipment can be stored in a large garage area closed to the weather. A workshop area is provided for light repairs and tool adjustments. Secured inventory storage is maintained to support daily operations. A large yard area provides storage for equipment infrequently used and materials inventory to support manhole frame and cover adjustment and replacement work.

Personnel assigned to TVI (Division 7270, 1296 Oak Grove Road) are also located at the Shades Valley Complex, and are responsible for all CCTV inspection operations, including scheduled pipe inspection and associated pipe cleaning, support for other departments, contractor support, service connection location, and SSO investigations throughout the service area.

TVI personnel are housed in a dedicated building with offices for the Sewer Video Operations Supervisor and field staff. CCTV inspection vans and hydraulic cleaners assigned to TVI can be stored in a large garage area closed to the weather. A workshop area is provided for light repairs and tool adjustments. Secured tool inventory storage to support daily activity is maintained. A secured inventory of critical parts to support camera inspection equipment and a CCTV Technician is located in the building performing this work in-house when possible.

A storage/parking area is maintained for dump trucks, heavy equipment, and trailers used in construction operations. A large covered area has been constructed to provide protected storage of consumable construction materials, pipe inventory, bypass pumps and hose, trench boxes, and prefabricated manhole components.

Village Creek Facility

Line Maintenance and Construction staff are located at the Village Creek facility and work out of separate yards. As a general rule, Village Line Maintenance (Division 7252, 1474 Pleasant Hill Road) personnel are responsible for pipe maintenance, manhole frame and cover repairs, and backup and SSO response for the northern and western portions of the Jefferson County collection system. Construction (Division 7230, 1470 Pleasant Hill Road) personnel are responsible for performing certain high priority pipe repairs.

The Village Line Maintenance yard includes two dedicated buildings with offices for the field Supervisor and staff. Hydraulic cleaners and portable equipment can be stored in a large garage area closed to the weather. A workshop area is provided for light repairs and tool adjustments. Secured inventory storage to support daily operations is maintained. A yard area adjacent to the garage provides storage for equipment and a storage container is used to secure materials needed for manhole frame and cover adjustment and replacement work.

The Construction yard includes two dedicated buildings with offices for the field Sewer/Construction Maintenance Supervisor, administrative clerk, and field staff. Response service trucks and portable equipment are housed in a large garage closed to the weather. A workshop area is provided for light repairs and tool adjustments. Secured inventory to support operations are maintained in the two buildings.

A storage/parking area is maintained for dump trucks, heavy equipment, and trailers

used in construction operations. A large covered area has been constructed to provide protected storage of consumable construction materials, pipe inventory, bypass pumps and hose, trench boxes, and prefabricated manhole components. Data Management

Mapping

Mapping information from the County's geographic information system (GIS) is available to field crews through cellular phones which connect to the County server, are easy to setup and manage, and function exactly like a PC, running enterprise software and standard Windows® desktop applications.

The GIS mapping application shows the components of the collection system that include:

- Sewer main, trunk and interceptor pipes
- Manhole and cleanout locations
- Pressure pipe and related pump stations
- Streets, property lines, and service area boundaries

GIS mapping is used extensively by field crews in locating manholes and system components in poor light or weather conditions and to confirm the pipe and manhole ID numbers for reporting purposes. For more information on collection system mapping and GIS, see the JCESD **Engineering Program** plan.

Computerized Maintenance Management System (CMMS)

Service requests are created when the Call Center receives calls from customers requesting service, or from other JCESD work groups requiring assistance. Service requests are transferred to a crew through Dispatch and are responded to appropriately. When work results from a service request, a work order is created to document the work and the service request number is attached for tracking.

Work orders are completed by field crews and electronically transferred to Dispatch. Dispatchers review each work order for accuracy, enter the appropriate data into JCESD's CMMS, and close out the work order. JCESD utilizes Cityworks asset management/work order management system to generate and track work orders and service request assignments.

JCESD crews are assigned smart phones to create work orders and record data from field activities. Sewer cleaning data captures the sub-basin number, the upstream and downstream manhole, and pipe asset ID number of pipes cleaned. A standardized cleaning form, which documents the type and estimated amount of material removed during cleaning has been developed.

For more information on service requests, see the JCESD **Customer Service Program**, and for more information on work orders, see the **CMOM IMS Program**.

Training

Best practice ideology for pipe cleaning has changed considerably over the past several years and now utilizes more advanced technology and formalized protocols. Best practice protocols will continue to drive the need for higher end technology in equipment, tooling, and data capture and management.

JCESD has developed a long-term operator training program to provide the necessary level of training for onboarding new personnel and keeping existing personnel current as new practices and technology are adopted. JCESD's Operator Training program provides training in individual and group settings on a variety of topics including, but not limited to, the following:

- SSORRP and emergency response
- Environmental awareness
- Traffic safety
- Safety and situational awareness
- Jobsite logistics
- Data and record keeping
- Assessing cleaning findings
- Manhole inspection
- Proper tool use protocols
- Equipment operation and maintenance
- Bypass pumping
- Inventory management and control
- SOP evaluation and development

JCESD has identified mandatory and recurrent training needs of personnel in the organization and provides recurring safety and pipeline assessment training opportunities for field personnel. For more information, see the **Training Program** plan.

Operator Certification

Certification for collection system operators in Alabama is available through the Alabama Department of Environmental Management (ADEM). JCESD understands that certification is a feature of best practice organizations that provide a higher level of training and competency for field personnel and supervisory staff. JCESD provides opportunities for personnel to become certified in the State certification program.

Safety

JCESD considers safety to be a top priority in field operations and continually makes improvements to field safety equipment and standards. Field supervisors conduct routine field crew visits to observe the jobsite and discuss and/or correct any safety concerns. JCESD has initiated several safety related programs and processes to better ensure personnel are protected and have the necessary equipment to perform their work safely and effectively. Among the programs that have been put in place are:

- Standardization of traffic management devices and deployment, creating a much higher visibility on roadways for construction and line maintenance operations
- Provisions for a steel toed shoe annual allowance for all field personnel that encourages routine replacement of footwear
- Use of trenching and shoring equipment on all construction jobsites, regardless of estimated depth, to increase trench safety
- Standardization of work practices in line maintenance, which improves safety awareness

JCESD is developing a safety plan and related program for its field and supervisory personnel. For more information, see the **Safety Program** plan.

Equipment

JCESD maintains a fleet of vehicles specifically used for line maintenance, including:

- Single function high velocity flushing machines (known as "jet wash trucks")
- Combined function high velocity flushing/vacuum machines (known as "combination cleaners" or "combo trucks")
- Easement cleaning machine designed specifically for off-road pipe cleaning
- Vans equipped with closed circuit television (CCTV) inspection equipment (known as TVI vans)
- Combined use flatbed trucks that carry hand rodding equipment, and tools and materials used for manhole raising
- Trailer mounted power rodding machine for both on-street and off-road pipe cleaning

Table 2 lists the JCESD maintenance groups and the types of equipment that is used by each group.

Table 2. Type of Collection System Maintenance Equipment Used by Line Maintenance Groups

Group	Jet Wash Trucks	Combo Trucks	TVI Vans	Rod Trucks	ROW Clearing Equipment	Manhole Trucks
7252 Village Line Maintenance	X			X		X
7253 Shades Line Maintenance	X	X		X	X	
7270 Sewer Video Operations	X		X			

In addition, Line Maintenance and TVI utilize pickup trucks, all-terrain vehicles and a variety of small equipment for specialized use (i.e., bypass pumping, easement access). For more information, see the JCESD **Equipment and Supplies Management Program.**

Hydraulic Cleaning Equipment

Hydraulic cleaning refers to the use of water under pressure to operate nozzles that deliver a powerful jet spray or can turn rotating tools in the pipe to scour sedimentary debris and FOG, as well as cut roots from pipes. Vacuum cleaning refers to the use of air conveyance systems that draw air through a long induction tube designed to lift sand, gravel, rock, grit, sludge, or slurry from pipes or large underground structures.

JCESD's jet wash and combo trucks are typically equipped with a 1,500-gallon water tank for the flushing system and approximately 600 feet of 1-inch diameter sewer cleaning hose on a powered, articulating reel. The pump is powered by a chassis power take-off (PTO) system, generating between 65 gallons per minute (gpm) at 2,000 pounds per square inch (psi) to 80 gpm at 2,500 psi, depending on the truck.

Figure 1 shows a jet wash truck staffed by a crew of two: a HEO, Heavy Equipment Operator, and a Skilled Laborer. The jet wash truck has the capability to clean 6-inch diameter to 30-inch diameter pipe; however, most routine cleaning is performed in 6-inch to 12-inch diameter pipe. Jet wash trucks are used primarily for scheduled routine maintenance throughout the JCESD service area.

Figure 1. JCESD Jet Wash Truck

This equipment is also used when responding to customer service requests generated through the Call Center and Dispatch staff and responds to Supervisor support requests. This equipment is frequently used when crews respond to SSO reports and blockage-related service requests.

Figure 2 shows a combo truck staffed by a crew of two: a CEO and a Skilled Laborer. This equipment is equipped with water flushing and vacuum systems. The water flushing system has the capability of cleaning 6-inches to 30-inch diameter pipes. The vacuum system has debris storage capacity of seven cubic yards. Debris removed with the vacuum system is offloaded at the Five Mile Creek WRF.

Figure 2. JCESD Combo Truck

This equipment is primarily used when debris removal is anticipated. Most work performed with this equipment is scheduled siphon cleaning, pump station wet well cleaning and providing support during WRF tank cleaning. Combo trucks may also be used when responding to SSO and blockage-related service requests.

JCESD utilizes an easement cleaning machine for off-road use. The easement machine is self-propelled on tracks, allowing it to maneuver over rough terrain. The machine is equipped with approximately 600 feet of 1-inch diameter sewer cleaning hose on a powered hose reel, which is controlled by the operator. A jet wash or combo truck connects a sewer cleaning hose to the easement machine to deliver water at desired pressures for the intended pipe cleaning work.

Figure 3 shows the easement machine staffed by a crew of two: a CEO and a Skilled Laborer. The easement machine has the capability to clean 6-inch diameter to 24-inch diameter pipe; however, most routine cleaning is performed in 6-inch to 12-inch diameter pipe. The easement machine is used primarily for scheduled routine maintenance in difficult access pipes throughout the JCESD service area.

Figure 3. JCESD Jet Wash Truck and Easement Machine

JCESD field crews are responsible for light maintenance of the hydraulic cleaners, in accordance with the original equipment manufacturer (OEM) recommendations and JCESD SOPs. Light (field) maintenance includes routine checks/cleaning of water tank strainers, greasing bearings and components on the cleaning equipment in accordance with OEM intervals, equipment and chassis fluid checks, and notifying the Supervisor if the equipment or chassis has mechanical issues.

The Jefferson County Fleet Management Division performs all chassis maintenance on a scheduled basis, and performs repair work as needed by the equipment. Cleaning equipment maintenance requiring specialized tools or significant time to complete may also be done by the Fleet Management Division or referred to a local dealer as necessary. For more information, see the **Equipment and Supplies Management Program**.

Mechanical Cleaning Equipment

Mechanical cleaning refers to the use of a series of mechanically connected metal rods, that are turned by hand or machine to rotate tools designed to cut and remove roots and other materials from pipes. This equipment is used primarily for responding to customer service requests. It is also used to clean pipes located in areas where jet wash or combo trucks cannot easily access.

Figure 4 shows a Rod Truck. These trucks are staffed with and carry a crew of four: a Labor Supervisor, two skilled laborers, and a Laborer III. Hand rodding equipment is capable of cleaning 6-inch to 12-inch diameter pipe, with most routine work performed in 6-inch to 8-inch pipe. Hand rodding equipment on these trucks includes a rod reel holding approximately 350 feet of connected sectional steel rod, assorted tools, and a rod turning machine (gas powered) to use in pipes when hand turning cannot be used.

Figure 4. JCESD Rod Truck

Rodding utilizes tools designed for specific material removal mounted on a string of mechanically connected steel rods. The rods are fed into the sewer pipe and are pushed, pulled, or turned by hand whenever possible. If the material is heavy, or the pipe condition reduces the ability of personnel to turn the rod by hand, a gasoline powered Rod Turning Machine is used. Special tools can cut and remove roots, FOG, and stubborn materials, such as rags and non-woven fabric (disposable wipes), that do not break down in wastewater. This equipment can be very effective in blockage relief.

In addition to performing hand rod cleaning and service request response, flatbed trucks are outfitted with the tools and materials necessary to perform manhole frame and cover adjustment/replacement on a scheduled basis, at the direction of the Sewer Service Inspector.

During warm months, some rod trucks are outfitted with mowing and weed maintenance equipment to perform scheduled junction box mowing and other services to augment easement maintenance operations.

Figure 5 shows a trailer mounted power rodding machine. Typically, this machine is staffed with a crew of two, either a CEO or Labor Supervisor, and Skilled Laborer. This machine is capable of cleaning 6-inch to 12-inch diameter pipe, with most routine work performed in 6-inch to 8-inch pipe. The machine holds approximately 500 feet of connected sectional steel rod, and carries assorted tools designed for pipe cleaning.

Figure 5. Trailer Mounted Power Rodding Machine

JCESD crews assigned to these trucks and equipment have various associated responsibilities: light maintenance of rod-turning machine, mowing equipment, and power rodding machine, replenishment of materials and fuel used the previous day, and taking an inventory of equipment. Jefferson County Fleet Management Division performs all chassis maintenance on a scheduled basis and performs repair work as necessary. For more information, see the JCESD **Equipment and Supplies Management Program**.

TV Inspection Equipment

Figure 6 shows a TVI van staffed with a crew of two, a Video Supervisor, and a Video Specialist. This equipment has the capability to inspect 6-Inch to 24-Inch diameter pipe. The TVI van houses camera inspection equipment and operation systems in the rear of the van, and is equipped with an operator cabin that houses a computer, printer, and other items.

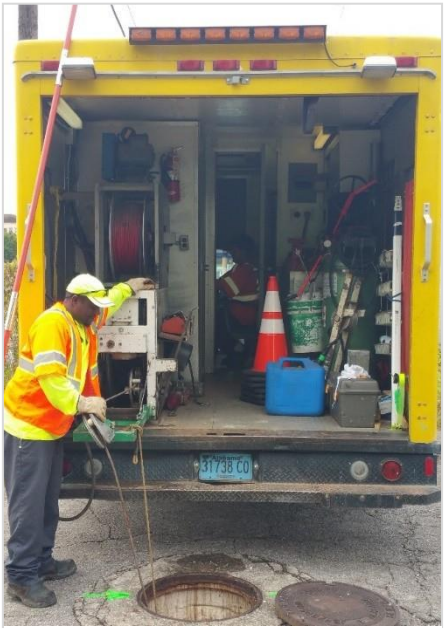

Figure 6. TVI Van

JCESD has standardized equipment and tools on board the TVI vans. The CCTV camera is equipped with pan/tilt capabilities, mounted on a wheeled transporter that can be adjusted for different pipe sizes, allowing the operator in the TVI van to remotely maneuver the camera transporter and/or rotate the camera lens to view and capture desired imagery for accurate determination and coding of a given defect or problem. An on-board computer system provides real-time defects coding to be captured during the inspection, and can be used to generate a

report and electronically transfer the data. For additional information on the inventory carried on the TVI Vans, see the **Equipment and Supplies Management Program**.

JCESD TVI crews are responsible for routine field maintenance of the camera system components, in accordance with the OEM recommendations and JCESD SOPs. Light field maintenance includes routine checks of the cable and connections, greasing of camera system components, cleaning the camera and transporter between each use and at the end of the day, and notifying the Supervisor if the equipment or chassis has mechanical issues.

Jefferson County Fleet Management Division performs all chassis maintenance and repair work. Some camera and camera system component service work is done in-house by the CCTV Technician, or it is shipped to the OEM for service when necessary. For more information, see the JCESD **Equipment and Supplies Management Program**.

Tools

Each cleaning and inspection vehicle is supplied with an array of tools required to do the assigned tasks. For a complete listing of tools and supplies carried on each maintenance vehicle, see the **Equipment and Supplies Management Program** plan.

In keeping with industry best practice, JCESD standardized the tool inventories used on like equipment and adopted new technologies to improve the pipe cleaning and point repair activities. The standardization process was done through an extensive evaluation and assessment process conducted by field staff. JCESD personnel performed an integral role in the equipment standardization process, similar to the SOP development process. Tools carried into the field were assessed, and a determination was made on what tools would be in the standard inventory and what tools and equipment would be available at each jobsite.

JCESD initiated the standardization process with the evaluation of cleaning nozzles and functions to improve the effectiveness of pipe cleaning. Nozzle technology improvements over recent years have introduced designs that have expanded the effectiveness of hydraulic cleaners in difficult cleaning applications. Engineered nozzle technology provides a wide selection of nozzles with different water jet patterns and spinning tools having very specific functions.

An assessment of cleaning issues that were being insufficiently met with existing nozzles was performed, which included:

- Root removal
- Hardened FOG deposits and other caked material removal
- Sag pipe hardened debris removal

An evaluation of different nozzle technology was made using TVI support, and nozzles with the greatest impact on these issues were issued to crews. Instead of having only one or two different nozzles, or many similar nozzles on each truck, the nozzle “Kit” was reduced to five different nozzles, each with specific cleaning functions. Training on these functions included a change in nozzle cleaning speeds in

the pipe to a much slower rate. Subsequent CCTV inspections in pipes known to have the cited issues were performed on a random basis to verify the effectiveness of the new technology and operation procedures. Subsequently, the nozzles were added to the standard inventory and SOPs changed to reflect the new use protocols.

Inventory standardization enables any operator to use any truck from any yard to perform cleaning and/or response duties efficiently and effectively using the same tools system wide. Tool inventory is managed at each facility using a minimum/maximum supply spreadsheet, allowing facility managers to assess what inventory items have a predictable consumption so that ordering can become more automated and is adjustable for items easily obtained or require long lead time to receive.

For additional information on the standardized inventory, see the **Equipment and Supplies Management Program** plan**.**

Program Implementation

Each year, JCESD's goal is to clean a certain percentage of its sewer collection system through the GLPMP. JCESD has implemented a structured cleaning program to improve its collection system's performance by reducing the number of SSOs and spills. A structured cleaning program centers around using data to determine which pipes need cleaning, and at what time and frequency in order to maximize cost-effectiveness. This allows ESD to clean more pipes on a preventive/predictive basis as opposed to a reactive basis (after an issue has already occurred.) Some pipe sections require a higher cleaning frequency than others due to pipe history, root cause analysis of SSOs and blockages, and routine television inspection.

Gravity Sewer Inspection and Assessment

The JCESD **CSSAP**, as described in the **Engineering Program** plan, defines the implementation of an ongoing inspection and assessment program to identify defects in the system that scores and prioritizes system maintenance needs. The **GLPMP** consists of ongoing cleaning and assessment efforts, as well as high frequency cleaning in areas that are more prone to accumulation of roots, FOG, and debris that may contribute to SSOs and backups.

Elements used to determine focus areas of the **GLPMP** include:

- Sewer pipe CCTV inspection
- Manhole inspection
- Small diameter gravity sanitary sewer acoustic inspection

The ongoing assessment of the gravity system is of ultimate importance for identifying preventive maintenance needs in the system. This is performed by pipe and manhole inspections to assess conditions of the conveyance system. These procedures are further defined in the **CSSAP**.

CCTV Pipe Inspection

The evaluation of detailed CCTV inspection data will further define pipeline defects so that maintenance or rehabilitation work can be appropriately prioritized for the collection system. The use of TVI assessment data is further described in the **CSSAP**.

CCTV inspection defect coding is standardized. Operators are trained in the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) coding system to standardize coding entries between operators and to support repair/rehabilitation/ replacement priority evaluation. Procedures for CCTV inspection are defined in the "CCTV Sewer Inspection Practices and NASSCO PACP Coding - Inside CCTV Van" and "CCTV Operational Practices Outside the Van" SOPs maintained in the **JCESD Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

The Video Operations Supervisor schedules inspections based on the following priorities:

- Service requests for service connection locates due to service interruption
- SSO investigation
- Engineering support inspection
- Construction/contractor support locating/marking pipes requiring point repair
- Lateral locates for non-emergency use
- Pipe condition assessments of County pipes having no recent (10 years) record of inspection

TVI crews create work orders for each inspection during the day and generate a report of the inspection. During inspections, defects are coded as they are encountered. If materials in the pipe prevent the camera from continuing, have a potential to hide defects, or if standing water in sags has to be lowered, a wash truck is called in to clean and/or dewater the pipe. Typically, an inspection is completed from manhole to manhole, even in instances where a specific repair location is all that is necessary. If an inspection cannot be completed from upstream, efforts are made to complete the inspection of the balance of the pipe from the downstream manhole.

TVI crews provide investigation inspections for SSO and backup events. For information on SSO response, see the JCESD **SSORRP**.

Inspection data and work orders are collected by the Supervisor at the end of the shift and recorded in a spreadsheet to update the pipe condition assessment map. Inspection data is forwarded to the Inspection Division where pipe defects are reviewed and appropriate repair/rehabilitation/replacement work is assigned to the Construction Division or to outside contractors. Work orders are forwarded to Dispatch for review, entry into the CMMS, and closing.

Acoustic Inspection

JCESD owns sixacoustic inspection equipment (InfoSense's Sewer Line Rapid Assessment Tool or SL-RAT) to inspect pipes, determine pipe blockages and perform sewer cleaning in order to reduce backups and SSOs.

The SL-RAT tool exploits the similarities and differences between water and sound transmission through a pipe segment to assess obstructions within a pipe. As shown in **Figure 7**, an acoustic transmitter and receiver are placed within manholes (above the water surface), and the low frequency sound waves generated at the transmitter propagate from the speaker to the receiving microphone located at the adjacent manhole.

Figure 7. SL-RAT Concept and Operational Procedure

In a clean pipe segment, the acoustic waves propagate naturally. Commonly encountered sanitary sewer defects such as roots, grease, and sags with absorb or reflect acoustic energy. These defects change a pipe segment's acoustic properties and produce a measurable impact on the received signal. The signal represents the pipe segment's acoustic profile: this profile changes over time as the conditions within the pipe segment change. The acoustic profile is evaluated to obtain two assessment criteria: SL-RAT Blockage Assessment and SL-RAT Measurement Confidence. These criteria are used to classify the sewer segment's condition on a numeric scale (1 to 10), where 1 is fully obstructed and 10 is unobstructed.

The objective of the SL-RAT Acoustic Inspection Program is to assess the aggregate obstruction within a 6- to 12-inch diameter gravity sewer pipe segment (baseline), and to use the baseline and subsequent test data to define the progression of partial-to-complete obstruction within a pipe segment over time.

Appropriate goals for an SL-RAT Acoustic Inspection Program involve using the valuable information to enhance cleaning operations in many ways, including, but not limited to, aiding with the following determinations:

- Whether a sewer pipe scheduled for cleaning actually needs to be cleaned
- Whether an assigned sewer cleaning work order was performed effectively
- Whether the condition of sewer pipe scheduled to be internally re-inspected has changed over time, and whether the sewer pipe should be re-inspected
- Whether FOG prevention measures undertaken by a specific sewer user are effective

The SL-RAT is a predictive maintenance tool that contributes to the development of a results-based cleaning program. Pipes showing a low numerical score will be cleaned and another inspection made to secure the acoustic footprint of the pipe for future use and comparison. Currently there are 2-3 crews (3 members per crew) performing acoustic inspections. JCESD uses the inspection datato assist in pipe cleaning frequency adjustments.

For more information on the application of this tool, see the JCESD **Engineering Program** plan.

Pipe Cleaning

As stated previously, JCESD crews are equipped to clean gravity sewer pipe that is 6- to 36-inch in diameter. This section describes how pipe cleaning activities are scheduled, performed, assessed, and recorded.

Scheduling

Cleaning crews perform routine scheduled cleaning from assigned lists of prioritized pipes generated from the **CSSAP**. For more information on the **CSSAP**, see the **Engineering Program** plan.

As pipe conditions can change over time due to repairs/rehabilitation, FOG discharge compliance upstream, and other circumstances, JCESD records the quantity and type of material removed from a specific pipe segment during the cleaning process in their cleaning work orders in Cityworks. This cleaning debris quantification process is useful in determining if assigned cleaning frequencies of specific pipes are appropriate.

To facilitate this process, JCESD crews use debris traps (see **Figure 8**) to capture material removed from pipes during cleaning for assessment.

Figure 8. Debris Trap Used to Capture Material During Pipe

JCESD has implemented a process and data management tool to optimize the sanitary sewer cleaning frequency for each pipe in the system so as to not clean too often, and not clean it too little. The ultimate goal is to reduce SSOs and comply with the Consent Decree. Preventative pipe cleaning intervals can range from 1-month to 24-month intervals. The planner/scheduler packages the cleaning work order bundles and assigns them to crews to finish the work within its cleaning window. Additional or unscheduled cleaning work during the shift may be assigned via Service Requests from the Call Center and Dispatch staff, or Supervisor direction in support of TVI or other Divisions.

The determination of how often a specific pipe segment should be cleaned (referred to as a "cleaning frequency") was made by one or more of the following methods:

- Performing an assessment of the historical performance of a pipe (complaints, field reports, or history of SSO or blockages)
- Identifying the root cause of a sewer surcharge as part of SSO investigations to be a pipe obstruction such as FOG build up, root intrusion, or debris deposition
- Observing FOG, roots, and debris deposition in manholes that is likely originating from upstream of the structure

- Assessing CCTV inspection data that indicates FOG build up, root intrusion, or debris deposits
- Acoustic inspection screening that indicates obstructions within a specific pipe segment
- Characterization and quantification of materials removed from pipes during cleaning

The cleaning frequency optimization tool processes CCTV data, acoustic inspection data and sewer cleaning data and automatically recommends changes to the cleaning frequency. The planner/scheduler can accept or reject the changes as they deem appropriate.

Quantifying materials removed during cleaning is an effective way to assess if cleaning frequency is too high, low, or properly set. JCESD has developed a Cleaning Findings Scale to characterize what is found during the cleaning process. Materials removed from the pipe during cleaning are trapped at the downstream manhole, removed, assessed for type and amount using the scale, recorded, and the material disposed.

For more information on use of debris traps and cleaning findings, see the hydraulic and mechanical cleaning SOPs and the Cleaning Findings Scale provided in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Changes will be made to cleaning frequencies based on the number of cleanings that record amounts lower or higher than anticipated. For example, one finding of "heavy" will advance a pipe cleaning to the next higher frequency. Multiple findings of "clear" or "light" will push a pipe cleaning to the next longer frequency. This process is designed to slowly move pipes into the best frequency, as determined by findings, without undue risk of service interruption.

JCESD will use cleaning findings data to make cleaning frequency adjustments to pipes on the preventive maintenance schedule.

Unimproved Easement Access

Cleaning pipes in unimproved easements poses two distinct challenges: access to manholes and the type of equipment that can be used to clean pipe. Currently, there is an easement clearing crew that uses specialized equipment to clear easements for manhole access. For more information on easement clearing activities, see the JCESD **Maintenance of Way Program** plan.

Hydraulic Cleaning

Hydraulic cleaning represents the majority of preventive maintenance pipe cleaning performed in the JCESD collection system. Standard procedures for hydraulic cleaning are further defined in the Wash Truck, Combination Truck, and Easement Machine SOPs maintained in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

Hydraulic cleaners also respond to SSO and blockage calls. For information on processes for SSO response, see the JCESD **SSORRP**.

Mechanical Cleaning

As described previously, mechanical cleaning is used for assigned preventive maintenance cleaning work, service request response, root removal in pipes that are difficult for hydraulic cleaning equipment to access, and SSO and blockage response. Mechanical cleaning is scheduled based on priority and areas

of concern. Routine mechanical cleaning will be completed in conjunction with acoustic inspection prior to and after cleaning activities and CCTV inspections.

Procedures for mechanical cleaning are further defined in the Hand Rodding and Rod Turning Machine Pipe Cleaning and Power Rodding Machine Operation SOPs maintained in the JCESD **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations** manual.

For information on the use of mechanical cleaning equipment (rod turning machines, hand rods, and power rodding machine) to remove blockages and respond to sewer surcharges and SSOs, see the JCESD **SSORRP.**

Pipe Cleaning Quality Assurance/Quality Control (QA/QC)

QA/QC CCTV inspections are currently performed on a random basis, following pipe cleaning activities, to assess cleaning operations. JCESD will continue to monitor cleaning work and tool effectiveness with this process. The SL-RAT tool used to develop acoustic footprints of specific pipes will also be used for QA/QC purposes to assess the performance of cleaning crews.

Root Control Program

The goal of JCESD's root control program is to limit root intrusion sufficiently to prevent significant capacity reductions and SSOs. Root intrusion is a significant cause of SSOs and backups in sanitary sewer systems. Roots can also serve as a ballast for debris and FOG to accumulate, thus accelerating the development of system backups and SSOs. Root intrusion typically occurs in the gravity sewer line through pipe joints and cracks in pipes, from root growth in service laterals that impact mainline sewer pipes, and from manhole structures. Roots eventually accumulate or collect debris and FOG to restrict flow and cause SSOs and backups.

JCESD will continue to use hydraulic and mechanical cleaning in pipes subject to root intrusion. A chemical root control plan has been implemented using outside contractors. On an average, approximately 650,000 LF of pipes is contracted out each year for new root treatment or re-treatment.

Manhole Raising and Repairs

The Manhole Raising Crew is responsible for raising manholes to grade, replacing broken manhole frames and covers, and addressing "rattling" manhole covers. All rod truck crews are outfitted with similar tools and materials to perform this work also. This work may result from the investigation of a Service Request or a request from another JCESD Division or County Department. For more information, see the JCESD **Maintenance of Way Program** plan.

Sewer Point Repairs

JCESD's Construction Division personnel generally perform point repair work on gravity sewers less than or equal to 16-inch diameter. The Chief Civil Engineer and/or the Sewer Construction/Maintenance Supervisor determine which point repairs will be attempted with in-house crews.

Currently, the approximate depth to which the Division repairs pipe defects is 12 feet, and it is assumed that all work assigned can be completed within one working day. Generally, repairs on pipe greater than 16 feet deep are performed by contractors. Additionally, shallow excavation work that is complicated

(e.g., extensive traffic control requirements, close proximity to critical buried utilities, expensive landscaping restoration) is also performed by contractors.

Construction crews perform assigned repair work based on a priority list generated by Construction Inspection personnel, and provide support for other divisions and departments in the County. Requests for repair notifications are received from the Inspection Division, resulting from defects found during CCTV pipe inspections. The Inspection Division provides detailed information on the priority (high to low), pipe type, diameter, location, and extent of the defect, along with appropriate supporting information such as inspection reports and video images. On occasion, the Division receives notifications from other parties, such as contractors, Line Maintenance Division, Pump Station Division, the Surveying Division, and senior management.

Requests for repair notifications are logged and a file is created for the repair work. The Sewer Construction/Maintenance Supervisor determines the severity/importance of the remaining (non-immediate attention) high-priority repairs.

The Sewer Construction/Maintenance Supervisor or an appointed field supervisor typically makes a site visit 48 hours prior to the scheduled start of the job. Site conditions are noted, and reference points are marked for the One Call utility locating service. An estimation of the materials, equipment, and personnel necessary for the job is made at that time and material is ordered, if needed.

If work will impact private property owners, the Sewer Construction/Maintenance Supervisor or an appointed field supervisor will contact the owner to discuss the impact, mitigation, and restoration plans. Door hangers may be used when property owners are not reached during the day. Property owners who may be impacted by equipment are contacted at the start of the job and given the opportunity to move vehicles or perform other tasks.

Worksite practices include the use of traffic management devices, flaggers, and/or detours, based on conditions. Excavation is typically performed using a backhoe or excavator, depending on need. Hand excavation is performed in areas where power equipment cannot be used. Trench boxes and/or shoring equipment are onsite and appropriately used. Excavation spoil is removed and offloaded at the Village Creek WRF facility grounds. On completion of the job, street and/or property restoration work is performed.

A notification of completion is sent to the Chief Civil Engineer, Line Maintenance Division, and Inspection Division. The Sewer Maintenance Superintendent or Sewer Construction/Maintenance Supervisor for the Line Maintenance Division orders the pipe section to be cleaned so no debris from the repair work remains in the pipe. Most pipe sections are then televised.

For more information on JCESD's sewer assessment, defect identification, and sewer rehabilitation and repair prioritization, see the **Engineering Program** plan.

Smoke Testing

JCESD has equipment used to generate a harmless, odorless smoke to find sources of extraneous water entry in the system through damaged pipe and service connections, discover source of odors in response to customer complaints, confirm sewer connections, and use connection data against billing records. JCESD will continue to utilize this equipment to investigate these issues in the service area.

Program Performance Measures

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enable JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

Principal elements of the sewer maintenance monitoring program are:

- Maintain relevant records and other information necessary to establish and prioritize maintenance program activities
- Monitor implementation of the Gravity Line Preventative Maintenance Program
- Measure the effectiveness of the various preventative maintenance elements, as well as overall program success
- Continue measuring SSO trends, including frequency, location, and volume
- Update program elements, as appropriate, based on monitoring and performance evaluations

The indicators that JCESD uses to measure the performance of its wastewater collection system and effectiveness of the **GLPMP** are listed in **Table 3** on the following page.

Program Updates

The JCESD **GLPMP** will be updated whenever required, based on the performance indicators and the results achieved, but at a minimum of every 5 years. Updates will include any major program changes, such as new maintenance methods being adopted, that would need to be documented and circulated to Sewer Maintenance Division staff. It is the intent of JCESD to continuously improve gravity sewer maintenance, which will require periodic updates to the **GLPMP**.

Table 3. GLPMP Performance Indicators

Performance Measure	Formula	Definition	Data Interval
Cleaning			
Linear feet (LF) of line rodded	LF	Length of pipe cleaned mechanically with rodding equipment	Monthly
Line washed	LF	Length of pipe cleaned with hydraulic cleaners	Monthly
Manholes (MH) Pumped Out	Value	Number of MH cleaned with hydraulic cleaners	Monthly
Siphons Cleaned	Value	Number of siphons cleaned with hydraulic cleaners	Monthly
WRF	Value	Number of WRF tanks cleaned with hydraulic cleaners	Monthly
Wet Wells	Value	Number of pump station wet wells cleaned with hydraulic cleaners	Monthly
Gallons Pumped	Gallons	Volume of water pumped for hydraulic cleaning purposes	Monthly
Blockage-related SSOs	Value	Number of dry-weather SSOs that are blockage-related	Monthly
Smoke Testing			
LF of Lines Smoked	LF	Length of pipe investigated using smoke testing methods	Monthly
Acoustic Inspection			
LF SL-Rat Inspection	LF	Length of pipe investigated using SL-RAT acoustic inspection methods	Monthly
Video Inspection			
LF of Line Inspected	LF	Length of pipe inspected using CCTV cameras	Monthly
Equipment			
# of Jet Washers	Value	Number of jet washers owned, operated, and maintained by JCESD	Monthly
# of Non-Operational Jet Washers	Value	Number of jet washers owned by JCESD that are not operational and in need of maintenance and/or repair	Monthly
# of Combos	Value	Number of combo trucks owned, operated, and maintained by JCESD	Monthly
# of Non-Operational Combos	Value	Number of combo trucks owned by JCESD that are not operational and in need of maintenance and/or repair	Monthly
# of Rod Trucks	Value	Number of rod trucks owned, operated, and maintained by JCESD	Monthly
# of Non-Operational Rod Trucks	Value	Number of rod trucks owned by JCESD that are not operational and in need of maintenance and/or repair	Monthly
# of TVI Vans	Value	Number of TVI vans owned, operated, and maintained by JCESD	Monthly
# of Non-Operational TVI Vans	Value	Number of TVI vans owned by JCESD that are not operational and in need of maintenance and/or repair	Monthly

Maintenance of Way Program

FINAL

February 2022

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Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	1	Update crew job classifications	11/17/18
1	4	Update street paving notification text	5/16/18

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Acronyms

CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
GIS	Geographic information system
JCESD	Jefferson County Environmental Services Department
ROW	Right-of-way
SOP	Standard operating procedure

Maintenance of Way Program

Program Overview

The Jefferson County Environmental Services Department (JCESD) maintains rights-of-way (ROWs) and sewer easements to minimize delays when crews need to access sewer system assets to perform inspection, preventive maintenance, repair, and emergency response activities. JCESD raises manholes to grade and performs manhole lid and cover repairs to ensure the safety of the traveling public. JCESD also coordinates non-emergency sewer repairs with municipal paving activities within its service area to avoid unnecessary repaving, and to ensure the utility's manholes are not paved over when a street is resurfaced.

Purpose and Goals

The purpose of JCESD's **Maintenance of Way Program** is to ensure collection system personnel are able to access sewer system assets when needed, to identify problems that may exist in areas that are not readily visible, and to ensure the safety of the general public by identifying and repairing manhole and sewer line defects.

The goals of the **Maintenance of Way Program** are to:

- Maintain manageable easements and ROWs to enable access for inspection, preventive maintenance, and emergency response for sewer assets.
- Coordinate sewer repairs in streets before scheduled paving/resurfacing, and minimize cutting and repairing recently paved streets.

Program Resources

Related CMOM Program Documents and Other References

JCESD developed standard operating procedures (SOPs) for various CMOM-related job duties. Copies of the easement maintenance-related SOPs are provided in the JCESD's **Standard Operation Procedures and Work Process Documentation for Collection System Field Operations.**

Other CMOM Program plans that reference or are referenced in the **Maintenance of Way Program** are as follows:

- CMOM Program Organization
- Engineering Program
- CMOM Information Management Systems Program

Staffing

The JCESD ROW Crew reports to Shades Line Maintenance (Division 7253) and includes a Construction Equipment Operator and Skilled Laborer. The ROW Crew is responsible for cleaning and clearing existing, unimproved easements. The JCESD Manhole Raising Crew reports to Village Line Maintenance, Crew 20, and includes a Labor Supervisor, three Skilled Laborers, and a Laborer III. When not raising or

repairing manholes, this crew performs sewer cleaning using a rodding machine. For more information on staffing and the JCESD organization charts, see the **CMOM Program Organization** plan.

Data Management

The JCESD's geographic information system (GIS) contains gravity sewer, manhole, cleanouts, parcel, streets, easements / ROW, and planned street repavement projects. These shapefiles, along with aerial photography, are used to identify unimproved easements within JCESD's service area.

Work orders for easement clearing and manhole raising/repairs are generated using JCESD's Cityworks computerized maintenance management system (CMMS). For more information on work orders, see the **CMOM Information Management Systems Program** plan.

Program Implementation

Easement and ROW Maintenance

JCESD regularly maintains the ROW in areas where regular or routine access or entrance to sewer facilities is necessary (e.g., flow monitors, sewer control structures, and pump stations). Work typically performed in these ROWs include mowing, regrading paths, trimming branches, and removing brush.

Unimproved Easement Clearing

In areas of the collection system where regular access is not required, JCESD does not perform regularly scheduled ROW maintenance. Based on direct visual observations from JCESD employees and complaints received from landowners adjoining unimproved sewer easement areas, unauthorized vehicular traffic and litter is regularly observed in recently cleared easements. It has been the County's experience that providing open access to easements in remote areas promotes unauthorized vehicle and pedestrian traffic, which eventually leads to criminal activity and vandalism of sewer system assets. In areas where unauthorized entry and vandalism become a routine problem, gates or fencing may be constructed and erected.

The ROW Crew will clear unimproved easements on an as-needed basis (e.g., ahead of scheduled sewer inspection and preventive maintenance) using heavy equipment (as shown in **Figure 1**), and by hand. This work is coordinated through the Construction/ Maintenance Supervisors. An example of an easement clearing work order is shown in **Figure 2** on the following page.

Figure 1. Heavy Equipment Used to Clear Easements

R.O.W. CREW WORK ORDER FORM

Date: ____________ Lab. Sup. ____________
Time Left Shop: ____________ CEO ____________
Arrival Time: ____________ HEO ____________ Crew # ____________
Depart. Time: ____________ Skilled Lab: ____________ Truck # ____________
Hours on Jobsite: ____________ Skilled Lab: ____________ Start Mileage ____________
Time Returned to the Shop: ____________ Lab. III ____________ End Mileage ____________
Lab. III ____________ Equipment # 1 ____________
Map Page Number: ____________ Start Hours ____________
End Hours ____________
Equipment # 2 ____________
Start Hours ____________
End Hours ____________

Location Address (Be exact with street number, city & zip) ____________________
Zip:

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

ROW CUT OLD NEW
____________ to # ____________ = ____________ ft X ____ Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other ____________

TOTAL R.O.W. CUT FOOTAGE: ____________ ft

Overflow Yes No

☐ All overflow information has been turned into dispatch

Detailed Work Description: ____________________

Lunch Break (Time & Location) ____________________

Closed Out Call with Dispatch (Name of Dispatcher & Time Called) ____________________

Supervisor Signature: ____________________

P.W.S. / S.V.O.S Signature: ____________________ Page Number ____________ of ____________

Figure 2. Easement Clearing Work Order Form

Manhole Raising and Repairs

The Manhole Raising Crew is responsible for raising manholes to grade, replacing broken manhole frames and covers, and addressing "rattling" manhole covers. This work may result from the investigation of a service request, or a request from another JCESD Division or County Department.

JCESD also deploys staff to raise manholes as part of a paving/resurfacing project undertaken by other Departments and governmental agencies. JCESD coordinates this work with local municipalities' Public Works Departments and County and State Roads and Transportation Departments.

An example manhole raising work order documentation, which is included within the Rod Work Order Form, is shown in **Figure 3** on the following page.

Street Paving Program

Linking Street Resurfacing Plans on GIS to Planned Sewer Rehabilitation Capital Improvement Projects

In 2015, JCESD initiated a program to link street resurfacing work that will be done within the service area to the development and scheduling of the County's upcoming sewer rehabilitation capital improvement projects and non-emergency point repairs.

As part of this program, letters were sent to the Jefferson County Roads and Transportation Department and the public works/street maintenance departments of each municipality in the Jefferson County service area (see sample letter provided in **Appendix A**). The purpose of the letters is to request information concerning the 1-year, 3-year and 5-year paving and resurfacing plan.

Through this program, JCESD learned that most municipalities do not develop annual paving lists. Municipalities will occasionally send updates, but JCESD does not receive the updates on a regular basis. JCESD provides a map on their website for municipality planning purposes.

A JCESD representative attends the City of Birmingham's Utility Coordination meeting each month to mention a potential conflict with one of their upcoming sewer rehabilitation capital improvement projects and non-emergency point repairs. Representatives from other utilities typically attend these meetings as well.

ROD CREW WORK ORDER FORM

Date: ____
Time Left Shop: ____
Arrival Time: ____
Depart. Time: ____
Hours on Jobsite: ____
Time Returned to the Shop: ____
Map Page Number: ____

Lab. Sup. ____
CEO: ____
HEO: ____
Skilled Lab: ____
Skilled Lab: ____
Lab. III ____
Lab. III ____

SR # ____
WO # ____
Crew # ____
Truck # ____
Start Mileage ____
End Mileage ____

Location Address (Be exact with street number, city & zip) ____

Zip:

RODDED LINE

MH number (From MH # to MH # and feet)

____ *to #* ____ = ____ *ft*

Tool Used: Saw Auger Spearhead Pick-up Tool

Size Used: 2 4 6 8 10

FINDINGS

Pipe Size 6 8 10 12

Pipe Material: Lined Ductile Clay C-900

Material Removed: Grease Rags Roots Other ____

Amount Removed: Light Medium Heavy

RODDED LINE

MH number (From MH # to MH # and feet)

____ *to #* ____ = ____ *ft*

Tool Used: Saw Auger Spearhead Pick-up Tool

Size Used: 2 4 6 8 10

FINDINGS

Pipe Size 6 8 10 12

Pipe Material: Lined Ductile Clay C-900

Material Removed: Grease Rags Roots Other ____

Amount Removed: Light Medium Heavy

RODDED LINE

MH number (From MH # to MH # and feet)

____ *to #* ____ = ____ *ft*

Tool Used: Saw Auger Spearhead Pick-up Tool

Size Used: 2 4 6 8 10

FINDINGS

Pipe Size 6 8 10 12

Pipe Material: Lined Ductile Clay C-900

Material Removed: Grease Rags Roots Other ____

Amount Removed: Light Medium Heavy

RODDED LINE

MH number (From MH # to MH # and feet)

____ *to #* ____ = ____ *ft*

Tool Used: Saw Auger Spearhead Pick-up Tool

Size Used: 2 4 6 8 10

FINDINGS

Pipe Size 6 8 10 12

Pipe Material: Lined Ductile Clay C-900

Material Removed: Grease Rags Roots Other ____

Amount Removed: Light Medium Heavy

MANHOLE ADJUSTMENT/ REPLACEMENT

____

Location: Street Dirt

Height Adjustment: Riser ring (no more than 2)

Frame & Cover: Locate Locate & Expose

Frame & Cover: Replace Repair

Height Adjustment (courses): 1 2 3 4 5

County Maintained Boxes

Mowing Grass: Yes NO

Weed Eating: Yes No

TOTAL ROD FOOTAGE ____ *ft*

Overflow ____ Yes ☐ No ☐

All overflow information has been turned into dispatch

Detailed Work Description: ____

Lunch Break (Time & Location) ____

Closed Out Call with Dispatch (Name of Dispatcher & Time Called) ____

Supervisor Signature: ____

S.V.O.S Signature: ____ Page Number ____ of ____

Figure 3. Manhole Raising Work Order Form

Program Performance Metrics

Performance measures are important management tools that allow for continuous measurement and evaluation of program activities. Performance measures are designed to collect information that enables JCESD to determine if established goals and level of service are being met and, if not, what activities need to be adjusted to meet program goals.

The Maintenance of Way Program performance measures established at JCESD are shown in **Table 1**.

Table 1. Maintenance of Way Program Performance Metrics

Performance Measure	Formula	Definition	Desired Result	Data Interval
Easements / ROWs Cleared	Value	Miles of Easements /ROWs Cleared for preventive or emergency response	Maintain records of performance for clearing easements /ROWs	Weekly and Monthly

APPENDIX

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Appendix A Example JCESD Sewer Line Repair/Pavement Project Coordination Letter

JEFFERSON COUNTY COMMISSION

GEORGE F. BOWMAN
SANDRA LITTLE BROWN
DAVID CARRINGTON
T. JOE KNIGHT
JAMES A. "JIMMIE" STHEPHENS

TONY PETELOS –
CHIEF EXECUTIVE OFFICER

ENVIRONMENTAL SERVICES
Suite A300
716 Richard Arrington, Jr. Blvd N.
Birmingham, AL 35203
Telephone (205) 325-5496

October 5, 2015

Mayor Pam Palmer
City of Adamsville
P.O. Box 309
Adamsville, AL 35005

Dear Mayor Palmer,

In an effort to better coordinate non-emergency sewer line construction projects with paving projects, the Jefferson County Environmental Services Department is requesting your municipality's future asphalt paving plans. At a minimum, we are requesting your proposed 1, 3 and 5 year plans; however, if you have developed paving plans that extend beyond 5 years, we would appreciate this information as well. By providing your paving plans, you will assist with our attempt to reduce the number of sewer cuts and the resulting pavement patches through newly paved areas.

As the County's Collection System Asset Management Program further develops, the County also intends to provide a list of its planned work locations to affected municipalities with some advanced notice. Please also provide a primary contact in your organization to coordinate these efforts.

Please forward your municipal paving plans to:

Celeste Lachenmyer, PE
Hazen and Sawyer
Two Chase Corporate Drive
Suite 170
Hoover, AL 35244

Your cooperation and assistance with our efforts to coordinate sewer construction with paving plans is greatly appreciated. Please feel free to call Celeste Lachenmyer at (205) 547-5960 if you need any additional information.

Best Regards,

David Denard, Director
Jefferson County Environmental Services Department

STANDARD OPERATING PROCEDURES
AND
WORK PROCESS DOCUMENTATION
For
Collection System Field Operations

November 2018

Revision History

Revision Number	Page Number(s)	Description of Change	Date of Change
1	1	Updated number of pump stations in JCESD collection system	7/11/18
1	Appendix A	Updated to reflect current pump stations	7/11/18
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1	Appendix C	Moved example pump station forms to new appendix	7/11/18

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Acronyms

CCTV	Closed-circuit television
CDL	Commercial Driver's License
CMMS	Computerized maintenance management system
CMOM	Capacity, Management, Operations, and Maintenance
EAM	Enterprise asset management
GIS	Geographic information system
IMS	Information management system
JCESD	Jefferson County Environmental Services Department
KPI	Key performance indicator
LEL	Lover explosive limit
LFL	Lower flammable limit
O&M	Operations and maintenance
OEM	Original equipment manufacturer
PM	Preventative maintenance
PTO	Power take off
QA/QC	Quality assurance/quality control
SOP	Standard Operating Practice
SSO	Sanitary sewer overflow
SSORRP	Sanitary Sewer Overflow Response and Reporting Program
SOP	Standard operating procedure
WPD	Work process documentation
WRF	Water Reclamation Facility

1. Standard Operating Procedures Policy

The Jefferson County Environmental Services Department (JCESD) uses different types of equipment to maintain sanitary collection systems and to prevent sanitary sewer overflows (SSOs).

The standard operating procedures (SOPs) and work process documentation (WPD) outline the standard use guide for field operations and are designed to:

- Minimize the risk of injury to personnel and bystanders
- Minimize the risk of damage to equipment and property
- Promote efficient and effective sewer maintenance and repair
- Provide continuity in equipment use between operators and crews

2. Purpose

JCESD's sewer maintenance field operations personnel improve system reliability and sustainability by:

1. Installing, repairing and/or replacing manholes. Manhole structures, frames, and covers need to be raised, lowered, or repaired. Buried pipes and gravity sewer system components need to be repaired or rehabilitated.
2. Maintaining sewer easements through wooded areas and unimproved rights-of-way.
3. Cleaning sewer pipe to remove deposits and organic materials that can interrupt flow and result in sanitary sewer overflows (SSOs).
4. Internally inspecting gravity sewer pipes with closed circuit television (CCTV) cameras to assess pipe conditions, collect information needed to schedule future maintenance, locate and identify defects, determine causes of SSOs, and to provide pipe cleaning and repair quality assurance and quality control (QA/QC) documentation.

JCESD's staff requires special training, equipment, tools, and protocols to complete this work. Accurate reporting is required to document the work completed and conditions encountered, so that a determination can be made if additional cleaning, repair or replacement of a given pipe or structure is needed. These SOPs provide equipment operation and related field protocols that will best ensure this result.

Operators assigned to the equipment in these SOPs shall be experienced beyond novice level or, when working on or with this equipment, an experienced operator must be present to oversee the work. For detailed information about a specific brand/model machine, refer to the original equipment manufacturers' (OEM) operation and maintenance (O&M) manuals.

These SOPs relate standards of operation under normal or anticipated conditions and are for use by JCESD personnel under current policy and/or past practice. Documentation of these practices does not limit equipment operation to these practices alone. These documents are intended as a guideline for

equipment operation; during emergencies or other abnormal circumstances, some flexibility in equipment use may be required.

The primary goal of operation is to ensure every pipe cleaned meets the standard of care and safe operation as outlined in the SOP. Any questions, comments, additions, corrections, or changes to this SOP should be addressed to the appropriate Crew Supervisor, Public Works Supervisor or their designee.

It is the intent of JCESD to review these SOPs and WPDs annually.

3. Safety

JCESD intends to provide a safe work environment for all employees and the public. A well-managed workplace safety program will benefit both the organization and the community in measurable ways.

The success of the program is dependent on the cooperative effort and active engagement of all JCESD employees, as well as the enforcement of program policies and standards.

Both management and operations employees must become familiar with the program, follow and enforce the procedures, and become active participants in this workplace safety program.

3.1 Personal Protective Equipment

All operators and other personnel working in the field must be protected from any hazards of operation that may be encountered. Operators and other personnel shall wear clothing appropriate to the weather conditions, as may be needed during operation, and observe JCESD policies regarding the following:

- Steel-toed shoes
- Traffic safety vests
- High visibility jackets and head gear
- Hard hats
- Gloves
- Respiratory, hearing, and eye protection
- Leg protection (as appropriate; i.e., chainsaw chaps, snake chaps, etc.)

3.2 Confined Space Entry

No personnel shall enter a confined space without following JCESD's Confined Space Entry practice.

A confined space is defined as a space that:

(1) Is large enough and so configured that an employee can bodily enter it;

(2) Has limited or restricted means for entry and exit; and

(3) Is not designed for continuous employee occupancy.

A Permit Required Confined Space is a confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4. Contains any other recognized serious safety or health hazard.

A hazardous atmosphere is defined as:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);
2. Airborne combustible dust at a concentration that meets or exceeds its lower flammable limit (LFL);
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart D – Occupational Health and Environmental Control, or in Subpart Z – Toxic and Hazardous Substances, and which could result in employee exposure in excess of its dose or permissible exposure limit; or
5. Any other atmospheric condition that is dangerous to life and health.

Confined space entry equipment includes the following:

- Approved gas detectors (properly calibrated and bump tested)
- Fresh air blower
- Safety harness, rope, and tripod safety system
- Approved hard hat
- Aluminum ladder
- Radio communication (preferred)

3.2.1 Confined Space Entry for Manholes

See the JCESD SOP for Confined Space Entry for Manholes provided in **Appendix A**.

3.3 Lockout/Tagout Procedures

See the JCESD SOP for Lockout/Tagout provided in **Appendix B**.

3.4 Hazard Identification

If any employee sees, suspects, or knows of a potential safety hazard, including equipment components, tools, set up conditions, or traffic conditions, it is his/her responsibility to immediately bring it to the attention of the crew leader or the operator in charge of the work crew, and other crew members.

The person in charge of the work site shall take appropriate corrective or preventive measures in addressing the situation. Any additional actions should be made with this information in mind if corrective, anticipatory, or preventive measures are needed. If the hazard is not able to be resolved with these actions, the person in charge of the work site shall notify the Field Supervisor (or onsite Supervisor or Inspector).

If the situation cannot be resolved, then the Field Supervisor (or onsite Supervisor or Inspector) shall consult with the Public Works Supervisor or his/her representative prior to proceeding.

3.5 Traffic Control

Follow JCESD's traffic control policy and procedures. Traffic control devices include the following (as appropriate):

- Cones
- Flags
- Signs (detour/stop/slow)
- Barricades

The need for a flagger (and/or police assistance) shall be determined by the Crew Supervisor and shall take into consideration sight distance, traffic volume, traffic speed, and location of the work in relation to the roadway. When required, traffic control plans shall be developed by the applicable crew's Supervisor in accordance with the **Manual of Uniform Traffic Control Devices** (current version).

4. Training

Each operator of JCESD sewer maintenance equipment (including CCTV inspection, construction, and cleaning equipment) shall be fully trained in operation and field use, and be thoroughly familiar with operating techniques, including mechanical systems, safe set-up and control functions, tool selection, and driving the vehicle (if applicable).

At no time should inexperienced personnel be in the field with this equipment without an experienced operator present. Only when suitable field training has been completed, and competency successfully demonstrated, can a JCESD employee operate heavy machinery.

Operational training shall include mechanical system familiarity, detection of irregularities in operation and machine performance, field operation instruction, and debris disposal. Cross-training on various maintenance processes and equipment will be provided as needed.

Each assigned equipment operator shall read the OEM operation and maintenance (O&M), user, and safety manuals, and any other current JCESD-approved reference materials.

5. Equipment Operation

5.1 Operation Parameters

An operator shall never operate equipment while under the influence of drugs or alcohol, as defined by JCESD policy. Operators shall follow all applicable City, State, and Federal regulations pertaining to a Commercial Driver's License (CDL) and other requirements.

Any personnel operating equipment shall be classified employees, and have the following minimum qualifications:

- Be fully trained and familiar with all systems and tools necessary for specific conditions
- Be able to set up, operate, and shut down the machine under various field conditions
- Demonstrate proper operational technique to the satisfaction of JCESD field management

Inexperienced operators may operate the equipment only under immediate supervision of an experienced operator.

Experienced operators, in addition to the above, shall:

- Demonstrate the ability to read, comprehend, and interpret operation manuals, safety codes, and other information pertinent to the correct and safe operation of the equipment used
- Possess knowledge of emergency procedures for equipment shut-down and how to summon assistance, if needed
- Demonstrate to the Crew Supervisor the ability to operate the specific type of equipment, or provide other satisfactory evidence of qualifications and experience
- Be familiar with all relevant safety standards or safety codes, applicable government regulations, and JCESD policies as they apply to the equipment, procedure, circumstance, and safety
- Recognize and be responsible for all field maintenance requirements of the equipment and tools used by the operator or by any trainee(s) under the operator's supervision
- Be thoroughly familiar with the equipment control functions and tool applications, associated maintenance, and storage; and have read, fully understood, and signed off on these operation procedures; and have completed the necessary course(s) of instruction and worked with a competent operator prior to sole operation of the equipment

5.2 Operator Mechanical Familiarity

An operator shall be familiar with the equipment's transport, including truck mounted equipment, compressors, generators, and flatbed towed equipment:

- Chassis/Auxiliary Engine (as applicable)
- Engine fluid reservoir location and level
- Fuel fill location and fuel type
- Power Take Off (PTO) drive shaft and engine throttle
- Air brake system and appropriate CDL-required checks
- Vehicle directional indicators, brake lights, and night running lights
- Emergency lighting, including beacons, traffic control arrows, and night operation lighting
- Tire condition and inflation pressures

An operator shall be familiar with the necessary equipment and communications systems, including:

Hydraulic System

- Hydraulic fluid reservoir location and level
- System filters
- Pressure gauges
- Type of fluid required

Basic Controls

- Power supply
- PTO
- Auxiliary engine
- Electrical generation
- Air pressure
- Emergency shut down

Electrical System

- Electric components and switches
- Fuse block

Communications

- Hand held radios

Hand Signals

Trailers and Towing

- Ramp deployment and securing
- Brake fluid and reservoir location and level
- Hitch mounting and safety chain use
- Electrical connections
- Weight limits
- Maneuvering requirements
- Tie down strapping and/or chains

The equipment used while performing routine operations is varied; experience is required to use the equipment, and to train new personnel. Refer to the original chassis and OEM O&M manuals for suggested maintenance intervals and use parameters.

5.3 Machine Pre-Inspection and Maintenance

An operator shall perform the following tasks on assigned vehicles, including truck mounted equipment, compressors, generators, and flatbed towed equipment:

- Inspect the mechanical tool and consumable (including disposable gloves, ear protection kits, and rags) inventory weekly.
- Check operational equipment inventory monthly, so that the proper minimum number and types of mechanical tools, operational equipment, nozzles and/or pipe cleaning tools, and safety items are on board the machine and in proper operational condition.
- Conduct an inventory after any maintenance and/or repairs are performed by the motor pool or vendor service.
- Conduct regular inspection checks as required by the chassis and equipment manufacturer maintenance guidelines, JCESD policy, and/or the Daily Pre-Trip Inspection Report. Lists of daily and weekly maintenance tasks for specific equipment are provided in individual SOPs.

Routine maintenance, such as oil changes and other mechanical procedures, should be conducted by Jefferson County Fleet Maintenance at regular intervals, as defined by Fleet Maintenance Policy.

6. Equipment Start-up and Transport to Job Site

6.1 Start-Up Duties

Follow these steps when starting the shift, and when traveling to field assignments:

1. Perform a vehicle and equipment check, including critical fluids, before leaving the facility.
2. Verify that all field equipment and tools required for the assigned work are on board and in good working order, including:
    - Traffic safety equipment, including cones (12 recommended)
    - Field tools, shovels, and picks
    - Personal protective equipment (vests, high visibility hats, hearing protection, gloves, and hard hats)
    - Manhole lid hooks, sledge hammer, and other necessary access tools
    - Manhole and debris removal tools (traps, scoops, and grabbing/hooking long-handled tools)
    - Portable radio(s), maps, mobile devices, data collection forms, and writing instrument
    - Any other required equipment
3. Once equipment is loaded, secure all tool boxes on the truck for travel. Lock the tool boxes when the truck is unattended.

4. Start portable equipment engine(s) to verify operation.
5. Start chassis engine and wait for air system to charge. Be sure that oil and air pressures are within normal operating ranges, and that beacon lights are functioning before moving a vehicle.

6.2 Machine Transport

Observe proper driving procedures, including:

- Adjust all mirrors, as needed by the driver, before putting the truck in gear.
- Buckle seat belts (this applies to driver and all passengers).
- Make no sudden starts and stops.
- Do not exceed the posted speed limit.
- Slow down when on unimproved or rough roads, at railroad crossings, or near other hazards.
- Prepare for any turns by being in the proper lane at least 100 yards before the turn.
- Use directional signals before changing direction.
- Do not make sharp turns at high speed.
- Do not back up without a backing assistant to clear the path.

6.2.1 Driving Hazards

Driving hazards include low bridges, weight restricted roadways/bridges, narrow lanes, sharp bends, blind junctions covered by vegetation, unmarked junctions, slow moving vehicles, pedestrians, cyclists, animals, weather related road conditions (ice, snow, rain), etc.

7. Cleaning Debris Trapping, Removal and Reporting

Debris traps are an essential tool for sewer cleaning and serve several important functions:

- Prevent the downstream migration of materials removed during cleaning
- Reduce the need for vacuums to remove small amounts of debris
- Collect a finite volume of material to allow for quantitative estimate
- Enable quick material type categorization

Observations of debris trap collection can be used as a proxy for pipe debris volume estimates because traps hold a discrete volume. In turn, cleaning findings may be utilized to establish and/or modify cleaning frequency cycles, making best use of personnel and equipment resources during routine cleaning.

The following sections describe the use of JCESD's Debris Severity Chart, how it is used in context to all pipe cleaning operations, and how debris type and quantities are reported as part of work order documentation.

7.1 Debris Severity Chart

JCESD's Debris Severity Chart is shown in **Figure 7.1** on the following page.

7.2 Debris Trap Use

Needed: Debris Trap, attachable pole sections

Debris Basket, chain harness, rope

Debris Severity Chart

1. Determine the number of pole connections needed for debris trap use for the manhole depth; attach poles to debris trap (see **Photo 7-1**).

   Use a chain harness and rope when it is impractical to use poles due to the depth or configuration of the manhole (see **Photo 7-2**).

Photo 7-1. Debris Traps and Poles Used to Set Debris Trap in Manhole Channel

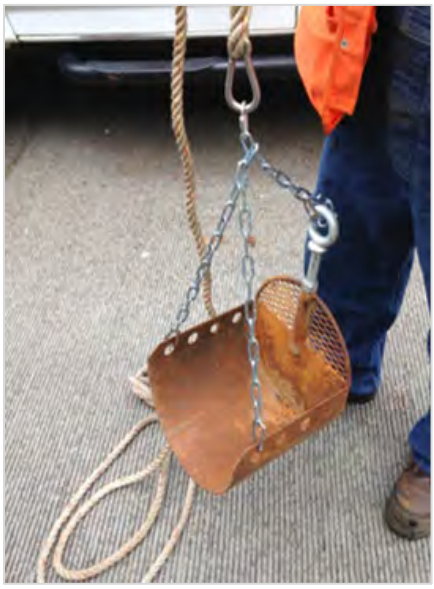


Photo 7-2. Chain Harness and Rope Used to Set Debris Trap in Manhole Channel

Material Type	Clear	Light	Medium	Heavy
Roots	***Visual:*** No evidence of roots.	***Visual:*** Small bits of hair/curtain roots observed in the trap or on the sewer cleaning hose, without large clumps.	***Visual***: Moderate clumps of roots in trap. Roots between 1/8-inch to 3/8-inch thick. ***Feel***: Hose does not bind or hydraulic pressure does not jump when roots encountered.	***Visual***: Large clumps of roots in trap. Roots over ½-inch thick. ***Feel***: Hose binds, jumps or slows down, hydraulic pressure can jump when using hydro cutter.
Grease	***Visual:*** No evidence of grease.	***Visual:*** Small bits of grease in flow or stuck to sewer cleaning hose. Water color changes to light milky color with some odor.	***Visual***: Popcorn size bits of grease with some larger chunks, from ½-inch to 1-inch diameter. Water color changes to light tan/brown with odor. ***Feel***: Hose may slow, but does not bind or hydraulic pressure does not jump when grease encountered.	***Visual:*** Any large chunks, logs or calcified grease of significant size. Water color changes to dark brown or black with foul odor. ***Feel:*** Hose binds and repeated attempts to clear some sections of the pipe are required.
Debris **Sand, rocks, gravel, sludge**	***Visual:*** No evidence of any debris.	***Visual:*** Conditions do not require shortening standard step cleaning length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Debris removed produces less than: *1 gallon (≤ 8 inch trap) *2 gallons (10 inch trap) *3 gallons (≥12 inch trap) Or - For every 25-foot step cleaning increment, less than 5% of channel filled with debris.	***Visual***: Debris removed is held back by the trap and conditions do not require shortening standard step cleaning length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Debris removed produces: *1-3 gallons (≤ 8 inch trap) *2-5 gallons (10 inch trap) *3-7 gallons (≥12 inch trap) Or - For every 25-foot step cleaning increment, 5-20% of channel is filled with debris.	***Visual***: Large amounts of debris are returned to the manhole channel with each cleaning pass. Shortened standard step cleaning length is required. Operator concern for blockage (debris feels concentrated in a small area). ***Quantity***: Debris removed produces more than: *3 gallons (≤ 8 inch trap) *5 gallons (10 inch trap) *7 gallons (≥12 inch trap) Or - For every 25-foot step cleaning increment, more than 20% of channel filled with debris.
Rags	***Visual:*** No evidence of rags.	***Visual:*** One or two rags are observed in the invert or are returned to the manhole channel during cleaning.	***Visual:*** Several rags are observed in the manhole or are returned to the manhole channel during cleaning.	***Visual:*** Many rags (in a ball or pile) are observed in the manhole or are returned to the manhole channel during cleaning and could cause a blockage if not removed.

*Findings amounts are based on 300 feet of 8-inch diameter pipe. For larger/smaller pipe or more/less footage, use best judgement in comparing actual findings to guidance above (for example, 1 gallon of sludge in a 50-foot long 8-inch diameter pipe would be considered "heavy.")

Volume of traps: 6-inch = 0.25 gallons, 8-inch = 1 gallon, 10-inch = 1.5 gallons, 12-inch = 2.5 gallons

Figure 7.1. Debris Severity Chart

2. Set up the pipe cleaning equipment as described in the appropriate equipment use SOP (i.e., wash truck, combination cleaner, rodding machine, etc.) in the manhole channel from which cleaning operations will be performed.

3. Place the debris trap into the downstream manhole channel of the pipe being cleaned (see **Photo 7-3**).

Photo 7-3. Debris Trap Placed in Manhole Channel

Note: When cleaning "with the flow" (from upstream to downstream), place the debris trap at the far manhole.

As described in the equipment use SOPs, use road cones to warn traffic at the far manhole and station a crew member to observe and control water flow. Do not leave an open manhole with an unattended debris trap deployed.

Position the debris trap in the channel to capture solid material and allow water to flow around it.

Note: If the debris trap does not fit in the channel:

a. Use a small sledge hammer to slightly modify the debris trap to fit (see **Photo 7-4**), OR

b. Use the next smaller pipe size debris trap

Photo 7-4. Using a Sledge Hammer to Slightly Modify a Debris Trap

4. Start the cleaning operation and monitor the water flow into and around the debris trap.

   If water backs up into the manhole and needs to be relieved, use the pole to tip the debris trap forward (upstream), keeping collected material in the debris trap and allowing more water to pass, lowering the water level (see **Photo 7-5**).

Photo 7-5. Tipping a Debris Trap to Relieve Backed Up Water

5. After the final cleaning pass (hydraulic cleaning equipment) or pull (mechanical equipment) and prior to lifting the trap from the manhole, inspect the debris trap and determine the type of material trapped and estimated volume.

   Follow cleaning equipment SOP for removing debris from the manhole.

6. Use the Debris Severity Chart (DSC) shown below to estimate material volume rating for the pipe.

   The DSC defines each volume rating based on 300-feet of 8-inch diameter pipe, for pipes larger or smaller in diameter and having lengths longer or shorter, extrapolate the findings appropriately.

7. Inspect the debris trap for signs of light roots which may not be visible during removal operations in the manhole but can be seen in the high back of the trap (see **Photo 7-6**).

Photo 7-6. Examining a Debris Trap for Signs of Light Roots

8. Dispose of the debris trap contents into a bag or 5-gallon bucket for later disposal.

9. Clean the debris trap with a wire brush to remove roots and other clingy materials from the trap for the next cleaning job.

10. Store the debris trap and poles on the truck prior to leaving the jobsite.

8. List of Field Operations SOPs and WPDs

The following SOPs and WPDs, as related to ESD's Capacity, Management, Operations, and Maintenance (CMOM) Program plans, are included as appendixes to this handbook:

Safety-Related
Confined Space Entry for Manholes
Lockout/Tagout
*Portable Gas Monitor Use**

Sanitary Sewer Overflow-Related
Sanitary Sewer Overflow Response and Reporting
Bypass Pumping System Operations

Gravity Line Preventive Maintenance-Related
Easement Clearing
Wash Truck Pipe Cleaning
Combination Cleaner Pipe Cleaning
Hand Rod and Rod Turning Machine Pipe Cleaning
Power Rodding Machine Pipe Cleaning
Easement Machine Pipe Cleaning

Engineering-Related
Geographic Information System Updates
Closed Circuit Television (inside the van)
Closed Circuit Television (outside the van)
Pre- and Post-Rehabilitation Flow Monitoring

Pump Station-Related
Pump Station Inspection and Preventive Maintenance
Pump Station Inspection Checkoff and Repair Log
Pump Drawdown Test
Pump Station Standby General Preventive Maintenance

Corrosion Control-Related
Air/Vacuum Relief Valve Procedures

Appendix A Confined Space Entry for Manholes

Confined Space Entry for Manholes

Objective:

To describe mandatory safe procedures to be used when working around an "open" manhole and entering a manhole for routine maintenance or inspection.

Responsibilities:

A manhole structure is a confined space that presents fall hazards where there is a potential for toxic gases to be present. Therefore, ALL ENVIRONMENTAL SERVICES DEPARTMENT PERSONNEL assigned to enter sanitary and storm manholes shall comply with this SOP.

Note: this SOP must be updated to reflect responsibilities of the ESD Director, Supervisors, Competent Persons, and Health and Safety Representatives at such time a formal Confined Space Entry Program is initiated, and/or when ESD requires Confined Space Entry Permits to be completed for each manhole entry.

Task:

Using proper safety equipment, enter sanitary and storm sewer manholes for routine maintenance and inspection.

Performance Standard:

Staff performing or assisting with a confined space entry into a storm or sanitary manhole shall have knowledge of appropriate safety measures and proper equipment and tool operation.

Safety and Field Cautions:

- Engulfment and drowning hazards
- Presence of toxic gases
- Presence of explosive/flammable gasses
- Oxygen deficiency
- Lifting hazards
- Falling object hazards
- Slip and fall hazards
- Tailgate safety meeting

Tools and Equipment:

- Approved gas detector (properly calibrated)
- Fresh air blower
- Safety harness, rope, and tripod safety system
- Approved hard hat
- Aluminum ladder
- Radio Communication (preferred)

A qualified person shall inspect all safety devices and instruct all involved employees on proper confined space safety procedures. All defective safety devices shall be reported to the __*Supervisor, Field Supervisor, Crew Lead*__ immediately.

It shall be the __*Field Supervisor's, Crew Lead's*__ responsibility to verify that crews assigned to enter confined spaces have the required safety devices in their possession. The __*Field Supervisor, Crew Lead*__ must assure the assigned employee is trained to operate all safety equipment and understands all safety procedures.

Prepare to Enter an Opened Manhole:

1. Before any personnel enters the confined space, test the space for all three atmospheric conditions.

    a. Measure the **Oxygen Content** at all levels (bottom, middle, and top of manhole). The oxygen content must be at least 19.5% in the confined space. The safe oxygen level is between 19.5% and 21%.

    Do not enter the confined space if the oxygen level is below 19.5% or above 21%.

    Due to the extreme danger of suffocation in confined spaces, constant and continuous oxygen monitoring is required throughout each work period. Oxygen content above 23% can cause explosions or vigorous burning of flammable materials, including hair and clothing.

    b. After the oxygen content is determined, use the detector to measure **Flammability** at all levels (bottom, middle, and top of manhole).

    Flammability is measured in terms of the Lower Flammable Limit (LFL) or Lower Explosive Limit (LEL). This is the smallest concentration of a combustible gas in air that will explode when it contacts a spark or open flame.

c. After testing for flammability, test the atmosphere for any **Toxicity** (toxic concentrations of vapors) at all levels (bottom, middle, and top of manhole).

Toxicity is measured in terms of the Threshold Limit Value (TLV). Since toxic concentrations may be lighter or heavier than air, they can be present at the top or bottom of the manhole.

NOTE: The confined space must be tested at three levels (not greater than 4' increments) minimum for each atmospheric condition from top to bottom. Each level must be tested for a minimum of 60 seconds.

The gas detector can be lowered into the confined space atmosphere with a safety line or the detector can be used with an aspirator pump so the detector is not lowered into the confined space.

Consult the gas detector user manual for further information on the gas detector operation.

2. Position the **gas detector** in the manhole and secure safety line.

The gas detector must remain in operation the entire time the entrant is in the confined space due to the possibility of a rapid change in the confined space atmosphere.

3. Set up and operate the fresh **air blower ventilation system.**

The fresh air blower ventilation system must be in operation before and during all inspection and maintenance procedures.

4. After the air blower ventilation system has been in operation, and the confined space atmosphere has been tested and determined to be safe for entry, equip the entrant with the following:

   a. **Tyvec suit**

   b. **Approved hard hat**

   c. **Safety harness and lifeline**

5. Set up the **tripod**.

   Consult the tripod user manual for further information on the proper tripod configuration and use.

6. Attach the entrant's safety harness and lifeline to the tripod; perform safety check to verify proper adjustment and fit.

   Adjust the tripod winch cable as necessary.

7. Begin descent into manhole.

   a. Test each manhole step carefully while descending into the manhole.

      If permanent ladder steps are not provided in the manhole, or not structurally sound, use an aluminum ladder (in good condition) to enter and exit the confined space.

   b. An attendant will lower the cable as the entrant descends into the manhole.

Two persons must be stationed above ground for support personnel whenever a confined space (manhole) is entered.

8. Upon completion of the work, an attendant will raise the cable as the entrant ascends the manhole.

   Attendants will help the entrant stand and move away from the open manhole.

9. Replace the manhole cover.

10. Dismantle and stow the tripod, winch, fresh air ventilation system, gas detector and all other equipment on the appropriate crew truck.

<u>Emergency Action Plan</u>:

No person shall enter a confined space (manhole, wet well, dry well, or underground vault) to retrieve someone who is unconscious without having required personnel above ground to assist.

Summon help.

The person entering the confined space for rescue purposes must be equipped with the required rescue equipment and follow the specific rescue procedure.

Appendix B Lockout/Tagout

Jefferson County ES: Technical Divisions

LOCKOUT/TAGOUT PROCEDURE

A good Lockout/Tagout Procedure, at a minimum, should contain the following elements:

1. All maintenance personnel shall be provided with a good lock. The lock shall have the individual workers' name and other identification on it. Each worker shall have the only key to the lock.

2. The worker shall check to be sure that no one is operating the machinery BEFORE turning -off the power. The machine operator shall be informed before the power is turned off. Sudden loss of power could cause an accident

3. Steam, air and hydraulic lines shall be bled, drained, and cleaned out. There shall be no pressure in these lines or in reservoir tanks.

4. Any mechanism under tension or pressure, such as springs, shall be released and blocked.

5. Each person who will be working on the machinery shall put a lock on the machine's lockout device(s). Each lock shall remain on the machine until that worker's work is complete.

6. All energy sources that could activate the machine shall be locked out (blocked/tagged).

7. The main valve or main electrical disconnect shall be tested to be sure that the power to the machine is off.

8. Electrical circuits shall be checked with proper and calibrated electrical testing equipment. An electrical failure could energize the equipment even if the switch is in the off position. Stored energy in electrical capacitors shall be safely discharged.

9. When working on machinery such as power presses and welding presses that have a ram that could fall, the ram shall be supported with safety blocks or pins. Fully interlocked safety blocks are the safest.

Program

Hazardous Energy Control Procedures
Lockout

I. Purpose and Scope

Effective hazardous energy control procedures will protect employees during machine and equipment servicing and maintenance where the unexpected energization, start up or release of stored energy could occur and cause injury, as well as while working on or near exposed deenergized electrical conductors and parts of electrical equipment. Hazards being guard against include being caught in, being crushed by, being struck by, being thrown from, or contacting live electrical circuits/parts.

The procedure herein established (III - VIII) will insure that machines and equipment are properly isolated from hazardous or potentially hazardous energy sources during servicing and maintenance and properly protect against reenergization as required by 29 CFR 1910.147.

While any employee is exposed to contact with parts of fixed electrical equipment or circuits that have been deenergized, the circuits energizing the parts shall be locked out and tagged in accordance with the requirements of 29 CFR 1910.333 (b) (2). SEE THIS OSHA STANDARD.

Only when disconnecting means or other devices are incapable of being locked out, and until lockout capability is provided, will a tagout procedure (without lockout), be utilized. SEE APPENDIX A.

II. Enforcement

Any employee who fails to follow these procedures will face disciplinary action in accordance with those listed in the company handbook.

III. Definitions

Authorized employee - a person who locks out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance that exposes him/her to potentially hazardous energy.

Affected employee - an employee whose job requires him/her to operate /use a machine or equipment or work in an area in which servicing or maintenance is being performed under lockout.

Energy isolating device - a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selectors switches, and other control circuit type devices are not energy isolating devices.

Other employee - an employee whose work operations are or may be in an area where energy control procedures may be utilized.

For additional definitions see 29 CFR 1910.147 (b).

IV. Authorization / Responsibility

Appropriate employees will be instructed in the safety significance of the lockout procedures. Appendix B is a list of employees authorized to lockout. Appendices C and D are a list of job titles for affected and other employees.

V. Rules

A. Locks, chains, wedges, or other hardware which meet the requirements defined in 1910.147 (c) (5) (ii) shall be provided by the company.

B. Lockout devices shall be singularly identified. They shall be the only devices used for controlling energy and shall not be used for other purposes.

C. The lockout devices shall indicate the identity of the employee applying the devices.

D. All machines/equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Lockout will also apply when working on or near exposed deenergized electrical circuits / parts.

E. No employee shall attempt to operate any switch, valve, or other energy -isolating device which is locked out.

F. Each lockout device shall only be removed by the employee who applied the device. *(Exception: see VII. B. 2.)*

VI. Lockout Procedures and Techniques

A. Preparation for Shutdown.

1. In preparation for lockout, an initial survey must be made to locate and identify all energy isolating devices to be certain which switch, valve, or other energy isolating devices apply to the machine / equipment to be locked out. (See Appendix E for Energy Source Evaluation) More than one energy source (electrical, hydraulic, pneumatic, chemical, thermal, or others) may be involved.

2. Before an authorized or affected employee turns off a machine or piece of equipment, the authorized employee must have knowledge of the type and magnitude of the energy to be controlled, and the methods or means to control the energy (see Appendix F for Specific Energy Control Procedures).

   Note: If work to be performed involves employees working on or near exposed deenergized electrical parts. *(See 29 CFR 1910.333).*

B. Machine or Equipment Shutdown.

1. All affected employees shall be notified that a lockout system is to be utilized and the reason for it, before the controls are applied.

2. If the machine or equipment is operating, shut it down by normal stopping procedure. (Depress stop button, open toggle switch, etc.)

C. Machine or Equipment Isolation.

Physically locate and operate the switch, valve, or other energy isolating devices so that the equipment is isolated from its energy sources and apply adequate hardware.

D. Lockout Device Application.

1. Authorized employees shall lockout the energy isolating devices with assigned individual locks.

2. Lockout devices shall be applied so that they will hold the energy isolating devices in a “Neutral” or “Off” position.

E. Stored Energy.

All stored or residual energy in rams, flywheels, springs, pneumatic, or hydraulic systems, etc. shall be blocked or dissipated. If there is a possibility of reaccumulation of stored energy, verification of isolation must be continued until servicing or maintenance is completed.

F. Verification of Isolation.

Prior to starting work on machines or equipment that have been locked and after ensuring that no personnel are exposed, the authorized employee shall operate the push button or normal operating controls to verify that the appropriate equipment or machine has been deenergized and make certain it will not operate.

CAUTION: Return Operating Controls to the "Neutral" or "Off" Position after the Test.

The machine / equipment is now locked out. Servicing or maintenance may now occur.

VII. Removal of Lockout Devices

A. After the servicing and / or maintenance is completed and before the lockout devices are removed and energy is restored, the sequence of activities in Appendix F shall be completed by the authorized employee(s).

B. If the authorized employee who applied the lock is not available, the supervisor shall take the following steps:

* Clear the machine or equipment of tools and materials.
* Remove employees from the machine or equipment.
* Remove the lockout device.
* Energize and proceed with testing or positioning.
- Deenergize all systems and reapply energy control measures in accordance with procedures set forth under SECTION VI.

VIII. Additional Requirements

A. In the proceeding steps, if more than one individual is required to lockout machines / equipment (group lockout), the following procedures shall be implemented to provide protection to all employees.

1. A primary authorized employee will be designated and responsible for the number of people working under the protection of the group lockout device. The primary authorized employee will ascertain the exposure status of the individual member participating in the group lockout to ensure continuity of protection for each individual. In addition, this primary authorized employee will be responsible for notifying affected employees before and after lockout procedures are performed.

2. Each authorized employee will place his/her own personal lockout device on the energy isolating device(s).

3. When an energy- isolating device cannot accept multiple locks, a multiple lockout system must be used.

B. ***Shift or Personnel Changes*** - If a lockout procedure will extend into the following shift, the authorized employee who originally placed the lock will remove it and it will immediately be replaced with the lock of the authorized employee who is to continue the repair or maintenance on that equipment or machine for the following shift.

C. ***Cord and Plug Connected Equipment*** - If servicing or maintenance is performed on cord and plug connected equipment the following procedure shall be performed to protect employees.

1. Unplug equipment from its electrical socket.

2. Place a lockable cover over the plug and a lock on the plug cover during machine / equipment servicing or maintenance.

D. ***Outside Contractors*** **-** If outside contractors perform servicing or maintenance that requires lockout, the Safety Director shall take the following steps.

1. Inform the outside contractor of out company's lockout procedures and supply them with a copy.

2. Obtain and review a copy of the outside contractor's lockout procedures.

3. Ensure that our employees understand and comply with the responsibilities and prohibitions of the outside contractor's lockout procedure.

E. ***Training***

1. Authorized employees shall receive training covering:

   * Recognition of hazardous energy sources.
   * Types and magnitude of hazardous energy in the workplace.
   * Methods, devices, and procedures used to lockout, verify lockout, and otherwise control hazardous energy on all pieces or types of equipment (including cord and plug connected equipment).
   * Procedures for removing locks and returning a machine or piece of equipment to operation.
   * Transfer of lockout responsibilities.

* Group lockout procedures.

2. Affected and all "other" employees shall receive training so that they are able to:

* Recognize when energy control procedures are being implemented, and
* Understanding the purpose of the procedures and the importance of not attempting to start up or use the machine / equipment that has been locked out.

F. *Retraining* - Authorized and affected employees shall receive retraining in proper application of lockout procedures when there is a change in:

* Job assignment(s) that expose an authorized employee to new hazards or lockout procedures.
* Machines, equipment, or processes that present a new hazard or require modified lockout procedures.
* Energy control procedures for a piece or type of equipment.
* Or when it becomes known that an employee incorrectly performs lockout procedures.

Retraining will re-establish employee proficiency in lockout, and ensure that employees are knowledgeable of new or revised procedures. All retraining will be certified.

G. *Periodic Inspections*

1. An inspection of the energy control procedures will be conducted annually and will be certified (see Appendix H).

2. Energy control procedures for each machine or type of machine must be inspected.

3. The inspection shall include a review of lockout responsibilities with each individual authorized to lockout the machine / equipment.

4. The person who performs the inspection must be authorized to perform the lockout procedures being inspected. The inspector cannot, however, review his/her own use of lockout procedures.

5. Any deviations or inadequacies identified shall be immediately addressed.

TAGOUT PROCEDURES

A. When a disconnecting means or other energy isolating device is incapable of being locked out, a tagout system shall be utilized. A tag used without a lock, shall be supplemented by at least on additional safety measure that provides a level of safety equivalent to that obtained by use of a lock such as opening an additional disconnecting device, removal of an isolating circuit element, blocking of a controlling switch or the removal of a valve handle to reduce the likelihood of inadvertent energization.

B. Only tags furnished by the company which meet the requirements of 1910.147 (c) (5) (ii) and (iii) shall be used.

C. All employees shall be trained in the use and limitations of tags as described in 1910.147 (c) (7) (ii) and (d) (4) (iii).

D. **All** employees must be able to understand the hazard warning written on the tags such as: **DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE, DO NOT OPERATE.**

E. On machines and equipment where tagout is used in lieu of lockout, the Periodic Inspection required by 1910.147 (c) (6) shall include the affected as well as the authorized employee(s). The periodic inspection shall be certified.

F. If tagout is used all other lockout rules and procedures apply.

NOTE: Should the machine / equipment required upgrade or modification, it will have lockable switches, fittings, valves, etc. added so that it becomes possible to lockout.

ENERGY SOURCE EVALUATION

DATE:_____/____/_____ CONDUCTED BY: _____

In order to determine all energy sources for each piece or type of machine or equipment, fill in the following table.

Location:_____ Work Center: _____

Equipment Name: _____

Model:_____ Serial #: _____

Lockout Procedure Number: _____

ENERGY SOURCE \ * MAGNITUDE	**LOCATION OF ISOLATING DEVICE**	**MEANS OF ISOLATION**
ELECTRICAL		
ENGINE		
SPRING		
COUNTER WEIGHT		
FLYWHEEL		
HYDRAULIC		
PNEUMATIC		
CHEMICAL		
THERMAL		
OTHER		

*** MAGNITUDE EXAMPLE - Electrical = 480v three phase**
Pneumatic = 125 p.s.i.

SPECIFIC ENERGY CONTROL PROCEDURES
FOR EACH PIECE OR TYPE OF MACHINE OR EQUIPMENT

PROCEDURE NUMBER: _____

DATE:_____/_____/_____ COMPLETED BY: _____
MACHINES OR EQUIPMENT UTILIZING THIS PROCEDURE:

_____ _____

_____ _____

PROCEDURE FOR CONTROLLING HAZARDOUS ENERGY

1. Be familiar with the sources of hazardous energy for the machine or equipment that will be serviced. **See Appendix F (Energy Source Evaluation)**

SOURCES OF HAZARDOUS ENERGY

___**Electrical**	___Engine	___Spring
___Counter Weight	___Flywheel	___Hydraulic
___Pneumatic	___Chemical	___Thermal
___Other _____		

2. Notify affected employees that the machine is about to be shut down and locked out.

Specific Instructions:

_____
_____
_____

3. Shut down the machine using normal stopping procedures.

Specific Instructions:

_____
_____
_____

4. Isolate all energy sources listed above.

Specific Instructions:

_____
_____
_____

5.A. Apply locks to all isolation devices operated in step four.

Specific Instructions:

_____
_____
_____

B. If a tag is used in lieu of a lock when the energy- isolating device is incapable of lockout (see Appendix A), the following additional safety precaution(s) shall be taken:

_____
_____
_____

6. Block or dissipate all stored energy in rams, flywheels, springs, pneumatic or hydraulic systems, etc.

Specific Instructions:

_____
_____
_____

7. Verify that the machine is locked out by testing the machine operating controls. RETURN ALL CONTROLS TO THE "**NEUTRAL" OR "OFF" POSITION AFTER TESTING.**

Specific Instructions:

_____
_____
_____

PROCEDURES FOR REMOVING LOCKS / TAGS

1. Check the machine to be sure it is operationally intact, tools have been removed, and guards have been replaced.

Specific Instructions:

_____
_____
_____

2. Check to be sure all employees are safely positioned.

Specific Instructions:

_____
_____
_____

3. Notify all affected employees that locks / tags are going to be removed and the machine is ready for operation.

Specific Instructions:

_____
_____
_____

4. Remove all locks, blocks, or other energy restraints.

Specific Instructions:

_____
_____
_____

5. Restore all energy to the machine.

Specific Instructions:

_____
_____
_____

OTHER COMMENTS:

_____
_____
_____
_____
_____
_____
_____

Periodic Inspection Certification

DATE OF INSPECTION:_____/_____/_____

INSPECTOR: _____

SIGNATURE: _____

Machine or equipment on which lockout / tagout procedures were performed:

Employee(s) performing the lockout / tagout procedures:

Employee Name (Please Print) **Employee Signature**

_____ _____

_____ _____

_____ _____

_____ _____

Were all the lockout / tagout procedures performed correctly? YES NO

Comments on improper lockout / tagout procedures being used (ex. list improper procedures being used that require retraining for the employee or modification of procedures):

HAZARDOUS ENERGY CONTROL PROCEDURES

Name of employee exposed to the hazard: _____

Machine / Equipment on which the task is being performed:

_____

Servicing / Maintenance task being performed:

_____

Frequency in which the employee performs the task:_____times per _____

Duration for which the employee has performed the task:_____hour/day/week

Hazard to which the employee is exposed when performing this task:

_____caught in _____

_____crushed by _____

_____struck by _____

_____thrown from _____

_____contact with _____

_____other _____

Energy source which exposes the employee to a hazard:

___Electrical ___Engine ___Spring ___Counter Weight
___Flywheel ___Hydraulic ___Pneumatic ___Chemical
___Thermal ___Other _____

Magnitude of the energy source:

____Volts ____Phase ____PSI ____Degree F ____Tons

Potential Injury associated with the improper isolation of energy:

Crushed_____Fractured_____
Amputated _____ Lacerated_____
Punctured_____Burns _____
____Air Embolism ____Death ____Electric Shock
Other_____

Means of Isolating the Energy Source (Procedures Used)
[If tagout is used see 1910.147 (c) (3) (ii)]

Location: _____ Method: _____

If machine / equipment is not capable of lockout when was it installed, renovated, modified, or repaired (major)? After 1/02/90_____/____/____
If Electrical, cord / plug (circle one); YES NO
Hazards discussed with exposed employee Mr. / Ms. _____
Remarks/Signed Statement (if documenting past exposure)
Hazard reviewed with employer Mr. / Ms. _____
Remarks:_____

THE CONTROL OF HAZARDOUS ENERGY
(LOCKOUT / TAGOUT) 1910.147
WRITTEN PROCEDURES EVALUATION

YES	NO	
		Do the written procedures contain the following elements:
___	___	A definition of the purpose and scope of lockout and/or tagout procedures.
___	___	Basic lockout / tagout rules and authorization.
___	___	Means of enforcing compliance.
		Specific procedures for:
___	___	Shutting down machines and/or equipment.
___	___	Isolating, blocking, and securing machines and/or equipment.
___	___	Placement of lockout / tagout devices.
___	___	Releasing stored energy.
___	___	Testing a machine and/or equipment to verify the effectiveness of the lockout / tagout devices.
___	___	Removal of lockout / tagout devices.
___	___	Transfer of lockout/tagout devices during group lockout/tagout [If Applicable].
___	___	Responsibility for lockout/tagout devices during group lockout/tagout [If Applicable].
___	___	Group Lockout/Tagout [If Applicable].
___	___	Additional measures taken if a tag is used in lieu of a lock.
		The employer must comply with the following items, however they do not have to be included in the written procedures:
___	___	Provide energy control devices that meet the requirements defined in 1910.147 (c) (5).
___	___	Inform outside contractors of your lockout/tagout program and notify your employees of the contractor's energy control program.
___	___	Certification of a periodic inspection conducted at least annually.
___	___	Certification of training and retraining for authorized, affected, and other employees.
___	___	Handling cord and plug connected equipment 1910.147 (a)(2)(iii) (A).

Appendix C Sanitary Sewer Overflow Response and Reporting SOP

Sanitary Sewer Overflow Response and Reporting

1. OBJECTIVE

The objective of this SOP is to aid staff in conducting responsible and prompt response, notification and reporting of sanitary sewer overflows (SSOs), and is intended only as a condensed version of the Jefferson County Environmental Services Department's (ESD) 2012 *Sanitary Sewer Overflow Response and Reporting Program (SSORRP)* document. The purpose of the SSORRP is to minimize the impact of SSOs to the public and the environment.

This SOP shall be reviewed and updated annually, and when changes to the SSORRP are adopted by ESD.

2. RESPONSIBILITIES

The parties responsible for the various elements of SSO response, notification, and reporting are listed below.

2.1 Reporting an SSO to the Dispatch Facility

Any ESD staff member who witnesses an SSO is required to report the SSO to the Dispatch Facility by calling (205) 942-0681. SSO reports may also be made by other individuals who witness an SSO.

2.2 Notifying ESD Personnel of an SSO Call

The Dispatcher shall notify the appropriate ESD personnel, giving details on the reported SSO (see Section 4).

2.3 Responding to an SSO Call

The first responders to an observed SSO location shall be the on-duty Line Maintenance crews, the Labor Supervisor, Heavy Equipment Operator (HEO), or the Construction Equipment Operator (COO), Public Works Supervisor and/or Inspector. Additional crews and equipment may be necessary (see Sections 5 and 7).

2.4 Evaluating the Cause and Extent of the SSO

The initial determination of the cause of an SSO shall be made by the responding Line Maintenance Crew Supervisor, Supervisor and/or Inspector (see Section 6.1).

The Line Maintenance crew, Crew Supervisor, Public Works Supervisor, and/or Inspector responding to the SSO call shall be responsible for:

- Identifying the discharge source that contributed to the SSO (See Section 6.2)
- Identifying the final destination of the SSO (see Section 6.3)
- Estimating the SSO volume (see Section 8)

2.4.1 Notifications for SSOs Lasting More than 12 Hours

If a SSO continues for more than 12 hours, the Sewer Construction/Maintenance Supervisor will notify the ESD Director, Deputy Director, and Chief Engineer. Reports will be made at least twice per day until the SSO has ceased.

2.5 Notifying and Reporting to Regulatory Agencies and the Public

If an SSO is determined to reach surface waters, Dispatch shall be responsible for sending a Sewer Overflow Advisory form to the appropriate parties (see Section 9.1).

If the Crew Supervisor and responding Supervisor (or Inspector) determines that a significant danger to public health exists due to SSO contact with surface water, the responding crew shall be responsible for placing warning signs, at the direction of the Crew Supervisor (see Section 9.3).

Responding crews shall be responsible for completing SSO reporting forms (see Section 8.2)

The Dispatcher, Onsite Supervisor, and Sewer Construction Maintenance Supervisor shall be responsible for the final review of information on SSO reporting forms (see Sections 8.3 and 8.4).

The Sewer Construction Maintenance Supervisor shall be responsible for submitting the Wastewater Discharge Reporting Form (ESD Form RF1-1) to all appropriate parties (see Section 9.2).

Within 24-hours of a reported SSO, Dispatch shall be responsible for notifying the Alabama Department of Environmental Management (ADEM) of the event by telephone, and for submitting the 24-Hour Report (ESD Form RF3-1) to ADEM and the Jefferson County Department of Health (JCDH) (see Section 9.2).

Within 5 days after an SSO event, the Sewer Construction Maintenance Supervisor shall be responsible for submitting a 5-Day Follow-Up Report (ESD Form RF3-1) to ADEM and JCDH (see Section 9.2).

2.6 Training

Annual training on this procedure shall be provided to all ESD individuals involved in responding to and reporting SSOs. Training will also be provided when any modifications to this SOP are adopted by ESD.

3. MAINTAIN A SAFE WORKING ENVIRONMENT

All personnel working in the field must be protected from any hazards of equipment operation that may be encountered. Operators and other personnel shall wear clothing appropriate for weather conditions as needed during operation, and shall observe ESD policy regarding the **Personal Protection Equipment (PPE)** listed in **Appendix A**.

FOLLOW ESD SAFETY POLICIES & PROCEDURES

Any crew member who sees, suspects, or knows of a potential safety hazard, including any equipment component, tool, set-up condition, or traffic condition, must bring it to the attention of the onsite Supervisor and/or other personnel immediately.

The onsite Supervisor shall use sound judgment when directing the response to the SSO, and shall document unsafe conditions. If working conditions prevent the ESD from responding to the SSO, the Supervisor shall notify his Manager, and document the unsafe conditions.

4. ESD PERSONNEL NOTIFICATION

The list of **ESD Personnel to be Notified** (as appropriate), and their contact information, is provided in **Appendix B**.

4.1 During Manned Call Center Hours (7:00 AM to 11:00 PM)

1. When the Call Center Dispatcher is notified of a potential SSO during working hours, the Dispatcher shall notify the appropriate Line Maintenance Division Crew Leader by radio.

   If the Dispatcher is unable to reach the Crew Leader or the crew personnel, the Dispatcher shall call the Public Works Supervisor.

   If the Dispatcher is unable to contact the Public Works Supervisor, the Dispatcher shall call a Principal Engineering Inspector.

2. The Dispatcher shall send an email regarding the potential SSO to the Sewer Construction/Maintenance Supervisor's and Principal Engineering Inspectors' cell phones.

4.2 After Manned Call Center Hours (11:00 PM to 7:00 AM)

1. After hours, an automated system will notify the on-call Supervisor that a potential SSO call was received.

   If the call is not acknowledged within 10 minutes, the automated system will continue to call the next on-call supervisor until the call is acknowledged.

2. The on-call Supervisor shall notify the appropriate Maintenance Division crew.

5. SSO RESPONSE

5.1 Crew Supervisor duties

1. The Crew Supervisor and the assigned crew shall respond to the site of the reported SSO with the proper **Spill Response Material** listed in **Appendix C**, a crew truck and a rod turning machine, a jet-washer truck, or a combination jet-washer/vacuum truck (as assigned to the responding crew).

   The Supervisor (Sewer Construction and Maintenance Supervisor, Principal Engineering Inspector, Public Works Supervisor, Sewer Video Operations Supervisor or Sewer Service Inspector) shall meet the crew at the SSO location.

FOLLOW ESD POLICIES & PROCEDURES FOR PROPER TRAFFIC CONTROL SETUP

2. The Crew Supervisor and Supervisor (or Inspector) shall assess the problem and assign the response crew duties to eliminate the overflow.

   If required, the Crew Supervisor shall request additional Line Maintenance trucks and equipment to assist the responding crew:

   - Rod turning machines
   - Jet-washer trucks
   - Combination jet-washer/vacuum truck
   - Portable bypass pumps

3. If the problem has escalated to an emergency situation, the ESD Construction Division's aid shall be requested for assistance with:

- Bypass pumping
- Sand bag and/or berm placement
- Piping and manhole repair

4. If outside service assistance is required, the following contractors may be called:

Alabama Pump & Power	(205) 2561-2563	Rental Equipment
Hydra Service, Inc.	(205) 647-5326	Rental Equipment
Alabama Barricade, Inc.	(205) 655-5290	Traffic Maintenance Equipment
Alabama Construction Supply	(205) 592-8499	Traffic Signs/Safety Equipment

5.2 Mitigation Efforts for SSOs Lasting More than 12 Hours

If a SSO continues for more than 12 hours, mitigation will be developed by the engineering staff. The mitigation plan may include placement of containment booms, sandbagging, temporary collection pits, temporary pipes and/or pumping, application of lime, and cleanup of debris after the event has subsided.

5.3 Corrective Action Plan for SSOs Lasting More than 12 Hours

ESD will initiate a plan to determine the cause of the SSO in an attempt to prevent its reoccurrence. The corrective plans may include visual upstream manhole inspections, wet-weather TVI, dry-weather TVI, smoke testing, night-time flow isolation, temporary flow monitoring, hydraulic and capacity analysis, and other engineering and inspection activities as needed to determine the cause.

Once the cause has been determined, a corrective action plan will be implemented to remedy the defects or deficiencies and prevent the reoccurrence of the SSO under design conditions.

6. SSO DETERMINATION

The responding Line Maintenance Crew Supervisor and Supervisor (or Inspector) shall make every attempt to initially determine the cause of the SSO and identify the SSO discharge source. A final determination of the cause shall be made after the SSO is mitigated.

6.1 SSO Cause

During a rain event, manholes upstream of the surcharged sewer shall be opened in an attempt to identify the location of a potential blockage by tracing surcharged sewer flow to the trunk line.

During a non-rain event, a visual inspection shall be made to determine the cause of the SSO (blockage, construction damage, vandalism, line break or other external cause).

Once the initial cause is determined, the responding Line Maintenance crew shall make every attempt to remove the blockage (see Section 8.1), or, with assistance from the ESD Construction Division, repair broken pipe, manhole or pump station (see Section 8.2).

After the SSO has been mitigated, sewer lines in the area of the discharge shall be internally CCTV inspected to verify the pipe was cleaned, identify sources of infiltration/inflow, and determine if another cause contributed to the SSO event.

FOLLOW ESD POLICIES & PROCEDURES FOR PROPER CCTV EQUIPMENT SETUP, OPERATION, AND PIPELINE INSPECTON

6.2 SSO Source

The responding Line Maintenance crew, Crew Supervisor, and Supervisor (or Inspector) shall determine if the SSO discharge source is owned and maintained by a private owner or by the County. The SSO notification and reporting procedures undertaken depend on the ownership and maintenance responsibilities of the SSO discharge source (see Section 9.).

The Crew shall take digital photographs of the SSO (or surrounding area if SSO is not visible) following the **SSO Picture Procedures** listed in **Appendix D**.

If there is not an active SSO when the crew arrives, The Crew shall take digital photographs of any evidence that will document the occurrence.

6.3 SSO Destination

The SSO notification procedures taken depend on the ultimate destination of the SSO, which may be one or more of the following:

- Water body that is entirely confined and drained completely within a single property, and is not readily accessible to the public
- Creek or river (surface waters)
- Drainage ditch or storm drain (surface waters)
- Ground absorbed (non-surface water)

The maintenance crew shall assist the Crew Supervisor and Supervisor (or Inspector) in visually inspecting the area surrounding the SSO, and tracing downstream to determine if the SSO reaches flowing water.

If the final destination is indeterminate, the assumption shall be that the SSO reached surface waters.

The maintenance crew may be required to place warning signs and/or alert citizens that are in immediate threat or danger due to the SSO event. See Section 9 for the SSO destination-related notification procedures.

7. MITIGATION

Using all available tools, ESD personnel shall make every effort to stop the SSO as quickly as possible. When a safety threat or higher priority incident is identified, work shall be temporarily suspended until conditions allow work to resume.

See Section 5.2 and 5.3 for mitigation measures required for SSO lasting more than 12 Hours.

7.1 Blockage Removal

If the cause of the SSO is a suspected blockage, the responding crew shall use a rod turning machine, a jet-washer truck, or a combination jet-washer/vacuum truck to remove the blockage.

FOLLOW ESD POLICIES & PROCEDURES FOR PROPER EQUIPMENT SETUP, OPERATION, AND EMERGENCY BLOCKAGE REMOVAL

If a blockage was removed, the type of blockage shall be determined based on the material removed during the cleaning. Photographs shall be taken if the reason is any of the following:

- Construction damage
- Line break
- Vandalism
- External causes

7.2 Pipe, Manhole, Service Lateral, Cleanout or Pump Station Repair

If the cause of the SSO is structural in nature, the ESD Construction Division shall attempt to repair the pipe, manhole, service lateral, cleanout, or pump station.

FOLLOW ESD POLICIES & PROCEDURES FOR PROPER CONSTRUCTION EQUIPMENT SETUP, OPERATION, AND PIPE AND MANHOLE REPAIR/REPLACEMENT

7.3 Containment

The responding crew shall make reasonable efforts to keep the SSO contained in as small an area as possible.

The responding crew (and/or assisting Construction Division crew) shall attempt to contain the SSO by using sand bags and/or a berm.

7.4 Bypass

After all reasonable efforts have been made to stop or contain the SSO and if the SSO is not anticipated to stop in the immediate future, then the County will implement where feasible bypass procedures to stop or mitigate the SSO.

FOLLOW ESD POLICIES & PROCEDURES FOR PROPER BYPASS PUMPING EQUIPMENT SETUP AND OPERATION

7.5 Unattended Active SSO

In the event that an active SSO must be left unattended due to safety issues, or the need to respond to a higher priority incident, the SSO site shall be delineated or otherwise made visible as needed to prevent public exposure.

The portable **Warning Sign**, carried on Line Maintenance crew trucks and shown in **Figure 1**, shall also be placed at the SSO site and removed when the SSO has ceased.

Figure 1. Portable SSO Notification Sign Placed Near SSO Discharge

7.6 Clean-Up

The maintenance crew shall do the following, as needed, to clean up the impacted area:

- Remove the SSO notification sign(s)
- Use hand tools (shovels, rakes and brooms) to collect any solids for removal and proper disposal
- Use a combination jet-washer/vacuum truck to vacuum up liquids and remaining solids
- Apply lime to the area surrounding the SSO
- If necessary, revisit the location to restore the impacted area to pre-SSO event conditions

8. RECORDKEEPING

8.1 Service Request

After the Crew receives a service request from Dispatch, the Crew shall respond. After the call, the Crew shall prepare a work order.

8.2 SSO Volume Estimation and Discharge Documentation

If the County owns and maintains the SSO discharge source (manhole service lateral, cleanout, pipe, or pump station), or, if the discharge source is privately owned and maintained, but the County is a contributing factor to the SSO occurrence, specific SSO documentation must be completed in accordance with the County's Consent Decree.

After the SSO has been mitigated, the Line Maintenance crews and Crew Supervisor shall estimate the SSO volume using a standard **Volume Estimating Worksheet** (and related tables) provided in **Appendix E** and following the procedures outlined in the SSORRP:

- SSO Volume Estimating Worksheet for Manholes (ESD Form WS1-1)
- SSO Volume Estimating Worksheet for Service Cleanouts (ESD Form WS1-2)
- SSO Volume Estimating Worksheet for Pipes or Cleanouts (ESD Form WS1-3)

The Line Maintenance crew shall measure the estimated height of the overflow using a plastic measuring stick (carried on all trucks). If Line Maintenance personnel cannot safely access the SSO point in order to use the plastic measuring stick, a visual field estimate shall be made.

All relevant field data shall be gathered on-site and recorded by the Line Maintenance crew on the appropriate Volume Estimating Worksheet and the **Wastewater Discharge Reporting Form (ESD Form RF1-1) and Check Lists** provided in **Appendix F**.

The Line Maintenance Crew Supervisor shall request the assistance of ESD engineering staff to perform an alternate SSO volume estimation if:

- Insufficient field data is available to use a standard estimating worksheet
- The standard method produces results that are not reasonable or consistent with field observations
- The nature of the overflow is non-standard
- A more accurate estimation method may be available

8.3 Documentation QA/QC

The Wastewater Discharge Reporting Form, SSO Volume Estimating Worksheet, photographs, and other SSO documentation shall be reviewed in accordance with the procedures outlined in the SSORRP.

The Dispatcher shall verify that the Wastewater Discharge Reporting Form (ESD Form RF1-1) and the Service Request are filled out completely and correctly.

The onsite Supervisor shall review and correct the Wastewater Discharge Reporting Form (ESD Form RF1-1), SSO Volume Estimating Worksheet, photographs, and other documentation.

8.4 Regulatory Report Preparation

The Principal Engineering Inspector shall review all SSO documentation and complete the **24 Hour Report (ESD Form RF2-1)** provided in **Appendix G.**

The Principal Engineering Inspector shall complete the **5-Day Follow-Up Report (ESD Form RF3-1)** provided in **Appendix H**.

9. NOTIFICATION AND REPORTING

All notification and reporting shall be performed in accordance with the County's Consent Decree requirements and as outlined in the SSORRP.

9.1 Sewer Overflow Advisories

If it has been determined that the SSO has reached surface waters (see Section 6.3), and the SSO discharge source is maintained by the county, or the County is a contributing factor to a privately maintained discharge source, Dispatch shall complete a **Sewer Overflow Advisory** form (provided in **Appendix I**) to the **Regulatory Agencies, Officials and Media Outlets** listed in **Appendix J** (as appropriate)**.**

NOTE: the Dispatcher shall notify specific individuals or groups directly if threat of exposure is eminent.

9.2 Regulatory Agencies

If the SSO discharge source (manhole, service lateral, pipe, or pump station) is privately owned and maintained, Dispatch (at request of the Crew) shall notify the JCDH of the SSO occurrence by fax.

Within 24 hours of the SSO event, Dispatch shall notify the Alabama Department of Environmental Management (ADEM) by telephone, and submit the 24-Hour Report (ESD Form RF2-1) to ADEM and the Jefferson County Department of Health (JCDH).

Within 5 days of the SSO occurrence, the Principal Engineering Inspector shall submit the 5-Day Follow-Up Report (ESD Form RF3-1) to the ADEM and JCDH.

Monthly SSO reporting procedures are outlined in the SSORRP.

9.3 The Public

If the SSO has entered surface waters, Line Maintenance crews shall place the portable **Warning Sign** shown in **Figure 1** in the immediate vicinity of the SSO.

If the SSO occurs during wet weather, or if the SSO occurs during dry weather and has an estimated volume greater than 10,000 gallons and reaches surface waters, the portable **Surface Water Sign** shown in **Figure 2** shall be placed at likely points of public access to the affected downstream surface waters.

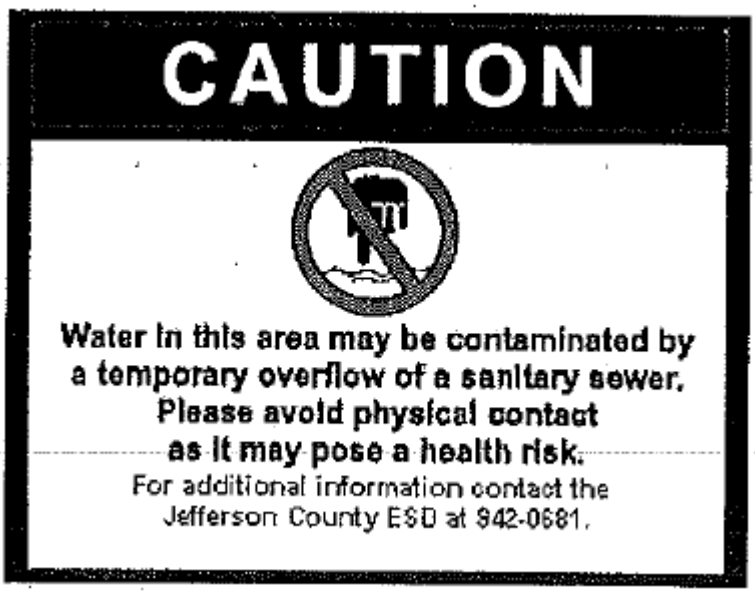


Figure 2. Portable SSO Notification Sign Placed Near Surface Waters

If the SSO occurs during dry weather and has an estimated volume less than 10,000 gallons and reaches surface waters, the portable Warning Sign shown in **Figure 1** shall be placed in a safe and visible location.

Line Maintenance Crews shall remove portable signs after the SSO has ceased and its effects have been mitigated.

10. REFERENCE DOCUMENTS

Jefferson County Environmental Services Department (2012) *Sanitary Sewer Overflow Response and Reporting Program*

Appendix A Personal Protective Equipment

The following items shall be made available for use and carried by all personnel working in the field:

- Splash Protection (Rain Gear)
- Leather Boots (Steel Toe)
- Hearing Protection
- Eye Protection
- Hard Hat
- Gloves
- Dust Mask
- Safety Vest
- Splash Shield
- First Aid Kit
- Waterless soap/disinfectant

Appendix B Initial SSO Notification Call List

Position	Name	Phone Number	Email Address
Sewer Construction / Maintenance Supervisor	Vacant	-	-
Principal Engineering Inspector	Brian Champion	(205) 601-5054	champion@jccal.org
Principal Engineering Inspector	Lavon Evans	(205) 601-5056	evansl@jccal.org
Sewer Video Supervisor	Don Goodwin	(205) 296-2012	goodwind@jccal.org
Public Works Supervisor	Todd Childers	(205) 396-3821	childerst@jccal.org
Public Works Supervisor	Ronnie Collier	(205) 601-5055	ronniecollier@jjcal.org
Public Works Supervisor	Vacant	-	-
Sewer Service Inspector	Jason Ashley	(205) 601-5052	ashleyj@jccal.org
Sewer Service Inspector	Vacant	-	-

Appendix C Spill Response Materials/Basic Field Tools and Accessories

Spill and Complaint Response

- Lime (disinfectant) - 40 pound container
- Digital Camera and batteries
- Stopwatch or Watch
- Plastic Measuring Stick
- Calculator
- Necessary Reporting Forms
- Clipboard and extra Pens

Tool Box

- Screwdrivers – large and small Phillips, large and small flat head
- American standard crescent wrenches set from 7/16-inch to 3/4-inch
- Pipe wrench (2)
- Adjustable wrench - large and small
- Small socket set and American standard sockets 3/8-inch drive
- Socket for draining pump
- Allen wrench set
- "T" handle Allen wrench for truck-sized Allen screws
- Deep well sockets (if needed for truck)
- Pliers, channel locks and side cutters
- Small hammer
- Hack saw
- Wire cutters
- Bailing wire
- Duct tape
- 25- and 100-foot tape measures
- Utility knife
- Lube spray
- Electrical tape and duct tape

Jet Cleaning Tools

- Stoppage nozzle, grease nozzle, invert cleaner, specialty nozzles
- Assorted sized finned extensions for cleaning
- 6-, 8-, 10-, and 12-inch proofing skids
- Upper maintenance hole roller
- Hose splice repair kit - hydraulic jack, dies, hacksaw, 2 splice fittings, 2 male

Field Accessories

- Sewer map
- Appropriate papers – time sheets, backup reports, unscheduled reports, and handouts
- Leader hose and tiger tail
- Dye – green, orange, and red
- Spray paint – green
- Water jug (5 gallon) with cups
- Traffic cones (10 minimum)
- Portable radios – two
- Stove pipe- various sizes
- Poly line
- Flashlight
- Spot light
- Metal detector
- Wheel footage counter
- Hydrant valve with hydrant wrench & key
- Maintenance hole hook, T hook for LIT and 16lb sledge hammer
- Mirror
- Shovels – 1 flat, 1 standard
- Debris traps for 6-, 8-, 10-, and 12-inch pipe with extension pipes
- (6) 5' extension pipes threaded type with couplings
- Spoon shovel (wood handle type)
- 12- foot grabbing tools (clam shovels)
- (2) 5-gallon buckets for debris
- Pruning saw, brush loppers, and machete
- Grease gun and spare cartridge
- Cones
- Magnet with 25 feet of small cord attached
- Skids, Chock blocks
- Spare filters

Appendix D **SSO Picture Procedure**
(*from Appendix C of the SSORRP)*

See following two pages

SSO PICTURE PROCEDURE

Please follow all steps to ensure that SSO pictures comply with requirements.

1) Verify that camera time and date are correct prior to taking pictures.

2) Verify that the time and date stamp is set to be active within the camera.

3) First picture should be taken from the side of the manhole or cleanout to show the height of the discharge on the measuring stick.

4) Second picture should be taken from a distance and angle so that a landmark (i.e.,house, street sign, mailbox) is visible in the picture.

5) If the SSO has ceased upon arrival, pictures are to be taken of the area surrounding the overflow.

6) The minimum number of pictures taken should be two. Additional pictures should be taken if necessary.

7) Please note the address of the closest structure or building to the manhole or cleanout. ***(Reported Location)***

8) The pictures should be submitted to the Public Works Supervisor or Sewer Video Operations Supervisor along with the ***Reported Location*** the same day.

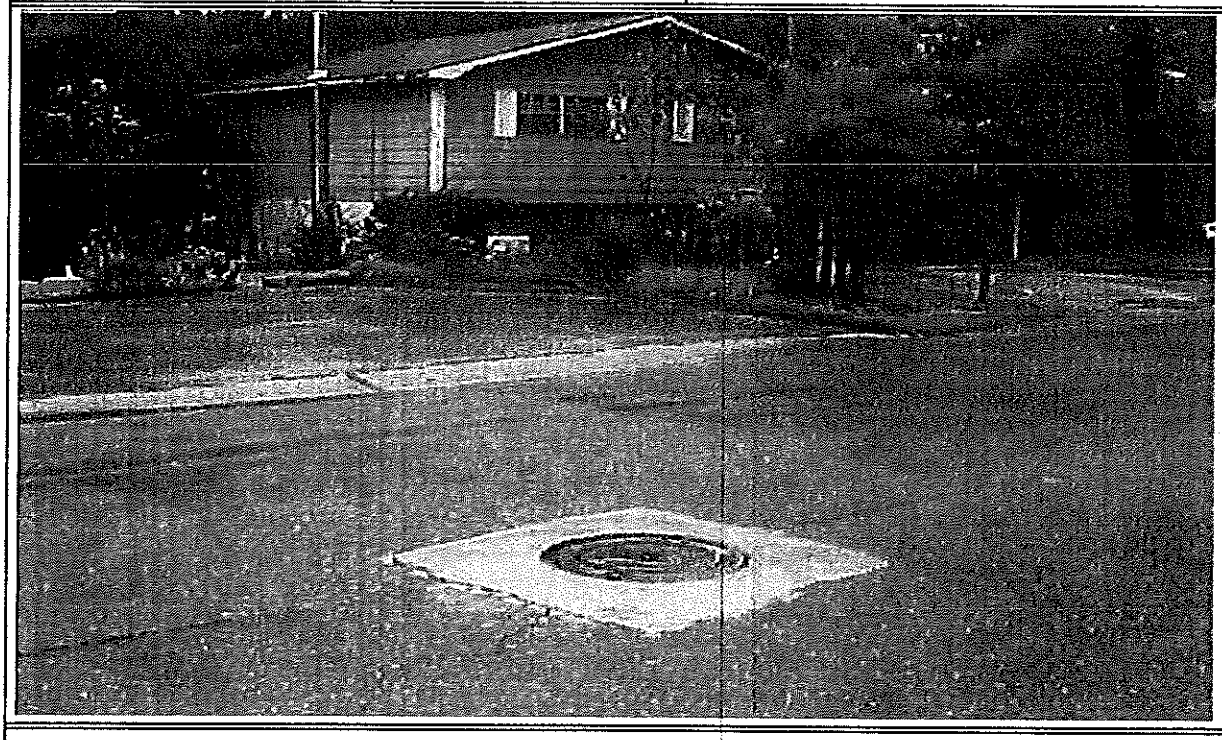
9) The Public Works Supervisor or Sewer Video Operations Supervisor will then forward the pictures along with the signed ***SSO Check List for Line Maintenance*** to the Principle Engineering Inspector.

10) The Principal Engineering Inspector should insert the pictures on the **SSO Picture Form** and insert the required information. ***(Service Request Number, Address of Reported Location, Manhole number for overflowing manhole, Mini-system number for overflowing cleanout)***

11) The Principal Engineering Inspector will save an electronic copy of the SSO Picture Form with a file name of the Service Request Number.

SSO PICTURE FORM

SERVICE REQUEST NUMBER	MANHOLE OR MINI SYSTEM NUMBER	ADDRESS



PEI's Intials _____

Version 1

SSO PICTURE PROCEDURE

Please follow all steps to ensure that SSO pictures comply with requirements.

1) Verify that camera time and date are correct prior to taking pictures.

2) Verify that the time and date stamp is set to be active within the camera.

3) First picture should be taken from the side of the manhole or cleanout to show the height of the discharge on the measuring stick.

4) Second picture should be taken from a distance and angle so that a landmark (i.e.,house, street sign, mailbox) is visible in the picture.

5) If the SSO has ceased upon arrival, pictures are to be taken of the area surrounding the overflow.

6) The minimum number of pictures taken should be two. Additional pictures should be taken if necessary.

7) Please note the address of the closest structure or building to the manhole or cleanout. ***(Reported Location)***

8) The pictures should be submitted to the Public Works Supervisor or Sewer Video Operations Supervisor along with the ***Reported Location*** the same day.

9) The Public Works Supervisor or Sewer Video Operations Supervisor will then forward the pictures along with the signed ***SSO Check List for Line Maintenance*** to the Principle Engineering Inspector.

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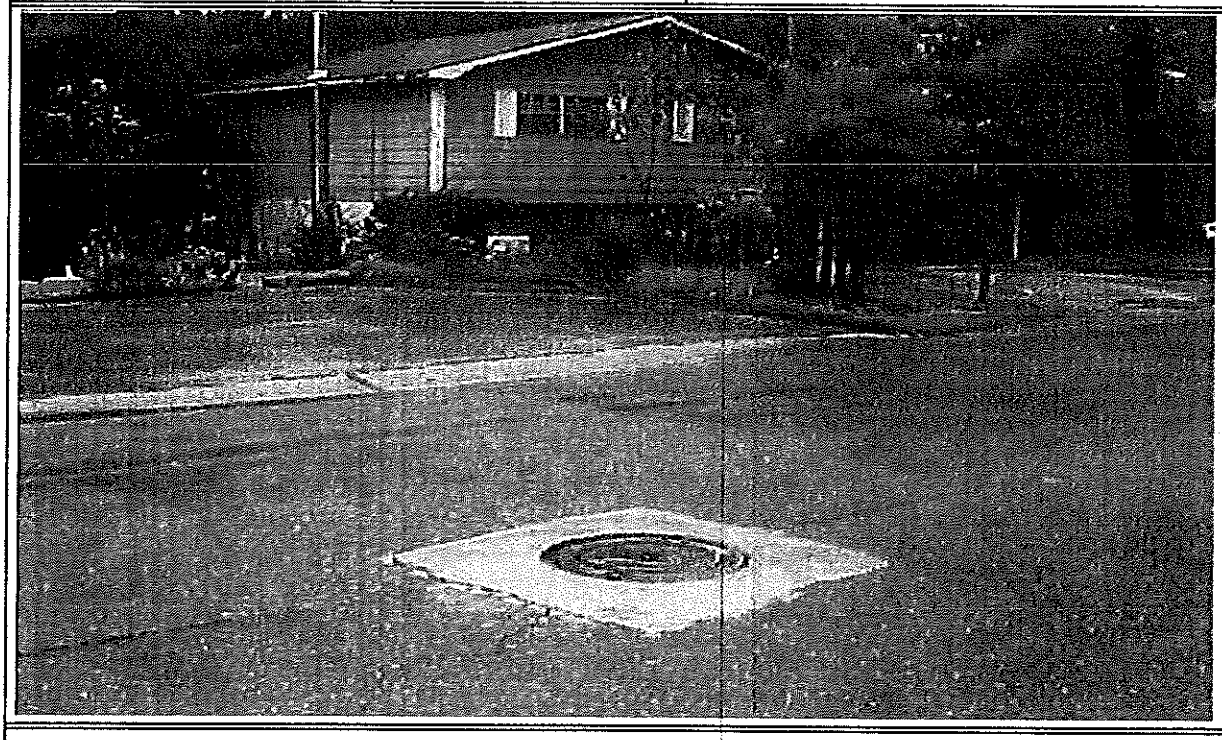
SSO PICTURE FORM

SERVICE REQUEST NUMBER	MANHOLE OR MINI SYSTEM NUMBER	ADDRESS



PEI's Intials _____

Version 1

Appendix E **SSO Volume Estimating Worksheets**
(*from Appendix B of the SSORRP)*

See following three pages

JEFFERSON COUNTY, AL

ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

SSO VOLUME ESTIMATING WORKSHEET FOR MANHOLES

Date: _____ Sewer Service Request Number: _____

If MANHOLE is overflowing or not overflowing at the time the crew arrives at the reported location, pictures will be taken in accordance with the SSO Picture Procedure. The Jefferson County SSO Volume Estimating Procedure will be used to determine the estimated flow rate.

Determine Duration

Time SSO Reported: _____ Time SSO Stopped: _____
(Dispatcher)

Time of Arrival: _____ * Duration of SSO: _____ Minutes

* DURATION OF SSO: If the MH is overflowing when crews arrive, then the SSO Start Time will be the Time SSO Reported (dispatcher) shown above. The duration of the SSO will be the difference between Time SSO Reported and Time SSO Stopped (minutes).

Determine Volume

○ *SSO Digital Photo Measurement - to be used when MH is overflowing upon crew arrival.*

_____ Average measured height from measuring stick.

_____ Cover On or Off _____ Table Used _____ GPM

Volume from Table - _____

Duration of SSO - _____ Minutes

Estimated Volume = _____ Gallons (est. rate in GPM X est. duration in minutes)

○ *Ponding Calculation - to be used when SSO originated from MH, is not overflowing upon crew arrival, but is contained in an area*

Volume of Sewage = length (ft) X width (ft) X depth (ft) X 7.48*

_____ length (ft)
_____ width (ft)
_____ depth (ft)

* 7.48 gallons = 1 ft^3

Volume = _____ ft^3 X 7.48 = _____ Gallons

○ *Not Determinable - when an SSO from a MH is not overflowing upon crew arrival and rate can not be determined.*

Explain: _____

Crew # : _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

JEFFERSON COUNTY, AL
ENVIRONMENTAL SERVICES DEPARTMENT
Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

Date: Sewer Service Request Number:

SSO VOLUME ESTIMATING WORKSHEET FOR SERVICE CLEANOUTS

1 Determine diameter (d) of service cleanout. = _____ inches
2 Estimate height (h) of flow from service cleanout. = _____ inches
3 Determine estimated flow rate (Q) from charts below. = _____ gpm
4 Estimate time (t) of discharge. = _____ minutes
5 Multiply step 3 & 4 to obtain estimated volume. = _____ Gallons

4" Diameter Cleanout	
h (in)	Q (gpm)
0.25	6
0.5	14
0.75	24
1	35
1.5	60
2	86
2.5	108
3	128
3.5	145
4	160
4.5	173
5	184
6	205
7	223
8	239
9	254
10	268
11	282
12	295
14	320
16	345
18	367
20	388

6" Diameter Cleanout	
h (in)	Q (gpm)
0.25	9
0.5	23
0.75	40
1	58
1.5	100
2	150
2.5	205
3	250
3.5	293
4	330
4.5	365
5	395
6	445
7	485
8	520
9	550
10	585
11	631
12	650
14	705
16	755
18	800
20	850

Time SSO Reported: (Dispatcher)

Time of Arrival:

Time SSO Stopped

* Duration of SSO

Minutes

*Duration of SSO: If the cleanout is overflowing when crews arrive, then the SSO start time will be the time SSO reported (dispatcher) shown above. The duration of SSO will be the difference between time SSO reported and time SSO stopped (minutes).

Crew #: _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

Disclaimer:

This table was developed by the Jefferson County ESD utilizing *Chapter 14-Measurements in Pressure Conduits, Section 13-Trajectory Methods* of the *U.S. Department of the Interior Bureau of Reclamation Water Measurement Manual.* This table is provided as an example. Other Agencies may want to develop their own estimating tables.

JEFFERSON COUNTY, AL

ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

SSO VOLUME ESTIMATING WORKSHEET FOR PIPES OR CLEANOUTS

Date: _____ Sewer Service Request Number: _____

If CLEANOUT is overflowing or not overflowing at the time the crew arrives at the reported location, pictures will be taken in accordance with the SSO Picture Procedure. The Jefferson County SSO Volume Estimating Procedure will be used to determine the estimated flow rate.

Determine Duration

Time SSO Reported: _____ Time SSO Stopped: _____
(Dispatcher)

Time of Arrival: _____ * Duration of SSO: _____ Minutes

* DURATION OF SSO: If the PIPE is overflowing when crews arrive, then the SSO Start Time will be the Time SSO Reported (dispatcher) shown above. The duration of the SSO will be the difference between Time SSO Reported and Time SSO Stopped (minutes).

Determine Volume

○ *Determine number of residential connections upstream of overflow. Each residence contributes approximately 250 gal/day-res (100 gal/day-cap X 2.5 cap/res), or 10.5 gal/hr-res (0.175 gal/min-res).*

Res. Connections - _____ X 0.175 = _____ GPM
Duration of SSO - _____ Minutes
Estimated Volume = _____ Gallons (est. rate in GPM X est. duration in minutes)

○ *Ponding Calculation - to be used when SSO is not overflowing upon crew arrival, but is contained in an area.*

Volume of Sewage = length (ft) X width (ft) X depth (ft) X 7.48* _____ length (ft)
_____ width (ft)
_____ depth (ft)

* 7.48 gallons = 1 ft^3

Volume = _____ ft^3 X 7.48 = _____ Gallons

○ *Volume computed by Engineering Staff of ESD - Attach copy of supporting documentation and Engineer's name.*

Comments: _____

Crew # : _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

JEFFERSON COUNTY, AL

ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

SSO VOLUME ESTIMATING WORKSHEET FOR MANHOLES

Date: _____ Sewer Service Request Number: _____

If MANHOLE is overflowing or not overflowing at the time the crew arrives at the reported location, pictures will be taken in accordance with the SSO Picture Procedure. The Jefferson County SSO Volume Estimating Procedure will be used to determine the estimated flow rate.

Determine Duration

Time SSO Reported: _____ Time SSO Stopped: _____
(Dispatcher)

Time of Arrival: _____ * Duration of SSO: _____ Minutes

* DURATION OF SSO: If the MH is overflowing when crews arrive, then the SSO Start Time will be the Time SSO Reported (dispatcher) shown above. The duration of the SSO will be the difference between Time SSO Reported and Time SSO Stopped (minutes).

Determine Volume

○ *SSO Digital Photo Measurement - to be used when MH is overflowing upon crew arrival.*

_____ Average measured height from measuring stick.

_____ Cover On or Off _____ Table Used _____ GPM

Volume from Table - _____

Duration of SSO - _____ Minutes

Estimated Volume = _____ Gallons (est. rate in GPM X est. duration in minutes)

○ *Ponding Calculation - to be used when SSO originated from MH, is not overflowing upon crew arrival, but is contained in an area*

Volume of Sewage = length (ft) X width (ft) X depth (ft) X 7.48*

_____ length (ft)
_____ width (ft)
_____ depth (ft)

* 7.48 gallons = 1 ft^3

Volume = _____ ft^3 X 7.48 = _____ Gallons

○ *Not Determinable - when an SSO from a MH is not overflowing upon crew arrival and rate can not be determined.*

Explain: _____

Crew # : _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

JEFFERSON COUNTY, AL
ENVIRONMENTAL SERVICES DEPARTMENT
Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

Date: Sewer Service Request Number:

SSO VOLUME ESTIMATING WORKSHEET FOR SERVICE CLEANOUTS

1 Determine diameter (d) of service cleanout. = _____ inches
2 Estimate height (h) of flow from service cleanout. = _____ inches
3 Determine estimated flow rate (Q) from charts below. = _____ gpm
4 Estimate time (t) of discharge. = _____ minutes
5 Multiply step 3 & 4 to obtain estimated volume. = _____ Gallons

4" Diameter Cleanout	
h (in)	Q (gpm)
0.25	6
0.5	14
0.75	24
1	35
1.5	60
2	86
2.5	108
3	128
3.5	145
4	160
4.5	173
5	184
6	205
7	223
8	239
9	254
10	268
11	282
12	295
14	320
16	345
18	367
20	388

6" Diameter Cleanout	
h (in)	Q (gpm)
0.25	9
0.5	23
0.75	40
1	58
1.5	100
2	150
2.5	205
3	250
3.5	293
4	330
4.5	365
5	395
6	445
7	485
8	520
9	550
10	585
11	631
12	650
14	705
16	755
18	800
20	850

Time SSO Reported: (Dispatcher)

Time of Arrival:

Time SSO Stopped

* Duration of SSO

Minutes

*Duration of SSO: If the cleanout is overflowing when crews arrive, then the SSO start time will be the time SSO reported (dispatcher) shown above. The duration of SSO will be the difference between time SSO reported and time SSO stopped (minutes).

Crew #: _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

Disclaimer:

This table was developed by the Jefferson County ESD utilizing *Chapter 14-Measurements in Pressure Conduits, Section 13-Trajectory Methods* of the *U.S. Department of the Interior Bureau of Reclamation Water Measurement Manual.* This table is provided as an example. Other Agencies may want to develop their own estimating tables.

JEFFERSON COUNTY, AL

ENVIRONMENTAL SERVICES DEPARTMENT

Suite A-300
716 Richard Arrington Jr. Boulevard, N
Birmingham, AL 35203

SSO VOLUME ESTIMATING WORKSHEET FOR PIPES OR CLEANOUTS

Date: _____ Sewer Service Request Number: _____

If CLEANOUT is overflowing or not overflowing at the time the crew arrives at the reported location, pictures will be taken in accordance with the SSO Picture Procedure. The Jefferson County SSO Volume Estimating Procedure will be used to determine the estimated flow rate.

Determine Duration

Time SSO Reported: _____ Time SSO Stopped: _____
(Dispatcher)

Time of Arrival: _____ * Duration of SSO: _____ Minutes

* DURATION OF SSO: If the PIPE is overflowing when crews arrive, then the SSO Start Time will be the Time SSO Reported (dispatcher) shown above. The duration of the SSO will be the difference between Time SSO Reported and Time SSO Stopped (minutes).

Determine Volume

○ *Determine number of residential connections upstream of overflow. Each residence contributes approximately 250 gal/day-res (100 gal/day-cap X 2.5 cap/res), or 10.5 gal/hr-res (0.175 gal/min-res).*

Res. Connections - _____ X 0.175 = _____ GPM
Duration of SSO - _____ Minutes
Estimated Volume = _____ Gallons (est. rate in GPM X est. duration in minutes)

○ *Ponding Calculation - to be used when SSO is not overflowing upon crew arrival, but is contained in an area.*

Volume of Sewage = length (ft) X width (ft) X depth (ft) X 7.48* _____ length (ft)
_____ width (ft)
_____ depth (ft)

* 7.48 gallons = 1 ft^3

Volume = _____ ft^3 X 7.48 = _____ Gallons

○ *Volume computed by Engineering Staff of ESD - Attach copy of supporting documentation and Engineer's name.*

Comments: _____

Crew # : _____ Signed: _____

I certify that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information. I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information.

Appendix D Bypass Pumping System SOP

Bypass Pumping System Operation

1. OBJECTIVE

The objective of this SOP is to establish a standard procedure for the Jefferson County Environmental Services Department (ESD) personnel to plan, install, maintain, break down, and demobilize a sewer bypass pumping system.

2. DEFINITIONS

2.1 **Bypass Pumping System Watch Schedule** – a listing of ESD personnel assigned to perform Pump Watch duties for each shift. This list is created by the Responsible ESD Supervisor.

2.2 **Bypass Pumping System Checklist** – a listing of items that are checked by ESD personnel assigned to the Pump Watch. These items are checked upon initial start-up and every hour on the half hour. This checklist is created by the Responsible ESD Supervisor.

2.3 **Bypass Pumping System Demobilization Checklist** – a listing of items that are checked by ESD personnel during the bypass pump system demobilization process.

3. POLICY

3.1. Certain circumstances necessitate the construction and maintenance of a temporary sewer bypass pumping system in the ESD's wastewater collection system to keep continuous and reliable flow. These instances involve planned construction work and/or emergency sanitary sewer overflow (SSO) response.

Temporary sewer bypass systems typically consist of primary and secondary bypass pumps, intake hoses, discharge hoses, pneumatic pipe plugs, and other equipment necessary to provide continuous flow, in turn preventing sewage backups, SSOs, and allowing for SSO containment.

3.2. ESD personnel are responsible for accurately planning the bypass pump system, and should base configuration and sizing the pumps according to the size of the pipe to be bypassed and the application (emergency or planned), when handled internally.

For large diameter pipe bypass systems, ESD Engineering staff may provide adequate flow information, pump and pipe sizing, and other configuration design support. ESD is responsible for installing, operating, maintaining, breaking down and demobilizing temporary bypass pumping systems.

In some cases, as dictated by a Sewer Construction/Maintenance Supervisor (SCMS), Chief Civil Engineer, Deputy Director or Director, or appointed designee, a contractor may design, install, maintain, break down, and demobilize the temporary bypass pumping system. ESD may be responsible for providing operational support during these cases.

3.3 The expected Response Time for ESD personnel to mobilize and set up a bypass pump system for emergency response is 3 to 4 hours, unless a contractor's service is required.

3.4 ESD personnel who may be involved with bypass pumping during normal work assignments (including overtime) shall receive documented hands-on training for bypass pumping system operations at least once per calendar year or per job site.

3.5 Personal Protective Equipment (PPE) will be used by each employee on the work site per Section 3.1 of the ESD Collection System Safety Program Plan.

The Safety Program Plan is included in the ESD Capacity, Management, Operations and Maintenance (CMOM) Program, available in the Crew Leads' offices.

3.6 If a confined space entry is required, ESD will follow all Confined Space Program requirements as delineated in Section 3.2 of the ESD Collection System Safety Program Plan.

The Safety Program Plan is included in the ESD CMOM Program Plan, available in the Crew Leads' offices.

3.7 In the event of a sewer overflow, ESD personnel will follow all response and reporting provisions of the **Sanitary Sewer Overflow Response and Reporting Plan (SSORRP)**, current version.

A copy of the SSORRP is included in the CMOM Program Plan, available in the Crew Leads' offices.

4. PROCEDURES

4.1 Bypass Pumping Operations Design and Planning

4.1.1 The Responsible ESD Supervisor may be one of the following, as determined by the Chief Civil Engineer, Deputy Director, or Director:

a) Sewer Construction / Maintenance Supervisor (SCMS)

b) Construction Supervisor (CS)

c) Principal Engineering Inspector (PEI)

d) Public Works Supervisor (PWS)

4.1.2 ESD Engineering staff will research bypass pumping flow data during the design phase of a project or the response to an emergency. The flow data will serve as the best-available sewer system flow information, from which the Responsible ESD Supervisor (or designee) can determine the required bypass pump sizes and appropriate system configuration.

4.1.3 A list of vehicles, equipment and tools that may be used to perform this work is provided in **Attachment A**.

4.1.4 The Responsible ESD Supervisor will determine the type of traffic control required in accordance with the Manual of Uniform Traffic Control Devices (MUTCD). The Responsible ESD Supervisor will determine if a combination cleaner crew will be assigned to assist in pump set up, pump and/or hose repair/failure and pump shut down.

4.1.5 The Responsible ESD Supervisor will develop a **Bypass Pumping System Checklist** for site specific conditions that the ESD will use while the bypass pumping system is in operation. An example **Bypass Pumping System Checklist** is provided in **Attachment B**.

4.1.6 The Responsible ESD Supervisor will develop a **Bypass Pump Watch Schedule** for ESD to follow during bypass pumping operations. An example **Bypass Pump Watch Schedule** is provided in **Attachment C**.

4.2 ESD utilizes three different types of pumps for bypass pumping as described below, as well as one pump hose/ utility trailer.

a) **Towable hose reel pump trailer** - this is an all-in-one trailer equipped with a pump, gas tank, suction hose and discharge hose.

b) **Towable pump trailer** – this trailer is equipped with one pump and gas tank.

c) **Hand carried pump** – this is a small pump that can be hand-loaded onto a vehicle and taken to the work site.

d) **Hose trailer** – this is a trailer that carries suction and discharge hoses, strainers, tools, sandbags, extra couplers, gaskets, pneumatic pipe plug, poles, wood, and discharge hoses.

4.3 Equipment Preparation

The assigned ESD Heavy Equipment Operator (HEO) or Construction Equipment Operator (CEO) will perform a walk around inspection to verify all components are loaded onto the bypass pumps and hose trailer. In addition, the following will be completed:

a) Check the oil level of the pump engine; add oil if needed.

b) Check fuel level; add fuel if needed.

c) Start pump and verify batteries are charged. Replace batteries if needed.

d) Verify that the proper number of hard suction hoses and the suction strainer are on the trailer, secured to the floor and/or side brackets.

e) Verify that there is enough lay-flat discharge hose on the trailer to reach the furthest manhole access points in the system, and that it is rolled up uniformly (female end out) and secured for travel.

f) Inspect the trailer tires for proper inflation.

g) Inspect the trailer hitch and safety chain assembly, and verify that the trailer hitch leveling jack are operable.

4.4 Mobilization

a) For each trailer to be towed, secure the trailer hitch to the towing vehicle. Verify that the hitch is secured to the ball and safety chains are properly attached.

b) Raise the trailer hitch leveling jack to avoid damage to the assembly during travel.

c) Plug in the trailer lights and check that all functions are operational.

d) Verify the load on the trailer is secured before transport.

e) Tow the bypass pump and/or hose trailer to the assigned work site.

4.5 Bypass Pumping System Set Up

4.5.1 Whenever possible, determine before arriving at the work site where the bypass pump should be positioned in the roadway or right-of-way. When responding to a SSO or surcharged pipe, the pumps should be set up from the surcharged manhole to the first available dry downstream manhole.

4.5.2 Look for, and take into consideration, any traffic concerns or other hazards that may exist on or near the site. Determine the appropriate traffic control requirements (flaggers, police, devices, etc.) or if the street must be closed. Place traffic control devices at each manhole and along the path of the discharge hose in accordance with ESD and MUTCD requirements.

4.5.3 If the pumps must be hand-carried to the manhole, make sure an adequate number of personnel is available to safely move the pumps, hoses, and tools.

4.5.4 Once at the work site, observe the following procedures before operation:

a) Maneuver the truck(s) and trailer(s) so the bypass pumps and suction hose can be most easily offloaded for use.

b) If needed, place traffic control devices at each manhole and along the path of the discharge hose with caution tape.

c) Set portable spill trays under each pump.

d) Request that a combination cleaning truck be made available to be stationed onsite. If available, verify the combination cleaner is onsite and ready to deploy to mitigate any pump or hose spill.

4.5.5 Perform the following steps for each pump:

a) Attach the suction strainer to the hard suction hose, and place the strainer in the surcharged manhole.

Consult the original equipment manufacturer (OEM) User Manual for maximum pump draft capabilities. Copies of the user manuals are kept in the Construction Division Sewer Maintenance/Construction Supervisor’s office.

b) Attach the hard suction (intake) hose to the suction port of the pump.

c) Attach the discharge hose to the discharge port of the pump.

d) Set up the discharge hose from the pump site to the discharge manhole. Once the hose sections are laid out, verify there is a gasket inside each quick disconnect coupling prior to connecting each hose section.

e) Verify there are no hard bends in the hose that may restrict flow during bypass pumping operations.

f) Secure the end of the discharge hose so it does not come out of the manhole.

g) Install hose ramps at locations where pedestrians or vehicles will traverse the discharge hose. Set out “BUMP” notification signs to give warning of a sharp change in the roadway profile.

4.5.6 Install the pneumatic pipe plug for temporary sewer bypass pumping.

a) Clean the plug and inspect for surface tears, cuts, or any other damage

b) Make sure air valve is removed from stem

c) Connect airline and inflate to test plug before use

d) Always use accurate air pressure gauges

e) Never exceed the maximum inflation pressure for the plug

f) Always choose the proper size of pneumatic plugs for pipe size

g) Use chain and/or rope and poles to handle, install and remove plug from pipe; secure chain or rope attached to the plug to a manhole step or other immovable object

h) Clean the pipeline thoroughly before inserting the pneumatic plug

i) Always correctly insert the pneumatic plug into pipeline

4.7 Bypass Pumping System Operation

4.7.1 Start the Pumps

Perform the following steps for each **wet prime pump**:

a) Open the priming chamber cap.

b) Pour water into the chamber to prime the pump.

c) Close chamber cap.

d) Start the pump to begin drawing water from the surcharged manhole.

To prime the pump, the discharge hose may need to be folded temporarily to stop the water flow.

Note: if the pump does not prime, check for foreign material in the priming chamber that may be blocking water flow.

Perform the following steps for each **dry prime pump**:

a) Start the pump to begin drawing water from the surcharged manhole.

Note: if the pump does not prime, check for foreign material in the priming chamber that may be blocking water flow.

The Responsible ESD Supervisor should contact an ESD Pump Station crew to address any unresolved pump problems.

4.7.2 Pump Operation

a) Pump water from the surcharged manhole to the discharge manhole.

b) When able, maintain a set water level in the surcharged manhole using the pump throttle (opposed to starting and stopping the pump). Continue pumping until the need for the bypass has ended.

c) The Responsible ESD Supervisor will determine if automatic floats should be used to turn the pump on and off during varying flow levels.

d) During pump operation, walk along the discharge hose alignment to verify the hose connections are tight and are not leaking.

i. If a connection leak develops, use combination cleaning machine, absorbent rags, or sandbags to contain the leak.

ii. If a small leak in the discharge hose develops, use a heavy industrial tape to seal off the leak or replace section and repair or replace the hose once the bypass operation is completed.

iii. If a large (significant) leak is detected, properly contain all spilled material while the leaking hose is replaced. The site supervisor will determine if the secondary bypass pump system (backup) is available and will be used while the primary bypass pump system is repaired.

If needed, the job site supervisor will request the assistance of a combination cleaning machine crew to contain the residue of the leaking discharge hose during repairs.

Upon completion of the repair, the primary bypass pump system will be re-engaged and inspected for any other leaks.

Note: follow all provisions of the ESD Sanitary Sewer Overflow Response and Reporting Program (SSORRP). A copy of the SSORRP Plan is included in the ESD CMOM Program Plan, available in the Crew Leads' offices.

4.8 Bypass Pump System Shut Down

Once notified by a Responsible ESD Supervisor that the bypass pumping system operation is no longer needed, the job site supervisor will request a combination cleaning machine truck to return to the jobsite and will direct ESD to follow the steps below for each pump:

a) If pneumatic plug is installed in the downstream line, deflate the pneumatic plug.

b) Confirm flow has been restored to the downstream manhole.

c) Shut down the pump.

d) Remove pneumatic plug.

e) Detach the hard suction hose from the suction port of the pump, using caution not to spill any wastewater.

Allow the wastewater to drain back down the hard suction hose into the manhole.

f) Wash down the manhole and clean the suction hose and strainer.

g) Remove the hard suction hose and strainer from the manhole.

h) Replace the manhole cover and secure with locking system (if necessary).

i) Remove the strainer from the suction hose and break down the sections of suction hose.

Return the suction hose and the strainer to the proper storage areas on the trailer.

j) Detach the discharge hose from the discharge port of the pump, using caution not to spill wastewater.

Raise the discharge hose and slowly move to the next hose connection so that wastewater drains through the hose to the downstream manhole.

As each section of discharge hose is drained, rinse the discharge hose after the wastewater has been drained and detach the discharge hose coupling. Continue the process until the discharge hose is fully drained.

k) Roll up hose (for lay-flat hose, verify the female end is out), tie up roll of discharge hose, and load onto the trailer. Mark hoses that require repairs. Secure the discharge hose for travel.

l) Remove the hard suction hoses from the far manhole. Replace the manhole cover and secure with locking system (if necessary). Return the hard suction hose sections to the proper storage areas on the trailer(s).

4.9 Demobilization

a) Move portable pumps to the trailer(s) or vehicle(s). Utilize the appropriate number of personnel to move and lift the portable pumps (if used) and equipment onto the trailer.

Move trailered pump equipment to the appropriate trailer.

b) Return all tools used during the operation to the appropriate trailer or vehicle.

c) Secure the loads for travel.

d) Re-hitch towed trailers.

e) Confirm the site is cleaned up.

f) Return the bypass pump trailer(s) to the yard and detach from the towing vehicle. Remove any hoses or items needing repair, and cover with the protective tarp.

g) Turn in damaged hoses to the appropriate work group for repairs.

h) Complete the **Bypass Pumping System Demobilization Checklist** and submit to the job supervisor for acceptance. An example **Bypass Pumping System Demobilization Checklist** is provided in **Attachment D**.

ATTACHMENTS

A. Vehicle, Equipment, and Tool List

B. Example Bypass Pumping System Checklist

C. Example Bypass Pumping System Watch Schedule

D. Example Demobilization Checklist

Attachment A Vehicle, Equipment and Tool List

Vehicles
- Combination cleaner
- Dump truck
- Crew truck
- Full size Pickup
- Hose/utility trailer

Equipment
- Excavator
- Skid steer loader
- Backhoe
- Forklift
- Light tower
- Compressor
- Generator

Trailer Mounted Pump & Trailer Supplies
- 8-inch pump
- 8-inch hard suction hose
- 8-inch lay-flat discharge hose
- Suction strainer attachments
- Coupling gaskets

Portable Pumps & Supplies
- 3-inch portable pumps
- 4-inch portable pumps
- Various sizes and lengths of lay-flat discharge hoses
- Suction strainer attachments
- Coupling gaskets

Other Bypass Pumping-Related Equipment
- Pneumatic pipe plugs
- Air compressor
- Inflation hose
- Chains
- Rope
- Poles
- Shackles
- Hose ramps

Toolbox
- Flat head screwdrivers
- Phillips head screwdrivers
- Crescent wrenches
- Pipe wrenches (at least two)
- Small Socket set
- Hack saw and extra blades
- Allen wrench set
- Pliers and side cutters
- Bailing wire
- Duct tape
- 25- and 100-foot tape measures
- Utility knife
- Wire cutters
- Box end wrenches
- Framing hammers
- Pick hammer
- Vise grip
- Manhole bolt sockets
- Nut driver
- Hose clamps

General Tools
- Sandbags
- Manhole hook
- Sledge hammer
- Broom
- Shovels
- Digging bar
- Handheld radios
- Absorbent rags
- Hose repair tape
- Fuel can and funnel
- 5-gallon buckets
- Flashlights
- Batteries
- Trash bags
- Plastic ties
- Mirror
- Motor oil
- Spray oil
- Rags
- Spray paint
- Measuring wheel walker
- Temporary Fence
- Caution tape
- Small work lights

Safety Equipment
- Personal Protective Equipment
- Confined space entry equipment
- Traffic control devices
- Bump notification signs

Attachment B Example Bypass Pumping System Checklist

HARBOR DR EMERGENCY BY-PASS SYSTEM

ALL PERSONNEL MUST WEAR PPE (STEEL TOE BOOTS / TRAFFIC VEST / HARD HAT) ETC. AND HAVE A RADIO WITH YOU AT ALL TIMES

PUMP WATCH EMPLOYEES MUST COMPLETE THIS FORM EVERY HOUR ON THE HALF HOUR AND INITIAL

Pump Location: **Pump #:** **Date:**

Park by Pump #3, put on all safety PPE, meet with crew on site, exchange & update any and all information, obtain radio from employee, make contact with Godwin employee

	7:30	8:30	9:30	10:30	11:30	12:30	13:30	14:30	15:30	16:30	17:30	18:30	19:30	20:30	21:30	22:30	23:30	0:30	1:30	2:30	3:30	4:30	5:30	6:30
Walk the Hi-Line from pump #3 to pump #2																								
Check all joints for leaks																								
Check all Air Plugs																								
Check all Airvacs for leaks																								
Check Pump #3 & #2 for Vacuum Pressure																								
Check Pump #3 & #2 temperature on Pump unit																								
Inspect #1 manhole in sidewalk by NASSCO BI.																								
Check Air Gauge for #2 manhole, air bag set at 15 pounds																								
Vactor #1 & #2 manholes, time set at 6:00 to 8:00 and 18:00 to 20:00																								
Turn on & off Light Towers																								
Check & Initial each box																								
CALL STAND-BY SUPERVISO[illegible]MEL[illegible]ELY [illegible]MP O[illegible]MPS FAIL OR IF ANY SEWER SPILLS FROM SYSTEM																								
Advise Godwin pump employee																								
Turn on #3 Back Up Pump																								
Turn idle down																								
Turn off Pump																								
Open ball valve on bottom of pump, close it																								
Turn on pump, if pump still not running correctly shut pump off																								
Need to remove top bonnet and remove debris from inside																								
COMMENTS:																								

Attachment C Example Bypass Pumping System Watch Schedule

HARBOR DR EMERGENCY BYPASS PUMP WATCH SCHEDULE

1ST NAME LISTED IS CREW LEADER AFTER EACH SHIFT

CREW LEADER COMPLETES OVERTIME REPORT WITH BOTH EMPLOYEES ON IT, VERIFIES THAT THAT PORTABLE ENGINE RUN HOUR LOG AND ASSIGNMENT LIST IS COMPLETED FOR THE SHIFT AND RETURN THEM TO SUPERVISOR

CHARGE # XXXXXXXXXXXX ON OT REPORT & TIME CARD
CALL SUPERVISOR ASAP (XXX)- XXX-XXXX IF YOU CAN NOT WORK YOUR SCHEDULED TIME
YOU CAN NOT BE ON STAND-BY OR EXCHANGE YOUR STAND-BY FOR THE DAY / SHIFT

***** ALL SHIFT CHANGES MUST BE DONE WITH ALL 4 EMPLOEES ON SITE!**

****** YOU WILL BE REMOVED FROM SITE AND LIST FOR FAILING TO MEET SCHEDULED TIME!**

MON 8TH		MON 15TH	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH
TUES 9TH		TUES 16TH	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH
WED 10TH		WED 17TH	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH
THURS 11TH		THURS 18TH	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH
FRI 12TH		FRI 19TH	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH
SAT 13TH		SAT 20TH	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH
SUN 14TH		SUN 21ST	
1530 - 2330	B. SMITH - B. SMITH	1530 - 2330	B. SMITH - B. SMITH
2330 - 0700	B. SMITH - B. SMITH	2330 - 0700	B. SMITH - B. SMITH

Attachment D Example Bypass Pumping System Demobilization Checklist

Bypass Pumping System Demobilization Checklist			
Task Details: These tasks shall be completed after every use to validate readiness and performance when the pumps are required for an emergency response and/or planned usage			
Instructions for: City Hose reel trailer, pumps and hose/utility trailer			
Complete the following items and record **ALL** information:		**circle one**	
Check fuel tank level and fill up if needed	completed	yes	no
Comments:			
Wipe down and clean pump and trailer	completed	yes	no
Comments:			
Request tool room personnel to have pump trailers and or pumps serviced	completed	yes	no
Need tool room signature and date:			
Comments:			
Repair, replace any items and/or turn into tool room	completed	yes	no
Comments:			
Visually inspect hose/utility trailer's overall condition	completed	yes	no
Comments:			
Clean up and organize hose/utility trailer	completed	yes	no
Comments:			
Replace missing items	completed	yes	no
Comments:			
Check hose/utility trailer tow chains, hooks and electrical/light plug	completed	yes	no
Comments:			
Check trailers for damage to landing gear, stabilizer jacks, marker/break lights	completed	yes	no
Comments:			
Return to storage area, cover, secure all support equipment and for transport	completed	yes	no
Comments:			
Have all unsatisfactory items been turned in for repair?		yes	no
If not, why?			
Print Name:			
Sign Name:		Date:	

Appendix E Easement Clearing SOP

Easement Clearing

Objective:

To describe safe and effective procedures to clear unimproved easements.

Responsibilities:

Easement clearing work shall be scheduled by the supervisor.

Task:

Using heavy equipment and cutting tools to clear trees, shrubs, and other growth from sewer line easements to facilitate maintenance and/or repair operations.

Performance Standard:

Staff performing or assisting with the use of heavy equipment and cutting tools should have knowledge of proper equipment/tool operation and appropriate safety measures.

Safety and Field Cautions:

Safeguards must exist for any machine part, function, or process that may cause injury. When the operation of a machine or accidental contact with it poses harm to the operator or others in the vicinity, the hazards must be either controlled or eliminated.

It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation they may encounter. Operators and other personnel shall wear weather-appropriate clothing, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and hearing and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters and operation procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not use this equipment in the field without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor variabilities in operation or machine performance, along with field operation instruction.

Tools and Equipment: See Attachments A and B

Procedures

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with ESD Personal Protective Equipment and Traffic Control policies.

Pre-Trip Duties:

1. Review assigned work order(s) to determine the appropriate heavy equipment and cutting tools to be used.

2. Load heavy equipment on trailer(s), and verify loads are secure.

3. Perform vehicle pre-trip inspections.

4. Conduct equipment checks, and load equipment and required fuel on appropriate trucks.

Arrival at the Site:

1. Upon arrival at the site, confirm that the easement to be cleared matches the location listed on the paperwork.

2. Position the trucks and trailer(s) in the best manner that provides access for equipment and limits exposure to traffic.

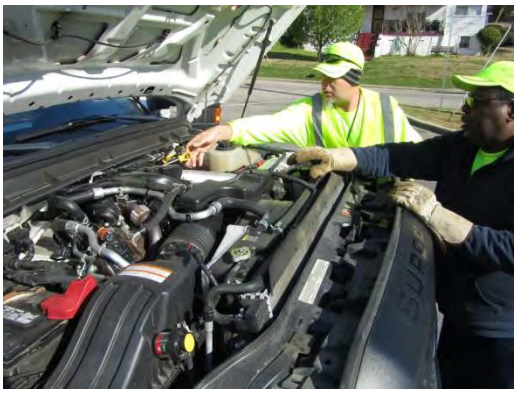
   Avoid blocking the entire street, unless it is absolutely necessary.

3. Place protective road cones around the work area.

4. Verify the trailer is located on terrain suitable for equipment deployment. Deploy the trailer ramp.

   Unload the equipment from the trailer.

   Return the ramp to the trailer. Secure any tools from the trailer and lock the towing vehicle.



Easement Clearing Operations:

1. Use the appropriate equipment to cut a narrow path into the easement.

   Use the Fecon machine for heavy brush cutting.

   Use the skid steer loader equipped with a brush hog for low brush and grass cutting.

   NOTE: Keep a fire extinguisher nearby at all times as brush and vines may catch fire during the cutting process.

2. Use axes, machetes, or Gerber knives to locate hazards and obstacles such as elevated manholes, force main cleanouts, and cables that could be damaged by heavy equipment, cause injuries, or become entangled in the equipment.

3. Make several passes with the heavy equipment to open easement up further until there is sufficient space to bring sewer cleaning, inspection, and/or repair equipment into the easement.

   NOTE: Use extreme caution when working near heavy equipment as the operator's visibility is limited.

4. Use heavy equipment to cut down brush and small trees to the limits of the easement.

5. Continue to clear the area; cut brush at stream crossings and other challenging terrain by hand.

NOTE: Easements are typically cleared in sections: one section is fully cleared, then a path is piloted into the following section. This process is repeated until the entire length of the easement is cleared and all manholes and cleanouts have been located.

If a manhole frame and/or cover are damaged during the cleaning process, report the manhole to the Supervisor to request the necessary repair.

Removing Cable and Vines from the Cutter:

Periodically, the brush hog (cutter) will become obstructed by heavy cables, wires, and vines when operating. The material may need to be removed by hand.

1. Raise the cutter to access the material to be removed. Engage the hydraulic stop for the cutter arms, or use a suitable prop to hold the cutter up.

NOTE: Use extreme caution when working under the cutter and boom assembly.

The wire or vine material should unwind from the cutter shaft when pulled from the blade.

If the material cannot be removed by hand, return the brush hog to the yard for maintenance.

Using a Bulldozer to Remove Cuttings:

1. Due to the bulldozer's weight and hard tracks, unload and load it from the trailer as close to the easement entry as possible to limit potential damage to roadways and property.

2. Use the bulldozer to push piles of refuse and cut materials to the sides of the easement.

3. Level mounds of dirt and fill holes in the easement as necessary to enable access for sewer cleaning, inspection, and/or repair equipment.

Leaving the Job Site:

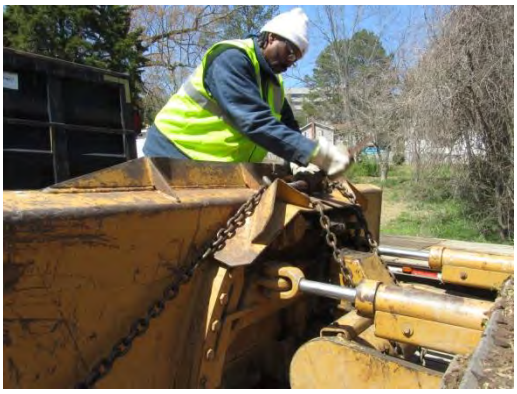
1. Prior to loading equipment, sweep the floor of the trailer.

2. Remove material that has adhered to the blade of the bulldozer, and knock heavy dirt from its tracks.

   Clear the brush and other debris from the cutter.

3. Deploy trailer ramps, and safely drive heavy equipment onto the trailers.

4. Chain the heavy equipment to the trailer, and verify it is secured for travel.



5. Stow all equipment and tools on the crew truck, and verify all tools have been retrieved from the job site.

   Retrieve all traffic management devices and stow them on the crew truck.

6. Fill out all the information fields in the Work Order entry screen on the field tablet, and complete any other required paperwork.

7. Proceed to the next job site, or return to the sewer maintenance yard.

Attachment A Equipment and Tool Inventories

- Street guide and/or map book
- Bulldozer, brush hog and/or skid steer loader
- Trailer(s) and hauling equipment
- Traffic control equipment
- Personal protective equipment
- Handheld radio
- Manhole hook
- Sledge hammer
- Tool box (see content list below)
- Heavy duty rakes
- Heavy duty brooms
- Shovels
- Brush axes
- Hand axes
- Loppers
- Gerber knives
- Spray paint (green)
- Fuel containers with appropriate fuel
- Water container (Igloo large)
- Fire extinguisher
- First aid kit

Tool Box Inventory

- Adjustable wrench
- Socket set
- Screw drivers
- Hammer
- Shovels
- Brush ax
- Saw
- Weed eater
- Chain
- Manhole bar

Appendix F Wash Truck Pipe Cleaning SOP

Wash Truck Pipe Cleaning

Objective:

To describe maintenance practices and operation of the Wash Truck.

Responsibilities:

Wash truck use shall be scheduled by the Field Supervisor.

Task:

Perform routine and specialized sewer cleaning, relieve sewer blockages, and provide field support for closed circuit television (CCTV) inspection crews in 6- to 24-inch diameter sanitary sewer pipe.

Performance Standard:

Staff performing or assisting with the use of wash truck equipment should have knowledge of the proper operation of the wash truck, hydraulic cleaning equipment and tools, traffic control set up, and appropriate safety measures. Crew supervisor and/or designees should have knowledge of the work order management system and use of assigned technology.

Safety and Field Cautions:

Any machine part, function, or process that many cause injury must be safeguarded. When the operation of a machine, or accidental contact with it, can injure the operator or others in the vicinity, the hazards must be either controlled or eliminated.

It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation that may be encountered. Operators and other personnel shall wear appropriate clothing for weather conditions, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and hearing and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters, operation procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not be in the field with this equipment without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor differences in operation or machine performance, along with field operation instruction.

Tools and Equipment: See Attachments A and B

Procedures

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with ESD Personal Protective Equipment, Confined Space Entry, and Traffic Control policies.

Pre-Trip Inspection and Duties:

1. Release the hood anchors (located near the doors) on both sides of the truck.

   With the help of two crew members, gently tilt the hood of the truck engine compartment forward to access fluid level indicators. Stop pushing on the hood if there is any resistance, and determine if there is anything in the way.

   If necessary, remove road cones and pole stands to avoid damaging the engine hood. Replace pitch pin holding stand at the 12:00 position and turn 180 degrees to 6:00 position.

2. Perform all Commercial Driver's License (CDL) required inspections, as detailed in the CDL cab card.

3. Check the water strainer in front of the water pump.

   Rinse materials from the screen, if necessary, and replace.

4. Using the water pump blow out valves, remove debris in the water pump. With the truck engine set to idle and the water pump cycling at a low RPM, engage the pump and gently open and close the blow out valve. Blow out and close each valve, one at a time, twice.

5. Notify the Supervisor of aging, loose, or worn coolant hoses, engine drive belts, or other critical parts.

6. Review assigned work orders and daily route.

7. Load all equipment and tools needed for the assigned cleaning work orders onto the truck. Verify all items are secured before travel.

Filling-Up the Water Tank:

1. Prior to filling the water tank, open and flush the water hydrant to remove rust and other particulates.

After the water runs clear, slowly close the hydrant valve to avoid water hammer.

2. Attach the water fill hose to the hydrant, making sure the hose will not kink during filling.

3. Slowly turn open the hydrant valve to reduce the amount of sediments entering the tank strainer.

Fill the water tank until water starts weeping from the fill inlet.

4. Shut the hydrant valve slowly to avoid water hammer, and replace the hydrant access cover.

5. Detach the fill hose and lay it downhill from the machine to drain. Drain the water from the fill hose before rolling it up and storing it on the truck.

Arriving at the Site:

1. Upon arrival at the site, position the Wash Truck in the best manner that provides access to the manhole and limits exposure to traffic.

Avoid blocking the entire street, unless it is absolutely necessary.

For off-road pipe cleaning, position the Wash Truck in the best location to accommodate the hose as it pulled off the reel to the remote manhole.

2. Place protective road cones around the work area.

If the line to be cleaned is in an area where a higher level of traffic control is necessary, set up additional traffic cones and other traffic management devices (including flagger).

Call the Supervisor, Dispatch, or other crew and ask for assistance if necessary.

3. Remove the manhole cover using proper lifting techniques to avoid strains. Move the cover out of the way to prevent a tripping hazard.

4. Use the manhole hook to scrape dirt and debris from the manhole rim.

5. Confirm the manhole depth, pipe diameter and material matches the manhole description on the work order.

   Determine if additional rollers, tiger tails, or other protective devices will be needed to protect the hose during cleaning.

   For off-road pipe cleaning, note the manhole location, and identify the path the sewer cleaning hose will need to take to reach the manhole.

6. Replace the manhole cover.

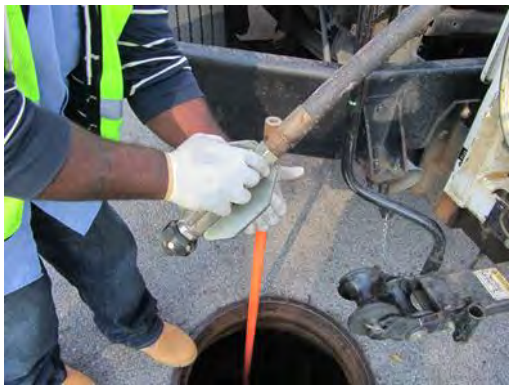
   NOTE: For jobsite safety, when possible, the manhole cover should remain on until the cleaning operation is ready to begin, and be replaced after the pipe has been cleaned.

7. When possible and safe to perform, position a crew member at the far manhole, set up road cones if necessary, and open the manhole lid.

8. Verify that a tiger tail is attached to the sewer cleaning hose.

9. Attach the appropriate cleaning nozzle for the job, and attach a nozzle extension if needed.

   Note: Bulldog and Grenade Bomb nozzles do not require a nozzle extension. To avoid getting the nozzle stuck when cleaning siphons, do not use a nozzle extension with any nozzle.



10. Lower the nozzle and tiger tail into the manhole channel.

    Secure the tiger tail rope to the Wash Truck.

11. If the sewer hose will run over the edge of the manhole frame, or if the manhole is off-road, use an upper manhole roller to protect the sewer hose while cleaning the pipe.

12. Select the proper size debris trap and attach the appropriate number of extension poles needed to place the trap in the manhole channel.

13. Lower the trap into the manhole and position the trap to catch materials at the downstream pipe invert.

    If needed, tip the trap forward to fit into the invert or to trap material in fast-moving flow.

    If the pipe is too deep and there are not enough extension poles, attach a rope to the trap and lower it into the manhole.

14. Activate the nozzle with low water pressure to verify visually that the nozzle is working properly, and then gently increase water pressure.

15. Clean the pipe using the appropriate cleaning technique based on the material encountered:

    - Step clean the pipe by moving the nozzle a set distance, returning the nozzle to the initial manhole to see what cleaning debris is returned, then sending the nozzle forward to further set distance, and returning the nozzle to the manhole. Repeat steps until nozzle reaches far manhole.

    - Move the nozzle straight through to the far manhole

    If gravel is encountered during the cleaning process that appears to be pipe bedding material, immediately stop cleaning and notify the Supervisor. Resume cleaning operations only when and if directed by the Supervisor.

16. Once the crew member stationed at the far manhole sees the nozzle, the crew member will signal the Wash Truck operator of its arrival, and the Wash Truck operator will pull the nozzle back through the pipe.

17. A proofing tool can be used to determine if there is material remaining in the pipe after cleaning.

    If the proofing tool does not fit into the pipe being cleaned, replace the proofing tool with the next size-down proofing tool.

18. On the final cleaning pass, maintain a nozzle return speed of 35 to 40 feet per minute. Use the white marking on the reel speed control valve as an indicator for this rate.

    If there is evidence of roots or grease from the cleaning process, re-clean the pipe using a nozzle specifically designed for the material being removed.

19. When the cleaning work is complete, lift the nozzle, and tiger tail from the manhole.

20. Remove the trap from the manhole, and indicate the type and amount of material removed as defined in the **Condition Findings Chart** (**Attachment C**).

    Use the trap or a pincher shovel to remove the solids, or consider using the vacuum system to remove the solids.

21. Place the material removed from the manhole into burlap bags or 5-gallon buckets.

Adding Grease Liquifier to Pipe:

When heavy grease is encountered during the cleaning process, use the grease liquefier to enhance the cleaning process.

1. When using the Jet Power II™ additive in pipes with odors or grease, verify the labeled container on the curbside of the truck is full before engaging the system. Follow manufacturer's application instructions provided by the supplier (located on the container).

Turn the supply line valve on and use the selector knob to set the chemical delivery rate.

For shallow manholes and short small diameter lines, use the low setting.

2. Clean the line and turn the water off.

3. Close the detergent valve and shut the detergent pump off.

   Note: if the valve is not closed, the tank will fill with detergent.

4. Let the detergent set in the line for 10 minutes.

   After 10 minutes, turn the water back on and continue washing the pipe.

End of Job Duties:

1. Replace the manhole lid, properly stow all equipment and tools on the Wash Truck, and retrieve all traffic management devices.

2. Fill out all the information fields in the Wash Truck Work Order Form and/or tablet. Estimate the type and amount of materials removed from the pipe.

3. Call and update the Dispatch office on the status of service request-related work.

4. Proceed to the next work order location, or return to the yard.

5. If tools and equipment were borrowed from another truck, replace all items.

   Notify Supervisor if any issues were noted with the vehicle, tools or equipment.

Attachment A Standard Nozzle Inventory

Nozzle Type	Pipe Sizes	Applications
 Std Radial	6" - 12"	Exploratory, light debris/grease, proofing skids
 Grenade	6" - 18"	Debris, especially good in sag pipe, light grease
 Chisel Point	6" - 18"	Relieve blockages
 Bulldog	8" - 18"	Roots, grease, some light debris
 Root Cutter	8" - 12"	Heavy/thick root removal

Nozzle Type	Grease	Roots	Grit/Sags	Stoppage	Exploration	Proofer
 Std Radial		●	◐	◐	○	○
 Grenade	○	●	○	●	◐	●
 Chisel Point	●	●	●	○	●	◐
 Bulldog	○	○	◔	●	◐	●
 Root Cutter	◐	○	●	◔	●	●

Legend: ○ Best use; ◐ Can work; ◔ Limited use; ● Not suitable

Attachment B Wash Truck Inventory

Nozzles		
Radial (Enz)	1	
Chisel (Enz)	1	
Bull Dog	1	
Hydraulic root cutter	1	
Grenade	1	
Brass nozzle	1	

Fins/Proofers		
2-inch finned sk id	1	
6-inch proofer	1	
8-inch proofer	1	
10-inch proofer	1	
12-inch proofer	1	
	1	

Hose Aids		
Leader hose (10 foot)	1	
Tiger tail	2	
Upper MH roller	1	

Traps		
6-inch open top	1	
8-inch open top	1	
10-inch open top	1	
12-inch open top	1	
5-foot Fiberglass poles	4	

Access Tools		
Cover hook - JC type	2	
Hydrant wrench	1	
Wheel chocks	2	
Counter wheel	1	
100-foot reel tape	1	
50-foot fill hose rolls	1	

Long Tools		
Fork head	1	
Chopper head	1	
12-foot Pinch er shovel	1	
10-foot Pinch er shovel	1	
8-foot Pinch ers hovel	1	
Rock bar	1	

Hard Tools		
Brush cutter (Gerber)	1	
Brush axe	1	
Shovel - round	1	
Shovel - flat	1	
Sledge - 12 lb	1	

Mechanical Tools		
Socket set tool box	1	
Asst d tools - tool box	1	
Grease gun	1	
Spray lube	1	
18-inch pipe wrench	2	
Hose reel crank	1	

Traffic Safety		
Road cones orange	12	
Stop/slow paddles	1	
Road work sign set	1	

SSORRP		
SSO measuring stick	1	
SSO Signage	2	

Misc. Item		
Green paint	2	
Rags (several)	1	
Dye - yellow/green	2	
Atlas map	1	
Caution/flag tape roll	2	
Rain gear sets	2	
Radio - hand held	2	
Boots - calf high	2	
Spot light	1	
Flashlight	1	
Water jug or cooler	1	
Anti bacterial soap	1	
Burlap sacks	5	
5-gallon bucket	1	
Vice mounted on bed	1	
Nozzle orifice cleaner	1	

PPE		
Gloves - leather	2 pair	
Gloves - rubber	2 pair	
Gloves - latex	1 box	
Safety glasses	2	
Hard Hat	2	
Hearing - push-ins	1 box	
Tyvek suits	2	
Dust mask	1 box	
Mirror	1	
Magnet	1	
Snake chaps	1	

Attachment C Condition Findings Chart

	Minor	Moderate	Heavy
Roots	***Visual:*** No evidence of roots or small bits of hair/curtain roots in the trap or on the sewer cleaning hose without large clumps	***Visual***: Moderate clumps of roots in trap. Roots of 1/8" to 3/8" thickness. ***Feel***: Hose does not bind or hydraulic pressure does not jump when roots encountered	***Visual***: Large clump/s of roots in trap. Roots over 1/2" thickness. ***Feel***: Hose binds, jumps or slows down, hydraulic pressure can jump when using hydro cutter.
Grease	***Visual:*** No evidence of grease or very small bits of grease in flow or stuck to sewer cleaning hose. Water color change to light milky color with some odor.	***Visual***: Popcorn size bits of grease with some larger chunks from 1/2" to 1" diameter. Water color change to light tan/brown with odor. ***Feel***: Hose may slow but does not bind or hydraulic pressure does not jump when grease encountered	***Visual:*** Any Large chunks, logs or calcified grease of significant size. Water color change to dark brown to black with foul odor. ***Feel:*** Hose binds and requires repeated attempts to clear some sections of the pipe.
Debris	***Visual:*** No evidence of any debris. Conditions do not require shortening standard step length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Max pass less than: *1 gallon (8 inch) *2 gallons (10 inches) *3 gallons (>= 12 inch) Or - For every 25 feet step increment, less than 5% of channel filled	***Visual***: Debris is removed held by trap, but conditions do not require shortening standard step length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Max pass between: *1-3 gallons (<= 8 inch) *2-5 gallons (10 inches) *3-7 gallons (>= 12 inch) Or - For every 25 feet step increment, must be between 5-20% of channel filled	***Visual***: Large amounts of debris returned with each pass. Condition requires shortening standard step length. Operator concern for blockage (debris feels concentrated in a small area) ***Quantity***: Max pass, more than: *3 gallons (<= 8 inch) *5 gallons (10 inches) *7 gallons (>= 12 inch) Or - For every 25 feet step increment, must be more than 20% of channel filled

Volume of Traps: 6" = .25 Gallon 8" = 1 Gallon 10" = 1.5 Gallon 12" = 2.5 Gallon

*BASED ON 300' LENGTH OF PIPE

Appendix G Combination Cleaner Pipe Cleaning SOP

Combination Cleaner Pipe Cleaning

Objective:

To describe maintenance practices and operation of the Combination Cleaner Truck.

Responsibilities:

Combination cleaner truck use shall be scheduled by the Field Supervisor.

Task:

Perform routine and specialized sewer cleaning, relieve sewer blockages, and provide field support for closed circuit television (CCTV) inspection crews in 6- to 24-inch diameter sanitary sewer pipe (may be used in up to 48-inch pipe in special circumstances).

Performance Standard:

Staff performing or assisting with the use of combination cleaner equipment should have knowledge of the proper operation of the combination cleaner, hydraulic cleaning equipment and tools, traffic control set up, and appropriate safety measures. Crew supervisor and/or designees should have knowledge of the work order management system and use of assigned technology.

Safety and Field Cautions:

Any machine part, function, or process that may cause injury must be safeguarded. When the operation of a machine, or accidental contact with it, can injure the operator or others in the vicinity, the hazards must be either controlled or eliminated.

It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation that may be encountered. Operators and other personnel shall wear appropriate clothing for weather conditions, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and hearing and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters, operation procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not be in the field with this equipment without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor differences in operation or machine performance, along with field operation instruction.

Tools and Equipment: See Attachments A and B

Procedures

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with ESD Personal Protective Equipment, Confined Space Entry, and Traffic Control policies.

Pre-Trip Inspection:

1. Release the hood anchors (located near the doors) on both sides of the truck, and move the sewer hose reel all the way forward.

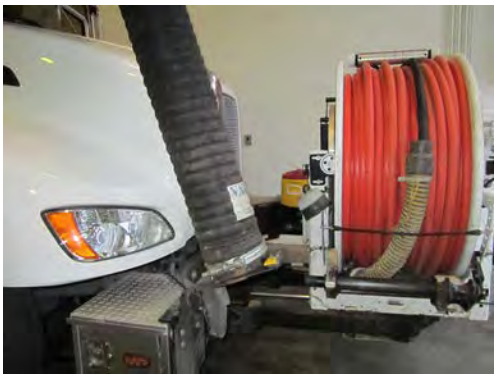
   With the help of two crew members, gently tilt the hood of the truck engine compartment forward to access fluid level indicators. Stop pushing on the hood if there is any resistance, and determine if there is anything in the way.

   Engage the hood brace to hold the hood in place while the fluids and engine components are checked.

2. Perform all Commercial Driver's License (CDL) required inspections, as detailed in the CDL cab card.

3. Check the hydraulic fluid level in the boom tower, and add fluid if needed.

4. Check the vacuum micro-screen strainers for debris every other week to once a month, depending on use. Rinse materials from the screens, if necessary, and replace.



5. Close the water tank valve to the pump and check the strainer at the water pump. Remove any debris found in the strainer and replace.

   Open the water control valve to the pump before operating the pump.

6. Check water strainer at the fill inlet to the water tanks.

   Remove any debris, and replace the strainer.

7. Using the water pump blow out valves, remove debris in the water pump. With the trunk engine set to idle and the water pump cycling at a low RPM, engage the pump and gently open and close the blow out valve. Blow out and close each valve, one at a time.

8. Notify the Field Supervisor of loose or worn coolant hoses, engine drive belts, or other critical parts.

9. Review assigned work orders and daily route.

10. Load all equipment and tools needed for the assigned cleaning work orders onto the truck. Verify all items are secured before travel.

Water Tank Fill-Up:

1. Prior to filling the water tank, open and flush the water hydrant to remove rust and other particulates.

After the water runs clear, slowly close the hydrant valve to avoid water hammer.

2. Attach the water fill hose to the hydrant, and make sure the hose will not kink during filling.

3. Slowly turn open the hydrant valve to reduce the amount of sediments entering the tank strainer.

   Fill the water tank until water starts weeping from the fill inlet.

4. Shut the hydrant valve slowly to avoid water hammer, and replace the hydrant access cover.

5. Detach the fill hose and lay it downhill from the machine to drain. Drain the water from the fill hose before rolling it up and storing it on the truck.

Arriving at the Site:

1. Upon arrival at the site, position the Combination Cleaner in the best manner that provides access to the manhole and limits exposure to traffic.

   Avoid blocking the entire street, unless it is absolutely necessary.

   For off-road pipe cleaning, position the Combination Cleaner in the best location to accommodate the hose as it pulled off the reel to the remote manhole.

2. Place protective road cones around the work area.

   If the line to be cleaned is in an area where a higher level of traffic control is necessary, set up additional traffic cones and other traffic management devices (including flagger)

   Call the Supervisor, Dispatch, or other crew and ask for assistance, if necessary.

3. Remove the manhole cover using proper lifting techniques to avoid strains. Move the cover out of the way to prevent a tripping hazard.

4. Use the manhole hook to scrape dirt and debris from the manhole rim.

5. Confirm the manhole depth, pipe diameter and material matches the manhole description on the work order.

6. Replace the manhole cover.

   NOTE: For jobsite safety, the manhole cover should remain on until the cleaning operation is ready to begin, and be replaced after the pipe has been cleaned.

   For off-road pipe cleaning, note the manhole location, and identify the path the water hose will need to take to reach the manhole.

Determine if additional rollers, tiger tails, or other protective devices will be needed to protect the hose during cleaning.

7. When possible and safe to perform, position a crew member at the far manhole, set up road cones if necessary, and open the manhole cover.

8. Verify that a tiger tail is attached to the sewer cleaning hose.

9. Attach the appropriate cleaning nozzle for the job, and attach a nozzle extension if needed.

   Note: Bulldog and Grenade Bomb nozzles do not require a nozzle extension. To avoid getting the nozzle stuck when cleaning siphons, do not use a nozzle extension with any nozzle.

10. Lower the nozzle and tiger tail into the manhole channel, and partially into the pipe to be cleaned.

    Secure the tiger tail rope to the Combination Cleaner.

11. If the sewer hose will run over the edge of the manhole frame, or if the manhole is off-road, use an upper manhole roller to protect the sewer hose while cleaning the pipe.

12. Select the proper size debris trap, and attach the appropriate number of extension poles needed to place the trap in the manhole channel.

13. Lower the trap into the manhole, and position the trap to catch materials at the downstream pipe invert.

    If needed, tip the trap forward to fit into the invert or to trap material in fast-moving flow.

    If the pipe is too deep and there are not enough extension poles, attach a rope to the trap and lower it into the manhole.

14. Activate the nozzle with low water pressure to verify visually that the nozzle is working properly, and then gently increase water pressure.

15. Clean the pipe using the appropriate cleaning technique based on the material encountered:

    - Step clean the pipe by moving the nozzle a set distance, returning the nozzle to the initial manhole to see what cleaning debris is returned, then sending the nozzle forward to further set distance, and returning the nozzle to the manhole. Repeat steps until nozzle reaches far manhole.

    - Move the nozzle straight through to the far manhole

    If gravel is encountered during the cleaning process that appears to be pipe bedding material, immediately stop cleaning and notify the Supervisor. Resume cleaning operations only when and if directed by the Supervisor.

16. Once the crew member stationed at the far manhole sees the nozzle, the crew member will signal the operator of its arrival, and the operator will pull the nozzle back through the pipe.

17. A proofing tool can be used to determine if there is material remaining in the pipe after cleaning.

    If the proofing tool does not fit into the pipe being cleaned, replace the proofing tool with the next size-down proofing tool.

18. On the final cleaning pass, maintain a nozzle return speed of 35 to 40 feet per minute. Use the white marking on the reel speed control valve as an indicator for this rate.

    If there is evidence of roots or grease from the cleaning process, re-clean the pipe using a nozzle specifically designed for the material being removed.

19. When the cleaning work is complete, remove the nozzle and gear from the manhole.

20. Remove the trap from the manhole, and indicate the type and amount of material removed as defined in the **Condition Findings Chart** (Attachment C).

    Use the trap or a pincher shovel to remove the solids, or consider using the vacuum system to remove the solids.

21. Place the material removed from the manhole into burlap bags or 5-gallon buckets.

Adding Grease Liquefier to Pipe:

When heavy grease is encountered during the cleaning process, use the grease liquefier to enhance the cleaning process.

When using the Jet Power II™ additive in pipes with odors or grease, verify the labeled container on the curbside of the truck is full before engaging the system

1. Follow manufacturer's application instructions provided by the supplier (located on the container).

   Turn the supply line valve on and use the selector knob to set the chemical delivery rate.

   For shallow manholes and short small diameter lines, use the low setting.

2. Clean the line and turn the water off.

3. Close the detergent valve and shut the detergent pump off.

   Note: if the valve is not closed, the tank will fill with detergent.

4. Let the detergent set in the line for 10 minutes.

   After 10 minutes, turn the water back on and continue washing the pipe.

Vacuum System Set-Up:

1. Verify there are no overhead obstructions such as trees, structures, streetlights, telephone/cable, and power wires that would prohibit the boom from maintaining a minimum distance of 10-feet from power wires.

If work requires the boom to be closer than this, stop work and contact the Supervisor.

2. Lower the tube racks, remove the appropriate vacuum tubes, and return the tube racks to the upright position if needed to avoid traffic.

3. If several vacuum tubes are needed to be assembled, lay the tubes on the ground and attach them to each other. Position the attached tubes into the manhole using the boom.

   Alternately, carefully use the manhole cover to hold the tubes in place while connecting additional sections.

4. Attach tube sections with the nozzle tube (tube with crown shape at the end). The nozzle tube will be used to vacuum materials from the manhole.

5. Verify the connecting clamps are snug, and fully locked down.

6. Engage the vacuum system to remove debris from the manhole.

7. Once the vacuum job is completed, remove the tubes in the same way they were added. Do not leave tube sections standing near the travel area of the road in the event they fall over into traffic.

8. Return the vacuum tube sections to their appropriate rack space and secure for travel.

   Return clamps to the assigned compartment.

Using the Hand Gun System:

The hand gun washing system is used to wash debris in manholes so it can be vacuumed up, or used to clean the debris tank and/or debris on the truck.

1. Pull off the hose from the washdown gun hose reel.

2. Engage the washdown system using the valve next to the reel and operate it by using the trigger on the cleaning gun wand.

3. Once done, close the washdown system valve, rewind the hose onto the hose reel, and stow the washdown gun.

End of Job Duties:

1. Replace the manhole lid, properly stow all equipment and tools on the Combination Cleaner, and retrieve all traffic management devices.

2. Fill out all the information fields in the Combination Cleaner Work Order Form and/or tablet. Estimate the type and amount of materials removed from the pipe.

3. Call and update the Dispatch office on the status of service request-related work.

4. Proceed to the next work order location, or return to the yard.

5. If tools and equipment were borrowed from another truck, replace all items.

   Notify Supervisor if any issues were noted with the vehicle, tools or equipment.


COMBINATION CLEANERS WORK ORDER FORM

Dumping the Debris Tank Decant into a Manhole:

1. Identify a manhole for decanting. Look for a manhole downstream of the area cleaned. Manhole must be a minimum of 5-feet deep and open and flowing.

   Note: loads with heavy grease must be hauled to the treatment plant and not decanted back into the collection system.

   Verify that there are no overhead obstructions or hazards that will be encountered when the debris body is raised.

2. Position the Combination Cleaner so that when the debris tank is raised, the decant water will be directly discharged into the receiving manhole.

   Avoid blocking the entire street, unless it is absolutely necessary.

3. Place protective road cones around the work area.

4. Remove the manhole cover using proper lifting techniques to avoid strains. Move the cover out of the way to prevent a tripping hazard.

5. Remove decant discharge valve cap off.

   Note: water may splash out when the cap is removed. To avoid spillage, hold the open end of the discharge hose below the connection to catch the water.

6. Connect discharge hose to the decant valve.

7. Hang the discharge hose into the manhole.

   Note: once the decant process is started, do not leave the discharge hose unattended. Monitor the discharge hose and level of flow in the manhole to avoid a sanitary sewer overflow.

8. Open the decant valve slowly, and wait until flow stops before raising the debris body.

   Note: raising the debris body too soon will fill the cyclone filters with water.

9. Raise the debris tank slowly and allow the decant to drain to the manhole.

   Avoid raising the debris tank any higher than necessary to decant the water, as debris may clog the decanting port.

10. Lower the debris body.

11. Close the decant valve and allow decant hose to drain into the manhole.

12. Disconnect hose and replace the decant discharge valve cap. Stow the hose.

13. Close the manhole lid. Retrieve and stow all traffic control devices.

14. Add notes to work order comment section with asset identification number and decant information.

Dumping the Debris Tank at the Five-Mile Treatment Plant:

1. Position the Combination Cleaner so that when the debris tank is raised, the debris will be directly discharged into the upper lagoon. A backing attendant should always be present during any backing process.

   Slowly back the cleaner up to the curb stop and set the brake.

2. Open the debris body tailgate.

3. Raise the debris tank slowly, and allow collected material to drain to the lagoon.

Continue to raise the debris tank body until it is emptied.

Open the cyclone clean out flaps on both sides of the debris tank body to drain.

4. Turn on internal wash down system.

With the debris tank body in the raised position, move the truck forward and back up onto the cleaning pad for internal cleaning.

5. Use the wash down gun the clean the entire debris tank; verify screen baffles inside the tank (forward and aft) are clear and free of debris.

6. Lower the debris tank, clean up any material spilled on the cleaning pad. 7. Stow the wash down hose. 8. Complete all the necessary and required paperwork, and return to the yard, or continue to the next job.	

Attachment A Standard Nozzle Inventory

Nozzle Type	Pipe Sizes	Applications
 Std Radial	6" - 12"	Exploratory, light debris/grease, proofing skids
 Grenade	6" - 18"	Debris, especially good in sag pipe, light grease
 Chisel Point	6" - 18"	Relieve blockages
 Bulldog	8" - 18"	Roots, grease, some light debris
 Root Cutter	8" - 12"	Heavy/thick root removal

Nozzle Type	Grease	Roots	Grit/Sags	Stoppage	Exploration	Proofer
 Std Radial		●	◐	◐	○	○
 Grenade	○	●	○	●	◐	●
 Chisel Point	●	●	●	○	●	◐
 Bulldog	○	○	◔	●	◐	●
 Root Cutter	◐	○	●	◔	●	●

Legend: ○ Best use; ◐ Can work; ◔ Limited use; ● Not suitable

Attachment B Combination Cleaner Inventory

Chisel (Enz)	1	
Bull Dog	1	
Hydraulic root cutter	1	
Grenade	1	
Brass nozzle	1	
Fins/Proofers		
2-inch finned skid	1	
6-inch proofer	1	
8-inch proofer	1	
10-inch proofer	1	
12-inch proofer	1	
	1	
Hose Aids		
Leader hose (10 foot)	1	
Tiger tail	2	
Upper MH roller	1	
Traps		
6-inch open top	1	
8-inch open top	1	
10-inch open top	1	
12-inch open top	1	
5-foot Fiberglass poles	4	
Access Tools		
Cover hook - JC type	2	
Hydrant wrench	1	
Wheel chocks	2	
Counter wheel	1	
100-foot reel tape	1	
50-foot fill hose rolls	1	

Chopper head	1	
12-foot Pincher shovel	1	
10-foot Pincher shovel	1	
8-foot Pinchers hovel	1	
Rock bar	1	
Hard Tools		
Brush cutter (Gerber)	1	
Brush axe	1	
Shovel - round	1	
Shovel - flat	1	
Sledge - 12 lb	1	
Mechanical Tools		
Socket set tool box	1	
Asst'd tools - tool box	1	
Grease gun	1	
Spray lube	1	
18-inch pipe wrench	2	
Hose reel crank	1	
Traffic Safety		
Road cones orange	12	
Stop/slow paddles	1	
Road work sign set	1	
SSO/RRP		
SSO measuring stick	1	
SSO Signage	2	

Rags (several)	1	
Dye - yellow/green	2	
Atlas map	1	
Caution/flag tape roll	2	
Rain gear sets	2	
Radio - hand held	2	
Boots - calf high	2	
Spot light	1	
Flashlight	1	
Water jug or cooler	1	
Anti bacterial soap	1	
Burlap sacks	5	
5-gallon bucket	1	
Vice mounted on bed	1	
Nozzle orifice cleaner	1	
PPE		
Gloves - leather	2 pair	
Gloves - rubber	2 pair	
Gloves - latex	1 box	
Safety glasses	2	
Hard Hat	2	
Hearing - push-ins	1 box	
Tyvek suits	2	
Dust mask	1 box	
Mirror	1	
Magnet	1	
Snake chaps	1	

Attachment C Condition Findings Chart

	Minor	Moderate	Heavy
Roots	***Visual:*** No evidence of roots or small bits of hair/curtain roots in the trap or on the sewer cleaning hose without large clumps	***Visual***: Moderate clumps of roots in trap. Roots of 1/8" to 3/8" thickness. ***Feel***: Hose does not bind or hydraulic pressure does not jump when roots encountered	***Visual***: Large clump/s of roots in trap. Roots over 1/2" thickness. ***Feel***: Hose binds, jumps or slows down, hydraulic pressure can jump when using hydro cutter.
Grease	***Visual:*** No evidence of grease or very small bits of grease in flow or stuck to sewer cleaning hose. Water color change to light milky color with some odor.	***Visual***: Popcorn size bits of grease with some larger chunks from 1/2" to 1" diameter. Water color change to light tan/brown with odor. ***Feel***: Hose may slow but does not bind or hydraulic pressure does not jump when grease encountered	***Visual:*** Any Large chunks, logs or calcified grease of significant size. Water color change to dark brown to black with foul odor. ***Feel:*** Hose binds and requires repeated attempts to clear some sections of the pipe.
Debris	***Visual:*** No evidence of any debris. Conditions do not require shortening standard step length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Max pass less than: *1 gallon (8 inch) *2 gallons (10 inches) *3 gallons (>= 12 inch) Or - For every 25 feet step increment, less than 5% of channel filled	***Visual***: Debris is removed held by trap, but conditions do not require shortening standard step length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Max pass between: *1-3 gallons (<= 8 inch) *2-5 gallons (10 inches) *3-7 gallons (>= 12 inch) Or - For every 25 feet step increment, must be between 5-20% of channel filled	***Visual***: Large amounts of debris returned with each pass. Condition requires shortening standard step length. Operator concern for blockage (debris feels concentrated in a small area) ***Quantity***: Max pass, more than: *3 gallons (<= 8 inch) *5 gallons (10 inches) *7 gallons (>= 12 inch) Or - For every 25 feet step increment, must be more than 20% of channel filled

Volume of Traps: 6" = .25 Gallon 8" = 1 Gallon 10" = 1.5 Gallon 12" = 2.5 Gallon

*BASED ON 300' LENGTH OF PIPE

Appendix H Hand Rod and Rod Turning Machine Pipe Clearing SOP

Hand Rod and Rod Turning Machine Pipe Cleaning

Objective:

To describe operations and maintenance (O&M) practices of hand rods and the Rod Turning Machine (RTM).

Responsibilities:

Hand rod and RTM use shall be scheduled and overseen by the Field Supervisor.

Task:

Perform routine sewer cleaning, specialized cleaning, and sewer blockage relief in 6- to 12-inch diameter sanitary sewer pipe.

Performance Standard:

Staff performing or assisting with the use of hand rodding equipment and the rod turning machine should have knowledge of the proper operation of the rodding equipment and tools, Confined Space Entry, traffic control set up, and appropriate safety measures.

Safety and Field Cautions:

Any machine part, function, or process that many cause injury must be safeguarded. When the operation of a machine, or accidental contact with it, can injure the operator or others in the vicinity, the hazards must be either controlled or eliminated.

It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation that may be encountered. Operators and other personnel shall wear appropriate clothing for weather conditions, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and hearing and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters, operation procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not be in the field with this equipment without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor differences in operation or machine performance, along with field operation instruction.

Tools and Equipment: See Attachment A

Procedures

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with the ESD Personal Protective Equipment, and Confined Space Entry policies.

Pre-Trip Duties:

1. Check the following RTM items and resolve any issues noted; contact the Supervisor if repairs are needed:
   - Oil level in rod machine motor
   - Fuel level
   - Spark plug and wires
   - Drive belt
   - Cotter pins in wheels

2. Verify RTM is operational by starting the machine and letting it run a few minutes.

   Verify that the Rod Truck chassis engine critical fluids are checked and all Pre-Inspection Checklist items are inspected.

   Notify the Field Supervisor of worn, damaged or missing equipment.

4. Review assigned work orders and daily route.

5. Load all equipment and tools needed for the assigned cleaning work orders onto the truck. Use ratchet straps to tie down the RTM.

   Verify spare fuel is on board for the RTM.

Arriving at the Site:

Note: if using hand rods to relieve a pipe blockage, access the pipe from the downstream, dry manhole. For routine cleaning, hand rods can be deployed from the upstream or downstream manhole.

1. Upon arrival at the site, position the Crew Truck in the best manner that provides direct access to the manhole and limits exposure to traffic.

   Avoid blocking the entire street, unless it is absolutely necessary.

   For off-road pipe rodding, position the Rod Truck in the best location to accommodate the rod as it pulled off the reel to the remote manhole.

2. Place protective road cones around the work area.

   If the line to be cleaned is in an area where a higher level of traffic control is necessary, set up additional traffic cones and/or other traffic management devices (including flagger).

   Call the Supervisor, Dispatch, or other crew and ask for assistance if necessary.

3. Remove the manhole cover using proper lifting techniques to avoid strains. Move the cover out of the way to prevent a tripping hazard.

4. Use the manhole hook to scrape dirt and debris from the manhole rim.

5. Confirm the manhole depth, pipe diameter and material matches the manhole description on the work order.

   For off-road pipe cleaning, note the manhole location, and identify the path the rods will need to take to reach the manhole.

Equipment Set-Up:

1. Remove the rod guide pipe (2-inch galvanized steel pipe with the lower manhole curved section) from the Rod Truck.

If the guide pipe is not long enough to reach the manhole invert, thread more sections of pipe onto the guide pipe.

2. Position a crew member at the far manhole (if manhole location permits).

   Set up road cones at the far manhole if necessary, and open the manhole lid.

3. Pull the rod from the rod reel, and thread the rod through the guide pipe.

Note: Sectional rods may be mounted on a reel, and pulled from the side (as shown) or rear of the truck.

4. Remove the RTM from the truck, and place it a safe location approximately 6 feet from the manhole.

5. Select the proper tool (size and type) to use for the pipe to be cleaned:

   - Use a root saw to remove roots, or an auger to remove grease.

   - Use a large spear point or small squarebar corkscrew to break up a blockage in a pipe.

6. Use the assembly wrenches to attach the selected tool to the rod that is threaded through the guide pipe.

7. Select the proper size debris trap and attach the appropriate number of extension poles needed to place the trap in the manhole channel.

   Note: if rodding a pipe from upstream to downstream, the trap should be placed in the downstream manhole.

8. Lower the trap into the manhole and position the trap to catch materials at the downstream pipe invert.

   If needed, tip the trap forward to fit into the invert or to trap material in fast-moving flow.

   If the pipe is too deep and there are not enough extension poles, attach a rope to the trap and lower it into the manhole.

Hand Rod Operation:

1. With the trap in place, lower the guide pipe and rodding tool into the manhole invert, and align the pipe in such a manner that it will experience the least amount of movement while the rodding work is performed.

2. Position personnel along the string of rods to help guide the rod into the rigid pipe and prevent the rod from unexpected movement while it is being turned during the cleaning process.

3. Pay out rods from the reel and push the rods through the guide pipe. Continue to move the rodding tool through the pipe until the tool stops.

   Note: Use caution when handling turning rods. Do not wear rubber gloves.

4. Once the rodding tool stops, disconnect the rod at approximately 10-feet from the manhole or as directed by the Labor Supervisor using the coupling wrenches.

   Use caution when taking rods apart as there may be tension on the rod that can cause it to move unexpectedly.

Maneuver the disconnected rod to insert the coupling into the RTM chuck (located at the front of the RTM) and remove the pin from the chuck.

Note: only one partial rod section is to protrude from the back of the RTM during use. <add photo>

Turn the chuck so the pin can be inserted once the rod coupling is positioned. Insert the rod coupling into the chuck until the hole in the coupling lines up with the chuck. Insert the pin through the RTM chuck and rod coupling.

5. Toggle the on switch, turn on the gas, turn on the choke, and pull the pull start until the RTM motor starts.

   Stand to the right side of the machine (away from the protruding rod) to access the rotation control and guide the machine toward the manhole as needed.

   Use the actuating lever that rotates the rod clockwise while pushing the rod into the manhole.

6. The lead operator pushes the rod into the manhole (RTM will be pulled towards the manhole).

   Pull the RTM forward as needed by the pushing the rod gently into the manhole.

   Adjust the rotation power and direction during operation to reduce twisting and tension on the rod.

Note: Use caution to avoid the buildup of rod torque (twisting) that can cause the RTM to tip or the rods to break. Manage rod torque by increasing/decreasing the turning power or reversing turning direction of the RTM when cutting through material in the pipe.

Continue pushing rod through pipe until the tool reaches the far manhole. Pull the tool back to the operating manhole. (If the tool does not move freely through the pipe while pulled back, return the tool to the far manhole and use a different tool.

If a different type or size tool is needed for the return pass to cut material, use a fork head pole to lift the tool out of the manhole.

Remove the tool from the rod and return the rod to the operating manhole.

If a larger tool is needed to clean the pipe, remove the rigid pipe set up from the manhole and replace the tool. Repeat the cleaning process.

Replace the tool at the end of the rod and use the fork head pole to assist the tool into the manhole channel for the return pass.

Note: Use care when changing rodding tools as the rod may move without warning.

8. When pipe is clean, shut down the RTM motor by toggling the off switch.

   Note: If this is the last job of the day, shut the fuel off and allow the motor run until residual fuel is consumed and the motor stops.

End of Operations:

1. When the pipe is clean, reattach the rod to the rod storage reel. Carefully draw the rod from the pipe through the rigid pipe set up and take up the rod with the reel.

   Once the tool reaches the guide pipe, remove the guide pipe and tool from the manhole, detach the tool from the rod and secure the rod on the storage reel.

2. Remove the trap from the manhole, and determine the type and amount of material removed from the pipe.

   Use pincher tool or fork head pole to remove materials from the manhole invert and deposit the material in a burlap bag or 5-gallon bucket for disposal at the yard.

3. Replace the manhole lid, properly stow all equipment and tools, and retrieve all traffic management devices.

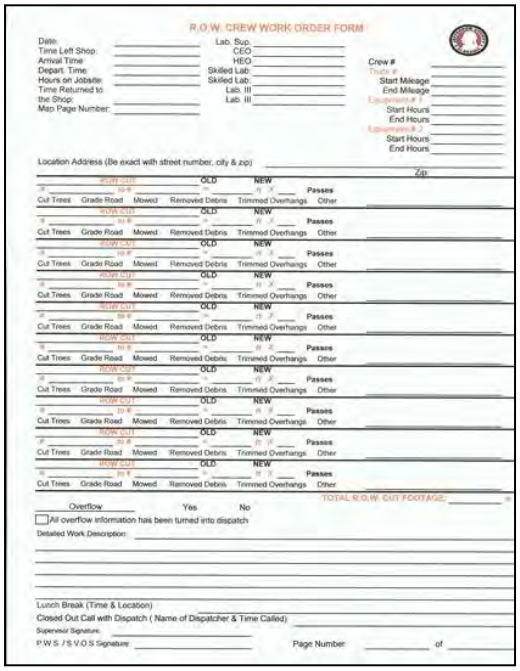
4. Fill out all the information fields in the Rod Truck Work Order Form and/or tablet. Estimate the type and amount of materials removed from the pipe.

5. Call and update the Dispatch office on the status of service request-related work.

6. Proceed to the next work order location, or return to the yard.

7. If tools and equipment were borrowed from another truck, replace all items.

   Notify Supervisor if any issues were noted with the vehicle, tools or equipment.



R.O.W. CREW WORK ORDER FORM

Date:
Time Left Shop:
Arrival Time:
Depart. Time:
Hours on Jobsite:
Time Returned to the Shop:
Map Page Number:

Lab. Sup.
CEO
HEO
Skilled Lab:
Skilled Lab:
Lab. III
Lab. III

Crew #
Truck #
Start Mileage
End Mileage
Equipment # 1
Start Hours
End Hours
Equipment # 2
Start Hours
End Hours

Location Address (Be exact with street number, city & zip)
Zip

ROW CUT — OLD — NEW — Passes
Cut Trees Grade Road Mowed Removed Debris Trimmed Overhangs Other

TOTAL R.O.W. CUT FOOTAGE:

Overflow Yes No
All overflow information has been turned into dispatch
Detailed Work Description:

Lunch Break (Time & Location)
Closed Out Call with Dispatch (Name of Dispatcher & Time Called)
Supervisor Signature
P.W.S. / S.V.O.S Signature
Page Number: of

Attachment A Rodding Tools and Equipment

Standard Inventory List for Rod Trucks

Rod Operation		
5/16" x 36" rod	350'	
Rod Turning Mach	1	
Gas can - 2 gal	1	

Galvanized Pipe		
2' pipe	2	
3' pipe	2	
4' pipe	3	
5' pipe	2	
6' pipe	2	
8' pipe	2	
10' pipe	2	
Pipe Couplings	6	
30° Bend with end	2	

Rod Tools		
4" Root saw	2	
6" Root saw	2	
8" Root saw	2	
4" Auger	2	
6" Auger	2	
1.5" Spear head	2	
3" Spear head	2	
Assembly wrench	2	
Pull out handle	1	

Traps		
6" Open top	1	
8" Open top	1	

PPE/Safety		
Gloves - leather (pr)	8	
Gloves - rubber (pr)	8	
Gloves - latex (box)	1	
Safety glasses	4	
Hard Hat	4	
Boots - knee high (pr)	4	
Rain gear (sets)	4	
Hearing push-ins - box	1	
Tyvek suits	2	
Dust masks - box	1	
SSO Signs	5	
Snake chaps (sets)	4	

Set Up & Access tools		
Cvr hook JC type	2	
Cvr hook cold rolled	1	
wheel chocks	2	
Counter wheel	1	
100' Reel tape	1	
Mirror	1	
Magnet with rope	1	
Steel palm mitts (pairs)	3	

Long Tools		
Fork head (pole)	1	
Chopper head (pole)	1	
12' Pincher shovel	1	
Rock bar - 12'	1	
Rock bar - 6'	1	

Traffic Safety		
Road cones orange	12	
Road work sign set	1	
Stop paddles	2	

CSE Equipment		
Tripod	1	
Winch (manual haul)	1	
Blower	1	
Bellows 20' min	1	
Harness	1	
Gas detector	1	

Hand Tools		
Brush cutter - Gerber	1	
Brush axe	2	
Shovel - round	2	
Shovel - flat	2	
Shovel - trench	1	
Sledge 16 lb	1	
Rake - metal leaf type	1	
Rake - metal earth type	2	
Post hole digger	1	
Mattock	2	
T handle probe - 5'	1	
Concrete mixing hoe	1	
Wheel barrow	1	
Concrete trowel	2	
Push broom	1	

Misc Item		
Green paint	2	
Rags - some/several	1	
Dye - yellow/green	2	
Atlas map	1	
Petzl head lamps	4	
Caution/flag tape roll	2	
Rain gear sets	4	
Radio - hand held	4	
Boots - calf high (pr)	4	
Flashlight	4	
Water jug or cooler	1	
Anti bacterial soap	1	
SSO measuring stick	1	
10' Chain 3/8" link	1	
Level - 4'	1	
Manhole cushion	5	
Rachet straps (set)	2	

Mechanical Tools		
Socket set tool box	1	
Asstd tools box	1	
Grease gun	1	
Assorted sprays	1	
Pipe wrench 24"	2	
Bolt/Chain cutter	1	

Misc supplies		
Water in 50 gal tank	25	
5- g bucket lime	3	
5- g bucket quickcreet	3	
5- g bucket concrete	2	
5- g bucket sand	3	
Spare MH cover 20"	2	
Spare MH cover 22"	2	
MH Riser - steel	2	
MH Frame - 20"	1	
Burlap sacks	12	

Appendix I Power Rodding Machine Pipe Clearing SOP

Trailer Power Rodding Machine Pipe Cleaning

Objective:

To describe operations and maintenance (O&M) practices of trailer mounted power rodding machine (rodder) and tools.

Responsibilities:

Rodder use shall be scheduled and overseen by the Field Supervisor.

Task:

Perform routine and specialized sewer cleaning, and relieve sewer blockage in 6- to 12-inch diameter sanitary sewer pipe.

Performance Standard:

Staff performing or assisting with the use of rodding equipment should have knowledge of the proper operation of the rodding machine, equipment, and tools, Confined Space Entry, traffic control set up, and appropriate safety measures.

Safety and Field Cautions:

Any machine part, function, or process that may cause injury must be safeguarded. When the operation of a machine, or accidental contact with it, can injure the operator or others in the vicinity, the hazards must be either controlled or eliminated.

It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation that may be encountered. Operators and other personnel shall wear appropriate clothing for weather conditions, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and hearing and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters, operation procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not be in the field with this equipment without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor differences in operation or machine performance, along with field operation instruction.

Tools and Equipment: **See Attachments A and B.**

Procedures

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with the ESD Personal Protective Equipment, Confined Space Entry, and Traffic Control policies.

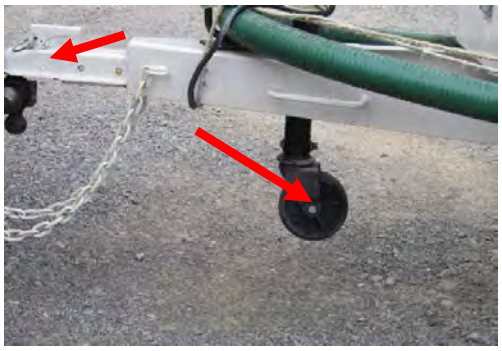
Pre-Trip Duties:

1. Check the following rodder items and resolve any issues noted; contact the Supervisor if repairs are needed:
   - Oil level in the rodder auxiliary engine
   - Fuel tank level (located in rear tool box)
   - Electrical connection to towing vehicle
   - Brake and turn signals
   - Machine gauges
   - Trailer hitch properly secured
   - Towing safety chains properly secured
   - Dolly wheel: remove and store

2. Verify rodder is operational by starting the machine and letting it run a few minutes.

   Verify that the towing vehicle engine critical fluids are checked, and all appropriate Pre-Inspection Checklist items are inspected.

   Notify the Field Supervisor of worn, damaged or missing equipment.



3. Review assigned work orders and daily route.

4. Load all tools and accessories needed for the assigned cleaning work orders are in the rodder tool boxes or on the towing vehicle. Verify the rod guide hose is secured to the machine.

Arrival at the Site:

Note: if using the rodder to relieve a pipe blockage, access the pipe from the downstream, dry manhole. For routine cleaning, rods can be deployed from the upstream or downstream manhole.

1. Upon arrival at the site, position the Crew Truck in the best manner that provides direct access to the manhole and limits exposure to traffic. When possible, the back of the rodder should point in the direction the rod will be traveling in the pipe.

   Avoid blocking the entire street or intersections, unless it is absolutely necessary.

   For off-road pipe cleaning, position the rodder in the best location possible to accommodate the manhole and rod guide hose access into the pipe.

2. Place protective road cones around the work area.

   If the line to be cleaned is in an area where a higher level of traffic control is necessary, set up additional traffic cones and other traffic management devices (including flagger).

   Call the Supervisor, Dispatch, or other crew and ask for assistance if necessary.

3. Remove the manhole cover using proper lifting techniques to avoid strains. Move the cover out of the way to prevent a tripping hazard.

4. Use the manhole hook to scrape dirt and debris from the manhole rim.

   Use care when removing manhole covers from off-road raised manhole structures.

   Cut plant growth around the structure.

   Use proper lifting practices to remove the cover.

5. Confirm that the manhole depth, pipe diameter, and material match the manhole description on the work order.

   NOTE: For jobsite safety, the manhole cover should remain on until the cleaning operation is ready to begin, and be replaced after the pipe has been cleaned.

   For off-road pipe cleaning, note the manhole location, and identify the path the rodder will need to take to reach the manhole.

Equipment Set-Up:

1. Remove the rod guide hose from the rodder and lay it out to determine whether a rod guide hose extension is needed to send rods through the hose.

2. Verify the rodding machine pressure is set to 300 psi forward pressure per the manufactures O&M manual.

3. Push the sewer rod into the guide hose, stopping as soon as the end of the rod emerges from the bell end and a tool can be attached.

   Note: The bell end of the rod guide hose should always be at the end of the guide hose so that rod couplings can easily pass in and out of the guide hose.

4. Verify the rod pressure by following the instructions for setting rod pressure (**Attachment C**).

5. Select the desired tool and attach it to the sewer rod.

   Note: An auger, one pipe size smaller than the pipe being cleaned, is typically used on the first pass.

6. Verify the lower rod guide hose brace is attached to the bell end of the guide hose and has a rope attached for insertion and removal.

7. Lower the rod guide hose with the selected tool into the manhole channel, pointing the tool toward the section of pipe that will be cleaned.

8. Once the tool is in the desired pipe, remove any slack or bends from the guide hose by pulling the rodder until slack and unnecessary bends are removed.

The rod guide hose should be set up with minimum bends and low angle of entry into the pipe being cleaned.

The lower manhole brace prevents the bell end of the rod guide hose from kicking back when the tool encounters material.

9. Place an appropriately size debris trap in the downstream manhole of the pipe section being cleaned.

Note: If rodding a pipe from upstream to downstream, the trap should be placed in the downstream manhole.

10. Position a crew member at the far manhole (if manhole location permits) to guide the operator when the tool has arrived and to make a tool change.

    If vehicle, bicycle, or pedestrian traffic are present, set up road cones at the far manhole.

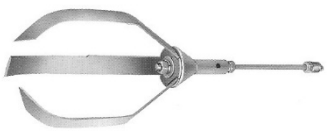
Basic Cleaning Tools:

The Equipment Operator is responsible for selecting the tools to be used for a given pipe cleaning task. The following tools are used in conjunction with the rodding machine.

<u>Boring tools:</u>
Augers are specifically designed to pilot a path through the pipe allowing other tools to be used. The first tool used should be an auger one pipe size smaller than the pipe being cleaned.

<u>Root saws:</u>
Root saws are designed to cut heavy root masses once a path through the pipe has been established. To avoid bending and coiling the rod by push cutting, these tools should be used only on the pullback pass.

<u>Finishing tools:</u>
Three-blade cutting tools are used on the pullback pass to scour the pipe walls to remove roots and grease.



Debris trap:
A debris trap/scoop should be placed in the downstream invert to trap any material that is removed during the cleaning process.

Note the debris removed from the pipe during cleaning on the work order form in the MDU. The debris type and quantity should be documented at each cleaning job. (See the debris chart provided in Attachment D.)

Operational speeds:
For best results, use the following rotation and speed guidelines, adjust travel speed as conditions require:

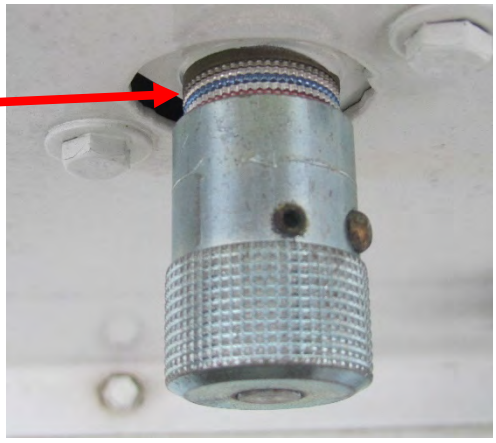
- Boring tools - 25 rpm turn rate – pushed at approximately 40 feet per minute
- Root saws - 55 rpm turn rate – pulled back at approximately 35 feet per minute
- Finishing tools - 65 rpm turn rate – pulled back at approximately 30 feet per minute

Rodder Operation:

1. The cleaning process begins with the use of an auger, one pipe size smaller than the pipe diameter. If this tool is not able to cut through materials in the pipe, remove it and replace with a smaller tool to pilot a path to the far manhole.
2. Start moving the tool forward into the pipe using the forward/reverse control.
3. Once the tool moves, rotation of the rod can be started by depressing the rod reel rotation control lever.
4. Tools are designed to be turned clockwise in the pipe and controlled with the reel rotation direction control.

   Boring tools like augers can be turned counter clockwise to pull over misaligned joints or be removed from materials through which they cannot fully pass.

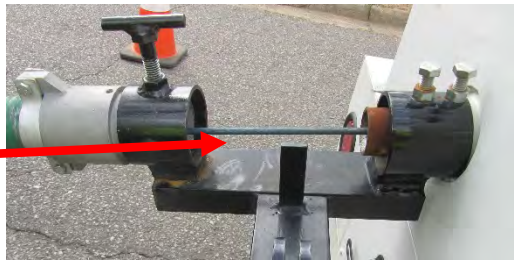
5. Rotation speed for augers (and all boring tools) is approximately 25 rpm, which is adjusted using the reel rotation control. Color rings are used as markers to set rotation speed.



6. As the tool encounters materials, rod torque can develop when tool rotation is slowed by the material and rod turning speed is not slowed. Some torque is necessary for the tool to cut, but excessive torque can damage or break the rod.

   Observe the rod between the guide hose anchor bracket and the end of the rodder.

   When the rod arches up, it means the tool is encountering resistance in the pipe.



   When scratches on the rod start to twist or "candy cane" on the rod, draw the tool back a foot so torque can be relieved, then return the tool into the material. Repeat as necessary until the tool clears a path through.

7. Operational techniques of the rodding machine vary for different cleaning situations, depending on the pipe condition, materials being removed, location and the quantity of debris to be removed from the pipe.

   Follow operational guidelines listed in the OEM O&M manual. In addition:

   - Do not rotate the rod without moving it slowly in or out of the machine to avoid heat build up
   - Do not use excessive pressure to push rods through obstacles
   - Start with a tool one pipe size smaller, and if it does not operate effectively, downsize it
   - Do not stress rod with excessive rotation when the tool is not turning
   - Do not stress rod by pushing into materials, use the proper technique of withdrawing and re-engaging repeatedly

Perform tool changes at the far manhole during operations; perform heavy cutting while pulling back. Use a gaff to guide the tool and string of rod to the top of the manhole.

Remove the tool from the rod and attach the desired tool for the return pass. Pull the tool into the manhole until it is resting in the manhole channel prior to rotating the tool. Pull the tool back at a slow rate of speed.

On completion of the return pass, remove the debris trap and check for type and amount of material.

Record the cleaning findings in the reporting form accurately.

Remove small roots from the back of the trap with a wire brush between each cleaning job to determine if each section has roots or not.

Machine and Jobsite Breakdown:

Use the following protocol when leaving the job site:

1. Secure the manhole lid, replace lock down bolts if used.
2. Secure the rod guide hose to the trailer.
3. Secure all tools and equipment for travel.
4. Remove the road cones from the immediate work area by removing the furthest cones first and working back towards the vehicle.
5. Move the vehicle to the curb or safe parking area to complete the work order.
6. Document all work performed before moving to the next job site or returning to the Yard.

Shut down lights and arrow boards when the leaving the job site.

Notify Supervisor if any issues were noted with the vehicle, tools or equipment.

Attachment A Basic Rodding Machine Tools and Applications

Rodding Tool Type	Pipe Sizes	Applications
 Standard Root Saw	6"-12"	Light root removal
 Concave Root Saw	6"-18"	Heavy root removal
 1.5" Spear Point	4"-18"	Relieve blockages
 3" Spear Point	6"-12"	Piloting tool in roots, grease
 Auger	6"-12"	Relieve blockages
 Square Bar	6"-12"	Remove roots/grease on pull back

Tool Type	Grease	Roots	Grit/Sag	Stoppage	Exploration
 Standard Root Saw	◐	●	○	◐	◐
 Concave Root Saw	◐	●	○	◐	◐
 1.5" Spear Point	○	○	○	●	○
 3" Spear Point	○	○	○	●	○
 Auger	●	●	○	○	◐
 Square Bar	◐	◐	○	●	◐

Legend	Best Use	Not Suitable	Potentially Suitable

Attachment B Rodding Machine Standard Equipment Inventory

Rodding Machine Inventory Checklist

Rod Operation		
5/16" x 36" rod	350'	
Rod Turning Mach	1	
Gas can - 2 gal	1	

Rod Tools		
4" Root saw	1	
6" Root saw	1	
8" Root saw	1	
4" Auger	1	
6" Auger	1	
8" - Auger	1	
8" - 3-Blade cutter	1	
10" - 3-Blade cutter	1	
4" - Squarebar	1	
6" - Squarebar	1	
8" - Squarebar	1	
1.5" Spear head	2	
3" Spear head	2	
Assembly wrench	2	
Pull out handle	1	

Traps		
6" Open top	1	
8" Open top	1	
10" Open top	1	
4 - 6' fiberglass poles	1	

PPE/Safety		
Gloves - leather (pr)	8	
Gloves - rubber (pr)	8	
Gloves - latex (box)	1	
Safety glasses	4	
Hard Hat	4	
Boots - knee high (pr)	4	
Rain gear (sets)	4	
Hearing push-ins - box	1	
Tyvek suits	2	
Dust masks - box	1	
SSO Signs	5	
Snake chaps (sets)	4	

Set Up & Access tools		
Cvr hook JC type	2	
Cvr hook cold rolled	1	
wheel chocks	2	
Counter wheel	1	
100' Reel tape	1	
Mirror	1	
Magnet with rope	1	
Steel palm mitts (pairs)	3	

Long Tools		
Fork head (pole)	1	
Chopper head (pole)	1	
12' Pincher shovel	1	
Rock bar - 6'	1	

Traffic Safety		
Road cones orange	12	
Road work sign set	1	
Stop paddles	2	

Hand Tools		
Brush cutter - Gerber	1	
Brush axe	2	
Shovel - round	2	
Shovel - flat	2	
Shovel - trench	1	
Sledge 16 lb	1	
Rake - metal leaf type	1	
Rake - metal earth type	2	
Post hole digger	1	
Mattock	2	
T handle probe - 5'	1	
Concrete mixing hoe	1	
Wheel barrow	1	
Concrete trowel	2	
Push broom	1	
1/2" impact wrench	1	
1 - set 2-way radios	1	

Misc Item		
Green paint	2	
Rags - some/several	1	
Dye - yellow/green	2	
Atlas map	1	
Petzl head lamps	4	
Caution/flag tape roll	2	
Rain gear sets	4	
Radio - hand held	4	
Boots - calf high (pr)	4	
Flashlight	4	
Water jug or cooler	1	
Anti bacterial soap	1	
SSO measuring stick	1	
10' Chain 3/8" link	1	
Level - 4'	1	
Manhole cushion	5	
Rachet straps (set)	2	

Mechanical Tools		
Socket set tool box	1	
Asstd tools box	1	
Grease gun	1	
Assorted sprays	1	
Pipe wrench 24"	2	
Bolt/Chain cutter	1	

Misc supplies		
Water in 50 gal tank	25	
5- g bucket lime	3	
5- g bucket quickcreet	3	
5- g bucket concrete	2	
5- g bucket sand	3	
Spare MH cover 20"	2	
Spare MH cover 22"	2	
MH Riser - steel	2	
MH Frame - 20"	1	
Burlap sacks	12	

Attachment C – Setting the Rod Pressure

When working with sectional rodding machines, the forward pressure setting is critical to proper operation and rod life. Not all brands of rodders set their pressures the same way, but the following basic steps are common to most types:

1. On sectional rodders, bring the rod out of the machine until the first coupling is between the end of the guide hose and the exit tube of the machine.

2. Use a Pullout tool or sewer rod cut down to 16-inches long and inserted into the center hole of the coupling can be used.

3. Use the rod directional control lever to pull the rod back into the machine, until the tool prevents the coupling from entering the machine.

4. With the rod directional control lever depressed in the pullback position, turn the pressure relief valve counter clockwise until it stops. This will bottom out the valve to zero pressure.

5. Keep the rod directional control lever depressed and turn the pressure relief valve clockwise. Observe the hydraulic pressure gauge until the gauge shows 300 pounds (lbs.) of pressure.

Attachment D Cleaning Findings and Debris Severity Chart

Material Type	Minor	Moderate	Heavy
Roots	***Visual:*** No evidence of roots to small bits of hair/curtain roots observed in the trap or on the sewer cleaning hose, without large clumps	***Visual***: Moderate clumps of roots in trap. Roots between 1/8-inch to 3/8-inch thick. ***Feel***: Hose does not bind or hydraulic pressure does not jump when roots encountered.	***Visual***: Large clumps of roots in trap. Roots over ½-inch thick. ***Feel***: Hose binds, jumps or slows down; hydraulic pressure can jump when using hydro cutter.
Grease	***Visual:*** No evidence of grease to small bits of grease in flow or stuck to sewer cleaning hose. Water color changes to light milky color with some odor.	***Visual***: Popcorn size bits of grease with some larger chunks, from ½-inch to 1-inch diameter. Water color changes to light tan/brown and odor. ***Feel***: Hose may slow, but does not bind or hydraulic pressure does not jump when grease encountered.	***Visual:*** Any large chunks, logs or calcified grease of significant size. Water color changes to dark brown or black with foul odor. ***Feel:*** Hose binds and repeated attempts to clear some sections of the pipe are required.
Debris **Sand, rocks, gravel, sludge**	***Visual:*** No evidence of debris to small amounts, conditions do not require shortening standard step cleaning length. No operator concern for blockage (no indication debris concentrated in a small area). ***Quantity***: Debris removed produces less than: *1 gallon (≤ 8 inch trap) *2 gallons (10 inch trap) *3 gallons (≥12 inch trap) Or - For every 25-foot step cleaning increment, less than 5% of channel filled with debris.	***Visual***: Debris removed is held back by the trap and conditions do not require shortening standard step cleaning length. No operator concern for blockage (no indication debris concentrated in a small area). ***Quantity***: Debris removed produces: *1-3 gallons (≤ 8 inch trap) *2-5 gallons (10 inch trap) *3-7 gallons (≥12 inch trap) Or - For every 25-foot step cleaning increment, 5-20% of channel is filled with debris.	***Visual***: Large amounts of debris are returned to the manhole channel with each cleaning pass. Shortened standard step cleaning length is required. Operator concern for blockage (debris feels concentrated in a small area). ***Quantity***: Debris removed produces more than: *3 gallons (≤ 8 inch trap) *5 gallons (10 inch trap) *7 gallons (≥12 inch trap) Or - For every 25-foot step cleaning increment, more than 20% of channel filled with debris.
Rags	***Visual:*** No evidence of rags to one or two rags observed in the invert or are returned to the manhole channel during cleaning.	***Visual:*** Several rags are observed in the manhole or are returned to the manhole channel during cleaning.	***Visual:*** Many rags (in a ball or pile) are observed in the manhole or are returned to the manhole channel during cleaning and could cause a blockage if not removed.

*Findings amounts are based on 300 feet of 8-inch diameter pipe. For larger/smaller pipe or more/less footage, use best judgement in comparing actual findings to guidance above (for example, 1 gallon of sludge in a 50-foot long 8-inch diameter pipe would be considered "heavy.")

Volume of traps: 6-inch = 0.25 gallons; 8-inch = 1 gallon; 10-inch = 1.5 gallons; 12-inch = 2.5 gallons

Appendix J Easement Machine Pipe Cleaning SOP

Easement Machine Pipe Cleaning

Objective:

To describe safe and effective procedures to clean pipes in unimproved easements.

Responsibilities:

Easement cleaning work shall be scheduled by the Field Supervisor.

Task:

Use a self-propelled easement cleaning machine with trailer and tools to clean pipes and clear minor debris, shrubs, and other growth from sewer line easements in order to facilitate maintenance operations.

Performance Standard:

Staff performing or assisting with the use of this equipment and cutting tools should have knowledge of proper equipment/tool operation and appropriate safety measures.

Safety and Field Cautions:

Safeguards must exist for any machine part, function, or process that may cause injury. When the operation of a machine or accidental contact with it poses harm to the operator or others in the vicinity, the hazards must be either controlled or eliminated.

It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation they may encounter. Operators and other personnel shall wear weather-appropriate clothing, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters and operating procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not use this equipment in the field without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor variabilities in operation or machine performance, along with field operation instruction.

Tools and Equipment: **See Attachments A, B, and C**

Procedures

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with ESD Personal Protective Equipment and Traffic Control policies.

Pre-Trip Duties:

1. Review assigned work order(s) to determine the appropriate access points and any equipment or cutting tools to be used.

2. Load equipment on trailer(s), and verify load is secure.

3. Perform vehicle pre-trip inspections. Verify trailer is properly mounted and secured to the towing vehicle hitch, that all trailer signal lights are operational, and that safety chains are properly attached.

4. Conduct equipment checks and load required fuel for the easement machine and/or other power equipment on the appropriate truck.

Arrival at the Site:

1. Upon arrival at the site, confirm that the easement to be cleaned matches the location listed on the paperwork.

2. Locate the downstream and upstream manholes of the pipe section being cleaned, and determine the best way to access both manholes.

3. Position the trucks and trailer in the manner that provides the best, safest access for equipment and limits exposure to traffic.

   Avoid blocking the entire street unless it is absolutely necessary.

4. Place protective road cones around the work area when working or parked in the road or pedestrian area.

5. Verify the trailer is located on terrain suitable for equipment deployment. Deploy the trailer ramp.

   Install the trailer jack legs so the trailer is stable when unloading the equipment.

   Unload the equipment from the trailer.

   Secure any tools from the trailer and lock the towing vehicle.

Easement Cleaning Operations:

1. Determine if the water supply truck sewer hose (attached to the wash truck or combination truck providing water supply via the sewer cleaning hose) can be attached to, and pulled by, the easement machine without damaging the sewer hose.

   Attach the sewer cleaning hose from the water supply truck to the towing coupling at the rear of the easement machine.

   Maneuver the easement machine into the easement along the best and safest route possible.

   Avoid traversing steep slopes with the easement machine. To reduce overturn potential, approach steep slopes at a 90° angle, straight up or straight down the slope.

2. Use axes, machetes, or Gerber knives when necessary to expose hazards and obstacles such as elevated manholes, force main cleanouts, and cables that could be damaged by the easement machine, cause injuries, or become entangled in the equipment.

   NOTE: Use caution when working near trees and shrubs: keep alert for low branches. Exercise caution walking through areas with vines and other brush that can pose a trip/slip hazard.

3. Use caution in removing the manhole covers of the upstream and downstream manholes where the easement machine will be used.

4. Confirm that the manhole depth, pipe diameter, and material matches the manhole description on the work order.

5. Determine if additional rollers, tiger tails, or other protective devices will be needed to aid the hose during cleaning.

6. When pulling the sewer cleaning hose with the easement machine, pull approximately 10-feet beyond the manhole to avoid hand pulling the hose.

7. Set up the easement machine for maximum stability, such that it allows the sewer hose and reel to be used without interference.

   If the water supply truck sewer hose is not pulled behind the easement machine, hand pull the supply hose to the easement machine.

8. Connect the supply sewer cleaning hose to the water delivery fitting. Wrenches should be used to secure a tight connection.

9. Select the appropriate cleaning nozzle for the job, verify that a tiger tail is on the easement machine sewer cleaning hose, and attach the nozzle to the hose.

10. On the easement machine control panel, change the operation selector switch to “Reel Operation.”

11. Using the easement machine hydraulic controls, pay out the sewer cleaning hose to allow the nozzle and tiger tail to be set up in the manhole channel.

    Verify the hose clears the manhole rim and manhole rungs or any other structure components.

    Manholes with flood plain risers may require use of an upper manhole roller. Do not allow the sewer hose to drag across the structure or frame without protection.

12. Select the proper size debris trap and attach the appropriate number of extension poles needed to place the trap in the manhole channel.

    Lower the trap into the manhole and position the trap to catch materials at the downstream pipe invert.

    If needed, tip the trap forward to fit into the invert or to trap material in fast-moving flow.

    If the pipe is too deep and there are not enough extension poles, attach a rope to the trap and lower it into the manhole.

    Do not change nozzles over the open manhole.

13. After checking the headset radio is functional, or by using hand signals, coordinate water delivery to the easement machine to start cleaning operation.

    The easement machine operator should direct the supply truck to start water flow, adjust water pressure, and to stop water flow.

14. When water arrives from the supplying wash truck or combo truck, verify the nozzle is working properly and use the reel controls to pay out the hose.

    Clean the pipe using the appropriate cleaning technique based on the material encountered.

15. Step clean the pipe by moving the nozzle a set distance and returning the nozzle to the initial manhole to check what cleaning debris is returned, before sending the nozzle forward to a farther set distance, and returning the nozzle to the manhole. Repeat steps until nozzle reaches far manhole.

16. Once the crew member stationed at the far manhole sees the nozzle, the crew member will signal the easement machine operator of its arrival, and the operator will pull the nozzle back through the pipe.

17. On the final cleaning pass, maintain a nozzle return speed of 35 to 40 feet per minute.

    If the cleaning process reveals evidence of roots or grease, re-clean the pipe using a nozzle specifically designed for the material being removed.

18. When the cleaning work is complete, lift the nozzle and tiger tail from the manhole.

19. Remove the trap from the manhole, and record the type and amount of material removed as defined in the **Condition Findings Chart** (**Attachment D**).

    If gravel is encountered during the cleaning process that appears to be pipe bedding material, immediately stop cleaning and notify the Supervisor. Resume cleaning operations only if and when directed by the Supervisor.

20. Use the trap or a pincher shovel to remove the solids, or consider using the vacuum system to remove the solids.

21. Place the material removed from the manhole into burlap bags or 5-gallon buckets.

    NOTE: Easements are typically cleaned in sections: one section is fully cleared, then the next section is cleaned. This process is repeated until the entire length (or designated pipe sections) of the easement is cleaned.

    If a manhole frame and/or cover are damaged during the cleaning process, report the manhole to the Supervisor to request the necessary repair.

End of Job Duties:

1. Replace the manhole lid, properly stow all equipment and tools, and secure the easement machine sewer cleaning hose to the travel coupling.

2. On the easement machine control panel, change the operation selector switch to "Track Operation."

3. If moving to the next upstream manhole, disconnect the water supply hose and reconnect it to the sewer hose towing connector.

4. Maneuver the easement machine to the next manhole and repeat the process, or move to the access point to return to trailer.

5. If moving back to the trailer, disconnect the water supply hose from the easement machine to the water supply truck reel in order to rewind the sewer cleaning hose to the truck. Assist the process by hand when the hose becomes snagged or tangled along the way.

6. Prior to loading equipment, sweep the floor of the trailer to remove rocks and gravel.

7. Remove material that has adhered to the easement machine, and knock heavy dirt from its tracks.

8. Safely maneuver the easement machine onto the trailer.

9. Secure the easement machine to the trailer using the proper chains or straps.

10. Raise and secure trailer ramp.

11. Fill out all the information fields in the Work Order Form and/or tablet. Estimate the type and amount of materials removed from the pipe.

    Call and update the Dispatch office on the status of any service request-related work.

12. Retrieve all traffic control devices and secure for travel.

13. Proceed to the next work order location, or return to the yard.

14. At the yard, if tools and equipment were borrowed from another truck, replace all items.

15. Notify Supervisor if any issues were noted with the vehicle, tools or equipment.


JET WASHER WORK ORDER FORM

Attachment A Equipment and Tools

Some of the following tools may be carried on the wash truck or combination cleaner that will supply water to the easement machine, or will be carried in the towing vehicle for the easement machine.

- Street guide and/or map book
- Trailer
- Traffic control equipment
- Personal protective equipment
- Headset radio (pair)
- Manhole hook
- Sledge hammer
- Adjustable wrench
- Tool box (with assorted tools)
- Socket set
- Bush axe
- Loppers
- Gerber knives
- Spray paint (green)
- Fuel containers with appropriate fuel
- Water container (Igloo large)
- Fire extinguisher
- First aid kit

Attachment B Standard Nozzle Inventory

The following nozzles are carried on the wash truck or combination cleaner that is providing the water supply to the easement machine.

Nozzle Type	Pipe Sizes	Applications
 Std Radial	6" - 12"	Exploratory, light debris/grease, proofing skids
 Grenade	6" - 18"	Debris, especially good in sag pipe, light grease
 Chisel Point	6" - 18"	Relieve blockages
 Bulldog	8" - 18"	Roots, grease, some light debris
 Root Cutter	8" - 12"	Heavy/thick root removal

Nozzle Type	Grease	Roots	Grit/Sags	Stoppage	Exploration	Proofer
 Std Radial	◐	●	◐	◐	○	○
 Grenade	○	●	○	●	◐	●
 Chisel Point	●	●	●	○	●	◐
 Bulldog	○	○	◕	●	◐	●
 Root Cutter	◐	○	●	◕	●	●

Legend: ○ Best use; ◐ Can work; ◕ Limited use; ● Not suitable

Attachment C Water Supply Truck Inventory

Nozzles		
Radial (Enz)	1	
Chisel (Enz)	1	
Bull Dog	1	
Hydraulic root cutter	1	
Grenade	1	
Brass nozzle	1	

Fins/Proofers		
2-inch finned skid	1	
6-inch proofer	1	
8-inch proofer	1	
10-inch proofer	1	
12-inch proofer	1	

Hose Aids		
Leader hose (10 foot)	1	
Tiger tail	2	
Upper MH roller	1	

Traffic Safety		
Road cones orange	12	
Stop/slow paddles	1	
Roadwork sign set	1	

PPE		
Gloves - leather (pr)	2	
Gloves - rubber (pr)	2	
Gloves - latex Safety	1 box	
Glasses	2	
Hard Hat	2	
Hearing - push-ins	1 box	
Tyvek suits	2	
Dust mask	1 box	
Mirror	1	
Magnet	1	
Snake chaps	1	

Traps		
6-inch open top	1	
8-inch open top	1	
10-inch open top	1	
12-inch open top	1	
5-foot Fiberglass poles	4	

Access Tools		
Cover hook - JC type	2	
Hydrant wrench	1	
Wheel chocks	2	
Counter wheel	1	
100-foot reel tape	1	
50-foot fill hose rolls	1	

Long Tools		
Fork head	1	
Chopper head	1	
12-foot Pincher shovel	1	
10-foot Pincher shovel	1	
8-foot Pincher shovel	1	
Rock bar	1	

Hand Tools		
Brush cutter (Gerber)	1	
Brush axe	1	
Shovel - round	1	
Shovel - flat	1	
Sledge - 12 lb	1	

Mechanical Tools		
Socket set tool box	1	
Asstd tools - tool box	1	
Grease gun	1	
Spray lube	1	
18-inch pipe wrench	2	
Hose reel crank	1	

Misc Item		
Green paint	2	
Rags (several)	1	
Dye - yellow/green	2	
Atlas map	1	
Caution/flag tape roll	2	
Rain gear sets	2	
Radio - hand held	2	
Boots - calf high	2	
Spot light	1	
Flashlight	1	
Water jug or cooler	1	
Anti bacterial soap	1	
Burlap sacks	5	
5-gallon bucket	1	
Vice mounted on bed	1	
Nozzle orifice cleaner	1	
SSO measuring stick	1	
SSO Signage	2	

Attachment D Conditions Findings Chart

	Minor	Moderate	Heavy
Roots	***Visual:*** No evidence of roots or small bits of hair/curtain roots in the trap or on the sewer cleaning hose without large clumps	***Visual***: Moderate clumps of roots in trap. Roots of 1/8" to 3/8" thickness. ***Feel***: Hose does not bind or hydraulic pressure does not jump when roots encountered	***Visual***: Large clump/s of roots in trap. Roots over 1/2" thickness. ***Feel***: Hose binds, jumps or slows down, hydraulic pressure can jump when using hydro cutter.
Grease	***Visual:*** No evidence of grease or very small bits of grease in flow or stuck to sewer cleaning hose. Water color change to light milky color with some odor.	***Visual***: Popcorn size bits of grease with some larger chunks from 1/2" to 1" diameter. Water color change to light tan/brown with odor. ***Feel***: Hose may slow but does not bind or hydraulic pressure does not jump when grease encountered	***Visual:*** Any Large chunks, logs or calcified grease of significant size. Water color change to dark brown to black with foul odor. ***Feel:*** Hose binds and requires repeated attempts to clear some sections of the pipe.
Debris	***Visual:*** No evidence of any debris. Conditions do not require shortening standard step length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Max pass less than: *1 gallon (8 inch) *2 gallons (10 inches) *3 gallons (>= 12 inch) Or - For every 25 feet step increment, less than 5% of channel filled	***Visual***: Debris is removed held by trap, but conditions do not require shortening standard step length. No operator concern for blockage (no indication debris is concentrated in a small area). ***Quantity***: Max pass between: *1-3 gallons (<= 8 inch) *2-5 gallons (10 inches) *3-7 gallons (>= 12 inch) Or - For every 25 feet step increment, must be between 5-20% of channel filled	***Visual***: Large amounts of debris returned with each pass. Condition requires shortening standard step length. Operator concern for blockage (debris feels concentrated in a small area) ***Quantity***: Max pass, more than: *3 gallons (<= 8 inch) *5 gallons (10 inches) *7 gallons (>= 12 inch) Or - For every 25 feet step increment, must be more than 20% of channel filled

Volume of Traps: 6" = .25 Gallon 8" = 1 Gallon 10" = 1.5 Gallon 12" = 2.5 Gallon

*BASED ON 300' LENGTH OF PIPE

Appendix K Geographic Information System Updates WPD

GIS Updates

1.0 OBJECTIVE

The objective of this SOP is to provide Jefferson County (County) with a clear and concise document that summarizes the methods and applications used by County staff to maintain data in the current Geographic Information System (GIS).

2.0 RESPONSIBILITIES

Applying physical changes to the GIS database is restricted to an appointed County GIS staff member with editing permissions (hereafter referred to as the GIS editor). Changes shall be made using GIS desktop software and applied to the County's centralized ESRI ArcSDE geodatabase.

In cases where the GIS editor requires it, County Survey Department staff will be responsible to verify the attribute information and/or physical location of utility assets in the field as directed. Survey staff will be responsible to provide all requested information back to the GIS department and ensure it is accurate. At a minimum, GPS coordinates of the site visit location should be collected. Additional information such as paper sketches of the utility layouts and general notes of observation may be required by the GIS editor.

The GIS editor will be responsible to regularly coordinate with operations and maintenance staff in order to determine which work orders have been completed that require updates within GIS. Inspection staff and the GIS editor should work together to facilitate identification of relevant work orders requiring GIS updates.

All County staff including engineers, inspectors, and maintenance workers will be responsible to communicate to the GIS editor any discrepancies found in the wastewater collection system during the normal course of their duties. The GIS editor will be responsible to implement all updates.

3.0 PROCEDURES

GIS UPDATES BASED ON RECORD DRAWINGS

1. Record drawings documenting changes to the system that are made during construction by outside contractors (including utility contractors or subdivision construction developers) shall be received by GIS staff and cataloged. It is recommended to make scans of all received documents during this step to link to GIS.

2. The GIS editor will utilize ESRI ArcGIS GIS software to digitize the wastewater pipe and structure network features, etc. shown on the record plans.

3. Attribute data shown on the plans or reported by the contractor will be updated in the GIS database. It is recommended to include the following sewer feature GIS data at a minimum:

Manholes	Gravity Lines	Force Mains	Lift Stations
Asset ID	Asset ID	Asset ID	Asset ID
MH Rim Elevation	Install or Replace Date	Install or Replace Date	Install or Replace Date
MH Depth	Upstream Invert Elevation	Line Diameter	Station Firm Capacity
Install or Replace Date	Downstream Invert Elevation	Pipe Material	Number of Pumps
Abandoned Date	Line Diameter		Station Pump Type (centrifugal, suction-lift, other)
Barrel Diameter	Pipe Material		Wet Well shape (circular, rectangular, irregular)
Sealed?	Cross Section Shape		Wet Well Cross Sectional Area (if not irregular)
Drop Manhole?	Siphon?		Standby Generator?
	Upstream MH Asset ID		Upstream MH Asset ID
	Downstream MH Asset ID		Downstream MH Asset ID

4. As required, pending changes to property boundaries, deed documents are scanned into digital format and electronic database links are created to the GIS features referenced by the deed document.
    a. These links should be stored in the GIS database using the SIMS interface. It should be noted that this SOP should be updated in the future if the County adopts the new web-based SIMS tool currently under development.)
    b. The resulting scanned deed document images should be stored in a centralized location on the County's servers.

5. The GIS editor may request additional field verification for inconsistencies or omissions on the record drawings. In any case where a GIS feature is field verified, the date of verification should be entered in the "FLD_VERIFY" field in the underlying GIS attribute table.

GIS UPDATES BASED ON WORK ORDERS

1. Work order records indicating changes to the wastewater network by County personnel shall be a primary means to identify assets in need of GIS update. The GIS editor shall determine the relevant work orders for assets to update on a regular basis. This update frequency should be no less than once every two months.

2. Once the relevant work orders have been identified, GIS staff will identify the location of work performed and print paper maps of the existing wastewater network and basemap features for reference by survey staff.

3. Survey staff shall utilize the paper map documents to locate the area of work and use survey equipment (total stations, manual survey, GPS, etc.) as appropriate to collect the modified physical locations and attributes in the field.

4. Survey staff shall manually mark up the changes to the network on the paper maps provided by the GIS staff and record notes and observations as necessary to clearly communicate to GIS editor the changes to be made.

5. When available, GIS staff will import database output from total station survey equipment to assist with generation of new GIS features.

6. Once survey staff provides verification of changes from work orders, GIS staff shall remove existing/replaced wastewater assets in the GIS as appropriate and replace with the new/modified features from the survey data into the existing GIS wastewater network.

7. Once the GIS feature is field verified, the date of verification should be entered in the "FLD_VERIFY" field in the underlying GIS attribute table.

8. The GIS editor may request additional field verification for inconsistencies or omissions on the survey drawings.

GIS UPDATES BASED ON CLOSED-CIRCUIT TELEVISED INSPECTION DATA

1. For all closed circuit television inspections (CCTV) on the wastewater system by both County and outside contractor staff, the County's GIS shall be updated to match accordingly.

2. The GIS editor will be responsible for comparing the following fields from the PACP inspection database based on the line Asset ID.

CCTV Update Fields
Height
Width
Shape
Material
Length Surveyed

3. It is recommended during this step to populate GIS fields with the following values from the CCTV inspection into the GIS gravity line feature:

CCTV Update Fields
Date Televised
Upstream Rim to Invert
Upstream Grade to Invert
Upstream Rim to Grade
Downstream Rim to Invert
Downstream Grade to Invert
Downstream Rim to Grade

4. The GIS editor may request additional field verification for inconsistencies or omissions in the CCTV inspection data. In any case where a GIS feature is field verified, the date of verification should be entered in the "FLD_VERIFY" field in the underlying GIS attribute table.

GIS UPDATES FOR NEW ASSETS IDENTIFIED IN FIELD

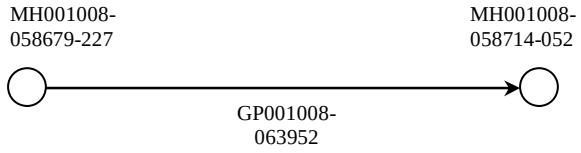
If manholes are discovered in the field that are not in GIS, the GIS editor will need to create new Asset IDs for the manholes and associated gravity lines. The Asset ID consists of three parts separated by hyphens [Feature Mini-Basin]-[Unique Numeric ID]-[Original Facility ID MH number]. Manholes are the only features that have the third part, which is a reference to the original Facility ID.

1. Referencing the downstream manhole Asset ID, the Asset ID of the new manhole(s) shall be created by appending either a letter or number to the original Facility ID.
2. A new unique numeric ID must also be generated for the new feature. The GIS editor will ensure this middle part of the Asset ID is unique to any other feature of the same type during this step.
3. New manholes that split existing gravity lines will require the new gravity line Asset IDs to be modified. Asset IDs for new gravity lines shall be assigned by ensuring the new feature(s) has a unique numeric ID in relation to any other gravity line.
4. See the following four examples for illustration of these update procedures.

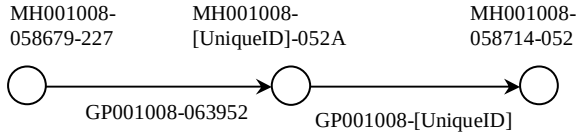
GIS Updates

Example 1: One MH discovered between two existing manholes with downstream manhole ID ending in a number

GIS data:

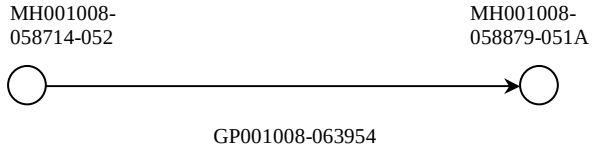


Field Observed data:

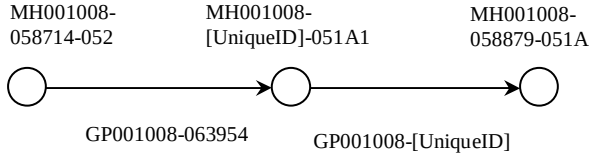


Example 2: One MH discovered between two existing manholes with downstream manhole ID ending in a letter

GIS data:

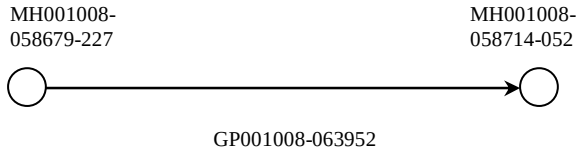


Field Observed data:

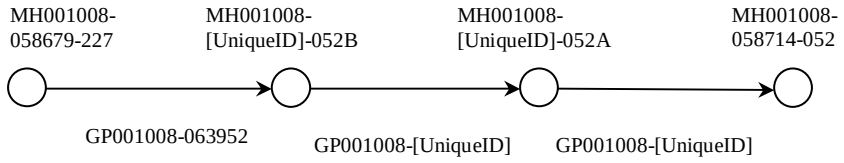


Example 3: Multiple MHs discovered between two existing manholes with downstream manhole ID ending in a number

GIS data:

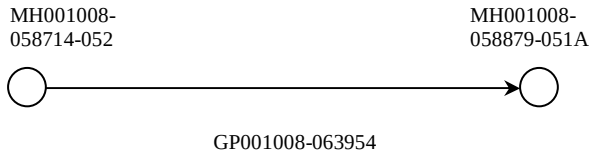


Field Observed data:

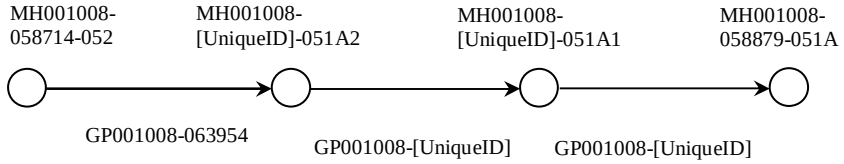


Example 4: Multiple MHs discovered between two existing manholes with downstream manhole ID ending in a letter

GIS data:



Field Observed data:



4.0 SAFETY PROCEDURES

1. Any field work should be in accordance with the County's standard safety procedures. These procedures should include provisions for traffic control and confined space entry at a minimum.

5.0 QA/QC

1. All updates that are inconsistent or suspicious in nature should be field verified. The GIS editor is ultimately responsible for all GIS edits.

2. CCTV inspection data is understood to have been field verified during data collection. The GIS editor should use basic software queries before final updates to check for inconsistencies with length surveyed and GIS.

3. Final updates shall be checked visually on-screen by GIS staff. GIS staff is encouraged to use basic software queries before leaving the update to check for inconsistencies with line diameters, length, and material.

Appendix L Closed-Circuit Television (Inside the Van) SOP

Closed Circuit Television (CCTV) Sewer Inspection Practices and NASSCO PACP Coding – Inside CCTV Van

1.0 OBJECTIVE

The objective of this SOP is to provide Jefferson County (County) with a clear and concise document that summarizes the methods and applications used by County staff to perform CCTV inspections of their sanitary sewer system using NASSCO PACP coding and software. This SOP will cover collecting, transferring, storing, reviewing and utilizing the data for making decisions on operating, maintaining and repairing the sewers.

See the SOP entitled Closed Circuit Television (CCTV) Operational Practices outside the van.

2.0 RESPONSIBILITIES

The CCTV operators were certified in NASSCO Pipeline Assessment and Certification Program (PACP) inspection on May 2012 and need to keep their certification update every 3 years by taking a recertification course and passing the exam.

The engineering department and data management staff need to transfer the video and data files from the operators and review for PACP coding accuracy, correct location, file naming, video and audio quality and asset ID accuracy. See section 3.2 for details on transferring the data.

The maintenance managers need to work with the engineering department to schedule future CCTV inspections of the sewers based upon prioritizations developed by the Asset Management Program.

3.0 PROCEDURES

3.1 CCTV INSPECTION OF SEWERS

1. The work orders are developed from the maintenance manager(s) and print outs of the locations of inspections to be done for each day are taken out in the field each morning.
2. Crews use a tool in ArcMAP (SIMS or SIMS replacement tool) to select sewer line segment for inspection and use fields on the displayed form to copy and paste feature attribute data into Pipetech Scan inspection software header fields. The “Asset ID” from ArcMap should be copied and pasted into the “Pipe Segment Reference” field and the Asset IDs of the manholes should be copied and pasted

into the Upstream and Downstream Manhole ID fields. The "Mini Basin" ID should be copied and pasted into the Pipetech Basin field.

3. A folder on the County server will be created for each inspection and the folder name should be: "Asset ID_ Date_Time". The Date should be in Year_Month_Day format and the time should be in military time. This name will also be used for the video file name.

   Table 1. The Variables Table in the PipeTech Template database (abbreviated).

Variables	
VariableName	VariableValue
Attachment Filter	{Incident Code}@{Footage}.jpg
MPEG Filter	{Pipe_Segment_Reference}_{Date}_{Time}_{Direction_of_Survey}.mpg
PDF Filter	{Pipe_Segment_Reference}_{Date}_{Time}_{Direction_of_Survey}.pdf

   The Variables Table in the attached PipeTech template file (JeffCoPACP.ptm) contains information that controls the names and pathnames of things like photo attachments, video files, and pdf files. Entries in the VariableValue field contained in {} brackets are field names from the Details table that are filled in on-the-fly as the photos, videos, and PDFs are generated and stored. For example, the inspection of the pipe with Pipe_Segment_Reference "GP004001-259036" done on 4/20/2013 at 8:30 AM in the downstream direction would generate a video with the filename based on
   {Pipe_Segment_Reference}_{Date}_{Time}_{Direction_of_Survey}.mpg, or

   GP004001-259036_04 20 2013_08 30_Downstream.mpg

   Other configurations are possible. Consult the PipeTech help for further details.

4. The camera operator should open the software program PIPETECH SCAN which will create *.ptd files (access database files), *.PDF files, *.JPG files and *.MPG or *.PTVfiles. A Pipetech template file (*.PTM file) should be pre-installed on the each CCTV computer that has a current PACP exchange template that will be utilized to collect the various Pipetech files.

5. The photos of each PACP code (.JPG files) should be collected as dictated by this protocol or the sewer maintenance manager. The software program can be set to collect NO Photos, ALL photos or only as the operator chooses. The digital video files will be collected in .PTV format or .MPG format. A one-page summary (*.PDF format) of inspection results for each pipe asset should be created and printed for each pipe as needed. The .PTD files are contained in a Microsoft Access database file for each MH to MH segment. The .PTD files will be combined into a larger database file by the data manager which are stored as a library file (*.PTL) on the county server. Pipetech View should be installed on individual computers to utilize this library of CCTV data.
6. The CCTV operator(s) should utilize the County cleaning crews as needed to properly clean the pipe. The cleaning should be completed after the pre-CCTV inspection to determine quantity and volume of debris. Typically one cleaning crew can keep the pace of two CCTV crews.
7. The camera operator and his crew should situate the camera within the manhole with the lowering hook to eliminate the need for man-entry of the manhole whenever possible.
8. The crew should situate the camera inside the pipe going downstream whenever possible. When the camera is in place in the pipe and the marking on the cable is observed to be at the center of the manhole, the operator should set the footage reading to 0.00 and begin recording the relevant codes.
9. The Pipetech software program shall be utilized to collect an inspection record from manhole to manhole whenever possible.
10. The camera operator should completely fill in all the mandatory PACP header fields per the PACP Manual and any additional optional fields per County protocol. The software will have mandatory and optional header fields to populate. The most critical field to enter correctly is the “Pipe_Segment_Reference”, which shall be populated from the Asset ID field (refer to Item 2 in this section).
11. The CCTV operator should collect all pertinent defect data per NASSCO PACP coding standards. The operator should reference the PACP Reference Manual and 2-page color coded sheet for any questions related to coding defects.
12. The CCTV operator shall collect video data with a minimum bit rate of 4,000 kbps.
13. The O&M defects such as roots and debris and deposits should be coded before the sewer is cleaned whenever possible.

14. The first code for each inspection should always be "AMH" at the starting access manhole and the last code should be "AMH" or other access code and the manhole identification should be entered into the "Remarks" column. The second code of the inspection should always be "MWL" to denote the beginning water level. The last code should be the ending access point such as a manhole and the code being AMH.
15. Special attention should be taken to properly code the worst structural defect in a given area and not excessively code defects that may be more aesthetic in nature.
16. Pipe sags should be recorded as a continuous defect from the beginning of the sag to the end of the sag with the code MWL. The % of the sag should be at the deepest location in the sag relative to the upstream or downstream normal water level. Several codes that are often coded incorrectly (all operators should be well versed in proper PACP coding) are: cracks, fractures, holes, sags, roots in the laterals and at the taps, deformed pipe, defective taps, continuous defects, taps (TFA vs. TF; TFA should only be used when water activity is observed).
17. Severe structural defects with a condition grade of 5 that require immediate repair or attention should be copied into an "Alert File" created by Jefferson County staff. Active spills and those conditions that appear could cause an overflow should be put into this type of file. A document file called Alert.txt should describe the problem and recommended solution if the operator is experienced enough to make an initial recommendation. The folder should contain a PDF of the PACP report, the PACP CCTV video, and jpg photos. These "Alert Files" should be given to the sewer operations manager on a daily basis for proper actions.

3.2 DATA COLLECTION, TRANSFER AND STORAGE

1. Crews will perform inspections and store the digital files initially onto the hard drive on the CCTV truck local computer. This SOP assumes the files will be located in C:\Pipetech_Staging
2. After inspection or at end of day, crews run a computerized routine developed by Jefferson County Staff that will copy all folders from C:\Pipetech_Staging onto a USB thumb drive and move the inspection folders into the C:\TVI_Backup\ folder.
3. A thumb drive gets inserted into a USB hub, at the maintenance shop, that can support up to 5 thumb drives at once. (There are 5 trucks in the maintenance shop.) These thumb drives can be connected to a computer as mapped drives and will show up as E:, F:, G:, H: and I: or some other letter. When these are plugged

into the USB hub, which is connected to the network, the GIS/CCTV data manager can see on his computer that they are plugged in.

4. Each truck will be assigned a designated truck ID (e.g. TVI-1, TVI-2, TVI-3 etc.).The volume label on the thumb drives should be named to match the truck ID so that the GIS/CCTV data manager can easily see files to be copied to the server.
5. Jefferson County staff shall schedule a task each work day to copy the folders from each of the thumb drives to the network share at the following location: \\esd-archive\esd\DocLinksP\Staging\. This task will also delete inspections from thumb drives once copied. Some QA/QC processes can be run on the inspections if needed at this point. Asset IDs, MH IDs, video quality, sound and other should be checked for accuracy
6. Jefferson County staff shall also copy any database changes onto these thumb drives so that they are ready to use the next day. This keeps the crews from having to wait to download the new database before they can leave in the morning. These can then be copied to the computer from the thumb drive on location.
7. Jefferson County staff shall use an existing application to parse the correct subbasin name from the inspection folder names and moves files to the correct \\esd-archive\esd\DoclinksP\PACP\TVI\{year}\ folder. This should be the final location for the inspections. Files shall be backed up regularly. Currently this task is performed nightly. After ten years, videos should be moved to an archive location.

3.3 CCTV DATA MANAGEMENT AND LIBRARY UPDATES

1. To add video files, use Pipetech View which is automatically set to the \\esd-archive \esd\DocLinksP\PACP\ folder to find new inspections to add to the library.
2. The CCTV database library (JEFFERSON COUNTY 2013.PTL file) will continuously update and become larger with the additional JEFFERSON COUNTY 2013.PTD files created in the field. This file shall be backed up regularly no less frequently than once per week.

3.4 IMPORTING GRAVITY INTERCEPTOR CONDITION DATA TO THE PIPETECH LIBRARY

1. If the data is organized per inspection, use PipeTech to import individual inspection databases (*.PTD files) into the master PipeTech Library.

   Before importing PipeTech data into the master PipeTech library; copy the data, *.ptd files, *.jpg and *.mpg files, to their final destination on the Jefferson County server. The data folder for a given inspection goes under the \\esd-archive\esd\

DoclinksP\PACP\TVI\{year}\{Pipe_Segment_Reference}_{Date}_{Time}_{Direction} folder. Ideally, the source data being copied will already have the desired directory structure, so copying to the final destination should involve copying entire folders without the need to manually create the destination folder structure.

For example, the inspection data for the pipe with AssetID "GP001080-253916," performed on 4/23/2013 at 8:58 AM, in the upstream direction, would include the files GP001080-253916_20130423_08 58_Upstream.mpg and JEFFERSON COUNTY 2013.ptd and would go under \\esd-archive\esd\DoclinksP\PACP\TVI\2013\ GP001080-253916_20130423_08 58_Upstream\

A. To import the data after copying it to the final destination, first open PipeTech View.

B. Set the current library to the master PipeTech library file: \\esd-archive\esd\DoclinksP\PACP\JEFFERSON COUNTY 2013.ptl.

C. Select 'File/Add PipeTech Data to Library' and browse for the location of the *.ptd files and press the 'OK' button. All *.ptd files at or below the selected location will be imported into the Master PipeTech Library. Be careful not to select a folder that would cause importing inspections that are already in the master library.

D. The PipeTech import process will replace any drive letter designation from the mpeg paths with the corresponding server share name: '\\esd-archive\esd\DocLinksP\PACP\'.

E. All of the decision tools can run with the server share name instead of the logical drive. The mpeg paths can be set back to the relative path drive designation by:

    a. Save a copy of the *.ptl file in the backup folder prior to opening MS Access.

    b. Start MS Access.

    c. Open the master PTL file. Note that the database access code is "sigchi".

    d. Create a new query.

    e. Go to SQL mode.

    f. Delete any text in the SQL window and enter the following text:

update Runs table and set MPEGPath = Replace (MPEGPath, "\\esd-archive\esd\DocLinksP\PACP\", ".\")

g. Run the query. Note that the query will state that it updated all of the rows; however, most rows will not need to be updated and will not be affected.

h. Notes:

1. When prompted to move or copy the video file(s), do not check any checkboxes, just press the "Next" button, as they are already in their final location.

2. The name of the *.ptd files must all match the name of the *.ptl file they are being imported to. If you get data from a contractor with different *.ptd names, you must first rename your master PTL file to match the *.ptd files, run the import routine, and then rename your *.ptl back to "JEFFCOSEWERPACP.ptl".

3. The recommended procedure is to give the contractor a seed *.ptd file (which is actually a *.ptm file) with the proper name you expect back with the data submittal. Giving the contractor the expected directory structure will help, too.

2. Importing a single PACP v 4.2 database.

The County specifies all submittals to be completed using the current version of PipeTech. It should be rare to receive data in another format. This may happen if the County receives assets from another organization and the data was recorded in a format other than PipeTech.

PACP version 6.1 interchange format does not include a specification for the video frame number or video timestamp. If you import data from a PACP exchange database, you will need to use some other means to import any video frame number or timestamp data.

3.5 POST REHABILITATION CCTV – CONSTRUCTION DELVERABLE

1. After a sewer line has been rehabilitated, a post rehabilitation CCTV video and database file (in current PACP exchange format) shall be provided that complies with all requirements of this SOP. The GIS/CCTV data manager shall edit the pipe

material in the County database as necessary (DIP/ VCP/RCP to CIPP) along with the date of the video which will be used as the in-service date.

4.0 SAFETY PROCEDURES

1. Refer to Standard Operating Procedures for CCTV Equipment Setup and Maintenance

5.0 QA/QC

1. It is recommended that 5% of the inspection data be reviewed in the office by a County staff person that is PACP certified.

Appendix M Closed-Circuit Television (Outside the Van) SOP

Closed-Circuit Television (CCTV) Operational Practices Outside the Van

Objective:

To describe practices to be followed for set up, operation, and breakdown of CCTV internal inspection equipment (referred to as "TVI equipment") outside the CCTV Van (referred to as the "TVI Van"). In general, ESD will perform internal sewer line inspections for pipes 15-inch diameter and smaller.

See the **Closed-Circuit Television (CCTV) Inspection Practices Inside the Van SOP** for TVI equipment and record keeping practices and procedures.

Responsibilities:

TVI van and related equipment use will be scheduled by the Sewer Line Video Supervisor.

Task:

Use a tractor mounted closed circuit television (TVI camera and recording equipment) to televise 6- to 15-inch diameter sanitary sewer pipe.

Performance Standard:

Staff performing or assisting with the use of TVI inspection equipment should have knowledge of the proper operation of the TVI inspection van, TVI equipment, traffic control set up, and appropriate safety measures.

Safety and Field Cautions:

Safeguards must exist for any machine part, function, or process that may cause injury. When the operation of a machine or accidental contact with it poses harm to the operator or others in the vicinity, the hazards must be either controlled or eliminated. It is ESD policy for all operators working in the field with this equipment to be protected from hazards of operation they may encounter. Operators and other personnel shall wear weather-appropriate clothing, steel toed shoes, and traffic safety vests when working. Hard hats and hearing protection shall be worn during machine operation, as well as suitable gloves and/or eye protection per ESD policy.

All primary operators shall read the equipment manufacturer's Operation and Maintenance manual for a full description of the machine, its operational parameters and operating procedures, and other information pertaining to the machine. Until suitable field training and operation has been successfully completed, inexperienced operators should not use this equipment in the field without an experienced operator present. Operational training shall include mechanical system awareness and ability to detect minor variabilities in operation or machine performance, along with field operation instruction.

Comply with the Jefferson County ESD Safety Rules relative to this equipment and field use.

Comply with ESD policies regarding Personal Protective Equipment, Confined Space Entry, and Traffic Control.

Pre-Trip Duties:

1. Perform pre-trip walkaround inspection of the TVI van (See **Attachment A, Pre-Trip Vehicle Inspection**).

2. Check generator oil level to verify it is filled.

3. Start generator to verify it starts and is operating properly.

4. Verify potable water tank is filled.

If the potable water tank is not full, fill the tank by connecting the fill hose to the hose bib at the rear of the truck.

5. (Operator inside TVI Van) Turn on the camera system to verify quality video picture , proper camera pressure, operable lights, and pan & tilt controls work properly.

6. (Operator inside TVI Van) Turn on transporter / crawler system to verify forward and reverse controls work properly.

7. Check camera and crawler screws and wheels for tightness.

8. Review assigned work order(s), noting the sizes of pipe to be televised and whether any special equipment will be required.

   Note: If a confined space entry is required to complete assigned work, notify the responsible supervisor. The responsible supervisor must prepare a planned entry (see **Confined Space Entry for Manholes SOP**).

9. Load all equipment necessary to perform the pipeline inspection(s) into an appropriate van (See **Attachment B, Standard Inventory List**).

Arrival at the Site:

1. Upon arrival at the site, position the TVI van in the best manner that provides access to the manhole and limits exposure to traffic.

   If a wash truck is onsite to clean the pipe prior to the inspection, park the TVI van safely at the side of the roadway. While waiting for the pipe to be cleaned, confirm the pipe to be inspected, and set up the camera and related systems in the viewing cabin (see Steps 8 and 9).

   Avoid blocking the entire street, unless it is absolutely necessary.

2. If the sewer pipe to be inspected is in an area that necessitates traffic or pedestrian control, set up traffic cones and other traffic management devices.

For off-road pipe inspections, position the TVI van in the best location to accommodate the camera cable as it is pulled off the reel to the remote manhole.

If the line to be cleaned is located in an area that necessitates a higher level of traffic control, set up additional traffic cones and other traffic management devices (including flagger) in accordance with ESD's Traffic Control policy.

3. Remove the manhole cover using proper lifting techniques to avoid strains.

   Move the cover out of the way to prevent a tripping hazard.

4. Use the manhole hook to scrape dirt and debris from the manhole rim.

5. Confirm that the manhole depth, pipe diameter, and construction material match the manhole description on the work order.

   For off-road pipe inspections, note the manhole location and identify the path the camera cable will need to take to reach the manhole.

   Determine if additional rollers, tiger tails, or other protective devices will be required to protect the camera cable during the inspection.

6. Replace the manhole cover.

   NOTE: For jobsite safety, the manhole cover should remain on until operation is ready to begin, and be replaced once the camera is taken out of the pipe and cleaned.

7. Deploy the cable winder located at the rear of the van.

   Fold the boom down, and verify cable guides are in place.

   Use the electric hoist to avoid strains, and when maneuvering the camera into and out of deep manholes.

   Deploy the hoist by swinging it to the overboard position, and use the electric controls to lower and raise the cable.

8. Verify the size of the transporter drive wheels are appropriate for the size of the pipe to be inspected.

   If necessary, change the transporter wheels to the correct size in accordance with the original equipment manufacturer's (OEM) user manual instructions.

   If a wheel change is not needed, check the wheel bolts for tightness.

9. Inside the van, turn on the camera status screen on the cabin control panel, and verify the camera is pressurized as recommended by the OEM. Refer to the camera system OEM user manual for correct pressures.

   If the air pressure in the camera is not within the OEM recommended range, follow OEM recommendations for pressurizing the system.

10. Place the camera transporter on the side of the manhole rim.

    Pan the camera head down; verify the image is clear, and the recording system is working.

    Record the condition of the manhole structure.

11. Measure the depth of the manhole and communicate depth to the TVI camera operator to record on the camera report.

12. If the van's hoist system will not be used to raise and lower the camera into the manhole, assemble the fiberglass pole and lift hook.

13. After verifying the camera and recording systems are operational, lower the camera unit into the manhole channel.

    Note: If the van's hoist system is not used, two people are necessary to raise and lower the camera. One person must hold the pole and support the weight of the camera, while the other person maneuvers the cable, protecting the camera lens as the camera moves down the manhole structure and into the channel.

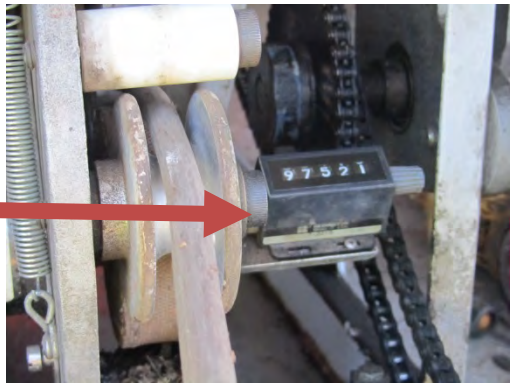
14. Once the camera is positioned in the channel to move downstream, remove the lift hook.

    Notify the operator that the camera is ready to travel to the "zero out" point (10 feet from the camera head lens). This point is indicated by a tape mark on the cable.

    The operator will then move the camera forward into the mouth of the pipe.

    Once the tape mark reaches the pipe, tell the operator that the camera has reached the zero point.

    The operator in the viewing cabin will set the computer footage to 10 feet. Set the mechanical footage meter on the cable reel to zero.



    At this point, the camera is operated by the operator in the viewing cabin (see **Operator Viewing Cabin Procedures**).

    Note: While waiting for the inspection to be completed, the Sewer Video Specialist should perform light maintenance of various components in the rear of the truck, along with cleaning and other housekeeping duties.

15. After the inspection is complete, the operator will pull the camera back to the manhole using the mechanical reel.

Remove the camera using the TVI van hoist or the lift pole and hook, taking care to keep the camera lens from hitting the side of the manhole structure.

16. Wash the camera each time it is removed from the manhole unless it is only removed to be repositioned.

    Place the camera unit near the manhole, and wash the camera using the on-board water system.

    Use a spray cleaner and/or disinfectant to clean off the camera lens if needed. Direct the wash water, spray cleaner, and/or disinfectant toward the open manhole.

    Once the camera has been cleaned, the lens should be cleaned with a soft cloth and sprayed with a water repellent.

17. Verify camera and crawler screws and wheels for tightness.

End of Job Duties:

1. Replace the manhole lid, properly stow all equipment and tools on the TVI van, and retrieve all traffic management devices.

2. Secure items in the TVI van cabin for travel.

3. Proceed to the next work order location, or return to the sewer maintenance yard.

On-Board Toilet Maintenance:

Periodically, the on-board toilet must be drained and cleaned. This is typically done every other day under normal use. Any manhole in the Shades Plant yard can be used for dumping.

1. Position the TVI van so that the drain valve is lined up over the over the open manhole.

2. Pull on the drain valve opener located at the base of the toilet, and drain the toilet. (Refer to the OEM user manual for drain valve opener location.)

3. After the toilet has been drained, clean the toilet bowl using the on-board water supply.

   Use a brush to clean the toilet bowl and clean the seat with a rag.

Attachment A Pre-Trip Vehicle Walkaround Inspection

Front of Vehicle, Lights/Reflectors, Emergency Lights, Steering Components, Engine Compartment (oil, coolant, transmission, windshield wash)

Steering Axle
- Suspension
- Brakes
- Tires

Driver/Passenger Door Mirrors

Fuel Area

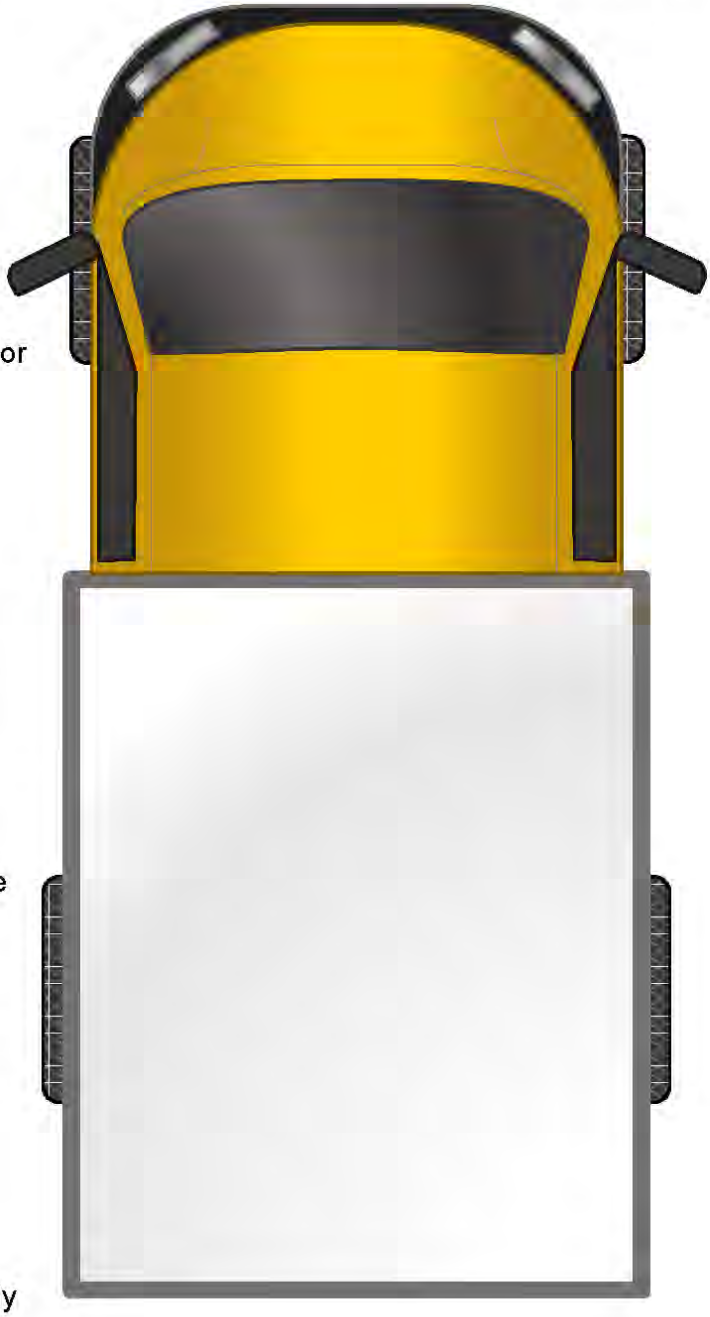
Under Vehicle
- Drive shaft
- Exhaust
- Frame

Sides of Vehicle & Lights/Reflectors

Lavatory Dump Valve

Drive Axle(s)
- Suspension
- Brakes
- Tires

Generator
- Check Oil
- Determine if running properly



Rear of Vehicle and Lights/Reflectors, Emergency Lights, & Arrow Board

Attachment B TVI Van Standard Inventory

Standard Inventory List for TVI Vans

Cameras		
Pan & tilt camera	1	
Camera transporter	1	
Hydrauic root saw	2	

Expanders and Wheels		
Set up for 8-inch pipe	1	
Set up for 10-inch pipe	1	
Set up for 12-inch pipe	1	
Set up for 15-inch pipe	1	

Cable Aids		
Tiger tail	1	
Upper manhole roller	1	
Lower manhole roller	1	
Large hook winch	1	
Small hook winch	1	

Hand Tools		
Cover hook	2	
5-foot fiberglass poles	8	
Probe bar	1	
Pick	1	
Flat shovel	1	
Round shovel	1	
Broom	1	
12-lb. sledge hammer	1	
Saw	1	
Lopers	1	
Brush cutter	1	
Brush axe	1	
Metal detector	2	
Measuring Wheel	3	
Story pole	1	

Traffic Safety Devices		
Road cones	12	
Raod work signs	set	
Stop/slow paddles	2	
Wheel chocks	4	

Other Items		
Lime green spray paint	2	
Liquid dye (green and purple)	2	
5-gallon bucket	2	
Locator/metal detector	1	
Flagging tape	2 roll	
Rags	box	
Radio	2	
Spotlight	2	
Flashlight	2	
Water jug	1	
Toilet bowl cleaner	1	
Water repellant spray	1	
Spray lube	1	
Grease gun	1	
Mirror	?	
Magnets	2	
Rope (100-feet)	1	

Personal Protective Devices		
Safety glasses	2 pair	
Hard Hat	2	
Hearing - push ins	1 box	
Rubber gloves	2 pair	
Canvas gloves	2 pair	
Latex gloves	1 box	
Rain Gear	2 sets	
Mid-length boots	2 pair	
Antibacterial soap	1	
Fire extinguisher	1	
First aid kit	1	
Snake chaps	1	
Tyvek suits	box	

SSORRP	
SSO Signage	
SSO meauring stick	

Standard Tool Box Inventory List for TVI Vans

25- and 100-foot tape measures	
Adjustable wrench - large	
Adjustable wrench - small	
Allen wrench set	
American standard cresent wrench set (7/16-inch to 3/4-inch)	
Bailing wire	
Channel locks	
Deep well sockets (if needed for truck)	
Duct tape	
Electrical tape	
Flat head screw driver - large	
Flat head screw driver - small	
Hack saw	
Phillips head screw driver - large	
Phillips head screw driver - small	
Pipe wrench (2)	
Pliers	
Side cutters	
Small hammer	
Small socket set and American standard sockets 3/8-inch drive	
Socket for draining pump	
1 1/8-inch socket	
1-inch socket	
T-handle Allen wrench (for truck-sized Allen scres)	
Utility knife	
Wire cutters	

Appendix N Pre-and Post-Rehabilitation Flow Monitoring SOP

Pre and Post Flow Monitoring

1.0 OBJECTIVE

The objective of this SOP is to provide Jefferson County Environmental Services Department (ESD) with a clear and concise document that summarizes procedures for analyzing flow monitoring data that has been collected from sanitary sewer rehabilitation project areas. Analytical procedures detailed in this SOP will provide the means and methods to produce defensible and measureable data that can show the effectiveness of rehabilitation projects and can be used by County officials to make educated decisions about the collection system.

2.0 RESPONSIBILITIES

Determining the effectiveness of sanitary sewer rehabilitation projects will be the responsibility of ESD Staff or designated representative. ESD is advised to use flow monitoring data (after QA/QC has been performed) from available flow monitors in completion of the analysis steps described in this SOP.

3.0 SUPPLEMENTAL DOCUMENTS

County staff is advised that this SOP provides direction solely on the strategies for locating flow monitors before and after rehabilitation as well as analytical procedures for determining the effectiveness of sewer rehabilitation projects. It should also be noted that heavy references to the Water Environment Federation Manual of Practice FD-6 (*WEF MOP6*) will be provided throughout this SOP, and it is recommended that a thorough review of WEF MOP 6 be made prior to beginning any data analysis tasks with particular attention to Chapter 7 *Effectiveness of Sewer Rehabilitation*.

Guidance on the topics discussed above can be found in the following supplemental documents:

1. Detailed Steps for analyzing flow monitoring data - see *Existing Sewer Evaluation and Rehabilitation*, MOP FD-6, Water Environment Federation and American Society of Civil Engineers, 3rd Edition , 2009.

4.0 PROCEDURES

4.01 Background

1. The analytical procedures described in this section are for determining the effectiveness of rehabilitation projects for the reduction of Infiltration and Inflow (I/I). Additional analytical methods for determining the effectiveness of rehabilitation for overflow remediation; capacity improvements; maintenance program improvement; regulatory compliance; structural rehabilitation and reduction of public risk can be found *in WEF MOP 6*, Chapter 7.

2. ESD staff should become familiar with the following terminology and are advised to review *WEF MOP 6* and other supplemental documents for more information:

   RDII - Rainfall Dependent Infiltration and Inflow that enters the collection system from a recent rainfall event. Infiltration enters through defects in the pipe, pipe joints or lateral connections that are below ground. Inflow enters through roof leaders, foundation drains or manhole covers.

   GWI- Ground Water Infiltration that enters the system through defects (foundation drains/sump pumps, lateral joints, mainline joints, mainline defects, lateral connections) that are below the dry-weather groundwater table. GWI may also include base sanitary sewer flow from residents, industry or businesses. GWI flows may not vary daily due to the base sanitary sewer flow but may vary seasonally due to the effects of evapotranspiration on the groundwater table.

   R-Value - RDII coefficient, that represents that percentage of rainfall that enters into the sanitary sewer system. The R-value is the indication of the severity of RDII in a sewershed, where a high R-value indicates a leaky system.

4.02 Collecting Flow Monitoring and Rainfall Data

1. In order to accurately determine the effectiveness of sewer rehabilitation projects, flow monitoring and rainfall data must be compared for a time period both before and after the sewer rehabilitation project is completed; known as the “pre-rehabilitation period” and “post-rehabilitation period”.

2. Verification of the rehabilitation effectiveness will also require a comparison of data collected from the rehabilitation project area and a control area (a selected location where no rehabilitation work has been performed). This comparison will

show how much I/I reduction can be attributed to the sewer rehabilitation improvements vs. other naturally occurring conditions.

3. For comparison of results, select a control area (sub-basin) that has been exposed to the same wet weather events as the rehabilitation area (review rain gauge data). The selected control area should be similar in size, similar in geography and have similar pipe material (as well as having similar RDII responses in terms of timing and amount).

4. After the project area and control area have been selected, wastewater flow and rainfall data must be collected for a minimum of 60 to 90 days prior to commencing any rehabilitation work. Note that monitoring will also be required for 60 to 90 days after completion of the rehabilitation work. Monitoring may be required for a longer period of time to capture an adequate number of events. Monitoring for pre and post-rehabilitation should also be done over the same season of the year and must include at least some portion of the wetter part of the season. Unless there is no other option summer and fall should not be used for pre and post rehabilitation flow monitoring.

5. A minimum baseflow must be available from each of the selected sub-basins for accurate flow monitoring data analysis. This information is typically provided by the flow monitoring vendor, however typical baseflow criteria are listed below:

   a. For most readily available flow monitors a minimum of 1” of cover is required above the monitoring probe.
   b. Flow monitors can typically monitor flows for up to 150 homes.

6. Using the parameters specified above, select a sufficient number of flow monitors for the control area and rehabilitation area (i.e. one flow monitor per 150 homes or choose a manhole location that provides 1” of cover for the flow monitoring probe).

7. If a sufficient number of existing flow monitors have been installed, proceed to collect data from the control area and rehabilitation area for at least 90 days pre-rehabilitation and at least 90 days post-rehabilitation. However, the longer the period of evaluation and the number and variety of storms in the evaluation will provide more accurate comparisons. In addition, a 90-day period may provide little to no quality large storm events with a variety of conditions

(antecedent moisture, seasonal variety, rainfall volume, rainfall intensity and rainfall duration) needed to understand the complex aspects of I/I.

8. Once the pre & post rehabilitation flow monitoring data has been processed by the County's flow monitoring vendor and final data has been sent to the County, proceed with the analytical steps described below.

4.03 Analyzing Collected Flow Monitoring Data – Volume

1. For both the control area and rehabilitation area, select several rain events where a minimum rainfall of 1" or greater fell over both the rehabilitation area and the control area (if a common rainfall event cannot be identified other analytical methods may be needed).

2. Using ESD's flow data analysis tool, Hazen Q, determine the R-value for each selected storm event and each installed flow monitor.

3. Plot the R values from the selected rehabilitation area flow monitor versus the R value for the selected control area flow monitor, as illustrated in **Figure 1.**

4. Perform linear regressions on the pre-rehabilitation R values and the post-rehabilitation R Values by forcing the regression line through "0,0" for both areas.

5. Calculate the correlation coefficient for each linear regression. Values as close to 1 as possible are desired.

6. Compute the RDII reduction by calculating the percent difference in the slopes of the lines from pre to post rehabilitation conditions. The percent reduction in the example shown in Figure 1, is (1.8167-0.6367)/1.8167 = 65% RDII reduction.

7. This resulting value represents the reduction of RDII entering the sanitary sewer system which can be directly attributed to the sewer rehabilitation improvements.

8. The calculated value can also be applied to the average R-value for the sewer rehabilitation area.

9. Additional analytical methods on adjusting RDII values for environmental factors are described in *WEF MOP6*, Chapter 7

10. If common rain events cannot be found between the control and rehabilitation areas other analysis methods must be utilized.

4.04 Analyzing Collected Flow Monitoring Data – Peak Flow

1. Plot the peak flows for each event for rehabilitation meter versus the control meter for both pre and post rehabilitation conditions.

2. Perform linear regressions on the pre-rehabilitation peak flows and the post-rehabilitation peak flows but do not force the regression through (0,0).

References:

1. Water Environment Federation/American Society of Civil Engineers, *Existing Sewer Evaluation and Rehabilitation*, Manual of Practice FD-6, 3rd Edition, 2009

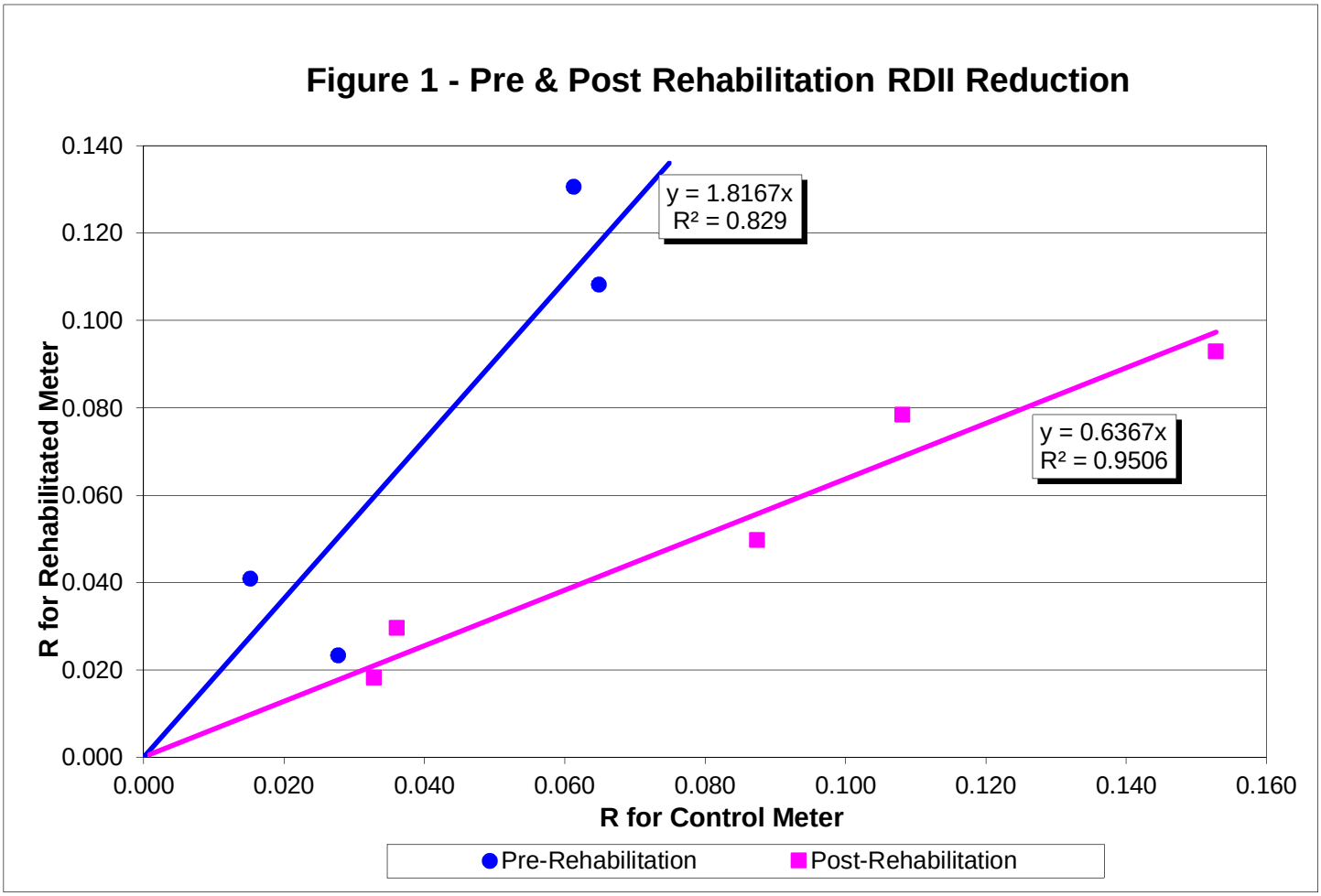


Figure 1 - Pre & Post Rehabilitation RDII Reduction
R for Rehabilitated Meter
R for Control Meter
y = 1.8167x
R² = 0.829
y = 0.6367x
R² = 0.9506
0.000
0.020
0.040
0.060
0.080
0.100
0.120
0.140
0.160
Pre-Rehabilitation
Post-Rehabilitation

Appendix O Pump Station Inspection and Preventive Maintenance

Wastewater Pump Station Inspection and Preventative Maintenance Process

1.0 OBJECTIVE

To outline general preventative maintenance practices for all wetwell/drywell, suction lift, and flooded suction pump stations in the Jefferson County service area.

2.0 RESPONSIBILITIES

Pump station preventative maintenance operations are schedule by the supervisor on a daily basis prior to leaving the maintenance shop.

3.0 SAFETY PROCEDURES

Personnel should observe all safety policies and regulations established by Jefferson County during the execution of this SOP to include but not limited to:

- Noxious and Toxic Atmospheres
- Confined Space Entry
- Mechanical and Electrical Hazards
- Infection and Disease Hazards

Note: All equipment manufacturer/vendor safety procedures and practices shall be followed in the care of their equipment.

3.0 PROCEDURE

All pump station equipment requires regular service to maintain its operability and reliability. A process is required to outline a preventative maintenance process (PM) and its frequency. This SOP contains a checklist and frequency of the items PM process required for each type of pump station.

3.1 Upon entering the site:
- Unlock and open cabinet and pit covers as need to perform the PM
- Turn on all ventilation devices
- Check site, wet well for any indication of abnormally high water levels. Attempt to determine cause of high level.

3.2 Refer to appropriate checklist(s) and perform indicated actions

3.3 As a part of the inspections, any work which cannot be corrected during inspection should be noted in a work order

3.4 Upon leaving the site
- Ensure alarms are cleared and addressed
- Ensure pumps are in AUTO mode – (unless locked out for maintenance)
- Ensure valves, switches and controls are in the correct position
- Turn off ventilation devices
- Close and lock all cabinets and pits
- Ensure the gate is locked
- Sign inspection report

3.5 Upon returning to the office

3.6 Notify supervisor of any problems

3.7 Supervisor enters a work request into INFOR

3.8 INFOR generates a work order and notifies the appropriate trade of the work that needs to be performed

3.9 Tradesman completes the work and generates a final report in INFOR

3.10 Supervisor orders and restocks spare parts that were used to complete the work order

3.11 Supervisor reviews the final report and the work order is closed

4.0 CHECKLISTS

Weekly, Semi-Annual, Annual Attached

Wastewater Pump Station Inspection and Preventative Maintenance Process

WEEKLY PUMP STATION INSPECTION CHECK OFF SHEET

No.	Task
1	Prior to field inspection, check Mission for any alarms
Site	
2	Ensure signage is mounted and visible
3	Check fence and gate locks
4	Ensure pump station grounds are clean
5	Ensure life safety equipment is operational
6	Clean up any spills
7	Wipe down any equipment as needed
Wet Well	
8	Check wet well for grease and debris accumulation
9	Check wet well float(s) - lift floats and turn upside down to ensure no water has entered
10	Check wet well aerator where applicable
11	Check guide rails to determine if vertical
12	Check wet well and all appurtenances for corrosion
Controls/Mechanical Systems	
21	Check grinder, trash baskets, and bar screens where applicable (clean as necessary)
22	Check high level light/alarm
23	Check power failure relay/alarm system
25	Confirm operation of all push to test lights
26	Record pump run times
27	Ensure water level in wet well is above the top of the pumps (submerisble pumps)
28	Check manual operation of pumps
28	Observe check valve operation while pumps are operating
30	Observe normal pump operation sequence via level monitoring system
31	Check sump pump operation
32	Check dehumidifier operation
33	Check seal water flow
34	Check packing for leaks
35	Bleed bubbler air tanks
36	Observe ultrasonic level measuring system in relation to actual wet well level
Generator	
35	Check generator control panel for faults
36	Check generators fluids
37	Check generator battery for loose connections
38	Check generator charging system
39	Exercise generator (no load)

DATE SIGNATURE

Wastewater Pump Station Inspection and Preventative Maintenance Process

SEMI-ANNUAL SUCTION-LIFT PUMP STATION INSPECTION CHECK OFF SHEET

No.	Task
1	Prior to field inspection, check Mission for any alarms
2	Perform all checks on the weekly checklist
Structure	
3	Inspect integrity of pump station and note any issues
4	Pump out grease and grit from wet well (or as needed)
Mechanical Systems	
5	Tighten bubbler system tubing and fittings
6	Check bubbler system alternator
7	Change pump motor oil (per pump manufacturer's recommendation)
8	Inspect check valve operation
9	Check/clean level control floats system
10	Lubricate ventilator blower
11	Lubricate air release valves
12	Check surge valve operation
13	Service grinder (oil and grease) where applicable
14	Inspect drive belts, adjust/replace if needed, and note wear
15	Check vacuum pump house and fittings
16	Grease pumps and motors
17	Exercise all valves (record number of turns)
Generator	
18	Exercise generator under pump station load
19	Check transfer switch

DATE SIGNATURE

SEMI-ANNUAL FLOODED SUCTION PUMP STATION INSPECTION CHECK OFF SHEET

No.	Task
1	Prior to field inspection, check SCADA for any alarms
2	Perform all checks on the weekly checklist
Structure	
3	Inspect integrity of pump station can and note any issues
4	Pump out grease and grit from wet well (or as needed)
Mechanical Systems	
5	Inspect seal water housing and packing (clean if needed)
6	Check surge valve operation
7	Service grinder (oil and grease) where applicable
8	Tighten bubbler system tubbing and fittings
9	Check bubbler system alternator
10	Change pump motor oil (per pump manufacturer's recommendation)
11	Lubricate ventilator blower
12	Grease motors and pumps
13	Inspect drive shafts and u-joints and grease if needed
14	Inspect and clean all filters (replace filter if necessary)
15	Inspect ventilator duct for holes, clean insect screen
16	Clean compressor moisture tap
17	Check (and replace if necessary) lift gear housing oil level
18	Oil lift chain (brush on)
19	Adjust lift chain and check for wear
20	Lubricate air release valves
21	Check and grease elevator and appurtenances at can pump stations
22	Check/clean level control float system
23	Inspect seal water lines and piping
24	Check crane operation
25	Check sump pump
26	Inspect ventilator belts
27	Exercise all valves (record number of turns)
Generator	
28	Exercise generator under pump station load
29	Check transfer switch

DATE SIGNATURE

Wastewater Pump Station Inspection and Preventative Maintenance Process

ANNUAL PUMP STATION INSPECTION CHECK OFF SHEET

No.	Task
1	Prior to field inspection, check mission for any alarms
2	Perform all checks on the weekly and semi-annual checklist
Site	
3	Inspect integrity of pump station and note any issues
Controls/Mechanical Systems	
4	Check volts, megger, amps, ohms, and thermals on all pump motors and leads
5	Perform a wet well draw down test (See draw down test SOP)
Generator	
6	Perform annual generator maintenance (See generator SOP)

DATE SIGNATURE

Appendix P Pump Station Drawdown Test

Pump Station Drawdown Testing Procedure

1.0 OBJECTIVE

To outline the procedure to perform a pump station drawdown test to check pump efficiency and operation.

2.0 RESPONSIBILITIES

Pump station drawdown tests are scheduled by the supervisor.

3.0 SAFETY PROCEDURES

Personnel should observe all safety policies and regulations established by Jefferson County during the execution of this SOP to include but not limited to:

- Noxious and Toxic Atmospheres
- Confined Space Entry
- Mechanical and Electrical Hazards
- Infection and Disease Hazards

Note: All equipment manufacturer/vendor safety procedures and practices shall be followed in the care of their equipment.

4.0 PROCEDURE

This procedure is broken down into three (3) levels. Each level requires more time and resources and should be performed as directed by the supervisor. It should be noted that Items Number 5 and listed below should generally only be performed when a pump curve is not available, the pump is operation off the manufacturer's curve, the pump station is operating abnormally, or the pump drawdown test is abnormal.

1. Pump Station Inspection

    a. Prior to test day, review available pump station drawings, pump curves and data, previous pump test reports, pump run data, etc. Identify typical pump cycle time including pump on and off durations. Identify if supplemental

water (e.g. from water truck or fire hydrants) will be needed to expedite testing procedures. Identify any other special requirements or unique conditions to prepare for such as inaccessible wet well, etc.

b. Review pump station inspection report, O&M information, and/or as-built drawings for pipe configuration/size, number and type of pumps, pump on/off level settings, and wet well dimensions. Verify this information and note any discrepancies. If this information is not available or in the case of discrepancies, document the items listed and verify while on-site for pump station testing.

c. All wet well depth or water level measurements should be measured with a tape measure with no greater than 0.05-foot increments connected to a flat wooden float. The connection of the tape measure to the float should be adjusted so that accurate depth readings are indicated. If necessary to allow for accurate readings for the depth of water from a fixed point that can be converted to a water surface elevation based on drawings of the station, place a straight edge across the wet well access opening. If wet well top of slab elevation is not available, it should be obtained using a survey crew and documented. Actual wet well elevations will be used to calculate static head based on force main high point or discharge elevation. Force main as-built drawings, GIS records, or other available data should be used in calculating static head. If force main profile/elevations are not known, survey crew should also obtain pipe elevations at force main discharge and high points (e.g. air valve installations). (Note: Obtaining accurate relative elevations of pump station and force main is more important than obtaining actual formal elevations.)

d. Ensure all necessary calibrated pressure gauges are installed. For a Level 2 drawdown test, a gauge must be installed on the upstream (pump) side of the discharge isolation valve (for each pump). When feasible, an additional gauge can be installed on the common discharge header pipe (to confirm the static pressure with pumps off and to observe surge pressures). When possible for non-submersible pumps, a separate pressure gauge should be installed on the suction side of each pump, as close to the pump as practicable. Record the locations of pressure gauges and taps on the piping. Measure the vertical distance from the pressure gauge center line to a

known reference point to allow the gauge elevation to be calculated based on drawings. If gauge elevation cannot be established, these elevations should be obtained using a survey crew as described here within. (Note: Again, elevations relative to the wet well and force main are more important than formal elevations.)

e. If the gauge is not stable when taking pressure readings, adjust the snubber (small valve) between the pressure gauge and the main tap. If there is no snubber, then pressure readings should be taken when the gauge is at the most stable point. If the gauge is bouncing when the reading is taken, this should be documented along with an estimate of the range of bouncing. The reading taken and recorded should be a visual estimate of the average.

f. On submersible pump stations, friction head losses between the pump and the discharge pressure gauge will need to be calculated using assumed pipe roughness(es). On wet well/dry well pump stations, the friction head losses between the suction pipe inlet and discharge pressure gauge will need to be calculated. In cases where a calibrated suction pressure gauge is available, only head losses between the suction and discharge pressure gauges will need to be calculated. These calculations will need to be performed by those familiar with this type of calculations.

g. Determine if any of the pumps are controlled by a VFD, soft-starter, or other variable-speed device. For testing of any pumps that do not experience a full-voltage startup, the beginning time, water depth and pressures should be recorded after the pump reaches full speed. The ending time, water depth and pressures should be recorded when the pump is first called to shut off prior to ramp down. If these procedures need to be simplified, just record the beginning and ending data.

h. Determine if any of the pumps include a mixing system that recycles part of the discharge flow back into the wet well upon pump startup such as Flygt's Mix-Flush system or a solenoid-controlled valve in the valve vault. For testing of any pumps that include a mixing system, the beginning time, water depth and pressure(s) should be recorded after the mixing system closes. For Flygt Mix-Flush systems, this can usually be determined by a "clunk" sound emanating from the wet well and a reduction in turbulence in the wet well. If

these procedures need to be simplified, just record the beginning and ending data.

i. Identify if any existing flow metering equipment exists. If flow metering equipment is available, attempt to verify its accuracy with drawdown testing data. If accuracy of flow metering equipment is determined to be 5-10 percent or better throughout flow ranges tested, subsequent water depth measurements may be suspended and the flow meter readings may be used in lieu of calculated flow rates for the remainder of the testing.

j. If needed, mobilize a water truck or activate a fire hydrant to supplement influent flow.

k. If a pump station has a force main that discharges into it or into an upstream gravity sewer, do not operate these influent pump stations during the drawdown test. However, provide adequate monitoring and coordination of these influent pump stations to avoid an overflow during testing.

2. Inspect Wet Well

a. For submersible pumps, run each pump at or near minimum water depth, and watch for any blow-by at pump discharge connections. Document any blow-by observed. Correct blow-by as necessary if historical data is not needed for model calibration activities.

b. Observe check valves for proper operation. If check valves allow the force main to drain back into the wet well after pump shuts off, then the leaking check valve will affect calculations for pump flow rates. If a check valve is leaking badly, it will need to be repaired prior to testing.

c. Document the presence of grease in the wet well. If significant grease is present, the wet well will need to be cleaned prior to performing the test. Otherwise, grease may prevent accurate water level measurements, prevent accurate volume calculations, obstruct important visual observations, etc.

d. Identify the section of the wet well that will be most appropriate for use during testing. This test range should be below all incoming sewers and

should have a constant cross-sectional area. If it is not possible to meet these criteria, choose the best section and note locations where the wet well volume changes due to submerged incoming pipes and/or changes in wet well cross-sectional area. Volume calculations will have to be adjusted based on this information and available drawings.

3. Determine the Incoming Flow Rate

    a. Pump down the wet well to the minimum depth.
    b. Turn the pumps off.
    c. Measure the depth from the wet well top of slab to the water surface in the wet well, hereinafter referred to as “water depth”.
    d. Record the start time (actual clock time) and take a reading of the water depth every minute (for a minimum of 10 minutes) until the level rises at least 1.00 foot, unless water level reaches the top of the test range in less time. Calculate the total inflow for the 10 minute duration in gallons per minute (gpm). If a water truck or fire hydrant is used to supplement the flow, this must be properly coordinated and accounted for in determining the incoming flow rate and the drawdown calculations. Supplemental water should be added either at a constant rate throughout the testing process or only during the period after the incoming flow rate has been calculated and before the pump is started. If this is not possible, a meter should be used to calculate the volume of supplemental water used to determine the test.

4. Field Determine Pumping Rate and System Curve (Level 1)

    a. Confirm that the valves on the force main are fully open.
    b. If a pressure gauge is available, record the force main pressure downstream of the check valves. However, it should be noted that various factors could affect this “at rest” pressure reading; and this reading does not necessarily correspond to static head for the system curve. For example, if the check valves close too slowly or leak, they could allow the force main to partially drain back to the wet well. The individual doing the testing should use all the available data, including as-built drawings, GIS contours, and survey data to determine actual static head. The effective static head is established by the point where flow transitions from full-pipe flow to gravity flow, which can occur at the force main discharge, a high point along the force main, or at

some intermediate point if siphoning occurs. For force mains that have high points above their discharge elevation, effective static head may be different at different flow rates.

c. Allow wet well level to fill to the top of the test range.
d. Turn on one pump. Ensure that the check valve lever raises properly. Record the beginning time, water depth, and related pressures.
e. Take a reading of the water depth each minute for at least 5 minutes (or as long as wet well volume permits). Also, record the flow rate provided by metering equipment, if available.
f. Turn the pump off and record the ending time and water depth.
g. Repeat the incoming flow rate procedure as the wet well refills. The flow rate calculations should use the average of the pre and post test inflow rates.
h. Perform procedures 4.c.-4.g. twice for each pump and twice for each pump combination.

5. Field Determine Points on Pump Curve (Level 2)

a. A discharge pressure gauge (preferably with a gauge protector) must be located between the pump and the discharge valve for this test to be performed.
b. Turn off all pumps.
c. Confirm that the valves on the force main are fully open.
d. Record the force main pressure downstream of the check valves.
e. Turn on one pump. Ensure that the check valve lever raises properly. Record the beginning time, water depth and related pressures.
f. Record the water depth and related pressures every minute for at least 5 minutes. Also record the flow rate provided by metering equipment, if available.
g. Turn the pump off. (Note: If Level 1 testing has already been conducted the same day, steps 5.e. and 5.g. may be skipped and only results from Level 1 testing are required.)
h. Repeat the incoming flow rate procedure as the wet well refills.
i. Turn the discharge valve (either the individual pump's discharge valve or a valve on the force main) until it is closed. Record the number of turns required to close the valve.
j. Turn on the pump. Verify the valve is not leaking by ensuring the check valve lever does not rise. Record water depth and related pressures.

k. With the pump still running, turn the discharge valve approximately ¼ of the way open or less.
l. Record the beginning time, water depth and related pressures.
m. Record the water depth and related pressures every minute for at least 5 minutes. Also record the flow rate provided by metering equipment, if available.
n. Turn the pump off.
o. Repeat the incoming flow rate procedure as the wet well refills.
p. Repeat steps 5.i.-5.o. for the valve at approximately ½ and ¾ of the way open (by flow rate).
q. Repeat steps 5.c.-5.p. for each pump. For some pumps, especially large pumps, the manufacturer's allowable operating region does not extend all the way to shutoff conditions. If there is any doubt about the liability of the pump to operate at shutoff conditions without damage, reverse the order of this Level 2 testing to gradually close the valve and end testing when the left-end of the pump's allowable operating regions is reached or when unusual vibration or noise is noticed.

6. Return Pump Station to Normal Operation

a. Ensure all valves are fully open.
b. Return pump controls to normal.
c. Recover all equipment and documentation.
d. Close and lock all hatches and gates.
e. Provide final test report to supervisor.

7. Determine Points on Pump Curve (Level 3)

a. For each corresponding status of the valve (i.e. ¼, ½, ¾), compute the average flow rate of each pump and combination of pumps.
b. For each corresponding status of the valve (i.e. ¼, ½, ¾), determine the total dynamic head (TDH) experienced by the pump or combination of pumps (in feet).
c. Chart each flow/TDH combination on a copy of the pump curve.
d. Provide final report to supervisor.

8. Determine Pump Station System Efficiency, Wire to Water Test (Level 3)

a. In order to determine individual pump efficiency and/or pump station system efficiency, follow the same procedure as in Number 4 (Level 1) and/or Number 5 (Level 2), but also record the Voltage and current (Amps) for each test. For individual pump efficiency, measure average Voltage and current on the power supply to the individual pump. If overall efficiency of the pump station system is desired (e.g. with multiple pumps operating), measure average Voltage and current on the main power supply to the pump station. For 3-phase electrical systems, also measure the power factor if a suitable meter is available.

b. Overall (wire to water) pump efficiency can be described as follows:

$$Overall\ Pump\ Efficiency\ (\%) = \frac{Water\ Horsepower}{HP\ Input} \times 100$$

Where:

$$Water\ Horsepower = \frac{GPM \times Total\ Dynamic\ Head\ (TDH)}{3{,}960}$$

$$3{,}960 = 33{,}000\ \frac{ft-lbs}{HP} \div 8.33 \frac{lbs\ of\ water}{gallon}$$

$$TDH = Discharge\ Head + Pumping\ Water\ Level\ (ft)$$

$$Discharge\ Head\ (ft) = Discharge\ Pressure \times 2.31 + Velocity\ Head$$

$$Suction\ Head\ (ft) = Discharge\ Pressure \times 2.31 + Velocity\ Head - Gauge\ Elevation\ Difference$$

$$Velocity\ Head = \frac{[Velocity(ft/sec)]^2}{64.4 ft/sec/sec}$$

$$Gauge\ Elevation\ Differnece\ (ft) = Discharge\ Pressure\ Gauge\ Elevation - Suction\ Pressure\ Gauge\ Elevation$$

$$Friction\ Head\ Loss\ in\ Pump\ Piping = Calculated\ Head\ Losses\ between\ Suction\ Pressure\ Gauge\ and\ Discharge\ Pressure\ Gauge$$

For submersible pumps and other cases where suction pressure is not measured, use the following substitute for TDH:

$$TDH\ (ft) = Discharge\ Head + Water\ Level\ Below\ Gauge + Friction\ Had\ Loss\ in\ Station\ Piping$$

$$Water\ Level\ Below\ Gauge = Elevation\ of\ Discharge\ Pressure\ Gauge - Elevation\ of\ Water\ Surface\ in\ Wet\ Well$$

$$Friction\ Head\ Loss\ in\ Station\ Piping = Calculated\ Head\ Losses\ in\ all\ station\ piping\ from\ wet\ well\ to\ Discharge\ Pressure\ Gauge$$

$$HP\ Input\ (to\ motor) = kW\ input \times 1.341$$

$$kW\ Input\ (single\ phase\ motor) = \frac{Volts \times Amps}{1000}$$

$$kW\ Input\ (3\ phase\ motor) = \frac{Volts \times Amps \times 1.732 \times Power\ Factor}{1000}$$

$$Motor\ Load\ (\%) = \frac{HP\ Input \times Motor\ Efficiency\ (\%)}{Name\ Plate\ HP\ of\ Motor}$$

c. The same equations can be used to calculate overall pump station system efficiency (e.g. with multiple pumps operating) by either calculating the station's overall water horsepower or the sum total of the water horsepower of each individual pump, with the latter method being preferred. Either way, the HP input would be calculated for the station's main power supply rather than an individual pump.
d. When evaluating the TDH of the system, the individual doing the testing should evaluate the in situ TDH with the theoretical TDH. The theoretical TDH should be calculated from record drawings and/or using field survey data.

5.0 PUMP STATION DRAWDOWN TEST FORM

The pump station drawdown testing forms are attached. Note all miscellaneous information needed to perform this SOP not specifically noted in the form, should be recorded in the Notes and Additional Information section.

Appendix Q Pump Station Standby General Preventive Maintenance

Wastewater Pump Station Standby Generator Preventative Maintenance Process

1.0 OBJECTIVE

To outline preventative maintenance practices for all standby generators serving the pump stations in the Jefferson County service area.

2.0 RESPONSIBILITIES

Standby generator preventative maintenance operations are scheduled by the supervisor.

3.0 SAFETY PROCEDURES

Personnel should observe all safety policies and regulations established by Jefferson County during the execution of this SOP to include but not limited to:

a. Noxious and Toxic Atmospheres
b. Confined Space Entry
c. Mechanical and Electrical Hazards
d. Infection and Disease Hazards

Note: All equipment manufacturer/vendor safety procedures and practices shall be followed in the care of their equipment.

3.0 PROCEDURE

All standby generator equipment requires regular service to maintain its operability and reliability. A process is required to outline the preventative maintenance (PM) process and its frequency. This SOP contains a checklist for the PM process for every standby generator.

a. Upon entering the site:
    1. Turn on all ventilation devices if not already in operation
    2. Unlock and open cabinet and pit covers as needed to perform the PM

3. Witness automatic starting of generator or review runtime information to ensure that unit is powering up and running as scheduled.

b. Refer to checklist and perform indicated actions
c. As a part of the inspection, any work which cannot be corrected during inspection should be noted in a work order
d. Upon leaving the site
    1. Ensure alarms are cleared and addressed
    2. Close and lock all cabinets and pits
    3. Turn off ventilation devices that are not required to run continuously
    4. Ensure the gate is locked
    5. Sign inspection report
e. Upon returning to the office
    1. Notify supervisor of any problems
    2. Supervisor enters a work request into INFOR
    3. INFOR generates a work order and notifies the appropriate trade of the work that needs to be performed
    4. Tradesman completes the work and generates a final report in INFOR
    5. Supervisor orders and restocks spare parts that were used to complete the work order
    6. Supervisor reviews the final report and the work order is closed

4.0 CHECKLIST

Attached

Wastewater Pump Station Standby Generator Preventative Maintenance Process

STANDBY GENERATOR INSPECTION CHECK OFF SHEET

GENERATOR LOCATION:_____

No.	General Procedures when Performing Maintenance	✓	Interval
1	Turn generator switch to the off position		Prior to Performing Maint.
2	Disconnect battery cables		Prior to Performing Maint.
3	Lock out tag out as necessary to ensure safety		Prior to Performing Maint.
Engine Maintenance			
4	Check air intake piping		Weekly
5	Check cooling fan		Weekly
6	Check crankcase breather tube		Weekly
7	Check air tanks and reservoirs		Weekly
8	Check engine coolant level and antifreeze level		Weekly
9	Drain fuel/water separator		Weekly
10	Check engine oil level		Weekly
11	Record run time		Weekly
12	Exercise generator set under no load conditions		Weekly
13	Exercise generator set under station load conditions		Monthly
14	Check air cleaner restriction		250 Hours or 3 Months
15	Check charge air piping		250 Hours or 3 Months
16	Check charge air cooler		250 Hours or 3 Months
17	Check fuel injection pump mounting		250 Hours or 3 Months
18	Check air compressor mounting		250 Hours or 3 Months
19	Change fuel filters		500 Hours or 6 Months
20	Check cooling system		500 Hours or 6 Months
21	Change coolant filter		500 Hours or 6 Months
22	Change engine oil and filter - (See Note 1)		500 Hours or 6 Months
23	Check air filter (change as needed)		
24	Check batteries		500 Hours or 6 Months
25	Check/Clean battery cables and connections		500 Hours or 6 Months
26	Check hose and fuel lines		500 Hours or 6 Months
27	Check radiator pressure cap		500 Hours or 6 Months
28	Check drive belts		1000 Hours or 1 Year
29	Check fan hub belt drive		1000 Hours or 1 Year
30	Check cooling fan belt tensioner		1000 Hours or 1 Year
31	Flush cooling system		2000 Hours or 2 Years
32	Check vibration damper, rubber		2000 Hours or 2 Years
33	Check vibration damper, viscous		2000 Hours or 2 Years
34	Clean engine steam clean		2000 Hours or 2 Years
35	Clean air compressor discharge lines		2000 Hours or 2 Years
36	Check engine mounts		2000 Hours or 2 Years
Generator Testing			
37	After PM is complete, run generator under pump station load for one hour		Annually
38	Check operation of circuit breaker and transfer switch		Annually

Note 1: Engine oil and filter change intervals can be adjusted based on an oil analysis to check the sulfur content of the used engine oil. This is performed as directed by a supervisor.

Note 2: The above preventative maintenance schedule should not be used in lieu of the manufacturer's recommended maintenance schedule.

DATE_____ SIGNATURE_____

*I certify that the items marked above have been checked/changed/completed.

Appendix R Air/Vacuum Relief Valve Procedures

Force Main – Air Valve Procedures

1.0 OBJECTIVE

Air valves are used to allow air to escape the system when pumping begins; to evacuate air that accumulates during operation; to prevent vacuum damage, cavitation (i.e. vapor cavity collapse); and excessive surge pressures in the system when pumping stops. There are three basic types of air valves that provide different functions:

- Air release valves use a small orifice to release accumulated air from a pressurized pipeline. Air release valves are not intended to admit air into the pipeline.
- Air/vacuum valves use a large orifice to exhaust large quantities of air during pipeline filling and to admit large quantities of air when pumping stops or a pipeline break occurs. Air/vacuum valves will not release accumulated air under pressure.
- Combination air valves combine the functions of both air release and air/vacuum valves—either in a single body or by attaching an air release valve to the side of an air/vacuum valve.

Combination air valves are typically used at high points in force mains, but the other types are also installed on force mains. The purpose of this procedure is to provide guidance in the inspection and maintenance of these devices, regardless of the particular valve type.

2.0 RESPONSIBILITIES

Air valve testing shall be scheduled by the Supervisor.

3.0 SAFETY PROCEDURES

Personnel should observe all safety policies and regulations established by the Environmental Services Department during execution of this SOP to include but not necessarily limited to:

- Confined Space Entry
- Non-Atmospheric Pressures
- Mechanical Hazards
- Work Zone Traffic Control
- Noxious and Toxic Atmospheres
- Infection and Disease Hazards
- Cross Contamination of Potable Water Sources

4.0 AIR VALVE BASICS

There are a few different types of Air valves. In its purest sense, ARV means air release valve (only). There are 3 basic functions that ARVs are intended for, with each ARV being capable of one or more of these functions:

Slow air release – This function is to release accumulated pockets of air at high points to prevent capacity loss. It should be noted that the valve may not seat if the operating pressure is too low. The pipe's internal pressure needs to be is at least 3-7 psi for the valve to seat and shut off. If the line pressure is too low, the valve will leak. This low line pressure and leakage issue is typically noticed in applications where there is an ARV at a local high point close to the absolute high point and/or the ARV is located close to the discharge.

Vacuum Relief – Vacuum relief (or vacuum breaking) allows air to enter the pipe which protects against vapor cavity formation and the resulting possibility of surge of vapor cavity collapse. In addition to potential pipe damage, the negative pressures that occur during the vacuum conditions can also compromise the pipe joints by displacing the gaskets. This function also allows the FM to operate as a gravity sewer beyond the final high point by breaking the siphon (in some cases). In most cases, the air that is let in must subsequently be released when the hydraulic grade line rises again above the top of pipe (i.e. when the pipe refills).

High-volume air release – This function allows air to escape the FM at a rapid rate during initial filling or at pump start up. Also, this function can occur after a large volume of air enters a force main under a vacuum condition. However, if air is allowed to escape too fast, a significant surge could result after the valve closes.

Another problem occurs when the air escapes with a velocity that is too high. This can cause noise problems.

A fourth function commonly found in modern ARVs is Controlled air release. This function commonly works together with high-volume air release to allow a FM to fill or recharge at an appropriate rate that will not create a surge condition upon closure. The switchover from high-volume to controlled air release typically occurs automatically as the water column within the FM approaches the valve (typically at a pressure around 0.7 psi). Controlled air release can also be incorporated into a valve in place of high-volume air release capability.

There are generally three types of ARV's on the market. Each type includes one or more of the functions described above. These are:

Air Release Valve: Include slow air release function only. These are typically placed at intermediate high points along the force main.

Air Vacuum Valve: These valves include vacuum breaking and high volume air release. This type of valve is located typically at absolute high points where the HGL drops below the pipe and air must enter to eliminate vacuum conditions. It is also placed along force mains to facilitate proper filling. These valves can pose a risk of creating surge conditions if the valve shuts too fast following high-volume air release.

Combination Air Valve: These valves include all three main functions of an ARV plus, in many cases, the fourth function of controlled air release is added to slow the release of air as the water column approaches the valve, thereby avoiding excessive surge conditions when the valve closes.

These functions make ARVs essential to many pressure systems. However, there are operation and maintenance (O&M) problems that can occur even if the valves are functioning properly. Following are examples of some of the problems that can occur:

Corrosion – Internal corrosion of a metallic pipe can occur when a vacuum breaking ARV introduces air into the pipe. For this reason, metallic FMs should use air release only ARVs wherever possible especially where the pipe is not protected with a ceramic epoxy (protecto 401) or equivalent liner. Additionally, external corrosion can occur inside the ARV vault as the air from the pipe is released. If the air contains hydrogen sulfide, the external wall of the pipe, the ARV itself, the saddle and isolation valve attaching the ARV to the pipe, the vault, and the vault cover may all become corroded over time.

Surge – The sudden closure of an ARV after it rapidly releases air can create a surge event. This can be caused when the orifice is oversized. A too large orifice will increase the rate of flow of the air and reduce the time between its opening and closing.

Lack of Surge Control – ARVs often are not effective surge control devices either because they do not react fast enough to allow air in to prevent vapor cavity formation or because they become plugged with grease and debris and fail to open. As mentioned above, a fast acting ARV can result in further surge conditions.

Odor and noise – ARVs can be a nuisance to nearby residents if they emit odor or cause a whistling as the air is released from the FM (due to improper orifice sizing).

Siphoning – While this typically does not present a problem, flow can siphon over high points along a force main that are higher in elevation than the discharge. This may be a complete siphon or, more commonly, a partial siphon that reduces the effective static head on the pumps. This becomes a problem if it causes the pumps to operate too far right on their curve (runout condition). In rare cases, a full siphon can form while a pump is running and continue to lower the wetwell after the pump shuts off (if the FM discharge is below the water level in the wetwell). In some cases, siphoning may actually be desirable to reduce energy costs.

In addition to the above functions, many ARV models are available with various options, including different orifice diameters and/or special features. When selecting and/or replacing an ARV, the actual orifice diameters and optional features of the ARV should be selected for the specific conditions of that installation, which may be

different even from other ARVs on the same FM. In order to ensure appropriate equipment replacements and spare parts inventory (and to allow for accurate surge modeling), the actual orifice diameters and optional features of each ARV should be documented at the time of installation.

Another consideration to note is that if ARVs are closed, particularly at intermediate high points along the force main, air binding may develop in the force main. Thus, if any ARVs are turned off, ESD should be certain to monitor the pumping capacity, pump run times and pump discharge pressures to identify any signs of air binding. Also, if an unexplained reduction in pumping capacity is observed—especially if this corresponds with an increased discharge pressure, any ARVs along the force main should be inspected for air binding.

5.0 PROCEDURE

The following is the recommended procedure for inspection and testing Air Valves.

a) At the Air Valve manhole, pull the truck in to face traffic, turn on the truck sign board and/or hazards lights. Crew members should put on reflective vests before exiting the truck. While a crewman flags traffic, the other crewman sets up cones around the work zone, refer to “Work Zone Traffic Control” practices.

b) **CAUTION:** Always use proper work zone traffic control methods, procedures and devices to block and mark off the work zone prior to commencing work. Using a pick and shovel, pull the cover and inspect the manhole (MH) contents.

   1. If the manhole is flooded, a Vac Truck or portable pump may be required.
   2. If the liquid is sewage, the valve float mechanism may have stuck. Isolate the valve, drain and depressurize for disassembly and inspection/cleaning.

c) Air valves shall be inspected annually assuming the initial inspection does not reveal significant problems. If significant problems are found, the valve shall be inspected every 6 months. Valves should be disassembled, cleaned and

returned to service. A quick check of the need for back flushing would be to open the bottom drain valve on the side of the valve body. If sewage drains out easily, back flushing may not be required. The valve should still be disassembled and cleaned as grease or other debris may have accumulated in the top portion of the valve. If sewerage does not drain out, the valve may need back flushing.

1. If back flushing is required, an external source of clean water is required.
   i. The air valve should be isolated from the main line.
   ii. The flushing water source is connected to the air valve's upper flushing connection.
   iii. A section of hose is connected to the bottom drain connection and its end placed in a suitable vessel to capture the contaminated flush water.
   iv. The drain valve and flushing water valves are opened and flushed through the bottom drain valve until it is clean.

CAUTION: It is highly recommended that distribution system potable water not be used as the flushing water source. Instead, clear water from a portable water tank and pump should be used as the flushing water source thus protecting against potential backflow.

2. The main line air valve's isolation valve shall be exercised at least annually.

d. Air valves with cast iron bodies should be removed, cleaned, corrosion removed, primed and painted at least every five years or more often depending on inspection and need. Install a spare air valve to replace the removed valve. After the removed air valve has been rehabilitated, in should be placed in inventory.

e. Air valves with either stainless steel or plastic bodies should be removed, cleaned, and inspected at least every five years or more often depending on inspection and need. Install a spare air valve to replace the removed valve.

After the removed air valve has been rehabilitated, in should be placed in inventory.

6.0 COMMON PROBLEMS and POSSIBLE SOLUTIONS

The following is a listing of common problems with Air Valves and possible solutions for resolution.

a) **Leakage at Inlet Connection**:
Tighten valve threaded connection or flange bolts. If leaks persist, remove valve and re-seal the threads with pipe sealant/tape, or reattach with new bolts and tighten as necessary. Check that the valve's actual operating pressure does not exceed its design Working Pressure as stamped on the valve's nameplate.

b) **Leakage at Cover/Body joint**:
Tighten bolts per the manufacturer's recommendations. It may be advisable to replace the cover/body gasket first. Check that the valve's actual operating pressure does not exceed its design Working Pressure as stamped on the valve's nameplate.

c) **Orifice not Releasing Air Under Pressure**:
Only for Air Release and Combination Valves. Air/Vacuum valves will never release air under line pressure. Check that the valve's actual operating pressure does not exceed its design Working Pressure as stamped on the valve's nameplate. If the valve is operating within its design pressure range, isolate, drain and depressurize the valve for inspection and cleaning. Open the isolation valve and allow the ARV to refill. Once the valve is again pressurized, test the valve for proper operation by injecting air (with compressor) into the bottom drain connection line and see if the valve releases the injected air. If the valve does not release the injected air the valve needs to be repaired or replaced.

d) **Liquid Leakage through Air Blow Off**:
Isolate valve from main line, and depressurize valve through bottom drain connection. Check for gravel or other debris in the outlet at the top of the valve; clean as needed. Back flush the valve to remove debris. If back flushing is not effective, disassemble and inspect the internal seat, orifices, float and float guide for debris, wear, or damage. Replace as needed with a float kit or seat kit from the manufacturer. Check that the valve's actual operating pressure does not exceed its design Working Pressure as stamped on the valve's nameplate. Check that the valve's minimum operating pressure (typically 3-7 psi) is not less than the actual operating pressure of the line. If the minimum pressure is not met, leakage will occur until the valve is modified to seal better. Contact the ARV manufacturer on a case-by-case basis.

CAUTION: Always isolate and drain the valve and ***depressurize the valve*** before opening the cover/body or removing the valve.

Replace all valves as necessary that cannot be repaired in the field. Ensure replacement valves are provided with same functionality and orifice sizing as the original valves (unless an appropriate evaluation is performed to confirm suitability of another valve type and/or size).


W HILLS DR
PUBLICALY
GLENN RD
PARKER RD
CANTERBURY DR
PELLA CIR
ALICE ST
WESTHILLS CT
HILLSIDE RD
WAVERLY TRL
WAVERLY LN
DIVISION ST SW
SHORT ST
9TH AVE SW
MILGRAY LN
6TH AVE
OAK ST SW
7TH AVE
5TH AVE
GRAMOR DR
WOODRIDGE RD
WOODHILL COVE DR
ORSO DR
WILLOW BROOK DR
ALABAMA AVE SW
MONTEREY DR
PINE TREE CIR
CRUMPTON DR
PINEDALE DR SW
4TH AVE SW
1ST AVE SW
GLENN RD
PINTO DR
JERRY AVE
STAPP AVE SW
ELM ST SW
2ND AVE
1ST ST
HOUSTON ST
GRAHAM ST
PINE ST SW
TINA CIR
MEMORIAL DR SW
MELFORD ST SW
CEDAR ST
BELVIEW ST
MEDICAL CENTER DR
PRINCESS CIR SW
PRINCESS LN