

CHAPTER 10 – CAPACITY ASSURANCE PLANNING ENVIRONMENT (CAPE)

10.1 Introduction

CAPE is a suite of integrated software applications and decision support tools designed specifically to support the master planning process. Its primary use is in integrating information technology to reduce data handling complexity and provide the decision-making tools that are essential in the master planning process. CAPE has several modules available; however, only three modules are being implemented:

- Time series data manager
- Infiltration/Inflow (I/I) work bench
- CIP manager

The other functions of CAPE are more effectively managed in the hydraulic models or GIS programs.

The use of CAPE modules is designed to give GWA planning personnel a valuable tool for maintaining time series data collected from flow monitors and rain gages. Other time series data like SCADA data may also be imported in the future. CAPE will also manage the capital improvements for the water and wastewater utility. Specific applications for combining the modules to produce useable results are detailed below.

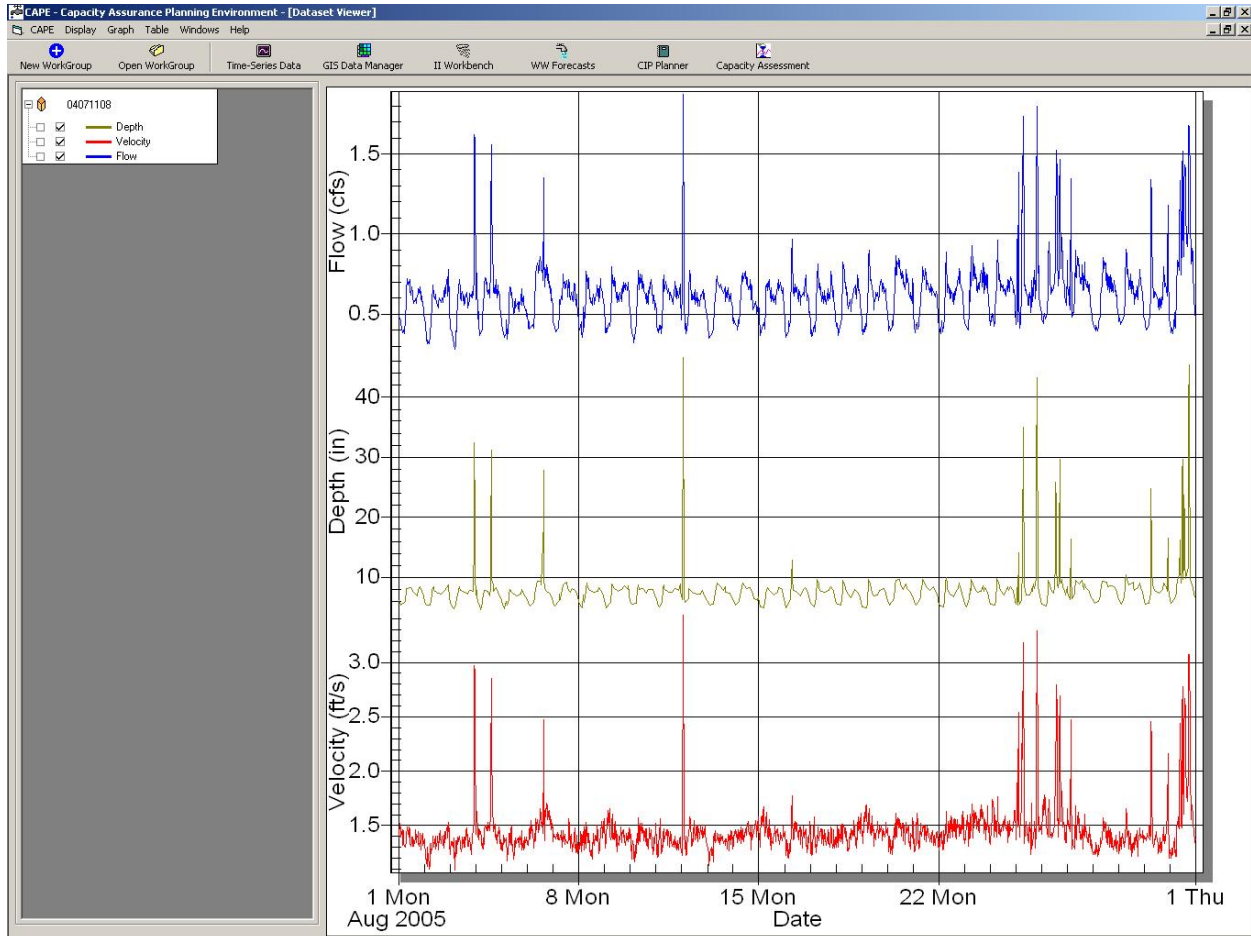
10.1.1 Time-Series Data Manager

The Time-Series Data Manager is a storage and retrieval system for managing large sets of time-series data (e.g. flow meter and rain gauge data). It uses powerful compression algorithms, which result in files that are less than 5% of the size required by an Microsoft Access database. Powerful graphing utilities allow the user to zoom-into the data, change measurement units quickly, and average data over various time steps.

When gathering flow monitor and rain gauge data from multiple sites, it is necessary to analyze them for use in the planning process. This module was used to process data collected and discussed in Volume 3, Chapter 4 – Levels of Service, Section 4.7.1 and addressed base flow calibration of the sewer model.

Figure 10-1, Time-Series Data Manager, shows how flow, depth and velocity can be displayed on a single graph for review.

Figure 10-1 – Time-Series Data Manager

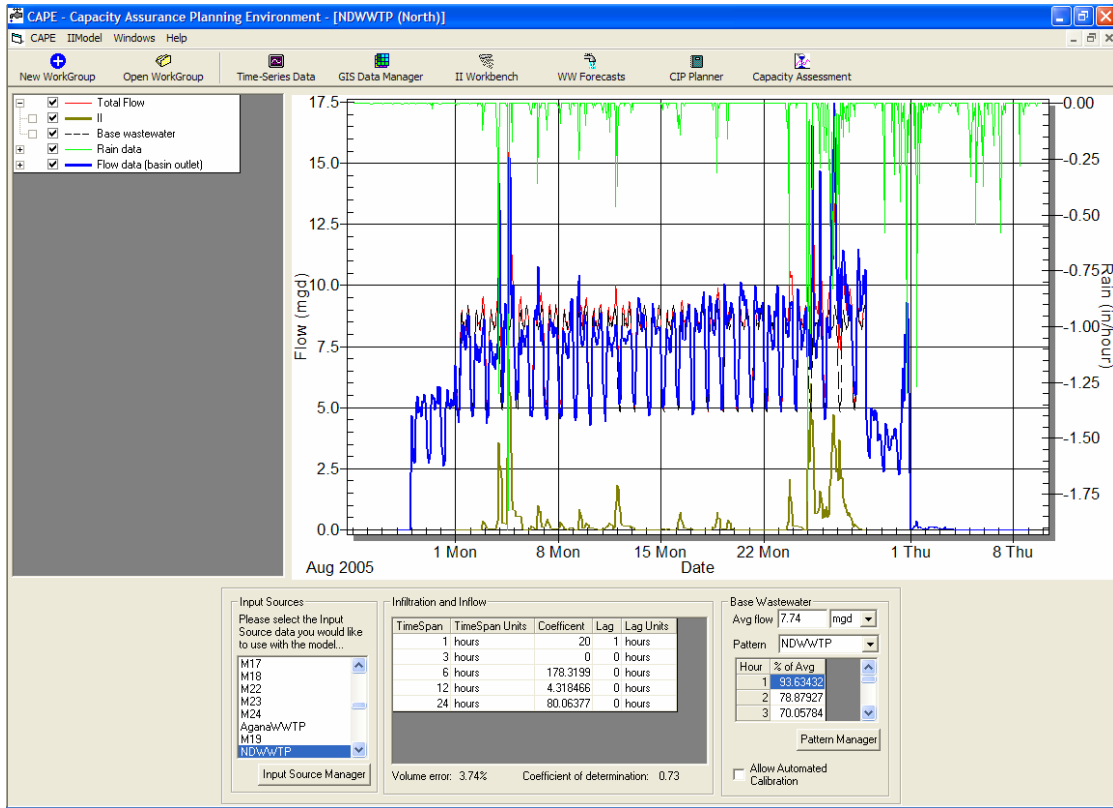


10.1.2 I/I Workbench

The I/I Workbench is a modeler’s workbench for performing area-wide I/I studies for wastewater collection system modeling. It includes two different kinds of continuous simulation I/I models – one based on a mathematical regression and the other on an urban-watershed model. The I/I Workbench works seamlessly with the Time-Series Data Manager to access rainfall and flow meter data. The I/I models include tools to assist with model calibration. The I/I models also include a statistical engine for determining the return period of flow events. This module was used to analyze and calibrate the sewer model against wet weather data discussed in Volume 3, Chapter 4, Section 4.7.2.

Figure 10-2, I/I Workbench, shows how the flow monitor data and rain gauge data can be used to develop I/I hydrographs for use in the MWH Soft wastewater models.

Figure 10-2 – I/I Workbench



10.1.3 Capital Improvement Project Planner

The Capital Improvement Project Planner provides a simple Gantt chart interface for managing capital improvement information. Project schedules can be changed by dragging boxes in the chart. Expenditures across a variety of funds are automatically recalculated whenever the schedule is modified. Expenditures for a project can be varied each year to represent different phases of work. Funding sources can be assigned to each expenditure to further improve GWA’s financial accounting and budgeting. A GWA customized single page report can be generated for each CIP in the Gantt chart.

Information from a variety of sources identified in this master plan will be imported into the CIP compilation. Specific details for establishing and maintaining the CIP are presented in Volume 1, Chapter 15.

Figure 10-3, CIP Planner, shows an example spreadsheet view of a 20-year CIP plan. The CIP costs can be summarized per year and per project throughout the 20-year CIP plan. Dependencies can also be added to ensure projects are scheduled and executed in the proper order.

Figure 10-3 – Capital Improvement Project Planner

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Water		\$35,075,000	\$179,065,000	\$245,565,000	\$177,715,000	\$239,365,000	\$115,465,000	\$115,465,000	\$192,465,000	\$158,965,000
Ugum WTP Improvements		\$550,000	\$4,500,000	\$8,700,000						
Ugum Water Treatment Plant Intake Modifications		\$550,000								
Ugum Water Treatment Plant Membrane Filtration			\$4,500,000							
Ugum Water Treatment Plant Reservoir Replacement				\$8,700,000						
Northern System			\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000
Water Distribution Improvements			\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000	\$104,500,000
Southern System Water Distribution Improvements			\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000
Central System Water Distribution Improvements			\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
Reservoirs			\$13,250,000	\$10,500,000	\$13,250,000	\$44,000,000				\$43,500,000
Northern System Raw Water Transmission Lines			\$31,500,000	\$44,100,000	\$109,900,000	\$49,000,000	\$80,500,000		\$77,000,000	
Water Booster Pumping Station Improvements			\$1,400,000	\$1,000,000						
Electrical Upgrades			\$900,000	\$350,000						
Electrical Upgrade - Other Water Booster Stations			\$250,000							
Electrical Upgrade - Pago Bay, Brigade, and Windward Hills Water			\$650,000							
Electrical Upgrade - Gayneno, Santa Rosa, Santa Rita Springs, and			\$350,000							
Other			\$2,125,000	\$1,665,000	\$1,665,000	\$1,665,000	\$1,665,000	\$1,665,000	\$1,665,000	\$1,665,000
Wastewater		\$27,728,000	\$274,530,000	\$137,620,000	\$69,547,000	\$1,560,000				\$50,440,000
STP Improvements		\$3,130,000	\$1,650,000	\$300,000	\$925,000	\$300,000				
Umatac-Merizo STP - Electrical Upgrade				\$300,000		\$300,000				
Baza Gardens STP - Electrical Upgrade										
Agat-Santa Rita STP - Electrical Upgrade			\$400,000							
Northern STP - Electrical Upgrade				\$1,650,000						
Baza Gardens STP Improvements			\$2,730,000							
Umatac-Merizo STP Improvements					\$925,000					
Northern District STP Expansion					\$7,500,000					
Northern District STP Biosolids Treatment Facilities					\$19,000,000					
Hagalma STP Screenings and Grit Removal Improvements and Eff					\$19,700,000					
Agat-Santa Rita STP Expansion					\$55,500,000					
Facility Plans		\$5,950,000	\$320,000		\$26,475,000					\$9,250,000
Sewer Extensions		\$15,900,000	\$270,000	\$385,000	\$6,500,000					\$41,190,000
Provide sewers in prioritized unsewered areas of the Hagalma STP		\$4,700,000	\$80,000,000							
Provide Sewers in prioritized unsewered areas of the North District		\$11,200,000	\$190,000,000							
Umatac-Merizo STP service basin sewer of unsewered areas				\$385,000						
Provide Sewers in prioritized unsewered areas of the Umatac-Merizo					\$6,500,000					
Provide Sewers in prioritized unsewered areas of the Baza Gardens										\$16,840,000
Provide Sewers in prioritized unsewered areas of the Inarajan STP										\$24,350,000
Sewer Upgrades					\$8,212,000					
SCADA Improvements		\$250,000	\$1,100,000	\$2,500,000	\$850,000					
Convert sewer in Chagamin Ave. to a Pressure Sewer					\$1,200,000					
Wastewater Collection System Replacement/Rehabilitation Program		\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000				
Wastewater Pumping Station Electrical Upgrade		\$1,000,000								
Water and Wastewater Field Data Collection		\$160,000	\$160,000	\$160,000	\$160,000	\$160,000				
Manhole Frame Seal Repair		\$84,000								
Agat I Manhole Rehabilitation		\$54,000								

Figure 10-4, Project Properties in the CIP Planner, shows how each project in GWA’s CIP has key information need to manage the 20-year CIP plan.

Figure 10-4 - Capital Project Properties

Project Properties

General | Budget | Management | Schedule Display

Name: Ugum Water Treatment Plant Intake Modifications

Alias: [] (Alias is optional. If it is provided, it will be used to provide a name for the project in the schedule. The Alias is often a shortened version of the full name.)

Start Date: 1 / 1 / 2007

Duration: 1 Year

Project Type:

- Unknown
- System Capacity
- Regulatory Compliance
- DM&R
- System Reliability
- Other []
- System Redundancy

Project Description: This project would improve the intake structure for the Ugum Water Treatment Plant to minimize siltation and to provide more reliable raw water supply during low

Project Justification: The existing intake is susceptible to siltation and requires frequent maintenance. The Ugum WTP is the sole source of water (except two small wells) for supplying the Southern System.

Buttons: Cancel, OK