Kure Beach Sewer Asset Management Project

Overview

Engineering Services, PA | January 30, 2026

Funding

- DWI Grant #: AIA-W-ARP-0133
- NCDWI AIA Grant: $150,000

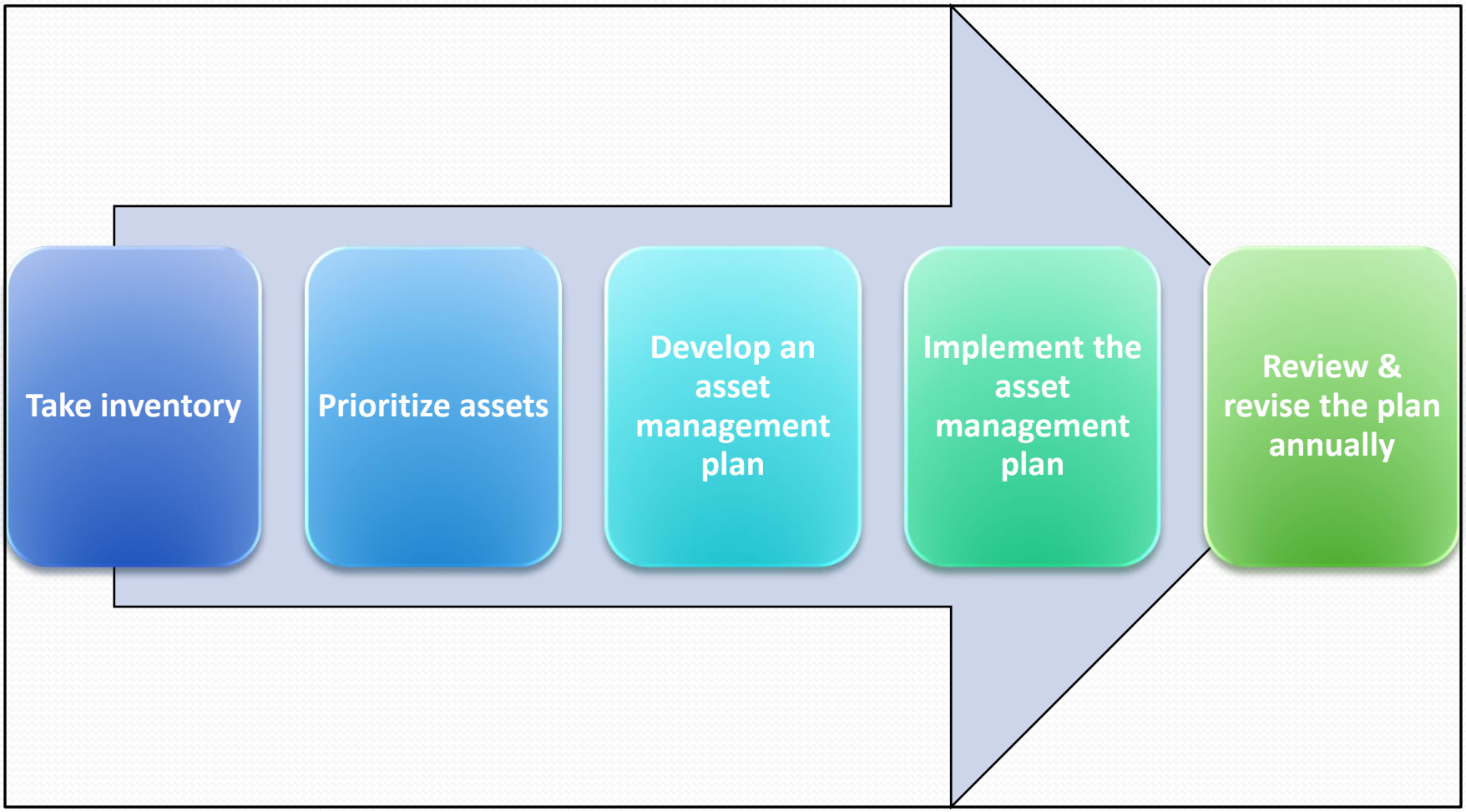
Asset Management Plan Overview

- Describes how the sewer system will be managed
- Provides an inventory & assessment of all sewer assets along with associated databases
- Outlines operation & maintenance (O&M) procedures
- Provides priority projects recommendations & associated costs
- Updated GIS mapping of sewer assets

Benefits of an AMP

- Increase system knowledge—know what you have
- Identify asset location, condition, & importance
- Prolong asset life through sound decision-making
- Reduce costs for operations & capital expenditures
- Improved O&M
- Meet federal/state regulatory requirements
- Improve access to federal/state financial assistance (additional application points)

Process


Take inventory
Prioritize assets
Develop an asset management plan
Implement the asset management plan
Review & revise the plan annually

Project Elements

- Inventory assets (gravity sewers, force mains, lift stations, etc.)
- Assess asset conditions
- Develop an O&M plan
- Identify & prioritize capital needs w/ cost estimates
- Project deliverables
  - Asset Inventory
  - Asset Management Plan
    - 10-year Capital Improvement Plan (CIP)
  - Updated GIS Mapping - DiamondMaps

Sewer System GIS Base Mapping

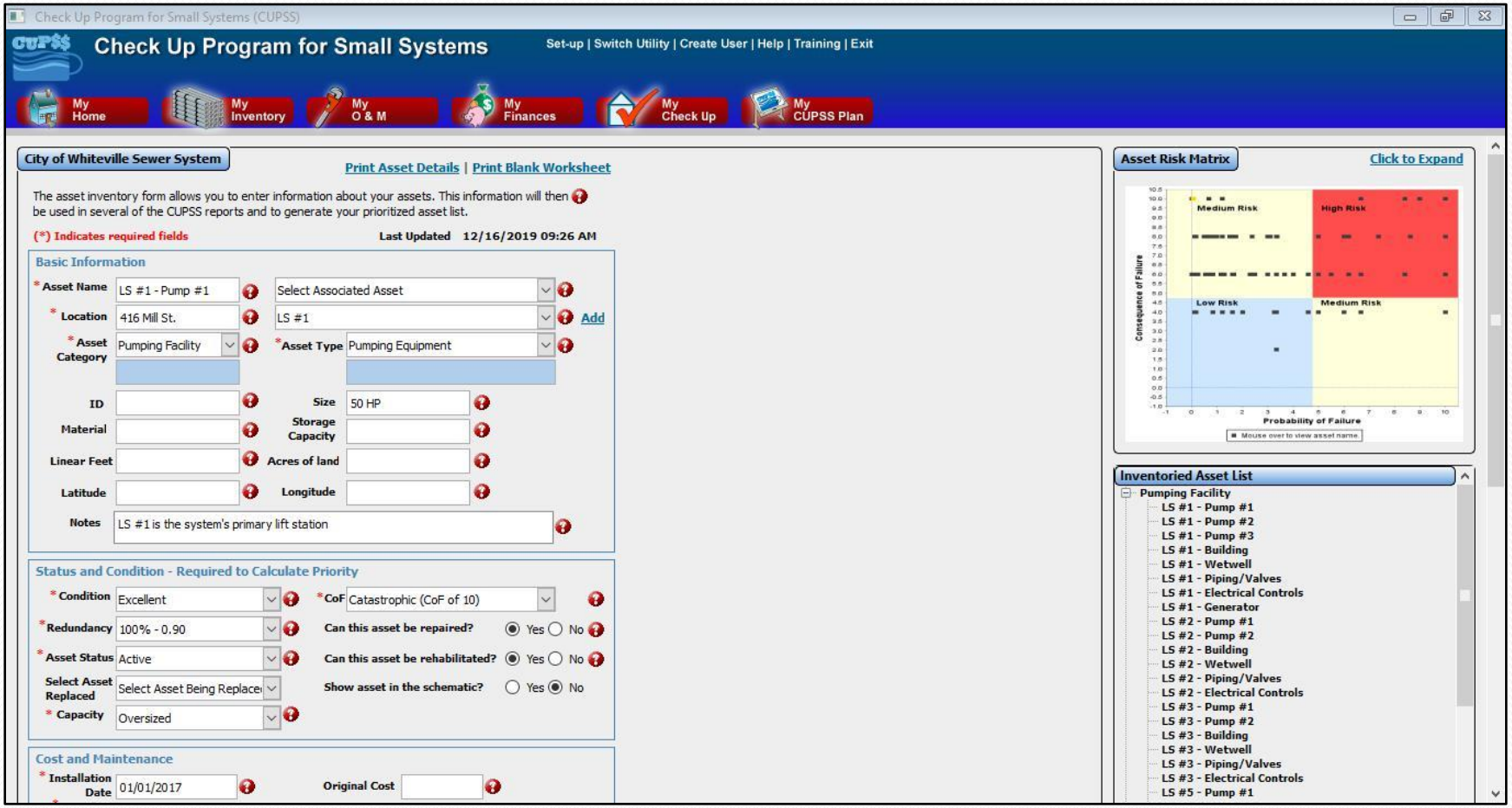
Asset Evaluation Process

- Field surveys & visual inspections
- Approximate asset age/industry-standard useful life
- Material type
- Condition assessment
- Criticality/importance to system
- Redundancy
- Institutional knowledge
- System maps, as-built/engineered drawings

CUPSS Software Program

- Check Up Program for Small Systems (CUPSS)
- USEPA-developed asset management software
- Used for asset inventory & assessment
- Developed using information provided by staff, field surveys, investigative methods, existing maps, & as-built drawings, etc.
- Asset useful life guidance provided by NC Division of Water Infrastructure

CUPSS Asset Inventory Entry Screen



Sewer System Snapshot

Kure Beach WWTP

LS #7 – Shop (Main)

Sewer System

- Inventoried 145 assets
- 33 (23%) identified as High-Risk (critical) assets
- 106 (73%) identified as Medium-Risk assets
- 6 (4%) identified as Low-Risk assets
- Certain assets (WWTP; lift stations; outfalls) are more important than others, but any asset failure could be tied to an environmental/public health risk and/or an NCDEQ violation
- Rates adjusted regularly with the Water & Sewer Fund Operating Ratio (OR) consistently above the recommended 1.0 threshold.
- Establish dedicated Capital Reserve Fund to fund future capital needs.
- Estimated sewer capital improvements over the next 10 years total **$3,278,541**

Collection System Assets

Gravity Sewers

- 16.0 miles of gravity sewer: 6" – 12" pipe (1955-2009)
- CIPP/CLAY/DIP/PVC pipes
- 74% ≤ 40 years in age (CIPP/DIP/PVC)
- 26% ≥ 40 years in age (CLAY/PVC)
  - 6" CLAY gravity sewers (8" State minimum)
  - 8" CLAY gravity sewers
- Gravity sewers in **Poor**-to-**Excellent** condition

Manholes

- 384 total
- Brick/pre-cast/rehab
- 2% of manholes in **Poor** condition

Pumping System Assets

- Lift Stations (1982-2017)
  - 10 lift stations (LS)
  - 5 equipped with generators
  - LS #7 – Shop (Main) was replaced in 2017
  - LS's in **Fair**-to-**Good** Condition
- Force Mains
  - 6.0 miles: 4" – 8" pipe (1982-2001)
  - CI/DI/PVC pipe
  - FM's in **Fair**-to-**Good** condition

Pumping System Assets (Cont.)

- Air Relief Valves: 8" & 10" (1995; 2016)
  - 10 total ARV's
  - All ARV's located on LS #7 & LS #9 force mains
  - 50% of ARV's replaced in 2016; other 50% original to 1995 installation
  - ARV's in **Poor**-to-**Good** Condition
    - 60% of ARV's require replacement; either in **Poor** condition or operate beyond 30-year useful life

Treatment Assets

WWTP

- Placed into service early-to-mid 1960's, expanded 1986 & 1991
- Permitted capacity: **0.285 MGD**
- Avg. 2024 daily flow : **0.215 MGD**
- Avg. 2024 daily flow to Carolina Beach: **0.178 MGD**
- WWTP assets in **Fair**-to-**Excellent** condition
- Dechlorination system added in 2013
- Aerators & lagoon baffles/curtains replaced in 2018 & 2022
- Areas of need include replacing chemical feed systems – Chlor/ dechlor systems

Specific Recommendations (5-year CIP)

Annual Collection System Maintenance Inspection

- System-wide smoke testing – Every 5 years
- Annual video-inspection - Minimum 10% of total system length; NCDEQ system requirement

Collection System

- Replace 417 LF of 6" CLAY gravity sewer; upsize to minimum 8"
- Rehab 6,885 LF of 8" CLAY gravity sewer
- Replace 6 air-relief valves
- Replace check/gate valves & electrical controls – LS #8 & LS #9
- Replace LS #9 2 x 30 HP pumps
- Replace LS #10 check/gate valves; electrical controls, & 50 KW generator
- Replace check/gate valves – LS #1 thru LS #6

Specific Recommendations (5-year CIP)

WWTP

- Replace chemical feed pumps & tubing – Chlorine Contact Chamber
- Replace chemical feed pumps & tubing – Dechlorination Chamber

Cost Estimates (5-year CIP)

Sewer System Improvements	Est. Cost	FY
Smoke Testing	$5,855	FY 28
Annual Video Inspection	$188,448	FY 26-FY30
6" CLAY Gravity Sewer Replacement	$450,000	FY 26
8" CLAY Gravity Sewer Rehab	$1,510,000	FY 26
ARV Replacements	$60,000	FY 26
LS #1 thru #6 Check/Gate Valve Replacements	$100,000	FY 26
LS #8 Upgrades – Valves & Electrical Controls Replacement	$50,000	FY 26
LS #9 Upgrades – Pumps, Valves, & Electrical Controls Replacement	$135,000	FY 26
LS # 10 Electrical Controls Replacement	$50,000	FY 26
LS #10 Generator & Valve Replacement	$95,000	FY 30
WWTP Chemical Feed Systems Replacements	$24,000	FY 26/29
Total:	**$2,668,303**	

Possible Council Actions

- No Action
- Adopt 10-year CIP & Update Regularly
  - 10-year CIP is a grant requirement
  - Incorporate into budgeting process
  - Receive 2 points in competitive funding applications.
    - Must be adopted w/in 2 years of application
- Adopt AMP & Update Regularly
  - Plan acceptance/adoption is a grant requirement
  - Receive 10 points in competitive funding applications
    - Must be adopted w/in 2 years of application

Questions?