# **GIS** Assessment Toolbox and Databases Implementation

Guam Water Resource Master Plan Project – Phase I

Government of Guam, Guam Waterworks Authority

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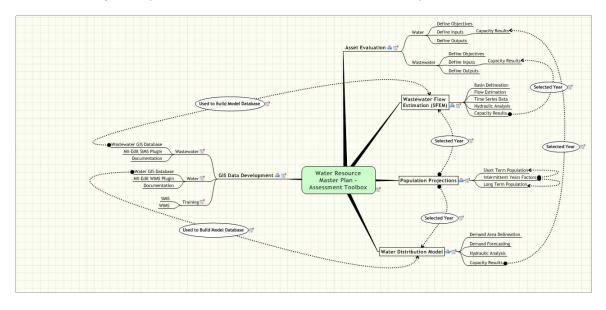
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# 1. Assessment Tools – Prototype Design

# Water Resource Master Plan - Assessment Toolbox

The water resource master plan uses a GIS based approach to system evaluation. This provides a common database between all the project tasks and adds long term value to the data that is collected. The integration of the GIS data are described in general in the follwoing diagram. Each of the major components are documented with more detailed specifications.



# Asset Evaluation

#### See also: Asset Evaluation

The GIS water and wastewater databases are used to support asset evaluations. The GIS data contains the location of features and important attributes and characterization of the system. The GIS contains fields to labeling conditions ranks used to visualize the overall condition of the system.

## Wastewater Flow Estimation (SFEM)

#### See also: <u>Wastewater Flow Estimation (SFEM)</u>

The wastewater flow estimation model is based on the GIS sewer database developed for the project. The objectivies of the flow model is to use automated modeling routines to do flow capacity analysis for multiple short and long term time horizons. The capacity analysis data is created by this model using the sewer network and population projection data. The outputs are projected capacities of the major sewers in the system.

# **Population Projections**

See also: Population Projections

See also: Wastewater Flow Estimation (SFEM), Water Distribution Model

The population projection data is used to support the water and wastewater modeling. The processes and overall integration of the data inputs, outputs and interactions with other processes are defined. The intent of this section is to document the processes at the "big picture" scale. More detailed development plans will be created as part of the development phase.

# Water Distribution Model

#### See also: Water Distribution Model

The water demand forecasting model is based on the GIS water database developed for the project. The objectivies of the demand model is to use automated modeling routines to do capacity analysis for multiple short and long term time horizons. The capacity analysis data is created by this model using the water network and population projection data. The outputs are projected capacities of the major water features in the system.

## **GIS Data Development**

#### See also: GIS Data Development

The GIS development task includes the database design, data input process and editing tools. The GIS data is developed are the water GIS Geodatabase, wastewater geodatabase, basemap layers and supporting population GIS layers. This section documents the overall process and components of the GIS development task as part of the project GIS integration plan.

#### Wastewater

The wastewater GIS database was developed as a ESRI geodatabase with a geometric network. The data structure was designed to support sewer flow modeling processes that will be conducted and implemented for this master plan and to support infrastructure management of the sewer assets.

#### Water

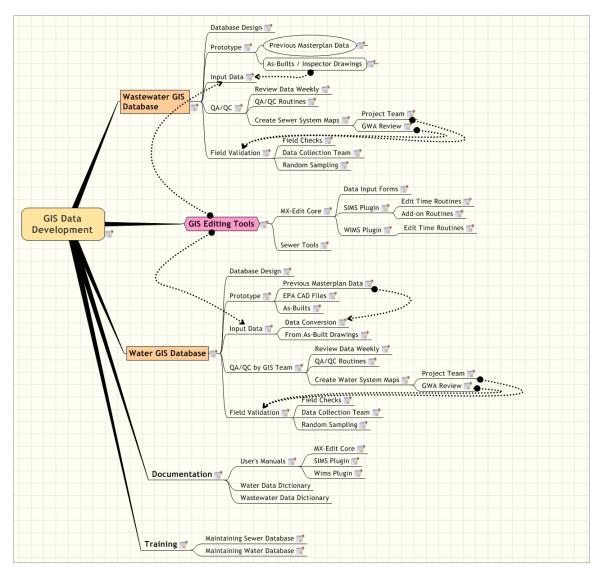
The water GIS database was developed as a ESRI geodatabase with a geometric network. The data structure was designed to support water demand forecasting modeling that will be conducted for this master plan and to support infrastructure management of the water assets.

#### Training

Training for the internal consultant team in understandin the GIS databases and the editing tools is provided. Training for GWA staff in maintaining these database is part of Phase II work.

# GIS Data Development

The GIS development task includes the database design, data input process and editing tools. The GIS data is developed are the water GIS Geodatabase, wastewater geodatabase, basemap layers and supporting population GIS layers. This section documents the overall process and components of the GIS development task as part of the project GIS integration plan.



## Wastewater GIS Database

The wastewater GIS database was developed as a ESRI geodatabase with a geometric network. The data structure was designed to support sewer flow modeling processes that will be conducted and implemented for this master plan and to support infrastructure management of the sewer assets.

## Database Design

The sewer Geodatabase design was developed primarily to support the needs of the master plan project, but considered future uses of the data. The design was developed using templates

previously used by the consultants with modifications being made for the requirements of GWA. Refer to Sewer Database design document for more details.

The feature layers are:

- Sewer mains
- Sewer laterals
- Manholes
- Treatment plants
- Pump stations
- Fittings
- Service connections
- Discharges

## Prototype

A prototype area was used to input sewer data from available data resources. The previous master plan data was evaluated as a source to input into the new geodatabase structure. The "As-Builts" or Inspector drawings were evaluated and determined to be the best source of the data. Since the new data structure is in a Geometric network, the data had to be re- digitized. The shapefiles from the previous master plan data could not be converted because of disconnects in the data, due to their CAD file origin.

## Previous Masterplan Data

Shape files developed in the 1993 master plan. This data was only used as mapping data and did not include the attributes required by hydraulic analysis. The data did not have the manholes snapped to the ends of the sewermains as nodes, rather as circles. This data could not be converted to the new structure and is used as reference only.

#### As-Builts / Inspector Drawings

#### See also: Input Data

The data determined to be the best source for inputting data into the new structure are the "Asbuilts" or inspector copies. This data has the necessary attributes needed for modeling (e.g. material types, invert elevations, and lateral pipes) The GIS input team has set up production near the GWA map room for convience.

The attribute data is only available on these maps.

#### Input Data

The data is input into the wastewater GIS database using the As-Builts and inspector copies. This is done on-site near the GWA maproom.

## QA/QC

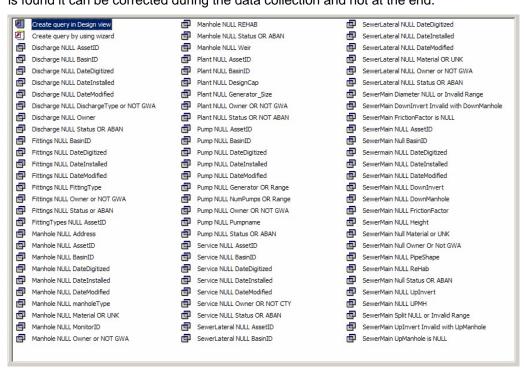
The quality assurance and quality control processes provides review by the GIS team not directly involved with the research and data input. This is important so that an objective review can be done on the data.

#### Review Data Weekly

The wastewater GIS data is reviewed on a weekly basis by the GIS development team, particularly the database design team. Data is transferred via FTP servers from the GIS team in Guam to the GIS developers in Hawaii.

## **QA/QC** Routines

As part of the overall quality control process, SQL routines were developed to help find missing or invalid data. There are many routines that are run on a regular basis. As missing or invalid data is found it can be corrected during the data collection and not at the end.



## Create Sewer System Maps

On a regular basis and as significant progress in the GIS data collection is made, overall system maps are created to be used by the project team. These maps server two purposes, 1.) provide additional review by project members outside of the GIS team, 2.) provide maps as reference for other project tasks.

ArcMap documents with a map layout and map tile system is created. A map tile system was created for the island coded by village. These map tools use the MapBook extension to automatically print map series in batch.

#### **Project Team**

See also: Field Validation

The project team can review the GIS sewer system maps and make recommendations for field inspection. The reviewers may include task leaders from the modeling teams, data collection and others.

#### **GWA Review**

See also: Field Validation

The GIS sewer system maps should be reviewed by GWA staff familiar with the each system. Many times valuable information about the system only exists by knowledge by staff. This review provides an important screening process to find potential errors in the data that may need field investigation.

# **Field Validation**

In some cases the available resources for building a complete and accurate sewer GIS database is not possible from the source material. Since the sewer database is to be used for hydraulic

analysis, it is essential that the system be as accurate as possible, particularly the connectivity and elevation data.

Based on review by GWA staff and the data collection team, some field investigation is expected. The field investigation will verify existence features, location of features and collect missing data attributes.

## Field Checks

Field crews are assigned to missing or suspect data as needed. If needed GPS locations of manholes or other point features will be collected. Field checks should include the verification of all data components of the GIS data.

## **Data Collection Team**

The data collection team are inspecting the features of the major sewers. When available, due to timing of data, the GIS system maps will be used as a reference by the field inspectors. Any inconsistencies found can be reported back to the GIS development team for correction.

## **Random Sampling**

A 10% random field investigation will also be completed and documented as a random sampling of data. Samples should however emphasize the system 10 inches in diameter or bigger.

## **GIS Editing Tools**

#### See also: Input Data, Input Data

The GIS editing tools used for the development and long term maintenance of the water and wastewater GIS databases is centralized into a common editing interface. This code editing tool is MX-Edit.

The Sewer Information Management System (SIMS) and the Water Information Management System (WIMS) customized routines are developed as plugins to MX- Edit. This provides a single user interface for both water and wastewater.

## MX-Edit Core

The MX-Edit program runs under ArcMap as an add-on extension. This program provides a common interface for editing GIS database. Specific QA/QC and automated routines specific to water or wastewater are installed as plugins to MX-Edit.

The major features of MX-Edit are:

- Form based data entry
- Advanced selection and categorization of selection sets.
- Stored Queries
- Bookmark useful for editing
- SIMS plugin routines
- WIMS plugin routines

GWA and the GIS development team receive a Site licenses of MX-Edit and the plugin programs.

## Data Input Forms

MX-Edit forms are setup to standardize the way that GIS water or wastewater data is input. Users can customize the entry forms to suite their work flow.

## SIMS Plugin

The Sewer Information Management System (SIMS) routines are developed as MX-Edit plugins. These plugins provide automated routines specific to wastewater GIS features. As attributes are updated, some fields are automatically updated making the data entry fast and more reliable.

#### **Edit Time Routines**

The SIMS plugin routines include some processes that are run as certain data fields are modified. After a data modification on these fields, automated routines are run to update other related fields. for example, the upstream and downstream manholes on the sewermains are updated if the manhole AssetID is changed.

The edit-time routines run during an editing session are:

Edit Time Component: Routines					
List of routines that are executed by the SIMS plug in at edit time.					
Functions	FeatureClasss	Fields	Description		
Auto AssetID	All featureclasses in the Sewers geometric network except SewerNetwork_Junctions	ASSETID	Assigns a unique Asset ID to all features throughout all featureclasses		
Modified Date	All featureclasses in the Sewers geometric network except SewerNetwork_Junctions	DATEMODIFIED	Populates the DATEMODIFIED field with the current system date when any changes are made to the feature.		
Calculate Slope	Sewermain	UPINVERT, DOWNINVERT, PIPELENGTH, SLOPE	Calculates the slope of the sewermain pipe using the formula: Slope = ((UpInvert - DownInvert) / PipeLength)		
Calculate Water Table	Sewermain	UPINVERT, DOWNINVERT, WATERTABLE	Calculates the slope of the sewermain pipe using the formula: <i>WaterTable = (UpInvert + DownInvert) / 2</i> If WaterTable > 1 then the pipe is above water. If WaterTable <= 1 then the pipe is below water.		
Get Invert Elevation	Sewermain, Manhole	UPMANHOLE (Sewermain), UPINVERT (Sewermain), ASSETID (Manhole), INVERTELEV (Manhole), GROUNDELEV (Manhole), DEPTH (Manhole)	Compares the UpInvert of each Sewermain that has the same Upmanhole and assigns the lowest Sewermain-UpInvert to the Manhole InvertElevation. Calculates the Depth of the Manhole with the new InvertElevation using the formula: <b>Depth = GroundElevation - InvertElevation</b>		
Calculate Friction Factor	Sewermain	MATERIAL, DIAMETER, FRICTIONFACTO R	Calculates the Friction Factor of the pipe according the following conditions: If the Material = CIPC, CCP or RCP then FrictionFactor = 0.015. If the Material isn't in the list, then if the pipe Diameter <= 18 inches then FrictionFactor = 0.015 If these conditions are not met then FrictionFactor = 0.013		
Up and Down	Sewermain, Manhole	ASSETID (Sewermain, Manhole),	Populates the Sewermain Upmanhole and DownManhole fields with the Asset ID of the		

Manhole		UPMANHOLE (Sewermain), DOWNMANHOLE (Sewermain)	corresponding Manhole.
Set Flow Split	Sewermain, Manhole	UPMANHOLE (Sewermain), FLOWSPLIT (Sewermain), ASSETID (Manhole)	Checks the number of Sewermains coming from their UpManhole and calculates the FlowSplit of the Sewermain pipe using the formula: <i>FlowSplit</i> = 100 / (Number of Sewermains)
Calculate Invert		Calculates the Invert Elevation of the Manhole using the formula:	
Elevation		DEPTH	Depth = GroundElevation- InvertElevation
			If Depth > 999 then Depth = 999.
			If Depth < 0 then Depth = 0.

#### Add-on Routines

Additional data processing routines that are run in batch or separate from attribute edits are in "Add-on" routines within the SIMS plugin. These are often run at the end of an edit session or on a regular basis. The routines developed are:

- Flipping of linear features when digitized the wrong direction
- Merging of database when multiple copies of the database are being used. This allows more than one editor to input data.
- Updating to upstream and downstream IDs on sewermains.

## WIMS Plugin

The Water Information Management System (WIMS) routines are developed as MX-Edit plugins. These plugins provide automated routines specific to water GIS features. As attributes are updated, some fields are automatically updated making the data entry fast and more reliable.

#### **Edit Time Routines**

The WIMS edit time plugin routines are automatically assign unique AssetIDs to GIS water features. Other routines will be developed as needed.

#### Sewer Tools

A collection of useful sewer tools are also provided to supplement the MX-Edit program. These tools are helpful for anyone using the sewer GIS data. The tools include several tracing routines for connectivity and tributary analysis. Tracing the sewer lines both upstream and downstream help the users and administrators of the data to understand the system and data better.

The GIS development team and GWA will receive installation programs for these tools.

## Water GIS Database

The water GIS database was developed as a ESRI geodatabase with a geometric network. The data structure was designed to support water demand forecasting modeling that will be conducted for this master plan and to support infrastructure management of the water assets.

#### **Database Design**

The water GIS database design was developed to support the modeling and infrastructure evaluation processes of the project. The database design was based on the ESRI water models

and then modified for the needs of the project GWA. The design may be simplified as data is inputted and its use is better defined.

The water distribution feature layers are:

- Clear Wells
- Control Valves
- Fittings
- Gravity Main
- Hydrants
- Lateral Lines
- Lateral Points
- Manholes
- Meters
- Network Structure
- Pressure mains
- Pump stations
- Sampling station
- System Valves

The water distribution feature layers are:

- Anodes
- Casings
- Reservoirs
- ScadaSensors
- Thrust Protection
- Water Structures

## Prototype

An evaluation of the data sources and input methods is analyzed. This is used to help determine the best source and method of input before embarking on the water GIS data collection.

#### Previous Masterplan Data

#### See also: Data Conversion

In a previous masterplan project conducted in 1993, some water data was collected and stored in GIS shapefiles. This data is outdated in some places and also does not include all the attribute data needed. This data however was evaluated as a data source.

It was determined that this data could be converted into the new GIS water database as a staring point. All the major lines and features were imported into the new GIS database, but still requires research to complete the effort. This previous data provides the location and line work of the features, but the attributes are incomplete and still need to be researched and entered using thee resources available.

# EPA CAD Files

The water drawings exist in CAD files and are evaluated as a possible source of data. This data is considered and resource for the research, but probably not adequate for data conversion.

Note: This evaluation is not complete, pending delivery of sample files.

## As-Builts

The As-Built or inspector copies are considered the best source of information for the water GIS database. These maps will be used to update data converted from the previous master plan data and to update areas developed since this last master plan.

The attribute data is only available on these maps.

## Input Data

Data is researched and input by the GIS development team using the GIS editing Tools developed and the As-Built and inspector drawings. The GIS database is originally seeded from the converted data in the previous master plan GIS layers. This is done on-site near the GWA maproom.

## Data Conversion

The data from the previous master plan layers were converted and inserted into the installed water GIS database. This data will need to be confirmed and additional attribute data added from the As-Built and inspector drawings.

## From As-Built Drawings

The As-Built and inspector drawings are used as the primary reference for checking the previous master plan data and to add more detailed attributes to the GIS database.

## QA/QC by GIS Team

QA/QC routines are developed and used to query for missing or invalid data. These should be run on a regular basis during the edit process.

## **Review Data Weekly**

The water GIS data is reviewed on a weekly basis by the GIS development team, particularly the database design team. Data is transferred via FTP servers from the GIS team in Guam to the GIS developers in Hawaii.

## **QA/QC** Routines

As part of the overall quality control process, SQL routines were developed to help find missing or invalid data.

## Create Water System Maps

On a regular basis and as significant progress in the GIS data collection is made, overall system maps are created to be used by the project team. These maps server two purposes, 1.) provide additional review by project members outside of the GIS team, 2.) provide maps as reference for other project tasks.

ArcMap documents with a map layout and map tile system is created. A map tile system was created for the island coded by village. These map tools use the MapBook extension to automatically print map series in batch.

Project Team See also: Field Validation The project team can review the GIS water system maps and make recommendations for field inspection. The reviewers may include task leaders from the modeling teams, data collection and others.

#### **GWA Review**

#### See also: Field Validation

The GIS water system maps should be reviewed by GWA staff familiar with the each system. Many times valuable information about the system only exists by knowledge by staff. This review provides an important screening process to find potential errors in the data that may need field investigation.

#### **Field Validation**

In some cases the available resources for building a complete and accurate water GIS database is not possible from the source material. Since the water database is to be used for hydraulic analysis, it is essential that the system be as accurate as possible, particularly the connectivity and elevation data.

Based on review by GWA staff and the data collection team, some field investigation is expected. The field investigation will verify existence features, location of features and collect missing data attributes.

A 10% random field investigation will also be completed and documented as a random sampling of data.

#### Field Checks

Field crews are assigned to missing or suspect data as needed. If needed GPS locations of point features will be collected. Field checks should include the varification of all data components of the GIS data.

#### Data Collection Team

The data collection team are inspecting the major features of water system . When available, due to timing of data, the GIS system maps will be used as a reference by the field inspectors. Any inconsistencies found can be reported back to the GIS development team for correction.

#### Random Sampling

A 10% random field investigation will also be completed and documented as a random sampling of data. Samples should however emphasize the system 10 inches in diameter or bigger.

#### **Documentation**

The tools and processes used to develop the water and wastewater GIS databases is documented in the form of design specifications and user's manuals. Phase II of the Guam Master Plan project includes more complete user's manuals in conjunction with the GWA training tasks.

#### **User's Manuals**

User's manuals to support the Phase I work and the GIS developement team are developed. More deatiled documentation will be developed as needed during the Phase II training tasks.

#### MX-Edit Core

Provide a complete user's manual for using the MX-Edit core product. This is available in printed, PDF file and Windows Help file formats.

#### SIMS Plugin

Provide a complete user's manual for using the SIMS plugin tools for internal use by the GIS development team. A more detailed version is developed as part of Phase II training tasks. This is available in printed, PDF file and Windows Help file formats.

## Wims Plugin

Provide a complete user's manual for using the WIMS plugin tools for internal use by the GIS development team. A more detailed version is developed as part of Phase II training tasks. This is available in printed, PDF file and Windows Help file formats.

## Water Data Dictionary

Database dictionary defining all the feature, tables, fields and domins designed in the database structure.

## Wastewater Data Dictionary

Database dictionary defining all the feature, tables, fields and domins designed in the database structure.

# Training

Training for the internal consultant team in understandin the GIS databases and the editing tools is provided. Training for GWA staff in maintaining these database is part of Phase II work.

## Maintaining Sewer Database

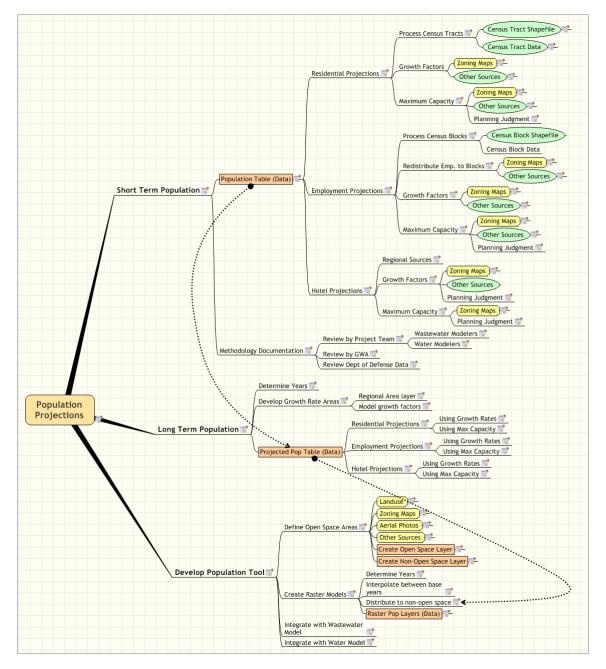
The sewer database basics and database design are documented as part of the Database Implementation document. This included information that the project team needs to complete the tasks in Phase I. A simplified user's manual for SIMS is developed and used by the GIS data team. This manual will be expanded as part of the Phase II training task.

## Maintaining Water Database

The water database basics and database design are documented as part of the Database Implementation document. This included information that the project team needs to complete the tasks in Phase I. A simplified user's manual for WIMS is developed and used by the GIS data team. This manual will be expanded as part of the Phase II training task.

# **Population Projections**

The population projection data is used to support the water and wastewater modeling. The processes and overall integration of the data inputs, outputs and interactions with other processes are defined. The intent of this section is to document the processes at the "big picture" scale. More detailed development plans will be created as part of the development phase.



# Short Term Population

The short term population data is being developed using the US census data as a basis. All population projections will be tied to the census block group polygons via the Blockgrp field in this population table. This table is used to project long term population using growth rate and

maximum capacity factors. The resulting population table is used to create raster models for all years of interest.

## **Population Table (Data)**

#### See also: Projected Pop Table (Data)

The population table contains population for residential, employment and hotels and all growth rate and maximum capacity factors. The data is at the block group level that can be linked to the Census block GIS layer.

#### **Residential Projections**

The residential data is based on the US census block level data. The base year is 2000 and the short term population projections are for the years 2005,2010, 2015, and 2020. Projections are applied using growth rate and maximum capacity factors.

#### Process Census Tracts

Census tract GIS layer is processed and projected into the GWA standard coordinate system. The original data is from the tr66\_00d shape file.

#### Census Tract Shapefile

GIS shape file from US Census Bureau for the census tracts (tr66\_00d) Data is projected to the Guam 1993 Datum.

#### Census Tract Data

GIS shape file from US Census Bureau for the census block groups (bg66\_00d) Data is projected to the Guam 1993 Datum.

#### **Growth Factors**

Growth Rate factors are determined at the block level to distribute residential population to the areas that have commercially or employment landuse activities. The projected data considers the census blocks that are likely to have employment growth in the future. Future projections are based on the zoning maps and other available planning resources.

#### Zoning Maps

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### **Other Sources**

Other resources within the Guam government agencies are investigated and used as appropriate.

#### Maximum Capacity

Residential population cannot grow indefinitely so the population projection factors must include a limit to the maximum capacity of an area. This will prevent the numerical projection process to not allow an area grow beyond the intended use of and area. These maximum limits are set at the block level using available resources, such as landuse, zoning maps and other planning information that is made available to the project.

#### Zoning Maps

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### **Other Sources**

Other resources within the Guam government agencies are investigated and used as appropriate.

#### Planning Judgment

Professional judgement as a planner and analyst are used to set reasonable maximum capacity factors. Any available resources will be used as appropriate.

## **Employment Projections**

The employment data is based on the US census tract level data. The base year is 2000 and the short term population projections are for the years 2005,2010, 2015, and 2020. These numbers are adjusted based on regional employment population data. Projections are applied using growth rate and maximum capacity factors.

#### **Process Census Blocks**

Census Block GIS layer is processed and projected into the GWA standard coordinate system. The original data is from the bg66\_00d shape file.

#### Census Block Shapefile

#### Census Block Data

#### Redistribute Emp. to Blocks

Since employment data is only available from the census data at the tract level. The employment population needs to be refined and redistributed to the block level. Tract level data is inadequate for modeling since large undeveloped areas are also included in the tracts.

Using planning judgement and available resources employment will be pushed into the blocks. Each block will be processed independently so that employment population, growth rate and maximum capacity factors are considered at the block level.

#### **Zoning Maps**

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### **Other Sources**

Other resources within the Guam government agencies are investigated and used as appropriate.

## **Growth Factors**

Growth Rate factors are determined at the tract level to distribute employment population to the areas that have commercially or employment landuse activities. The projected data considers the census blocks that are likely to have employment growth in the future. Future projections are based on the zoning maps and other available planning resources.

#### Zoning Maps

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### **Other Sources**

Other resources within the Guam government agencies are investigated and used as appropriate.

#### Maximum Capacity

Employment population cannot grow indefinitely so the population projection factors must include a limit to the maximum capacity of an area. This will prevent the numerical projection process to not allow an area grow beyond the intended use of and area. These maximum limits are set at the block level using available resources, such as landuse, zoning maps and other planning information that is made available to the project.

#### Zoning Maps

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### **Other Sources**

Other resources within the Guam government agencies are investigated and used as appropriate.

#### Planning Judgment

Professional judgement as a planner and analyst are used to set reasonable maximum capacity factors. Any available resources will be used as appropriate.

## **Hotel Projections**

The hotel data is based on regional data sources and projections are applied using growth rate and maximum capacity factors.

#### **Regional Sources**

Hotel population uses existing visitor count and hotel data available through Guam Government.

#### **Growth Factors**

Growth Rate factors are determined at the block level to distribute hotel population to the areas that have hotels or are likely to have hotels in the future. Future projections are based on the zoning maps and other available planning resources.

#### Zoning Maps

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### **Other Sources**

#### Planning Judgment

Professional judgement as a planner and analyst are used to set reasonable maximum capacity factors. Any available resources will be used as appropriate.

#### Maximum Capacity

Hotel and other visitor accommodations cannot grow indefinitely so the population projection factors must include a limit to the maximum capacity of an area. This will prevent the numerical projection process to not allow an area grow beyond the intended use of and area. These maximum limits are set at the block level using available resources, such as landuse, zoning maps and other planning information that is made available to the project.

#### Zoning Maps

Guam Government zoning maps are available in hardcopy only. They are used as reference to help determine the zoned landuse for distributing population and defining growth rate and maximum capacity factors.

#### Planning Judgment

Professional judgement as a planner and analyst are used to set reasonable maximum capacity factors. Any available resources will be used as appropriate.

#### **Methodology Documentation**

The population projection methodology is documented as supporting information about the population data. This document will used by the water and wastewater models and will be included in the project documentation.

## **Review by Project Team**

It is critical that the project team, especially those involved with the water and wastewater modeling review and provide comments to the methodology used to generate the population data. The population projections are one of the most important inputs to the models and buy-in from the modelers is critical.

The recommended reviewers are:

- Project Management
- Wastewater Modeler
- Water Modeler
- Certified planner
- GIS team

#### Wastewater Modelers

The wastewater modeling team is to review the population projections to ensure understanding and to get buy-in on the input data to the models.

#### Water Modelers

The water modeling team is to review the population projections to ensure understanding and to get buy-in on the input data to the models.

#### Review by GWA

The methodology used to process and project future population should be reviewed by GWA. It is critical that the process is understood and is consistent with methods used within Guam Government to provide a legitimate modeling process. Buy-in on this methodology will help the modeling team know that the processes are approved and in line Guam government planning practices.

The recommended reviews are:

- Water Resource Master Plan project management
- Department of Planning
- Guam Bureau of Statistics and Plans

## Review Dept of Defense Data

The Federal Department of Defense has some population projections for the island of Guam as related to their purposes. In processing the population table, this data could be used to compare results and provide guidance.

# Long Term Population

Long term population is projected basin on growth rates and other factors used to project beyond the near term time horizon. The master plan long term horizon is for 100 years.

#### **Determine Years**

The short term population is created for predefined years up to the year 2020. Water and wastewater utility planning require a longer range projection. The short term population is used as a base. The 2020 year can be projected numerically using the growth rate factors provided at each census block.

The long range population will allow projections to be made to the year 2100. Intermittent years between the the base 2020 data and the 2100 can be interpolated.

## **Develop Growth Rate Areas**

The growth rate factors used for the population distribution are used to process data at the block level based on localized information. The growth rate areas is a modeling concept to be able to apply additional growth factors at a much larger scale. For example, suppose the modeler wants

to apply a heavier growth to a specific area to do what-if scenarios, this growth rate area could be applied. The areas and the weighting factors can be adjusted by the modeler as needed since they are a simple shapefile.

## **Regional Area layer**

An initial growth rate layer will be created to be used by the modelers. This initial layer could be created at the village level or at a grosser scale. More than one growth area layers can be created to support different what-if scenarios.

## Model growth factors

Initial growth rates will be assigned to the initial growth area layer. This will be based on long range planning judgments.

## **Projected Pop Table (Data)**

See also: Distribute to non-open space

#### **Residential Projections**

Additional residential population years will be created for the years required. This data is stored in additional data fields in the population table.

#### **Using Growth Rates**

Growth rates developed at the block level are used to project the long term population. Maximum capacity is considered. Rates are for estimated annual growth.

#### Using Max Capacity

The maximum capacity factor is applied to ensure that long term population does not exceed unreasonable levels.

## **Employment Projections**

Additional employment population years will be created for the years required. This data is stored in additional data fields in the population table.

#### Using Growth Rates

Growth rates developed at the block level are used to project the long term population. Maximum capacity is considered. Rates are for estimated annual growth.

#### Using Max Capacity

The maximum capacity factor is applied to ensure that long term population does not exceed unreasonable levels.

## **Hotel Projections**

Additional hotel population years will be created for the years required. This data is stored in additional data fields in the population table.

#### Using Growth Rates

Growth rates developed at the block level are used to project the long term population. Maximum capacity is considered. Rates are for estimated annual growth.

#### Using Max Capacity

The maximum capacity factor is applied to ensure that long term population does not exceed unreasonable levels.

# **Develop Population Tool**

The population projection tool is a common program used to generate population GIS data used for both the water and wastewater modeling programs. The GIS processing is done using raster processing techniques.

## **Define Open Space Areas**

An open space layer is needed in the population distribution to the spatial data. Population at the block level may still include some open space areas that are not typically wastewater flow generators or water consumers. These areas will help push the population data into areas of development. Some examples of open space areas might include water bodies, undeveloped parks and large undeveloped land. This data can be developed using zoning maps, aerial photos and local knowledge.

## Landuse

If available, existing landuse information can be used in any form.

## Zoning Maps

The zoning maps developed by the Guam Planning Department can be used to define open space areas

## **Aerial Photos**

If available, aerial photos can help define the open space areas.

## **Other Sources**

Other sources that may help to define open space will be researched and used as appropriate.

## Create Open Space Layer

The open space layer developed will be in he form of a GIS shapefile. There maybe different version of this layer since water and wastewater may have different needs. The shape file will be converted to a raster dataset used in creating the raster population data.

## Create Non-Open Space Layer

The reverse image of the of the open space layer will be created. This will be done within the program as a raster dataset.

#### **Create Raster Models**

A GIS program will be developed that will do the spatial and raster processing of the population projection data and the census block shapes. This data will be processed into raster datasets, one for each year required for modeling. The program will run as an ArcGIS extension and be integrated with the water and wastewater modeling programs.

## **Determine Years**

The user can determine the required years needed to support water and wastewater modeling. A raster population dataset will generated for he years selected. Any year between the census base year (2000) and the ultimate long term year (2100) can be selected.

#### Interpolate between base years

The interpolation and distribution of the selected model years between predefined years can be generated using a straight line interpolation.

## Distribute to non-open space

All population will be distributed within the raster population dataset to non-open space areas only. This process will move the people closer to where they actual are and out of the undeveloped and open space areas. This refines the model since population is used to estimate wastewater flow or water demand so the actual population needs to be as close to the pipes as possible.

## Raster Pop Layers (Data)

For each of the selected model years a raster population dataset is created. This raster data can be displayed and analyzed within the ArcGIS programs. Change of population patterns can be determined spatially and provide a good visual of the population data.

These raster datasets are used as inputs to the water and wastewater models.

## Integrate with Wastewater Model

The integration of the raster population datasets for the selected model years is integrated with the wastewater flow model.

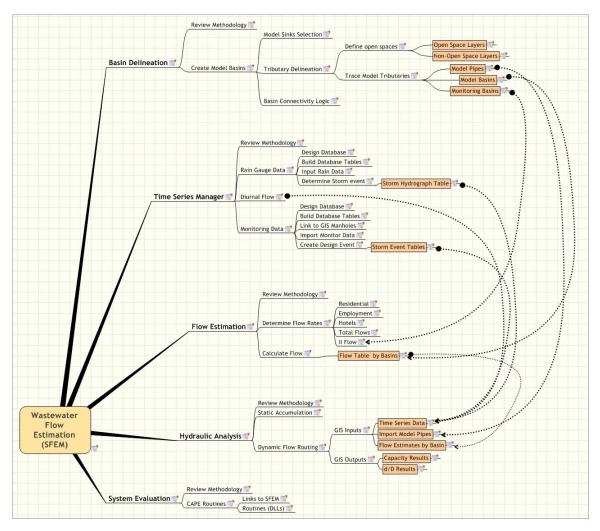
## Integrate with Water Model

The integration of the raster population datasets for the selected model years is integrated with the water demand forecasting model.

# Wastewater Flow Estimation (SFEM)

The Sewer Flow Estimating Model (SFEM) prototype is based on processes previously used. SFEM is the GIS application that runs as an ArcMap extension. This program automates the process of flow estimation and flow analysis suitable for capacity analysis in a master plan. The automated processes provide consistence between model scenarios. Scenarios can be run for any short or long term years generated by the population model or for alternative evaluations in the sewer network.

The major components in SFEM are the model basin delineation, processing of time series data, calculation of flow estimation, links to hydraulic analysis and capacity evaluation software.



# **Basin Delineation**

The basin delineation process is a module within the SFEM program to used to define the model basins. Model basins are the tributary areas of selected model sinks. These model sinks are the inputs to the hydraulic analysis. The model basins are the areas where flow estimation are calculated using population and per capita flow rates.

This process is automated so that many scenarios of the model tributary basins can be generated to support the master planning process.

## **Review Methodology**

The methodology of the basin delineation process is reviewed by the project team, particularly those involved with the wastewater flow modeling. Based on comments recipe this prototype design can be modified.

## **Create Model Basins**

Using GIS spatial processing and existing basin generation routines, the process will is modified as needed to support the needs of the project. The output of this process are basin areas that define model tributaries. These basin are stored in a GIS feature layer.

## Model Sinks Selection

Automated routines to query model sinks from a GIS geometric network.

## **Tributary Delineation**

Wastewater tributary basins are automatically delineated using various methods depending on the underlying base maps (parcel, landuse, zoning).

#### Define open spaces

The open space areas help to define the basin tributary more accurately. Open space areas such as water bodies or large undeveloped areas should not be included in the tributary areas.

These open space areas are the same used in the population projection process defined by landuse, zoning and other available planning information.

#### **Open Space Layers**

The open space are used to help to define the basin tributary more accurately. Open space areas such as water bodies or large undeveloped areas should not be included in the tributary areas.

These open space areas are the same used in the population projection process defined by landuse, zoning and other available planning information.

This data is stored in Raster format.

#### Non-Open Space Layers

The non-open space areas are the reverse image of open space areas. These are the areas that will accept population projections and generate flow estimates.

These non-open space areas are the same used in the population projection process defined by landuse, zoning and other available planning information.

This data is stored in Raster format.

#### Trace Model Tributaries

The sewer network is traced to identify the model sink that each sewermain is tributary to. This data is used to generate the polygonal area for the model basins.

#### Model Pipes

#### See also: Import Model Pipes

The pipes downstream of the defined model sinks are considered the model network or the skeleton. These are the pipes that will be modeled in the hydraulic analysis process. These are automatically identified by the program and exported for hydraulic modeling.

#### Model Basins

#### See also: Flow Table by Basins

The polygonal area of the model basins that represent the tributary areas of the selected model sinks is generated. This is the GIS feature layer that is used to estimate wastewater flow.

#### **Monitoring Basins**

#### See also: II Flow

Monitoring basins are created to define the tributary areas of the monitoring basins. These are defined using the model basin tools, using the flow gauges as the tributary sinks. The basin areas are used to distribute the II flow to the model.

## **Basin Connectivity Logic**

The basin connectivity logic is generated that describes the basin inter- connectivity. This is needed for data reporting and flow accumulation routines. The logic is displayed in graphical tree diagrams.

## **Time Series Manager**

The time series data manager is a module in the SFEM program used to store and process flow monitoring and rain gauge data.

## **Review Methodology**

The methodology of the processing of the time series data is reviewed by the project team, particularly those involved with the wastewater flow modeling. Based on comments received this prototype design can be modify.

#### Rain Gauge Data

The rain gauge data is used to help define storms event hydrographs used as input to the hydraulic analysis.

#### Design Database

The database structure of the rain gauge data is to be defined considering local conditions and availability of data. This database design will be incorporated in the overall system design of the master plan.

## **Build Database Tables**

The input of rain gauge data is imported into the database tables that store this data. This data input should be easily be repeatable through routines or defined procedures.

#### Input Rain Data

The rain gauge data is imported into the time series database. The source data is evaluated for typical conditions suitable for modeling.

#### Determine Storm event

The CAPE routines are incorporated into SFEM to process the rain gauge data and allow the user to select storm events that characterize the II flow conditions.

#### Storm Hydrograph Table

#### See also: Time Series Data

The storm hydrograph table is the input to the hydraulic analysis that adds the wet weather component to the flow analysis. This component accounts for the II flow in the system.

## **Diurnal Flow**

#### See also: <u>Time Series Data</u>

The diurnal flow pattern for residential, employment and hotel flow is defined in a hydrograph. Diurnal patterns can be applied uniformly across the system or geographically by flow monitor basin.

## Monitoring Data

The flow monitoring data is used to help calibrate the model and is used as input data to help the modeler select and build storm event hydrographs.

## Design Database

The database structure of the monitoring data is to be defined considering flow data collected for this project and other available data. This database design will be incorporated in the overall system design of the master plan.

## **Build Database Tables**

The input of flow monitoring data is imported into the database tables that store this data. This data input should be easily be repeatable through routines or defined procedures.

## Link to GIS Manholes

Monitoring data is linked to the GIS manhole features through the AssetID field. The GIS database is the central repository of the sewer features, all data related to sewer features in the GIS should be linked using this AssetID field.

## Import Monitor Data

The flow monitoring data to be used for flow analysis is loaded into the tables designed for the Time Series data manager tools. This data is linked to the GIS with the AssetID field.

## Create Design Event

Using the flow monitoring and rain gauge data, design flow hydrographs are processed and created using the tools in the Time Series Manager. These design flow hydrographs are used as input data to the Hydraulic Analysis process that represent the II flow component of the model.

#### Storm Event Tables

#### See also: Time Series Data

The storm event tables represent the wet weather hydrograph and the wet weather II flow. The storm event tables are linked to monitoring basins and used to process the II flow component and to provide time series data to the hydraulic modeling.

## **Flow Estimation**

The flow estimation is a module within the SFEM used to process wastewater flow at the model basin level. This process allows the modeler to make changes to the flow scenarios using different population years, different flow rates and II flow tables.

## **Review Methodology**

The methodology of the processing of the flow estimation is reviewed by the project team, particularly those involved with the wastewater flow modeling. Based on comments received this prototype design can be modified.

## **Determine Flow Rates**

The flow rates are used to estimate wastewater use per capita. These are developed for each flow component (residential, employment, and hotels) and can be used uniformly for the entire system or varied geographically. The flow rates are the parameters used to help tweek and calibrate the model.

## Residential

The residential flow rate is the average daily flow per person. It is used to calculate the residential flow estimate. This rate can be a standard rate applied to all areas or be defined geographically.

## Employment

The employment flow rate is the average daily flow per person. It is used to calculate the employment flow estimate. This rate can be a standard rate applied to all areas or be defined geographically.

#### **Hotels**

The hotel flow rate is the average daily flow per person. The is for occupied persons only, not the employees or the operation of the hotel since this is picked up with the employment estimate. This rate can be a standard rate applied to all areas or be defined geographically.

## **Total Flows**

The total average dry weather flows are calculated by adding the residential, employment and hotel flow components.

#### **Calculation**

TotalFlow = ResFlow + EmpFlow + HotelFlow

#### II Flow

Standard average daily II flow rates can be applied to the total average dry weather flow. This accounts for average II flow in typical dry weather conditions. The wet weather flow component is applied using the time series

#### **Calculate Flow**

#### **Residential Flow**

The residential flow is calculated by the estimated or projected population from the population projection process and the per capita flow rate. This represents the average dry weather flow for residential use.

The flow is calculated using:

ResFlow = ResPop \* ResFlowRate

#### **Employment Flow**

The employment flow is calculated by the estimated or projected population from the population projection process and the per capita flow rate. This represents the average dry weather flow for employment use.

The flow is calculated using:

EmpFlow = EmpPop \* EmpFlowRate

#### Hotel Flow

The hotel flow is calculated by the estimated or projected population from the population projection process and the per capita flow rate (visitors only). This represents the average dry weather flow for hotel use.

The flow is calculated using:

HotelFlow = HotelPop \* HotelFlowRate

## Flow Table by Basins

#### See also: Flow Estimates by Basin

The flow table contains the dry weather flow components and totals linked to the GIS modeling basins. This flow can be analyzed spatially within GIS using maps, exported to other programs for analysis and used as input to the hydraulic modeling process. The table is stored in MS Access format within the GIS geodatabase.

# **Hydraulic Analysis**

The hydraulic analysis of the wastewater collection system is modeled using data processed by the flow estimation, the sewer network data and the hydraulic modeling software used. This will provide the tools to do system evaluation and capacity analysis of the system. Only the major lines will be hydraulically modeled.

## **Review Methodology**

The methodology of the hydraulic modeling process is reviewed by the project team, particularly those involved with the wastewater flow modeling. Based on comments received this prototype design can be modified.

The software to be used for modeling is to be evaluated and selected. The links to this software will be defined at that time.

## Static Accumulation

A static accumulation of the flow estimates are run to give an initial screening of the flow modeling. This does not account for the time component of the flow or the hydraulic head and routing. Average dry weather flow is added up to downstream basin sinks.

## **Dynamic Flow Routing**

Dynamic flow routing is done on the major feature of the system (e.g. lines 10" or greater). The output of this process will produce flow capacities for model pipes, d/D results and other flow summary data needed.

## **GIS Inputs**

The data inputs of the Hydraulic modeling software are defined and the import of this data is automated where feasible.

#### Time Series Data

Time series data representing the wet weather and diurnal flow for each model basin sink. This flow is used as input to the hydraulic modeling software. This data is linked by the nodes that were used as the model basin sinks.

#### Import Model Pipes

The model network is created from the GIS data as import data into the hydraulic modeling software. The pipes and nodes exported are the feature downstream of model basin sinks and will represent the major pipes in the system.

#### Flow Estimates by Basin

The total average dry weather flow is imported into the hydraulic model linked to the nodes used as model basin sinks.

## **GIS Outputs**

The data outputs of the Hydraulic modeling software are defined and the export of this data is automated where feasible.

#### Capacity Results

Capacity and freeboard thresholds are calculated for each pipe segment in the model network pipes. This data can be used to identify areas under capacity as data for the master planning process.

#### d/D Results

The d/D for each pipe segment in the model network can be computed and used for master planning.

# System Evaluation

The system evaluation module is a set of tools that uses the outputs and data in the SFEM program and GIS to do data processing and screening of the system. These tools are currently in the "Capacity Assurance Planning Environment" (CAPE) routines that are to be integrated within the SFEM program. These automated routines will help process data in support of the master planning tasks.

## **Review Methodology**

The methodology and integration of the CAPE routines into the SFEM program will be further defined in detail. This methodology should be defined by those involved with the wastewater flow modeling.

## **CAPE** Routines

The CAPE routines are used in the master planning tasks. Some of the capabilities of CAPE are:

- How will a new development impact my collection system?
- How much infiltration and inflow do I have in my system?
- How will sewering a residential neighborhood impact my system?
- How will BOD loads change at the treatment plant as a large industrial user scales back production over time?
- If the population grows at 1.5 percent when will I run out of capacity? What if the population grows at 3.0 percent?
- How much revenue can I expect over the next 20-years from rates and connection fees?
- What are the impacts of delaying a Capital Improvement Project?
- How effective would water conservation programs be for my system?

## Links to SFEM

The CAPE data is linked back to the GIS data through the AssetID for spatial analysis and display of results. These links will be defined in more detail during the development phase.

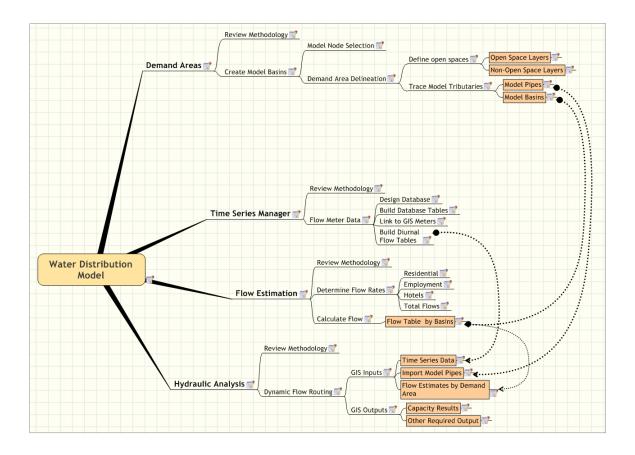
## Routines (DLLs)

The CAPE routines are to be integrated with in the GIS and SFEM programs. The programming logic and DLLs will be defined in more detail during the development phase.

# Water Distribution Model

The Water Distribution Model prototype is based on processes previously used. The GIS application that runs as an ArcMap extension. This program automates the process of water demand forecasting and flow analysis suitable for capacity analysis in a master plan. The automated processes provide consistence between model scenarios. Scenarios can be run for any short or long term years generated by the population model or for alternative evaluations in the water distribution network.

The major components in the model are demand area delineation, processing of time series data, calculation of demand estimation, links to hydraulic analysis and capacity evaluation software.



## **Demand Areas**

The demand area delineation process is a module within the water distribution program. Demand areas are the areas that server a defined demand area. These areas idenfinted by performing isolation valve tracing. The demand areas is where demand forecasts are estimated using population and per capita flow rates.

This process is automated so that many scenarios of the model tributary basins can be generated to support the master planning process.

#### **Review Methodology**

The methodology of the basin delineation process is reviewed by the project team, particularly those involved with the wastewater flow modeling. Based on comments recipe this prototype design can be modified.

#### **Create Model Basins**

Using GIS spatial processing and existing basin generation routines, the process will is modified as needed to support the needs of the project. The output of this process are basin areas that define model tributaries. These basin are stored in a GIS feature layer.

#### Model Node Selection

Automated routines to query model nodes from a GIS geometric network. These nodes define the demand areas through network tracing and demand area association.

## **Demand Area Delineation**

Water demand areas are automatically delineated using various methods depending on the underlying base maps (parcel, landuse, zoning).

#### Define open spaces

The open space areas help to define the demand areas more accurately. Open space areas such as water bodies or large undeveloped areas should not be included in the demand areas.

These open space areas are the same used in the population projection process defined by landuse, zoning and other available planning information.

#### **Open Space Layers**

The open space are used to help to define the basin tributary more accurately. Open space areas such as water bodies or large undeveloped areas should not be included in the tributary areas.

These open space areas are the same used in the population projection process defined by landuse, zoning and other available planning information.

This data is stored in Raster format.

#### Non-Open Space Layers

The non-open space areas are the reverse image of open space areas. These are the areas that will accept population projections and generate flow estimates.

These non-open space areas are the same used in the population projection process defined by landuse, zoning and other available planning information.

This data is stored in Raster format.

#### Trace Model Tributaries

The water network is traced to identify the isolated demand areas that each water line is associated to. This data is used to generate the polygonal area for the demand areas.

#### Model Pipes

#### See also: Import Model Pipes

The major lines to be used in the hydraulic modeling software. These are the major lines in the system and are the pipes that will be modeled in the hydraulic analysis process. These are automatically identified by the program and exported for hydraulic modeling.

#### Model Basins

#### See also: Flow Table by Basins

The polygonal area of the areas that represent the demand areas. This is the GIS feature layer that is used to estimate water use based on projected population and captia consumption rates.

# **Time Series Manager**

The time series data manager is a module in the SFEM program used to store and process flow monitoring and rain gauge data.

## **Review Methodology**

The methodology of the processing of the time series data is reviewed by the project team, particularly those involved with the wastewater flow modeling. Based on comments received this prototype design can be modify.

## **Flow Meter Data**

The flow monitoring data is used to help calibrate the model and is used as input data to help the modeler select and build storm event hydrographs.

## Design Database

The database structure of the meter data is to be defined considering meter data collected for this project and other available data. This database design will be incorporated in the overall system design of the master plan.

## **Build Database Tables**

The input of flow meter data is imported into the database tables that store this data. This data input should be easily be repeatable through routines or defined procedures.

## Link to GIS Meters

Water meter data useful for modeling is linked to the GIS meter features through the AssetID field.

## **Build Diurnal Flow Tables**

See also: Time Series Data

The diurnal flow pattern for residential, employment and hotel flow is defined in a hydrograph from flow meter data. Diurnal patterns can be applied uniformly across the system or geographically by flow meter basins.

## **Flow Estimation**

The flow estimation is a module within the SFEM used to process wastewater flow at the model basin level. This process allows the modeler to make changes to the flow scenarios using different population years, different flow rates and II flow tables.

## **Review Methodology**

The methodology of the processing of the flow estimation is reviewed by the project team, particularly those involved with the water demand forecast modeling. Based on comments received this prototype design can be modified.

#### **Determine Flow Rates**

The flow rates are used to estimate water use per capita. These are developed for each flow component (residential, employment, and hotels) and can be used uniformly for the entire system or varied geographically. The flow rates are the parameters used to help tweek and calibrate the model.

#### Residential

The residential flow rate is the average daily flow per person. It is used to calculate the residential demand estimate. This rate can be a standard rate applied to all areas or be defined geographically.

## Employment

The employment flow rate is the average daily flow per person. It is used to calculate the employment demand estimate. This rate can be a standard rate applied to all areas or be defined geographically.

#### **Hotels**

The hotel flow rate is the average daily flow per person. The is for occupied persons only, not the employees or the operation of the hotel since this is picked up with the employment demand estimate. This rate can be a standard rate applied to all areas or be defined geographically.

## **Total Flows**

The total average water demand is calculated by adding the residential, employment and hotel demand components.

#### **Calculation**

TotalDemand = ResDemand + EmpDemand + HotelDemand

## **Calculate Flow**

#### Residential Demand

The residential water demand is calculated by the estimated or projected population from the population projection process and the per capita flow rate. This represents the average daily water demand for residential use.

The flow is calculated using:

ResDemand = ResPop \* ResDemandRate

#### **Employment Demand**

The employment water demand is calculated by the estimated or projected population from the population projection process and the per capita flow rate. This represents the average daily water demand for employment use.

The flow is calculated using:

EmpDemand = EmpPop \* EmpDemandRate

#### Hotel Demand

The hotel flow is calculated by the estimated or projected population from the population projection process and the per capita flow rate (visitors only). This represents the average daily water demand for hotel use.

The flow is calculated using:

HotelDemand = HotelPop \* HotelDemandRate

## Flow Table by Basins

See also: Flow Estimates by Demand Area

The flow table contains the daily water demand components and totals linked to the GIS modeling demand areas. This water demand can be analyzed spatially within GIS using maps, exported to

other programs for analysis and used as input to the hydraulic modeling process. The table is stored in MS Access format within the GIS geodatabase.

## **Hydraulic Analysis**

The hydraulic analysis of the wastewater collection system is modeled using data processed by the flow estimation, the sewer network data and the hydraulic modeling software used. This will provide the tools to do system evaluation and capacity analysis of the system. Only the major lines will be hydraulically modeled.

## **Review Methodology**

The methodology of the hydraulic modeling process is reviewed by the project team, particularly those involved with the water flow modeling. Based on comments received this prototype design can be modified.

The software to be used for modeling is to be evaluated and selected. The links to this software will be defined at that time.

## **Dynamic Flow Routing**

Dynamic flow routing is done on the major feature of the system (e.g. lines 10" or greater). The output of this process will produce flow capacities for model pipes.

### **GIS Inputs**

The data inputs of the Hydraulic modeling software are defined and the import of this data is automated where feasible.

#### Time Series Data

Time series data representing the diurnal pattern for water demand for each model demand area. This flow is used as input to the hydraulic modeling software. This data is linked by the nodes that were used as the model demand area isolation valves.

#### Import Model Pipes

The model network is created from the GIS data as import data into the hydraulic modeling software. The pipes and nodes exported are the major features of the system, connecting the demand areas.

#### Flow Estimates by Demand Area

The total average daily water demand is imported into the hydraulic model linked to the nodes on the major model features.

### **GIS Outputs**

The data outputs of the Hydraulic modeling software are defined and the export of this data is automated where feasible.

#### **Capacity Results**

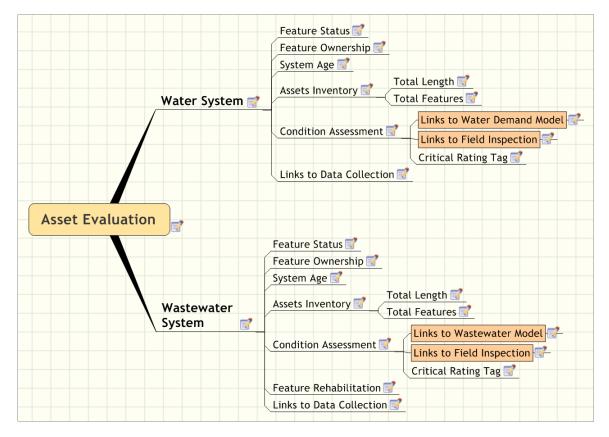
Required capacity to meet the water demands are calculated for each pipe segment and junction feature in the model network pipes. This data can be used to identify areas under capacity as data for the master planning process.

#### **Other Required Output**

Other required output to be determined and exported from the hydraulic model, including pumping station capacity and treatment facilities.

# Asset Evaluation

The GWA water and wastewater system can be evaluated using data stored in GIS and links to other data sources. The GIS based asset evaluation provides a centralized database, linked by a unique AssetID field, that can be used for queries, reports, spatial analysis and maps.



## Water System

The GWA water system assets stored in GIS and other linked data sources provide a basis for performing system evaluation. System maps and reports are used to support the master planning process.

## Feature Status

Using a "Status" field on each GIS feature (pipe, valve, pumps, etc.), maps and reports can be created using this field. The status values are:

- Active
- Inactive
- Abandoned
- Proposed

## Feature Ownership

Using a "Owner" field on each GIS feature (pipe, valve, pumps, etc.), maps and reports can be created using this field. The owner values are:

- GWA
- Private
- Military
- Unknown

## System Age

Using a "DateInstalled" field on each GIS feature (pipe, valve, pumps, etc.), maps and reports can be created using this field. The "DateInstalled" date is the date the feature was constructed as shown on the inspector and As-Built drawings.

Maps showing the age of the system can be created or data exported to other programs for analysis.

#### **Assets Inventory**

The overall inventory of the water system can be evaluated using the data in the GIS database. Maps and reports can be created to support the master plan process.

### **Total Length**

The total length of water feature and attributes from those features can be queried and reported. The feature layers are:

- Gravity Main (Total Length)
  - Carrier
  - Inline Storage
  - Transport Pipe
- Pressure mains (Total Length)
  - Air Release
  - Blowoff
  - Bypass
  - Chemical Injection
  - Distribution Main
  - Interconnect
  - Pipe Bridge
  - Sampling Station
  - Transmission Main

#### **Total Features**

The total number of feature on the water system and attributes from those features can be queried and reported. The feature layers are:

- Clear Wells
- Control Valves
- Fittings
- Hydrants

- Lateral Lines
- Lateral Points
- Manholes
- Meters
- Network Structure
- Pump stations
- Sampling station
- System Valves

#### The water distribution feature layers are:

- Anodes
- Casings
- Reservoirs
- ScadaSensors
- Thrust Protection
- Water Structures

#### **Condition Assessment**

The overall condition of the water system is estimated and displayed using the GIS based approach. This provides a way to create system maps showing the condition of the system.

### Links to Water Demand Model

The GIS features and data are linked to the water demand forecast model results. The results are used for further spatial analysis, query, maps and reports. The links are through the unique AssetID field.

#### Example:

Water lines that are modeled to be under capacity can be shown on a map and used for further analysis.

### Links to Field Inspection

Data collected through the data collection process can be linked back to the GIS features for spatial analysis and mapping.

#### Example:

A visual summary of field inspection findings can be displayed on a water system map.

## **Critical Rating Tag**

A field set aside on the GIS water database to store a critical rating. This rating is used to categorize each feature to a rating factor identifying its overall condition and critical value to the system. This field can be used to create maps and to export other feature attributes in the GIS to other programs.

The values on the CriticalRating are:

• A - Good

- B Average
- C Poor
- None

## Links to Data Collection

Any other data collected during the project is linked back to the GIS features through the AssetID field. This enables any data collected on a feature to be displayed in the GIS maps and reports.

## Wastewater System

The GWA wastewater system assets stored in GIS and other linked data sources provide a basis for performing system evaluation. System maps and reports are used to support the master planning process.

## Feature Status

Using a "Status" field on each GIS feature (pipe, manholes, pumps, etc.), maps and reports can be created using this field. The status values are:

- Active
- Inactive
- Abandoned
- Proposed

#### **Feature Ownership**

Using a "Owner" field on each GIS feature (pipe, valve, pumps, etc.), maps and reports can be created using this field. The owner values are:

- GWA
- Private
- Military

Unknown

### System Age

Using a "DateInstalled" field on each GIS feature (pipe, manholes, pumps, etc.), maps and reports can be created using this field. The "DateInstalled" date is the date the feature was constructed as shown on the inspector and As-Built drawings.

Maps showing the age of the system can be created or data exported to other programs for analysis.

### **Assets Inventory**

The overall inventory of the wastewater system can be evaluated using the data in the GIS database. Maps and reports can be created to support the master plan process.

### Total Length

The total length of wastewater feature and attributes from those features can be queried and reported. The feature layers are:

• Sewer mains (Total Length)

- ForceMains
- Gravity
- Model Links
- Outfalls
- Siphons
- Treatment Lines

Sewer laterals (Total Length)

### **Total Features**

The total number of wastewater feature and attributes from those features can be queried and reported. The feature layers are:

- Manholes
  - Plain
  - Pressure
  - Drop
  - Shallow Box
  - Junction Box
  - Terminal
  - Injection
- Treatment plants
- Pump stations
- Fittings
  - Cleanout
  - General Fitting
  - Lateral Fitting
  - Plugged End
- Service connections
- Discharges
  - Outfall
  - Injection Well
  - Reclaimation Facility
  - Manhole
- Cess Pool

## **Condition Assessment**

The overall condition of the wastewater system is estimated and displayed using the GIS based approach. This provides a way to create system maps showing the condition of the system.

## Links to Wastewater Model

The GIS features and data are linked to the wastewater flow estimation model results. The results are used for further spatial analysis, query, maps and reports. The links are through the unique AssetID field.

#### Example:

Sewer lines that are modeled to be under capacity can be shown on a map and used for further analysis.

## Links to Field Inspection

Data collected through the data collection process can be linked back to the GIS features for spatial analysis and mapping.

#### Example:

A visual summary of field inspection findings can be displayed on a water system map.

## **Critical Rating Tag**

A field set aside on the GIS wastewater database to store a critical rating. This rating is used to categorize each feature to a rating factor identifying its overall condition and critical value to the system. This field can be used to create maps and to export other feature attributes in the GIS to other programs.

The values on the CriticalRating are:

- A Good
- B Average
- C Poor
- None

## Feature Rehabilitation

The sewer main feature in GIS has a field set aside to store the type of rehabilitation on the sewer main. The rehab values identify the type of pipe lining used:

- Grouted
- CIPP
- Fold and Form
- Slip-Lined
- Link Sleeve
- 8" Slip High Density Polyethene
- Unknown
- None
- Others as needed

## Links to Data Collection

Any other data collected during the project is linked back to the GIS features through the AssetID field. This enables any data collected on a feature to be displayed in the GIS maps and reports.

# 2. GIS Sewer Database

The sewer GIS database is stored in an ESRI geodatabase structure made up of classes and subclasses. It is not the intent of this document to describe how geodatabases work or how they are designed; however it is important to have a general understanding of how the sewer database is organized. For more complete explanation of geodatabases, please refer to ESRI documentation that comes with ArcInfo ("Modeling Our World", pg 75). The major terms important to understand how the sewer GIS database is designed are explained below:

**GeoDatabase:** Top level unit of geographic data containing dataset, feature classes, object classes and relationship classes. The sewer GIS database is stored within this package of data. The geodatabase is stored in a personal geodatabase in MS Access format.

**Feature Dataset:** Feature Datasets are collections of spatial data within a geodatabase. Attribute tables are the other common types of data stored within a geodatabase but typically are outside of the feature dataset.

**Feature Class:** Feature classes are the spatial entities or layers within the spatial database. These are the major classes, at the top level, of graphical features. These will be described in more detailed later.

**Subtypes:** Subtypes are the minor classes under each of the features classes. For example, a manhole feature class breaks down the manholes into sub-categories, plain, pressured, junction box, etc.

**Domains:** Domains are valid values and ranges for feature class attributes. The database stores and only allows data in attributes that meet the valid domains defined in the database. These domains can be added upon as needed.

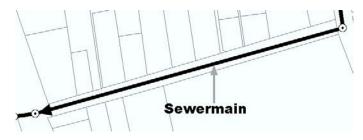
**Attributes:** Each feature class can have attribute data stored with each feature class object, adhering to the defined domains.

# **Database Feature Classes**

The feature classes defined in the sewer GIS database are explain in general terms. For more information on the definitions of each feature class refer to the Data Dictionary in this section.

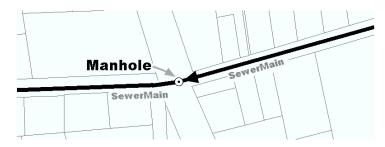
## SewerMain

Sewer mains are pipe segments defined between manholes. The entire reach, from manhole to manhole is considered a sewer main reach. The direction of flow is stored within the sewer main reach. The subtypes are gravity, force mains, outfalls, siphon, modelLinks and treatmentLinks.



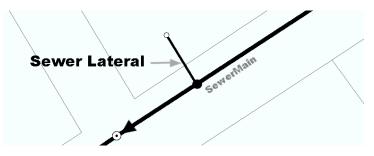
## Manhole

Manholes are the junctions between sewer mains and represent the physical location of manhole. The subtypes of manholes are plain, pressure, drop, shallow box and junction box types.



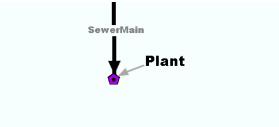
## Lateral

Sewer lateral in the GIS database represent the connection between the sewer mains and the parcels. Laterals must feed into gravity mains. Laterals are graphical representation and general do not represent the actual lengths. The AUDL field stores the actual length from the design drawings. Laterals must extend into the parcel in order for the sewer database to stay be automatically be updated by the parcel layer and parcel data. There are no lateral subtypes.



## Plant

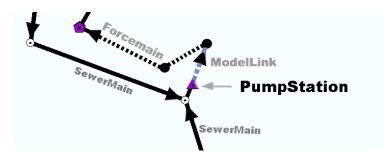
Treatment plants are summarized down to one connection; typically this is the location of the point of influent. The pipes within the treatment plant are not general digitized in the GIS database, but can be using the treatmentLink subtype of the sewer mains feature class.



# Pumpstation

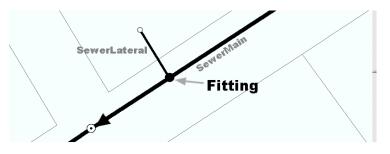
Pump plants are summarized down to one point. A model link should be connected to the immediate reach downstream of a pump plant. Force mains must be connected to the downstream reach of a modelLink node and reach. This format will maintain

compatibility with future uses of the data with hydraulic modeling software. There are no subtypes for pumps.



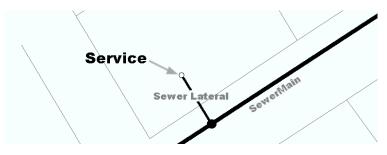
## Fitting

The miscellaneous other junction types are usually defined as fittings. The most common are the junctions between sewer laterals and sewer mains. The fitting sub-types are lateral fitting, plugged end, valve, test site, coupling, boundary, and cleanout.



## Service

The end of a sewer lateral feature class must have a service junction. This is a special junction type that can only be on the end of laterals. The database connection rules and SIMSLE ensure that services are only entered at these ends. The service junction is important because it stores the connection information about the lateral, (e.g. connection date, Property\_ID, etc.)



## Discharge

Discharge locations are special locations at the outflow of a collection system, usually at the end of outfall subtypes, but maybe at injection wells.



# **Database Dictionary**

The database dictionary for the sewer GIS database was generated by a utility called "Geodatabase Reporter" that can be downloaded for free from the ESRI ArcScripts site. The data dictionary generated by this utility is shown below. This is a HTML document so it is easier to read and navigate using the hypertext in the HTML version.

The report shows all field definitions, valid domains, default values, connectivity rules and other geodatabase definitions. If modifications are made to the database design, this Geodatabase Report should be regenerated.

	Geodatabase Summary					
FeatureDataset	Object Name (Alias)	Туре	Geometry	Subtypes		
	Discharge (Discharge) ( <u>C</u> )	Simple Junction	Point	<u>DischargePointST</u>		
	<u>Fittings</u> (Fittings) ( <u>C</u> )	Simple Junction	Point	<u>CleanOutST</u> <u>GeneralFittingST</u> <u>LateralFittingST</u> <u>PluggedEndST</u>		
	<u>guam_final_poly</u> (guam_final_poly) ( <u>C</u> )	Simple Feature	Polygon	None		
	Manhole (Manhole) ( <u>C</u> )	Simple Junction	Point	ManholeST		
	Plant (Plant) ( <u>C</u> )	Simple Junction	Point	TreatmentPlantST		
Sewers ( <u>S</u> )	PumpStation (PumpStation) (C)	Simple Junction	Point	StationST		
	<u>Service</u> (Service) ( <u>C</u> )	Simple Junction	Point	<u>ServicePointST</u>		
	SewerLateral (SewerLateral) (C)	Complex Edge	Polyline	LateralST		
	<u>SewerMain</u> (SewerMain) ( <u>C</u> )	Complex Edge	Polyline	ForceST GravityST ModelLinkST OutfallST SiphonST TreatmentST		
	SewerNetwork Junctions (SewerNetwork_Junctions) ( <u>C</u> )	Simple Junction	Point	None		
	SewerNetwork	Geometric	Network			
None	UNIQUE_ASSETID (UNIQUE_ASSETID) ( <u>C</u> )	Table	None	None		
	AncillaryRoleDomain	Domain	Coded Value	•		
1	D BarrelDiameter	Domain	Range			
	D_Basin	Domain	Coded Value			
	D CoverDiameter	Domain	Range			
	D CriticalRating	Domain	Coded Value			
1	D Discharge	Domain	Coded Value			
1	D_Elevation	Domain	Range			
1	D FittingMaterial	Domain	Coded Value			
1	D FittingType	Domain	Coded Value			
1	D_FlowSplit	Domain	Range			
1	D_Friction	Domain	Coded Value			
1	D GeneratorSize	Domain	Range			
1	D LateralDiameter	Domain	Range			
	D LineMaterial	Domain	Coded Value			

D MainDiameter	Domain	Range
D Manhole	Domain	Coded Value
D ManholeLining	Domain	Coded Value
D ManholeMaterial	Domain	Coded Value
D_Owner	Domain	Coded Value
D PipeLength	Domain	Range
D PipeLining	Domain	Coded Value
D PipeShape	Domain	Coded Value
D_PlantType	Domain	Coded Value
D ServiceCleanOut	Domain	Coded Value
D Status	Domain	Coded Value
D WaterTable	Domain	Coded Value
D_YesNoUnknown	Domain	Coded Value
EnabledDomain	Domain	Coded Value

Geometric Network Summary				
Geometric Newtork Name	Role	FeatureClass Name	Links	
		Discharge		
		Fittings		
		Manhole		
	Simple Junction	Plant		
		PumpStation		
SewerNetwork		Service		
		SewerNetwork Junctions		
	Complex Junction	None		
	Simple Edge	None		
	Complex Edge	SewerLateral	EJ Rules EE Rules	
	Complex Edge	SewerMain	EJ Rules EE Rules	

	Edge-Junction-Edge Geometric Network Connectivity Rules				
SewerNetwo	ork				
	From		То	Via	
Edge	Subtype	Edge	Subtype	Junction::Subtype	
	SewerLateral	LateralST	Fittings::LateralFittingST [Default]		
		DewerLateral		Manhole::ManholeST	
			ForceST	Manhole::ManholeST [Default]	
SewerLateral	LateralST		<u>GravityST</u>	Fittings::LateralFittingST [Default]	
		<u>SewerMain</u>		Manhole::ManholeST	
1			ModelLinkST	Manhole::ManholeST [Default]	
1			SiphonST	Manhole::ManholeST [Default]	
SewerMain		SewerLateral	LateralST	Manhole::ManholeST [Default]	
1				Fittings::GeneralFittingST	
1	ForceST		ForceST	Manhole::ManholeST [Default]	
	Forcest	<u>SewerMain</u>		Plant::TreatmentPlantST	
1			ModelLinkST	PumpStation::StationST [Default]	
			TreatmentST	Plant::TreatmentPlantST [Default]	
1	GravityST	SewerLateral	LateralST	Fittings::LateralFittingST [Default]	
		SewerLateral		Manhole::ManholeST	

				Manhole::ManholeST [Default]
			ForceST	Plant::TreatmentPlantST
				PumpStation::StationST
				Fittings::LateralFittingST
		SewerMain	GrovityST	Manhole::ManholeST [Default]
		Sewermain	<u>GravityST</u>	Plant::TreatmentPlantST
				PumpStation::StationST
			ModelLinkST	Manhole::ManholeST [Default]
			OutfallST	Plant::TreatmentPlantST [Default]
			SiphonST	Manhole::ManholeST [Default]
M	ModelLinkST	SewerLateral	LateralST	Manhole::ManholeST [Default]
		<u>SewerMain</u>	ModelLinkST	Fittings::GeneralFittingST [Default]
		SewerLateral	LateralST	Manhole::ManholeST [Default]
Si	iphonST	SewerMain	SiphonST	Fittings::GeneralFittingST
				Manhole::ManholeST [Default]
			OutfallST	Fittings::GeneralFittingST [Default]
Tr	TreatmentST SewerMain	<u>SewerMain</u>		Manhole::ManholeST
			TreatmentST	Fittings::GeneralFittingST [Default]

	Edge-Junction	Geometric Netwo	rk Connectivity Rules	5			
SewerNetwork							
	From		То	No. of Edges		No. of Junctions	
Edge	Subtype	Junction	Subtype	Min	Max	Min	Max
		Fittings	LateralFittingST	1	10	0	99
SewerLateral	LateralST	Manhole	ManholeST	0	10	0	1
		Service	ServicePointST [Default]	-1	-1	-1	-1
<u>SewerMain</u>		Fittings	GeneralFittingST	0	6	0	99
	ForceST	Manhole	ManholeST	0	4	0	1
	FOICEST	Plant	TreatmentPlantST	0	10	0	1
		PumpStation	StationST	1	2	1	2
	<u>GravityST</u>	<u>Fittings</u>	GeneralFittingST	0	2	0	99
			LateralFittingST	0	2	0	99
			PluggedEndST	1	1	0	1
		Manhole	ManholeST [Default]	-1	-1	-1	-1
		Plant	TreatmentPlantST	0	4	0	1
		PumpStation	StationST	0	4	0	1
		Fittings	GeneralFittingST	-1	-1	-1	-1
	ModelLinkST	Manhole	ManholeST	0	1	0	1
		PumpStation	StationST	0	1	0	1
		Discharge	DischargePointST	0	1	0	1
	OutfallST	Fittings	GeneralFittingST	0	2	0	99
		Manhole	ManholeST	0	2	0	2
		Plant	TreatmentPlantST	0	1	0	1
	SiphonST	Fittings	GeneralFittingST	0	2	0	10
		Manhole	ManholeST	0	3	0	2
	TreatmentST	Discharge	DischargePointST	0	10	0	10
		Fittings	GeneralFittingST	0	10	0	99
		Manhole	ManholeST	0	10	0	10
		Plant	TreatmentPlantST	0	10	0	1

	PumpStation	StationST	0 10 0 10				
	Domain In	formation					
AncillaryRoleDomain							
Field Type	Small Integer	Merge Policy	Default Value				
Domain Type	Coded Value	Split policy	Default Value				
Value	Description	<b>e</b> p(pee)					
0	None						
1	Source						
2	Sink						
Domain Assigned To							
ObjectClass Type	ObjectClass Name	Subtype	Field				
FeatureClass	Discharge	DischargePointST	ANCILLARYROLE				
FeatureClass FeatureClass	<u>Fittings</u> <u>Fittings</u>	<u>CleanOutST</u> <u>GeneralFittingST</u>	ANCILLARYROLE ANCILLARYROLE				
FeatureClass	Fittings	LateralFittingST	ANCILLARYROLE				
FeatureClass	Fittings	PluggedEndST	ANCILLARYROLE				
FeatureClass	<u>Manhole</u>	<u>ManholeST</u>	ANCILLARYROLE				
FeatureClass	<u>Plant</u>	TreatmentPlantST					
FeatureClass FeatureClass	PumpStation Service	<u>StationST</u> ServicePointST	ANCILLARYROLE ANCILLARYROLE				
i culti coluss							
D_BarrelDiameter							
Field Type	Integer	Merge Policy	Default Value				
Domain Type	Range	Split policy	Default Value				
Value	Description						
1	Minimum						
100	Maximum						
Domain Assigned To							
ObjectClass Type	ObjectClass Name	Subtype	Field				
FeatureClass	<u>Manhole</u>	ManholeST	BARRELDIAM				
D Basin							
Field Type	String	Merge Policy	Default Value				
Domain Type	Coded Value	Split policy	Default Value				
Value	Description	Opin policy					
NorthDist	Northern District STP						
Agana	Agana STP						
Pago	Pago Socio STP						
Agat	Agat STP						
Umatac Inarajan	Umatac/Merizo STP Inarajan STP						
Baza	Baza Gardens STP						
Comm	Commercial Port STP						
Domain Assigned To							
ObjectClass Type	ObjectClass Name	Subtype	Field				
FeatureClass	<u>Discharge</u>	DischargePointST	BASINID				
FeatureClass FeatureClass	<u>Fittings</u>	CleanOutST CoportelFittingST	BASINID				
FeatureClass	<u>Fittings</u> Fittings	<u>GeneralFittingST</u> LateralFittingST	BASINID BASINID				
FeatureClass	<u>Fittings</u>	PluggedEndST	BASINID				
FeatureClass	Manhole	ManholeST	BASINID				
FeatureClass	Plant Duran Otation	TreatmentPlantST	BASINID				
FeatureClass FeatureClass	PumpStation Service	<u>StationST</u> <u>ServicePointST</u>	BASINID BASINID				
FeatureClass	<u>SewerLateral</u>	LateralST	BASINID				
FeatureClass	SewerMain	ForceST	BASINID				

FeatureClass FeatureClass FeatureClass FeatureClass	<u>SewerMain</u> <u>SewerMain</u> <u>SewerMain</u> SewerMain	<u>GravityST</u> <u>ModelLinkST</u> <u>OutfallST</u> SiphonST	BASINID BASINID BASINID BASINID
FeatureClass	<u>SewerMain</u>	TreatmentST	BASINID
D_CoverDiameter			
Field Type	Integer	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description Minimum		
100	Maximum		
Domain Assigned To			
ObjectClass Type FeatureClass	ObjectClass Name	Subtype ManholeST	Field COVERDIAM
FeatureClass	<u>Manhole</u>	MannoleST	COVERDIAM
D_CriticalRating			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
A	None Good		
В	Average		
с Domain Assigned To	Poor		
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>SewerMain</u>	ForceST	CRITICALRATING
FeatureClass FeatureClass	<u>SewerMain</u> SewerMain	<u>GravityST</u> ModelLinkST	CRITICALRATING CRITICALRATING
FeatureClass	<u>SewerMain</u>	OutfallST	CRITICALRATING
FeatureClass	<u>SewerMain</u>	SiphonST Transformer OT	
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	CRITICALRATING
D_Discharge			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value OUTF	Description Outfall		
IWELL	Injection Well		
RECL MANH	Reclamation Facility Manhole		
CESS	Community CessPool		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>Discharge</u>	<u>DischargePointST</u>	DISCHARGETYPE
D_Elevation			
Field Type	Double	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value -400	Description Minimum		
2000	Maximum		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass FeatureClass	<u>Discharge</u> <u>Fittings</u>	DischargePointST GeneralFittingST	GROUNDELEV GROUNDELEV

FeatureClass	<u>Fittings</u>	LateralFittingST	GROUNDELEV
FeatureClass	<u>Fittings</u>	PluggedEndST	GROUNDELEV
FeatureClass	Manhole	<u>ManholeST</u>	INVERTELEV
FeatureClass	Plant	TreatmentPlantST	GROUNDELEV
FeatureClass	PumpStation	StationST	GROUNDELEV
FeatureClass	<u>Service</u>	ServicePointST	GROUNDELEV
FeatureClass	<u>SewerMain</u>	ForceST	
FeatureClass FeatureClass	<u>SewerMain</u>	ForceST CrovityST	
FeatureClass	<u>SewerMain</u> SewerMain	<u>GravityST</u> GravityST	DOWNINVERT UPINVERT
FeatureClass	<u>SewerMain</u>	ModelLinkST	DOWNINVERT
FeatureClass	<u>SewerMain</u>	ModelLinkST	UPINVERT
FeatureClass	<u>SewerMain</u>	OutfallST	DOWNINVERT
FeatureClass	SewerMain	OutfallST	UPINVERT
FeatureClass	SewerMain	SiphonST	DOWNINVERT
FeatureClass	<u>SewerMain</u>	<u>SiphonST</u>	UPINVERT
FeatureClass	<u>SewerMain</u>	TreatmentST	DOWNINVERT
FeatureClass	<u>SewerMain</u>	TreatmentST	UPINVERT
D_FittingMaterial			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
BRASS	Brass		
PLAST	Plastic		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
	ObjectClass Name	Subtype	
FeatureClass	<u>Fittings</u>	<u>GeneralFittingST</u>	MATERIAL
D_FittingType			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
LATE	LateralFitting		
PLUG	Plugged End		
VALV	Valve		
TEST	Test Site		
COUP	Coupling		
BC	Boundary		
COUT	Clean Out		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	Fittings	CleanOutST	FITTINGTYPE
FeatureClass	Fittings	GeneralFittingST	FITTINGTYPE
FeatureClass	Fittings	LateralFittingST	FITTINGTYPE
FeatureClass	Fittings	PluggedEndST	FITTINGTYPE
D_FlowSplit			
Field Type	Integer	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description		
0	Minimum		
100	Maximum		
Domain Assigned To			
•	ObjectOlaca Name	Cubble or a	Field
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>SewerMain</u>	ForceST	FLOWSPLIT
FeatureClass	<u>SewerMain</u>	<u>GravityST</u> Madall inkST	FLOWSPLIT
FeatureClass	<u>SewerMain</u>	<u>ModelLinkST</u>	FLOWSPLIT

FeatureClass FeatureClass	<u>SewerMain</u> SewerMain	<u>OutfallST</u> <u>SiphonST</u> Tastastor IOT	FLOWSPLIT FLOWSPLIT
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	FLOWSPLIT
D_Friction			
Field Type	Double	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
0.013	0.013		
0.015	0.015		
-1 Domain Assigned To	Unknown		
Domain Assigned To		Out to man	Field
ObjectClass Type FeatureClass	ObjectClass Name	Subtype	Field
FeatureClass	<u>SewerMain</u> SewerMain	<u>ForceST</u> GravityST	FRICTIONFACTOR FRICTIONFACTOR
FeatureClass	SewerMain	ModelLinkST	FRICTIONFACTOR
FeatureClass	<u>SewerMain</u>	OutfallST	FRICTIONFACTOR
FeatureClass	<u>SewerMain</u>	SiphonST The second	FRICTIONFACTOR
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	FRICTIONFACTOR
D_GeneratorSize			
Field Type	Integer	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description		
0	Minimum		
1500	Maximum		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	Plant Plant	TreatmentPlantST	GENERATOR_SIZE
FeatureClass	PumpStation	<u>StationST</u>	GENERATOR_SIZE
D_LateralDiameter			
Field Type	Integer	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description		
1	Minimum		
12	Maximum		
Domain Assigned To	<b>. .</b>	<b>.</b> .	
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>SewerLateral</u>	<u>LateralST</u>	DIAMETER
D_LineMaterial			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	,	
VCP	Vitrified Clay Pipe		
RCP	Reinforced Concrete Pipe		
RCPL	Lined Reinforced Concrete Pi	ipe	
CIP DIP	Cast Iron Ductile Iron Pipe		
CIPC	Cast In Place Concrete		
PVC	PVC		
HDPE	High Density Polyethylene		
GFR PCP	Glass-Fiber Reinforced Polymer Concrete Pipe		
UNK	Unknown		

TCP ACP STL PEP Domain Assigned To ObjectClass Type FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass	Terra Cotta Pipe Asbetos Cement Pipe Steel Polyethylene Pipe ObjectClass Name SewerLateral SewerMain SewerMain SewerMain SewerMain	Subtype LateralST ForceST ModelLinkST OutfallST SiphonST TreatmentST	Field MATERIAL MATERIAL MATERIAL MATERIAL MATERIAL
D_MainDiameter			
Field Type	Integer	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description	•pp)	
1	Minimum		
200	Maximum		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>SewerMain</u>	ForceST	DIAMETER
FeatureClass FeatureClass	<u>SewerMain</u>	<u>GravityST</u> Modell inkST	DIAMETER DIAMETER
FeatureClass	<u>SewerMain</u> SewerMain	<u>ModelLinkST</u> OutfallST	DIAMETER
FeatureClass	SewerMain	SiphonST	DIAMETER
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	DIAMETER
D. Marilada			
D_Manhole	0.1	Marra Dalla	<b>5</b> ( )))))
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
PLN	Plain Pressure		
PRES DROP	Drop		
SHDP	Shallow Drop		
JBOX	Junction Box		
CHIM	Chimney		
	Terminal Injector Manhole		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	Manhole	ManholeST	MANHOLETYPE
<b></b>			
D_ManholeLining	0.1	Mana Dali	
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
PLAS EPOX	Plastic Liner Cementious Epoxy		
FIBG	Fiberglass		
NONE	None		
UNK	Unknown		
PUT	Polyurethane Coating		
PUE EPX	Polyurea Coating Epoxy Mortar Coating		
LIN	Pre-formed liner		
CIP	Cured-in-Place liner		

Cured-in-Place liner

CIP

Domain Assigned To ObjectClass Type FeatureClass	ObjectClass Name Manhole	Subtype ManholeST	Field REHAB
D ManholeMaterial			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
•••		Split policy	Delault value
Value BRIC	Description Brick		
CONC	Concrete		
CONL	Concrete With Liner		
FIBG	Fibgerglass		
UNK	Unknown		
CIPC	Cast In Place Concrete		
Domain Assigned To		0.11.1.1	<b>F</b> 1.1.1
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>Manhole</u>	<u>ManholeST</u>	MATERIAL
D_Owner			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
PVT	Private		
MIL	Military		
UNK GWA	Unknown Guam Waterworks		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	Discharge	DischargePointST	OWNER
FeatureClass	Fittings	CleanOutST	OWNER
FeatureClass	<u>Fittings</u>	GeneralFittingST	OWNER
FeatureClass	<u>Fittings</u>	LateralFittingST	OWNER
FeatureClass FeatureClass	<u>Fittings</u> Manhole	PluggedEndST ManholeST	OWNER OWNER
FeatureClass	Plant	TreatmentPlantST	OWNER
FeatureClass	PumpStation	StationST	OWNER
FeatureClass	Service	ServicePointST	OWNER
FeatureClass FeatureClass	<u>SewerLateral</u> SewerMain	<u>LateralST</u> ForceST	OWNER OWNER
FeatureClass	<u>SewerMain</u>	<u>GravityST</u>	OWNER
FeatureClass	<u>SewerMain</u>	ModelLinkST	OWNER
FeatureClass	<u>SewerMain</u>	<u>OutfallST</u>	OWNER
FeatureClass	<u>SewerMain</u>	<u>SiphonST</u>	OWNER
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	OWNER
D_PipeLength			
Field Type	Double	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description		
0	Minimum		
10000 Devenie Accievant To	Maximum		
Domain Assigned To		0.17	<b>—</b> :
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass FeatureClass	<u>SewerMain</u> SewerMain	<u>ForceST</u> GravityST	PIPELENGTH PIPELENGTH
FeatureClass	SewerMain	ModelLinkST	PIPELENGTH
FeatureClass	SewerMain	OutfallST	PIPELENGTH

FeatureClass	<u>SewerMain</u>	SiphonST	PIPELENGTH
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	PIPELENGTH
D. Division			
D_PipeLining	0.1	Manua Dallari	
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
NONE	None		
GRT CIPP	Grouted CIPP		
FLFR	Fold & Form		
SLIP	Slip-lined		
UNK	Unknown		
LNK	Link Sleeve		
HDP8 Domain Assigned To	8" Slip High Density Polyether	ne	
Domain Assigned To		0.1.4	<b>-</b> :
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass FeatureClass	<u>SewerMain</u> SewerMain	ForceST GravityST	REHAB REHAB
FeatureClass	SewerMain	ModelLinkST	REHAB
FeatureClass	SewerMain	OutfallST	REHAB
FeatureClass	<u>SewerMain</u>	SiphonST	REHAB
FeatureClass	<u>SewerMain</u>	TreatmentST	REHAB
D_PipeShape			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
CIRC	Circular		
RECT	Rectangular		
UNK Domain Assigned To	Unknown		
Domain Assigned To	ObjectClass Name	Cubture	
ObjectClass Type	ObjectClass Name SewerMain	Subtype ForceST	Field PIPESHAPE
FeatureClass	SewerMain	GravityST	PIPESHAPE
FeatureClass	SewerMain	ModelLinkST	PIPESHAPE
FeatureClass	<u>SewerMain</u>	OutfallST	PIPESHAPE
FeatureClass	<u>SewerMain</u>	SiphonST	PIPESHAPE
FeatureClass	<u>SewerMain</u>	TreatmentST	PIPESHAPE
D_PlantType		M D I	
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
AS	Activated Sludge		
OTHER TFSC	Other Trickling Filter, Solid Contact		
AL	Aerated Lagoons		
Domain Assigned To	Ũ		
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	<u>Plant</u>	TreatmentPlantST	PLANTTYPE
		-	
D_ServiceCleanOut			
_ Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	r · · · · · · · · · · · · · · · · · · ·	

NONE UNK PARC ROW Domain Assigned To ObjectClass Type	No Cleanout Unknown Within Parcel Within ROW ObjectClass Name	Subtype	Field
FeatureClass	<u>Service</u>	<u>ServicePointST</u>	CLEANOUT
D_Status			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
ACT	Active		
INAC	Inactive		
ABAN	Abandoned		
PROP Domain Assigned To	Proposed		
Domain Assigned To		0.11.22	<b>-</b> 1.1.1
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass FeatureClass	<u>Discharge</u> <u>Fittings</u>	<u>DischargePointST</u> CleanOutST	STATUS STATUS
FeatureClass	Fittings	<u>GeneralFittingST</u>	STATUS
FeatureClass	Fittings	LateralFittingST	STATUS
FeatureClass	Fittings	PluggedEndST	STATUS
FeatureClass	Manhole	ManholeST	STATUS
FeatureClass FeatureClass	<u>Plant</u> <u>PumpStation</u>	TreatmentPlantST	STATUS
FeatureClass	Service	<u>StationST</u> <u>ServicePointST</u>	STATUS STATUS
FeatureClass	<u>SewerLateral</u>	LateralST	STATUS
FeatureClass	<u>SewerMain</u>	ForceST	STATUS
FeatureClass	<u>SewerMain</u>	<u>GravityST</u>	STATUS
FeatureClass	<u>SewerMain</u>	ModelLinkST	STATUS
FeatureClass FeatureClass	<u>SewerMain</u> SewerMain	OutfallST Siphon ST	STATUS STATUS
FeatureClass	<u>SewerMain</u> <u>SewerMain</u>	<u>SiphonST</u> <u>TreatmentST</u>	STATUS
			ennice
D_WaterTable			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
ABV	Above Groundwater		
BLW Domain Assigned To	Below Groundwater		
ObjectClass Type	ObjectClass Name	Subturno	Field
FeatureClass	SewerMain	Subtype ForceST	Field WATERTABLE
FeatureClass	SewerMain	GravityST	WATERTABLE
FeatureClass	SewerMain	ModelLinkST	WATERTABLE
FeatureClass	<u>SewerMain</u>	OutfallST	WATERTABLE
FeatureClass	<u>SewerMain</u>	<u>SiphonST</u>	WATERTABLE
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	WATERTABLE
D_YesNoUnknown			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	· · ·	
YES	Yes		
NO	No		
UNK	Unknown		

Domain Assigned To ObjectClass Type FeatureClass	ObjectClass Name Manhole	Subtype ManholeST	Field WEIR
EnabledDomain			
Field Type	Small Integer	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
0	False		
1	True		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	Discharge	DischargePointST	ENABLED
FeatureClass	Fittings	CleanOutST	ENABLED
FeatureClass	Fittings	GeneralFittingST	ENABLED
FeatureClass	<u>Fittings</u>	LateralFittingST	ENABLED
FeatureClass	<u>Fittings</u>	PluggedEndST	ENABLED
FeatureClass	Manhole	<u>ManholeST</u>	ENABLED
FeatureClass	<u>Plant</u>	TreatmentPlantST	ENABLED
FeatureClass	PumpStation	StationST	ENABLED
FeatureClass	<u>Service</u>	ServicePointST	ENABLED
FeatureClass	SewerLateral	LateralST	ENABLED
FeatureClass	<u>SewerMain</u>	<u>ForceST</u>	ENABLED
FeatureClass	<u>SewerMain</u>	<u>GravityST</u>	ENABLED
FeatureClass	<u>SewerMain</u>	ModelLinkST	ENABLED
FeatureClass	<u>SewerMain</u>	<u>OutfallST</u>	ENABLED
FeatureClass	<u>SewerMain</u>	<u>SiphonST</u>	ENABLED
FeatureClass	<u>SewerMain</u>	<u>TreatmentST</u>	ENABLED
FeatureClass	SewerNetwork Junctions	None	Enabled

#### **Spatial Reference Information**

## Sewers (FeatureDataset)

**Spatial Domain** 

	Minimum	Maximum	Precision
Х	-40000	2159023.254528	) 076 56240000505
Y	-830000	1369023.254528	} 976.562499090505
Μ	0	21474.83645	100000
Z	0	21474.83645	100000
Projection System		Geographic Coord	linate System
PROJCS["1993 Guam Geo PROJECTION["Transverse PARAMETER["False_Easti PARAMETER["False_North PARAMETER["Central_Me PARAMETER["Cale_Fact PARAMETER["Latitude_Of UNIT["Meter",1.0]]	_Mercator"] ng",100000.0] ning",200000.0] ridian",144.75] pr",1.0]	GEOGCS["GCS_North_ DATUM["D_North_Ame SPHEROID["GRS_1980 PRIMEM["Greenwich",0 UNIT["Degree",0.01745:	rican_1983"  ",6378137.0,298.257222101]] .0]

Guam Water Resources Master Plan

# GIS Sewer Database Attributes

The GIS attributes that are to be collected and entered in support of the master plan project are identified in table1. The sewer GIS database is designed to store additional information in support of future uses of the GIS data. These uses may include an Asset Management system, Construction, Maintenance and Management system (CMS), Work Order Management system and others. The database fields will be populated to support the modeling requirement of the master plan and as data is readily available the additional (future) fields will be populated as permitted.

In the table, the fields listed as priority 1 are required for the flow modeling ad master plan functions. Priority 2 fields can be deferred for future uses. If data is readily available for priority 2 fields it should be entered for efficiency.

Table 1: GIS	Sewer Database A	ttributes	s – Priority List
Feature Class	Attribute Field	Priority	Notes
SewerMain	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	Treatment service area ID
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP
			database
	Status	1	
	Owner	1	
	Material	2	Material type (if known)
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	Diameter	1	
	Upmanhole ID	1	Auto-Created by SIMSLE
	DownManhole ID	1	Auto-Created by SIMSLE
	FrictionFactor	2	Auto-Created by SIMSLE
	FlowSplit	2	Auto-Created by SIMSLE
	PipeShape	1	
	Rehab	2	
	Height	1	When shape is non-circular
	SewerMainSubType	1	
SewerLateral	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	
	ProjectID	2	CIP project ID (if known) – <b>REMOVED, added to CIP</b> database
	Status	1	
	Owner	1	
	Material	2	Material type (if known)
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	SewerLateralSubType	1	
Manhole	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP database
	Status	1	
	Owner	1	
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	ManholeType	1	
	Weir	1	
	MonitorID	1	
	Material	2	
	Rehab	2	
	ManholeSubType	1	
	Address	2	Nearest Parcel Address, Auto-Created by SIMSLE
Service	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	Auto-Created by SIMSLE
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP

			database
	Status	1	
	Owner	1	
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	Property_ID	1	Can mass calculate at end
	ServiceSubType	1	
Plant	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP database
	Status	1	
	Owner	1	
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	PlantName	1	
	Property_ID	1	Can mass calculate
	PlantSubType	1	
	DesignCap	1	
	Generator_size	1	
PumpStation			
	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	Auto-Created by SIMSLE
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP database
	Status	1	
	Owner	1	
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	
	PumpName	1	
	Property_ID	1	
	PlantSubType	1	
	NumPumps	1	
	Generator_size	1	
	PumpStaSubType	1	
Discharge	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	Auto-Created by SIMSLE
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP database
	Status	1	
	Owner	1	
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	DischargeType	1	
	DischargeSubType	1	
Fittings	AssetID	1	Unique ID, Auto-Created by SIMSLE
	BasinID	1	Auto-Created by SIMSLE
	ProjectID	2	CIP project ID (if known) – REMOVED, added to CIP database
	Status	1	
	Owner	1	
	DateInstalled	2	Date the feature was constructed (if known)
	DateDigitized	1	Auto-Created by SIMSLE
	FittingType	1	
	FittingSubtype	1	

# **Quality Control Processes**

As part of the overall quality control and the GIS features (graphical features) are to be researched and entered using as-built drawings and other sources. A data entry checklist can be created for each of the as-built drawings in the GWA map room. This will help ensure that all maps are processed and inputted into the GIS. An additional checklist of connected property Ids, available from billing records could be used to verify that all parcels are connected having sewer connections. This checklist will help ensure that all sewered areas are entered into the GIS database. The checklist is shown in table 2.

The feature and attribute quality control process should included 3 steps to ensure that the data was entered correctly as listed in table 2. As data is evaluated and entered by each of the connected parcels the status of four QA/QC steps should be run.

### Feature Checks

The feature column is marked if the GIS attribute (graphical feature) was entered. The feature was digitized into the GIS from the As-Built drawings provides and in some cases clarification from Wastewater staff. If all attributes were entered using these data sources, the connected parcel, on this table was checked. If data was not available, the issue was documented in this Status Reports checklist.

### **Attribute Checks**

The attribute column is marked if the data associated to the GIS features was entered for all attributes entered into the GIS. In a few cases some data was not available so comments are provides at the connected zone, section plat level.

## QA/QC Checks

The QA/QC step is an additional process where SQL database queries were run to look for missing or invalid database attributes. These queries were run repetitively until data was inputted correctly or the issue was documented. Another important QA/QC was to ensure that the sewer network had the proper connectivity including direction of flow. This was tested using the tracing tools provided the SIMSLE and the Sewer Tools applications provided. Table 5 shows an example QA/QC checklist with example SQL scripts.

## Pump Stations and Treatment Plants

Using the data and information provided for the pump station and treatment plant, the GIS feature attributes are entered. Comments are provided on the status of the data on these features in Tables 3 and 4.

# Table 1: Example - Status of GIS Sewer Data

C	Drawing	Bookmark	
Village	Set	Name	Feature Attributes QA/QC Complete

Comments

Table 2: : Ex	ample -	Pump St	ations					
		Drawing	Bookmark					
Name	Village	Set	Name	Feature	Attributes	QA/QC	Complete	Comments

# Table 3: : Example - Treatment Plants

		Drawing	Bookmark					
Name	Village	Set	Name	Feature	Attributes	QA/QC	Complete	Comments

Table 4: Example - Data Qu	ality Ch				
		Data Needing	0		
Query Name	SQL Run	Verification?	Comments		
Sewer Mains					
SewerMain Diameter NULL or Invalid Range SewerMain NULL AssetID					
SewerMain NULL AssenD					
SewerMain NULL DateDigitized					
SewerMain NULL DateInstalled SewerMain NULL DateModified					
SewerMain NULL DWNMH					
SewerMain NULL FrictionFactor					
SewerMain NULL Height					
SewerMain Null Material or UNK					
SewerMain Null Owner Or Not CTY					
SewerMain NULL PipeShape					
SewerMain NULL ReHab					
SewerMain Null Status OR ABAN					
SewerMain NULL UPMH					
SewerMain Split NULL or Invalid Range					
Sewer Laterals					
SewerLateral NULL AssetID					
SewerLateral NULL BasinID					
SewerLateral NULL DateDigitized					
SewerLateral NULL DateInstalled					
SewerLateral NULL DateModified					
SewerLateral NULL Material OR UNK					
SewerLateral NULL Owner or NOT CTY					
SewerLateral NULL Status OR ABAN				 	
Manhole Junctions					
Manhole NULL Address					
Manhole NULL AssestID					
Manhole NULL BasinID					
Manhole NULL DateDigitized					
Manhole NULL DateInstalled					
Manhole NULL DateModified					
Manhole NULL manhole Type					
Manhole NULL Material OR UNK					
Manhole NULL MonitorID					
Manhole NULL Owner or NOT CTY					
Manhole NULL REHAB					
Manhole NULL Status OR ABAN					
Manhole NULL Weir					

Treatment Plant Junctions Print NULL AssettD Print NULL SestID Print Pri		
Plant NULL BosinCap Plant NULL Solitor OR NOT CTY Plant NULL Solitor OR NOT CTY Plant NULL Solitor OR NOT CTY Plant NULL Solitor OR NOT ABAN Pump NULL AsselD Pump NULL AsselD Pump NULL AsselD Pump NULL AsselD Pump NULL SaleNodfied Pump NULL SaleNodfied Pump NULL Solitor OR Range Pump NULL Solitor OR RANA Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Range Pump Ran	Treatment Plant Junctions	
Plant NULL Generator. Size Plant NULL Generator. Size Plant NULL Senerator. Size Plant NULL Situs OR NOT ABAN Pump NULL BacinID Pump NULL DateInstalled Pump NULL DateInstalled Pump NULL BacinID Plant NULL Situs OR ABAN Plant NULL Pump ABAN Plant NULL Pump ABAN Plant NULL Situs OR ABAN Plant NULL Pump ABAN Plant ABAN Plant NULL Pump ABAN Plant NULL Pump ABAN Plant ABAN Plant ABAN Plant NULL Pump ABAN Plant ABAN Plant NULL Pump ABAN Plant ABAN Pla		
Plant NULL Owner OR NOT CTY Plant NULL Owner OR NOT CTY Plant NULL Status OR NOT ABAN Plant NULL Status OR NOT ABAN Plant NULL Status OR NOT ABAN Pump NULL AssetID Pump NULL AssetIO PUT		
Plant NULL Situs OR NOT ABAN Plant NULL Situs OR NOT ABAN Plant NULL Situs OR NOT ABAN Pump Situs AssettD Pump Situs AssettD Pump NULL DateDigitized Pump NULL DateModified Pump NULL DateModified Pump NULL DateDigitzed Pump NULL DateDigitzed Pump NULL DateDigitzed Pump NULL Satus OR ABAN Pump NULL DateDigitzed Pump NULL Pump Pump Pump Pump Pump Pump Pump Pump		
Plan NULL Poperty JD Pum NULL Poperty JD Pum NULL AssetID Pump NULL AssetID PUT		
Plant NULL Property_ID Pump Station Junctions Pump NULL AssettD Pump NULL BasinID Pump NULL Datebistatled Pump NULL Datebistatled Pump NULL Datebistatled Pump NULL Generator OR Range Pump NULL Generator OR Range Pump NULL Generator OR Range Pump NULL Status OR ABAN Pump NULL Pumpparty. ID Fittings Junctions Fittings Junctions Fittings NULL Datebistatled Fittings NULL Datebistatled Fittings NULL Datebistatled Fittings NULL Datebistatled Fittings NULL Datebistatled Fittings NULL Datebistatled Fittings NULL Status OR ABAN Fittings NULL Status OR ABAN Fittings NULL Status OR ABAN Fittings NULL AssettID Discharge NULL AssettID Discharge NULL AssettID Discharge NULL Datebistatled Fittings NUL Datebistatled Fittings NULL Datebistatled Fittings NULL Datebistatled Fittings NULL AssettID Discharge NULL BastID Discharge NULL DateINSTILE Service NULL DateINSTILE Service NULL BastID Service NULL BastID Service NULL BastID Service NULL BastID Service NULL DateINSTILE Service NULL BastID Service NULL DateINSTILE Service NULL BastID Service NULL DateINSTILE Service NULL BastID Service NULL DateINSTILE Service NULL DateINSTILE Ser		
Pump Station Junctions           Pump NULL AssetID           Pump NULL BashID           Pump NULL DateDigitized           Pump NULL DateDigitized           Pump NULL DateInstalled           Pump NULL DateModified           Pump NULL DateModified           Pump NULL DateModified           Pump NULL NumPumps OR Range           Pump NULL NumPumps OR Range           Pump NULL Tumpname           Pump NULL Status OR ABAN           Pump NULL Property ID           Fittings NULL DateInstalled           Fittings NULL AssestID           Discharge NULL AssestID           Discharge NULL DateInstalled           Discharge NUL DateInstalled		
Pump NULL AssettID Pump NULL BasinID Pump NULL BasinID Pump NULL Dateinstalled Pump NULL Status of Range Pump NULL Nomer OR NOT CTY Pump NULL Property_ID Fittings NULL BasinID Fittings NULL BasinID Fittings NULL Dateinstalled Fittings NULL Dateinstalled Discharge NULL AssettID Discharge NULL DateInstalled Service NULL Status OR ABAN Service NULL Status OR ABAN Service NULL DateInstalled Service NULL		
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# Sewer Information Management System

# SIMS Plugin

The SIMS Plug in enhances the MxEdit2 editing by allowing functions and other operations to be available at edit time or as an add-on application. The two types of components, which make up the plug in, are the 'Edit Time' and the 'Add-On' components. The Edit Time component is activated during edit time, usually unseen by the editor, and offers functions to the editor to make editing data easier and more efficient. The Add-On component offers customized applications that an editor needs to ensure data integrity and also provides tools that will help in data processing or in other areas pertaining to the geodatabase as a whole.

## Installation and Setup

The SIMS plug in is installed as an MxEdit2 Plug in. The computer must already have ArcGIS software installed, the MxEdit2 extension installed and proper database access components normally loaded with ArcGIS.

## **Database Connection**

There must be a valid Personal Geodatabase designed specifically for the GWA in order to use the SIMS plug in.

## Installing SIMS Plug in

If a previous version of SIMS Plug in is installed, uninstall it first (step 4). Then load the plug in through the 'MxEdit2 Manage Plug in' form by clicking the 'Load' button and locating the SIMS\_COHAW\_PI.ini file and choosing it. This will create a SIMS plug in folder in the MxEdit2 application folder and install all the files required to run the SIMS plug in. An entry in the MxEdit2 plug in manager will be listed. The plug in DLL will be registered in the Microsoft Registry. The following is a list of files that will be installed in the plug in directory:

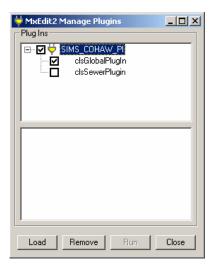
- SIMS\_COHAW\_PI.dll
- SIMS\_COHAW\_PI.ini

The plug in manager with the SIMS plug is successfully loaded if they show up under the MX-Edit Plugin Manager.

✓ MxEdit2 Manage Plugins         Plug Ins         □ ✓ ✓ SIMS_COHAW_PI         □ ✓ ✓ clsGlobalPlugIn         □ ClsSewerPlugin
Plug In: SIMS_COHAW_PI Plugin information for COHAW(County of Hawaii) Version: 1.0.0
Load Remove Run Close

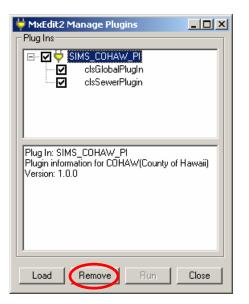
## **Enabling the Plug in**

Within the plug in manager, the SIMS plug in components can be disabled or enabled by checking the component in the plug in tree. By disabling a plug in component, the functions of the component will not execute.



# **Uninstalling SIMS Plug in**

The SIMS plug in can be uninstalled selecting the plug in located in the tree and clicking the 'Remove' button on the plug in manager form. All SIMS plug in related files will be removed and not affect the common libraries and DLLs or ArcGIS files.



## **Using SIMS Plugin**

The Edit Time component is used only with MxEdit and in an edit session in ArcMap. The geodatabase editor usually will not see the Edit Time functions take place so it is recommended to check any Edit Time functions that have taken place.

The SIMS plug in manager can be accessed through the MxEdit2 menu. This will bring up the 'MxEdit2 Manage Plugins' form. This plug in manager is also where the plug in components can be loaded or removed and enabled or disabled.



# Edit Time Routines

Below is a table of Edit Time routines with it's associated feature classes, fields and descriptions.

List of routines	that are executed by the SIM	IS plug in at edit time	
List of roadinos			
Functions Auto AssetID	FeatureClasss All featureclasses in the Sewers geometric network except SewerNetwork_Junctions	Fields ASSETID	Description Assigns a unique Asset ID to all features throughout all featureclasses
Modified Date	All featureclasses in the Sewers geometric network except SewerNetwork_Junctions	DATEMODIFIED	Populates the DATEMODIFIED field with the current system date when any changes are made to the feature.
Calculate Slope	Sewermain	UPINVERT, DOWNINVERT, PIPELENGTH, SLOPE	Calculates the slope of the sewermain pipe using the formula: Slope = ((UpInvert - DownInvert) / PipeLength)
Calculate Water Table	Sewermain	UPINVERT, DOWNINVERT, WATERTABLE	Calculates the slope of the sewermain pipe using the formula: <i>WaterTable = (UpInvert + DownInvert) / 2</i> If WaterTable > 1 then the pipe is above water. If WaterTable <= 1 then the pipe is below water.
Get Invert Elevation	Sewermain, Manhole	UPMANHOLE (Sewermain), UPINVERT (Sewermain), ASSETID (Manhole), INVERTELEV (Manhole), GROUNDELEV (Manhole), DEPTH (Manhole)	Compares the UpInvert of each Sewermain that has the same Upmanhole and assigns the lowest Sewermain-UpIncert to the Manhole InvertElevation. Calculates the Depth of the Manhole with the new InvertElevation using the formula: <b>Depth = GroundElevation - InvertElevation</b>
Calculate Friction Factor	Sewermain	MATERIÁL, DIAMETER, FRICTIONFACTOR	Calculates the Friction Factor of the pipe according the following conditions: If the Material = CIPC, CCP or RCP then FrictionFactor = 0.015. If the Material isn't in the list, then if the pipe Diameter <= 18 inches then FrictionFactor = 0.015 If these conditions are not met then FrictionFactor = 0.013
Up and Down Manhole	Sewermain, Manhole	ASSETID (Sewermain, Manhole), UPMANHOLE (Sewermain), DOWNMANHOLE (Sewermain)	Populates the Sewermain Upmanhole and DownManhole fields with the Asset ID of the corresponding Manhole.
Set Flow Split	Sewermain, Manhole	UPMANHOLE (Sewermain), FLOWSPLIT (Sewermain), ASSETID (Manhole)	Checks the number of Sewermains coming from their UpManhole and calculates the FlowSplit of the Sewermain pipe using the formula: <i>FlowSplit</i> = 100 / (Number of Sewermains)
Calculate Invert Elevation	Manhole	INVERTELEV, GROUNDELEV, DEPTH	Calculates the Invert Elevation of the Manhole using the formula: <b>Depth = GroundElevation–InvertElevation</b> If Depth > 999 then Depth = 999. If Depth < 0 then Depth = 0.

## **Add-on Applications**

The Add-On applications for the SIMS plug in can be accessed by selecting the Add-On plug in located in the plug in tree and clicking the 'Run' button.

WxEdit2 Manage Plugins							
SIMS_COHAW_PI							
l clsSewerPlugin							
Module: clsGlobalPlugIn Plug In: SIMS_COHAW_PI Module Type: Add-On Tool Enabled: Yes Comments: Global Plugin for COHAW							
Load Remove Run	Close						

Two applications are currently included in the Add-On plug in, 'Flip Flow Direction' and 'Set Flow'. An edit session must be open to use these applications.

🐂 County of Hawaii	<u> </u>
Flip Flow Direction	
Flip the flow direction of the selected features:	Flip
Set Flow	
Network Dataset:	Set Flow
	Close

## **Flip Flow Direction**

This application was developed to flip the flow direction of Sewermain and SewerLateral features that were drawn in the wrong direction.

- 1. Open an edit session on the Sewers geodatabase.
- 2. Select all the Sewermains and Sewrlaterals that need to flipped.
- 3. Click the 'Flip' button and save edits to save the new flow direction of the pipes.

### Set Flow

When the flow of the Sewers geometric network needs to be reset for any reason, the user may need to set the flow of the geometric network. The flow of the geometric network allows tracing on then geometric network.

- 1. Open an edit session on the Sewers geodatabase.
- 2. Select the Sewers feature dataset in from the Network Dataset combo box.
- 3. Click the 'Set Flow' button to set the flow and save edits to save the flow of the geometric network.

## **Editing the Sewer Network**

It is assumed that the basic editing functionalities are understood. Refer to the ESRI ArcGIS documentation that comes with the software for editing GIS features. This document provides the editing procedures related specifically to the Sewer GIS database designed and is not intended to replace the documentation that comes with ArcGIS software.

Although each user will probably discover tricks and techniques that work for them, often depending on the data sources, this section will address the important steps in editing the GIS sewer network database designed for the GWA.

The SIMS plugin that was developed specifically for the GWA sewer database should be loaded and turned on within MX-Edit to provide automated QA/QC routines that are run as features are edited. Refer to the section "SIMS Plugin" for more information on how to use MX-Edit.

### **Adding New Features**

New sewer feature are entered into the GIS using the standard ArcMap Editor tools. Load the editor toolbar from the ArcMap "Customize... menu item under "Tools". Users that will be editing the sewer GIS database should be very familiar with the Editor Toolbar, refer to the ESRI ArcGIS documentation for help on using the Editor Toolbar. As the graphical features are added to the GIS, the attributes will need to be entered using the MX-Edit and SIMS plug-in routines.

## Feature Snapping

One of the most important steps in setting up an editing environment is the snapping of features. This will help ensure that dependant features that are associated are connected as they are entered. It is more difficult to debug disconnected features later as they discovered by the users of the data. The snapping settings are located under the standard Editor Toolbar. The snapping of associated sewer features may change depending on the task at hand. Generally the linear feature ends and edges should snap to the vertecies of the junction features. The default settings should be set as shown below:

Snapping Environment						
Layer	Vertex	Edge	End			
SewerNetwork_Junc Service PumpStation Plant Manhole Fittings Discharge streetname_other streetname_major SewerLateral SewerMain Parcels Coast						
<ul> <li>□ Edit Sketch</li> <li>□ Edit Sketch vertices</li> <li>□ Edit sketch edges</li> <li>□ Perpendicular to sketch</li> <li>□ Topology Elements</li> <li>□ Topology nodes</li> </ul>						

## **Order of Operation**

The order of operation when adding GIS sewer features will help structure how data is created in the geometric network. Following the recommended order of operation will help to ensure that GIS features are created properly with some operations automatically performed by the database. The recommended order of operation is:

Order of	of Operation when D	Digitizing	
Order	Feature	Editor Action	Database Action
1.	Plant	Add new plant junction at the location of the headworks of the treatment plant	None
2.	SewerMain	Digitize sewermain feature in the direction of flow starting from the upstream point to the downstream point. Snap to existing manholes if they already exist.	Manholes at the ends of sewermains are automatically created, if not snapping to existing manholes.
3.	Manhole	<ul> <li>a.) Enter new manhole along an existing sewermain if sewermain is to be split, otherwise let the sewermain create the manholes for you in order of operation #2.</li> <li>b.) Enter manhole, snapping it to an existing junction of another type (pump, fitting, etc.) if junction is to be converted to a manhole type junction.</li> </ul>	<ul> <li>a.) New manholes can be entered first and then sewermains snapped to these manholes, but it is recommended to let the sewermains create the manholes for you for efficiency reasons.</li> <li>b.) Database rules will convert</li> </ul>
4.	PumpStation	<ul> <li>a.) Enter pumpstation snapping, it to an existing junction of another type (manhole, fitting, etc.) if junction is to be converted to a pumpstation type junction.</li> <li>b.) Enter connected forcemains and modeling link</li> </ul>	junction to manhole for you. a.) Database rules will convert junction to pumpstation for you.
5.	SewerLateral	features Digitize sewerLateral feature in the direction of flow, letting the snapping rules jump the cursor to the connecting sewermain.	A LateralFitting subtype of the Fittings feature will be automatically added along the sewermain. Sewermain will be converted to a complex feature. Service junction is automatically created at the beginning of the lateral.
6.	Discharge	Remove manhole at the end of a Outfall subtype of sewermain and replace with a Dischrage junction feature. Snapping to end of sewermain.	None
7.	Fittings	New fitting types are added along sewermain or sewerLateral features, snpping to edge of line.	Sewermain or sewerlateral will be converted to a complex feature.

### **Geometric Connectivity Rules**

The sewer geometric network design includes connectivity rules that enforce valid connections between sewer GIS features. This helps enforce how features are input into the GIS. Invalid connections are not allowed during the editing process. These connectivity rules should be familiar to the person editing and maintaining the GIS sewer database. For example, reading from the charts below, SewerLaterals can connect to the either another lateral or to a sewermain. The connection is via a LateralFitting junction for laterals or via manholes.

The "Edge-Junction-Edge Geometric Network Connectivity Rules" table defines the valid connecitons between the pipes and the junction features in the GIS database.

	Edge-	Junction-Edge Geo	ometric Network Co	onnectivity Rules
SewerNetwork				
From			То	Via
Edge	Subtype	Edge	Subtype	Junction::Subtype
		Cowerl stored		Fittings::LateralFittingST [Default]
		<u>SewerLateral</u>	<u>LateralST</u>	Manhole::ManholeST
			ForceST	Manhole::ManholeST [Default]
<u>SewerLateral</u>	LateralST		GravityST	Fittings::LateralFittingST [Default]
		<u>SewerMain</u>	GlavityST	Manhole::ManholeST
			ModelLinkST	Manhole::ManholeST [Default]
			SiphonST	Manhole::ManholeST [Default]
		SewerLateral	LateralST	Manhole::ManholeST [Default]
				Fittings::GeneralFittingST
	ForceST		ForceST	Manhole::ManholeST [Default]
	<u>Forcest</u>	SewerMain		Plant::TreatmentPlantST
			ModelLinkST	PumpStation::StationST [Default]
			TreatmentST	Plant::TreatmentPlantST [Default]
	<u>GravityST</u> <u>fain</u>	SewerLateral	LatoralST	Fittings::LateralFittingST [Default]
		SewerLateral	<u>LateralST</u>	Manhole::ManholeST
				Manhole::ManholeST [Default]
			ForceST	Plant::TreatmentPlantST
				PumpStation::StationST
				Fittings::LateralFittingST
SewerMain		SewerMain	CrowityCT	Manhole::ManholeST [Default]
Sewenviain		Sewenviain	<u>GravityST</u>	Plant::TreatmentPlantST
				PumpStation::StationST
			ModelLinkST	Manhole::ManholeST [Default]
			OutfallST	Plant::TreatmentPlantST [Default]
			SiphonST	Manhole::ManholeST [Default]
	Sewe	SewerLateral	LateralST	Manhole::ManholeST [Default]
	<u>ModelLinkST</u>	SewerMain	ModelLinkST	Fittings::GeneralFittingST [Default]
	<u>SiphonST</u>	SewerLateral	LateralST	Manhole::ManholeST [Default]
			SinhonST	Fittings::GeneralFittingST
		<u>SewerMain</u>	<u>SiphonST</u>	Manhole::ManholeST [Default]
			OutfollST	Fittings::GeneralFittingST [Default]
	TreatmentST	SewerMain	<u>OutfallST</u>	Manhole::ManholeST
			TreatmentST	Fittings::GeneralFittingST [Default]

The "Edge-Junction Geometric Network Connectivity Rules" table defines the valid connecitons
between the pipes and the junctions with the valid number of connections.

Edge-Junction Geometric Network Connectivity Rules							
SewerNetwork							
From			То			No. of Junctions	
Edge	Subtype	Junction	Subtype	Min	Мах	Min	Max
		<u>Fittings</u>	LateralFittingST	1	10	0	99
SewerLateral	LateralST	<u>Manhole</u>	<u>ManholeST</u>	0	10	0	1
		<u>Service</u>	<u>ServicePointST</u> [Default]	-1	-1	-1	-1
		<u>Fittings</u>	GeneralFittingST	0	6	0	99
	ForceST	<u>Manhole</u>	ManholeST	0	4	0	1
		<u>Plant</u>	<b>TreatmentPlantST</b>	0	10	0	1
		PumpStation	StationST	1	2	1	2
			GeneralFittingST	0	2	0	99
		<u>Fittings</u>	LateralFittingST	0	2	0	99
	<u>GravityST</u>		PluggedEndST	1	1	0	1
		<u>Manhole</u>	ManholeST [Default]	-1	-1	-1	-1
		<u>Plant</u>	<b>TreatmentPlantST</b>	0	4	0	1
		PumpStation	StationST	0	4	0	1
		Fittings	GeneralFittingST	-1	-1	-1	-1
SewerMain	ModelLinkST	<u>Manhole</u>	<u>ManholeST</u>	0	1	0	1
Sewenniain	OutfallST	PumpStation	StationST	0	1	0	1
		Discharge	DischargePointST	0	1	0	1
		Fittings	GeneralFittingST	0	2	0	99
	Outland	<u>Manhole</u>	ManholeST	0	2	0	2
	<u>SiphonST</u>	<u>Plant</u>	<b>TreatmentPlantST</b>	0	1	0	1
		<u>Fittings</u>	GeneralFittingST	0	2	0	10
		<u>Manhole</u>	ManholeST	0	3	0	2
		Discharge	DischargePointST	0	10	0	10
		<u>Fittings</u>	GeneralFittingST	0	10	0	99
	TreatmentST	<u>Manhole</u>	<u>ManholeST</u>	0	10	0	10
		<u>Plant</u>	TreatmentPlantST	0	10	0	1
		PumpStation	StationST	0	10	0	10

### Plants

Order of Operation: 1

### Adding New

Treatment plants should be added first when adding a new treatment plan system. The plant junction represents the headworks or the centroid of the treatment facility. Sewermains connected to the plant junction are add next.

### **Moving Plants**

Plants can be moved if the location is incorrect in the GIS. Sewermains are interconnected to plants and manholes so the connected sewermains will move with the plant. Refer to "Moving Sewermains" for related information.

### **Updating Attributes**

The data attributes on the plants should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS.

### The valid Sub-Types are:

	TreatmentPlantST	
	PlantType	
Plants	Activated Sludge	
Fiditts	Trickling Filter, Solid Contact	
	Aerated Lagoon	
	Other	

### **Connectivity Rules**

Generally, plants are conencted to ends of sewermains. Refer to the Connectivity rules for detail information

### **SewerMains**

Order of Operation: 2

### Adding New

Sewermains are added to the sewer GIS database first second only to the "Plant" feature. When adding new sewermains, the geometric connectivity rules will automatically add manholes, by default, to the ends of the sewermains. The default sewermain subtype is "Gravity", but can be changed once the feature is added. The sewermains must snap to other mains or laterals via manholes or lateral filltings as defined in the connectivity rules. This ensures connectity required for preforming tracing operations on the sewer network.

One of the most steps in adding new sewermains is to digitize the feature in the order of dirrection. When drawing the line, the beginning point should be the location of the upstream manhole with the end point being the downstream manhole.

### Splitting SewerMains

Existing sewermains can be split when a new manhole is constructed along a sewermain. The GIS can be updated to accommodate a new manhole by adding a manhole feature on a sewermain feature. It is important that the snapping settings are set to snap manhole vertex to the sewermain edges. This will ensure that the manhole is inserted onto the sewermain line feature. When adding a new manhole, the sewermain feature is automatically split into to two parts. In doing this, the sewermain feature attributes will need to be added since most attributes will have changed, particularily the invert elevations.

### Moving Sewermains

Sewermains can be moved if the location or alignment is incorrect in the GIS. Sewermains are interconnected to manholes so the manhole must move with the sewermain. To move the sewermain, the user must move the upstream and downstream manholes. In doing this, the sewermain line feature will move with the manhole. Do not move the line feature independently!

### **Updating Attributes**

The data attributes on the sewermains should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS. Sewermain attributes should be added to the GIS feature as new data is aquired, data is validated and incorrect or is the feature changes because of a construction project.

	ForceST
	GravityST
SewerMain	ModelLinkST
Seweiman	OutfallST
	SiphonST
	TreatmentST

### The valid sub-types are:

### **Connectivity Rules**

Generally, sewermains are conencted via manholes and other junction types. Refer to the Connectivity rules for detail information

### Manholes

Order of Operation: 3

### Adding New

Manholes are adding automatically to the ends of newly digitized sewermains, this is the perfered method of adding manholes to the GIS data. Optionally, new manholes could be added first using X,Y coordinates and then adding connected sewermains as long as the sewermain ednds snap to the new manholes.

### Splitting SewerMains

Existing sewermains can be split when a new manhole is constructed along a sewermain. The GIS can be updated to accommodate a new manhole by adding a manhole feature on a sewermain feature. It is important that the snapping settings are set to snap manhole vertex to the sewermain edges. This will ensure that the manhole is inserted onto the sewermain line feature. When adding a new manhole, the sewermain feature is automatically split into to two parts. In doing this, the sewermain feature attributes will need to be added since most attributes will have changed, particularily the invert elevations.

### Moving Manholes

Manholes can be moved if the location is incorrect in the GIS. Sewermains are interconnected to manholes so the connected sewermains will move with the manhole. Refer to "Moving Sewermains" for related information.

### **Updating Attributes**

The data attributes on the manholes should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS. This will help to ensure that invert elevations are updated properly on the conencted sewermains.

	ManholeST
	ManholeTypes
	Plan
	Pressure
Manholes	Drop
	Shallow Drop
	Junction Box
	Chemney
	Plugged End

The valid Sub-Types are:

### **Connectivity Rules**

Generally, manholes are conencted to ends of sewermains or sewer laterals. Refer to the Connectivity rules for detail information

### Pumps

Order of Operation: 4

### Adding New

Pumping plants should be added as the sewermain features are being digitized. The pump junction represents the centroid of the pumping facility. Sewermains, as model links or frocemains are add next to build the pump station configuration.

### **Moving Pumps**

Pumps can be moved if the location is incorrect in the GIS. Sewermains are interconnected to pumps so the connected sewermains will move with the plant. Refer to "Moving Sewermains" for related information.

### **Updating Attributes**

The data attributes on the plants should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS.

The valid Sub-Types are:

### **Connectivity Rules**

Generally, pumps are conencted to ends of sewermains with subtypes of modelLinks or Forcemains. Refer to the Connectivity rules for detail information.

## Sewer Laterals

Order of Operation: 5

### Adding New

Sewer laterals are added to the sewer GIS database after the sewermains are all in place. When adding new sewer laterals, the geometric connectivity rules will automatically add a service junction at the upstream end. When the downstream end is snapped and connected to a sewermain feature, a LateralFitting junction is automatically added. It is important that the snapping environment is setup correctly. The sewerlaterals must snap to other laterals or to sewermains via manholes or lateral filltings and other fitting types.

One of the most steps in adding new sewerlaterals is to digitize the feature in the order of dirrection. When drawing the line, the beginning point should be the location of the upstream service junction with the end point being the downstream fitting or manhole.

### Moving SewerLaterals

Sewer laterals can be moved if the location or alignment is incorrect in the GIS. Sewer laterals are interconnected to manholes and fittings so these must move with the sewer lateral. To move the sewer lateral, the user must move the upstream service junction and the downstream fitting. In doing this, the sewer lateral line feature will move with the service junction or fitting. Do not move the line feature independently! In the case that the lateral conenction to the main is incorrect, the manhole feature can be moved along the sewermain. This will move all connected features together, but may require sewermain attributes to be modified in this case.

### **Updating Attributes**

The data attributes on the sewer laterals should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS.

The valid Sub-Types are:

SewerLateral	LateralST	

### **Connectivity Rules**

Generally, sewer laterals are conencted to other laterals or sewer mains via fittings, or manholes. Refer to the Connectivity rules for detail information

## Discharge Points

Order of Operation: 6

### Adding New

Discharges are added to the sink junction of the tributary area. To do this, delete the manhole that was automatically added at the downstream end of the Outfall sewermain type and then add a discharge feature. Make sure that the discharge snapping settings are set to snap discharge vertex to sewermain ends.

### Moving Discharges

Discharges can be moved if the location is incorrect in the GIS. Sewermains are interconnected to discharge junctions so the connected sewermains will move with the manhole. Refer to "Moving Sewermains" for related information.

### **Updating Attributes**

The data attributes on the discharges should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS.

The valid Sub-Types are:

	DischargeST
	DischargeType
	Outfall
Discharge	Injection Well
	Reclaimamtion Facility
	Manhole
	Gang Cesspool

### **Connectivity Rules**

Generally, discharges are conencted to ends of sewermains at the downstream end. Refer to the Connectivity rules for detail information

## **Sewer Fittings**

Order of Operation: 7

### Adding New

Fittings are added along line features without splitting the line. Lateral fittings are added automatically when snappng a new lateral feature to a sewermain feature. Other fittings must be added along sewermains or sewer lateral lines, making sure that the snapping settings has the fittings vertex and the line edges are snapped.

### Moving Discharges

Fittings can be moved if the location is incorrect in the GIS. Fittings are not interconnected to the line feature, with the exception of the lateral fittings. Moving the lateral fitting will move the lateral line with it, otherwise fittings can be moved as needed.

### **Updating Attributes**

The data attributes on the fittings should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS.

The valid Sub-Types are:

	GeneralST
	LateralFittingST
	CleanOutST
	SiphonST
	TreatmentST
	FittingType
Fittings	LateralFitting
i nungs	Plugged End
	Valve
	Test Site
	Coupling
	Boundary
	Clean Out
	Cmimney

### **Connectivity Rules**

Generally, fittings are conencted to other laterals or sewer mains. Refer to the Connectivity rules for detail information

# 3. GIS Water Distribution Database

The water GIS database is stored in an ESRI geodatabase structure made up of classes and subclasses. It is not the intent of this document to describe how geodatabases work or how they are designed; however it is important to have a general understanding of how the water database is organized. The same geodatabase structure of datasets, feature classes, subtypes and domains within the sewer database applies to the water database.

## Database Feature Classes

The feature classes defined in the water GIS database are explain in general terms. For more information on the definitions of each feature class refer to the Data Dictionary in this section.

## Anode

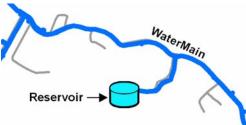
An *anode* is a feature (specifically, an electrical mechanism) that's applied to system components for the prevention of rust, pitting, and the corrosion of metal surfaces that are in contact with water or soil. A low-voltage current is applied to the water or soil in contact with the metal, such that the electromotive force renders the metal component cathodic. Corrosion is concentrated on the anodes instead of on the associated (and protected) water system components. This type of corrosion may occur in copper, steel, stainless steel, cast iron, and ductile iron pipes.

## Casing

The *casing* is a line protector that surrounds or encloses a water line in order to protect it from physical damage or other ground-based contaminants. Casings are used when installing water mains under railroad tracks, major highways, and other obstructions. Types of casings are Casement, ConduitBridge, ProtectiveTunnel, and AccessTunnel.

## Reservoirs

A *reservoir* feature that represents an open water storage used as water supply within the water distrubution system.



## ScadaSensor

The SCADA sensor is a feature that's used to remotely measure the status of network components as part of a supervisory control and data acquisition (SCADA) system. SCADA systems provide alarms, responses, data acquisition, and control for collection and distribution systems. Operators use the SCADA system to monitor and adjust processes and facilities. along a line where a repair occurred. The types of spatial operations records are Leak, Maintenance, Repair, and Inspection.

## ThrustProtection

The *ThrustProtection* class represents a type of line protector that's used to prevent pipe movement. Thrust protection is commonly implemented as thrust blocks (masses of concrete material) that are placed at bends and around valve structures. The types of thrust protection include Anchor, Blocking, Deadman, and Kicker.

## UndergroundEnclosures

UndergroundEnclosure is a general-purpose class that's intended to house various types of aspatial equipment found in a water system. The underground enclosures allow access to and provide protection of facilities and equipment in the water system. The contained equipment does not participate in the network—their relationship to the underground equipment is via peer-to-peer associations. The types of underground enclosures are MeterBox, ValveVault, and Vault.

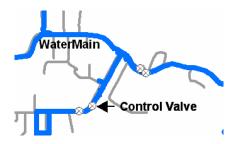
## ClearWell

A *clear well* is an enclosed tank that is associated with a treatment plant. Clear wells are used to store filtered water of sufficient capacity to prevent the need to vary the filtration rate with variations in demand. Clear wells are also used to provide chlorine contact time for disinfection. Pumps are used to move the water from the clear well to the treatment plant or to a distribution system. A *pump* is a facility that moves, compresses, or alters the pressure of a fluid, such as water or air, being conveyed through a natural or artificial channel. Pumps are also much like hydrants and meters as they also have an associated warehouse object (WarehousePump).

## ControlValve

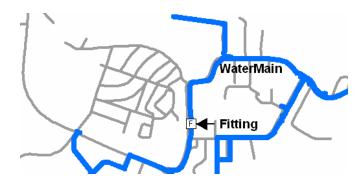
*Control valves* are a set of valves that operate in special ways. There are three fundamental types of control valves; backflow control, air control, and altitude. A backflow control valve is a control valve designed to prevent water from flowing in the reverse direction. Essentially, backflow control valves allow flow in only one direction-the normal flow direction. Backflow control valves are open in the direction of normal flow and closed with the reversal of flow. Backflow control valves are commonly found near pump stations and reservoirs. Air control valves are control valves that are used to either relieve the system of trapped air or vacuums that may develop. Finally, an altitude valve is a control valve that controls water flow into a tower when the water level drops below a threshold. Altitude valves automatically shut off water flow when the water level in an elevated tank (or tower) reaches a preset elevation. A pressure reducing valve is a system valve with a horizontal disk for automatically reducing water pressures to a preset value. A pressure relief valve is a system valve that opens automatically when water pressure reaches a preset limit to relieve stress on a pipeline. Pressure relief valves are used to protect against rapid increases in pressure (i.e., water hammer). A pressure sustaining valve is a system valve that automatically sustains water pressures at a preset value. A pressure sustaining value is similar to a pressure reducing valve but governs the pressure on the upstream rather than the downstream flow.

Types of control valves represented include AirGap, AirControl, AirRelease, Altitude, BackflowControl, Combination, AtmosphericVacuum, DoubleCheck, PressureVacuum, ReducedPressureBackflow, RPZ, SimpleCheck, Vacuum, VacuumBreaker, and VacuumRelease.



## Fitting

The *Fitting* class represents the facility found at the joint between two lines where a transition of some sort must occur. In order to cut down on the number of network feature classes and improve geometric network performance, we have chosen to rely on subtypes here to differentiate the different types of fitting-related classes. Fitting types include Bend, Cap, Cross, Coupling, ExpansionJoint, Offset, Reducer, Riser, Saddle, Sleeve, Tap, Tee, Wye, and Weld.



## GravityMain

A *gravity main* is a type of main line that is unpressurized and relies on gravity to move the water through the main. *GravityMain* is a concrete class. For the water distribution model, the types of gravity mains are Carrier, InlineStorage, and TransportPipe.

For the sewer and stormwater model, the types are Collector, Culvert, InlineStorage, InvertedSiphon, Intercepter, OpenChannel, Outfall, Overflow, and Tunnel. A collector is a pipe that collects and transports wastewater to a treatment plant or disposal system. Service laterals connect to collectors. Outfalls are the conduit leading to the final disposal point or area for wastewater and drainage. Outfalls discharge into a receiving water body, such as a stream, river, lake, ocean, or other surface, or groundwater. An open channel is a channel open to the environment that transmits raw water and drainage. Tunnels are used to transmit water through mountains or deep below the ground. Tunnels are generally created in bedrock and may contain features such as pipes and conduits within the tunnel. An overflow connects a chamber or pipe to another part of the system or outfall during overload conditions or peak flows.

## Hydrant

A *hydrant* enables fire fighters to attach fire hoses to the distribution network. Hydrants also have secondary uses that include flushing main lines and laterals, filling tank trucks, and providing a temporary water source for construction jobs. Hydrants have an association with a WarehouseHydrant object. The warehouse hydrant contains the key inventory/warehouse-related properties, while the *Hydrant* facility class is intended primarily to represent the position and connectivity of the warehouse hydrant. Certain warehouse hydrant properties are cached within

the hydrant, namely, each of the five that are found on the Hydrant class itself (but not including those inherited from its ancestors in the model).



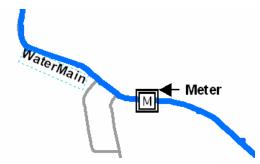
## Manhole

A *manhole* is a facility that is used to allow access to water lines. There are two primary types of manholes: standard manholes and drop manholes. A standard manhole is an opening in a sewer allowing access operators or equipment. It may also be called an access hole or maintenance hole. Drop manholes have a line entering the manhole at a higher elevation than the main flow line or channel (hence the "drop"). Drop manholes themselves come in two varieties: inside drop and outside drop. Inside drop manholes route the higher-elevation flow down through the manhole barrel. Outside drop manholes route the flow to the main manhole channel outside of the manhole. Being a facility, a manhole plays the role of a junction on the active network.

### Meter

A *meter* is a facility that is used to measure water consumption (volume). Being a facility, a meter plays the role of a junction on the active network. Meters are also much like hydrants as they also have an associated warehouse object, namely, a WarehouseMeter.

The various water meter types are Compound, Current, DetectorCheck, MagneticOrifice, Pito, PositiveDisplacement, Proportional, Sonic, and Venturi. In sewer and stormwater systems the meter types are Flume, Magnetic, ModifiedVenturi, MultiJet, OrificePlate, Propeller, FlowTube, Proportional, Sonic, Turbine, Venturi, and Wier.

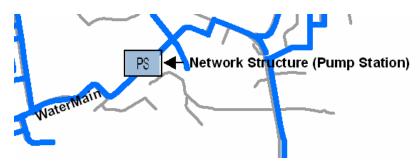


## PressureMain

A *pressureMain* is a type of main line that is pressurized and relies a pump to deliever the water. *GravityMain* is a concrete class. For the water distribution model, the types of pressuremains are defined by the subtypes; Blowoff, Bypass, AirRelease, ChemicalInjection, DistributionMain, Interconnect, pipeBridge, SamplingStation, TransmissionMain and unkown.

### NetworkStructure

*Network structures* are used for a variety of purposes within a water distribution system. These purposes include equalizing supply and demand, increasing operating convenience, leveling out pumping requirements, minimizing power costs, providing water in the event of pump or supply failure, and providing large quantities of water for fighting fires. The primary types of water network structures are enclosed StorageFacilities, PumpStations, TreatmentPlants, and ProductionWells. The Primary types of wastewater network structures are DiversionChamber, JunctionChamber, PumpStation, StorageBasin, TreatmentPlant, DischargeStructure, DiversionPoint, ProductionWell, SplitManhole, TideChamber, and LiftStation. Structures may either be enclosed or open and may contain either raw or treated water.

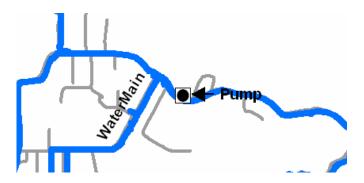


## WaterStructure

WaterStructures are used primarily as the main supply centers in the water distribution network. The praimry subtypes are; EnclosedStorageFacility, ProductionWell, PumpStation, StorageBasin and TreatmentPlant.

## Pump

A *pump* is a facility that moves, compresses, or alters the pressure of a fluid, such as water or air, being conveyed through a natural or artificial channel. Pumps are also much like hydrants and meters as they also have an associated warehouse object (WarehousePump). Pump types include AxialFlow, Centrifugal, Jet, Reciprocating, Rotary, Screw, and Turbine.



## SamplingStation

A *sampling station* is a facility that is used for collecting water samples. Sampling stations may be dedicated sampling devices, or they may be other devices of the system where a sample may be obtained.

## SystemValve

A *system valve* is a facility that is fitted to a pipeline or orifice in which the closure member is either rotated or moved transversely or longitudinally in the waterway so as to control or stop the flow. System valves are used to regulate pressure, isolate, throttle flow, prevent backflow, and relieve pressure.

System valve types include Gate, Plug, Ball, Cone, and Butterfly. These specific types may be classified as isolation valves. Isolation valves are designed to start and stop the flow of water within the distribution network (and isolate portions of the network for maintenance or repair).

Isolation valves are the predominant type of SystemValve installed in a distribution network. They are commonly intended to be either fully open or fully closed. They are not intended to throttle flow by being partially open.

A gate valve is an isolation valve (which is modeled here as a system valve) that is used to prevent water flow via a simple gate mechanism. Gate valves may be motorized (and remotely controlled), and they may also have small bypass valves. Gate valves are not installed in locations where they need to be frequently operated due to the time required to open and close them.

A butterfly valve is similar to a gate valve but uses a disk that is rotated ninety degrees to control the flow of water. Butterfly valves operate easier under large pressures and volumes of water than standard gate valves, and are thus found on larger pipes. However, because the butterfly valve disk stays in the water path even when the valve is open, the valve creates a higher resistance to flow (i.e., pressure loss) than a gate valve. Additionally, if it becomes necessary to clean a main by using pigs or swabs, the butterfly valve would block the operation. Butterfly valves can be operated quickly, increasing the risk of serious water hammer.



## **Database Dictionary**

The database dictionary for the water GIS database was generated by a utility called "Geodatabase Reporter" that can be downloaded for free from the ESRI ArcScripts site. The data dictionary generated by this utility is shown below. This is a HTML document so it is easier to read and navigate using the hypertext in the HTML version.

The report shows all field definitions, valid domains, default values, connectivity rules and other geodatabase definitions. If modifications are made to the database design, this Geodatabase Report should be regenerated.

Geodatabase Summary				
FeatureDataset Object Name (Alias)	Туре	Geometry Subtypes		

	<u>wAnode</u> (Anode) ( <u>C</u> )	Simple Feature	Point	None
	w <u>Casing</u> (Casing) ( <u>C</u> )	Simple Feature	Polygon	AccesssTunnel Casement ConduitBridge ProtectiveTunnel
	wReservoirs (wReservoirs) ( <u>C</u> )	Simple Feature	Point	None
	wScadaSensor (ScadaSensor) (C)	Simple Feature	Point	None
Water Distribution Features ( <u>S</u> )	$\frac{\text{wThrustProtection}}{(\underline{C})}$ (ThrustProtection)	Simple Feature	Polygon	Anchor Blocking Deadman Kicker
	wUndergroundEnclosure (UndergroundEnclosure) ( <u>C</u> )	Simple Feature	Polygon	<u>MeterBox</u> <u>ValveVault</u> <u>Vault</u>
	wWaterStructure (WaterStructure)	Simple Feature	Polygon	EnclosedStorageFacility ProductionWell PumpStation StorageBasin TreatmentPlant
Water Distribution Network ( <u>S</u> )	WaterNetwork Junctions (WaterNetwork_Junctions) (C)	Simple Junction	Point	None
	WaterNetwork	Geometric	Network	
	wClearWell (wClearWell) ( <u>C</u> )	Simple Junction	Point	None
	wControlValve (wControlValve) ( <u>C</u> )	Simple Junction	Point	AirControl AirGap Altitude AtmosphericVacuum BackflowControl CVAirRelease CVCombination DoubleCheck PressureVacuum ReducedPressureBackflow RPZ SimpleCheck Unknown Vacuum VacuumBreaker VacuumRelease
	wFitting (wFitting) ( <u>C</u> )	Simple Junction	Point	Bend Cap Coupling Cross ExpansionJoint Offset Reducer Riser Saddle Sleeve Tap Tee Unknown Weld Wye
	w <u>GravityMain</u> (wGravityMain) ( <u>C</u> )	Complex Edge	Polyline	Carrier InlineStorage TransportPipe Unknown
	wHydrant (wHydrant) ( <u>C</u> )	Simple Junction	Point	None
	wLateralLine (wLateralLine) ( <u>C</u> )	Complex Edge	Polyline	
	wLateralPoint (wLateralPoint) ( <u>C</u> )	Simple Junction	Point	None

	wManhole (wManhole) ( <u>C</u> )	Simple Junction	Point	None
	<u>wMeter</u> (wMeter) ( <u>C</u> )	Simple Junction	Point	Compound Current DetectorCheck MagneticOrifice Pito Poportional Sonic Uknown Venturi
	wNetworkStructure (wNetworkStructure) ( <u>C</u> )	Simple Junction	Point	EnclosedStorageFacility ProductionWell PumpStation StorageBasin TreatmentPlant Unknown
	<u>wPressurizedMain</u> (wPressurizedMain) ( <u>C</u> )	Complex Edge	Polyline	AirRelease BlowOff Bypass ChemicalInjection DistributionMain Interconnect PipeBridge SamplingStation TransmissionMain Unknown
	<u>wPump</u> (wPump) ( <u>C</u> )	Simple Junction	Point	AxialFlow Centrifugal Jet Reciprocating Rotary Screw Turbine Unknown
	wSamplingStation (wSamplingStation) ( <u>C</u> )	Simple Junction	Point	None
	wSystemValve (wSystemValve) ( <u>C</u> )	Simple Junction	Point	Ball Butterfly Cone Gate Plug Unknown
None	D_AccessDiam	Domain	Range	
1	D AccessType	Domain	Coded Value	
1	D_Basin	Domain	Coded Value	
	D_Boolean	Domain	Coded Value	•
	D_FrameCoverMaterial	Domain	Coded Value	
	D GravityMainShapes	Domain	Coded Value	
	D_HydrantDeviceID	Domain	Coded Value	
	D_JointType	Domain	Coded Value	·
	D_JunctionMaterial	Domain	Coded Value	
	D LifeCycleStatus	Domain	Coded Value	
	D_MainDistDiam	Domain	Coded Value	
	D_Manufacturer	Domain	Coded Value	
	D_NetworkStructureUsage	Domain	Coded Value	
	D Owner	Domain	Coded Value	
	D_PressurizedMainDiam	Domain	Range	
	D_ScadaSensorType	Domain	Coded Value	
	D_Status	Domain	Coded Value	
	D ValveDeviceID	Domain	Coded Value	
	D_WarehouseStatus	Domain	Coded Value	
	D_WaterLineMaterial	Domain	Coded Value	
	D_WaterType	Domain	Coded Value	

D WHSystemValveReg	Domain	Coded Value
EnabledDomain	Domain	Coded Value

Geometric Network Summary								
Geometric Newtork Name	Role	FeatureClass Name	Links					
		WaterNetwork_Junctions						
		wClearWell						
		wControlValve						
		wFitting						
		wHydrant						
	Simple Junction	wLateralPoint						
		wManhole						
		wMeter						
WaterNetwork		wNetworkStructure						
		wPump						
		wSamplingStation						
		wSystemValve						
	Complex Junction	None						
	Simple Edge	None						
		wGravityMain	EJ Rules EE Rules					
	Complex Edge	wLateralLine	EJ Rules EE Rules					
		wPressurizedMain	EJ Rules EE Rules					

Edge-Junction-Edge Geometric Network Connectivity Rules							
WaterNetwor	k						
F	From To		Го	Via			
Edge	Subtype	Edge	Subtype	Junction::Subtype			
This Geometric Network Does Not Contain Any Edge->Junction->Edge Connectivity Rules							

Edge-Junction Geometric Network Connectivity Rules								
WaterNetwork								
Fr	om	Т	No. of Edges		No. of Junctions			
Edge	Subtype	Junction Subtype		Min Max	Min	Max		
This Geometric Network Does Not Contain Any Edge->Junction Connectivity Rules								

## **ObjectClass Information**

### wAnode (Simple Feature) (Point) No Subtypes

o Subtypes					
Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
SHAPE	Geometry	0	0	0	
AssetID	Integer	0	0	4	
BasinID	String	0	0	8	D_Basin
Owner	String	0	0	8	D Owner
Status	String	0	0	8	D Status
Location_Desc	String	0	0	255	
Elevation	Double	0	0	8	
AnodeCount	Small Integer	0	0	2	
Material	String	0	0	8	D JunctionMaterial
Weight	String	0	0	20	

WaterType	String	0	0	8	D WaterType
DateInstalled	Date	0	0	8	
DateDigitized	Date	0	0	8	
DateModified	Date	0	0	8	

### wCasing (Simple Feature) (Polygon) Subtype: Casement (SUBTYPE = 0) [Default] **Field Name** Field Type Pre Sc Len DV Domain OBJECTID OID 0 0 4 SHAPE Geometry 0 0 0 SubType Integer 0 0 4 AssetId Integer 0 0 4 BasinID String 0 0 4 D\_Basin D\_Owner GWA Owner String 0 0 8 D Status Status String 0 0 8 ACT Location\_Desc String 0 0 255 Elevation Double 0 0 8 0 Diameter String 0 50 0 0 8 String D\_WaterLineMaterial Material WaterType String 0 0 8 POT D\_WaterType 0 SHAPE\_Length Double 0 8 SHAPE\_Area Double 0 0 8 DateInstalled Date 0 0 8 DateDigitized Date 0 0 8 DateModified Date 0 0 8 Subtype: ConduitBridge (SUBTYPE = 1) **Field Name** Field Type Pre Sc Len DV Domain OBJECTID OID 0 0 4 SHAPE Geometry 0 0 0 SubType 0 0 4 Integer AssetId Integer 0 0 4 4 BasinID String 0 0 D Basin 8 0 0 GWA Owner String D Owner 0 0 8 ACT D Status Status String Location Desc String 0 0 255 Elevation Double 0 0 8 Diameter String 0 0 50 **D** WaterLineMaterial Material String 0 0 8 D WaterType POT WaterType String 0 0 8 0 0 SHAPE\_Length 8 Double SHAPE Area Double 0 0 8 DateInstalled Date 0 0 8 DateDigitized Date 0 0 8 0 0 8 DateModified Date Subtype: ProtectiveTunnel (SUBTYPE = 2) **Field Name** Field Type Pre Sc Len DV Domain OBJECTID OID 0 0 4 SHAPE Geometry 0 0 0 SubType 0 0 4 Integer AssetId Integer 0 0 4 BasinID String 0 0 4 D\_Basin 8 GWA D\_Owner Owner String 0 0 String 0 8 D\_Status Status 0 ACT Location Desc String 0 0 255 Elevation 0 0 8 Double Diameter String 0 0 50 0 0 D\_WaterLineMaterial Material String 8 0 POT 0 8 D\_WaterType WaterType String SHAPE\_Length 0 0 8 Double SHAPE Area Double 0 0 8

Date

0 0 8

DateInstalled

DateDigitized	Date	0	0	8				
DateModified	Date	0	0	8				
Subtype: AccesssTunnel (SUBTYPE = 3)								
Field Name	Field Type	-	Sc	Len	DV	Domain		
OBJECTID	OID	0	0	4				
SHAPE	Geometry	0	0	0				
SubType	Integer	0	0	4				
AssetId	Integer	0	0	4				
BasinID	String	0	0	4		D_Basin		
Owner	String	0	0	8	GWA	D_Owner		
Status	String	0	0	8	ACT	D_Status		
Location_Desc	String	0	0	255				
Elevation	Double	0	0	8				
Diameter	String	0	0	50				
Material	String	0	0	8		D_WaterLineMaterial		
WaterType	String	0	0	8	POT	D_WaterType		
SHAPE_Length	Double	0	0	8				
SHAPE_Area	Double	0	0	8				
DateInstalled	Date	0	0	8				
DateDigitized	Date	0	0	8				
DateModified	Date	0	0	8				

### wReservoirs (Simple Feature) (Point)

No Subtypes					
Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
ENTITY	String	0	0	14	
LAYER	String	0	0	32	
ELEVATION	Double	0	0	8	
THICKNESS	Double	0	0	8	
COLOR	Integer	0	0	4	

### wScadaSensor (Simple Feature) (Point)

### No Subtypes

Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
SHAPE	Geometry	0	0	0	
ASSETID	Integer	0	0	4	
OWNER	String	0	0	8	D_Owner
BASINID	String	0	0	8	D_Basin
STATUS	String	0	0	8	D_Status
LOCATION_DESC	String	0	0	255	
ELEVATION	Double	0	0	8	
CURRENTVALUE	String	0	0	20	
SCADAID	String	0	0	20	
MEASUREMENTTYPE	String	0	0	20	D_ScadaSensorType
WATERTYPE	String	0	0	8	D_WaterType
DATEINSTALLED	Date	0	0	8	
DATEDIGITIZED	Date	0	0	8	
DATEMODIFIED	Date	0	0	8	

### wThrustProtection (Simple Feature) (Polygon)

### Subtype: Anchor (SUBTYPE = 0) [Default]

Field Name	Field Type	Pre	e Sc	Ler	۱DV	Domain
OBJECTID	OID	0	0	4		
SHAPE	Geometry	0	0	0		
SUBTYPE	Small Integer	0	0	2		
ASSETID	Integer	0	0	4		
OWNER	String	0	0	8	GWA	D_Owner

BASINID	String	0	0	8		D Basin
STATUS	String	0	0	8	ACT	D Status
LOCATION_DESC	String	0	0	255		
ELEVATION	Double	0	0	8		
WATERTYPE	String	0	0	8		D WaterType
SHAPE_Length	Double	0	0	8		
SHAPE_Area	Double	0	0	8		
DATEINSTALLED	Date	0	0	8		
DATEDIGITIZED	Date	0	0	8		
DATEMODIFIED	Date	0	0	8		
Subtype: Blocking (SUBTYP	F = 1)					
		<b>D</b>	0-	1		Demain
Field Name	Field Type	Pre	9 S C	Ler	DV	Domain
OBJECTID	OID	0	0	4		
SHAPE	Geometry	0	0	0		
SUBTYPE	Small Integer	0	0	2		
ASSETID	Integer	0	0	4		
OWNER	String	0	0	8	GWA	D_Owner
BASINID	String	0	0	8		<u>D_Basin</u>
STATUS	String	0	0	8	ACT	D_Status
LOCATION_DESC	String	0	0	255		
ELEVATION	Double	0	0	8		
WATERTYPE	String	0	0	8		D_WaterType
SHAPE_Length	Double	0	0	8		
SHAPE_Area	Double	0	0	8		
DATEINSTALLED	Date	0	0	8		
DATEDIGITIZED	Date	0	0	8		
DATEMODIFIED	Date	0	0	8		
Subtype: Deadman (SUBTYF	PF = 2)					
	•	Dre	0.	امم		Demain
Field Name	Field Type				עטו	Domain
OBJECTID	OID	0	0	4		
CUADE	Coomotry					
SHAPE	Geometry	0	0	0		
SUBTYPE	Small Integer	0	0	2		
SUBTYPE ASSETID	Small Integer Integer	0 0	0 0	2 4		
SUBTYPE ASSETID OWNER	Small Integer Integer String	0 0 0	0 0 0	2 4 8	GWA	D_Owner
SUBTYPE ASSETID OWNER BASINID	Small Integer Integer String String	0 0 0 0	0 0 0 0	2 4 8 8	-	D_Basin
SUBTYPE ASSETID OWNER BASINID STATUS	Small Integer Integer String String String	0 0 0 0 0	0 0 0 0 0	2 4 8 8 8	GWA ACT	
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC	Small Integer Integer String String String String	0 0 0 0 0 0	0 0 0 0 0 0	2 4 8 8 8 255	-	D_Basin
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION	Small Integer Integer String String String String Double	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	2 4 8 8 8 255 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE	Small Integer Integer String String String Double String	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8	-	D_Basin
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length	Small Integer Integer String String String Double String Double	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area	Small Integer Integer String String String Double String Double Double	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED	Small Integer Integer String String String Double String Double Double Double Date	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED	Small Integer Integer String String String Double String Double Double Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED	Small Integer Integer String String String Double String Double Double Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED	Small Integer Integer String String String Double String Double Double Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED Subtype: Kicker (SUBTYPE =	Small Integer Integer String String String Double String Double Double Date Date Date Date <b>= 3)</b>	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED Subtype: Kicker (SUBTYPE = Field Name	Small Integer Integer String String String Double String Double Double Date Date Date <b>= 3)</b> Field Type	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED Subtype: Kicker (SUBTYPE = Field Name OBJECTID	Small Integer Integer String String String Double String Double Double Date Date Date <b>= 3)</b> Field Type OID	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE	Small Integer Integer String String String Double String Double Double Date Date <b>a 3)</b> Field Type OID Geometry	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE	Small Integer Integer String String String Double String Double Date Date Date <b>5 ()</b> Field Type OID Geometry Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER	Small Integer Integer String String String Double String Double Date Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain Domain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain Domain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain D_Owner D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain Domain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String String Double String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain D_Owner D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String String Double String Double String Double Double Double Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8 8 255 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain D_Owner D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer String String String String String Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain D_Owner D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED <b>Subtype: Kicker (SUBTYPE =</b> Field Name OBJECTID SHAPE SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE SHAPE_Length SHAPE_Area	Small Integer Integer String String String Double String Double Date Date Date <b>- 3)</b> <b>Field Type</b> OID Geometry Small Integer Integer String String String String Double String Double String Double Double Double Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 4 8 8 2555 8 8 8 8 8 8 8 8 8 8 255 8 8 8 8	ACT	D_Basin D_Status D_WaterType Domain D_Owner D_Basin D_Status

### wUndergroundEnclosure (Simple Feature) (Polygon) Subtype: MeterBox (SUBTYPE = 0) [Default]

Field Name         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OI         0	Subtype: MeterBox (SUBTYF	PE = 0) [Def	ault	:]		
SHAPE         Geometry         0         0         0           SUBTYPE         Small Integer         0         0         2           ASSETID         Integer         0         0         8         D_Status           CWNRR         String         0         0         8         D_Status           COVEND.DESC         String         0         0         8         D_Status           COVERNATERIAL         String         0         0         8         D_FrameCoverMaterial           COVERNATERIAL         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         2         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         Material           FRAMEMATERIAL         String         0         0         8         D_AccessType           MEASUREMENT1         Small Integer         0         0         2         Material           MAEASUREMENT2         Small Integer         0         0         8         D_AccessType           SHAPE_Area         Double         0         0         8         D_AccessType           DATEMODIFIE	Field Name	Field Type	Pre	Sc	LenDV	Domain
SUBTYPE         Small Integer         0         0         2           ASSETID         Integer         0         0         8         D_Curner           BASINID         String         0         0         8         D_Estin           STATUS         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_FrameCoverMaterial           COVERNATERIAL         String         0         0         0         1         D_AccessType           DEFTH         Integer         0         0         2         D_AccessType           DEFTH         Integer         0         0         2         D_AccessType           MEASUREMENT2         Small Integer         0         0         2         D_AccessType           MAEASUREMENT1         Small Integer         0         0         2         D_MENCTYPE           SHAPE_Length         Double         0         0         8         D_ACCESSTYPE           Field Name         Field Type         PE'SC         Len DV         Domain           OBJECTID         Date         0         0         2           SHAPE	OBJECTID	OID	0	0	4	
ASE TID         Integer         0         0         4           OWNER         String         0         0         8         D_Owner           BASIND         String         0         0         8         D_Elasin           STATUS         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_EranaCoverMaterial           COVERNATERIAL         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         2         DeranaCoverMaterial           FRAMEMATERIAL         String         0         0         2         DeranaCoverMaterial           FRAMEMATERIAL         String         0         0         2         DecessType           DEFTH         Integer         0         0         2         MeasUREMENT1         Small Integer         0         0         2           MEASUREMENT2         Small Integer         0         0         8         D         MaterType           SHAPE_Area         Double         0         0         8         D         D           DATEOIOTIZED         Date	SHAPE	Geometry	0	0	0	
OWNER         String         0         8         D_Owner           BASINID         String         0         0         8         D_Basin           STATUS         String         0         0         8         D_Status           LCCATION_DESC         String         0         0         8         D_FameCoverMaterial           COVERNATERIAL         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         4           FRAMETYPE         String         0         0         2           MEASUREMENT1         Smail Integer         0         0         2           WATERTYPE         String         0         0         8         D_WaterType           SHAPE_Length         Double         0         0         8         D           DATEINSTALLED         Date         0         0         8         D           SUBTYPE         Smail Integer         0         0         2         ASSETID           SUBTYPE         Smail Integer         0         0         2         ASSETID           SUBTYPE         Smail Integer         0         0         2         <	SUBTYPE	Small Integer	0	0	2	
BASIND         String         0         0         8         D. Basin           STATUS         String         0         0         8         D. Status           LOCATION_DESC         String         0         0         8         D. Status           COVERNATERAL         String         0         0         8         D. FrameCoverMaterial           COVERNYPE         String         0         0         4         D. AccessType           DEPTH         Integer         0         0         2         D. FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         D. AccessType           DEPTH         Integer         0         0         2         D. AccessType           MEASUREMENT1         Small Integer         0         0         2         D. WaterType           SHAPE_Length         Double         0         0         8         D. Status           DATEONGITIZED         Date         0         0         8         D. Status           DATEDOGITIZED         Date         0         0         4         O. Status           SUBTYPE         Small Integer         0         0         4         O. Statu	ASSETID	Integer	0	0	4	
STATUS         String         0         0         8         D. Status           LOCATION_DESC         String         0         0         8         D. FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D. FrameCoverMaterial           COVERTYPE         String         0         0         4         D. AccessType           DEPTH         Integer         0         0         4         D. FrameCoverMaterial           FRAMETYPE         String         0         0         2         MEASUREMENT1         Small Integer         0         0         2           MEASUREMENT2         Small Integer         0         0         8         D. VaterType           SHAPE_Length         Double         0         0         8         D. Status           DATEINSTALED         Date         0         0         8         D. Status           Subtype: ValveVault (SUBTYPE = 1)         Domain         O         2         ASSETID         Domain           Subtype: ValveVault (SUBTYPE = 1)         String         0         0         4         D. Owner           Subtype: ValveVault (SUBTYPE = 1)         String         0         0         2         <	OWNER	String	0	0	8	D Owner
LOCATION_DESC         String         0         0         255           ELEVATION         Double         0         0         8         D_FrameCoverMaterial           COVERTYPE         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         20         P_FrameCoverMaterial           FRAMENTERIAL         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         4         AccessType           MEASUREMENT1         Small Integer         0         0         2         MassureMement           MEASUREMENT2         Small Integer         0         0         8         D_WaterType           SHAPE_Length         Double         0         0         8         D           DATEMODIFIED         Date         0         0         8         D           SUBTYPE         ValveVault (SUBTYPE = 1)         Domain         0         0         0           SUBTYPE         Small Integer         0         0         8         D_AccessType           SUBTYPE         Sming         0         0         8         D_AccessType	BASINID	String	0	0	8	D Basin
ELEVATION         Double         0         0         8         D_FrameCoverMaterial           COVERMATERIAL         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         20         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         4           FRAMEMATERIAL         String         0         0         4           MEASUREMENT1         Small Integer         0         0         2           MEASUREMENT2         Small Integer         0         0         8           SHAPE_Length         Double         0         0         8           DATEINSTALED         Date         0         0         8           Subtype: ValveVault (SUBTYPE = 1)         Field Type         Pres C         Len DV         Domain           OBLCTID         OID         0         0         4         Downer           Subtype: ValveVault         String         0         0         8         D_Status           OWNER         String         0         0         8	STATUS	String	0	0	8	D Status
COVERMATERIAL         String         0         0         8         D. FrameCoverMaterial           COVERTYPE         String         0         0         0         0         0         D.AccessType           DEPTH         Integer         0         0         0         0         0         D.FrameCoverMaterial           FRAMETYPE         String         0         0         0         2         D.FrameCoverMaterial           MEASUREMENT1         Small Integer         0         0         2         Material           MEASUREMENT2         Small Integer         0         0         8         D.WaterType           SHAPE_Length         Double         0         0         8         D.WaterType           SHAPE_Area         Double         0         0         8         D.TEDICITIZED         Date         0         0         8           OBLECTID         OID         0         0         4         D.Owner         Sastin         D.Status           SUBTYPE         String         0         0         2         Status         D.AccessType           SUBTYPE         String         0         0         2         String         0         0         D.A	LOCATION_DESC	String	0	0	255	
COVERTYPE         String         0         0         50         D. AccessType           DEPTH         Integer         0         0         4           FRAMEMATERIAL         String         0         0         20         D. FrameCoverMaterial           FRAMEMATERIAL         String         0         0         0         4           MEASUREMENT1         Small Integer         0         0         2           MEASUREMENT2         Small Integer         0         0         8           WATERTYPE         String         0         0         8           SHAPE_Length         Double         0         0         8           DATEINSTALLED         Date         0         0         8           Subtype: ValveVault (SUBTYPE = 1)         Field Type         Pre SC         Len DV         Domain           OBJECTID         OID         0         0         4         String         0         2           SUBTYPE         Small Integer         0         0         8         D.evner           String         0         0         8         D.staus           LOCATION_DESC         String         0         2         Staus	ELEVATION	Double	0	0	8	
DEPTH         Integer         0         0         4           FRAMEMATERIAL         String         0         0         20         D_FrameCoverMaterial           FRAMETYPE         String         0         0         4           MVERTELEVATION         Integer         0         0         2           MASUREMENT1         Small Integer         0         0         2           WATERTYPE         String         0         0         8         D_WaterType           SHAPE_Area         Double         0         0         8         D_WaterType           SHAPE_Area         Double         0         0         8         D_WaterType           DATEDIGTIZED         Date         0         0         8         D           Shape         Geometry         0         0         4         Shape           Gate         O         0         8         D_Owner         Sastring           SubtyPe         Small Integer         0         0         4         Downer           SubtyPe         Small Integer         0         0         4         Downer           SubtyPe         Small Integer         0         0         4	COVERMATERIAL	String	0	0	8	D FrameCoverMaterial
FRAMEMATERIAL       String       0       0       20       D_FrameCoverMaterial         FRAMETYPE       String       0       0       8         INVERTELEVATION       Integer       0       0       2         MEASUREMENT1       Small Integer       0       0       2         MARSUREMENT2       Small Integer       0       0       8       D         WATERTYPE       String       0       0       8       D         SHAPE_Length       Double       0       0       8       D         DATEINSTALLED       Date       0       0       8       D         DATEMODIFIED       Date       0       0       8       D         Subtype: ValveVault (SUBTYPE = 1)       Field Type       Presc       Len DV       Domain         OBJECTID       OID       0       0       4       D         SHAPE       Geometry       0       0       255       D         SUBTYPE       String       0       0       8       D       Basinus         STATUS       String       0       0       8       D       Date         COVERTYPE       String       0       0	COVERTYPE	String	0	0	50	D AccessType
FRAMETYPE       String       0       0       8         INVERTELEVATION       Integer       0       0       2         MEASUREMENT1       Small Integer       0       0       2         WATSURFENT2       Small Integer       0       0       2         WATERTYPE       String       0       0       8         SHAPE_Length       Double       0       0       8         DATEINSTALLED       Date       0       0       8         DATEMODIFIED       Date       0       0       8         SthAPE_Length       Double       0       0       8         DATEINSTALLED       Date       0       0       8         SthAPE       Geometry       0       0       4         SHAPE       Geometry       0       0       2         ASSETID       Integer       0       0       4         OWNER       String       0       0       8       Dassin         STATUS       String       0       0       8       Dassin         COVERMATERIAL       String       0       0       8       D-FrameCoverMaterial         COVERMATERIAL       Str	DEPTH	Integer	0	0	4	
INVERTELEVATION         Integer         0         0         4           MEASUREMENT1         Small Integer         0         0         2           MAEASUREMENT2         Small Integer         0         0         2           WATERTYPE         String         0         0         8         D_WaterType           SHAPE_Length         Double         0         0         8         D_WaterType           SHAPE_Area         Double         0         0         8         D_WaterType           DATEMODIFIED         Date         0         0         8         D_WaterType           Subtype:         ValveVault (SUBTYPE = 1)         Domain         0         0         8           Subertype:         Samall Integer         0         0         0         0         0           SUBTYPE         Small Integer         0         0         8         D_Status         0           SUCCATION_DESC         String         0         0         8         D_Status         0           COVERMATERIAL         String         0         0         8         D_Status         0           COVERMATERIAL         String         0         0         8         D	FRAMEMATERIAL	String	0	0	20	D FrameCoverMaterial
MEASUREMENT1         Small Integer         0         0         2           MEASUREMENT2         Small Integer         0         0         2           WATERTYPE         String         0         0         8         D.WaterType           SHAPE_Length         Double         0         0         8         D.WaterType           SHAPE_Area         Double         0         0         8         D.WaterType           DATEINSTALLED         Date         0         0         8         D.WaterType           DATEINSTALLED         Date         0         0         8         D.WaterType           Subtype:         ValueYeauti (SUBTYPE = 1)         Freid Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4         D.VaterType         ASSETID         Integer         0         0         2           ASSETID         Integer         0         0         8         D.Owner         D.Status           LOCATION_DESC         String         0         0         8         D.FrameCoverMaterial           COVERMATERIAL         String         0         0         4         D.AccessType           DEPTH </td <td>FRAMETYPE</td> <td>String</td> <td>0</td> <td>0</td> <td>8</td> <td></td>	FRAMETYPE	String	0	0	8	
MEASUREMENT2         Small Integer         0         0         2           WATERTYPE         String         0         0         8         D.WaterType           SHAPE_Length         Double         0         0         8           DATEDIGTZED         Date         0         0         8           DATEDIGTIZED         Date         0         0         8           Subtype:         ValveVault (SUBTYPE = 1)         E         Domain           Field Name         Field Type         PreSc         Len DV         Domain           OBJECTID         OID         0         0         4         Overant           SHAPE         Geometry         0         0         4         Overant           SUBTYPE         Small Integer         0         0         8         D.Basin           STATUS         String         0         0         8         D.Status           LOCATION_DESC         String         0         0         8         D.FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D.FrameCoverMaterial           FRAMETYPE         String         0         0         8         D.FrameCoverMateri	INVERTELEVATION	Integer	0	0	4	
WATERTYPE         String         0         0         8         D.WaterType           SHAPE_Length         Double         0         0         8           DATEINSTALLED         Date         0         0         8           DATEDIGITIZED         Date         0         0         8           Subtype:         ValveVault (SUBTYPE = 1)         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4         Asset         Asset           SHAPE_Area         Geometry         0         0         4         Asset         Asset           OBJECTID         OID         0         0         4         Asset         Downer           ASSETID         Integer         0         0         8         D-Owner           BASINID         String         0         0         8         D-Status           LOCATION_DESC         String         0         0         8         D-FrameCoverMaterial           COVERTYPE         String         0         0         8         D-FrameCoverMaterial           RAMENTERIAL         String         0         0         2         D-FrameCoverMaterial     <	MEASUREMENT1	Small Integer	0	0	2	
SHAPE_Length         Double         0         0         8           SHAPE_Area         Double         0         0         8           DATEINSTALLED         Date         0         0         8           DATEINSTALLED         Date         0         0         8           DATEMODIFIED         Date         0         0         8           Subtype: ValveVault (SUBTYPE = 1)         Frield Name         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4         0         0         4           SHAPE         Geometry         0         0         2         ASSETID         Integer         0         0         4           OWNER         String         0         0         8         D.Owner         Basin           STATUS         String         0         0         8         D.Status         COVERMATERIAL         String         0         0         8         D.FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D.FrameCoverMaterial           FRAMEMATERIAL         String         0         0         4         D.AccessType <td>MEASUREMENT2</td> <td>Small Integer</td> <td>0</td> <td>0</td> <td>2</td> <td></td>	MEASUREMENT2	Small Integer	0	0	2	
SHAPE_Area         Double         0         0         8           DATEINSTALLED         Date         0         0         8           DATEDIGITIZED         Date         0         0         8           Subtype: ValveVault (SUBTYPE = 1)         Image: Construct the construct t	WATERTYPE	String	0	0		D WaterType
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DATEDIGITIZED DATEMODIFIED         Date         0         8           Subtrype:         ValveVault (SUBTYPE = 1)         V           Field Name         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4           SHAPE         Geometry         0         0         4           SHAPE         Geometry         0         0         4           SUBTYPE         Small Integer         0         0         4           OWNER         String         0         0         8         D-Owner           BASINID         String         0         0         8         D-Status           LOCATION_DESC         String         0         0         8         D-FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D-FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D-FrameCoverMaterial           RAMEMATERIAL         String         0         0         8         D-FrameCoverMaterial           RAMEMATERIAL         String         0         0         8         D-FrameCoverMaterial <th< td=""><td></td><td>Double</td><td>0</td><td>0</td><td>8</td><td></td></th<>		Double	0	0	8	
DATEMODIFIED         Date         0         0         8           SUbtype: ValveVault (SUBTYPE = 1)         V         Subtype: ValveVault (SUBTYPE = 1)           Field Name         Field Type         Sc         Len DV         Domain           OBJECTID         OID         0         0         4           SHAPE         Geometry         0         0         2           ASSETID         Integer         0         0         8         D.Owner           BASINID         String         0         0         8         D.Status           COVERTANDESC         String         0         0         8         D.Status           LOCATION_DESC         String         0         0         8         D.FrameCoverMaterial           COVERMATERIAL         String         0         0         2         D.FrameCoverMaterial           COVERTYPE         String         0         0         2         D.FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         D.FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         D.FrameCoverMaterial           FRAMEMATERIAL         String         0	_	Date	0	0	8	
Subtype: ValveVault (SUBTYPE = 1)           Field Name         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4         1           SUBTYPE         Small Integer         0         0         2         1           ASSETID         Integer         0         0         8         D_Owner           BASINID         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         4         FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         4         FrameCoverMaterial           RAMETYPE         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         2         MATERIAL         String         0         2         MATERIAL         String         0		Date				
Field Name         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4           SHAPE         Geometry         0         0         2           SUBTYPE         Small Integer         0         0         2           ASSETID         Integer         0         0         4           OWNER         String         0         0         8         D.Owner           BASINID         String         0         0         8         D.Basin           STATUS         String         0         0         8         D.Status           LOCATION_DESC         String         0         0         8         D.FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D.AccessType           DEPTH         Integer         0         0         4         MEASUREMENT1         Small Integer         0         0         8           INVERTELEVATION         Integer         0         0         8         D.WaterType           SHAPE_Length         Double         0         0         8         D.WaterType           SHAPE_Length <t< td=""><td></td><td></td><td>0</td><td>0</td><td>8</td><td></td></t<>			0	0	8	
OBJECTID         OID         0         0         4           SHAPE         Geometry         0         0         0           SUBTYPE         Small Integer         0         0         2           ASSETID         Integer         0         0         8         D_Owner           ASSETID         Integer         0         0         8         D_Owner           BASINID         String         0         0         8         D_Basin           STATUS         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         4         ExameCoverMaterial           FRAMEMATERIAL         String         0         0         4         ExameCoverMaterial           FRAMEMATERIAL         String         0         0         8         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         8         D_EventMaterial           FRAMEMEMENT1         Small Integer	Subtype: ValveVault (SUBTY	PE = 1)				
SHAPE         Geometry         0         0         0           SUBTYPE         Small Integer         0         0         2           ASSETID         Integer         0         0         4           OWNER         String         0         0         8         D_Basin           STATUS         String         0         0         8         D_Basin           STATUS         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D_FrameCoverMaterial           COVERMATERIAL         String         0         0         4         FrameCoverMaterial           FRAMEMATERIAL         String         0         0         4         FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         FrameCoverMaterial           FRAMEMETPE         String         0         0         2         FrameCoverMaterial           FRAMEMETPIPE         String         0         0         2         FrameCoverMaterial           FRAMEMENT1	Field Name	Field Type	Pre	Sc	LenDV	Domain
SUBTYPE         Small Integer         0         0         2           ASSETID         Integer         0         0         4           OWNER         String         0         0         8         D_Basin           BASINID         String         0         0         8         D_Basin           STATUS         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         8         D_FrameCoverMaterial           COVERMATERIAL         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         4            FRAMEMATERIAL         String         0         0         2            INVERTELEVATION         Integer         0         0         4            FRAMEMATERIAL         String         0         0         8             INVERTELEVATION         Integer         0         0         2             MEASUREMENT1         Small Integer         0         0         8             DATEINSTALLED         Da	OBJECTID	OID	0	0	4	
ASSETID       Integer       0       0       4         OWNER       String       0       0       8       D_Owner         BASINID       String       0       0       8       D_Basin         STATUS       String       0       0       8       D_Status         LOCATION_DESC       String       0       0       8       D_Status         LOCATION_DESC       String       0       0       8       D_FrameCoverMaterial         COVERMATERIAL       String       0       0       8       D_FrameCoverMaterial         COVERTYPE       String       0       0       4       PrameCoverMaterial         COVERTYPE       String       0       0       4       PrameCoverMaterial         FRAMEMATERIAL       String       0       0       8       PrameCoverMaterial         FRAMEMATERIAL       String       0       0       4       MEASUREMENT       Integer       0       0       4         MEASUREMENT1       Small Integer       0       0       2       MATERTYPE       String       0       8       DATEINSTALLED       Date       0       8       DATEINSTALED       Date       0       8	SHAPE	Geometry	0	0	0	
OWNERString008D_OwnerBASINIDString008D_BasinSTATUSString008D_StatusLOCATION_DESCString00255ELEVATIONDouble008D_FrameCoverMaterialCOVERMATERIALString008D_FrameCoverMaterialCOVERMATERIALString0050D_AccessTypeDEPTHInteger004FRAMEMATERIALString002DEPTHInteger004FRAMEMATERIALString002MATERTYPEString002MEASUREMENT1Small Integer002MATERTYPEString008DATEINSTALLEDDate008DATENDGIFIEDDate008DATENDGIFIEDDate008Stubtype: Vault (SUBTYPE = 2)Field TypePre ScLen DVDomainOBJECTIDOID002ASSETIDInteger008D_OvnerSUBTYPESmall Integer008D_OvnerSUBTYPESmall Integer0002ASSETIDInteger008D_OvnerSUBTYPEString008D_OvnerSASETIDInteger0 <td>SUBTYPE</td> <td>Small Integer</td> <td>0</td> <td>0</td> <td>2</td> <td></td>	SUBTYPE	Small Integer	0	0	2	
BASINID         String         0         0         8         D_Basin           STATUS         String         0         0         8         D_Status           LOCATION_DESC         String         0         0         255           ELEVATION         Double         0         0         8         D_FrameCoverMaterial           COVERMATERIAL         String         0         0         8         D_AccessType           DEPTH         Integer         0         0         4           FRAMEMATERIAL         String         0         0         20         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         2         MEASUREMENT2         Small Integer         0         0         2           WEASUREMENT2         Small Integer         0         0         2         MeasUREMENT2         Small Integer         0         0         2           WATERTYPE         String         0         0         8         D_WaterType           SHAPE_Length         Double         0         0         8         D_WaterType           SHAPE_LArea         Double         0         0         8         D_Eteintonon         0	ASSETID	Integer	0	0	4	
STATUS       String       0       8       D_Status         LOCATION_DESC       String       0       0       255         ELEVATION       Double       0       0       8       D_FrameCoverMaterial         COVERMATERIAL       String       0       0       8       D_FrameCoverMaterial         COVERTYPE       String       0       0       4         FRAMEMATERIAL       String       0       0       8         INVERTELEVATION       Integer       0       0       4         MEASUREMENT1       Small Integer       0       0       2         MEASUREMENT2       Small Integer       0       0       8       D_WaterType         SHAPE_Area       Double       0       0       8       D_Accessitype         DATEMODIFIED       Date       0       0       8       D_Accessitype         INVERTELEVATION       Integer       0       0       8       D_Accessitype         DATEINST	OWNER	String	0	0	8	D_Owner
LOCATION_DESCString00255ELEVATIONDouble008D_FrameCoverMaterialCOVERMATERIALString0050D_AccessTypeDEPTHInteger004FRAMEMATERIALString0020D_FrameCoverMaterialFRAMEMATERIALString0008INVERTELEVATIONInteger004MEASUREMENT1Small Integer002WATERTYPEString002WATERTYPEString008JATEINSTALLEDDouble008DATEINSTALLEDDate008DATEINSTALLEDDate008DATEINSTALLEDDate008DATEINSTALLEDDate008DATEINSTALLEDDate008DATEINSTALLEDDate008DATENODIFIEDDate008Subtype: Vault (SUBTYPE = 2)Field TypePre ScLen DVField NameField Type002ASSETIDInteger004OWNERSmall Integer002ASSETIDInteger008D_OwnerBASINIDString008D_OwnerBASINIDString008D_OwnerBASINIDS	BASINID	String	0	0	8	D_Basin
ELEVATION         Double         0         0         8           COVERMATERIAL         String         0         0         8         D_FrameCoverMaterial           COVERTYPE         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         4         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         20         D_FrameCoverMaterial           FRAMETYPE         String         0         0         4         D_FrameCoverMaterial           FRAMETYPE         String         0         0         4         D_VaterTial           MEASUREMENT1         Small Integer         0         0         2         D_WaterType           SHAPE_Length         Double         0         0         8         D_TEINSTALLED         Date         0         0         8           DATEINSTALLED         Date         0         0         8         D_TEINSTALLED         Date         0         8           DATENDIFIED         Date         0         0         8         D_TEINSTALLED         Date         0         8           SUBTYPE         Small Integer         0         <	STATUS	String	0	0	8	D_Status
COVERMATERIAL         String         0         0         8         D_FrameCoverMaterial           COVERTYPE         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         4         D_FrameCoverMaterial           FRAMEMATERIAL         String         0         0         20         D_FrameCoverMaterial           FRAMETYPE         String         0         0         8         D_VaccessType           INVERTELEVATION         Integer         0         0         8         D_VaccessType           MEASUREMENT1         Small Integer         0         0         2         MaterType           MATERTYPE         String         0         0         8         D_WaterType           SHAPE_Length         Double         0         0         8         D_VaterType           SHAPE_Area         Double         0         0         8         D_VaterType           DATENODIFIED         Date         0         0         8         D_VaterType           SUbtype:         Vault (SUBTYPE         String         0         0         8         D_VaterType           SUBTYPE         Small Integer         0 <td>LOCATION_DESC</td> <td>String</td> <td>0</td> <td>0</td> <td>255</td> <td></td>	LOCATION_DESC	String	0	0	255	
COVERTYPE         String         0         0         50         D_AccessType           DEPTH         Integer         0         0         4         D         FrameCoverMaterial           FRAMEMATERIAL         String         0         0         20         D_FrameCoverMaterial           FRAMETYPE         String         0         0         4         D         FrameCoverMaterial           FRAMETYPE         String         0         0         4         D         FrameCoverMaterial           FRAMETYPE         String         0         0         4         D         D           MEASUREMENT1         Small Integer         0         0         2         D         WaterType           MEASUREMENT2         Small Integer         0         0         8         D         D         WaterType           SHAPE_Length         Double         0         0         8         D         <	ELEVATION	Double	0	0	8	
DEPTH         Integer         0         0         4           FRAMEMATERIAL         String         0         0         20         D_FrameCoverMaterial           FRAMETYPE         String         0         0         8           INVERTELEVATION         Integer         0         0         4           MEASUREMENT1         Small Integer         0         0         2           WATERTYPE         String         0         0         2           WATERTYPE         String         0         0         2           WATERTYPE         String         0         0         8           SHAPE_Length         Double         0         0         8           DATEINSTALLED         Date         0         0         8           DATEMODIFIED         Date         0         0         8           Stubtype: Vault (SUBTYPE = 2)         Field Type         Pre Sc         Len DV         Domain           OBJECTID         Other         0         0         4         SHAPE         Geometry         0         0         2           ASSETID         Integer         0         0         4         Downer         SHasin	COVERMATERIAL	String	0	0	8	D_FrameCoverMaterial
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MEASUREMENT1Small Integer002MEASUREMENT2Small Integer002WATERTYPEString008SHAPE_LengthDouble008DATEINSTALLEDDate008DATEDIGITIZEDDate008DATEMODIFIEDDate008DATEMODIFIEDDate008SUBTYPEValid (SUBTYPE = >VVariant (SUBTYPE = )Field NameField TypePre ScLen DVDomainOBJECTIDOID004SUBTYPESmall Integer002ASSETIDInteger004OWNERString008D.OwnerBASINIDString008D.BasinSTATUSString008D.BasinLOCATION_DESCString0002	FRAMETYPE	String	0	0	8	
MEASUREMENT2Small Integer002WATERTYPEString008D_WaterTypeSHAPE_LengthDouble008DATEINSTALLEDDate008DATEDIGITIZEDDate008DATEMODIFIEDDate008String00DATEMODIFIEDDate008String008String008String008String0008SUBTYPESmall Integer0041OWNERString008D_OwnerBASINIDString008D_BasinSTATUSString008D_Status	INVERTELEVATION	Integer	0	0	4	
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DATEDIGITIZED DATEMODIFIEDDate008DATEMODIFIEDDate008Status (SUBTYPE = UField NameField TypePr - SLen DVDomainOBJECTIDOID004SHAPEGeometry0002SUBTYPESmall Integer002ASSETIDInteger004OWNERString08DownerBASINIDString0010BasinSTATUSString00025	—					
DATEMODIFIEDDate008Status (SUBTYPE = UField NameField TypePr - SLen DVDomainOBJECTIDOID004SHAPEGeometry0002SUBTYPESmall Integer002-ASSETIDInteger004-OWNERString008DownerBASINIDString000BasinSTATUSString00025						
Subtype: Vault (SUBTYPE = SField NameField TypePr SLen DVDomainOBJECTIDOID004SHAPEGeometry000SUBTYPESmall Integer002ASSETIDInteger004OWNERString08DownerBASINIDString008DSTATUSString0025						
Field NameField TypePre ScLen DVDomainOBJECTIDOID004SHAPEGeometry000SUBTYPESmall Integer002ASSETIDInteger004OWNERString008D OwnerBASINIDString008D BasinSTATUSString008D StatusLOCATION_DESCString00255			0	0	8	
OBJECTIDOID004SHAPEGeometry000SUBTYPESmall Integer002ASSETIDInteger004OWNERString008DBASINIDString008DSTATUSString008DLOCATION_DESCString00255						
SHAPEGeometry000SUBTYPESmall Integer002ASSETIDInteger004OWNERString008D_OwnerBASINIDString008D_BasinSTATUSString008D_StatusLOCATION_DESCString00255	Field Name	Field Type	Pre	Sc	Len DV	Domain
SUBTYPESmall Integer002ASSETIDInteger004OWNERString008D_OwnerBASINIDString008D_BasinSTATUSString008D_StatusLOCATION_DESCString00255	OBJECTID	OID	0	0	4	
ASSETIDInteger004OWNERString008D_OwnerBASINIDString008D_BasinSTATUSString008D_StatusLOCATION_DESCString00255	SHAPE	Geometry	0	0	0	
OWNERString008D_OwnerBASINIDString008D_BasinSTATUSString008D_StatusLOCATION_DESCString00255	SUBTYPE	Small Integer	0	0		
BASINIDString008D_BasinSTATUSString008D_StatusLOCATION_DESCString00255	ASSETID	Integer	0	0	4	
STATUSString008D_StatusLOCATION_DESCString00255	OWNER	String	0	0	8	D_Owner
LOCATION_DESC String 0 0 255		String	0			<u>D_Basin</u>
				0		D_Status
ELEVATION Double 0 0 8		-				
	ELEVATION	Double	0	0	8	

COVERMATERIAL	String	0	0	8	D FrameCoverMaterial
COVERTYPE	String	0	0	50	D AccessType
DEPTH	Integer	0	0	4	
FRAMEMATERIAL	String	0	0	20	D FrameCoverMaterial
FRAMETYPE	String	0	0	8	
INVERTELEVATION	Integer	0	0	4	
MEASUREMENT1	Small Integer	0	0	2	
MEASUREMENT2	Small Integer	0	0	2	
WATERTYPE	String	0	0	8	D WaterType
SHAPE_Length	Double	0	0	8	
SHAPE_Area	Double	0	0	8	
DATEINSTALLED	Date	0	0	8	
DATEDIGITIZED	Date	0	0	8	
DATEMODIFIED	Date	0	0	8	
WaterStructure (Simple Fea	ture) (Polva	on)			
		···/			

### w٧ Subtype: EnclosedStorageFacility (SUBTYPE = 0) [Default]

Field Name	Field Type	Pre	Sc	Len	DV	Domain
OBJECTID	OID	0	0	4		
SHAPE	Geometry	0	0	0		
SUBTYPE	Small Integer	0	0	2		
ASSETID	Integer	0	0	4		
OWNER	String	0	0	8	GWA	D_Owner
BASINID	String	0	0	8		D_Basin
STATUS	String	0	0	8	ACT	D_Status
LOCATION_DESC	String	0	0	255		
ELEVATION	Double	0	0	8		
WATERTYPE	String	0	0	8		D_WaterType
OPERATIONDATE	Date	0	0	8		
SHAPE_Length	Double	0	0	8		
SHAPE_Area	Double	0	0	8		
DATEINSTALLED	Date	0	0	8		
DATEDIGITIZED	Date	0	0	8		
DATEMODIFIED	Date	0	0	8		
Subtype: ProductionWell (SL	JBTYPE = 1	)				
Field Name	Field Type		Sc	Len	DV	Domain
OBJECTID	OID	0	0	4		
SHAPE	Geometry	0	0	0		
SUBTYPE	Small Integer	0	0	2		
ASSETID	Integer	0	0	4		
OWNER	String	0	0	8	GWA	D Owner
BASINID	String	0	0	8		D Basin
STATUS	String	0	0	8	ACT	D_Status
LOCATION_DESC	String	0	0	255		
ELEVATION	Double	0	0	8		
WATERTYPE	String	0	0	8		D WaterType
OPERATIONDATE	Date	0	0	8		
SHAPE_Length	Double	0	0	8		
SHAPE_Area	Double	0	0	8		
DATEINSTALLED	Date	0	0	8		
DATEDIGITIZED	Date	0	0	8		
DATEMODIFIED	Date	0	0	8		
Subtype: PumpStation (SUB	TYPE = 2)					
Field Name	Field Type	Pro	Sc	l en	עס	Domain
OBJECTID	OID	0	0	4		Domain
SHAPE	Geometry	0	0	4		
			0	2		
SUBTYPE ASSETID	Small Integer Integer	0 0	0	2		
	0	0	0	4 8	GWA	D. Owner
OWNER	String				GWA	D_Owner
BASINID	String	0	0 0	8 8	ACT	D_Basin D_Status
STATUS	String	0	U	0	ACT	D_Status

LOCATION_DESC	String	0	0	255		
ELEVATION	Double	0	0	8		
WATERTYPE	String	0	0	8		D WaterType
OPERATIONDATE	Date	0	0	8		
SHAPE_Length	Double	0	0	8		
SHAPE_Area	Double	0	0	8		
DATEINSTALLED	Date	0	0	8		
DATEDIGITIZED	Date	0	0	8		
DATEMODIFIED	Date	0	0	8		
Subtype: StorageBasin (SUE						
		<b>D</b>	<u>.</u>			Destrict
Field Name	Field Type				עטו	Domain
OBJECTID	OID	0	0	4		
SHAPE	Geometry	0	0	0		
SUBTYPE	Small Integer	0	0	2		
ASSETID	Integer	0	0	4		
OWNER	String	0	0	8	GWA	D_Owner
BASINID	String	0	0	8		<u>D_Basin</u>
STATUS	String	0	0	8	ACT	D_Status
LOCATION_DESC	String	0	0	255		
ELEVATION	Double	0	0	8		
WATERTYPE	String	0	0	8		D_WaterType
OPERATIONDATE	Date	0	0	8		
SHAPE_Length	Double	0	0	8		
SHAPE_Area	Double	0	0	8		
DATEINSTALLED	Date	0	0	8		
DATEDIGITIZED	Date	0	0	8		
DATEMODIFIED	Date	0	0	8		
Subtype: TreatmentPlant (SU	JBTYPE = 4	)				
Field Name	Field Type	-	Sc	Lor	עם	Domain
						Domain
OBJECTID	OID	0	0	4		
SHAPE	Geometry	0	0	0		
	0	~	~	~		
SUBTYPE	Small Integer	0	0	2		
SUBTYPE ASSETID	Integer	0	0	4	0)4/4	
SUBTYPE ASSETID OWNER	Integer String	0 0	0 0	4 8	GWA	D_Owner
SUBTYPE ASSETID OWNER BASINID	Integer String String	0 0 0	0 0 0	4 8 8	-	D_Basin
SUBTYPE ASSETID OWNER BASINID STATUS	Integer String String String	0 0 0 0	0 0 0 0	4 8 8 8	GWA ACT	
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC	Integer String String String String	0 0 0 0	0 0 0 0 0	4 8 8 8 255	-	D_Basin
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION	Integer String String String String Double	0 0 0 0 0	0 0 0 0 0 0	4 8 8 255 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE	Integer String String String Double String	0 0 0 0 0 0	0 0 0 0 0 0 0 0	4 8 8 255 8 8	-	D_Basin
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE	Integer String String String Double String Date	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length	Integer String String String Double String Date Double	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area	Integer String String String Double String Date Double Double	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED	Integer String String String Double String Date Double Double Date	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED	Integer String String String Double String Date Double Double Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED	Integer String String String Double String Date Double Double Date	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED	Integer String String String Double String Date Double Double Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED	Integer String String String Double String Date Double Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDGITIZED DATEMODIFIED	Integer String String String Double String Date Double Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 255 8 8 8 8 8 8 8 8 8 8 8 8	-	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes	Integer String String String Double String Date Double Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled WClearWell (Simple Junction)	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled WClearWell (Simple Junction)	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT DV	D_Basin D_Status D_WaterType Domain EnabledDomain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled WClearWell (Simple Junction)	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT DV	D_Basin D_Status D_WaterType
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled WClearWell (Simple Junction)	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT DV	D_Basin D_Status D_WaterType Domain EnabledDomain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled WClearWell (Simple Junction) ( No Subtypes Field Name	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 2555 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT DV	D_Basin D_Status D_WaterType Domain EnabledDomain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled WClearWell (Simple Junction) ( No Subtypes Field Name Shape	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT DV	D_Basin D_Status D_WaterType Domain EnabledDomain
SUBTYPE ASSETID OWNER BASINID STATUS LOCATION_DESC ELEVATION WATERTYPE OPERATIONDATE SHAPE_Length SHAPE_Area DATEINSTALLED DATEDIGITIZED DATEMODIFIED WaterNetwork_Junctions (Sim No Subtypes Field Name OBJECTID SHAPE Enabled wClearWell (Simple Junction) of No Subtypes Field Name Shape OBJECTID	Integer String String String Double String Date Double Date Date Date Date Date Date Date Dat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 8 8 255 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ACT DV	D_Basin D_Status D_WaterType Domain EnabledDomain

SubType	Integer	0	0	4	1	
	0			-	1	
AssetID	Integer	0	0	4		
BasinID	String	0	0	200		
Owner	String	0	0	4		D Owner
Status	String	0	0	204		
LocationDescription	String	0	0	200		
Elevation	Double	0	0	8		
Capacity	String	0	0	20		
Depth	Integer	0	0	4		
OperatingMax	String	0	0	10		
OperatingMin	String	0	0	10		
StationID	String	0	0	20		
Diameter1	Integer	0	0	4		D AccessDiam
Diameter2	Integer	0	0	4		D AccessDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		

### wControlValve (Simple Junction) (Point) Subtype: AirGap (Subtype = 1) [Default]

Subtype: AirGap (Subtype =	1) [Default]					
Field Name	Field Type	Pre	Sc	Ler	۱DV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: AirControl (Subtyp	e = 2)					
Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	4		D Basin
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Diameter	Small Integer	0	0	2		D MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: CVAirRelease (Sub	otype = 3)					
Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
OBJECTID	OID	0	0	4		

	Shape	Geometry	0	0	0		
	AncillaryRole	Small Integer	0	0	2		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	SubType	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	4		<u>D Owner</u>
	BasinID	String	0	0	4		<u>D Basin</u>
	Status	String	0	0	4		<u>D Status</u>
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	Diameter	Small Integer	0	0	2		<u>D MainDistDiam</u>
	WaterType	String	0	0	255		<u>D WaterType</u>
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
S	ubtype: AtmosphericVacuu	m (Subtype	e = 4	4)			
	Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
	OBJECTID	OID	0	0	4		
	Shape	Geometry	0	0	0		
	AncillaryRole	Small Integer	0	0	2		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	SubType	Integer	0	0	4	1	
	AssetID	Integer	0	0	4	•	
	Owner	String	0	0	4		D_Owner
	BasinID	String	0	0	4		D_Basin
	Status	String	0	0	4		D_Status
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	Diameter	Small Integer	0	0	2		D_MainDistDiam
	WaterType	String	0	0	255		D_WaterType
	DateInstalled	Date	0	0	8		<u>D_Waterrype</u>
	Datomotalioa			0	8		
	DateDigitized	Date	()				
	DateDigitized DateModified	Date Date	0 0				
ç	DateModified	Date	0	0	8		
S	DateModified ubtype: Altitude (Subtype =	Date <b>5)</b>	0	0	8		Demain
S	DateModified ubtype: Altitude (Subtype = Field Name	Date 5) Field Type	0 Pre	0 Sc	<sup>8</sup> Ler	۱DV	Domain
S	DateModified ubtype: Altitude (Subtype = Field Name OBJECTID	Date 5) Field Type OID	0 Pre	0 Sc 0	8 Ler 4	۱DV	Domain
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape	Date <b>5)</b> Field Type OID Geometry	0 Pre 0 0	0 Sc 0 0	8 Ler 4 0	۱DV	Domain
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole	Date <b>5)</b> Field Type OID Geometry Small Integer	0 Pre 0 0 0	0 Sc 0 0 0	8 Ler 4 0 2		
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole Enabled	Date <b>5)</b> Field Type OID Geometry Small Integer Small Integer	0 Pre 0 0 0	0 Sc 0 0 0 0	8 4 0 2 2	1	Domain <u>EnabledDomain</u>
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole Enabled SubType	Date <b>5)</b> Field Type OID Geometry Small Integer Small Integer Integer	0 Pre 0 0 0 0 0	0 SC 0 0 0 0 0	8 4 0 2 2 4		
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID	Date <b>5)</b> <b>Field Type</b> OID Geometry Small Integer Integer Integer	0 Pre 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0	8 4 0 2 2 4 4	1	<u>EnabledDomain</u>
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner	Date <b>5)</b> <b>Field Type</b> OID Geometry Small Integer Small Integer Integer Integer String	0 Pre 0 0 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0 0	8 4 0 2 2 4 4 4	1	EnabledDomain
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID	Date <b>5)</b> <b>Field Type</b> OID Geometry Small Integer Small Integer Integer Integer String String	0 Pre 0 0 0 0 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0 0 0 0	8 4 0 2 2 4 4 4 4	1	EnabledDomain D_Owner D_Basin
S	DateModified <b>ubtype: Altitude (Subtype =</b> Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID Status	Date <b>5)</b> <b>Field Type</b> OID Geometry Small Integer Small Integer Integer Integer String String String	0 Pre 0 0 0 0 0 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0 0 0 0 0	8 4 0 2 2 4 4 4 4 4	1	EnabledDomain
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S	DateModified ubtype: Altitude (Subtype = Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation	Date <b>5)</b> <b>Field Type</b> OID Geometry Small Integer Small Integer Integer Integer String String String String Double Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 <b>SC</b> 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 4 0 2 2 4 4 4 4 4 4 4 200 8 8 8	1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u>
S	DateModified ubtype: Altitude (Subtype = Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation Diameter	Date <b>5)</b> <b>Field Type</b> OID Geometry Small Integer Small Integer Integer String String String String String Double Double Small Integer	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 <b>Sc</b> 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 4 0 2 2 4 4 4 4 4 4 200 8 8 2	1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u>
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	DateModified ubtype: Altitude (Subtype = Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation Diameter WaterType DateInstalled DateDigitized DateModified ubtype: BackflowControl (Section 2015)	Date <b>5)</b> Field Type OID Geometry Small Integer Integer Integer Integer String String String String String Double Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 4 0 2 2 4 4 4 4 4 4 200 8 8 2 255 8 8 8 8	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_WaterType
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	DateModified ubtype: Altitude (Subtype = Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation Diameter WaterType DateInstalled DateDigitized DateModified ubtype: BackflowControl (Section 2015)	Date <b>5)</b> Field Type OID Geometry Small Integer Integer Integer Integer String String String String String Double Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Double Small Integer String Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 4 0 2 2 4 4 4 4 4 4 200 8 8 2 255 8 8 8 8	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_WaterType
	DateModified ubtype: Altitude (Subtype = Field Name OBJECTID Shape AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation Diameter WaterType DateInstalled DateDigitized DateModified ubtype: BackflowControl (S Field Name	Date 5) Field Type OID Geometry Small Integer Small Integer Integer Integer String String String String String Double Double Small Integer String Double Small Integer String Double Double Double Date Date String String Date String String String String String String String String String Double Double String Date String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 4 2 2 4 4 4 4 4 4 200 8 8 2255 8 8 8 8 Ler	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_WaterType
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LocationDescription         String         0         0         200           Rotation         Double         0         0         8           Elevation         Double         0         0         8           Diameter         Small Integer         0         0         2         D         MainDistDiam           WaterType         String         0         0         255         D         WaterType           DateInstalled         Date         0         0         8         DateDigitized         Date         0         8           DateModified         Date         0         0         8         DateModified         Domain           OBJECTID         OID         0         0         4         Domain         Enabled           Shape         Geometry         0         0         2         1         EnabledDomain           SubType         Integer         0         0         4         1         AssettD           Marce         String         0         0         4         D_Owner           BasinD         String         0         0         4         D_Assin           Status         String         0
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Elevation         Double         0         0         8           Diameter         Small Integer         0         0         2         D.MainDistDiam           WaterType         String         0         0         255         D.WaterType           DateDigitized         Date         0         0         8         D.WaterType           DateDigitized         Date         0         0         8         D.WaterType           DateModified         Date         0         0         8         D.WaterType           BateDigitized         Date         0         0         8         D.WaterType           BateDigitized         Date         0         0         8         D.WaterType           BateDigitized         Date         0         0         4         D.MainDistDiam           OBJECTID         OID         0         0         4         D.MainDistDiam           Shape         Geometry         0         0         2         EnableDomain           Status         Small Integer         0         0         4         D.Owmer           Status         String         0         0         4         D.Status           Locati
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AncillaryRole       Small Integer       0       0       2         Enabled       Small Integer       0       0       2       1       EnabledDomain         SubType       Integer       0       0       4       1         AssetID       Integer       0       0       4       1         AssetID       Integer       0       0       4       Downer         BasinID       String       0       0       4       Destine         Status       String       0       0       4       Destine         LocationDescription       String       0       0       8       Destine         Diameter       Double       0       0       8       Destine         DatePoint       Double       0       0       8       Destine         DateInstalled       Date       0       0       8       Destine         DateModified       Date       0       0       8       Destine         DateModified       Date       0       0       8       Destine         DateModified       Date       0       0       8       Destine         OBJECTID       OID       0 </td
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AssetIDInteger004DOwnerOwnerString004DDBasinBasinIDString004DBasinStatusString004DStatusLocationDescriptionString008DStatusLocationDouble008DMainDistDiamMaterDouble0022DMainDistDiamDiameterSmall Integer008DDateMaterTypeString008DWaterTypeDateInstalledDate008DVaterTypeDateModifiedDate008DDField NameField TypePre ScLer DVDomainOBJECTIDOID0002EnabledShapeGeometry002EnabledDomainAncillaryRoleSmall Integer0021EnabledDomainSubTypeInteger00041EnabledDomain
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DateModifiedDate008Subtype: DoubleCheck (Subtype = 8)Field NameField TypePre ScLen DVDomainOBJECTIDOID0041ShapeGeometry00021AncillaryRoleSmall Integer0021EnabledDomainSubTypeInteger00411
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ShapeGeometry000AncillaryRoleSmall Integer002EnabledSmall Integer0021SubTypeInteger0041
AncillaryRoleSmall Integer002EnabledSmall Integer0021EnabledDomainSubTypeInteger0041
EnabledSmall Integer021EnabledDomainSubTypeInteger0041
SubType Integer 0 0 4 1
Owner String 0 0 4 D_Owner
BasinID String 0 0 4 D_Basin
Status String 0 0 4 D_Status
LocationDescription String 0 0 200
Rotation Double 0 0 8
Elevation Double 0 0 8
Diameter Small Integer 0 0 2 D_MainDistDiam
WaterTypeString00255D_WaterType
Water I ypeString00255D_Water I ypeDateInstalledDate008
DateInstalledDate008DateDigitizedDate008
DateInstalledDate008DateDigitizedDate008DateModifiedDate008
DateInstalledDate008DateDigitizedDate008
DateInstalledDate008DateDigitizedDate008DateModifiedDate008
DateInstalledDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)
DateInstalledDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePre ScLen DVDomain
DateInstalled         Date         0         0         8           DateDigitized         Date         0         0         8           DateModified         Date         0         0         8           Subtype: PressureVacuum (Subtype = 9)         Field Name         Field Type         Pre Sc         Len DV         Domain           OBJECTID         OID         0         0         4         0         0         4
DateInstalledDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePre ScLen DVDomainOBJECTIDOID004ShapeGeometry0000
DateInstalledDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePre ScLen DVDomainOBJECTIDOID004ShapeGeometry000AncillaryRoleSmall Integer002
DateInstalledDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePre ScLen DVDomainOBJECTIDOID004ShapeGeometry002EnabledSmall Integer0021SubTypeInteger004AssetIDInteger004
DateDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePre ScLen DVDomainOBJECTIDOID004ShapeGeometry002EnabledAncillaryRoleSmall Integer0021EnabledSmall Integer0041AssetIDInteger0041OwnerString004Downer
DateDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePre ScLen DVDomainOBJECTIDOID0041OBJECTIDOID0021EnabledAncillaryRoleSmall Integer0021EnabledDomainSubTypeInteger00411AssetIDInteger00411OwnerString004Downer1BasinIDString004D1
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DateInstalledDate008DateDigitizedDate008DateModifiedDate008Subtype: PressureVacuum (Subtype = 9)Field NameField TypePr - ScLen DVDomainOBJECTIDOID0041OBJECTIDOID0021EnabledAncillaryRoleSmall Integer0021EnabledDomainSubTypeInteger00411AssetIDInteger00411OwnerString004DownerBasinIDString004D_Basin

Elevation	Double	0	0	8	
Diameter	Small Integer	0	0	2	D MainDistDiam
WaterType	String	0	0	255	D WaterType
DateInstalled	Date	0	0	8	
DateDigitized DateModified	Date Date	0 0	0 0	8 8	
		-			
Subtype: ReducedPressure	•			•	<b>-</b> .
Field Name	Field Type				Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
AncillaryRole	Small Integer	0	0	2	
Enabled	Small Integer	0	0	2 1	<u>EnabledDomain</u>
SubType	Integer	0	0	4 1	
AssetID Owner	Integer	0 0	0 0	4 4	D. Owner
BasinID	String String	0	0	4	<u>D_Owner</u> D_Basin
Status	String	0	0	4	D_Basin D_Status
LocationDescription	String	0	0	200	<u>D_Otatus</u>
Rotation	Double	0	0	8	
Elevation	Double	0	0	8	
Diameter	Small Integer	0	0	2	D_MainDistDiam
WaterType	String	0	0	255	D_WaterType
DateInstalled	Date	0	0	8	
DateDigitized	Date	0	0	8	
DateModified	Date	0	0	8	
Subtype: RPZ (Subtype = 11	)				
Field Name	Field Type	Pre	e Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
AncillaryRole	Small Integer	0	0	2	
Enabled	Small Integer	0	0	2 1	EnabledDomain
SubType	Integer	0	0	4 1	
AssetID	Integer	0	0	4	
Owner	String	0	0	4	D_Owner
BasinID	String	0	0	4	<u>D_Basin</u>
Status	String	0	0	4	D_Status
LocationDescription	String	0	0	200	
Rotation	Double	0	0	8	
Elevation		0	0	8	D. MainDiatDiam
Diameter WeterTure	Small Integer	0 0	0 0	2	D_MainDistDiam
WaterType DateInstalled	String Date	0	0	255 8	D_WaterType
DateDigitized	-	0	0	-	
DateModified	Date Date	0	0	8	
Subtype: SimpleCheck (Sub		Ŭ	Ũ	0	
Field Name	Field Type	Dra	- Sc		Domain
OBJECTID	OID	0	0	4	Domain
Shape	Geometry	0	0	0	
AncillaryRole	Small Integer	0	0	2	
Enabled	Small Integer	õ	0	2 1	EnabledDomain
SubType	Integer	0	0	4 1	
AssetID	Integer	0	0	4	
Owner	String	0	0	4	D Owner
BasinID	String	0	0	4	<u>D Basin</u>
Status	String	0	0	4	D_Status
LocationDescription	String	0	0	200	
Rotation	Double	0	0	8	
Elevation	Double	0	0	8	
Diameter	Small Integer	0	0	2	D_MainDistDiam
WaterType	String	0	0	255	D WaterType
DateInstalled	Date	0	0	8	
DateDigitized	Date	0	0	8	

		_	_	_		
DateModified	Date	0	0	8		
Subtype: Vacuum (Subtype :	-	_	~			<b>D</b> .
Field Name	Field Type				DV	Domain
OBJECTID	OID	0	0	4		
Shape Appillan/Bolo	Geometry	0	0 0	0 2		
AncillaryRole Enabled	Small Integer Small Integer	0 0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0 0	8		
DateDigitized DateModified	Date Date	0 0	0	8 8		
Subtype: VacuumBreaker (S		-	0	0		
			0.	ا م		Domoin
Field Name	Field Type				IDV	Domain
OBJECTID	OID	0 0	0 0	4 0		
Shape AncillaryRole	Geometry Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	Enabloadonnain
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Diameter WeterTure	Small Integer	0	0	2		D_MainDistDiam
WaterType DateInstalled	String Date	0 0	0 0	255 8		D_WaterType
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: VacuumRelease (S		5)	•	-		
Field Name	Field Type	-	Sc	ا م	עם	Domain
OBJECTID	OID					Domain
Shape	Geometry	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	4		<u>D Basin</u>
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Diameter WaterType	Small Integer String	0 0	0 0	2 255		<u>D_MainDistDiam</u> D_WaterType
DateInstalled	Date	0	0	200 8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Unknown (Subtype						
Field Name	Field Type	Pre	Sc	lon	עח	Domain
OBJECTID	OID	0	0	4		Domain
		U	U	-		

Shape	Geometry	0	0	0		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	4		D Basin
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Diameter	Small Integer	0	0	2		D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		

### wFitting (Simple Junction) (Point) Subtype: Bend (Subtype = 1) [Default]

Subtype: Bend (Subtype = 1)	[Dolaan]					
Field Name	Field Type	Pre	Sc	Ler	١DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
JointType	String	0	0	20	Flange	D_JointType
Material	String	0	0	20	PVC	D_JunctionMaterial
WaterType	String	0	0	50	POT	D_WaterType
Diameter1	Small Integer	0	0	2		D_MainDistDiam
Diameter2	Small Integer	0	0	2		D_MainDistDiam
Diameter3	Small Integer	0	0	2		D_MainDistDiam
Diameter4	Small Integer	0	0	2		D_MainDistDiam
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Datemballica	Dute	0	-			
Subtype: Cap (Subtype = 2)	Dulo	Ū	-			
	Field Type	Ū	Sc	Ler	١DV	Domain
Subtype: Cap (Subtype = 2)		Ū	Sc 0	Ler	DV	Domain
Subtype: Cap (Subtype = 2) Field Name	Field Type	Pre			DV	Domain
Subtype: Cap (Subtype = 2) Field Name Shape	Field Type Geometry	Pre	0	0	nDV	Domain
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID	Field Type Geometry OID	Pre	0 0	0 4	1 DV	Domain EnabledDomain
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole	Field Type Geometry OID Small Integer	Pre 0 0	0 0 0	0 4 2		
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled	Field Type Geometry OID Small Integer Small Integer	Pre 0 0 0 0	0 0 0 0	0 4 2 2	1	
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType	Field Type Geometry OID Small Integer Small Integer Integer	Pre 0 0 0 0	0 0 0 0	0 4 2 2 4	1	
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID	Field Type Geometry OID Small Integer Small Integer Integer Integer	Pre 0 0 0 0 0 0	0 0 0 0 0	0 4 2 2 4 4	1	EnabledDomain
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner	Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0 0 0	0 0 0 0 0 0	0 4 2 2 4 4 4	1	EnabledDomain
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID	Field Type Geometry OID Small Integer Small Integer Integer Integer String String	Pre 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 4 2 4 4 4 4	1	EnabledDomain D_Owner D_Basin
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String	Pre 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4	1	EnabledDomain D_Owner D_Basin
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 200	1	EnabledDomain D_Owner D_Basin
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 200 8	1	EnabledDomain D_Owner D_Basin
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 200 8 8	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u>
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8 20	1 1 Flange	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_JointType</u>
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8 20 20	1 1 Flange PVC	EnabledDomain  D Owner D Basin D Status  D JointType D JunctionMaterial D WaterType D MainDistDiam
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8 20 20 50	1 1 Flange PVC	EnabledDomain  D_Owner D_Basin D_Status  D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
Subtype: Cap (Subtype = 2) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String String String String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 200 8 8 8 200 20 50 2 2	1 1 Flange PVC	EnabledDomain  D Owner D Basin D Status  D JointType D JunctionMaterial D WaterType D MainDistDiam

Diameter4	Small Integer	0	0	2		D MainDistDiam
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Cross (Subtype = 3						
Field Name	Field Type	Pre	Sc	Ler	۱DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin D_Status
Status	String	0 0	0 0	4 200		D_Status
LocationDescription Rotation	String Double	0	0	200		
Elevation	Double	0	0	8		
JointType	String	0	0	20	Flange	D_JointType
Material	String	0	0	20	PVC	D JunctionMaterial
WaterType	String	0	0	_0 50	POT	D_WaterType
Diameter1	Small Integer	0	0	2		D_MainDistDiam
Diameter2	Small Integer	0	0	2		D_MainDistDiam
Diameter3	Small Integer	0	0	2		D_MainDistDiam
Diameter4	Small Integer	0	0	2		D_MainDistDiam
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Coupling (Subtype	= 4)					
Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnchladDemain
	omail integer	0			-	EnabledDomain
SubType	Integer	0	0	4	1	EnabledDomain
			0 0	4 4		EnabledDomain
SubType AssetID Owner	Integer	0 0 0	0 0	4 4		D_Owner
SubType AssetID Owner BasinID	Integer Integer String String	0 0 0 0	0 0 0	4 4 4		<u>D_Owner</u> D_Basin
SubType AssetID Owner BasinID Status	Integer Integer String String String	0 0 0 0 0	0 0 0 0	4 4 4 4		D_Owner
SubType AssetID Owner BasinID Status LocationDescription	Integer Integer String String String String	0 0 0 0 0 0	0 0 0 0 0	4 4 4 4 200		<u>D_Owner</u> D_Basin
SubType AssetID Owner BasinID Status LocationDescription Rotation	Integer Integer String String String Double	0 0 0 0 0 0 0	0 0 0 0 0 0	4 4 4 200 8		<u>D_Owner</u> D_Basin
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation	Integer Integer String String String Double Double	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	4 4 4 200 8 8	1	<u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u>
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType	Integer Integer String String String String Double Double String	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20	1 Flange	D_Owner D_Basin D_Status D_JointType
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material	Integer Integer String String String Double Double String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType	Integer Integer String String String Double Double String String String	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50	1 Flange	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1	Integer Integer String String String Double Double String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 20 50 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2	Integer Integer String String String Double Double String String String String String Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 20 50 2 2 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1	Integer Integer String String String Double Double String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 20 50 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3	Integer Integer String String String Double Double String String String String Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 20 50 2 2 2 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 20 50 2 2 2 2 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 20 50 2 2 2 2 2 8	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 2 8 8 8	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified Subtype: ExpansionJoint (Su	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date Date Date Date Jate	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 2000 8 8 200 200 500 2 2 2 2 2 2 8 8 8 8 8	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified Subtype: ExpansionJoint (Set Field Name	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date Date Date Date Jbtype = 5) Field Type	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 2000 8 8 200 20 500 2 2 2 2 2 8 8 8 8 8	1 Flange PVC POT	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: ExpansionJoint (Se</b> <b>Field Name</b> Shape	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date Date Date Date Jate	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 2000 8 8 200 200 500 2 2 2 2 2 2 8 8 8 8 8	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified Subtype: ExpansionJoint (Set Field Name	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date Date Date Date <b>Jbtype = 5)</b> Field Type Geometry	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 8 8 8 8 8 8	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterIype Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: ExpansionJoint (St</b> <b>Field Name</b> Shape OBJECTID	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Small Integer Date Date Date Date Date <b>Jbtype = 5)</b> Field Type Geometry OID	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 8 8 8 8 8 Ler 0 4	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: ExpansionJoint (St</b> <b>Field Name</b> Shape OBJECTID AncillaryRole	Integer Integer String String String Double Double String String String String Small Integer Small Integer Small Integer Date Date Date Date Date <b>Jbtype = 5)</b> Field Type Geometry OID Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 8 8 8 8 8 Ler 0 4 2	flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterIype Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: ExpansionJoint (St</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled	Integer Integer String String String Double Double String String String Small Integer Small Integer Small Integer Date Date Date Date <b>Jbtype = 5)</b> Field Type Geometry OID Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 8 8 8 8 8 <b>Ler</b> 0 4 2 2	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterIype Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: ExpansionJoint (St</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType	Integer Integer String String String Double Double String String String Small Integer Small Integer Small Integer Date Date Date Date Date <b>Jbtype = 5)</b> Field Type Geometry OID Small Integer Small Integer Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 2 8 8 8 8 8 8 8 8 8 8 1 Ler 0 4 2 2 4	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterIype Diameter1 Diameter2 Diameter3 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: ExpansionJoint (St</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID	Integer Integer String String String Double Double String String String String String Small Integer Small Integer Small Integer Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 200 8 8 20 20 50 2 2 2 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8 1 4 4 2 2 4 4 4 4 4 200 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	1 Flange PVC POT	D_Owner D_Basin D_Status D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam

	Status	String	0	0	4		D Status
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	JointType	String	0	0	20	Flange	D JointType
	Material	String	0	0	20	PVC	D JunctionMaterial
	WaterType	String	0	0	50	POT	D WaterType
	Diameter1	Small Integer	0	0	2		D MainDistDiam
	Diameter2	Small Integer	0	0	2		D MainDistDiam
	Diameter3	Small Integer	0	0	2		D MainDistDiam
	Diameter4	Small Integer	0	0	2		D MainDistDiam
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
S	ubtype: Offset (Subtype = 6	)					
	Field Name	, Field Type	Dro	Sc	ا م	עחי	Domain
							Domain
	Shape	Geometry	0	0	0 4		
		OID	0	0	-		
		Small Integer	0	0	2		Excite d Deservice
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	SubType	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		D. O
	Owner	String	0	0	4		D_Owner
	BasinID	String	0	0	4		D_Basin
	Status	String	0	0	4		D_Status
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8	-	B. 1.1.7
	JointType	String	0	0	20	Flange	D_JointType
	Material	String	0	0	20	PVC	D_JunctionMaterial
	WaterType	String	0	0	50	POT	D_WaterType
	Diameter1	Small Integer	0	0	2		D_MainDistDiam
	Diameter2	Small Integer	0	0	2		D_MainDistDiam
	Diameter3	Small Integer	0	0	2		D_MainDistDiam
	Diameter4	Small Integer	0	0	2		D_MainDistDiam
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
	ubtype: Reducer (Subtype =	-					
	Field Name	Field Type	Pre	Sc	Ler	DV	Domain
	Shape	Geometry	0	0	0		
	OBJECTID	OID	~	~			
		OID	0	0	4		
	AncillaryRole	Small Integer	0 0	0	4 2		
	AncillaryRole Enabled	-	-	-		1	EnabledDomain
	-	Small Integer	0	0	2	1 1	EnabledDomain
	Enabled	Small Integer Small Integer	0 0	0 0	2 2		<u>EnabledDomain</u>
	Enabled SubType	Small Integer Small Integer Integer	0 0 0	0 0 0	2 2 4		EnabledDomain D_Owner
	Enabled SubType AssetID	Small Integer Small Integer Integer Integer	0 0 0 0	0 0 0 0	2 2 4 4		
	Enabled SubType AssetID Owner	Small Integer Small Integer Integer Integer String	0 0 0 0 0	0 0 0 0 0	2 2 4 4 4		D_Owner
	Enabled SubType AssetID Owner BasinID	Small Integer Small Integer Integer String String	0 0 0 0 0 0	0 0 0 0 0 0	2 2 4 4 4 4		<u>D_Owner</u> D_Basin
	Enabled SubType AssetID Owner BasinID Status	Small Integer Small Integer Integer String String String	0 0 0 0 0 0 0	0 0 0 0 0 0 0	2 2 4 4 4 4 4 4		<u>D_Owner</u> D_Basin
	Enabled SubType AssetID Owner BasinID Status LocationDescription	Small Integer Small Integer Integer String String String String String	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 4 200		<u>D_Owner</u> D_Basin
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation	Small Integer Small Integer Integer Integer String String String String Double	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 4 200 8		<u>D_Owner</u> D_Basin
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material	Small Integer Small Integer Integer String String String String Double Double	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 200 8 8	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType	Small Integer Small Integer Integer String String String String Double Double String String String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 200 8 8 8 20	1 Flange	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material	Small Integer Small Integer Integer String String String String Double Double String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 200 8 8 20 20 50 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType	Small Integer Small Integer Integer String String String String Double Double String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 200 8 8 20 20 50 2 2 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1	Small Integer Small Integer Integer String String String String Double Double String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 200 8 8 200 200 500 2 2 2 2 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4	Small Integer Small Integer Integer String String String Double Double String String String String String String String Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 200 8 8 8 20 20 50 2 2 2 2 2 2 2	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled	Small Integer Small Integer Integer String String String Double Double String String String String String String String Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 4 200 8 8 8 20 20 50 2 2 2 2 2 2 8	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized	Small Integer Small Integer Integer String String String Double Double String String String String String String String Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 200 8 8 20 20 50 2 2 2 2 2 2 8 8 8 8	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
	Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled	Small Integer Small Integer Integer String String String Double Double String String String String String String String Small Integer Small Integer Small Integer Small Integer Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 4 4 4 4 200 8 8 8 20 20 50 2 2 2 2 2 2 8	1 Flange PVC	D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam

Subtype: Riser (Subtype = 8	)					
Field Name	Field Type	Pre	e Sc	Ler	۱DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
JointType	String	0	0	20	Flange	D_JointType
Material	String	0	0	20	PVC	D_JunctionMaterial
WaterType	String	0	0	50	POT	D_WaterType
Diameter1 Diameter2	Small Integer	0 0	0 0	2 2		D_MainDistDiam
Diameter2 Diameter3	Small Integer Small Integer	0	0	2		D_MainDistDiam
Diameter4	Small Integer	0	0	2		<u>D_MainDistDiam</u> D_MainDistDiam
DateInstalled	Date	0	0	2		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Saddle (Subtype =		0	U	0		
	-	<b>D</b>		1		Demain
Field Name	Field Type				עטו	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole Enabled	Small Integer	0 0	0 0	2 2	1	EnchladDomain
SubType	Small Integer	0	0	2	1	EnabledDomain
AssetID	Integer Integer	0	0	4	I	
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		<u>D_olaldo</u>
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
JointType	String	0	0	20	Flange	D_JointType
Material	String	0	0	20	PVC	D_JunctionMaterial
WaterType	String	0	0	50	POT	D_WaterType
Diameter1	Small Integer	0	0	2		D_MainDistDiam
Diameter2	Small Integer	0	0	2		D_MainDistDiam
Diameter3	Small Integer	0	0	2		D_MainDistDiam
Diameter4	Small Integer	0	0	2		D_MainDistDiam
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Sleeve (Subtype =	10)					
Field Name	Field Type	Pre	Sc	Ler	۱DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	4		<u>D Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		

### Subtype: Riser (Subtype = 8)

	- ·					
JointType	String	0	0	20	Flange	<u>D_JointType</u>
Material	String	0	0	20	PVC	D JunctionMaterial
WaterType	String	0	0	50	POT	D WaterType
Diameter1	Small Integer	0	0	2		D MainDistDiam
Diameter2	Small Integer	0	0	2		D MainDistDiam
Diameter3	Small Integer	0	0	2		D MainDistDiam
Diameter4	Small Integer	0	0	2		D MainDistDiam
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Tap (Subtype = 11)						
Field Name	Field Type	Pre	Sc	Ler	۱DV	Domain
Shape	Geometry	0	0	0		Domain
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	EnabledDomain
AssetID	Integer	0	0	4	1	
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	4 200		D_Oldius
Rotation	Double	0	0	200 8		
Elevation	Double	0	0	8		
		0	0	o 20	Florgo	D. JointTurno
JointType Motorial	String				Flange PVC	D_JointType
Material	String	0 0	0 0	20 50	PVC	D_JunctionMaterial
WaterType	String		-		PUT	D_WaterType
Diameter1	Small Integer	0	0	2		D_MainDistDiam
Diameter2	Small Integer	0	0	2		D_MainDistDiam
Diameter3	Small Integer	0	0	2		D_MainDistDiam
Diameter4	Small Integer	0	0	2		D_MainDistDiam
DateInstalled	Date	0	0	8		
	Data	~	~	~		
DateDigitized	Date	0	0	8		
DateDigitized DateModified	Date	0 0	0 0	8 8		
DateDigitized DateModified Subtype: Tee (Subtype = 12)	Date	0	0	8		
DateDigitized DateModified	Date	0	0	8	۱DV	Domain
DateDigitized DateModified Subtype: Tee (Subtype = 12)	Date	0	0	8	۱DV	Domain
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name	Date Field Type	0 Pre	0 Sc	<sup>8</sup> Ler	۱DV	Domain
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape	Date Field Type Geometry	0 Pre	0 e Sc 0	8 Ler	۱DV	Domain
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID	Date Field Type Geometry OID	0 Pre 0 0	0 e Sc 0 0	8 Ler 0 4	DV 1	Domain <u>EnabledDomain</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole	Date Field Type Geometry OID Small Integer	0 Pre 0 0 0	0 e Sc 0 0 0	8 Ler 0 4 2		
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled	Date Field Type Geometry OID Small Integer Small Integer	0 Pre 0 0 0	0 e Sc 0 0 0 0	8 Ler 0 4 2 2	1	
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType	Date Field Type Geometry OID Small Integer Small Integer Integer	0 Pre 0 0 0 0 0	0 <b>Sc</b> 0 0 0 0 0	8 Ler 0 4 2 2 4	1	
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID	Date Field Type Geometry OID Small Integer Small Integer Integer Integer	0 Pre 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4	1	<u>EnabledDomain</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String	0 Pre 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0	8 0 4 2 2 4 4 4	1	EnabledDomain D_Owner
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID	Date Field Type Geometry OID Small Integer Small Integer Integer String String	0 Pre 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4	1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status	Date Field Type Geometry OID Small Integer Small Integer Integer String String String String	0 Pre 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 0 4 2 2 4 4 4 4 4	1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 200	1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 0 4 2 2 4 4 4 4 4 200 8	1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 <b>Sc</b> 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 8	1 1	EnabledDomain D_Owner D_Basin D_Status
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 <b>Sc</b> 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 20	1 1 Flange	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_JointType</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String String String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 20 20	1 1 Flange PVC	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_JointType</u> <u>D_JunctionMaterial</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String String String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 200 8 8 20 20 50	1 1 Flange PVC	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String String String String String String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 20 20 50 2	1 1 Flange PVC	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u>
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String String String String String String String String String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2	1 1 Flange PVC	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2	1 1 Flange PVC	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 2 2	1 1 Flange PVC	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 5 5 5 5 5 5 5 5 5 5 5 5 5	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 2 8	1 1 Flange PVC	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified <b>Subtype: Tee (Subtype = 12)</b> Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String String String String String String String String String String String String String String String Double Double Double Double String String String String String String String Double Double Double Double String String String String String String String String String String Double Double Double Double String String String String String String String String String String String String String String String String Double Double Double Double Double Double Double String	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 SC 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 2 8 8	1 1 Flange PVC	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified <b>Subtype: Tee (Subtype = 12)</b> Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Weld (Subtype = 1</b> )	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String Strin	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 8 8 8 8 8	1 1 Flange PVC POT	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified <b>Subtype: Tee (Subtype = 12)</b> Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Weld (Subtype = 13</b> Field Name	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String Strin	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 8 8 8 8 Ler	1 1 Flange PVC POT	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified Subtype: Tee (Subtype = 12) Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified Subtype: Weld (Subtype = 13)	Date Field Type Geometry OID Small Integer Integer Integer Integer String Str	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 8 8 8 8 Ler 0 0 4 2 2 4 4 4 4 4 2 2 0 2 8 8 2 2 2 2 9 4 2 9 9 9 9 9 9 9 9 9 9 9 9 9	1 1 Flange PVC POT	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
DateDigitized DateModified <b>Subtype: Tee (Subtype = 12)</b> Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Weld (Subtype = 13</b> Field Name	Date Field Type Geometry OID Small Integer Small Integer Integer Integer String Strin	0 Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 Ler 0 4 2 2 4 4 4 4 4 4 4 200 8 8 20 20 50 2 2 2 2 8 8 8 8 Ler	1 1 Flange PVC POT	EnabledDomain D_Owner D_Basin D_Status D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam

AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
SubType	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		<u>D Owner</u>
BasinID	String	0	0	4		D Basin
Status	String	0	0	4		<u>D Status</u>
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		D. IsistTure
JointType	String	0 0	0 0	20 20	Flange PVC	<u>D_JointType</u> D_JunctionMaterial
Material	String	0	0	20 50	POT	
WaterType Diameter1	String Small Integer	0	0	50 2	PUI	<u>D WaterType</u> D MainDistDiam
Diameter2	Small Integer	0	0	2		<u>D</u> MainDistDiam
Diameter3	Small Integer	0	0	2		<u>D</u> MainDistDiam
Diameter4	Small Integer	0	0	2		D MainDistDiam
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Wye (Subtype = 14)						
Field Name	Field Type	Dro	Sc	Lor		Domain
	Geometry	0	0	0		Domain
Shape OBJECTID	OID	0	0	0 4		
	-		0	4 2		
AncillaryRole Enabled	Small Integer	0	0	2	1	EnchladDomain
SubType	Small Integer Integer	0 0	0	2 4	1	EnabledDomain
AssetID	Integer	0	0	4	1	
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
	0			-		
Status	String	()	()	4		
Status LocationDescription	String String	0 0	0	4 200		D_Status
LocationDescription	String	0	0	200		<u>D_Status</u>
	0			-		
LocationDescription Rotation	String Double	0 0	0 0	200 8	Flange	D_JointType
LocationDescription Rotation Elevation	String Double Double	0 0 0	0 0 0	200 8 8	Flange PVC	
LocationDescription Rotation Elevation JointType	String Double Double String	0 0 0 0	0 0 0 0	200 8 8 20	0	D_JointType
LocationDescription Rotation Elevation JointType Material	String Double Double String String	0 0 0 0 0	0 0 0 0 0	200 8 8 20 20	PVC	<u>D_JointType</u> D_JunctionMaterial
LocationDescription Rotation Elevation JointType Material WaterType	String Double Double String String String	0 0 0 0 0 0	0 0 0 0 0 0	200 8 8 20 20 50	PVC	<u>D_JointType</u> D_JunctionMaterial D_WaterType
LocationDescription Rotation Elevation JointType Material WaterType Diameter1	String Double Double String String String Small Integer	0 0 0 0 0 0 0	0 0 0 0 0 0 0	200 8 8 20 20 50 2	PVC	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2	String Double Double String String String Small Integer Small Integer	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2	PVC	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3	String Double Double String String String Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2	PVC	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized	String Double Double String String String Small Integer Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 2 2	PVC	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified	String Double Double String String String Small Integer Small Integer Small Integer Small Integer Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 2 8	PVC	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized	String Double Double String String String Small Integer Small Integer Small Integer Small Integer Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 2 8 8 8	PVC	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified	String Double Double String String String Small Integer Small Integer Small Integer Small Integer Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 2 8 8 8 8	PVC POT	<u>D_JointType</u> <u>D_JunctionMaterial</u> <u>D_WaterType</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified Subtype: Unknown (Subtype	String Double Double String String Small Integer Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 2 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified Subtype: Unknown (Subtype Field Name	String Double Double String String Small Integer Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> Field Name Shape	String Double Double String String Small Integer Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> Field Name Shape OBJECTID	String Double Double String String Small Integer Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8 4	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> Field Name Shape OBJECTID AncillaryRole	String Double Double String String Small Integer Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> Field Name Shape OBJECTID AncillaryRole Enabled	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateIngitized DateDigitized DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> Field Name Shape OBJECTID AncillaryRole Enabled SubType	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Small Integer Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Small Integer Integer Integer String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> Field Name Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Small Integer Integer Integer String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam Domain EnabledDomain D_Owner
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription	String Double Double String String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Integer Integer String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Integer Integer String String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	PVC POT	D_JointType D_JunctionMaterial D_WaterType D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam D_MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Integer Integer String String String Double Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2000 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 8 4 4 4 4 4 4 4 4 4	PVC POT	D JointType D JunctionMaterial D WaterType D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Integer Integer String String String Double Double String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2000 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 4 4 4 4 4 4 4 4 4 4	PVC POT	D JointType D JunctionMaterial D WaterType D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType Material	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Integer Integer String String String Double Double String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 20 20 50 2 2 2 8 8 8 8 8 2 2 4 4 4 4 4 4 4 4 4 2 20 8 8 8 20 2 2 2 2 8 8 8 8 8 8 20 2 2 2 2	PVC POT 1 1 Flange PVC	D JointType D JunctionMaterial D WaterType D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam
LocationDescription Rotation Elevation JointType Material WaterType Diameter1 Diameter2 Diameter3 Diameter4 DateInstalled DateDigitized DateModified <b>Subtype: Unknown (Subtype</b> <b>Field Name</b> Shape OBJECTID AncillaryRole Enabled SubType AssetID Owner BasinID Status LocationDescription Rotation Elevation JointType	String Double Double String String Small Integer Small Integer Small Integer Date Date Date <b>= 99)</b> Field Type Geometry OID Small Integer Integer Integer String String String Double Double String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2000 8 8 20 20 50 2 2 2 2 8 8 8 8 8 8 4 4 4 4 4 4 4 4 4 4	PVC POT	D JointType D JunctionMaterial D WaterType D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam D MainDistDiam

	Diameter2	Small Integer	0	0	2		D MainDistDiam
	Diameter3	Small Integer	0	0	2		D MainDistDiam
	Diameter4	Small Integer	0	0	2		D MainDistDiam
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
-							
	ravityMain (Complex Edge)						
S	ubtype: Carrier (Subtype =	1) [Default]					
	Field Name	Field Type	Pre	Sc	Ler	DV	Domain
	OBJECTID	OID	0	0	4		
	Shape	Geometry	0	0	0		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	Subtype	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	200		<u>D_Owner</u>
	BasinID	String	0	0	4		D_Basin
	Status	String	0	0	4		<u>D_Status</u>
	FlowMeasurementID Material	String String	0 0	0 0	255	PVC	D Motori in Motorial
	ExteriorCoating	String	0	0	202	FVC	D_WaterLineMaterial
	JointType1	String	0	0	20	Flange	D_JointType
	JointType2	String	0	0	20	Flange	D_JointType
	LiningType	String	0	0	20	. lange	<u></u>
	PipeClass	String	0	0	20		
	BarrelCount	Integer	0	0	4		
	UpstreamInvert	Double	0	0	8		
	DownstreamInvert	Double	0	0	8		
	Slope	Double	0	0	8		
	Measurement1	Small Integer	0	0	2	12	D_MainDistDiam
	Measurement2	Small Integer	0	0	2	12	D_MainDistDiam
	NominalDiameter	Small Integer	0	0	2	12	D_MainDistDiam
	FrictionFactor	Double	0	0	8		
	CrossSectionShape	String	0	0	20		D_GravityMainShapes
	WaterType Shape_Length	String Double	0 0	0 0	20 8		
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
S	ubtype: InlineStorage (Subt	type = 2)					
	Field Name	Field Type	Pre	Sc	Ler	DV	Domain
	OBJECTID	OID					
	Shape	Geometry	0	0	0		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	Subtype	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	200		D_Owner
	BasinID	String	0	0	4		<u>D Basin</u>
	Status	String	0	0	4		<u>D Status</u>
	FlowMeasurementID	String	0	0	255		
	Material	String	0 0	0		PVC	D_WaterLineMaterial
	ExteriorCoating JointType1	String String	0	0 0	20 20	Flange	D JointType
	JointType2	String	0	0	20	Flange	D JointType
	LiningType	String	0	0	20	riunge	<u>D domerype</u>
	PipeClass	String	0	0	20		
	BarrelCount	Integer	0	0	4		
	UpstreamInvert	Double	0	0	8		
	DownstreamInvert	Double	0	0	8		
	Slope	Double	0	0	8		
	Measurement1	Small Integer	0	0	2	12	D MainDistDiam
	Measurement2	Small Integer	0	0	2	12	D_MainDistDiam

NominalDiameter	Small Integer	0	0	2	12	D MainDistDiam
FrictionFactor	Double	0	0	8		
CrossSectionShape	String	0	0	20		D GravityMainShapes
WaterType	String	0	0	20		
Shape_Length	Double	0	0	8		
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: TransportPipe (Sub	•••					
Field Name	Field Type	Pre	Sc	Len	DV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
Enabled	Small Integer	0	0	2	1	<b>EnabledDomain</b>
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	200		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
FlowMeasurementID	String	0	0	255		
Material	String	0	0	255	PVC	D_WaterLineMaterial
ExteriorCoating	String	0	0	20		
JointType1	String	0	0	20	Flange	D_JointType
JointType2	String	0	0	20	Flange	D_JointType
LiningType	String	0	0	20		
PipeClass	String	0	0	20		
BarrelCount	Integer	0	0	4		
UpstreamInvert	Double	0	0	8		
DownstreamInvert	Double	0	0	8		
Slope	Double	0	0	8		
Measurement1	Small Integer	0	0	2	12	D_MainDistDiam
Measurement2	Small Integer	0	0	2	12	D_MainDistDiam
NominalDiameter	Small Integer	0	0	2	12	D_MainDistDiam
FrictionFactor	Double	0	0	8		
CrossSectionShape	String	0	0	20		D_GravityMainShapes
WaterType	String	0	0	20		
Shape_Length	Double	0	0	8		
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8 8		
DateModified	Date	0	0	0		
Subtype: Unknown (Subtype	= 99)	-				
		-			DV	Domain
Subtype: Unknown (Subtype	= 99)	-			DV	Domain
Subtype: Unknown (Subtype Field Name	<b>= 99)</b> Field Type	Pre	Sc	Len	DV	Domain
Subtype: Unknown (Subtype Field Name OBJECTID	= 99) Field Type OID Geometry Small Integer	Pre	Sc 0	Len 4 0 2	1 DV	Domain EnabledDomain
Subtype: Unknown (Subtype Field Name OBJECTID Shape	<b>= 99)</b> Field Type OID Geometry	Pre 0	e Sc 0 0	Len 4 0		
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled	= 99) Field Type OID Geometry Small Integer	Pre 0 0	e Sc 0 0 0	Len 4 0 2	1	
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype	<b>= 99)</b> Field Type OID Geometry Small Integer Integer	Pre 0 0 0 0	e Sc 0 0 0 0	Len 4 0 2 4	1	
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID	= 99) Field Type OID Geometry Small Integer Integer Integer String String	Pre 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4	1	EnabledDomain D_Owner D_Basin
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String	Pre 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4	1	EnabledDomain
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String	Pre 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255	1 1	EnabledDomain D_Owner D_Basin D_Status
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 255 255	1	EnabledDomain D_Owner D_Basin
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 255 255 20	1 1 PVC	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 255 255 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 255 20 20 20 20	1 1 PVC	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<ul> <li>Sc</li> <li>0</li> <li>0</li></ul>	Len 4 0 2 4 4 200 4 4 255 200 20 20 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 255 20 20 20 20 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass BarrelCount	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String Integer	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 205 20 20 20 20 20 20 4	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass BarrelCount UpstreamInvert	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String String String Ditional String S	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 205 20 20 20 20 20 4 8	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass BarrelCount UpstreamInvert DownstreamInvert	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String String Ditring String String String Ditring S	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 205 20 20 20 20 20 20 4 8 8	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass BarrelCount UpstreamInvert DownstreamInvert Slope	<b>= 99)</b> <b>Field Type</b> OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String String String String String Distring String Double Double Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 20 20 20 20 20 20 20 4 8 8 8 8	1 1 PVC Flange Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType
Subtype: Unknown (Subtype Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass BarrelCount UpstreamInvert DownstreamInvert	<b>= 99)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String String Ditring String String String Ditring S	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Len 4 0 2 4 4 200 4 4 255 205 20 20 20 20 20 20 4 8 8	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType

NominalDiameter	Small Integer	0	0	2	12	D MainDistDiam
FrictionFactor	Double	0	0	8		
CrossSectionShape	String	0	0	20		D GravityMainShapes
WaterType	String	0	0	20		D WaterType
Shape_Length	Double	0	0	8		
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		

# wHydrant (Simple Junction) (Point) No Subtypes

Ν	o Subtypes						
	Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
	Shape	Geometry	0	0	0		
	OBJECTID	OID	0	0	4		
	AncillaryRole	Small Integer	0	0	2		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	Subtype	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	4		D_Owner
	BasinID	String	0	0	4		D_Basin
	Status	String	0	0	4		D_Status
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	MainValveType	String	0	0	20		
	OutletConfiguration	String	0	0	20		
	SeatDiameter	Integer	0	0	4		
	BarrellDiameter	Small Integer	0	0	2	10	D_MainDistDiam
	NozzleDiameter1	Small Integer	0	0	2	4	D_MainDistDiam
	NozzleDiameter2	Small Integer	0	0	2	4	D_MainDistDiam
	NozzleDiameter3	Small Integer	0	0	2		D_MainDistDiam
	NozzleDiameter4	Small Integer	0	0	2		D_MainDistDiam
	WaterType	String	0	0	255		D_WaterType
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		

## wLateralLine (Complex Edge) (Polyline)

### wLateralPoint (Simple Junction) (Point)

	<b>``</b>	, , ,					
No	Subtypes						
F	ield Name	Field Type	Pre	Sc	Ler	۱DV	Domain
S	hape	Geometry	0	0	0		
С	BJECTID	OID	0	0	4		
A	ncillaryRole	Small Integer	0	0	2		
E	nabled	Small Integer	0	0	2	1	EnabledDomain
S	ubtype	Integer	0	0	4	1	
A	ssetID	Integer	0	0	4		
С	Owner	String	0	0	4		D_Owner
В	asinID	String	0	0	4		<u>D_Basin</u>
S	itatus	String	0	0	4		D_Status
L	ocationDescription	String	0	0	200		
R	lotation	Double	0	0	8		
E	levation	Double	0	0	8		
A	ccountID	String	0	0	20		
С	CriticalCustomer	Small Integer	0	0	2	0	D_Boolean
V	VaterType	String	0	0	255		D_WaterType
D	DateInstalled	Date	0	0	8		
D	DateDigitized	Date	0	0	8		
D	DateModified	Date	0	0	8		

No Subtypes						
Field Name	Field Type	Pre	Sc	Len	DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
AccessDiameter	Integer	0	0	4	36	D_AccessDiam
AccessType	String	0	0	20	Cover	D_AccessType
GroundType	String	0	0	20		
HighPipeElevation	Double	0	0	8		
InteriorDrop	Small Integer	0	0	2		
InvertElevation	Double	0	0	8		
Wallmaterial	String	0	0	20		
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		

# wManhole (Simple Junction) (Point)

#### wMeter (Simple Junction) (Point) Subtype: Compound (Subtype = 1) [Default]

Subtype. Compound (Subty		aun	1			
Field Name	Field Type	Pre	Sc	Ler	DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Current (Subtype =	: 2)					
Field Name	Field Type	Pre	Sc	Ler	DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status

LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		
Diameter	Small Integer	0	0	2		D MainDistDiam
WaterType	String	0	0	255		<u>D WaterType</u>
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: DetectorCheck (Su	btype = 3)					
Field Name	Field Type	Pre	Sc	Lei	nDV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: MagneticOrifice (S	ubtype = 4)					
	••••••	Pre	Sc	Lei	n DV	Domain
Field Name	Field Type				nDV	Domain
Field Name Shape	Field Type Geometry	Pre 0	0	Lei 0 4	nDV	Domain
Field Name Shape OBJECTID	Field Type Geometry OID	0		0	nDV	Domain
Field Name Shape	Field Type Geometry OID Small Integer	0 0	0 0	0 4	n DV	
Field Name Shape OBJECTID AncillaryRole	Field Type Geometry OID	0 0 0	0 0 0	0 4 2		Domain EnabledDomain
Field Name Shape OBJECTID AncillaryRole Enabled	Field Type Geometry OID Small Integer Small Integer	0 0 0	0 0 0 0	0 4 2 2	1	
Field Name Shape OBJECTID AncillaryRole Enabled Subtype	Field Type Geometry OID Small Integer Small Integer Integer	0 0 0 0	0 0 0 0	0 4 2 2 4	1	
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID	Field Type Geometry OID Small Integer Small Integer Integer Integer	0 0 0 0 0	0 0 0 0 0	0 4 2 2 4 4	1	EnabledDomain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner	Field Type Geometry OID Small Integer Small Integer Integer Integer String	0 0 0 0 0 0	0 0 0 0 0 0	0 4 2 4 4 4	1	EnabledDomain D_Owner
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID	Field Type Geometry OID Small Integer Small Integer Integer Integer String String	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 4 2 4 4 4 4	1 1	EnabledDomain D_Owner D_Basin
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status	Field Type Geometry OID Small Integer Small Integer Integer Integer String String	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4	1 1	EnabledDomain D_Owner D_Basin
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200	1 1	EnabledDomain D_Owner D_Basin
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8	1 1	EnabledDomain D_Owner D_Basin
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8	1 1	EnabledDomain D_Owner D_Basin
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8 20	1 1	EnabledDomain D_Owner D_Basin
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate	Field Type Geometry OID Small Integer Integer Integer String String String String String Double Double String Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 200 8 8 20 8	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter	Field Type Geometry OID Small Integer Integer Integer String String String String Double Double String Date Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 200 8 8 20 8 20	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType	Field Type Geometry OID Small Integer Integer Integer String String String String Double Double String Date Small Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 200 8 2255	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled	Field Type Geometry OID Small Integer Small Integer Integer String String String String Double Double String Date Small Integer String Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 2000 8 8 200 8 20 8 2255 8	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized	Field Type Geometry OID Small Integer Small Integer Integer String String String String Double Double String Date Small Integer String Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 200 8 8 200 8 200 8 2255 8 8 8	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Pito (Subtype = 5)	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String Double Double String Date Small Integer String Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8	1	EnabledDomain          D_Owner         D_Basin         D_Status
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Pito (Subtype = 5)</b> Field Name	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String Double Double String Date Small Integer String Date Small Integer String Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 2	1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Pito (Subtype = 5) Field Name Shape	Field Type Geometry OID Small Integer Integer Integer Integer String String Double Double String Date Small Integer String Date String Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 2 2555 8 8 8 8 0	1	EnabledDomain          D_Owner         D_Basin         D_Status
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Pito (Subtype = 5) Field Name Shape OBJECTID	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 8 9 4	1	EnabledDomain          D_Owner         D_Basin         D_Status
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Pito (Subtype = 5)</b> Field Name Shape OBJECTID AncillaryRole	Field Type Geometry OID Small Integer Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 2 2555 8 8 8 8 0	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_WaterType Domain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Pito (Subtype = 5)</b> Field Name Shape OBJECTID AncillaryRole Enabled	Field Type Geometry OID Small Integer Integer Integer String String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 2255 8 8 8 2 255 8 8 8 2 255 8 8 2 255 8 8 8 2 2 2 5 5 8 8 2 2 2 2	1	EnabledDomain          D_Owner         D_Basin         D_Status
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Pito (Subtype = 5)</b> Field Name Shape OBJECTID AncillaryRole	Field Type Geometry OID Small Integer Integer Integer String String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 2 2555 8 8 8 8 2 2555 8 8 8 2 2 2 5 5 8 8 8 2 2 2 2	1 1 n DV	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_WaterType Domain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Pito (Subtype = 5)</b> Field Name Shape OBJECTID AncillaryRole Enabled Subtype	Field Type Geometry OID Small Integer Integer Integer String String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 2 2555 8 8 8 8 2 2555 8 8 8 2 2 4 4 4 4 4 2 2 4 4 4 4 4 4 2 2 4	1 1 n DV	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_WaterType Domain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Pito (Subtype = 5)</b> Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID	Field Type Geometry OID Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 2 2555 8 8 8 8 2 255 8 8 8 8	1 1 n DV	EnabledDomain D. Owner D. Basin D. Status D. MainDistDiam D. WaterType Domain EnabledDomain

		_	_			
Status	String	0	0	4		<u>D Status</u>
LocationDescription	String	0	0	200		
Rotation	Double Double	0 0	0	8 8		
Elevation FlowRange	String	0	0 0	° 20		
MeasurementDate	Date	0	0	20 8		
Diameter	Small Integer	0	0	2		D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		<u>D Water Type</u>
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Proportional (Subt	vpe = 6)					
Field Name	Field Type	Pre	Sc	l ei	nDV	Domain
Shape	Geometry	0	0	0		2 01110
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: PositiveDisplacem	ent (Subtyr	e =	()			
Subtype: PositiveDisplacem			-			
Field Name	Field Type	Pre	Sc		nDV	Domain
Field Name Shape	Field Type Geometry	Pre 0	e Sc	0	n DV	Domain
Field Name Shape OBJECTID	Field Type Geometry OID	Pre 0 0	9 Sc 0 0	0 4	nDV	Domain
Field Name Shape OBJECTID AncillaryRole	Field Type Geometry OID Small Integer	Pre 0 0 0	e Sc 0 0 0	0 4 2		
Field Name Shape OBJECTID AncillaryRole Enabled	Field Type Geometry OID Small Integer Small Integer	Pre 0 0 0 0	9 Sc 0 0 0 0	0 4 2 2	1	Domain EnabledDomain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype	Field Type Geometry OID Small Integer Small Integer Integer	Pre 0 0 0 0 0	8 Sc 0 0 0 0 0	0 4 2 2 4		
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID	Field Type Geometry OID Small Integer Small Integer Integer Integer	Pre 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0	0 4 2 2 4 4	1	EnabledDomain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner	Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0	0 4 2 2 4 4 4	1	<u>EnabledDomain</u> D_Owner
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID	Field Type Geometry OID Small Integer Small Integer Integer Integer String String	Pre 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4	1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String	Pre 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4	1 1	<u>EnabledDomain</u> D_Owner
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8 20	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 200 8 8 20 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u>
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter	Field Type Geometry OID Small Integer Integer Integer String String String String String Double Double String Date Small Integer	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 200 8 8 20 8 20	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType	Field Type Geometry OID Small Integer Integer Integer String String String String Double Double String Date Small Integer String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 2000 8 8 200 8 208 2255	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled	Field Type Geometry OID Small Integer Integer Integer String String String String Double Double String Date Small Integer String Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 4 2000 8 8 200 8 2255 8	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized	Field Type Geometry OID Small Integer Small Integer Integer String String String String Double Double String Date Small Integer String Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 200 8 8 200 8 200 8 2255 8 8 8	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified	Field Type Geometry OID Small Integer Small Integer Integer String String String String Double Double String Date Small Integer String Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 2000 8 200 8 200 8 2255 8 8 8 8 8	1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8	Field Type Geometry OID Small Integer Small Integer Integer Integer String String String Double Double Double String Date Small Integer String Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 2000 8 200 8 200 8 2255 8 8 8 8 8	1	EnabledDomain  D_Owner  D_Basin  D_Status  D_MainDistDiam  D_WaterType
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8 Field Name	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	Pre	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 2	1	EnabledDomain  D_Owner  D_Basin  D_Status  D_MainDistDiam  D_WaterType
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8 Field Name Shape	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 1 Leit 0	1	EnabledDomain  D_Owner  D_Basin  D_Status  D_MainDistDiam  D_WaterType
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8 Field Name Shape OBJECTID	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 9 4	1	EnabledDomain  D_Owner  D_Basin  D_Status  D_MainDistDiam  D_WaterType
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8 Field Name Shape OBJECTID AncillaryRole	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 2 2555 8 8 8 0 4 2	1 1	EnabledDomain  D_Owner D_Basin D_Status  D_MainDistDiam D_WaterType  Domain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 4 4 2000 8 8 200 8 2255 8 8 8 8 8 8 8 2 2555 8 8 8 8 2 2555 8 8 8 8	1 1 n DV	EnabledDomain  D_Owner D_Basin D_Status  D_MainDistDiam D_WaterType  Domain  EnabledDomain
Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation FlowRange MeasurementDate Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Sonic (Subtype = 8 Field Name Shape OBJECTID AncillaryRole Enabled Subtype	Field Type Geometry OID Small Integer Small Integer Integer Integer String String Double Double String Date Small Integer String Date Date Date Date Date Date Date Date	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 4 4 4 4 4 4 4 200 8 8 20 8 2255 8 8 8 2255 8 8 8 2 255 8 8 8 2 255 8 8 8 2 255 8 8 8 2 2 4 4 4 4 2 2 4 4 4 4 2 2 4 4 4 4	1 1 n DV	EnabledDomain  D_Owner D_Basin D_Status  D_MainDistDiam D_WaterType  Domain

BasinID	String	0	0	4		D Basin
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		D. M. ( D) (D)
	Small Integer	0	0	2		D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Venturi (Subtype =		_	~		5.7	<b>.</b> .
Field Name	Field Type				١DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Uknown (Subtype =	= 99)					
Field Name	Field Type	Pre	Sc	Ler	١DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
FlowRange	String	0	0	20		
MeasurementDate	Date	0	0	8		
Diameter	Small Integer	0	0	2		D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
NotworkStructure (Simple Ju	notion) (Pa	int)				

# wNetworkStructure (Simple Junction) (Point)

# Subtype: EnclosedStorageFacility (Subtype = 1) [Default]

Field Name	Field Type	Pre	Sc	Len DV	Domain
Shape	Geometry	0	0	0	
OBJECTID	OID	0	0	4	
AncillaryRole	Small Integer	0	0	2	

Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	String	0	0	20		
Owner	String	0	0	200		<u>D Owner</u>
BasinID	String	0	0	200		<u>D Basin</u>
Status	String	0	0	20		<u>D Status</u>
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Name	String	0	0	20		
OperationalDate	Date	0	0	8		
ReferenceID	String	0	0	20		
Source	String	0	0	20		
NetworkUsage	String	0	0	20		D NetworkStructureUsage
NetworkOID	Integer	0	0	4		
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: ProductionWell (S	Subtype = 2)					
Field Name	Field Type	Pr	e Sc	l er	υDV	Domain
Shape	Geometry	0	0	0		Bornain
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
	•	0	0	2	1	EnabledDomain
Subtype AssetID	Integer String	0	0	4 20	I	
Owner	0	0	0			D. Owner
	String			200		D_Owner D_Desire
BasinID	String	0	0	200		D_Basin
Status	String	0	0	20		<u>D_Status</u>
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Name	String	0	0	20		
OperationalDate	Date	0	0	8		
ReferenceID	String	0	0	20		
Source	String	0	0	20		
NetworkUsage	String	0	0	20		D_NetworkStructureUsage
NetworkOID	Integer	0	0	4		
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: PumpStation (Sub	otype = 3)					
Field Name	Field Type	Pr	e Sc	Ler	١DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	String	0	0	- 20	•	
Owner	String	0	0	200		D_Owner
BasinID	String	0	0	200		<u>D_Basin</u>
Status	String	0	0	200		D_Status
LocationDescription	String	0	0	200		<u>D_010100</u>
Rotation	Double	0	0	200 8		
Elevation	Double	0	0	o 8		
				8 20		
Namo		0	0			
Name OperationalDate	String	0	0	0		
OperationalDate	Date	0	0	8 20		
OperationalDate ReferenceID	Date String	0	0	20		
OperationalDate	Date					D_NetworkStructureUsage

NetworkOID	Integer	0	0	4		
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: StorageBasin (Sub	type = 4)					
Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	String	0	0	20		
Owner	String	0	0	200		D_Owner
BasinID	String	0	0	200		<u>D_Basin</u>
Status	String	0	0	20		<u>D_Status</u>
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Name	String Date	0 0	0 0	20 8		
OperationalDate ReferenceID	String	0	0	20		
Source	String	0	0	20		
NetworkUsage	String	0	0	20		D_NetworkStructureUsage
NetworkOID	Integer	0	0	4		<u>D_Hotmontondotaroobago</u>
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: TreatmentPlant (Su	btype = 5)					
Field Name	Field Type	Pre	Sc	Ler	١DV	Domain
Shape	Geometry	0	0	0		Domain
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	String	0	0	20		
Owner	String	0	0	200		D_Owner
BasinID	String	0	0	200		<u>D_Basin</u>
Status	String	0	0	20		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
Name OperationalDate	String	0	0	20		
ReferenceID	Date String	0 0	0 0	8 20		
Source	String	0	0	20		
NetworkUsage	String	0	0	20		D_NetworkStructureUsage
NetworkOID	Integer	0	0	4		<u>B_NetworkOlldolarcosage</u>
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Unknown (Subtype	= 99)					
Field Name	, Field Type	Pre	Sc	l er	υDV	Domain
Shape	Geometry	0	0	0		Domain
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	String	0	0	20		
Owner	String	0	0	200		D_Owner

String	0	0	200	<u>D Basin</u>
String	0	0	20	D Status
String	0	0	200	
Double	0	0	8	
Double	0	0	8	
String	0	0	20	
Date	0	0	8	
String	0	0	20	
String	0	0	20	
String	0	0	20	D NetworkStructureUsage
Integer	0	0	4	
String	0	0	255	D WaterType
Date	0	0	8	
Date	0	0	8	
Date	0	0	8	
	String String Double Double String Date String String Integer String Date Date Date	String0String0Double0Double0String0String0String0String0Integer0String0Date0Date0Date0	String00String00Double00Double00String00String00String00String00String00String00String00Date00Date00Date00	String         0         0         20           String         0         0         200           Double         0         0         8           Double         0         0         8           String         0         0         20           Date         0         0         8           String         0         0         20           Integer         0         0         4           String         0         0         255           Date         0         0         8

#### wPressurizedMain (Complex Edge) (Polyline) Subtype: BlowOff (Subtype = 1) [Default]

Subtype: BlowOff (Subtype = 1) [Default]									
Field Name	Field Type	Pre	Sc	Len	DV	Domain			
OBJECTID	OID	0	0	4					
Shape	Geometry	0	0	0					
Enabled	Small Integer	0	0	2	1	EnabledDomain			
Subtype	Integer	0	0	4	1				
AssetID	Integer	0	0	4					
Owner	String	0	0	4		D_Owner			
BasinID	String	0	0	4		D_Basin			
Status	String	0	0	4		D_Status			
FlowMeasurementID	String	0	0	255					
Material	String	0	0	255	PVC	D_WaterLineMaterial			
ExteriorCoating	String	0	0	20					
JointType1	String	0	0	20	Flange	D_JointType			
JointType2	String	0	0	20	Flange	D_JointType			
LiningType	String	0	0	20	-				
PipeClass	String	0	0	20					
Roughness	Double	0	0	8					
Depth	Integer	0	0	4					
GroundSurfaceType	String	0	0	20					
PressureRating	String	0	0	20					
Shape_Length	Double	0	0	8					
Diameter	Small Integer	0	0	2	12	D_MainDistDiam			
WaterType	String	0	0	255		D_WaterType			
DateInstalled	Date	0	0	8					
Dateinstalleu	Dale	0							
DateDigitized	Date	0	0	8					
DateDigitized DateModified	Date Date	0	0	8					
DateDigitized	Date Date <b>2)</b>	0 0	0 0	8 8	DV	Domain			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name	Date Date <b>2)</b> Field Type	0 0 Pre	0 0 9 Sc	8 8 Len	DV	Domain			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID	Date Date <b>2)</b> Field Type OID	0 0 Pre	0 0 <b>Sc</b> 0	8 8 Len 4	DV	Domain			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape	Date Date <b>2)</b> Field Type OID Geometry	0 0 Pre 0 0	0 0 <b>Sc</b> 0 0	8 8 Len 4 0					
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled	Date Date <b>2)</b> Field Type OID Geometry Small Integer	0 0 Pre 0 0 0	0 0 <b>Sc</b> 0 0	8 8 Len 4 0 2	1 1	Domain <u>EnabledDomain</u>			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer	0 0 Pre 0 0 0	0 0 0 0 0 0 0	8 8 Len 4 0	1				
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer	0 0 Pre 0 0 0 0 0	0 0 0 0 0 0 0 0	8 8 4 0 2 4 4	1	EnabledDomain			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4	1	EnabledDomain D. Owner			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String	0 0 Pre 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4	1	EnabledDomain D Owner D Basin			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4 4	1	EnabledDomain D. Owner			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4 4 4 255	1 1	EnabledDomain D Owner D Basin D Status			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4 4 255 255	1	EnabledDomain D Owner D Basin			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4 4 4 255	1 1 PVC	EnabledDomain <u>D Owner</u> <u>D Basin</u> <u>D Status</u> <u>D WaterLineMaterial</u>			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4 255 255 20	1 1 PVC Flange	EnabledDomain <u>D Owner</u> <u>D Basin</u> <u>D Status</u> <u>D WaterLineMaterial</u> <u>D JointType</u>			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 0 2 4 4 4 4 4 4 4 255 255 20 20	1 1 PVC	EnabledDomain <u>D Owner</u> <u>D Basin</u> <u>D Status</u> <u>D WaterLineMaterial</u>			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 4 4 4 4 4 4 2555 2055 20 20 20	1 1 PVC Flange	EnabledDomain <u>D Owner</u> <u>D Basin</u> <u>D Status</u> <u>D WaterLineMaterial</u> <u>D JointType</u>			
DateDigitized DateModified Subtype: Bypass (Subtype = Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2	Date Date <b>2)</b> Field Type OID Geometry Small Integer Integer Integer String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 8 4 4 4 4 4 4 4 2555 2055 20 20 20 20	1 1 PVC Flange	EnabledDomain <u>D Owner</u> <u>D Basin</u> <u>D Status</u> <u>D WaterLineMaterial</u> <u>D JointType</u>			

Depth	Integer	0	0	4		
GroundSurfaceType	String	0	0	20		
PressureRating	String	0	0	20		
Shape_Length	Double	0	0	8		
Diameter	Small Integer	0	0	2	12	D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: AirRelease (Subtyp	•					
Field Name	Field Type	Pre	Sc	Len	DV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
FlowMeasurementID	String	0	0	255		
Material	String	0	0	255	PVC	D_WaterLineMaterial
ExteriorCoating	String	0	0	20		
JointType1	String	0	0	20	Flange	D_JointType
JointType2	String	0	0	20	Flange	D_JointType
LiningType	String	0	0	20		
PipeClass	String	0	0	20		
Roughness	Double	0	0	8		
Depth	Integer	0	0	4		
GroundSurfaceType	String	0	0	20		
PressureRating	String	0	0	20		
Shape_Length	Double	0	0	8		
Diameter	Small Integer	0	0	2	12	D_MainDistDiam
WaterType	String	0	0	255		<u>D_WaterType</u>
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: ChemicalInjection	(Subtype =	4)				
Field Name	Field Type	Pre	Sc	Len	DV	Domain
Field Name OBJECTID	Field Type	Pre 0	9 Sc 0	Len 4	DV	Domain
					DV	Domain
OBJECTID	OID	0	0	4 0 2	1	Domain EnabledDomain
OBJECTID Shape Enabled Subtype	OID Geometry Small Integer Integer	0 0 0	0 0 0	4 0 2 4		
OBJECTID Shape Enabled	OID Geometry Small Integer Integer Integer	0 0 0 0	0 0 0 0	4 0 2 4 4	1	EnabledDomain
OBJECTID Shape Enabled Subtype AssetID Owner	OID Geometry Small Integer Integer String	0 0 0 0 0	0 0 0 0 0	4 0 2 4 4 4	1	EnabledDomain
OBJECTID Shape Enabled Subtype AssetID Owner BasinID	OID Geometry Small Integer Integer String String	0 0 0 0 0 0	0 0 0 0 0 0	4 0 2 4 4 4 4	1	EnabledDomain D_Owner D_Basin
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status	OID Geometry Small Integer Integer Integer String String String	0 0 0 0 0 0 0	0 0 0 0 0 0 0	4 0 2 4 4 4 4 4	1	EnabledDomain
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID	OID Geometry Small Integer Integer Integer String String String String	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 4 255	1 1	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u>
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material	OID Geometry Small Integer Integer String String String String String String	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 4 255 255	1	EnabledDomain D_Owner D_Basin
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating	OID Geometry Small Integer Integer String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 255 255 20	1 1 PVC	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_WaterLineMaterial</u>
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1	OID Geometry Small Integer Integer String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 255 255 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2	OID Geometry Small Integer Integer String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 255 205 20 20 20	1 1 PVC	EnabledDomain <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_WaterLineMaterial</u>
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType	OID Geometry Small Integer Integer String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 255 255 20 20 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass	OID Geometry Small Integer Integer String String String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 255 255 20 20 20 20 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness	OID Geometry Small Integer Integer String String String String String String String String String String String String String String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 255 205 20 20 20 20 20 20 8	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth	OID Geometry Small Integer Integer String String String String String String String String String String String String String String String Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 2 4 4 4 4 255 255 20 20 20 20 20 20 8 4	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType	OID Geometry Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 2 4 4 4 4 255 255 20 20 20 20 20 8 4 20 20 20 20	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating	OID Geometry Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 255 205 200 200 200 200 8 4 200 200 8 4 200 200	1 1 PVC Flange	EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length	OID Geometry Small Integer Integer String Double Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 4 255 205 200 200 200 200 8 4 200 8 4 200 200 8 3 8 4 200 200 8 3 200 8 3 200 200 200 200 200 200 200 200 200 2	1 1 PVC Flange Flange	EnabledDomain  D_Owner D_Basin D_Status D_WaterLineMaterial  D_JointType D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter	OID Geometry Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 255 255 200 200 200 200 8 4 200 8 20 8 20 8 20	1 1 PVC Flange	EnabledDomain  D Owner D Basin D Status D WaterLineMaterial D JointType D JointType D JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType	OID Geometry Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 255 255 200 200 200 200 200 8 4 200 8 4 200 8 205 5 5 5	1 1 PVC Flange Flange	EnabledDomain  D_Owner D_Basin D_Status D_WaterLineMaterial  D_JointType D_JointType
OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter	OID Geometry Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 0 2 4 4 4 255 255 200 200 200 200 8 4 200 8 20 8 20 8 20	1 1 PVC Flange Flange	EnabledDomain  D Owner D Basin D Status D WaterLineMaterial D JointType D JointType D JointType

DateModified	Date	0	0	8		
Subtype: DistributionMain (S	•••	-				
Field Name	Field Type	Pre	Sc	Ler	١DV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		<u>D_Status</u>
FlowMeasurementID	String	0	0	255	51/0	
Material	String	0	0		PVC	D_WaterLineMaterial
ExteriorCoating	String	0	0	20	-	B. 1.1.7
JointType1	String	0	0	20	Flange	D_JointType
JointType2	String	0	0	20	Flange	D_JointType
	String	0	0	20		
PipeClass	String	0	0	20		
Roughness	Double	0	0	8		
	Integer	0	0	4		
GroundSurfaceType	String	0 0	0 0	20 20		
PressureRating	String Double	0	0	20 8		
Shape_Length Diameter	Small Integer	0	0	2	12	D MainDistDiam
WaterType	String	0	0	2 255	12	D_WaterType
DateInstalled	Date	0	0	200		D_Water Type
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
		0	0	0		
Subtype: Interconnect (Subt		-	~		<b>D</b> \/	<b>D</b> .
Field Name	Field Type	Pre	Sc	Ler	١DV	Domain
OBJECTID	OID	0	0	4		
	÷.=		-	-		
Shape	Geometry	0	0	0		
Enabled	Geometry Small Integer	0 0	0 0	0 2	1	EnabledDomain
Enabled Subtype	Geometry Small Integer Integer	0 0 0	0 0 0	0 2 4	1 1	EnabledDomain
Enabled Subtype AssetID	Geometry Small Integer Integer Integer	0 0 0 0	0 0 0 0	0 2 4 4		
Enabled Subtype AssetID Owner	Geometry Small Integer Integer Integer String	0 0 0 0 0	0 0 0 0 0	0 2 4 4 4		D_Owner
Enabled Subtype AssetID Owner BasinID	Geometry Small Integer Integer String String	0 0 0 0 0 0	0 0 0 0 0 0	0 2 4 4 4 4		<u>D_Owner</u> D_Basin
Enabled Subtype AssetID Owner BasinID Status	Geometry Small Integer Integer Integer String String String	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 2 4 4 4 4 4 4		D_Owner
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID	Geometry Small Integer Integer Integer String String String String	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 4 255	1	<u>D_Owner</u> D_Basin D_Status
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material	Geometry Small Integer Integer Integer String String String String String String	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 4 255 255		<u>D_Owner</u> D_Basin
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating	Geometry Small Integer Integer Integer String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 255 20	1 PVC	D_Owner D_Basin D_Status D_WaterLineMaterial
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1	Geometry Small Integer Integer Integer String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 255 20 20	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2	Geometry Small Integer Integer String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 255 20 20 20	1 PVC	D_Owner D_Basin D_Status D_WaterLineMaterial
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType	Geometry Small Integer Integer String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 205 20 20 20 20	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass	Geometry Small Integer Integer Integer String String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 255 255 20 20 20 20 20 20	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness	Geometry Small Integer Integer Integer String String String String String String String String String String String String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 255 255 20 20 20 20 20 8	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth	Geometry Small Integer Integer Integer String String String String String String String String String String String String String Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 20 20 20 20 20 20 8 4	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType	Geometry Small Integer Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 4 4 255 255 20 20 20 20 20 20 8 4 20	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating	Geometry Small Integer Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 4 255 255 20 20 20 20 20 20 8 4 20 20 20 20 20	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length	Geometry Small Integer Integer Integer String String String String String String String String String String String String String String String String String String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 2555 2055 200 200 200 200 8 4 200 200 8 4 200 200 8 4	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter	Geometry Small Integer Integer Integer String	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 2555 200 200 200 200 200 200 8 4 200 200 8 4 200 200 8 202 8 202 202 202 202 202 202	1 PVC Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType	Geometry Small Integer Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 2 4 4 4 255 255 20 20 20 20 20 20 20 8 4 20 20 8 4 20 20 8 2 255	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled	Geometry Small Integer Integer Integer String Strin			0 2 4 4 4 255 255 20 20 20 20 20 20 20 20 8 4 20 20 8 4 20 20 8 55 8	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized	Geometry Small Integer Integer Integer String			0 2 4 4 4 255 255 20 20 20 20 20 20 20 8 4 20 20 8 4 20 20 8 2 255	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified	Geometry Small Integer Integer Integer String String String String String String String String String String String Double Integer String String String String String String String String String Double Small Integer String Date Date Date			0 2 4 4 4 255 255 20 20 20 20 20 20 20 20 8 4 20 20 8 4 20 20 8 8 4 20 20 8 8 4 20 55 8 8 8 8 8	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified Subtype: PipeBridge (Subtyp	Geometry Small Integer Integer Integer String String String String String String String String String String String Double Integer String String Double Small Integer String Double Small Integer String Date Date Date Date Date Date Date			0 2 4 4 4 255 255 20 20 20 20 20 20 20 20 20 20 8 4 20 20 8 4 20 20 8 8 8 8 8 8 8 8	1 PVC Flange Flange	<ul> <li><u>D</u> Owner</li> <li><u>D</u> Basin</li> <li><u>D</u> Status</li> <li><u>D</u> WaterLineMaterial</li> <li><u>D</u> JointType</li> <li><u>D</u> JointType</li> <li><u>D</u> JointType</li> <li><u>D</u> WaterType</li> </ul>
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: PipeBridge (Subty)</b> Field Name	Geometry Small Integer Integer Integer String String String String String String String String String Double Integer String Double String Double String Double String Double String Double String Double Small Integer String Double Small Integer String Stri	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 2555 20 20 20 20 20 20 20 20 20 20 8 4 20 20 8 4 20 20 8 8 8 8 8 8 8 8	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: PipeBridge (Subty)</b> Field Name OBJECTID	Geometry Small Integer Integer Integer String String String String String String String String String Double Integer String Double String Double String Double String Double String Double String Double Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 255 255 20 20 20 20 20 20 20 20 20 20 8 4 20 20 8 4 2020 8 4 2055 8 8 8 2 2555 8 8 8 2 2555 8 8 8 2 2555 8 8 8 8	1 PVC Flange Flange	<ul> <li><u>D</u> Owner</li> <li><u>D</u> Basin</li> <li><u>D</u> Status</li> <li><u>D</u> WaterLineMaterial</li> <li><u>D</u> JointType</li> <li><u>D</u> JointType</li> <li><u>D</u> JointType</li> <li><u>D</u> WaterType</li> </ul>
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: PipeBridge (Subty)</b> Field Name OBJECTID Shape	Geometry Small Integer Integer Integer String String String String String String String String String String Double Integer String Double Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 255 20 20 20 20 20 20 20 20 20 20 20 20 20	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType D_JointType D_WaterType
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: PipeBridge (Subty)</b> Field Name OBJECTID Shape Enabled	Geometry Small Integer Integer Integer String String String String String String String String String String Double Integer String Double Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 255 20 20 20 20 20 20 20 20 20 20 20 20 20	1 PVC Flange Flange 12	<ul> <li><u>D</u> Owner</li> <li><u>D</u> Basin</li> <li><u>D</u> Status</li> <li><u>D</u> WaterLineMaterial</li> <li><u>D</u> JointType</li> <li><u>D</u> JointType</li> <li><u>D</u> JointType</li> <li><u>D</u> WaterType</li> </ul>
Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: PipeBridge (Subty)</b> Field Name OBJECTID Shape	Geometry Small Integer Integer Integer String String String String String String String String String String Double Integer String Double Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2 4 4 4 4 255 255 20 20 20 20 20 20 20 20 20 20 20 20 20	1 PVC Flange Flange	D_Owner D_Basin D_Status D_WaterLineMaterial D_JointType D_JointType D_JointType D_JointType D_WaterType

Owner	String	0	0	4		<u>D Owner</u>
BasinID	String	0	0	4		<u>D Basin</u>
Status	String	0	0	4		D Status
FlowMeasurementID	String	0	0	255		
Material	String	0	0	255	PVC	D WaterLineMaterial
ExteriorCoating	String	0	0	20		
JointType1	String	0	0	20	Flange	D JointType
JointType2	String	0	0	20	Flange	D JointType
LiningType	String	0	0	20		
PipeClass	String	0	0	20		
Roughness	Double	0	0	8		
Depth	Integer	0	0	4		
GroundSurfaceType	String	0	0	20		
PressureRating	String	0	0	20		
Shape_Length	Double	0	0	8		
Diameter	Small Integer	0	0	2	12	D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: SamplingStation (S	Subtype = 8	)				
Field Name	Field Type		50	Lor		Domain
	21					Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		<u>D_Status</u>
FlowMeasurementID	String	0	0	255		
	0					
Material	String	0	0	255	PVC	D_WaterLineMaterial
Material ExteriorCoating	String String	0 0	0 0	255 20	-	
Material ExteriorCoating JointType1	String String String	0 0 0	0 0 0	255 20 20	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2	String String String String	0 0 0 0	0 0 0 0	255 20 20 20	-	
Material ExteriorCoating JointType1 JointType2 LiningType	String String String String String	0 0 0 0 0	0 0 0 0 0	255 20 20 20 20 20	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass	String String String String String String	0 0 0 0 0 0	0 0 0 0 0 0	255 20 20 20 20 20 20	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness	String String String String String Double	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	255 20 20 20 20 20 20 8	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth	String String String String String Double Integer	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType	String String String String String Double	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4 20	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating	String String String String String Double Integer String String	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4 20 20	Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType	String String String String String Double Integer String	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4 20 20 8	Flange Flange	D_JointType
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter	String String String String String Double Integer String String Double Small Integer	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4 20 20 8 20 8 2	Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType	String String String String String Double Integer String String Double	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 8 4 20 20 8 20 8 2 255	Flange Flange	<u>D_JointType</u> <u>D_JointType</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled	String String String String String Double Integer String String Double Small Integer String Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 8 4 20 20 8 20 8 20 8 255 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized	String String String String String Double Integer String String Double Small Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4 20 20 8 20 8 255 8 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled	String String String String String Double Integer String String Double Small Integer String Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 8 4 20 20 8 20 8 20 8 255 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized	String String String String String Double Integer String String Double Small Integer String Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 20 8 4 20 20 8 20 8 255 8 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified Subtype: TransmissionMain	String String String String String Double Integer String Double Small Integer String Date Date Date Date (Subtype =	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 20 8 2 2555 8 8 8 8 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u> <u>D_WaterType</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> Field Name	String String String String String Double Integer String Double Small Integer String Date Date Date Date Field Type	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> Field Name OBJECTID	String String String String String Double Integer String Double Small Integer String Date Date Date Csubtype = Field Type OID	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	255 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8	Flange Flange	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u> <u>D_WaterType</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateDigitized DateModified <b>Subtype: TransmissionMain</b> Field Name OBJECTID Shape	String String String String String Double Integer String Double Small Integer String Date Date Date Date Field Type OID Geometry	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 2555 8 8 8 8 8 8 8 8 8 8 8	Flange Flange 12	D_JointType D_JointType
Material ExteriorCoating JoinType1 JoinType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled	String String String String String Double Integer String Double Small Integer String Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 8 2 255 8 8 8 8	Flange Flange 12 DV	<u>D_JointType</u> <u>D_JointType</u> <u>D_MainDistDiam</u> <u>D_WaterType</u>
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype	String String String String Double Integer String Double Small Integer String Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 8 8 8 2 2555 8 8 8 8	Flange Flange 12	D_JointType D_JointType
Material ExteriorCoating JoinType1 JoinType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID	String String String String Double Integer String Double Small Integer String Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer Integer Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 8 8 4 0 2 4 4 4	Flange Flange 12 DV	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID Owner	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer Integer Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4	Flange Flange 12 DV	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID Owner BasinID	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer Integer Integer String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4 4	Flange Flange 12 DV	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner D_Basin
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> Field Name OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer Integer Integer String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4 4 4 4	Flange Flange 12 DV	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> Field Type OID Geometry Small Integer Integer Integer String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4 4 4 255	Flange Flange 12 DV 1 1	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner D_Basin D_Status
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> <b>Field Type</b> OID Geometry Small Integer Integer Integer String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4 4 4 255 255	Flange Flange 12 DV	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner D_Basin
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material ExteriorCoating	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> <b>Field Type</b> OID Geometry Small Integer Integer Integer String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4 4 4 4 255 255 20	Flange Flange 12 DV 1 1 PVC	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner D_Basin D_Status D_WaterLineMaterial
Material ExteriorCoating JointType1 JointType2 LiningType PipeClass Roughness Depth GroundSurfaceType PressureRating Shape_Length Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: TransmissionMain</b> <b>Field Name</b> OBJECTID Shape Enabled Subtype AssetID Owner BasinID Status FlowMeasurementID Material	String String String String String Double Integer String Double Small Integer String Date Date Date Date <b>(Subtype =</b> <b>Field Type</b> OID Geometry Small Integer Integer Integer String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2555 20 20 20 20 8 4 20 20 8 2 255 8 8 8 8 8 8 8 8 4 0 2 4 4 4 4 4 4 4 255 255	Flange Flange 12 DV 1 1	D_JointType D_JointType D_JointType D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner D_Basin D_Status

	LiningType	String	0	0	20		
	PipeClass	String	0	0	20		
	Roughness	Double	0	0	8		
	Depth	Integer	0	0	4		
	GroundSurfaceType	String	0	0	20		
	PressureRating	String	0	0	20		
	Shape_Length	Double	0	0	8		
	Diameter	Small Integer	0	0	2	12	D MainDistDiam
	WaterType	String	0	0	255		D WaterType
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
S	ubtype: Unknown (Subtype	= 99)					
	Field Name	Field Type	Pre	Sc	Len	DV	Domain
	OBJECTID	OID	0	0	4		
	Shape	Geometry	0	0	0		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	Subtype	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	4		D_Owner
	BasinID	String	0	0	4		D_Basin
	Status	String	0	0	4		D_Status
	FlowMeasurementID	String	0	0	255		
	Material	String	0	0	255	PVC	D_WaterLineMaterial
	ExteriorCoating	String	0	0	20		
	JointType1	String	0	0	20	Flange	D_JointType
	JointType2	String	0	0	20	Flange	D_JointType
	LiningType	String	0	0	20		
	PipeClass	String	0	0	20		
	Roughness	Double	0	0	8		
	Depth	Integer	0	0	4		
	GroundSurfaceType	String	0	0	20		
	PressureRating	String	0	0	20		
	Shape_Length	Double	0	0	8		
	Diameter	Small Integer	0	0	2	12	D_MainDistDiam
	WaterType	String	0	0	255		D_WaterType
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		

### wPump (Simple Junction) (Point) Subtype: AxialFlow (Subtype = 1) [Default]

		/ 6					
Fi	eld Name	Field Type	Pre	Sc	Ler	nDV	Domain
Sh	ape	Geometry	0	0	0		
OE	BJECTID	OID	0	0	4		
An	cillaryRole	Small Integer	0	0	2		
En	abled	Small Integer	0	0	2	1	EnabledDomain
Su	btype	Integer	0	0	4	1	
As	setID	Integer	0	0	4		
Ov	vner	String	0	0	4		D Owner
Ba	sinID	String	0	0	200		D_Basin
Sta	atus	String	0	0	4		D Status
Lo	cationDescription	String	0	0	200		
Ro	tation	Double	0	0	8		
Ele	evation	Double	0	0	8		
Ra	tedFlow	String	0	0	20		
Ra	tedPressure	String	0	0	20		
То	talDynamicHead	String	0	0	20		
Inl	etDiameter	Small Integer	0	0	2	10	D_MainDistDiam
Dis	schargeDiameter	Small Integer	0	0	2	10	D MainDistDiam
Wa	aterType	String	0	0	255		D WaterType
Da	teInstalled	Date	0	0	8		

DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Centrifugal (Subty	•	_	~		<b>D</b> \/	<b>.</b> .
Field Name	Field Type				IDV	Domain
Shape	Geometry	0	0	0 4		
OBJECTID AncillaryRole	OID Small Integer	0 0	0 0	4 2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	Enableabornain
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	200		D_Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
RatedFlow	String	0	0	20		
RatedPressure TotalDynamicHead	String String	0 0	0 0	20 20		
InletDiameter	Small Integer	0	0	20	10	D_MainDistDiam
DischargeDiameter	Small Integer	0	0	2	10	D_MainDistDiam
WaterType	String	0	0	- 255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Jet (Subtype = 3)						
Field Name	Field Type	Pre	Sc	Ler	١DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		<u>D_Owner</u>
BasinID	String	0 0	0 0	200 4		D_Basin D_Status
Status LocationDescription	String String	0	0	4 200		D_Status
Rotation	Double	0	0	200		
Elevation	Double	0	0	8		
RatedFlow	String	0	0	20		
RatedPressure	String	0	0	20		
TotalDynamicHead	String	0	0	20		
InletDiameter	Small Integer	0	0	2	10	D_MainDistDiam
DischargeDiameter	Small Integer	0	0	2	10	D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Reciprocating (Sub	•••	_	~		<b>.</b>	<b>_</b>
Field Name	Field Type				۱DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole Enabled	Small Integer Small Integer	0 0	0 0	2 2	1	EnabledDomain
Subtype	Integer	0	0	2 4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	200		D Basin
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		

RatedFlow	String	0	0	20		
RatedPressure	String	0	0	20		
TotalDynamicHead	String	0	0	20		
InletDiameter	Small Integer	0	0	2	10	D MainDistDiam
DischargeDiameter	Small Integer	0	0	2	10	D MainDistDiam
WaterType	String	0	0	255		<u>D WaterType</u>
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Rotary (Subtype =			_			
Field Name	Field Type	Pre	Sc	Ler	nDV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	200		D_Basin D_Status
Status	String	0	0	4		D_Status
LocationDescription Rotation	String Double	0 0	0 0	200 8		
Elevation	Double	0	0	о 8		
RatedFlow	String	0	0	8 20		
RatedPressure	String	0	0	20		
TotalDynamicHead	String	0	0	20		
InletDiameter	Small Integer	0	0	2	10	D MainDistDiam
DischargeDiameter	Small Integer	õ	0	2	10	D_MainDistDiam
WaterType	String	õ	0	255	10	D_WaterType
DateInstalled	Date	0	0	8		<u></u>
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
DateModified		0	0	8		
DateModified Subtype: Screw (Subtype = 0	6)	•				Domain
DateModified Subtype: Screw (Subtype = ) Field Name	6) Field Type	Pre	e Sc	Ler	nDV	Domain
DateModified Subtype: Screw (Subtype = ) Field Name Shape	6) Field Type Geometry	Pre 0	e Sc	Ler	۱DV	Domain
DateModified Subtype: Screw (Subtype = ) Field Name Shape OBJECTID	6) Field Type Geometry OID	Pre 0 0	e Sc 0 0	Ler 0 4	۱DV	Domain
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole	6) Field Type Geometry OID Small Integer	Pre 0 0	e Sc 0 0 0	Ler 0 4 2		
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled	6) Field Type Geometry OID Small Integer Small Integer	Pre 0 0 0 0	e Sc 0 0 0 0	Ler 0 4 2 2	1	Domain <u>EnabledDomain</u>
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype	6) Field Type Geometry OID Small Integer Small Integer Integer	Pre 0 0 0 0 0	e Sc 0 0 0 0 0	Ler 0 4 2 2 4		
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled	6) Field Type Geometry OID Small Integer Small Integer Integer Integer	Pre 0 0 0 0 0 0	e Sc 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4	1	EnabledDomain
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0	e Sc 0 0 0 0 0	Ler 0 4 2 2 4 4 4	1	EnabledDomain D_Owner
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String	Pre 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0 0 0 0	e Sc 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200	1	EnabledDomain D_Owner
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String	Pre 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0	e Sc 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 4 4 4 200 4 200	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 200 4 200 8 8	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	e Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 4 4 4 200 4 200 8 8 20	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String String Double Double String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 200 20	1	EnabledDomain D_Owner D_Basin
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String String String String Double Double String String String String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 200 20 20	1 1	EnabledDomain D_Owner D_Basin D_Status
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter	6) Field Type Geometry OID Small Integer Small Integer Integer String String String String String Double Double String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 200 20 20 20 2	1 1	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled	6) Field Type Geometry OID Small Integer Small Integer Integer String String String String String Double Double String St	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 20 20 20 20 20 2 255 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized	6) Field Type Geometry OID Small Integer Small Integer Integer String St	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 20 20 20 20 20 2 255 8 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified	6) Field Type Geometry OID Small Integer Small Integer Integer String String String String String String Double Double String St	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 20 20 20 20 20 2 255 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized	6) Field Type Geometry OID Small Integer Small Integer Integer String String String String String String Double Double String St	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 20 20 20 20 20 2 255 8 8	1 1	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified	6) Field Type Geometry OID Small Integer Small Integer Integer String String String String String String Double Double String St	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 20 20 20 2 2 255 8 8 8 8	1 1 10 10	<u>EnabledDomain</u> <u>D_Owner</u> <u>D_Basin</u> <u>D_Status</u> <u>D_MainDistDiam</u> <u>D_MainDistDiam</u>
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified Subtype: Turbine (Subtype =	6) Field Type Geometry OID Small Integer Small Integer Integer String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 200 4 200 8 8 20 20 20 2 2 255 8 8 8 8	1 1 10 10	EnabledDomain D_Owner D_Basin D_Status D_Status D_MainDistDiam D_MainDistDiam D_WaterType
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified Subtype: Turbine (Subtype = Field Name	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 4 2000 4 200 4 200 2 200 20 20 20 2 2 2 5 8 8 8 8 8 8 8 8 8 8 8 8 8	1 1 10 10	EnabledDomain D_Owner D_Basin D_Status D_Status D_MainDistDiam D_MainDistDiam D_WaterType
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified Subtype: Turbine (Subtype = Field Name Shape	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 200 4 200 4 200 8 8 200 20 20 20 2 255 8 8 8 8 Ler 0	1 1 10 10	EnabledDomain D_Owner D_Basin D_Status D_Status D_MainDistDiam D_MainDistDiam D_WaterType
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified Subtype: Turbine (Subtype = Field Name Shape OBJECTID	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String Date Date Strie Cometry OID	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 200 4 200 4 200 2 200 2 200 2 2 2 2 5 8 8 8 8 8 8 8 8 8 8 8 8 8	1 1 10 10	EnabledDomain D_Owner D_Basin D_Status D_Status D_MainDistDiam D_MainDistDiam D_WaterType
DateModified Subtype: Screw (Subtype = 0 Field Name Shape OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedFlow RatedPressure TotalDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled DateDigitized DateModified Subtype: Turbine (Subtype = Field Name Shape OBJECTID AncillaryRole	6) Field Type Geometry OID Small Integer Small Integer Integer Integer String	Pre 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ler 0 4 2 2 4 4 200 4 200 4 200 2 200 2 200 2 2 255 8 8 8 8 Ler 0 4 2 2 2 2 2 2 2 2 2 2 2 2 2	1 1 10 10	EnabledDomain D_Owner D_Basin D_Status D_MainDistDiam D_MainDistDiam D_WaterType Domain

AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	200		D Basin
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
RatedFlow	String	0	0	20		
RatedPressure	String	0	0	20		
TotalDynamicHead	String	0	0	20		
InletDiameter	Small Integer	0	0	2	10	D MainDistDiam
DischargeDiameter	Small Integer	0	0	2	10	D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Unknown (Subtype	è = 99)					
Field Name	Field Type	Pre	Sc	Ler	DV	Domain
Shape	Geometry	0	0	0		
OBJECTID	OID	0	0	4		
•	OID Small Integer	0 0	0 0	4 2		
OBJECTID		-	-		1	<u>EnabledDomain</u>
OBJECTID AncillaryRole	Small Integer	0	0	2	1 1	EnabledDomain
OBJECTID AncillaryRole Enabled	Small Integer Small Integer	0 0	0 0	2 2	-	EnabledDomain
OBJECTID AncillaryRole Enabled Subtype	Small Integer Small Integer Integer	0 0 0	0 0 0	2 2 4	-	EnabledDomain
OBJECTID AncillaryRole Enabled Subtype AssetID	Small Integer Small Integer Integer Integer	0 0 0 0	0 0 0 0	2 2 4 4	-	
OBJECTID AncillaryRole Enabled Subtype AssetID Owner	Small Integer Small Integer Integer Integer String	0 0 0 0 0	0 0 0 0 0	2 2 4 4 4	-	D_Owner
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID	Small Integer Small Integer Integer Integer String String	0 0 0 0 0 0	0 0 0 0 0 0	2 2 4 4 4 200	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status	Small Integer Small Integer Integer Integer String String String	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	2 2 4 4 4 200 4	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription	Small Integer Small Integer Integer String String String String String	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation	Small Integer Small Integer Integer String String String String Double	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation	Small Integer Small Integer Integer String String String String Double Double	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow	Small Integer Small Integer Integer String String String Double Double String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8 20	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure	Small Integer Small Integer Integer String String String Double Double String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8 20 20	-	D_Owner D_Basin
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotalDynamicHead	Small Integer Small Integer Integer String String String Double Double String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8 20 20 20	1	D_Owner D_Basin D_Status
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotaIDynamicHead InletDiameter DischargeDiameter WaterType	Small Integer Small Integer Integer String String String Double Double String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8 20 20 20 20 2 2 2 255	1	D_Owner D_Basin D_Status D_MainDistDiam
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotaIDynamicHead InletDiameter DischargeDiameter WaterType DateInstalled	Small Integer Small Integer Integer String String String Double Double String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8 8 200 20 20 20 20 20 22 255 8	1	D_Owner D_Basin D_Status D_MainDistDiam D_MainDistDiam
OBJECTID AncillaryRole Enabled Subtype AssetID Owner BasinID Status LocationDescription Rotation Elevation RatedFlow RatedPressure TotaIDynamicHead InletDiameter DischargeDiameter WaterType	Small Integer Small Integer Integer String String String Double Double String String String String String String String String String String String String String String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 4 4 200 4 200 8 8 20 20 20 20 2 2 2 255	1	D_Owner D_Basin D_Status D_MainDistDiam D_MainDistDiam

# wSamplingStation (Simple Junction) (Point) No Subtypes

N	o Subtypes						
	Field Name	Field Type	Pre	Sc	Len	DV	Domain
	Shape	Geometry	0	0	0		
	OBJECTID	OID	0	0	4		
	AncillaryRole	Small Integer	0	0	2		
	Enabled	Small Integer	0	0	2	1	<b>EnabledDomain</b>
	Subtype	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	4		D Owner
	BasinID	String	0	0	4		D_Basin
	Status	String	0	0	4		D Status
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	StationID	String	0	0	20		
	WaterType	String	0	0	255		D WaterType
	DateInstalled	Date	0	0	8		
	DateDigitied	Date	0	0	8		
	DateModified	Date	0	0	8		

## wSystemValve (Simple Junction) (Point) Subtype: Ball (Subtype = 1) [Default]

Subtype: Ball (Subtype = 1) [Default]						
Field Name	Field Type	Pre	Sc	Len	DV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D Owner
BasinID	String	0	0	4		<u>D Basin</u>
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
BypassValve	Small Integer	0	0	2	0	<u>D Boolean</u>
ClockwiseToClose	Small Integer	0	0	2	1	<u>D Boolean</u>
CurrentlyOpen	Small Integer	0	0	2	1	<u>D Boolean</u>
Motorized	Small Integer	0	0	2	0	<u>D Boolean</u>
NormallyOpen	Small Integer	0	0	2	1	D Boolean
PercentOpen	Integer	0	0	4	100	
PressureSetting	String	0	0	20		
RegulationType	String	0	0	20		D WHSystemValveReg
TurnsToClose	Integer	0	0	4	10	D. Main Dist Diam
Diameter WaterType	Small Integer	0	0	2 255	10	D MainDistDiam
DateInstalled	String Date	0 0	0 0	255 8		<u>D WaterType</u>
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Butterfly (Subtype		U	U	0		
Field Name	-	Dre	. C.	ا م		Domoin
OBJECTID	Field Type	0	0	4	עטו	Domain
	Geometry	0	0	4 0		
Shape AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4	1	
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		D_Basin
Status	String	0	0	4		D Status
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
BypassValve	Small Integer	0	0	2	0	D_Boolean
ClockwiseToClose	Small Integer	0	0	2	1	D_Boolean
CurrentlyOpen	Small Integer	0	0	2	1	D_Boolean
Motorized	Small Integer	0	0	2	0	D_Boolean
NormallyOpen	Small Integer	0	0	2	1	D_Boolean
PercentOpen	Integer	0	0	4	100	
PressureSetting	String	0	0	20		
RegulationType	String	0	0	20		D_WHSystemValveReg
TurnsToClose	Integer	0	0	4		
Diameter	Small Integer	0	0	2	10	D_MainDistDiam
WaterType	String	0	0	255		D_WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Cone (Subtype = 3)		_	_			
Field Name	Field Type	Pre	Sc	Len	DV	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
AncillaryRole	Small Integer	0	0	2		

Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		<u>D Owner</u>
BasinID	String	0	0	4		<u>D Basin</u>
Status	String	0	0	4		<u>D Status</u>
LocationDescription	String	0	0	200		
Rotation	Double	0	0	8		
Elevation	Double	0	0	8		
BypassValve	Small Integer	0	0	2	0	<u>D Boolean</u>
ClockwiseToClose	Small Integer	0	0	2	1	<u>D Boolean</u>
CurrentlyOpen	Small Integer	0	0	2	1	D Boolean
Motorized	Small Integer	0	0	2	0	D Boolean
NormallyOpen	Small Integer	0	0	2	1	<u>D Boolean</u>
PercentOpen	Integer	0	0	4	100	
PressureSetting	String	0	0	20		
RegulationType	String	0	0	20		D WHSystemValveReg
TurnsToClose	Integer	0	0	4		
Diameter	Small Integer	0	0	2	10	D MainDistDiam
WaterType	String	0	0	255		D WaterType
DateInstalled	Date	0	0	8		
DateDigitized	Date	0	0	8		
DateModified	Date	0	0	8		
Subtype: Gate (Subtype = 4)						
Field Name	Field Type	Dro	80	Lor		Domain
	Field Type				עטו	Domain
OBJECTID	OID	0	0	4		
Shape	Geometry	0	0	0		
AncillaryRole	Small Integer	0	0	2		
Enabled	Small Integer	0	0	2	1	EnabledDomain
Subtype	Integer	0	0	4	1	
AssetID	Integer	0	0	4		
Owner	String	0	0	4		D_Owner
BasinID	String	0	0	4		<u>D_Basin</u>
Status	String	0	0	4		D_Status
LocationDescription	String	0	0	200		<u>D_Status</u>
LocationDescription Rotation	String Double	0 0	0 0	200 8		<u>D_Status</u>
LocationDescription Rotation Elevation	String Double Double	0 0 0	0 0 0	200 8 8		
LocationDescription Rotation Elevation BypassValve	String Double Double Small Integer	0 0 0 0	0 0 0 0	200 8 8 2	0	D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose	String Double Double Small Integer Small Integer	0 0 0 0 0	0 0 0 0 0	200 8 8 2 2	1	<u>D Boolean</u> <u>D Boolean</u>
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen	String Double Double Small Integer Small Integer Small Integer	0 0 0 0 0 0	0 0 0 0 0 0	200 8 8 2 2 2 2	1 1	<u>D Boolean</u> <u>D Boolean</u> <u>D Boolean</u>
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized	String Double Double Small Integer Small Integer Small Integer Small Integer	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2	1 1 0	D_Boolean D_Boolean D_Boolean D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen	String Double Double Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 2	1 1 0 1	<u>D Boolean</u> <u>D Boolean</u> <u>D Boolean</u>
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen	String Double Double Small Integer Small Integer Small Integer Small Integer Integer	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4	1 1 0	D_Boolean D_Boolean D_Boolean D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting	String Double Double Small Integer Small Integer Small Integer Small Integer Integer String	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20	1 1 0 1	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType	String Double Double Small Integer Small Integer Small Integer Small Integer Integer String String	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20	1 1 0 1	D_Boolean D_Boolean D_Boolean D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose	String Double Double Small Integer Small Integer Small Integer Small Integer Integer String String Integer	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 2 4 20 20 4	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter	String Double Double Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 2 4 20 20 4 20 4 2	1 1 0 1	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer Small Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 20 4 2 255	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer Small Integer String Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 4 20 20 4 20 4 2 255 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer Small Integer String	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer Small Integer String Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 4 20 20 4 20 4 2 255 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer Small Integer String Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Plug (Subtype = 5)	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String Integer Small Integer String Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Plug (Subtype = 5)</b> Field Name	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer Small Integer String Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateInstalled DateDigitized DateModified Subtype: Plug (Subtype = 5) Field Name OBJECTID	String Double Double Small Integer Small Integer Small Integer Small Integer String String String Integer Small Integer String Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified Subtype: Plug (Subtype = 5) Field Name OBJECTID Shape	String Double Double Small Integer Small Integer Small Integer Small Integer String String String Integer Small Integer String Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Plug (Subtype = 5)</b> Field Name OBJECTID Shape AncillaryRole	String Double Double Small Integer Small Integer Small Integer Small Integer String String String Integer Small Integer String Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8 8 8 2 2 2 2 4 20 20 8 4 20 20 8 2 2 2 2 2 4 20 20 8 8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Plug (Subtype = 5)</b> Field Name OBJECTID Shape AncillaryRole Enabled	String Double Double Small Integer Small Integer Small Integer Small Integer String Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8 8 8	1 1 0 1 100	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateModified <b>Subtype: Plug (Subtype = 5)</b> Field Name OBJECTID Shape AncillaryRole Enabled Subtype	String Double Double Small Integer Small Integer Small Integer Small Integer String String Integer Small Integer String Date Date Date Date Date Date OID Geometry Small Integer Small Integer Small Integer Small Integer Small Integer Small Integer Small Integer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8 8 8 8 8 2 2 2 4 20 20 4 2 2 2 4 2 2 2 2 4 2 2 2 2	1 1 0 1 100 10	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateDolified <b>Subtype: Plug (Subtype = 5)</b> Field Name OBJECTID Shape AncillaryRole Enabled Subtype AssetID	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String Integer Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 2 4 2 2 2 4 2 2 2 4 2 2 5 5 8 8 8 8 8 8 8 8 8 8 8 9 2 2 2 2 2 2 4 2 2 2 2 2 2 2 2 2 2 2 2	1 1 0 1 100 10	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType Domain EnabledDomain
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateDolified <b>Subtype: Plug (Subtype = 5)</b> Field Name OBJECTID Shape AncillaryRole Enabled Subtype AssetID Owner	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String Integer Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 4 20 20 4 2 255 8 8 8 8 8 8 8 8 4 0 2 2 4 4 2 2 5 5 4 4 2 2 2 2 4 4 2 2 2 2	1 1 0 1 100 10	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType Domain EnabledDomain D_Owner
LocationDescription Rotation Elevation BypassValve ClockwiseToClose CurrentlyOpen Motorized NormallyOpen PercentOpen PressureSetting RegulationType TurnsToClose Diameter WaterType DateInstalled DateDigitized DateDolified <b>Subtype: Plug (Subtype = 5)</b> Field Name OBJECTID Shape AncillaryRole Enabled Subtype AssetID	String Double Double Small Integer Small Integer Small Integer Small Integer Small Integer String Integer Small Integer String Date Date Date Date Date Date Date Date	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200 8 8 2 2 2 2 2 2 2 4 2 2 2 4 2 2 2 4 2 2 5 5 8 8 8 8 8 8 8 8 8 8 8 9 2 2 2 2 2 2 4 2 2 2 2 2 2 2 2 2 2 2 2	1 1 0 1 100 10	D_Boolean D_Boolean D_Boolean D_Boolean D_Boolean D_WHSystemValveReg D_MainDistDiam D_WaterType Domain EnabledDomain

	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	BypassValve	Small Integer	0	0	2	0	D Boolean
	ClockwiseToClose	Small Integer	0	0	2	1	<u>D Boolean</u>
	CurrentlyOpen	Small Integer	0	0	2	1	D Boolean
	Motorized	Small Integer	0	0	2	0	D Boolean
	NormallyOpen	Small Integer	0	0	2	1	D Boolean
	PercentOpen	Integer	0	0	4	100	
	PressureSetting	String	0	0	20		
	RegulationType	String	0	0	20		D WHSystemValveReg
	TurnsToClose	Integer	0	0	4		
	Diameter	Small Integer	0	0	2	10	D MainDistDiam
	WaterType	String	0	0	255		D WaterType
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		
S	ubtype: Unknown (Subtype	= 99)					
	Field Name	Field Type	Dro	50	Lon	עם	Domain
		• •					Domain
	OBJECTID	OID	0 0	0	4 0		
	Shape	Geometry	-	0	-		
	AncillaryRole	Small Integer	0	0	2		
	Enabled	Small Integer	0	0	2	1	EnabledDomain
	Subtype	Integer	0	0	4	1	
	AssetID	Integer	0	0	4		
	Owner	String	0	0	4		D_Owner
	BasinID	String	0	0	4		<u>D_Basin</u>
	Status	String	0	0	4		<u>D_Status</u>
	LocationDescription	String	0	0	200		
	Rotation	Double	0	0	8		
	Elevation	Double	0	0	8		
	BypassValve	Small Integer	0	0	2	0	<u>D_Boolean</u>
	ClockwiseToClose	Small Integer	0	0	2	1	D_Boolean
	CurrentlyOpen	Small Integer	0	0	2	1	<u>D_Boolean</u>
	Motorized	Small Integer	0	0	2	0	<u>D_Boolean</u>
	NormallyOpen	Small Integer	0	0	2	1	<u>D_Boolean</u>
	PercentOpen	Integer	0	0	4	100	
	PressureSetting	String	0	0	20		
	RegulationType	String	0	0	20		D_WHSystemValveReg
	TurnsToClose	Integer	0	0	4		
	Diameter	Small Integer	0	0	2	10	D_MainDistDiam
	WaterType	String	0	0	255		D_WaterType
	DateInstalled	Date	0	0	8		
	DateDigitized	Date	0	0	8		
	DateModified	Date	0	0	8		

# RelationshipClass Information

The Geodatabase does not contain any Relationships.

### **Domain Information**

D_AccessDiam			
Field Type	Integer	Merge Policy	Default Value
Domain Type	Range	Split policy	Default Value
Value	Description		
0	Minimum		
72	Maximum		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wClearWell	None	Diameter1

FeatureClass	wClearWell	None	Diameter2
FeatureClass	wManhole	None	AccessDiameter
D_AccessType			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
Door	Door		
Grate	Grate		
Hand	Hand		
Lid	Lid		
Cover	Manhole Cover		
Oth Unk	Other Unknown		
-	UNKNOWN		
Domain Assigned To		Quilt to us a	Field
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass FeatureClass	wManhole	None	AccessType
FeatureClass	wUndergroundEnclosure wUndergroundEnclosure	<u>MeterBox</u> ValveVault	COVERTYPE COVERTYPE
FeatureClass	wUndergroundEnclosure	Vault	COVERTYPE
1 outer of a co	WondergroundEntitiodare	vaur	ooven ne
D Basin			
Field Type	String	Merge Policy	Default Value
	C C	<b>o</b> ,	
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
Agat			
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wAnode	None	BasinID
FeatureClass	wCasing	AccesssTunnel	BasinID
FeatureClass	wCasing	Casement	BasinID
FeatureClass	<u>wCasing</u>	ConduitBridge	BasinID
FeatureClass	wCasing	ProtectiveTunnel	BasinID
FeatureClass	wControlValve	<u>AirControl</u>	BasinID
FeatureClass FeatureClass	wControlValve wControlValve	<u>AirGap</u> Altitude	BasinID BasinID
FeatureClass	wControlValve	<u>AtmosphericVacuum</u>	BasinID
FeatureClass	wControlValve	BackflowControl	BasinID
FeatureClass	wControlValve	<u>CVAirRelease</u>	BasinID
FeatureClass	wControlValve	<u>CVCombination</u>	BasinID
FeatureClass	wControlValve	DoubleCheck	BasinID
FeatureClass	wControlValve	PressureVacuum	BasinID
FeatureClass	wControlValve	ReducedPressureBackflow	BasinID
FeatureClass FeatureClass	wControlValve	<u>RPZ</u> SimpleCheck	BasinID
FeatureClass	wControlValve wControlValve	<u>SimpleCheck</u> <u>Unknown</u>	BasinID BasinID
FeatureClass	wControlValve	Vacuum	BasinID
FeatureClass	wControlValve	VacuumBreaker	BasinID
FeatureClass	wControlValve	VacuumRelease	BasinID
FeatureClass	wFitting	Bend	BasinID
FeatureClass	wFitting	<u>Cap</u>	BasinID
FeatureClass	wFitting	Coupling	BasinID
FeatureClass	wFitting	<u>Cross</u> Expansion loint	BasinID BasinID
FeatureClass FeatureClass	<u>wFitting</u> wFitting	<u>ExpansionJoint</u> <u>Offset</u>	BasinID BasinID
FeatureClass	wFitting	<u>Reducer</u>	BasinID
FeatureClass	wFitting	Riser	BasinID
FeatureClass	wFitting	Saddle	BasinID
FeatureClass	wFitting	Sleeve	BasinID

FeatureClass wFitting wFitting wFitting wFitting wFitting wGravityMain wGravityMain wGravityMain wGravityMain wHydrant wLateralPoint wManhole wMeter wMeter wMeter wMeter <u>wMeter</u> <u>wMeter</u> wMeter wMeter wMeter wMeter wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wPressurizedMain wPump wPump wPump wPump wPump wPump wPump wPump wSamplingStation wScadaSensor wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wThrustProtection wThrustProtection wThrustProtection wThrustProtection wUndergroundEnclosure wUndergroundEnclosure wUndergroundEnclosure wWaterStructure wWaterStructure wWaterStructure

Tap BasinID BasinID Tee <u>Unknown</u> BasinID <u>Weld</u> BasinID BasinID <u>Wye</u> BasinID Carrier InlineStorage BasinID **TransportPipe** BasinID BasinID Unknown None BasinID None BasinID None BasinID BasinID Compound Current BasinID **DetectorCheck** BasinID **MagneticOrifice** BasinID Pito Pito BasinID BasinID **PositiveDisplacement Proportional** BasinID <u>Sonic</u> BasinID Uknown BasinID Venturi BasinID EnclosedStorageFacility BasinID **ProductionWell** BasinID **PumpStation** BasinID **StorageBasin** BasinID **TreatmentPlant** BasinID <u>Unknown</u> BasinID **AirRelease** BasinID <u>BlowOff</u> BasinID BasinID **Bypass ChemicalInjection** BasinID **DistributionMain** BasinID Interconnect BasinID **PipeBridge** BasinID **SamplingStation** BasinID **TransmissionMain** BasinID <u>Unknown</u> BasinID **AxialFlow** BasinID **Centrifugal** BasinID <u>Jet</u> BasinID Reciprocating BasinID BasinID **Rotary** Screw BasinID Turbine BasinID Unknown BasinID None BasinID BASINID None Ball BasinID **Butterfly** BasinID BasinID Cone <u>Gate</u> BasinID BasinID Plug <u>Unknown</u> BasinID BASINID Anchor **Blocking** BASINID Deadman BASINID **Kicker** BASINID **MeterBox** BASINID ValveVault BASINID Vault BASINID **EnclosedStorageFacility** BASINID **ProductionWell** BASINID **PumpStation** BASINID

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FeatureClass	wWaterStructure	StorageBasin	BASINID
FeatureClass	wWaterStructure	<b>TreatmentPlant</b>	BASINID
D_Boolean			
Field Type	Small Integer	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	opin poiloj	
0	False		
1	True		
Domain Assigned To	1100		
•	ObjectClass Name	Subturno	Field
ObjectClass Type	•	Subtype	CriticalCustomer
FeatureClass FeatureClass	wLateralPoint wSystemValve	None Ball	BypassValve
FeatureClass	wSystemValve	Ball	ClockwiseToClose
FeatureClass	wSystemValve	Ball	CurrentlyOpen
FeatureClass	wSystemValve	Ball	Motorized
FeatureClass	wSystemValve	Ball	NormallyOpen
FeatureClass	wSystemValve	<u>Butterfly</u>	BypassValve
FeatureClass	wSystemValve	Butterfly	ClockwiseToClose
FeatureClass	wSystemValve	Butterfly	CurrentlyOpen
FeatureClass	wSystemValve	Butterfly Butterfly	Motorized
FeatureClass FeatureClass	wSystemValve wSystemValve	<u>Butterfly</u> Cone	NormallyOpen BypassValve
FeatureClass	wSystemValve	Cone	ClockwiseToClose
FeatureClass	wSystemValve	Cone	CurrentlyOpen
FeatureClass	wSystemValve	Cone	Motorized
FeatureClass	wSystemValve	Cone	NormallyOpen
FeatureClass	wSystemValve	Gate	BypassValve
FeatureClass	wSystemValve	<u>Gate</u>	ClockwiseToClose
FeatureClass	wSystemValve	Gate	CurrentlyOpen
FeatureClass	wSystemValve	<u>Gate</u>	Motorized
FeatureClass	wSystemValve	<u>Gate</u>	NormallyOpen
FeatureClass FeatureClass	<u>wSystemValve</u> wSystemValve	<u>Plug</u> Plug	BypassValve ClockwiseToClose
FeatureClass	wSystemValve	Plug	CurrentlyOpen
FeatureClass	wSystemValve	Plug	Motorized
FeatureClass	wSystemValve	Plug	NormallyOpen
FeatureClass	wSystemValve	Unknown	BypassValve
FeatureClass	wSystemValve	<u>Unknown</u>	ClockwiseToClose
FeatureClass	wSystemValve	<u>Unknown</u>	CurrentlyOpen
FeatureClass	wSystemValve	<u>Unknown</u>	Motorized
FeatureClass	wSystemValve	<u>Unknown</u>	NormallyOpen
D_FrameCoverMaterial			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	,	
Street	Street		
Iron	Iron		
Oth	Other		
Unk	Unknown		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wUndergroundEnclosure	MeterBox	COVERMATERIAL
FeatureClass	wUndergroundEnclosure	MeterBox	FRAMEMATERIAL
FeatureClass	wUndergroundEnclosure	ValveVault	COVERMATERIAL
FeatureClass	wUndergroundEnclosure	ValveVault	FRAMEMATERIAL
FeatureClass	wUndergroundEnclosure	Vault	COVERMATERIAL
FeatureClass	wUndergroundEnclosure	<u>Vault</u>	FRAMEMATERIAL

#### D\_GravityMainShapes

D_GravityMainShapes			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	-1 -1	
CIRC	Circular		
HORSE	Horseshoe		
OBLONG	Oblong		
UNK	Unknown		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wGravityMain	Carrier	CrossSectionShape
FeatureClass	wGravityMain	InlineStorage	CrossSectionShape
FeatureClass	wGravityMain	<u>TransportPipe</u>	CrossSectionShape
FeatureClass	wGravityMain	<u>Unknown</u>	CrossSectionShape
D_HydrantDeviceID			
Field Type	Small Integer	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	-1 -1	
0	Hydrant Equipment #1		
1	Hydrant Equipment #2		
2	Hydrant Equipment #3		
Domain Assigned To	, , , ,		
ObjectClass Type	ObjectClass Name	Subtype	Field
Not Assigned		Cubtype	
D_JointType			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description	Opin poiloy	Boldan Valuo
Flange	Flange		
Weld	Weld		
Bond	Bond		
Oth	Other		
Unk	Unknown		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wFitting	Bend	JointType
FeatureClass	wFitting		JointType
FeatureClass	wFitting	Coupling	JointType
FeatureClass	wFitting	<u>Cross</u>	JointType
FeatureClass	wFitting	ExpansionJoint	JointType
FeatureClass	wFitting	<u>Offset</u>	JointType
FeatureClass FeatureClass	<u>wFitting</u> wFitting	<u>Reducer</u> Riser	JointType JointType
FeatureClass	wFitting	Saddle	JointType
FeatureClass	wFitting	Sleeve	JointType
FeatureClass	wFitting		JointType
FeatureClass	wFitting	Tee	JointType
FeatureClass	wFitting	<u>Unknown</u>	JointType
FeatureClass	wFitting	Weld	JointType
FeatureClass	<u>wFitting</u>	<u>Wye</u>	JointType
FeatureClass	wGravityMain	<u>Carrier</u>	JointType1
FeatureClass FeatureClass	<u>wGravityMain</u> wGravityMain	<u>Carrier</u> InlineStorage	JointType2 JointType1
FeatureClass	wGravityMain wGravityMain	InlineStorage	JointType2
FeatureClass	wGravityMain	TransportPipe	JointType1
	·	<u></u>	

FeatureClass	wGravityMain	TransportPipe	JointType2
FeatureClass	wGravityMain	<u>Unknown</u>	JointType1
FeatureClass	<u>wGravityMain</u>	<u>Unknown</u>	JointType2
FeatureClass	wPressurizedMain	<u>AirRelease</u>	JointType1
FeatureClass	wPressurizedMain	AirRelease	JointType2
FeatureClass	wPressurizedMain	<u>BlowOff</u>	JointType1
FeatureClass	wPressurizedMain	<u>BlowOff</u>	JointType2
FeatureClass FeatureClass	wPressurizedMain wPressurizedMain	<u>Bypass</u> Bypass	JointType1
FeatureClass	wPressurizedMain	<u>ChemicalInjection</u>	JointType2 JointType1
FeatureClass	wPressurizedMain	ChemicalInjection	JointType2
FeatureClass	wPressurizedMain	DistributionMain	JointType1
FeatureClass	wPressurizedMain	DistributionMain	JointType2
FeatureClass	wPressurizedMain	Interconnect	JointType1
FeatureClass	wPressurizedMain	Interconnect	JointType2
FeatureClass	wPressurizedMain	PipeBridge	JointType1
FeatureClass	wPressurizedMain	PipeBridge	JointType2
FeatureClass	wPressurizedMain	SamplingStation	JointType1
FeatureClass	wPressurizedMain	SamplingStation	JointType2
FeatureClass	wPressurizedMain	TransmissionMain	JointType1
FeatureClass	wPressurizedMain	TransmissionMain	JointType2
FeatureClass	wPressurizedMain	<u>Unknown</u>	JointType1
FeatureClass	wPressurizedMain	<u>Unknown</u>	JointType2
D_JunctionMaterial			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
		Opint policy	Dolaalt Valuo
Value	Description		
DI	Ductile Iron		
CI	Cast Iron		
PVC AC	Poly Vinyl Chloride		
CL	Asbestos Concrete		
WO	Clay Wood		
OTH	Other		
UNK	Unknown		
Domain Assigned To	0		
•	ObjectClass Name	Subturne	Field
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wAnode	None	Material
FeatureClass	wFitting	Bend Con	Material Material
FeatureClass	wFitting wFitting	<u>Cap</u> Coupling	
FeatureClass FeatureClass	<u>wFitting</u> wFitting	<u>Coupling</u> <u>Cross</u>	Material Material
FeatureClass	wFitting	ExpansionJoint	Material
FeatureClass	wFitting	Offset	Material
FeatureClass	wFitting	Reducer	Material
FeatureClass	wFitting	Riser	Material
FeatureClass	wFitting	Saddle	Material
FeatureClass	wFitting	Sleeve	Material
FeatureClass	wFitting	Tap	Material
FeatureClass	wFitting	Tee	Material
FeatureClass	wFitting	Unknown	Material
FeatureClass	wFitting	Weld	Material
FeatureClass	wFitting	Wye	Material
D_LifeCycleStatus			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value		opin policy	

Active

ACT

PRO	Proposed		
ABAN	Abandoned		
REM Demois Assistant	Removed		
Domain Assigned To			
ObjectClass Type Not Assigned	ObjectClass Name	Subtype	Field
D_MainDistDiam			
Field Type	Small Integer	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
1	1 Inch		
2	2 Inch		
4	4 Inch		
6	6 Inch		
8	8 Inch		
10	10 Inch		
12	12 Inch		
14 16	14 Inch 16 Inch		
18	18 Inch		
20	20 Inch		
24	24 Inch		
0	Unknown		
-1	Other		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wControlValve	<u>AirControl</u>	Diameter
FeatureClass	wControlValve	<u>AirGap</u>	Diameter
FeatureClass	wControlValve	Altitude	Diameter
FeatureClass	wControlValve	<u>AtmosphericVacuum</u>	Diameter
FeatureClass FeatureClass	wControlValve wControlValve	BackflowControl CVAirRelease	Diameter Diameter
FeatureClass	wControlValve	<u>CVCombination</u>	Diameter
FeatureClass	wControlValve	DoubleCheck	Diameter
FeatureClass	wControlValve	PressureVacuum	Diameter
FeatureClass	wControlValve	ReducedPressureBackflow	Diameter
FeatureClass	wControlValve	<u>RPZ</u>	Diameter
FeatureClass	wControlValve	SimpleCheck	Diameter
FeatureClass	wControlValve	<u>Unknown</u>	Diameter
FeatureClass FeatureClass	wControlValve wControlValve	<u>Vacuum</u> VacuumBreaker	Diameter Diameter
FeatureClass	wControlValve	VacuumRelease	Diameter
FeatureClass	wFitting	Bend	Diameter1
FeatureClass	wFitting	Bend	Diameter2
FeatureClass	wFitting	Bend	Diameter3
FeatureClass	wFitting	Bend	Diameter4
FeatureClass	wFitting	<u>Cap</u> Cop	Diameter1
FeatureClass FeatureClass	<u>wFitting</u> wFitting	<u>Cap</u> <u>Cap</u>	Diameter2 Diameter3
FeatureClass	wFitting	<u>Cap</u>	Diameter4
FeatureClass	wFitting	Coupling	Diameter1
FeatureClass	wFitting	Coupling	Diameter2
FeatureClass	wFitting	Coupling	Diameter3
FeatureClass	wFitting	Coupling	Diameter4
FeatureClass	wFitting	Cross	Diameter1
FeatureClass FeatureClass	wFitting wFitting	<u>Cross</u> Cross	Diameter2 Diameter3
FeatureClass	<u>wFitting</u> wFitting	<u>Cross</u> <u>Cross</u>	Diameter3
FeatureClass	wFitting	ExpansionJoint	Diameter1
FeatureClass	wFitting	ExpansionJoint	Diameter2
	-		

FeatureClass	wFitting	ExpansionJoint	Diameter3
FeatureClass	wFitting	ExpansionJoint	Diameter4
FeatureClass	wFitting	Offset	Diameter1
FeatureClass	wFitting	Offset	Diameter2
FeatureClass	wFitting	<u>Offset</u>	Diameter3
FeatureClass	wFitting	<u>Offset</u>	Diameter4
FeatureClass	wFitting	Reducer	Diameter1
FeatureClass	wFitting	Reducer	Diameter2
FeatureClass	wFitting	Reducer	Diameter3
FeatureClass	wFitting	<u>Reducer</u>	Diameter4
FeatureClass	wFitting	Riser	Diameter1
FeatureClass	wFitting	Riser	Diameter2
FeatureClass	wFitting	Riser	Diameter3
FeatureClass	wFitting	Riser	Diameter4
FeatureClass	wFitting	Saddle	Diameter1
FeatureClass	wFitting	Saddle	Diameter2
FeatureClass	wFitting	Saddle	Diameter3
FeatureClass	wFitting	Saddle	Diameter4
FeatureClass	wFitting	Sleeve	Diameter1
FeatureClass	wFitting	Sleeve	Diameter2
FeatureClass	wFitting	Sleeve	Diameter3
FeatureClass	wFitting	Sleeve	Diameter4
FeatureClass	wFitting	Tap	Diameter1
FeatureClass	wFitting	Tap	Diameter2
FeatureClass	wFitting	Tap	Diameter3
FeatureClass	wFitting	<u>Tap</u>	Diameter4
FeatureClass	wFitting	<u>Tee</u>	Diameter1
FeatureClass	wFitting	Tee	Diameter2
FeatureClass	wFitting	Tee	Diameter3
FeatureClass	wFitting	Tee	Diameter4
FeatureClass			Diameter1
FeatureClass	<u>wFitting</u>	<u>Unknown</u> Unknown	Diameter2
FeatureClass	<u>wFitting</u>		
	<u>wFitting</u>	<u>Unknown</u>	Diameter3
FeatureClass	<u>wFitting</u>	<u>Unknown</u> Wold	Diameter4
FeatureClass	<u>wFitting</u>	<u>Weld</u>	Diameter1
FeatureClass	<u>wFitting</u>	<u>Weld</u>	Diameter2
FeatureClass	<u>wFitting</u>	<u>Weld</u>	Diameter3
FeatureClass	wFitting	Weld	Diameter4
FeatureClass	wFitting	<u>Wye</u>	Diameter1
FeatureClass	wFitting	<u>Wye</u>	Diameter2
FeatureClass	wFitting	<u>Wye</u>	Diameter3
FeatureClass	wFitting	<u>Wye</u>	Diameter4
FeatureClass	wGravityMain	Carrier	Measurement1
FeatureClass	wGravityMain	Carrier	Measurement2
FeatureClass	wGravityMain	Carrier	NominalDiameter
FeatureClass	wGravityMain	InlineStorage	Measurement1
FeatureClass	wGravityMain	InlineStorage	Measurement2
FeatureClass	wGravityMain	InlineStorage	NominalDiameter
FeatureClass	wGravityMain	TransportPipe	Measurement1
FeatureClass	wGravityMain	TransportPipe	Measurement2
FeatureClass	wGravityMain	TransportPipe	NominalDiameter
FeatureClass	wGravityMain	<u>Unknown</u>	Measurement1
FeatureClass	wGravityMain	Unknown	Measurement2
FeatureClass	wGravityMain	<u>Unknown</u>	NominalDiameter
FeatureClass	<u>wHydrant</u>	None	BarrellDiameter
FeatureClass	wHydrant	None	NozzleDiameter1
FeatureClass	wHydrant	None	NozzleDiameter2
FeatureClass	wHydrant	None	NozzleDiameter3
FeatureClass	wHydrant	None	NozzleDiameter4
FeatureClass	<u>wMeter</u>	<u>Compound</u>	Diameter
FeatureClass	wMeter	Current	Diameter
FeatureClass	<u>wMeter</u>	<b>DetectorCheck</b>	Diameter
FeatureClass	wMeter	MagneticOrifice	Diameter
FeatureClass	wMeter	<u>Pito</u>	Diameter

FeatureClass	<u>wMeter</u>	PositiveDisplacement	Diameter
FeatureClass	<u>wMeter</u>	Proportional	Diameter
FeatureClass	<u>wMeter</u>	<u>Sonic</u>	Diameter
FeatureClass	<u>wMeter</u>	<u>Uknown</u>	Diameter
FeatureClass	<u>wMeter</u>	<u>Venturi</u>	Diameter
FeatureClass	wPressurizedMain	<u>AirRelease</u>	Diameter
FeatureClass	wPressurizedMain	<u>BlowOff</u>	Diameter
FeatureClass	wPressurizedMain	<u>Bypass</u>	Diameter
FeatureClass	wPressurizedMain	ChemicalInjection	Diameter
FeatureClass	wPressurizedMain	DistributionMain	Diameter
FeatureClass	wPressurizedMain	Interconnect	Diameter
FeatureClass FeatureClass	wPressurizedMain	<u>PipeBridge</u>	Diameter
FeatureClass	wPressurizedMain	SamplingStation TransmissionMain	Diameter
	wPressurizedMain		Diameter
FeatureClass FeatureClass	wPressurizedMain	<u>Unknown</u> AvialElaw	Diameter Diacharga Diameter
FeatureClass	<u>wPump</u>	<u>AxialFlow</u>	DischargeDiameter
FeatureClass	wPump	<u>AxialFlow</u>	InletDiameter
FeatureClass	<u>wPump</u> wPump	<u>Centrifugal</u> Centrifugal	DischargeDiameter InletDiameter
FeatureClass	<u>wPump</u>		DischargeDiameter
FeatureClass	<u>wPump</u>	<u>Jet</u> Jet	InletDiameter
FeatureClass	<u>wPump</u>	Reciprocating	DischargeDiameter
FeatureClass	<u>wPump</u>	Reciprocating	InletDiameter
FeatureClass	<u>wPump</u>	Rotary	DischargeDiameter
FeatureClass	wPump	Rotary	InletDiameter
FeatureClass	wPump	Screw	DischargeDiameter
FeatureClass	<u>wPump</u>	Screw	InletDiameter
FeatureClass	<u>wPump</u>	Turbine	DischargeDiameter
FeatureClass	wPump	Turbine	InletDiameter
FeatureClass	wPump	Unknown	DischargeDiameter
FeatureClass	wPump	Unknown	InletDiameter
FeatureClass	wSystemValve	Ball	Diameter
FeatureClass	wSystemValve	Butterfly	Diameter
FeatureClass	wSystemValve	Cone	Diameter
FeatureClass	wSystemValve	Gate	Diameter
FeatureClass	wSystemValve	Plug	Diameter
FeatureClass	wSystemValve	Unknown	Diameter
D_Manufacturer			
Field Type	String	Merge Policy	Default Value
	C C	• •	
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
VEN1	Vendor 1		
VEN2	Vendor 2		
VEN3	Vendor 3		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
Not Assigned		Castype	i loid
Not nooighou			
D_NetworkStructureUsa	ade		
	-	Morge Deliev	Default Value
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
RAW	Raw		
POT	Potable		
TRT	Treated		
STR	Storm		
WW	Waterwater Effluent		
REC	Reclaimed		
Domain Assigned To			

ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wNetworkStructure	EnclosedStorageFacility	NetworkUsage
FeatureClass	wNetworkStructure	ProductionWell	NetworkUsage
FeatureClass	wNetworkStructure	PumpStation	NetworkUsage
FeatureClass	wNetworkStructure	<u>StorageBasin</u>	NetworkUsage
FeatureClass	wNetworkStructure	TreatmentPlant	NetworkUsage
FeatureClass	wNetworkStructure	<u>Unknown</u>	NetworkUsage
D_Owner			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value		Opin policy	Doladit Value
	Description		
GWA PVT	Guam Waterworks		
MIL	Private Militan/		
UNK	Military Unknown		
-	GIRIOWI		
Domain Assigned To		0.1.1.2.2	<b>-</b> 2.1.1
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wAnode	None	Owner
FeatureClass	wCasing	AccesssTunnel	Owner
FeatureClass	wCasing	Casement	Owner
FeatureClass FeatureClass	wCasing	ConduitBridge ProtectiveTuppel	Owner
FeatureClass	<u>wCasing</u> wClearWell	ProtectiveTunnel None	Owner Owner
FeatureClass	wControlValve	AirControl	Owner
FeatureClass	wControlValve	AirGap	Owner
FeatureClass	wControlValve	Altitude	Owner
FeatureClass	wControlValve	AtmosphericVacuum	Owner
FeatureClass	wControlValve	BackflowControl	Owner
FeatureClass	wControlValve	<u>CVAirRelease</u>	Owner
FeatureClass	wControlValve	<b>CVCombination</b>	Owner
FeatureClass	wControlValve	DoubleCheck	Owner
FeatureClass	wControlValve	PressureVacuum	Owner
FeatureClass	wControlValve	ReducedPressureBackflow	Owner
FeatureClass	wControlValve	<u>RPZ</u>	Owner
FeatureClass	wControlValve	SimpleCheck	Owner
FeatureClass	wControlValve	<u>Unknown</u>	Owner
FeatureClass FeatureClass	wControlValve wControlValve	<u>Vacuum</u> <u>VacuumBreaker</u>	Owner Owner
FeatureClass	wControlValve	VacuumRelease	Owner
FeatureClass	wFitting	Bend	Owner
FeatureClass	wFitting	Cap	Owner
FeatureClass	wFitting	Coupling	Owner
FeatureClass	wFitting	Cross	Owner
FeatureClass	wFitting	ExpansionJoint	Owner
FeatureClass	wFitting	Offset	Owner
FeatureClass	<u>wFitting</u>	Reducer	Owner
FeatureClass	wFitting	<u>Riser</u>	Owner
FeatureClass	wFitting	Saddle	Owner
FeatureClass	wFitting	<u>Sleeve</u>	Owner
FeatureClass	<u>wFitting</u>	Tap Tao	Owner
FeatureClass FeatureClass	<u>wFitting</u> wFitting	<u>Tee</u> Unknown	Owner Owner
FeatureClass	wFitting	Weld	Owner
FeatureClass	wFitting	Wye	Owner
FeatureClass	wGravityMain	Carrier	Owner
FeatureClass	wGravityMain	InlineStorage	Owner
FeatureClass	wGravityMain	TransportPipe	Owner
FeatureClass	wGravityMain	Unknown	Owner
FeatureClass	wHydrant	None	Owner
FeatureClass	wLateralPoint	None	Owner

FeatureClass wManhole wMeter wMeter <u>wMeter</u> <u>wMeter</u> <u>wMeter</u> wMeter wMeter wMeter wMeter wMeter wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wPressurizedMain wPump wPump wPump wPump wPump wPump wPump wPump wSamplingStation wScadaSensor wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wThrustProtection wThrustProtection wThrustProtection wThrustProtection wUndergroundEnclosure wUndergroundEnclosure wUndergroundEnclosure wWaterStructure wWaterStructure wWaterStructure wWaterStructure wWaterStructure

None Compound Current **DetectorCheck MagneticOrifice** Pito PositiveDisplacement **Proportional** Sonic Uknown Venturi **EnclosedStorageFacility ProductionWell PumpStation StorageBasin TreatmentPlant** <u>Unknown</u> <u>AirRelease</u> **BlowOff Bypass ChemicalInjection DistributionMain** Interconnect **PipeBridge** SamplingStation **TransmissionMain** <u>Unknown</u> **AxialFlow Centrifugal** <u>Jet</u> Reciprocating **Rotary Screw** Turbine Unknown None None Ball **Butterfly** <u>Cone</u> Gate Plug U<u>nknown</u> Anchor Blocking **Deadman Kicker MeterBox** ValveVault Vault **EnclosedStorageFacility ProductionWell PumpStation** StorageBasin **TreatmentPlant** 

Owner

#### D\_PressurizedMainDiam

Field Type	
Domain Type	
Value	
0	
48	

Small Integer Range Description Minimum Maximum Merge Policy Split policy Default Value Default Value

Domain Assigned To ObjectClass Type Not Assigned	ObjectClass Name	Subtype	Field
D_ScadaSensorType Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
AMP	Amperage		
CR	Chlorine Residual		
CTW	Chlorine Tank Weight		
DEP	Depth		
	Discharge Pressure		
ELEV	Elevation		
FLOW PRES	Flow Pressure		
SP	Suction Pressure		
TL	Tank Level		
TEMP	Temperature		
TURB	Turbidity		
VELO	Velocity		
VOLT	Voltage		
WL	Well Level		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wScadaSensor	None	MEASUREMENTTYPE
D_Status			
		Manna Daliau	
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
ACT	Active		
PRO	Proposed		
ABAN	Abandoned		
REM	Removed		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wAnode	None	Status
FeatureClass	wCasing	<u>AccesssTunnel</u>	Status
FeatureClass	wCasing	Casement	Status
FeatureClass FeatureClass	wCasing	ConduitBridge ProtectiveTunnel	Status Status
FeatureClass	wCasing wControlValve	AirControl	Status
FeatureClass	wControlValve	AirGap	Status
FeatureClass	wControlValve	Altitude	Status
FeatureClass	wControlValve	<u>AtmosphericVacuum</u>	Status
FeatureClass	wControlValve	<b>BackflowControl</b>	Status
FeatureClass	wControlValve	<u>CVAirRelease</u>	Status
FeatureClass	wControlValve	<u>CVCombination</u>	Status
FeatureClass	wControlValve	DoubleCheck	Status
FeatureClass	wControlValve	PressureVacuum DeducedPressureDedution	Status
FeatureClass FeatureClass	wControlValve wControlValve	ReducedPressureBackflow RPZ	Status Status
FeatureClass	wControlValve	SimpleCheck	Status
FeatureClass	wControlValve	Unknown	Status
FeatureClass	wControlValve	Vacuum	Status
FeatureClass	wControlValve	VacuumBreaker	Status
FeatureClass	wControlValve	VacuumRelease	Status
FeatureClass	wFitting	Bend	Status

FeatureClass wFitting wGravityMain wGravityMain wGravityMain wGravityMain wHydrant wLateralPoint wManhole wMeter wMeter wMeter wMeter wMeter wMeter <u>wMeter</u> wMeter <u>wMeter</u> wMeter wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wPressurizedMain wPump wPump wPump wPump wPump wPump wPump wPump wSamplingStation wScadaSensor wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wThrustProtection

<u>Cap</u>	Status
Coupling	Status
Cross	Status
	Status
ExpansionJoint	
<u>Offset</u>	Status
<u>Reducer</u>	Status
Riser	Status
Saddle	Status
Sleeve	Status
<u>Tap</u>	Status
<u>Tee</u>	Status
<u>Unknown</u>	Status
Weld	Status
Wye	Status
Carrier	Status
InlineStorage	Status
<u>TransportPipe</u>	Status
<u>Unknown</u>	Status
None	Status
None	Status
None	Status
Compound	Status
<u>Current</u>	Status
<u>DetectorCheck</u>	Status
MagneticOrifice	Status
Pito	Status
PositiveDisplacement	Status
Proportional	Status
	Status
Sonic	
<u>Uknown</u>	Status
<u>Venturi</u>	Status
EnclosedStorageFacility	Status
ProductionWell	Status
PumpStation	Status
<u>StorageBasin</u>	Status
TreatmentPlant	Status
<u>Unknown</u>	Status
<u>AirRelease</u>	Status
<u>BlowOff</u>	Status
<u>Bypass</u>	Status
ChemicalInjection	Status
DistributionMain	Status
Interconnect	Status
<u>PipeBridge</u>	Status
SamplingStation	Status
TransmissionMain	Status
Unknown	Status
AxialFlow	Status
Centrifugal	Status
Jet	Status
Reciprocating	Status
<u>Rotary</u>	Status
<u>Screw</u>	Status
Turbine	Status
Unknown	Status
	Status
None	
None	STATUS
<u>Ball</u>	Status
Butterfly	Status
Cone	Status
Gate	Status
Plug	Status
<u>Unknown</u>	Status
Anchor	STATUS

FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass FeatureClass	wThrustProtection wThrustProtection wThrustProtection wUndergroundEnclosure wUndergroundEnclosure wUndergroundEnclosure wWaterStructure wWaterStructure wWaterStructure wWaterStructure wWaterStructure wWaterStructure wWaterStructure	Blocking Deadman Kicker MeterBox ValveVault Vault EnclosedStorageFacility ProductionWell PumpStation StorageBasin TreatmentPlant	STATUS STATUS STATUS STATUS STATUS STATUS STATUS STATUS STATUS
D_ValveDeviceID			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
0	Valve Equipment #1		
1 2	Valve Equipment #2		
-	Valve Equipment #3		
Domain Assigned To	ObjectClass Name	Subturno	Field
ObjectClass Type Not Assigned	ObjectClass Name	Subtype	Field
Not Assigned			
D_WarehouseStatus			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
INS	In Service		
INT	In Transit		
INW RET	In Warehouse Retired		
Domain Assigned To	Kellieu		
ObjectClass Type	ObjectClass Name	Subtype	Field
Not Assigned		Oubtype	T ICIU
U U			
D_WaterLineMaterial			
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
DI	Ductile Iron		
CI	Cast Iron		
PVC AC	Poly Vinyl Chloride Asbestos Concrete		
WO	Wood		
ОТН	Unknown		
	Other		
Domain Assigned To		0.14	<b>-</b> :
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass FeatureClass	<u>wCasing</u> wCasing	<u>AccesssTunnel</u> Casement	Material Material
FeatureClass	wCasing	<u>ConduitBridge</u>	Material
FeatureClass	wCasing	ProtectiveTunnel	Material
FeatureClass	wGravityMain	Carrier	Material
FeatureClass FeatureClass	<u>wGravityMain</u> wGravityMain	<u>InlineStorage</u> <u>TransportPipe</u>	Material Material
FeatureClass	wGravityMain	<u>Unknown</u>	Material
FeatureClass	wPressurizedMain	AirRelease	Material
FeatureClass	wPressurizedMain	<u>BlowOff</u>	Material

FeatureClass	wPressurizedMain	<u>Bypass</u>	Material
FeatureClass	wPressurizedMain	ChemicalInjection	Material
FeatureClass	wPressurizedMain	DistributionMain	Material
FeatureClass	wPressurizedMain	Interconnect	Material
FeatureClass	wPressurizedMain	PipeBridge	Material
FeatureClass	wPressurizedMain		Material
		SamplingStation	
FeatureClass	wPressurizedMain	TransmissionMain	Material
FeatureClass	wPressurizedMain	<u>Unknown</u>	Material
D_WaterType			
•••	String	Marga Daliay	
Field Type	String	Merge Policy	Default Value
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
TRT	Treated Water		
POT	Potable Water		
RAW	Raw Water		
REC	Reclaimed Water		
SALT	Salt Water		
SEW	Sewage		
STR	Storm Runoff		
EFF	Wastewater Effluent		
Domain Assigned To			
•	ObjectClass Name	Cubbins	Field
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wAnode	None	WaterType
FeatureClass	wCasing	<u>AccesssTunnel</u>	WaterType
FeatureClass	wCasing	<u>Casement</u>	WaterType
FeatureClass	wCasing	ConduitBridge	WaterType
FeatureClass	wCasing	ProtectiveTunnel	WaterType
FeatureClass	wClearWell	None	WaterType
FeatureClass	wControlValve	AirControl	WaterType
FeatureClass	wControlValve	AirGap	WaterType
FeatureClass	wControlValve	Altitude	WaterType
FeatureClass	wControlValve	AtmosphericVacuum	WaterType
FeatureClass	wControlValve	BackflowControl	WaterType
FeatureClass			
	wControlValve	<u>CVAirRelease</u>	WaterType
FeatureClass	wControlValve	<u>CVCombination</u>	WaterType
FeatureClass	wControlValve	DoubleCheck	WaterType
FeatureClass	wControlValve	PressureVacuum	WaterType
FeatureClass	wControlValve	ReducedPressureBackflow	WaterType
FeatureClass	wControlValve	<u>RPZ</u>	WaterType
FeatureClass	wControlValve	SimpleCheck	WaterType
FeatureClass	wControlValve	<u>Unknown</u>	WaterType
FeatureClass	wControlValve	<u>Vacuum</u>	WaterType
FeatureClass	wControlValve	VacuumBreaker	WaterType
FeatureClass	wControlValve	VacuumRelease	WaterType
FeatureClass	wFitting	Bend	WaterType
FeatureClass	wFitting		WaterType
FeatureClass	wFitting	Coupling	WaterType
FeatureClass	wFitting	Cross	WaterType
FeatureClass	wFitting	ExpansionJoint	WaterType
FeatureClass			WaterType
	wFitting	<u>Offset</u>	
FeatureClass	wFitting	Reducer Bieger	WaterType
FeatureClass	wFitting	Riser	WaterType
FeatureClass	wFitting	<u>Saddle</u>	WaterType
FeatureClass	wFitting	Sleeve	WaterType
FeatureClass	wFitting	<u>Tap</u>	WaterType
FeatureClass	wFitting	Tee	WaterType
FeatureClass	wFitting	<u>Unknown</u>	WaterType
FeatureClass	wFitting	Weld	WaterType
FeatureClass	wFitting	Wye	WaterType
FeatureClass	wGravityMain	Unknown	WaterType
FootureClass	webudropt	Nono	WaterTupe

wHydrant

None

FeatureClass

WaterType

FeatureClass wLateralPoint wManhole wMeter <u>wMeter</u> <u>wMeter</u> wMeter wMeter wMeter wMeter wMeter wMeter wMeter wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wNetworkStructure wPressurizedMain wPump wPump wPump wPump wPump wPump wPump wPump wSamplingStation wScadaSensor wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wSystemValve wThrustProtection wThrustProtection wThrustProtection wThrustProtection wUndergroundEnclosure wUndergroundEnclosure wUndergroundEnclosure wWaterStructure wWaterStructure wWaterStructure wWaterStructure wWaterStructure

None None Compound Current **DetectorCheck MagneticOrifice** Pito **PositiveDisplacement Proportional** Sonic Uknown Venturi **EnclosedStorageFacility ProductionWell PumpStation StorageBasin TreatmentPlant** <u>Unknown</u> AirRelease **BlowOff Bypass ChemicalInjection DistributionMain** Interconnect PipeBridge **SamplingStation TransmissionMain** <u>Unknown</u> **AxialFlow** Centrifugal <u>Jet</u> Reciprocating **Rotary Screw** Turbine Unknown None None **Ball Butterfly** Cone <u>Gate</u> Plug <u>Unknown</u> Anchor Blocking **Deadman** <u>Kicker</u> **MeterBox** ValveVault Vault **EnclosedStorageFacility ProductionWell PumpStation** StorageBasin **TreatmentPlant** 

WaterType WATERTYPE

WaterType

WaterType

WaterType

WaterType

WaterType WaterType

WaterType

#### D\_WHSystemValveReg

Field Type Domain Type Value FLOW String Coded Value Description Flow Merge Policy Split policy Default Value Default Value

PRES	Pressure		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	wSystemValve	Ball	RegulationType
FeatureClass	wSystemValve	Butterfly	RegulationType
FeatureClass	wSystemValve	Cone	RegulationType
FeatureClass FeatureClass	wSystemValve	<u>Gate</u>	RegulationType
FeatureClass	wSystemValve wSystemValve	<u>Plug</u> <u>Unknown</u>	RegulationType RegulationType
EnabledDomain			
Field Type	Small Integer	Merge Policy	Default Value
	-	• •	
Domain Type	Coded Value	Split policy	Default Value
Value	Description		
0	False		
1	True		
Domain Assigned To			
ObjectClass Type	ObjectClass Name	Subtype	Field
FeatureClass	WaterNetwork Junctions	None	Enabled
FeatureClass	wClearWell	None	Enabled
FeatureClass	wControlValve	<u>AirControl</u>	Enabled
FeatureClass	wControlValve	AirGap	Enabled
FeatureClass	wControlValve	Altitude	Enabled
FeatureClass	wControlValve	AtmosphericVacuum	Enabled
FeatureClass FeatureClass	wControlValve	BackflowControl	Enabled Enabled
FeatureClass	wControlValve wControlValve	CVAirRelease CVCombination	Enabled
FeatureClass	wControlValve	DoubleCheck	Enabled
FeatureClass	wControlValve	PressureVacuum	Enabled
FeatureClass	wControlValve	ReducedPressureBackflow	Enabled
FeatureClass	wControlValve	RPZ	Enabled
FeatureClass	wControlValve	<u>SimpleCheck</u>	Enabled
FeatureClass	wControlValve	Unknown	Enabled
FeatureClass	wControlValve	<u>Vacuum</u>	Enabled
FeatureClass	wControlValve	VacuumBreaker	Enabled
FeatureClass	wControlValve	VacuumRelease	Enabled
FeatureClass	wFitting	Bend	Enabled
FeatureClass	wFitting	<u>Cap</u>	Enabled
FeatureClass	wFitting	Coupling	Enabled
FeatureClass	wFitting	<u>Cross</u>	Enabled Enabled
FeatureClass FeatureClass	<u>wFitting</u> wFitting	<u>ExpansionJoint</u> <u>Offset</u>	Enabled
FeatureClass	wFitting	Reducer	Enabled
FeatureClass	wFitting	Riser	Enabled
FeatureClass	wFitting	<u>Saddle</u>	Enabled
FeatureClass	wFitting	Sleeve	Enabled
FeatureClass	wFitting		Enabled
FeatureClass	wFitting	Tee	Enabled
FeatureClass	wFitting	<u>Unknown</u>	Enabled
FeatureClass	wFitting	Weld	Enabled
FeatureClass	wFitting	<u>Wye</u>	Enabled
FeatureClass	wGravityMain	Carrier	Enabled
FeatureClass	wGravityMain	InlineStorage	Enabled
FeatureClass	wGravityMain	TransportPipe	Enabled
FeatureClass	wGravityMain	<u>Unknown</u> None	Enabled
FeatureClass FeatureClass	<u>wHydrant</u> <u>wLateralPoint</u>	None None	Enabled Enabled
FeatureClass	wLateraiPoint wManhole	None	Enabled
FeatureClass	wMeter	Compound	Enabled
FeatureClass	wMeter	Current	Enabled
FeatureClass	wMeter	DetectorCheck	Enabled

wMeter

**DetectorCheck** 

FeatureClass

Enabled

Es sture Ols se		ManualiaOrifica	Exclusion 1
FeatureClass	<u>wMeter</u>	MagneticOrifice	Enabled
FeatureClass	<u>wMeter</u>	<u>Pito</u> Basilias Disata sanat	Enabled
FeatureClass	<u>wMeter</u>	PositiveDisplacement	Enabled
FeatureClass	wMeter	Proportional	Enabled
FeatureClass	<u>wMeter</u>	Sonic	Enabled
FeatureClass	wMeter	Uknown	Enabled
FeatureClass	wMeter	Venturi	Enabled
FeatureClass	wNetworkStructure	EnclosedStorageFacility	Enabled
FeatureClass	wNetworkStructure	ProductionWell	Enabled
FeatureClass	wNetworkStructure	PumpStation	Enabled
FeatureClass	wNetworkStructure	<u>StorageBasin</u>	Enabled
FeatureClass	wNetworkStructure	<u>TreatmentPlant</u>	Enabled
FeatureClass	wNetworkStructure	<u>Unknown</u>	Enabled
FeatureClass	wPressurizedMain	<u>AirRelease</u>	Enabled
FeatureClass	wPressurizedMain	<u>BlowOff</u>	Enabled
FeatureClass	wPressurizedMain	<u>Bypass</u>	Enabled
FeatureClass	wPressurizedMain	ChemicalInjection	Enabled
FeatureClass	wPressurizedMain	<b>DistributionMain</b>	Enabled
FeatureClass	wPressurizedMain	Interconnect	Enabled
FeatureClass	wPressurizedMain	PipeBridge	Enabled
FeatureClass	wPressurizedMain	SamplingStation	Enabled
FeatureClass	wPressurizedMain	<b>TransmissionMain</b>	Enabled
FeatureClass	wPressurizedMain	<u>Unknown</u>	Enabled
FeatureClass	<u>wPump</u>	AxialFlow	Enabled
FeatureClass	<u>wPump</u>	Centrifugal	Enabled
FeatureClass	<u>wPump</u>	<u>Jet</u>	Enabled
FeatureClass	<u>wPump</u>	Reciprocating	Enabled
FeatureClass	<u>wPump</u>	<u>Rotary</u>	Enabled
FeatureClass	<u>wPump</u>	<u>Screw</u>	Enabled
FeatureClass	wPump	<u>Turbine</u>	Enabled
FeatureClass	<u>wPump</u>	<u>Unknown</u>	Enabled
FeatureClass	wSamplingStation	None	Enabled
FeatureClass	wSystemValve	<u>Ball</u>	Enabled
FeatureClass	wSystemValve	Butterfly	Enabled
FeatureClass	wSystemValve	Cone	Enabled
FeatureClass	wSystemValve	Gate	Enabled
FeatureClass	wSystemValve	Plug	Enabled
FeatureClass	wSystemValve	Unknown	Enabled

	Row/Feature Count Information				
Feature Dataset	Dataset (Type)	Subtype/ Band	Count	Extent	SnapShot
Water Distribution Features	wAnode (FeatureClass)	No Subtypes	0	No Spatial Extent	
		AccesssTunnel	0		
	wCasing	Casement	0	No Spatial Extent	
	(FeatureClass)	ConduitBridge	0		
		ProtectiveTunnel	0		
	wReservoirs (FeatureClass)	No Subtypes	9	Xmin 91318.2004422331 Xmax 110705.99489228 Ymin 174917.257127393 Ymax 201787.290560404	00 <b>(</b> 0 0 0
	wScadaSensor (FeatureClass)	No Subtypes	0	No Spatial Extent	
	wThrustProtection	Anchor	0	No Spatial Extent	
	(FeatureClass)	Blocking	0		
		Deadman	0		

		Kicker	0		
		MeterBox	0		
	wUndergroundEnclosure (FeatureClass)	ValveVault	0	No Spatial Extent	
		Vault	0	-	
		EnclosedStorageFacility	0		
		ProductionWell	0	-	
	wWaterStructure	PumpStation	0	No Spatial Extent	
	(FeatureClass)	StorageBasin	0	_	
		TreatmentPlant	0	-	
Water Distribution Network	WaterNetwork_Junctions (FeatureClass)	No Subtypes	1600	Xmin 89644.0925366748 Xmax 400000 Ymin 172956.901285568 Ymax 690000	
	wClearWell (FeatureClass)	No Subtypes	9	Xmin 98995.6281613794 Xmax 400000 Ymin 194885.39333798 Ymax 690000	
		AirControl	0		
		AirGap	0		
		Altitude	0		
		AtmosphericVacuum	0	-	
	wControlValve (FeatureClass)	BackflowControl	0	-	
		CVAirRelease	0	-	
		CVCombination	0		
		DoubleCheck	0	89643.6040886743 Xmax 400000	
		PressureVacuum	0	Ymin	
		ReducedPressureBackflow	-	172957.693861569	
		RPZ	0	Ymax 690000	
		SimpleCheck	0	-	
		Unknown	985	-	
		Vacuum	0	-	
		VacuumBreaker	0	-	
		VacuumRelease	0	-	
			0		
		Bend	1.	_	
		Сар	0	_	
		Coupling	0	_	
		Cross	0	_	
		ExpansionJoint	0	_	
		Offset	0	_	
	wFitting	Reducer	0		
	(FeatureClass)	Riser	0	No Spatial Extent	
	· · ·	Saddle	0		
		Sleeve	0		
		Тар	0		
		Тее	0		
		Unknown	0		
		Weld	0		
		Wye	0		
		Carrier	0		
	wGravityMain	InlineStorage	0	No Cretic Fritant	
	(FeatureClass)	TransportPipe	0	- No Spatial Extent	
		Unknown	0	-	

wHydrant (FeatureClass)	No Subtypes	249	Xmin 89662.7467446922 Xmax 400000 Ymin 175411.738535853 Ymax 690000	•	
wLateralPoint (FeatureClass)	No Subtypes	0	No Spatial Extent		
wManhole (FeatureClass)	No Subtypes	0	No Spatial Extent		
	Compound	0			
	Current	0			
	DetectorCheck	0			
	MagneticOrifice	0			
wMeter	Pito	0	No Spatial Extent		
(FeatureClass)	PositiveDisplacement	0			
	Proportional	0			
	Sonic	0			
	Uknown	0			
	Venturi	0			
	EnclosedStorageFacility	0			
	ProductionWell	0			
wNetworkStructure	PumpStation	0	No Cratic Extant		
(FeatureClass)	StorageBasin	0	— No Spatial Extent		
	TreatmentPlant	0			
	Unknown	0			
	AirRelease	0			
	BlowOff	2731	_		
	Bypass	0	_		
	ChemicalInjection	0	Xmin 89643.6040886743		
wPressurizedMain	DistributionMain	0	Zmax 400000		
(FeatureClass)	Interconnect	0	Ymin		
	PipeBridge	0	172956.901285568 Ymax 690000	1	
	SamplingStation	0			
	TransmissionMain	0			
	Unknown	0			
	AxialFlow	0	İ		
	Centrifugal	0			
	Jet	0	Xmin 90141.9756731382		
wPump	Reciprocating	0	Xmax 400000		
(FeatureClass)	Rotary	0	Ymin		
	Screw	0	178069.076906327 Ymax 690000	•	
	Turbine	0			
	Unknown	4			
wSamplingStation (FeatureClass)	No Subtypes	0	No Spatial Extent		
	Ball	0			
	Butterfly	0			
wSystemValve	Cone	0	No Spotial Estant		
(FeatureClass)	Gate	0	— No Spatial Extent		
	Plug	0			
	Unknown	0	-		

### **Spatial Reference Information**

## Water Distribution Features (FeatureDataset)

Spatial Domain

Minimum

Maximum

Precision

X Y	-40000 -830000	2159023.25452689 1369023.25452689	} 976.562499091	
Μ	0	21474.83645	100000	
Z	0	21474.83645	100000	
Projection System		Geographic Coordinate System		
Projection System PROJCS["1993 Guam Geodetic Network" PROJECTION["Transverse_Mercator"] PARAMETER["False_Easting",100000.0] PARAMETER["False_Northing",200000.0] PARAMETER["Central_Meridian",144.75] PARAMETER["Scale_Factor",1.0] PARAMETER["Latitude_Of_Origin",13.5] UNIT["Meter",1.0]]		GEOGCS["GCS_North_Ame DATUM["D_North_American_ SPHEROID["GRS_1980",637 PRIMEM["Greenwich",0.0] UNIT["Degree",0.0174532923	_1983" 78137.0,298.257222101]]	

#### Water Distribution Network (FeatureDataset)

**Spatial Domain** 

	Minimum	Maximum	Precision		
Х	-40000	2159023.25452689	} 976.562499091		
Y	-830000	1369023.25452689	} 970.302499091		
Μ	0	21474.83645	100000		
Z	0	21474.83645	100000		
Projection System		Geographic Coordi	Geographic Coordinate System		
PROJCS["1993 Guam Geodetic Network" PROJECTION["Transverse_Mercator"] PARAMETER["False_Easting",100000.0] PARAMETER["False_Northing",200000.0] PARAMETER["Central_Meridian",144.75] PARAMETER["Scale_Factor",1.0] PARAMETER["Latitude_Of_Origin",13.5] UNIT["Meter",1.0]]		GEOGCS["GCS_North_A DATUM["D_North_Ameri SPHEROID["GRS_1980" PRIMEM["Greenwich",0.0 UNIT["Degree",0.017453	can_1983" ,6378137.0,298.257222101] )]		

## Water Information Management System

## WIMS Plugin

The WIMS Plug in enhances the MxEdit2 editing by allowing functions and other operations to be available at edit time or as an add-on application. The two types of components, which make up the plug in, are the 'Edit Time' and the 'Add-On' components. The Edit Time component is activated during edit time, usually unseen by the editor, and offers functions to the editor to make editing data easier and more efficient. The Add-On component offers customized applications that an editor needs to ensure data integrity and also provides tools that will help in data processing or in other areas pertaining to the geodatabase as a whole.

## Installation and Setup

The WIMS plug in is installed as an MxEdit2 Plug in. The computer must already have ArcGIS software installed, the MxEdit2 extension installed and proper database access components normally loaded with ArcGIS.

## **Database Connection**

There must be a valid Personal Geodatabase designed specifically for the GWA in order to use the SIMS plug in.

## Installing WIMS Plug in

If a previous version of WIMS Plug in is installed, uninstall it first (step 4). Then load the plug in through the 'MxEdit2 Manage Plug in' form by clicking the 'Load' button and locating the WIMS\_COHAW\_PI.ini file and choosing it. This will create a WIMS plug in folder in the MxEdit2 application folder and install all the files required to run the WIMS plug in. An entry in the MxEdit2 plug in manager will be listed. The plug in DLL will be registered in the Microsoft Registry. The following is a list of files that will be installed in the plug in directory:

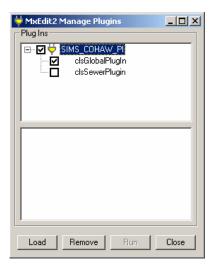
- WIMS\_COHAW\_PI.dll
- WIMS\_COHAW\_PI.ini

The plug in manager with the WIMS plug is successfully loaded if they show up under the MX-Edit Plugin Manager.

✓ MxEdit2 Manage Plugins         Plug Ins         □ ✓ ✓ SIMS_COHAW_PI         □ ✓ ✓ clsGlobalPlugIn         □ ClsSewerPlugin				
Plug In: SIMS_COHAW_PI Plugin information for COHAW(County of Hawaii) Version: 1.0.0				
Load Remove Run Close				

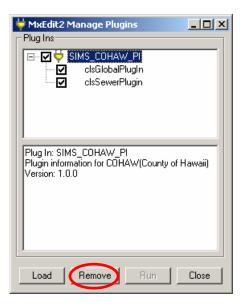
## **Enabling the Plug in**

Within the plug in manager, the SIMS plug in components can be disabled or enabled by checking the component in the plug in tree. By disabling a plug in component, the functions of the component will not execute.



## **Uninstalling WIMS Plug in**

The WIMS plug in can be uninstalled selecting the plug in located in the tree and clicking the 'Remove' button on the plug in manager form. All WIMS plug in related files will be removed and not affect the common libraries and DLLs or ArcGIS files.



## **Using WIMS Plugin**

The Edit Time component is used only with MxEdit and in an edit session in ArcMap. The geodatabase editor usually will not see the Edit Time functions take place so it is recommended to check any Edit Time functions that have taken place.

The WIMS plug in manager can be accessed through the MxEdit2 menu. This will bring up the 'MxEdit2 Manage Plugins' form. This plug in manager is also where the plug in components can be loaded or removed and enabled or disabled.



## **Edit Time Routines**

Below is a table of Edit Time routines with it's associated feature classes, fields and descriptions.

Edit Time Component: Routines					
List of routines	List of routines that are executed by the SIMS plug in at edit time.				
Functions	FeatureClasss	Fields	Description		
Auto AssetID	All featureclasses in the Sewers geometric network except SewerNetwork_Junctions	ASSETID	Assigns a unique Asset ID to all features throughout all featureclasses		
Modified Date	All featureclasses in the Sewers geometric network except SewerNetwork_Junctions	DATEMODIFIED	Populates the DATEMODIFIED field with the current system date when any changes are made to the feature.		

## **Add-on Applications**

The Add-On applications for the SIMS plug in can be accessed by selecting the Add-On plug in located in the plug in tree and clicking the 'Run' button.

💛 MxEdit2 Manage Plugins	- 🗆 🗙
Plug Ins	
□-♥ ♥ SIMS_COHAW_PI ClsGlobalPlugIn ClsSewerPlugin	
Module: clsGlobalPlugIn Plug In: SIMS_COHAW_PI Module Type: Add-On Tool Enabled: Yes Comments: Global Plugin for COHAW	
Load Remove Run	Close

Two applications are currently included in the Add-On plug in, 'Flip Flow Direction' and 'Set Flow'. An edit session must be open to use these applications.

🐂 County of Hawaii	<u> </u>
Flip Flow Direction	
Flip the flow direction of the selected features:	Flip
_ Set Flow	
Network Dataset:	Set Flow
	Close

## Flip Flow Direction

This application was developed to flip the flow direction of the linear features that were drawn in the wrong direction.

- 1. Open an edit session on the Water geodatabase.
- 2. Select all the linear features that need to flipped.
- 3. Click the 'Flip' button and save edits to save the new flow direction of the pipes.

### Set Flow

When the flow of the Water Distribution geometric network needs to be reset for any reason, the user may need to set the flow of the geometric network. The flow of the geometric network allows tracing on then geometric network.

- 1. Open an edit session on the Water geodatabase.
- 2. Select the Water Distribution feature dataset in from the Network Dataset combo box.
- 3. Click the 'Set Flow' button to set the flow and save edits to save the flow of the geometric network.

## Editing the Water Network

It is assumed that the basic editing functionalities are understood. Refer to the ESRI ArcGIS documentation that comes with the software for editing GIS features. This document provides the editing procedures related specifically to the Sewer GIS database designed and is not intended to replace the documentation that comes with ArcGIS software.

Although each user will probably discover tricks and techniques that work for them, often depending on the data sources, this section will address the important steps in editing the GIS sewer network database designed for the GWA.

The SIMS plugin that was developed specifically for the GWA sewer database should be loaded and turned on within MX-Edit to provide automated QA/QC routines that are run as features are edited. Refer to the section "WIMS Plugin" for more information on how to use MX-Edit.

### Adding New Features

New sewer feature are entered into the GIS using the standard ArcMap Editor tools. Load the editor toolbar from the ArcMap "Customize... menu item under "Tools". Users that will be editing the sewer GIS database should be very familiar with the Editor Toolbar, refer to the ESRI ArcGIS documentation for help on using the Editor Toolbar. As the graphical features are added to the GIS, the attributes will need to be entered using the MX-Edit and SIMS plug-in routines.

### Feature Snapping

One of the most important steps in setting up an editing environment is the snapping of features. This will help ensure that dependant features that are associated are connected as they are entered. It is more difficult to debug disconnected features later as they discovered by the users of the data. The snapping settings are located under the standard Editor Toolbar. The snapping of associated sewer features may change depending on the task at hand. Generally the linear feature ends and edges should snap to the vertecies of the junction features. The default settings should be set as shown below:

Snapping Environm	ent			×	
Layer SewerNetwork_Junc Service PumpStation Plant Manhole Fittings Discharge streetname_major SewerLateral SewerIvain Parcels Coast	Vertex				
Edit Sketch     Edit sketch vertices     Edit sketch vertices     Edit sketch edges     Perpendicular to sketch     Topology Elements     Topology nodes					

### **Order of Operation**

The order of operation when adding GIS sewer features will help structure how data is created in the geometric network. Following the recommended order of operation will help to ensure that GIS features are created properly with some operations automatically performed by the database. The recommended order of operation is:

Order of	Order of Operation when Digitizing				
Order	Feature	Editor Action	Database Action		
1.	WaterStructure	Add new waterstrutures as the supply centers in the system. The network can then be digitized from these junctions.	None		
2.	Pressure and Gravity Mains	Digitize pressure and gravity main feature in the direction of flow starting from the upstream point to the downstream point. Snap to existingjunctions if they already exist in the database.	None		
3.	Junction Types	Add various junction types defined in the geodatabase	None		
4.	LateralLines	Digitize LateralLine features in the direction of flow, letting the snapping rules jump the cursor to the connecting sewermain.	None		
5.	Fittings	New fitting types are added along pipe features, snpping to edge of line.	Pipe features will be converted to a complex feature.		

### **Geometric Connectivity Rules**

The sewer geometric network design includes connectivity rules that enforce valid connections between water GIS features. This helps enforce how features are input into the GIS. Invalid connections are not allowed during the editing process. At this time no connectivity rules are defined. These can be setup as the data is used in the modeling.

The "<u>Edge-Junction-Edge Geometric Network Connectivity Rules</u>" table defines the valid connecitons between the pipes and the junction features in the GIS database.

Edge-Junction-Edge Geometric Network Connectivity Rules						
WaterNetwork						
From To			Via			
Edge	Subtype	Edge	Subtype	Junction::Subtype		
This Geometric Network Does Not Contain Any Edge->Junction->Edge Connectivity Rules						

The "Edge-Junction Geometric Network Connectivity Rules" table defines the valid connecitons between the pipes and the junctions with the valid number of connections.

Edge-Junction Geometric Network Connectivity Rules							
WaterNetwork							
Fro	om	т	No. of Edges		o. of ctions		
Edge	Subtype	Junction	Subtype	Min Max	Min	Max	
This Geometric Network Does Not Contain Any Edge->Junction Connectivity Rules							

### Plants

Order of Operation: 1

#### Adding New

Treatment plants should be added first when adding a new treatment plan system. The plant junction represents the headworks or the centroid of the treatment facility. Sewermains connected to the plant junction are add next.

#### **Moving Plants**

Plants can be moved if the location is incorrect in the GIS. Sewermains are interconnected to plants and manholes so the connected sewermains will move with the plant. Refer to "Moving Sewermains" for related information.

#### **Updating Attributes**

The data attributes on the plants should be updated with the SIMS programs. This will help maintain the integrity of the data with the built in data validation routines in SIMS.

#### The valid Sub-Types are:

	TreatmentPlantST
	PlantType
Plants	Activated Sludge
Fiditts	Trickling Filter, Solid Contact
	Aerated Lagoon
	Other

#### **Connectivity Rules**

Generally, plants are conencted to ends of sewermains. Refer to the Connectivity rules for detail information

# 4. GIS Basemap Database

The related GIS layers used for general mapping and analysis, have been organized into a GIS geodatabase. The GIS features layers used for the project should be inserted into the geodatabase for organization and asurance that the projection information is the same. The source of the data varies from different Guam Government agencies. The layers currently in the basemap geodatabase are:

- Wetlands
- Municipal
- Landmarks
- Parcels
- Guam Island
- Map Tiles used to create Map series for field inspection
- Census Tracts
- Census Blocks

## **Database Dictionary**

The databases within the Guam\_Basemap geodatabase are documented using the Geodatabase Reporter tool. Thi data dictionary should be updated with this tool as the database is changed, either from data structure or with added layers.

Geodatabase Summary							
FeatureDataset	Object Name (Alias)	Туре	Geometry	Subtypes			
	Guam_Island (Guam_Island) (C)	Simple Feature	Polygon	None			
	Landmarks (Landmarks) ( <u>C</u> )	Simple Feature	Point	None			
Basemap Layers (S)	<u>Municipal</u> (Municipal) ( <u>C</u> )	Simple Feature	Polygon	None			
	Parcels (Parcels) ( <u>C</u> )	Simple Feature	Polygon	None			
	<u>Roads</u> (Roads) ( <u>C</u> )	Simple Feature	Polyline	None			
	<u>Wetlands</u> (Wetlands) ( <u>C</u> )	Simple Feature	Polyline	None			
Map Tiles (S)	Fieldmaps100_2 (Fieldmaps100_2) (C)	Simple Feature	Polygon	None			
	<u>fieldmaps100</u> (fieldmaps100) ( <u>C</u> )	Simple Feature	Polygon	None			
Population (S)	<u>CenusBlockGrps_2000</u> (CenusBlockGrps_2000) ( <u>C</u> )	Simple Feature	Polygon	None			
	<u>CenusTracts_2000</u> (CenusTracts_2000) ( <u>C</u> )	Simple Feature	Polygon	None			

#### **ObjectClass Information**

#### Guam\_Island (Simple Feature) (Polygon)

N	lo Subtypes					
	Field Name	Field Type	Pre	Sc	Len DV	Domain
	OBJECTID	OID	0	0	4	
	Shape	Geometry	0	0	0	
	AREA	Double	0	0	8	
	PERIMETER	Double	0	0	8	
	GUAM_POLY_	Integer	0	0	4	
	GUAM_POL_1	Integer	0	0	4	
	centerx	Double	0	0	8	

center_y	Double	0	0	8
Shape_Length	Double	0	0	8
Shape_Area	Double	0	0	8

#### Landmarks (Simple Feature) (Point)

#### No Subtypes

Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
ID	Integer	0	0	4	
CATEGORY	String	0	0	35	
DESC_	String	0	0	40	
LAND_USE	String	0	0	40	
CONTACT	String	0	0	20	
PHONE	String	0	0	14	
ADDRESS	String	0	0	16	
ADDTAG	String	0	0	16	
ADD_	String	0	0	40	

### Municipal (Simple Feature) (Polygon)

#### **No Subtypes**

ain

### Parcels (Simple Feature) (Polygon)

#### **No Subtypes**

21					
Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
TAG	String	0	0	32	
VILLAGE	String	0	0	20	
TRACT	String	0	0	30	
BLOCK	String	0	0	30	
LOT	String	0	0	50	
UNIT	String	0	0	30	
MUN	String	0	0	3	
TLEN	Double	0	0	8	
BLEN	Double	0	0	8	
ULEN	Double	0	0	8	
DLMTAG	String	0	0	50	
Shape_Length	Double	0	0	8	
Shape_Area	Double	0	0	8	

#### Roads (Simple Feature) (Polyline)

No Subtypes	,	,				
Field Name		Field Type	Pre	Sc	Len DV	Domain
OBJECTID		OID	0	0	4	
Shape		Geometry	0	0	0	
TAG		String	0	0	32	
PRE_DIR		String	0	0	10	
PRE_TYPE		String	0	0	16	
STREETNAME		String	0	0	45	
STR_TYPE		String	0	0	12	
SUF_DIR		String	0	0	12	

LTOLFROM	String	0	0	15
CSTATUS	String	0	0	16
LFROM	Integer	0	0	4
LTO	Integer	0	0	4
RFROM	Integer	0	0	4
RTO	Integer	0	0	4
Shape_Length	Double	0	0	8

#### Wetlands (Simple Feature) (Polyline)

#### No Subtypes

Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
LAYER	String	0	0	32	
COUNT_	Double	0	0	8	
MAX_COLOR	Integer	0	0	4	
Shape_Length	Double	0	0	8	

#### Fieldmaps100\_2 (Simple Feature) (Polygon) No Subtypes

o Subtypes					
Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID_1	OID	0	0	4	
Shape	Geometry	0	0	0	
OBJECTID	Integer	0	0	4	
ID	Integer	0	0	4	
MapID	String	0	0	8	
Village	String	0	0	50	
Shape_Leng	Double	0	0	8	
Shape_Length	Double	0	0	8	
Shape_Area	Double	0	0	8	

#### fieldmaps100 (Simple Feature) (Polygon)

#### No Subtypes

Field Name	Field Type	Pre	Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
ID	Integer	0	0	4	
MapID	String	0	0	8	
Village	String	0	0	50	
Shape_Length	Double	0	0	8	
Shape_Area	Double	0	0	8	

### CenusBlockGrps\_2000 (Simple Feature) (Polygon)

	$\mathbf{I} = \mathbf{V} \mathbf{I}$	/ \			,	
N	o Subtypes					
	Field Name	Field Type	Pre	Sc	Len DV	Domain
	OBJECTID	OID	0	0	4	
	Shape	Geometry	0	0	0	
	GIST_ID	Integer	0	0	4	
	FIPSSTCO	String	0	0	5	
	TRACT	String	0	0	6	
	GROUP_	String	0	0	1	
	STFID	String	0	0	12	
	Shape_Length	Double	0	0	8	
	Shape_Area	Double	0	0	8	
	RES2000	Integer	0	0	4	
	RES2005	Integer	0	0	4	
	RES2010	Integer	0	0	4	
	RES2015	Integer	0	0	4	
	RES2020	Integer	0	0	4	

RES2050	Integer	0	0	4	
RES2100	Integer	0	õ	4	
	integer	0	0	4	
EMP2000	Integer	0	0	4	
EMP2005	Integer	0	0	4	
EMP2010	Integer	0	0	4	
EMP2015	Integer	0	0	4	
EMP2020	Integer	0	0	4	
EMP2050	Integer	0	0	4	
EMP2100	Integer	0	0	4	
RESGROWTH	Integer	0	0	4	
EMPGROWTH	Integer	0	0	4	
HOTELGROWTH	Integer	0	0	4	
RESCAP	Integer	0	0	4	
EMPCAP	Integer	0	0	4	
HOTELCAP	Integer	0	0	4	
	-				

## CenusTracts\_2000 (Simple Feature) (Polygon)

No Subtypes					
Field Name	Field Type	Pre	e Sc	Len DV	Domain
OBJECTID	OID	0	0	4	
Shape	Geometry	0	0	0	
GIST_ID	Integer	0	0	4	
FIPSSTCO	String	0	0	5	
TRT2000	String	0	0	6	
STFID	String	0	0	11	
TRACTID	String	0	0	10	
Shape_Length	Double	0	0	8	
Shape_Area	Double	0	0	8	

	Rov	v/Feature Count Inf	ormation		
Feature Dataset	Dataset (Type)	Subtype/ Band	Count	Extent	SnapSho
Basemap Layers	Guam_Island (FeatureClass)	No Subtypes	43	Xmin 85712.656501079 Xmax 122390.840471238 Ymin 170580.501411863 Ymax 217084.715983174	
	Landmarks (FeatureClass)	No Subtypes	552	Xmin 87973.0085031841 Xmax 118210.474131345 Ymin 172130.085797306 Ymax 217203.088335284	<b>*</b>
	Municipal (FeatureClass)	No Subtypes	19	Xmin 85751.1947411149 Xmax 122589.959319424 Ymin 171593.823140807 Ymax 217072.377807162	and a
	Parcels (FeatureClass)	No Subtypes	32500	Xmin 88303.1829674917 Xmax 120293.920917285 Ymin 170736.211876008 Ymax 217308.780495382	<b>T</b>

1					
	Roads (FeatureClass) No Subtype:		5346	Xmin 88745.0993839032 Xmax 119114.846356187 Ymin 171995.509669181 Ymax 209855.380424441	6
	Wetlands (FeatureClass)	No Subtypes	22	Xmin 85620.4719249932 Xmax 122527.894679366 Ymin 170061.74710738 Ymax 217308.087247382	1
Map Tiles	Fieldmaps100_2 (FeatureClass)	No Subtypes	14696	Xmin 84855.6002442808 Xmax 123479.856280252 Ymin 171772.000164973 Ymax 217583.439823638	
	fieldmaps100 (FeatureClass)	No Subtypes	14696	Xmin 84855.6002442808 Xmax 123479.856280252 Ymin 171593.823140807 Ymax 217583.439823638	
Population	CenusBlockGrps_2000 (FeatureClass)	No Subtypes	203	Xmin 85736.0641171008 Xmax 122385.668247233 Ymin 170546.336675831 Ymax 217102.63393519	
Population	CenusTracts_2000 (FeatureClass)	No Subtypes	56	Xmin 85736.0641171008 Xmax 122385.668247233 Ymin 170546.336675831 Ymax 217102.63393519	<b>Band</b>

### **Spatial Reference Information**

## **Basemap Layers (FeatureDataset)**

Spatial Domain

	Minimum	Maximum	Precision
Х	-40000	2159023.254528	} 976.562499090505
Y	-830000	1369023.254528	3970.302499090303
Μ	0	21474.83645	100000
Z	0	21474.83645	100000
Projection System		Geographic Coordinate	e System
PROJCS["1993 Guam Geode PROJECTION["Transverse_M PARAMETER["False_Easting PARAMETER["False_Northing PARAMETER["Central_Merid PARAMETER["Scale_Factor", PARAMETER["Latitude_Of_C UNIT["Meter",1.0]]	lercator"] ",100000.0] y",200000.0] an",144.75] 1.0]	GEOGCS["GCS_North_American_1983" DATUM["D_North_American_1983" SPHEROID["GRS_1980",6378137.0,298.2572 PRIMEM["Greenwich",0.0] UNIT["Degree",0.0174532925199433]]	

## Map Tiles (FeatureDataset)

#### **Spatial Domain**

	Minimum
Х	-40000
Y	-830000
М	0
Z	0

**Projection System** 

PROJCS["1993 Guam Geodetic Network" PROJECTION["Transverse\_Mercator"] PARAMETER["False\_Easting",100000.0] PARAMETER["False\_Northing",200000.0] PARAMETER["Central\_Meridian",144.75] PARAMETER["Scale\_Factor",1.0] PARAMETER["Latitude\_Of\_Origin",13.5] UNIT["Meter",1.0]]

#### **Population (FeatureDataset)**

Spatial Domain

	Minimum
Х	-40000
Y	-830000
Μ	0
Z	0

**Projection System** 

PROJCS["1993 Guam Geodetic Network" PROJECTION["Transverse\_Mercator"] PARAMETER["False\_Easting",100000.0] PARAMETER["False\_Northing",200000.0] PARAMETER["Central\_Meridian",144.75] PARAMETER["Scale\_Factor",1.0] PARAMETER["Latitude\_Of\_Origin",13.5] UNIT["Meter",1.0]]

Maximum	Precision		
2159023.254528	} 976.562499090505		
1369023.254528	} 970.302499090303		
21474.83645	100000		
21474.83645	100000		
Geographic Coordinate System			

GEOGCS["GCS\_North\_American\_1983" DATUM["D\_North\_American\_1983" SPHEROID["GRS\_1980",6378137.0,298.257222101]] PRIMEM["Greenwich",0.0] UNIT["Degree",0.0174532925199433]]

Maximum	Precision	
2159023.254528	} 976.562499090505	
1369023.254528	310.00240000000	
21474.83645	100000	
21474.83645	100000	
Geographic Coordinate System		

GEOGCS["GCS\_North\_American\_1983" DATUM["D\_North\_American\_1983" SPHEROID["GRS\_1980",6378137.0,298.257222101]] PRIMEM["Greenwich",0.0] UNIT["Degree",0.0174532925199433]]

# 5. Population Database

A prototype table has been designed for your reference with the field definitions that are expected for the modeling tasks. This table has been populated with the blockgroup records from the original US Census Block group data (bg66\_d00). There are 204 block level records in this table.

This table can then be linked back to the Census tract and block shapefiles related by the "Tract" and "BlkGroup" fields respectively and used for spatial operations in GIS.

The wastewater and water models expect some breakdown in the types of population, residential, employment and hotel or visitor and transient population. These categories are included in this table with the base year and some target years.

## Model Resolution

The GIS modeling should use the smallest resolution of data possible, since these numbers will be used to project flow or water demand in pipes. The US Census tract level data contains employment information, while the residential population exists at the smaller block group level. It is recommended that all data be processed down to the block level. In the case of employment and hotel/visitor population the distribution could be done using landuse or zoning information or aerial photos.

Employment and hotel population could be distributed to the block level based on local knowledge and resources. The Census employment population at the tract level could be used as a reference to cross check the local population numbers.

Census blocks that are clearly vacant should remain vacant unless future uses are indicated in a landuse or zoning plan or other weighting factor. As much as possible and based on information available, population must be applied to areas where the actually development exists (near the modeling pipes).

## Growth Rates

The population growth rate factors should use historical data for growth trends, but consider regional geographic trends. As a whole, the Guam growth rates can be easily determined using statistical methods, but for wastewater and water modeling we need to apply growth rates geographically based on landuse, zoning or Guam government planning policies. These growth rates should be applied to the smallest possible resolution, either by some defined growth rate area, by village, by Census Tract or Census bock.

A uniform growth rate applied to the entire island is not reasonable as input for hydraulic modeling requiring a lower resolution. If growth rates are feasible at the Census block level, fields can be used in the prototype table to store this data. (e.g. resGrowth, EmpGrowth, HotelGrowth)

## Maximum Capacity

The population projection should also consider the carrying capacity or target maximum capacity or density. Growth rates applied based on historical growth rates cannot continue infinitely without exceeding reasonable capacity. Based on landuse, zoning and judgment from a planning perspective, the maximum allowable capacity should be determined for each census clock. This will prevent the GIS modeling from projecting and distributing growth unrealistically. A maximum population capacity should be expressed for each of the population categories in the fields ResCap, EmpCap and HotelCap.

## Database Design

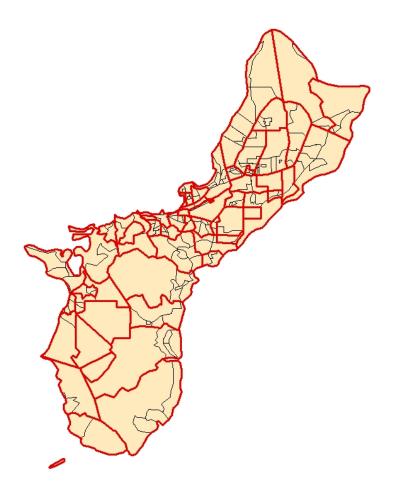
A MS Access table has been designed as an example of the expected population data. Other data may be necessary. The table has been linked to the Census block group GIS shapefiles by then blkgroup field. This shapefile is used within ArcView to process the data with the spatial component. Once the data is complete the table can be imported into the basemap geodatabase and used for the GIS modeling. This table can also be exported to Excel if needed and loaded with the existing data that you have prepared.

RACT LKGROUP es2000 es2005 es2010 es2015	Text Text Number	Census track number (2000 release) Census Block group number (2000 release)			
es2000 es2005 es2010	Number				
es2005 es2010	Thermore a				
es2010	Number	Residential population 2000 - Census base year (block level)			
	NUMBER	Residential population 2005 (block level)			
es2015	Number	Residential population 2010 (block level)			
	Number	Residential population 2015 (block level)			
es2020	Number	Residential population 2020 (block level)			
es2050	Number	Residential population 2050 (block level)			
es2100	Number	Residential population 2100 (block level)			
mp2000	Number	Employment population 2000 - Census base year (Track level)			
mp2005	Number	Employment populaiton 2005 (Track level)			
mp2010	Number	Employment population 2010 (Track level)			
mp2015	Number	Employment population 2015 (Track level)			
mp2020	Number	Employment population 2020 (Track level)			
mp2050	Number	Employment population 2050 (Track level)			
mp2100	Number	Employment population 2100 (Track level)			
otel2000	Number	Hotel populaiton 2000 (Census base year)			
otel2005	Number	Hotel population 2005 (block level)			
otel2010	Number	Hotel population 2010 (block level)			
otel2015	Number	Hotel population 2015 (block level)			
otel2020	Number	Hotel population 2020 (block level)			
otel2050	Number	Hotel population 2050 (block level)			
otel2100	Number	Hotel population 2100 (block level)			
esGrowth	Number	Residential growth rate factor used for projections			
mpGrowth	Number	Employment growth rate factor used for projections			
otelGrowth	Number	Hotel growth rate factor used for projections			
esCap	Number	Residential landuse/zoning Population Cap (maximum capacity)			
mpCap	Number	Employment landuse/zoning Population Cap (maximum capacity)			

## **Census Tract and Block Shapefiles**

The population projection table is linked to the GIS via the Census Tract (tr66\_d00 file) and the Census Blockgroup (bg66\_d00 file). As seen in the map below the resolution of the tracts does not put population where development is since the entire island is covered by tracts, including open space. The blockgroup level allows the population to be distributed to developed areas or areas where wastewater and water pipes are located. Data should be distributed down to the tract level to provide a more adequate resolution to support the GIS modeling.

There are 57 Census tract areas and 204 Census block areas in the GIS shape files. The population projection table should have a one to one match.



# 5. Using MX-Edit

MX-Edit is an ArcGIS extension that enhances feature editing for more productive and intuitive editing of GIS data. It enhances the tools that are used most often while editing GIS data. The objective of the MX-EDIT extension is to provide an advanced and customizable interface for organizing attribute edit forms within ArcMap and to make editing GIS data more efficient. This extension can make editing GIS data both more productive and more enjoyable, because you can organize the look and feel of edit forms that match your style of editing, and your work flow.

#### The major benefits of the MX-Edit extension are:

1. User Customizable Edit Forms: MX-Edit allows the user to take control of the edit interface customized the layouts, ordering of fields and the overall look of the attribute edit forms. These forms are created "on-the-fly" using saved edit session settings tied to GIS datasets.

2. Improved User Interfaces: Many of the commonly used tools for feature selection and attribute editing are improved and organized for efficiency. This reduces the number of clicks of the mouse for tools that you most often use during editing.

3. Custom plugins can be developed that can be executed automatically at edit time from the database, featureclass or down to the feature attribute level.

## Why Use MX-EDIT?

### 1. Increase Productivity

Increasing productivity results in cost savings in the GIS data collection process. Cost savings from increased productivity is sometimes less quantifiable, but it can be an absolute difference in project schedules. MX-Edit provides the user with enhanced tools to make their edit session more productive. This is done by setting up edit forms that match the work flow of the data, by organizing the form using order of field display, colors font types and all the features available with MX-Edit.

#### **Example Scenario**

Assuming 10,000 features in the data collection project and a savings of 3 seconds per feature results in over 8 hours of labor costs. It is estimated that MX-Edit can provide 1-5 seconds per feature in a typical GIS data collection process. Providing productivity tools in GIS editing makes sense.

#### **Productivity Tools**

- Customized data entry forms with "Feature Editor"
- Entry forms supported one to many related tables defined in the relationship classes
- Enhanced "Table Editor" for geodatabase tables
- More efficient "Selectable Layers" interface
- Enhanced Bookmark tool for marking editing zones
- Stored SQL procedures for recalling features needing editing
- Most common editing tools stored in common toolbar

### 2. Increase Quality Control

Custom data entry forms can be designed within MX-Edit to provide a more structured way of entering data. All fields use attribute domains from the database design. Controlling the attribute field order, visibility, permissions, colors can help reduce bad data. One of the most powerful features of MX-Edit is the ability to run custom plugin routines that can be executed at edit or run time down to the field level. The plugins can be developed to automatically calculate fields based on other fields, database rules or anything that can be programmed with ArcObjects. This provides the highest level of quality control for a specific database design.

#### **Quality Control Tools**

- Automatically update date fields in the database as features are added or modified
- Lock or hide fields that should not be altered
- Perform mass calculates for consistency and efficiency

MX-Edit plugins are developed in Visual Basic using ArcObject and common database components. These plugins can be developed to provide very high level editing routines and quality control processes. These are usually developed for specific database designs. <u>Custom plugins</u> for MX-Edit are developed by <u>Integrated Information Solutions</u> on contract basis. Consulting service also available to help design databases and related work flow processes.

#### Example Plugin capabilities

- Increment unique IDs for primary keys

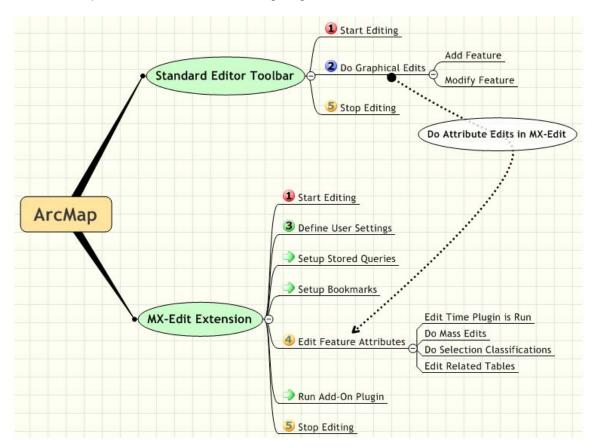
- Calculate and update a slope field when ever the length and elevations field values change

- Automatically update fields based on database rules or connectivity
- Run global database updates or spatial operations before saving or posting
- Run global database QA/QC checks on the data before saving or posting

## Using MX-Edit

MX-Edit complements and works in conjuction with the standard Editor tools. The standard ArcMap Editor toolbar is used to do the graphical edits to features, while the enhanced tools in MX-Edit provide additional tools for doing the attribute edits. The start and stop edit processes on both the standard editor toolbar and the MX-Edit tools are integrated. Starting and stopping edits in either tool bar does the same thing.

Although attributes can be editted from either tool, using one tool for the attribute edits can help establish controls to the data, particularily if <u>plugin routines</u> are implemented. MX-Edit is best used with the process defined in the following diagram.



## Installation and Registration

MX-Edit is installed using an Installshield installation program. After installation the MX-Edit will be made available as an ArcGIS extension. An unregistered version is a fully functioning program with, but works with a limitation of 100 databases records. Registering MX-Edit and entering a valid registration code, will remove this database size limitation. Registration is done under the "About..." menu item on the MX-Edit toolbar.

### **System Requirements**

- Administrator rights for installation
- Windows 2000 or XP
- ArcGIS 8.3 with either ArcView or ArcInfo (version for 9.0 will be available soon)
- 2 mb disk space
- Edits Geodatabases and Shapefiles with appropriate ESRI software licenses.

#### Evaluation License

If MX-EDIT is not registered, it is fully functioning except on feature classes with fewer than 100 features. To enable editing on unlimited number of features, a MX-EDIT license must be purchased and valid username and registration code must be entered. Evaluation version, with the 100 record limitation will never expire.

#### **Registering Single Use License**

A single use license authorizes the use of MX-EDIT on one computer using the registered user name and registration code. Please see <u>"How to Buy MX-Edit"</u> for more information.

#### **Registering a Site-License**

Site licenses can be purchased, which provides a special username and registration ID which can be used to install on unlimited computers within an organization. Please see <u>"How to Buy MX-Edit"</u> for more information.

### Upgrades

To check for the latest version of MX-EDIT visit <u>www.iisgis.com</u>. All minor updates are free of charge.

After purchasing a license, a registration code will be emailed to the email address provided. This registration code should be entered into the "Key Code" and the user name must match the user name provided when the license was purchased.

About MxEdit			×
	Edit fo	r ArcGI	<b>S</b> Mis
Evaluating: 28 days left Version: 2.0.2	Release	e Date: Novemb	per 24, 2004
Registration User Name Evaluation Version: After featureclasses that have			
[Registration]		Show Credits	Close

*User Name:* Enter the valid user name supplied after <u>purchasing MX-Edit</u> Note: must be exact, case sensitive.

*Key Code:* Enter the valid key code supplied after <u>purchasing MX-Edit</u> Note: must be exact, case sensitive.

Register: Press to register MX-Edit using the user name and key code entered

Registration: Collapses and expands the registration information

Show Credits: Displays the developer information and credits

Close: Closes the dialog

# Getting Support

### Support Forum

If you have a question about MX-Edit, please use the product Support Forum at <u>www.iisgis.com/products/Support.htm</u>. Some questions can be addressed by responses from other users. Supporting software in a support forum helps keep our software overhead down, resulting in lower costs on our products. All responses will be posted to this forum as well as by direct email to the person submitting the support question.

### Feedback Forum

This product will continue to be enhanced to provide the tools that will help you be more productive. Your feedback is greatly appreciated and can be helpful to continue the support and enhancements of this product. If you have an idea, comment or question about how to make MX-Edit better, we would like to hear from you. Please use email: support@iisgis.com or visit the product Feedback forum at <a href="https://www.iisgis.com/products/Support.htm">www.iisgis.com/products/Support.htm</a>

### **Product Demos**

MX-Edit demos can be viewed at www.iisgis.com/products/products.asp

### **Contact Us**

If you need to contact us directly, please use email. This helps us keep support cost down, allowing us to offer lower costing products.

#### 1. Product Support Forum

www.iisgis.com/products/Support.htm

#### 2. email: support@iisgis.com

Please use template in email requests:

- ArcGIS product and version (ArcView or ArcInfo)
- MX-Edit version and installation date
- Database type
- Question or description of problem

## Loading the Extension

After installing the MX-Edit software, the extension will appear in the list of extensions and toolbars in ArcMap.

### Activating the MX-Edit Extension in ArcMap

The MX-EDIT extension can be loaded into ArcMap under the "Tools/Extensions..." ArcMap menu. The extension must be activated to enable the MX-EDIT toolbar, even if the toolbar is already loaded.

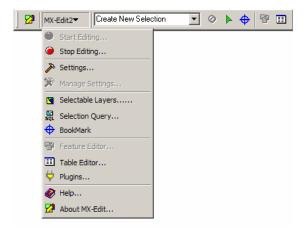
Istomize	?
Tool <u>b</u> ars Commands Options	
Toolb <u>a</u> rs:	
Create Map Sheets	▲ <u>N</u> ew
Map Series	
	Rename
Asbestos Tools	
Custom Toolbar 1	Delete
SFAS ADMIN Toolbar	Reset
SFAS MODELER Toolbar	<u>n</u> eset
SFEM Toolbar	
✓MX-Edit2 Toolbar	
Dimensioning	
Georeferencing	
Route Editing	
Disconnected Editing	▼
Keyboard	Add from file Close

## MX-Edit ToolBar

The MX-Edit extension is organized on an ArcMap toolbar. This toolbar can be loaded into ArcMap using the "Tools" and "Customize..." menu in ArcMap. The items on the toolbar are enabled if the extension is loaded. As with other toolbars in ArcMap, it can be moved and can be used as a tear-off or floating toolbar if desired.

Some capabilities, such as the selection method, selection tool and clear selection, operate the same as those that are standard in ArcMap. However, the placement and organization of these tools was considered for increased productivity.

Note: Some Menu Features are disabled until data is loaded into the project and editing has been started.



*Start Editing:* If data is loaded into the ArcMap document, the <u>Start Editing</u> menu item is enabled.

Stop Editing: If a dataset is currently being edited, then the Stop Editing menu item is enabled.

**Settings:** If a dataset is currently being edited and the Feature Editor is not open, the <u>Settings</u> menu item is enabled.

*Manage Settings:* Open a dialog to <u>manage</u> reset and clear settings for previously defined datasets. The current edit dataset cannot be reset until editing is stopped.

Selectable Layers: Opens enhanced dialog for controlling selectable layers

Selection Query: Opens enhanced dialog for defining, saving and running <u>SQL queries</u>.

**Bookmark:** Opens enhanced <u>bookmark tool</u> for creating, managing and zooming to saved bookmarks

Feature Editor: Opens the Attribute Editor using the current selection set

Table Editor: Opens the Table Editor

Plugins: Opens dialog to load, manage and turn off and on custom plugins

Help: Opens this help file

About MX-Edit: Opens dialog for more Information about MX-Edit, the developer and registration

Loads the MX-Edit "About" dialog. Information about the product, including version and release date, registration information and a brief description of the product.



Selects features set as <u>Selectable</u>, same as ArcMap selection tool

- Bookmark tool, intentionally does nothing. Required for ArcObjects programming
- Opens the <u>Attribute Editor</u> using the current selection set
- Opens the <u>Table Editor</u>

## Settings Dialog

The "Settings" dialog is used to customize the layout and characteristics of the <u>Feature Editor</u>. These settings are saved in system files to be loaded each time that a dataset is opened for editing. The settings are saved by dataset and for each feature class. The settings can be cleared using the <u>Manage Settings</u> dialog or using the reset button within the Options tab of this dialog.

	1 +			<b>@</b>	Apply Close
Layer SewerNetwork_Junctions	Fields Visible Locked	Form Op	tions   Us	er Options/Misc	
🔀 Service	Name	Visible	Locked	Alias	Control Color 🔺
🚰 PumpStation	0. OBJECTID		<b>v</b>	OBJECTID	×
🚰 Plant 👘	2. ANCILLARYROLE		<b>v</b>	ANCILLARYROLE	×
🔀 Manhole	3. ENABLED		<b>v</b>	ENABLED	×
🔀 Fittings	4. ASSETID	<b>v</b>	<b>v</b>	ASSETID	×
🔀 Discharge	5. BASINID	<b>v</b>		BASINID	×
SewerLateral	6. STATUS	<b>v</b>		Status	×
SewerMain	7. OWNER	<b>v</b>		Owner	×
	8. GROUNDELEV	~		GROUNDELEV	×
	9. DATEINSTALLED	~		DATEINSTALLED	×
	10. DATEDIGITIZED	<b>v</b>		DATEDIGITIZED	×
▲1 I III Datasource: D:\COHAW Wastewa	ater\HI_Sewers_SAMPLE.mdb	î.	î	1	

#### The customization options are:

- Changing Field Display Order: Moves the field up or down on the list. This defines the order of display in the "Feature Editor" tool
- Changing Field labels: Change the font color and Bold font state
- Changing Field Control Color: Change the color of each field control to emphasis and group common fields
- Changing Label Text: Change the label text displayed in the list of selected features
- Making Fields Invisible: Turn on or off fields on the 'Feature Editor" tool
- Locking Fields: Make fields read-only status on the 'Feature Editor" tool
- Changing Form Options: Change general layout option on the "Feature Editor" Tool
- Changing User Options: Change user editor name, and date stamp settings.

## **Field Display Order**

The display order in the 'Feature Editor" for each field can be arranged within the "Settings" form. This is done using the up and down arrows. The order of the field is saved and remembered each time this feature class is edited using MX-Edit.

	* I I I						87344		
					⊡ <mark>⊠</mark> M	anhole 87344	SEWERID		87344
Layer	Fields Visible Locked	Eorm Or	tions 1 11s	er Ontior	÷ ÷	86705	3. STATUS	ACT	•
SewerNetwork_Junctions		S		1	Ť.	86712		1.001	
Service	Name	Visible	Locked	Alias	÷	1001082	BASINID	WM	-
PumpStation	0. OBJECTID		~	OBJEC	+	87389	PROJECTID		
📶 Plant	2. ANCILLARYROLE		~	ANCIL	÷	86736	FRUJECTID	1	257
📶 Manhole 👘	3. ENABLED		~	ENABL	÷	86831	OWNER	CITY	-
🛃 Fittings	4. ASSETID	~	~	ASSE1	<b>+</b>	86928			_
🚨 Discharge 📃	5. BASINID	~	2. ENA	BLED	÷	87500	GROUNDELEV		24.35
🗄 SewerLateral 🛛 🚺	6. STATUS	~	3. SEW	ERID	÷	87507	DATEINSTALLED	5/7/1980	
🗄 SewerMain	7. OWNER	· 2.	6. STAT	rus	+	86963	UTTERIO ITIELEU	10/1/1300	
	8. GROUNDELEV		4. BASI	NID	~	ж			
	9. DATEINSTALLED	~	5. PRO.	JECTID	~	×			
	10. DATEDIGITIZED	~	7. OWN	IER	~	×			
	11 DATEMODIEIED		8. GRO	UNDELEV	~	×			
•	2	_	9 DATE	EINSTALL	ED 🖌				

Status Moved up up to Second Position in Edit Form

## **Changing Field Labels**

The field labels in the "Feature Editor" can be changed to read from the defined Alias name in the database or from any field in the Feature Class. This primary display field by default is the Primary display field defined in the Geodatabase, but can be changed in the 'Form Options" tab of the 'Settings" form.

MX-Edit - Settings for WS_14	
Layer Service Plant Manhole Fields Visible Locked Form Options User Option Workspace Type: Local database(Access) Manhole Settings Prmary Display Field: SSETIO Usu Classify Features by	Manhole         87344           Berlin         86705           Berlin         86702
Image: SewerLateral       Image: SewerMain         Image: SewerMain       Image: SewerSewerMain         Image: SewerMain       Image: SewerSewerSewerSewerSewerSewerMeterMain         Image: SewerSewerSewerSewerSewerSewerSewerSewe	⊕-         86831         OWNER         DTY           ⊕-         86928         GROUNDELEV         24.35

Primary Display Field can be from any field

## **Classify Features**

The selected feature in the "Feature Editor" can be classified by either subtypes defined in a geodatabase or by an attribute field. This is useful to organize selected features requiring editing. The classified selections are particular useful when doing <u>mass edits</u> on multiple features. For example, when selecting features from ArcMap a field called "owner", the selected features can be sorted by the unique values such as "City", "Private", or "Military".

Classify by Owner	
Manhole   Manhole   Fittings   Discharge   SeverAain   SewerMain   SewerLateral   SewerLateral   SewerShed   Coast     Show Relationship Classes     Datasource: D:\SFASModels\W/M8_10.wdb	4025 303 305
Classify by Geodatabase SubType Manhole Fittings Discharge ServerMain ServerMain SewerMain SewerLateral SewerLateral Coast Datasource: D:\SFASModels\WM8_10.mdb	
MX-Edit - Feature Editor	
Image: Second Control       Image: Second Contro       Image: Second Control	Close
CITY     CITY     SEWERID 4025303 MANHOLETYPE Plain     VI	-
ter dozsaoa BASINID Waimanalo	=
E I SewerMain STATUS Active WEIR No	
GravityST OWNER Private MONITORID	-
Brick IP_ForceST GROUNDELEV 11.1 MATERIAL Brick	- I
TreatmentST	=
DATEMODIFIED 5/7/2004 ADDRESS	_
ASSETID OLDID	_
<pre>4</pre>	
OBJECTID': 265 (4025303)	

## **Changing Number of Columns**

The fields in the 'Feature Editor" can be organized in one, two or three columns. This is useful to organize feature classes with varying number of fields.

Manhole 1001073	90085					C
9 1001075 9 90073 9 90076	2. SEWERID	90085	DATEDIGITIZED	6/30/1993	MONITORID	
90085 90101	BASINID	Waimanalo	DATEMODIFIED	5/11/2004	MATERIAL	
g 90105	PROJECTIO	264	ASSETID	C-90085	REHAB	
	STATUS	Active	MANHOLETYPE	Plain 💌	ANHOLESUBTYPE	1
	OWNER	City & County of Honolulu	DEPTH	9.3	ADDRESS	41-930 KALANIANAOLE HWY
	GROUNDELEV	12.55	INVERTELEV	3.28	OLDID	WM01DA0217
	DATEINSTALLED	12/16/1987	WEIR	Unknown	1	

Changing Number of Columns

## **Changing Column Width**

The attribute editor form is automatically created at run time using the definitions in the database. Each attribute data entry control is created with default and user settings. Based on the length of the field names in the database, the width of the columns can be adjusted to three settings; Small, Medium and Large. The default is medium. To change the column width, go to the <u>Settings dialog</u> and the <u>Form Options tab</u>. The columns are equal spaced based on this setting, customizable for each feature class.

MX-Edit - Settings for WS_	4						
	1	Apply Close					
Layer Public_Access	Fields Visible Locked Form Options User Options/Mi Workspace Type: Local database(Access)	sc					
		as for field labels. Reset Reset All					
	No. Columns C  ■  C  ■  C  ■  C  ■  C  ■  C  ■  C  Built C  Column Width: Medium Small Medium Large						
Datasource: F:\CoHaw_PublicAccess\PublicAccess_052704.mdb							

## **Changing Field Control Colors**

The colors for each of the field controls can be changed to provide greater control of the organization and emphasis of fields. Colors can be used to group similar field types or to place emphasis on critical fields. To change the color of a field control, use the right mouse button on the field name. A context menu is displayed to change the Control Color.

Layer	Fields Visible Locked	F 0	e)			
Plant		,			1	
PumpStation	Name	Visible	Locked	and the second se	Control Co	
🚰 Manhole	0. OBJECTID		¥	OBJECTID	×	
🔛 Fittings	1. ANCILLARYROLE		~	ANCILLARYROLE	×	
🚨 Discharge	2. ENABLED		~	ENABLED	*	
🔀 Service	7. 3. SEWERID	**	1	Sewerld	COLOR	
🗄 SewerMain	4. BASINID V Bold			Basin	×	Custom colors:
🗄 SewerLateral	5. PRUJECHU	el Color		Plan Id	×	
2 Parcel	6. STATUS Con	trol Color		Status	COLOR	
Sewershed	7. OWNER	~	_	Owner	COLOR	
☑ Coast	8. GROUNDELEV	~		Ground Elev	×	
	9. DATEINSTALLED	~		Date Built	×	Define Custom Colors >>
•	10 DATEDIGITIZED	**		Data Dia	×	OK Cancel

Field Control Color Changed



## **Changing Field Text**

The field labels in the "Feature Edit" can be changed to provide better organization and emphasis on certain fields. To change the label color, use the right mouse button on the label name and select "Label Color". To change the field label font to use a bold font, do the same and check the "Bold" option. Using color and bold fonts in customizing an edit form provides greater control in organizing an edit form that is more efficient and readable.

		Color 2.	<u>? ×</u>	
		Basic colors:		
MX-Edit - Settings for WS_	15			
	1 1		se	
Layer Plant	Fields Visible Locked Form Options	ι 💻 🗖 📰 🗖 🗖		
PumpStation	Name Visible Lock	.e		
Manhole	0. OBJECTID 🖌 🗸			
🔛 Fittings	1. ANCILLARYROLE 🗸			
🔛 Discharge	2. ENABLED 🗸	Custom colors:		
Service	1. 3. SEWE			
🔛 SewerMain	4. BASINIE Bold			
🚟 SewerLateral	5. PROJE(			
🖾 Parcel	6. STATUS Control Color	Define Custom Colo	( ) )	
Sewershed	7. OWNER 🖌	🔗 MX-Edit - Feature Editor		
🖾 Coast	8. GROUNDELEV 🖌			
	9. DATEINSTALLED 🖌	🖃 💹 Manhole		T SQL
		i∃… 1001073	90085	
			30003	
Datasource: D:\SFASModels\WM	8_10\WM8_10.mdb	i∰ 90073	3. SEWERID	90085
		⊕ 90073 ⊕ 90076 ⊕ <b>900085</b> ⊕ 90101 ⊕ 90105		90085
Field Label Co	lor and Bold Font	iter 190085 iter 190101	BASINID	Waimanalo 💌
Field Laber Col			PROJECTID	
		E 30103	THOSECHD	264

### **Making Fields Invisible**

The fields in the "Feature Edit" visibility can be turned off to provide better control of editing only the fields that are of interest. MX-Edit increases the productivity of the editing process by focusing the user's attention to the fields that require editing. If a field needs to be displayed for reference only, use the option to change the "Locked" status. This will allow the values of fields to be seen in read only mode useful for reference information.

P.						1	MX-Edit - Settings for WS_15		
MX-Edit - Settings for W5_	_15 _1	•				Г			
Layer Riant	C	Fields Visible Locked	Form Op	tions   Us	er Options/Misc		Layer     Fields       Plant     Lock       PumpStation     Lock	Visible Locked Fo ked	/m
PumpStation		Name	Visible	Locked			🛿 Manhole 🛛 🔽 🖸	BJECTID	_
🔛 Manhole		0. OBJECTID		<ul> <li></li> </ul>	OBJECTID		📓 Fittings 🛛 🗹 🗛	NCILLARYROLE	
🛂 Fittings		1. ANCILLARYROLE		<b>~</b>	ANCILLARYROL		🖬 Discharge 🛛 🗹 E	NABLED	
🔛 Discharge		2. ENABLED		<ul> <li></li> </ul>	ENABLED		🛃 Service 🛛 🗖 S	EWERID	
Service		3. SEWERID	<b>~</b>		Sewer Id		🖩 SewerMain 🛛 🖊 🗖 B	ASINID	
🚟 SewerMain 📃		4. BASINID	<b>~</b>		Basin			ROJECTID	
	7.	5. PROJECTID	<b>~</b>	<b>~</b>	Plan Id			TATUS	
S Parcel	Im	6. STATUS	<b>~</b>		Status		Recurrenced.	W/MED	
Sewershed		7. OWNER	<b>~</b>		Owner		COLOR		
🖾 Coast		8. GROUNDELEV	<b>~</b>	20 m	X-Edit - Feature		14		
		9. DATEINSTALLED	✓		A-Edit - reature	-	itor		
٠		10 DATEDIGITIZED	**		Manhole	_			
	_				. 1001073				
Datasource: D:\SFASModels\WM	8_1	0\WM8_10.mdb			··· 1001075		90085		
					90073 90076 90076 90085 90101 90105		SEWERID	90085	[
				E E	90085		BASINID Waiman	alo	
				-	⊴… 90101 ∃… 90105			264	
Locking Fields	c						STATUS Active	•	
country rielus	•							🗖	

## Locking Field

The fields in the "Feature Edit" can be locked and viewable in read-only mode in the form. This allows critical system fields and those not requiring editing to be locked and protected from accidental editing. When a field is locked the color of the field control is set to gray, over-riding any control color set on the field. This is an important safe guard to make system sensitive data viewable to the editing process, but secure against accentual editing.

				🥕 MX-Edit - Settings f	or WS_15
MX-Edit - Settings for WS_	15 Fields Visible Locked F	orm Optior	ns User Options/Misc	Layer	Fields         Visible         Locked         Form
Plant Plant PumpStation PumpStation Planta	Name         N           0. OBJECTID         1. ANCILLARYROLE           1. ANCILLARYROLE         2. ENABLED           3. SEWERID         4. BASINID           4. BASINID         5. PROJECTID           6. STATUS         7. OWNER           8. GROUNDELEV         4. GROUNDELEV	Visible L	Locked Alias OBJECTID ANCILLARYRO ENABLED Sewer Id Basin	PumpStation     Manhole     Fittings     Efitings     Service     Service     SewerMain     SewerLateral     SewerLateral     Sewershed	Locked         ☑ OBJECTID         ☑ ANCILLARYROLE         ☑ ENABLED         □ SEWERID         □ BASINID         ☑ PROJECTID         □ STATUS         □ OWNER
Datasource: D:\SFASModels\WM	8_10\WM8_10.mdb	Dnly)	□         •         •         •         Waiman           □         • </td <td>2000697   0BJ <b>3.</b> ANCILLAR<sup>1</sup> EN</td> <td>ECTID 344 (ROLE None V D ABLED True V VERID 2000697</td>	2000697   0BJ <b>3.</b> ANCILLAR <sup>1</sup> EN	ECTID 344 (ROLE None V D ABLED True V VERID 2000697

## Form Options

Each feature class in a Geodatabase can be customized individually for the 'Feature Editor". The Settings tab provides the tools to customize "Feature Editor" forms at the dataset or feature class levels. It is important to remember that these settings can be set for each feature class as desired. For example, a feature class with a few fields can be set to use one column while a feature class with many fields can be set to use three columns.

Note: The Apply Button must be pressed after making a change on each tab of the "Settings" form

MX-Edit - Settings for WS_	15	_ 🗆 X
	1 I As	oply Close
Layer  Layer  Plant  PumpStation  Fittings  Solicharge  Service  SewertMain  SewertLateral  Sewershed  Coast	Fields       Visible       Locked       Form Options       User Options/Misc         Workspace Type:       Local database(Access)         Manhole       Settings         Prmary Display Field:       SEWERID       Use Alias for field labels.         Classify Features by       Use Alias for field labels.         None       Image: Column Width:       Medium         Show Relationship Classes       Show Relationship Classes	Reset All
Datasource: D:\SFASModels\WM8	3_10\WM8_10.mdb	

*Primary Display Field:* Changes the label on the feature of the 'Feature Editor''. Refer to <u>Changing Field Labels</u>.

**Use Alias for Field Label:** Sets the field label in the "Feature Editor" to use the Alias field name defined in the Geodatabase. Refer to <u>Changing Field Labels</u>.

*Classify Features by:* Changes the method of classifying selected features in the "Feature Editor". Refer to <u>Using Classified Selections</u>.

**No. Columns:** Choice to organize field controls in the 'Feature Editor" to one, two or three columns. Refer to <u>Changing Number of Columns</u>.

**Column Width:** There are three settings to adjust the width of the controls in the feature editor (small, medium and large)

**Show Relationship Classes:** Enables the related tables to be shown for editing in the Feature Editor Refer to Relationship Classes.

*Reset:* Resets all settings of the current feature class to the defaults. This affects settings in all the tabs of this form .

**Reset All:** Resets all settings of all the feature classes to the defaults. This affects settings in all the tabs of this form.

**Apply:** Changes made on this tab are applied to the current feature class.

## User/Misc Options

Each feature class in a Geodatabase can be customized to automatically update fields that can store the name of the editor and the date of the last update. This is useful in tracking attribute changes made to a database. All database settings are stored at the computer level and therefore can be setup at the user level on each computer that will be editing databases. If users share computers, they may have to change the name string each time they begin an editing session.

The workspace configuration file is the system file that MX-Edit user to save all database settings. This file can be opened, by extreme caution should be used in editing this file. A corrupted file can cause error in the software. In some cases minor changes can be made, such as the database path, if a database is moved or copied to another file location.

Note:	The Apply	/ Button	must be	pressed	after	making a	change	on each	tab of the	"Settings"
form										

MX-Edit - Settings for WS_	4	
	1 +	Apply Close
Layer Public_Access Public_Areas	Fields       Visible       Locked       Form Options       User Options/Misc         User Options       Image: Contract of the second seco	View
Datasource: F:\CoHaw_PublicAcc	ess\PublicAccess_052704.mdb	1

**User:** If enabled, a character defined field can be updated by a name as features attributes are edited.

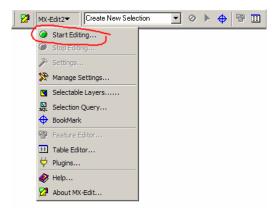
*Date Stamp:* If enabled, a date defined field can be updated with the system date as features attributes are edited.

View Workspace Configuration File: The settings file that stores the settings for the database.

## Starting and Edit Session

Before a Geodatabase can be edited using MX-Edit, the database must first be loaded into the ArcMap document and then be opened for editing. To open a Geodatabase in the document, use the "Start Editing..." menu item on the MX-Edit toolbar. Only one database can be edited at a time supporting any of the database format (Geodatabases, ShapeFiles and Coverages). Most menu items and toolbar buttons are disabled until a valid database is opened for editing. If a dataset that was previously edited using MX-Edit is opened all previous settings are loaded. To clear settings of a previously opened database, use the <u>Manage Settings</u> feature.

The edit session that is started is integrated with the standard Edit Toolbar. Starting and stopping edits from either the MX-Edit toolbar and the Editor Toolbar perform the same function. All edits to features attributes in MX-Edit are held in the Edit Cache until the database is saved by stopping or saving edits.



The Start Editing form displays all valid database formats that are loaded in the ArcMap document, including the source file path.

<mark>7</mark> MX-Edit - Start Ed	iting	_ 🗆 🗙
	atabase you wish to edit. Only databases loaded into ArcMap are shown. are made immediately to the database.	
Work Space Type	Location	
Local Database	F:\CoHaw_PublicAccess\PublicAccess_052704.mdb	
•		
	Start	Cancel

Start: Opens the currently selected for editing.

*Cancel:* Closes the form without opening any database for editing.

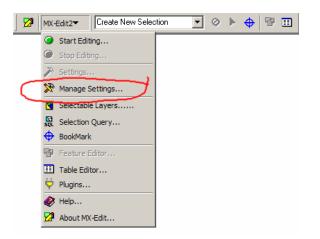
## Stopping an Edit Session

The currently edit database is stopped from editing using this menu item. All feature class and database settings are saved and remembered for the next time the database is edited. The important thing to remember, unlike the start and stop editing feature under the standard ArcMap Editor toolbar, is that the database is saved live. As edits are made to the field controls in the 'Feature Editor" the changes are made directly and immediately to the database. The current version of MX-Edit does not support any undo or recovery to the database. If this is a concern, especially during the evaluation of MX-Edit, you should make a working copy of the database.



## Manage Settings

Each time a database is edited using MX-Edit, the settings are remembered in system files stored with the application as INI files. This enables you to customize the editing forms for each feature class and dataset and have these settings automatically loaded each time the dataset is edited using MX-Edit. Over time these settings files can accumulate and should be managed and removed. The "Manage Settings" feature provides the interface to safely clean up these system files and efficiently reset all MX-Edit settings back to default. It is highly recommended that you use this interface for your house cleaning, rather than manually deleting all associated files.



	sets/FeatureDatasets that have it's settings saved. To remove the settings or return them to the the items to reset and click on the 'Defaults' button.
Work Space Type	Location
WS_TYPE1	F:\Guam GWA\GIS\Wastewater\D&A100104\GWA_Sewers.mdb
WS_TYPE1	F:\Guam GWA\GIS\Guam_Basemap.mdb
WS_TYPE1	F:\CoHaw_Wastewater\Data7_6_04\WW_Current_070204\WW_Updated_070604\HI_Sewe_
WS_TYPE1	F:\CoHaw_PublicAccess\PublicAccess_052704.mdb
WS_TYPE0	f:\sfem_inputs\data10_1_04
WS_TYPE0	F:\CoHaw_Wastewater\GIS_Data\Annotation
WS_TYPE1	D:\COHAW Wastewater\Training\SewerTools Sample\Sample_Data\Sample_HI_Sewers.mdb
T	
	Import Defaults Close

*Import:* Import settings from other saved settings files. MX-Edit stores these files in the ../Program Files/MX-Edit/bin folder.

**Defaults:** Restores the default settings for all databases that are checked. Also removes system settings files.

Close: Closes the dialog.

## **Data Structure Changes**

All the user settings in MX-Edit are stored in configuration files within the MX-Edit installation folders. These configuration files are saved and linked to previously edited databases. Since some settings is dependent on a specific data structure, fields names or relationship classes. If a database item changes and is stored in the MX-Edit settings, the user will be notified of this change and will need to reset the settings files. All saved settings will need to be setup again with this new data structure.

Note: It is recommended that a database structure be stablized before creating elaborate MX-Edit user settings.

## Setting Selectable Layers

One of the most commonly used tasks in editing feature attributes is the constant changing of selectable layers. The "Feature Selection" tool is an enhanced tool to organize all layers by data source, making layers easier to locate and change the selectable state. This affects both the standard ArcMap select tool and the one located on the MX-Edit toolbar. The list of selectable layers is displayed in a tree structure, which is particularly useful for projects with many layers loaded.

K MX-Edit - Selectable Layers	
	Clear Selected Features
Select All Clear All Show Pathname	
□	
PumpStation	
Fittings	
Discharge	
SewerMain	
SewerLateral	
Parcel	
Coast	
III III street III stream	
hydro	
Selection Options Selection Method	
Set Selection Color Create New Selection	

Select All: Makes all layers in list selectable.

Clear All: Clears all layers and makes them not selectable.

Show Pathname: Shows the source path name in the layers list.

*Clear Selected Features:* Clears all currently selected features in the ArcMap map document. Same as the clear select on the MX-Edit toolbar.

Set Selection Color: Changes the selection color.

**Selection Method:** Sets the selection method for dealing with new or existing selection sets. The selection method on the <u>MX-Edit toolbar</u> is the same.

Close: Closes the form

## **Selection Methods**

When using the selection tool, selection methods can be applied to define how to handle existing selection sets. This settings affects both the standard ArcMap selection tool and the one on the MX-Edit toolbar. It is placed on the MX-Edit toolbar for easy access to this commonly used function during editing sessions.

MX-Edit2	Create New Selection	0	¢	🥸 🎞
	Create New Selection Add To Selection Remove from Selection Select from current Selection			

Create New Selection: Creates a new selection, replacing any existing selection

Add To Selection: Appends new selected features to the existing selection set.

*Remove from Selection:* Removes or subtracts new selections from the existing selection set.

Select from Current Selection: Creates a subset or intersection of the existing selection set.

# **Selection Query**

During an edit session, a user may switch between selection sets or have set queries that are repeatedly used to find missing data or feature categories. With the standard ArcGIS query tools, a user cannot save these queires and run them later. The MX-Edit query selection tools allow SQL queries to be created, saved and organized by feature class. These queries are saved within the MX-Edit configuration file at the machine level.

Saved queries can be recalled either from the Selection Query interface or from within the Feature Editor form. Saved quesries can be run either individually or combined with other saved querie using the AND operation between SQL commands.

MX-Edit - Selection Query	×
Datasets and Layers	
Comparison of the second	
■ <u>500</u> Owner is Private ■ <b>500</b> Material is PVC	
SewerLateral SewerMain	
Streetname other	•
Build Selection Query 1	
PIPELENGTH     =     <>     Like     8       DIAMETER     >     =     <>     Like     6       SLOPE     >     >     =     And     10       UPINVERT     <	
FRICTIONFACT	
SELECT * FROM SewerMain WHERE	
DIAMETER > 12	
Peletes the selected saved SQL query	



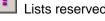
Deletes the selected saved SQL query



Clears the SQL command



Checks the SQL command as valid syntax



Lists reserved key words that cannot be used in SQL command



Saves SQL command to the MX-Edit settings filt

Apply: Runs the selected SQI commands. All selected are applied.

# Attribute Edit Form

The Feature Attribute Editor interface is the heart of MX-Edit. The customized interface that can be tailored to make editing more efficient and effective, you might consider it as a ramped up Object Inspector. Using the customization options, a custom edit form can be designed and saved for each feature class of a Geodatabase or layers in shapefiles. These customization settings are stored in settings files within MX-Edit and recalled each time the data is loaded in ArcMap. All Feature Editor forms are generated on the fly using the stored feature class settings. When Geodatabase domains are linked to attribute fields, a combo-box control is used to provide a drop down list of the valid domains. IMPORTANT: All fields maintain the integrity of the defined Geodatabase.

MX-Edit has the power of designing efficient order and display of attribute fields for truly customized edit forms. As with the Standard Edit Toolbar, geodatabase with defined subtypes, geometric networks or relationship classes cannot be edited using ArcView. Proper ArcMap license are required depending on the design features of a geodatabase.

The MX-Edit customization tools provide basic features that in combination can design efficient and cost effective features editing forms. The basic customization features are:

- Form Layout
- Field Display Order
- Field labeling and font control
- Field control colors
- Powerful classified selections
- Marking edit features as completed
- Recalling saved queries

The MX-Edit toolbar is organized with the most commonly used tools for attribute editing. Although the standard clear selection and selection tools also work with MX-Edit these tools are also placed on the MX-Edit as to create a tool collection of most commonly used tools. The 'Feature Editor" form is opened using the toolbar button circled as shown below:

						~	× .
MX-Edit2	Create New Selection	•	0	►	<del>\$</del> (	8	<u></u>
						$\smile$	

### Example Form:

A customized form for can use a combination of color, fonts, visible, locked and field order to create a form that is efficient for the task at hand.

<mark>थ</mark> MX-Edit - Feature Editor					
Plant		▼ SQL			Close
	C-2000704				1
🗄 🏭 SewerMain	SEWERID	2000704	WATERTABLE	Below Groundwater	•
⊡ ForceST ⊡ <b>C-2000704</b>	ASSETID	C-2000704	FLOWSPLIT		0
	BASINID	Waimanalo 💽	PIPESHAPE	Circular	•
E In the travitys in the travity is the travity in the travity is the travity in the travity is the travit	PROJECTID	0	REHAB	None	•
⊕ ⊕ ModelLinkST ⊕ ⊕ TreatmentST	OWNER	City & County of Honolulu	DIAMETER		18
	STATUS	Active	HEIGHT		0
	MATERIAL	Cast Iron 💌	(ERMAINSUBTYPE		2
	PIPELENGTH	17	NEIGHBORHOOD		
	SLOPE	-1.429	PROJECT LINK		
	UPINVERT	-14.5	YR_REHAB		
	DOWNINVERT	9.79	REHAB_ID		
	UPMANHOLE	3020005	DATEINSTALLED	1/25/1965	
	DOWNMANHOLE	2000705	DATEDIGITIZED	6/18/1999	
	FRICTIONFACTOR	0.015	DATEMODIFIED	6/2/2004	_
	CRITICALRATING				
'OBJECTID': 279 (C-2000704)					1.

## **Recalling Saved Queries**

Stored queries defined in the Selection Query tool can be easily recalled within the Feature Editor. This allows the editor to setup queies to locate data that needs to be changed, data with null or incomplete data or any other query from with the Feature Editor. The editor can quickly switch between saved queries until all data has been edited. The selected can even be updated in mass using the Mass Edits capability.

The saved SQL queires show up in the query drop down list when the feature class category is selected, not at the individual feature record level.

😵 MX-Edit - Feature Editor			
	Material is PVC Owner is Private Material is PVC		Close
± 1741 	Diameter greater than 12 OBJECTID	UPINVERT	
	ENABLED	DOWNINVERT	
	ASSETID	UPMANHOLE	
in 1766 in 1768	BASINID	DOWNMANHOLE	
	STATUS		
	OWNER	CRITICALRATING	
⊡ 1781 ⊡ 1783	MATERIAL	▼ WATERTABLE	
	DATEINSTALLED	FLOWSPLIT	
	DATEDIGITIZED	PIPESHAPE	
	DATEMODIFIED	REHAB	
	PIPELENGTH	HEIGHT	
	DIAMETER	(ERMAINSUBTYPE	
	SLOPE	SHAPE_Length	
WARINING: All features in th	nis grouping will be cha	anged!	1.

Runs the selected saved SQI query for the feature class category

## **Using Classified Selections**

Using classified feature selections adds a whole new dimension of selection sets to Geodatabase data. Now you can make selections using any of the standard ArcMap selection tools or those within MX-Edit and apply a level of classification in the MX-Edit feature tree. This allows you to group data in categories that are of interest of editing. For example, suppose you need to change the ownership of all sewer laterals in a geographic area. You could set the "Classified Selection" in the <u>Settings Form Options</u> to group the selection based on ownership of the sewer laterals. You could then select from the screen all features within an area. In the 'Feature Selection" form the selected sewer laterals are clearly separated by ownership. The private (PVT) lines can then be changed from "Private" ownership to "City" using the <u>mass update capabilities</u>. Using the same example below, suppose that all force main sewers need to be edited, the classified selection could be set to be based on the SewerMain FeatureSubType as defined in the GeoDatabase design.

MX-Edit - Feature Editor		▼ 10 SQL			
	C-3006585				
	SEWERID	3006585	WATERTABLE	Above Groundwater	
😟 😳 ManholeST	ASSETID	C-3006585	FLOWSPLIT	0	
	BASINID	Waimanalo 💽	PIPESHAPE	Circular 💌	
🕀 🧷 C-3006585	PROJECTID	5292	REHAB	None	
E In GravityST E In LP_ForceST	OWNER	City & County of Honolulu	DIAMETER	18	
HodelLinkST	STATUS	Inactive 🔹	HEIGHT	0	
	MATERIAL	Cast Iron 💌	(ERMAINSUBTYPE	2	
<u> </u>	PIPELENGTH	51	NEIGHBORHOOD		
	SLOPE	-0.00275	PROJECT LINK		
	UPINVERT	9.79	YR_REHAB		
	DOWNINVERT	9.93	REHAB_ID		
	UPMANHOLE	2000705	DATEINSTALLED	1/25/1965	
	DOWNMANHOLE	2000708	DATEDIGITIZED	6/18/1999	
		0.015 🔹	DATEMODIFIED	3/31/2004	
	CRITICALRATING	<b>_</b>			
<b>۱</b>					
-3006585					

### **Classified Selection by Field Name**

To group the feature selection set to based on a value in a Field, select the field option and then a field to classify on. This set in the Settings Form Option.

		MX-Edit - Feature Editor	
<ul> <li>Discharge</li> <li>Service</li> <li>SewerMain</li> <li>SewerLateral</li> <li>Parcel</li> <li>Sewershed</li> <li>Coast</li> </ul>	Classify Features by       Field       No. Columns       C       ■       ●       III       C       IIII       C       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Performan Service Antiparticle Plant  Performan Service Antiparticle	C-402530
Datasource: D:\SFASModels	WM8_10\WM8_10.mdb		F

### Classified Selection by Geodatabase FeatureSubType

To group the feature selection set based on a feature subtype, select the subtype option. This option is only available when there are subtypes defined for a feature class. This set in the Settings Form Option.

Discharge Service SewerMain SewerLateral Sewershed Coast	Classify Features by SubType ▼ No. Columns C ■ C IIII Column Width: Medium ▼	MX-Edit - Feature Editor	)007(
Datasource: D:\SFASModels\WM	8_10\WM8_10.mdb		

## **Tracking Edits**

One of the time savers while editing is the ability to visualize and track edits made. When a value in one of a feature's fields is changed, a pencil icon is displayed next to that feature. This is a visual cue that a value was modified or changed. As you move to another feature for editing, the pencil changes to a blue check mark, signifying that the attributes of the feature class was edited and changes were saved. Using these visual tracking cues, a selection set can be more efficiently edited while ensuring that all desired features of a selection set were edited.

For example, in the screen shot below, all selected force main SubTypes of the SewerMain feature class need to be edited. You can select all sewer mains in a geographic area and let MX-Edit to a <u>Classified Selection</u>. Each force main could then be edited and marked as modified until all desired force main sewer lines have been edited. This reduces the chance of oversight or remembering which features you have edited. These small time savers add up to large cost savings, particularly in large database editing projects.

	🔀 MX-Edit - Feature Editor				
	Plant		V SQL		
	PumpStation	C-3006585			
Modified Feature	i ∰ 🔛 Manhole I 🔄 🚟 SewerMain	SEWERID	3006585	WATERTABLE	Above Groundwate
	E	ASSETID	C-3006585	FLOWSPLIT	
	🗩 🕀 🧷 C-3006585	BASINID	Waimanalo 💽	PIPESHAPE	Circular
	in - Handling GravityST in - Handling ModelLinkST	PROJECTID	5292	REHAB	None
Current Edited Feature	🗄 🔠 TreatmentST	OWNER	City & County of Honolulu	DIAMETER	
		STATUS	Inactive 💌	HEIGHT	
		MATERIAL	Cast Iron 💌	(ERMAINSUBTYPE	
		PIPELENGTH	51	NEIGHBORHOOD	
		SLOPE	-0.00275	PROJECT LINK	
		UPINVERT	9.79	YR_REHAB	
		DOWNINVERT	9.93	REHAB_ID	

### **Making Mass Updates**

One of the most time saving features of MX-Edit is the ability to organize feature selection sets and then perform mass edits to selection sets or <u>classified selections sets</u>. This is not possible within the standard ArcMap editing tools with the alternative being SQL update scripts outside of ArcMap.

#### Mass Updates to Feature Class Selection

After selecting the features to be edited, within the <u>Feature Editor</u> the feature layer (top level) can be selected for editing. The edit form is blank when in mass edit mode. Any edits made while selecting the a entire feature class will be performed on all selected features of that class. A warning message is displayed for the user to confirm this mass update when the cursor is moved to another item on the selection tree.

E     Plart     ✓     Apply     Clore       B     Varianalo TP     SeverMain     ✓     Apply     Clore       B     Varianalo TP     SeverMain     ✓     Varianalo TP       B     SeverMain     SeverMain     ✓     Varianalo TP       SeverMain     SeverMain     ✓     Varianalo TP       SeverMain     SeverMain     ✓     Varianalo TP       SeverMain     ✓     Varianalo TP     ✓       Assertio     ✓     Varianalo TP     ✓       Production     SeverMain     ✓     Varianalo TP       Assertio     ✓     Varianalo TP     ✓       Production     SeverMain     ✓     Varianalo TP       Production     ✓     Varianalo TP     ✓       Production     ✓     ✓     Varianalo TP       Production     ✓     ✓     ✓       Production     ✓     ✓     ✓       Verticity     ✓     ✓     ✓       Verticity </th <th>😵 MX-Edit - Feature Editor</th> <th></th> <th></th> <th></th> <th></th>	😵 MX-Edit - Feature Editor				
Berninah     Sewendan					Apply Close
Several Severa		SewerMain			
ASSETID FLOWSPLIT BASINID PIPESHAPE PROJECTID REHAB OWNER DIAMETER STATUS HEIGHT MATERIAL MATERIAL PIPELENOTH NEIGHBOHOD SLOPE PROJECT_LINK UPIWERT PROJECT_LINK UPIWERT REHAB DOWNIVERT REHAB DOWNIMARE DATEDIGITZED FRICTIONFACTOR 0.015 DATEMOSFIED CRITICALRATING Z	🕫 📴 Manhole	CEV/EDID		WATERTARIE	
BASINID Y PIPESHAPE Y PROJECTID REHAB Y OWNER DIAMETER STATUS HEIGHT MATERIAL Y ERMAINSUBTYPE PIPELENGTH NEIGHBORHOOD SLOPE PROJECT_LINK UPIWVERT PROJECT_LINK UPIWVERT REHAB DOWNIWVERT REHAB DOWNIWVERT REHAB DOWNIWVERT DATEINSTALLED DOWNIWNHEE FRICTIONFACTOR 0.015 DATEINSTALLED CRITICALRATING Y	E SewerMain				
PROJECTIO REHAB OWNER DIAMETER STATUS HEIGHT MATERIAL 'FEMAINSUBTYPE PIPELENGTH NEIGHBORHOOD SLOPE PROJECT.INK UPINVERT YR_REHAB DOWNINVERT REHAB.ID DOWNINVERT REHAB.ID DOWNINVERT AREHAB.ID DOWNINVERT AREHAB.ID CHITICALRATING T					
OVWER DIAMETER STATUS HEIGHT MATERIAL FERMAINSUBTYPE PIPELENGTH NIGHBORHOOD SLOPE PROJECT, LINK URINVERT YR_RENAB DOWNINVERT REHAB JD DOWNINVERT DATEDIGITZED FRICTIONFACTOR 0.015 DATEMOSIFIED CRITICALRATING		BASINID		PIPESHAPE	<b>_</b>
STATUS     HEIGHT       MATERIAL     PREMAINSUBTYPE       PIPELENGTH     NEIGHBORHOOD       SLOPE     PROJECT_LINK       UPINVERT     YR_REHAB       DOWNINVERT     REHAB_ID       UPMAHOLE     DATENISTALLED       DOWNIAHHEE     DATENISTALLED       PRICTIONFACTOR     0.015       CRITICALRATING     Y		PROJECTID		REHAB	<b>_</b>
MATERIAL CEMAINSUBTYPE PIPELENATH NEIGHBORHOOD SLOPE PROJECT_LINK UPINVERT YR_REHAB DOWNINVERT REHAB_ID UPMANHOLE DATENISTALLED DOWNIAMHOLE DATENISTALLED PROTIONFACTOR 0.015 DATEMODIFIED CRITICALRATING		OWNER	<b>-</b>	DIAMETER	
PIPELENGTH     NEIGHBORHOOD       SLOPE     PROJECT_LINK       UPINVERT     YR_REHAB       DOWNINVERT     REHAB_ID       UPMANHOLE     DATEINSTALLED       DOWNINAHHOLE     DATEINSTALLED       PRUCTIONFACTOR     0.015       CRITICALRATING     Y		STATUS	<b></b>	HEIGHT	
SLOPE PROJECT_LINK UPINVERT YR_REHAB DOWNINVERT REHAB_ID UPMANHOLE DATEINSTALLED DOWNINVERT DATEINSTALLED PROCTIONFACTOR [0.015  DATEINSTALLED CRITICALRATING J		MATERIAL		/ERMAINSUBTYPE	
UPINVERT YR_REHAB   DOWNINVERT REHAB_ID UPMANHOLE DATEINSTALLED DOWNINAHHOLE DATEDIGITZED   FRICTIONFACTOR [0.015 _ DATEMODIFIED   CRITICALRATING		PIPELENGTH	,	NEIGHBORHOOD	
UPINVERT YR_REHAB DOWNINVERT REHAB_ID UPMANHOLE DATEINSTALLED DOWNINAHHOLE DATEDIGITZED FRICTIONFACTOR [0.015] DATEMODIFIED CRITICALRATING		SLOPE	, [	PROJECT_LINK	
DOWNINVERT REHAB_ID UPMANHOLE DATEINSTALLED DOWNIMANHOLE DATEDIGITZED FRICTIONFACTOR 0.015 DATEMODIFIED CRITICALRATING		UPINVEBT			
UPMANHOLE DATEINSTALLED DOWNMANHOLE DATEINSTALLED DATEINSTALLED FRICTIONFACTOR 0.015 DATEMODIFIED CRITICALRATING					
DOVAMANHOLE DATEDIGITIZED FRICTIONFACTOR 0.015 DATEMODIFIED CRITICALRATING					
CRITICALRATING					
				-	
		FRICTIONFACTOR	0.015 💌	DATEMODIFIED	
		CRITICALBATING	·		
SewerMain	SewerMain				

#### Mass Updates to Classified Feature Class Selections

After selecting the features to be edited, within the <u>Feature Editor</u> a <u>classified selection</u> can be selected for editing. The edit form is blank. Any edits made while selecting the classified selection feature class will be performed on all selected features of that classification. A warning message is displayed for the user to confirm this mass update when the cursor is moved to another item on the selection tree.

Plant		- SQL		Apply	Clos
Waimanalo TP PumpStation	GravityST				
Manhole SewerMain	SEWERID		WATERTABLE		-
ForceST	ASSETID		FLOWSPLIT		-
MedelLink31	BASINID	•	PIPESHAPE		•
- 🔠 TreatmentST	PROJECTID		REHAB		-
	OWNER		DIAMETER		=
	STATUS	•	HEIGHT		-
	MATERIAL	•	ERMAINSUBTYPE		-
	PIPELENGTH		NEIGHBORHOOD		-
	SLOPE		PROJECT_LINK		-
	UPINVERT		YR_REHAB		-
	DOWNINVERT		REHAB_ID		-
	UPMANHOLE		DATEINSTALLED		-
	DOWNMANHOLE		DATEDIGITIZED		-
	FRICTIONFACTOR		DATEMODIFIED		-
		3	-) '		

### **Editing Related Tables**

Tables defined by relationship classes with one-to-many relationships to feature classes can be edited within MX-Edit. MX-Edit can allow you to add and edit database records to related tables, making it more efficient and quicker to maintain related tables. ArcMap editing tools does not allow you to edit linked tables with the standard editing tools. This is a big time saver since one-to-many relationship tables can be edited at the same time as the feature class. MX-Edit uses the relationship classes defined within geodatabases to build related editing forms.

If relationship classes are defined in a geodatabase, editing of these tables can be turned on by enabling this feature within the <u>Settings dialog</u>. This must be done for each feature class within the database.

MX-Edit - Settings for WS_	4	_ 🗆 🗙
	1	Apply Close
Layer Public_Access Public_Areas	Fields       Visible       Locked       Form Options:       User Options/         Workspace Type:       Local database(Access)         Public_Access       End       End         Prmary Display Field:       Traditional_Nam       User         Classify Features by       Image: Column Width:       Media         No. Columns       Image: Column Width:       Media         V       Show Relationship Classes       Image: Column Width:       Media	Alias for field labels. Reset Reset All
Datasource: F:\CoHaw_PublicAcc	ess\PublicAccess_052704.mdb	11

If enabled, the selected features in the <u>Feature Editor</u> will build, at run time, editing forms for all related tables. These will be shown as additional tabs on the Feature Editor. The use of related tables in a GIS makes for a very efficient and normalized database design. Without good tools to edit these related tables, these tables must be edited and maintained independent of the GIS feature. This manual method of editing related tables may cause data errors and non-matching records to appear in a database.

The primary field that defines in the related table, is populated in the related table. In some cases it might be useful to add other related fields, such as the Feature ObjectID. This might be done as an added measure to ensure a link to the feature.

YX-Edit - Feature Editor     Public_Access     H - 270     H - 4naula Guich     H - Hanuala Guich     H - Hanuala Guich     H - Hanuala Guich     H - Kaynaia Bay     H - Kaynaia Bay     H - Kaynala Bay     H - Kaynala, Hapuu & Ka     H - Keokea Bay     H - Pahoa Beach     Public_Areas	▼ B       Poloku Valley     ₹3 ACCESS_ACTIVITE       CBJECTID     84       Shape_Length     3017.9265       AccessSubType     County_Site_No       Public_Access_Type     Yes       TMK_Stat     351001005       TMK_End     351001005       Stating_Reizt     End of Government Main       Ending_Reizt     Beach of Poloku Valley       Trail_Type     Foot Trail       Trail_Cccss     2wheel       Sheet No     71.A	Public, Access     Public,
One Trail	> Many Amenities	County_Size_No 5029 Amenity Parking



Used to execute stored SQL queries

+ Adds new record to related table, and builds a entry form.

Switches the related table to Edit mode. By default the table is locked until this toggle is switched to edit mode.



Deletes the record selected on the table view.

# Table Editor Form

Tables registered within a Geodatabase can be edited using the MX-Edit Table Editor with a more for based interface. To edit tables with this tool, you must registered them within a ArcCatalog. This registration allows ArcMap to view and use non-spatial tables. After registrering a table, an OnjectID field is added by the ArcCataog registration process.

👿 MX-Edit - Table Editor		_ 🗆 🗡
HI_Sewers_SAMPLE     CTV_TAPELIB     CTV		
	7900 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\sampleCCTV.avi M_123	
	7902 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\sampleCCTV.avi M_123	
	7904 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\sampleCCTV.avi M_123	
	7906 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\sampleCCTV.avi M_123	
	7908 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\sampleCCTV.avi M_123	
	7910 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\sampleCCTV.avi M_123	3
	7902 Image File D:\COHAW Wastewater\MEDIA\IMAGES\7902.BMP BMP_	123
	7908 Image File D:\COHAW Wastewater\MEDIA\IMAGES\7908.BMP BMP_	124
	18301 Movie File D:\COHAW Wastewater\MEDIA\MOVIES\W3010101.ptv M_12	5 -
	ASSETID 18301 TAPE_NO	
	MEDIA_FORMAT Movie File POSITION 0	
	MEDIA_PATH D:\COHAW Waste MEDIA_DATE 12:01:35 AM	
	MEDIA_ID M_125 COMMENTS Full Pipe. 18 minute	
	UPMH 7892 OBJECTID 15	
9 <b></b>		

- Load registered geodatabase tables into the Table Editor

Add record to the selected table and edit build form



Delete selected record fromt he data grid

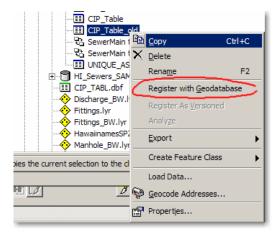


Toggle to enable editing on a table.

- OK: Saves the changes to the table
- Close: Closes the Table Editor dialog

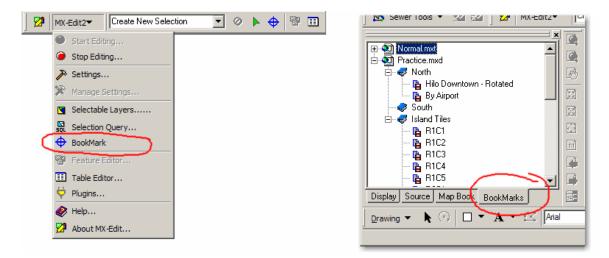
# **Loading Tables**

Tables to be edited using the MX-Edit Table Editor must be registed as a Geodatabase table. This is done within the ArcCatalog product. Select the table to be registered and right click the mouse button. This will bring up a menu that will allow you to register with Geodatabase. An ObjectID will be added to the table as an indexed field.



## Enhanced Bookmarks

During any ArcMap project, the user can be constantly switching between map extents, particularly during editing sessions. The ability to create and organize saved map extents that can be recalled saves time. The enhanced bookmark feature within MX-Edit allows a user to create and organize bookmarks including saved map rotations. The bookmarks can be easily accessed with the MX-Edit dialog or from an added context menu at the bottom of the ArcMap table of contents. The bookmarks are stored within the MX-Edit user settings, attached to a database with system configuration files.



#### Bookmarks - Normal.mtx

The default bookmarks that are created with the standard ArcMap bookmark feature is also listed within the MX-Edit bookmark interfaces. Groups can be created under the ArcMap project or the other enhanced capabilities within the bookmarks created by the standard tools. These are saved only with the saved ArcMap project file in the Normal.mtx file.

#### **Bookmarks - Database Settings**

Bookmarks created with the MX-Edit bookmark tools are saved with the database settings configuration file. These bookmarks are loaded each time a database is loaded, regardless of the saved project.

The enhanced Bookmark tools within MX-Edit are:

- Bookmark groups
- Bookmark user comments
- Saved map rotation for bookmarks
- Automatically create a series of bookmark tiles
- Easy access through ArcMap context menu

### **Bookmark Tools**

The enhanced bookmarks are created and managed within the bookmark interface opened from the MX-Edit menu. The bookmarks are saved under the Normal.mtx saved with the ArcMap project or with the MX-Edit configuration settings for a database.

### **Group Properties**

Bookmarks can be organized by region or any other organization. This is helpful in edit sessions with many bookmarks, such as a map tile series.

n MX-Edit Bookmarks	
Normal.mxt  Practice.mxd  Practice.mxd  By Airport By Airport By South Point Britt B	Group Properties Sookmark Properties Properties Name: North Notes: North end of Island Bookmark Series Rows: 1 Columns: 1
	Extent:         Totxs:         Columns:         Column:         Columns:         Column:         Columns:         Columns:         Columns:         Columns:         Column:         Column:         Co

*Name:* The named assigned to the bookmark group

*Notes:* User comments about the bookmark group

*Rows:* Number of rows when creating a bookmark series of tiles

Columns: Number of columns when creating a bookmark series

Min X: Lower extent in defined map units when creating a bookmark series

Min Y: Left extent in defined map units when creating a bookmark series

Max X: Upper extent in defined map units when creating a bookmark series

Max Y: Right extent in defined map units when creating a bookmark series

Dursor to define the outer map extents when creating a <u>bookmark series</u> from the map view

Button to create the bookmark series using the number of rows, columns and the outer extents

Delete Group: Delete the selected group and all child bookmarks

New Group: Create new group

Modify: Save settings for existing group

### **Bookmark Properties**

Bookmarks can be created and managed under he bookmark properties tab.

MX-Edit Bookmarks          Normal.mxt         Default         Practice.mxd         Hilo Downtown - Rotated         By Airport         South         Island Tiles         R1C1         R1C2         R1C3         R1C4         R1C5         R2C1         R2C1	Group Properties Bookmark Properties Group: North Name: Hilo Downtown - Rotated Notes: downtown Map Rotation: 90 Use Rotation Map Extent: Min X 1782151.9986467 Min Y 316783.62327396 Max X 1790668.9793907 Max Y 323566.31699206 Delete Bookmark New BookMark Modify
Zoom To Bookmark	

*Name:* The name assigned to the saved bookmark

Notes: User comments about the bookmark

Map Rotation: The rotation of the saved bookmark in degrees (clock-wise)

Apply rotation to current map view

- Min X: Lower extent in defined map units
- Min Y: Left extent in defined map units
- Max X: Upper extent in defined map units
- Max Y: Right extent in defined map units

igoplus Cursor to define the map extents of a new or existing bookmark from the map view

I Lock map extents from accidental changes

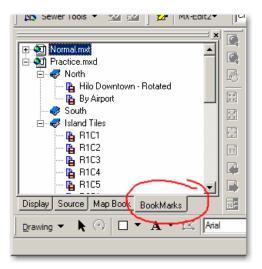
Delete Bookmark: Delete the selected group and all child bookmarks

New Bookmark: Create new bookmark under current group

Modify: Save settings for new or existing bookmark

### **Bookmark Context Menu**

Using the saved MX-Edit bookmarks or the standard (normal.mtx) bookmarks, a additional context menu below the ArcMap table of contents is added. This provides quick access to all the saved bookmarks. Double clicking on a bookmark will zoom the Map view to the saved map extents, including saved map rotations.



### **Creating Bookmark Series**

The MX-Edit bookmark tools includes a feature to automatically create a tile system for a bookmark series stored under a bookmark group. Under the Group Properties tab of the <u>Bookmark tool</u>, a new group and bookmark series can be created. The tiles are named using the naming convention R<row number>C<column number>. For example a 5 x 5 tiles system will create bookmarks that R1C1, R1C2, R1C3, etc. These bookmark names and user comments can be modified within the Bookmark Properties tab. Map tiles are created by dividing the number of rows ad columns by the length of the X axis and the Y axis from the defined outer extents.

🛷 MX-Edit Bookmarks	
Image: Second secon	Group Properties       Bookmark Properties         Properties       Name: Island Tiles         Name:       Island Tiles         Notes:       Bookmarks covering the whole island         Bookmark Series       Rows: 1 Columns: 1         Extent:       Rows: 1 Columns: 1         Min X       Min Y         Max X       Max Y         Delete Group       New Group       Modify
Zoom To Bookmark	Close

Rows: Number of rows when creating a bookmark series of tiles

Columns: Number of columns when creating a bookmark series of tiles

- Min X: Lower extent in defined map units
- Min Y: Left extent in defined map units
- Max X: Upper extent in defined map units
- Max Y: Right extent in defined map units

igoplus Cursor to define the outer map extents for creating a bookmark series from the map view

Button to create the bookmark series using the number of rows, columns and the outer extents

# Increased Efficiency

MX-Edit was developed to work generically with any database with enhanced tools and interfaces. MX-Edit can load valid plugin DLLs to perform custom routines either real time as data is saved or as extension to that are customized for a particular database design.

### **Problems with Class Extensions**

A similar concept can be applied within a geodatabase with a ESRI Class Extensions (see ArcGIS Help). Class extension allow custom routines or actions to programmed and compiled as DLLs to be attached to feature classes. Whenever a feature class is touched, these class extensions can run a custom script and action. The inherent problem with class extensions assigned to feature classes is that ALL users of the data must have the DLL installed on their computer. This is a serious problem with shared databases across a network. The Class Extension concept allows very powerful quality control and automated editing routines to be run as features are edited, but the shared database problem makes this awkward approach. The MX-Edit plugin concept allows custom editing routines to be developed and managed by MX-Edit without these problems.

### **Benefits of Custom Plugins**

In structured databases requiring a high level of quality control checks and processes, MX-Edit plugins can be developed to perform automated data processing and controls. This is particularly beneficial in municipal agencies that maintain GIS database in a very structured environment. Some of the benefits of using custom MX-Edit plugins are:

- Get the benefits of Class Extensions without the installation and data distribution problems
- Perform automated updates to related data fields as features are modified
- Apply sophisticated routines at edit time using database connectivity rules
- Integrate geoprocessing routines within editing tools
- Perform mass updates or processes to database before posting data to SDE
- Run QA/QC routines before publishing data or posting to SDE
- Integrate any GIS process programmed in ArcObjects into editing tools

# **Using Plugins**

Plugins are loaded into MX-Edit from the plugin manager after the plugins have been installed including all required libraries and components from a InstallSheild setup program. Once the plugins have been installed on a computer they will appear on the list of valid plugins that can be enabled or disabled as needed. Since plugins are typically developed for specific database structures, they can be turned off when working with other data. Additional documentation specific to the features of plugins are installed with the plugin. There are two categories of MX-Edit plugins; Edit time routines and Add-on Tools. MX-Edit plugins must be developed by Integrated Information Solutions on consulting or contract basis.

### **Edit Time Routines**

Edit time routines are performed as features are edited through the MX-Edit Feature Editor. These may include automated updates to related data fields, QA/QC checks real time as data is modified or other required data processing that can be triggered as features are edited with the MX-Edit Feature Editor. They can be enabled or disabled as needed through the Manage Plugin dialog.

### **Add-on Tools**

Add-on tools are additional applications, forms or routines that can be launched with the Run button. These are routines that are not run 'Real Time" as features are edited. A common use is to develop add-on processes to be run before data is finalized or posted to SDE. Any database process or spatial operation that can be programmed with ArcObjects can be included in MX-Edit plugins

