

Reference Guide For Asset Management Inventory and Risk Analysis (Waste Water)



Prepared by the Southwest Environmental Finance Center

Document's Intended Use: This document provides suggestions on the type of information to be collected in the field, in the office and electrical data (where applicable) by asset category when completing an asset inventory. For each asset category, following the inventory table, there is a table providing suggestions for factors that could be considered when defining what impacts Probability of Failure and Consequence of Failure when determining an asset's criticality (or risk). The lists provided are not intended to be all inclusive nor do they purposefully exclude any items. Certainly you will come up with other things that are important to your utility. This guide is intended to help you get started.

Pumps

Inventory	
Necessary Data	Optional Data
<ul style="list-style-type: none"> Asset size - diameter and/or flow rate Asset location Installation date Condition - Visible inspection, then update as needed with Maintenance history, age Useful life (varies with type, 5 - 15 years) 	<ul style="list-style-type: none"> Model number Serial number Manufacturer Supplier name & phone Under warranty Warranty expiration date Manufacturer's recommended O&M Maintenance records Operational Are spare parts available? Redundancy- Spare pump/parts always available if this pump fails? Were design specifications followed? <p>Electrical Data:</p> <ul style="list-style-type: none"> Variable speed? Nameplate horsepower (used to calculate power consumption)

Inventory Data Locations	
<ul style="list-style-type: none"> Aerial photographs As-built record drawings Existing utility maps Visible inspection Repair, maintenance and inspection records Purchase records O&M Manual 	<ul style="list-style-type: none"> Interview current and former operators Site visit Photographs Contact contractors or engineers familiar with the system

Note: Data may not be available for all sources- record what is available

Risk Assessments	
Factors Affecting Probability of Failure	Factors Affecting Consequence of Failure
<ul style="list-style-type: none"> Age Condition Maintenance history - routine maintenance performed? Correct lubricants used? etc. Installation - vibration concerns, alignment concerns Running as designed - on the pump curve Properly sized? 	<ul style="list-style-type: none"> Level of service failures Health concerns Environmental concerns Illegal discharge Time to repair may be lengthy - spare parts on hand? Cost of the failure Number and type of customers impacted

Manholes

Inventory	
Necessary Data	Optional Data
<ul style="list-style-type: none"> Asset size - diameter and/or depth Asset location Installation date Condition - Visible inspection, then update as needed with Maintenance history, age Useful life 	<ul style="list-style-type: none"> Model number Serial number Manufacturer Supplier name & phone Under warranty Warranty expiration date Manufacturer's recommended O&M Maintenance records Last date of inspection Last date manhole was cleaned Depth of sediment Are there visible roots from the vegetation above? Operational Are spare parts available? Were design specifications followed? Direction of flow Depth Rim elevation Invert elevation Manhole material type

Inventory Data Locations	
<ul style="list-style-type: none"> Aerial photographs As-built record drawings Existing utility maps Visible inspection Repair, maintenance and inspection records 	<ul style="list-style-type: none"> Interview current and former operators Site visit Photographs Contact contractors or engineers familiar with the system

Note: Data may not be available for all sources- record what is available

Risk Assessments	
Factors Affecting Probability of Failure	Factors Affecting Consequence of Failure
<ul style="list-style-type: none"> Age Condition Frequency of inspection and maintenance history Location 	<ul style="list-style-type: none"> Illegal discharge concerns Damage to property Health concerns Environmental concerns Level of service failures Cost of failure

Pipe

Inventory	
Necessary Data	Optional Data
<ul style="list-style-type: none"> • Asset size • Asset location • Installation date • Condition - repair history and age • Useful life 	<ul style="list-style-type: none"> • Redundancy- Can wastewater still flow to plant if this pipe fails? • Manufacturer • Supplier name & phone • Maintenance records- break records • Last inspection date • Last date cleaned • Pipe type • Direction of flow • Depth of bury • Slope • Were design specifications followed?

Inventory Data Locations	
<ul style="list-style-type: none"> • As-built record drawings • Existing utility maps • Repair, maintenance and inspection records • Purchase records • 	<ul style="list-style-type: none"> • Interview current and former operators • Photographs • Contact contractors or engineers familiar with the system

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Risk Assessments	
Factors Affecting Probability of Failure	Factors Affecting Consequence of Failure
<ul style="list-style-type: none"> • Age • Condition • Bedding • Vibration • Temperature change • Soil Corrosivity • Electrolysis • Root intrusion • Clogging 	<ul style="list-style-type: none"> • Illegal discharge concerns • Damage to structures • Environmental concerns • Health concerns • Level of service failures • Cost of the failure

Lift Station Structure

Inventory	
Necessary Data	Optional Data
<ul style="list-style-type: none"> • Asset size - length, width, depth or volume • Asset location • Installation date • Condition - • Useful life 	<ul style="list-style-type: none"> • Supplier name & phone • Under warranty • Warranty expiration date • Manufacturer's recommended O&M • Maintenance records: last date painted or cleaned? • Last date of inspection • Inspection results • Operational • Were design specifications followed?

Inventory Data Locations	
<ul style="list-style-type: none"> • Aerial photographs • As-built record drawings • Existing utility maps • Visible inspection • Repair, maintenance and inspection records • Purchase records • O&M Manual 	<ul style="list-style-type: none"> • Interview current and former operators • Site visit • Photographs • Contact contractors or engineers familiar with the system

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Risk Assessments	
Factors Affecting Probability of Failure	Factors Affecting Consequence of Failure
<ul style="list-style-type: none"> • Age • Condition • Inspection and Maintenance history • Location / elevation • Size • Exposure to corrosive or damaging elements 	<ul style="list-style-type: none"> • Level of service failures • Health concerns • Inability to transport sewage • Time to repair • Cost of the failure • Environmental concerns • Illegal discharge Concerns • Health concerns

Valves

Inventory	
Necessary Data	Optional Data
<ul style="list-style-type: none"> Asset size - diameter or settings Asset location Installation date Condition - Visible inspection, then update as needed with Maintenance history, age Useful life (varies with type, 15-20 years) 	<ul style="list-style-type: none"> Supplier name & phone Model Manufacturer Under warranty Warranty expiration date Manufacturer's recommended O&M Maintenance records – Last date Valve was exercised etc. Operational Redundancy- Will sewage continue to be transported if this valve were to fail? Were design specifications followed?

Inventory Data Locations	
<ul style="list-style-type: none"> As-built record drawings Existing utility maps Visible inspection Repair, maintenance and inspection records Purchase records O&M Manual 	<ul style="list-style-type: none"> Interview current and former operators Site visit Photographs Contact contractors or engineers familiar with the system

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Risk Assessments	
Factors Affecting Probability of Failure	Factors Affecting Consequence of Failure
<ul style="list-style-type: none"> Age Condition Maintenance history Clogging 	<ul style="list-style-type: none"> Backflow concerns Pressure concerns Health concerns Environmental concerns Pump failure Level of service failures Illegal discharge concerns