



4.0 SOURCE IDENTIFICATION

This section documents the County's compilation of source identification data, including Geographic Information System (GIS) data and other information as required by its NPDES Storm Sewer System Permit under Part III. C. Source Identification. This section also documents tracking of new and existing stormwater management facilities through the Urban Best Management Practices (BMP)/Stormwater Management (SWM) Facilities database.

4.1 GIS SOURCE IDENTIFICATION DATA

This section identifies permit-required efforts under Parts III.C. 1. and 2. During 2005, Frederick County continued to make progress in enhancing its GIS capabilities and in compiling source identification data about stormwater management and storm drainage infrastructure. The following items illustrate the progress made this year on GIS priorities that support NPDES permit compliance efforts.

In January 2005, Frederick County awarded a major contract to collect orthophotography at a mapping scale of 1:120. The images will have half-foot pixel ground resolution as well as two-foot contour data and planimetric features. The orthophotography gained from this project will update aerial photography obtained in 2000 at a smaller mapping scale. Higher resolution of ground features will be provided, enabling change detection and more contemporary ground feature interpretations.

The derived two-foot contour information will increase the accuracy of elevation data currently stored in Frederick County's GIS holdings. Contour information, breakline, masspoint, and spot elevation features will also be produced, enhancing the amount of terrain data available. Planimetric features may be collected, including higher accuracy hydrographic features and impervious surfaces. The higher accuracy hydrographic features will permit the update of Frederick County's current stream, river, and pond and lake databases. Impervious surfaces data may include features such as roadways, paved and unpaved parking and driveway areas, and building footprints.

A successful pilot project was conducted in 2005 that collected roadway asset information (signs, guardrails, roadway striping, and legends). This project will be expanded with the intent to complete the remaining five highway districts and include roadway pavement conditions. As the data from this project are accumulated, Frederick County will acquire the capability to more closely manage pavement operations and maintain roadway assets in general.

The County also completed its work on the Upper Monocacy River Watershed Restoration Action Strategy (WRAS) grant from DNR with funds from the EPA Section 319 program. The plan and associated outreach efforts are described in Section 6.5. As in the first grant for the Lower Monocacy Watershed, this grant consisted of field and GIS components that will help the

County to red-flag areas with baseflow water quality problems, evaluate stream biological condition via benthic and fish indices, and identify point problems along streams that include pipe outfalls, fish blockages, and erosion points. The grant for the Upper Monocacy included a training program for County staff and NPDES Phase II municipalities on an improved Illicit Discharge Detection and Elimination (IDDE) Program, discussed further in Section 6.2.1. Stream Corridor Assessment (SCA) data for the Upper and Lower Monocacy WRAS are now available in GIS format. In addition, SCA stream walk data in Ballenger Creek, Upper Linganore, and Lower Linganore are also available in GIS format.

The data gathered from the SCAs performed in the above-mentioned watersheds have been used to supplement the efforts of the County's Watershed Restoration and Retrofit Assessments as well as grant-funded community restoration projects. A brief description of how the GIS data are being used in each of these projects is discussed below. Detailed descriptions of the projects are provided in Section 7.

- Backyard Buffers – Available GIS data are being used to target the mailing of brochures to landowners with property along stream corridors throughout the County; specifically, those that were identified during the SCA as having inadequate buffers.
- Bennett Creek Restoration Initiative – Potomac Conservancy, a partner during the Lower Monocacy WRAS process, was able to obtain grant funding from the Chesapeake Bay Trust (CBT) to target restoration on priority sites that were identified in the Lower Monocacy WRAS plan. The available SCA and GIS data have been used to create hard copy maps so that the Community Restoration Coordinator from the County's Watershed Management Section and Potomac Conservancy's Forester/Director of Restoration are able to discuss voluntary restoration, enhancement, and protection options with landowners in the Bennett Creek watershed along Fahrney and Pleasant Branches (Figures 4-1 and 4-2).
- Libertytown Stewards Project – SCA data collected and analyzed during the Lower Monocacy WRAS were used to identify Town Branch watershed as the highest priority watershed for restoration. The County's Watershed Management Section was able to obtain grant funding from CBT to target restoration projects in this watershed.
- Holding Our Ground: Water Quality and Stewardship in the Linganore Watershed – Available GIS data are being used to develop a "House Call" program. This program will allow the Watershed Management Section to make site visits to interested landowners to discuss specific property conditions and possible voluntary restoration, enhancement, and protection options.
- Linganore Total Maximum Daily Load (TMDL) Urban Demonstration Project – GIS data, such as the impervious surfaces from the orthophotography project discussed above, will be used in conjunction with SCA data and the Watershed Restoration and Retrofit Assessment for Upper and Lower Linganore to identify areas where Best Management Practices (BMPs) can be installed to reduce sediment, phosphorus, and other non-point source pollution.

A copy of the GIS Strategic Plan is included in Appendix P.

In 2004, NPDES staff assisted the GIS Section with the creation of a sinkhole tracking database to be used by Highway Operations in the field. During 2005, this database was also used in watershed restoration planning. The Microsoft Access database RoadwaySinkholes.mdb allows users to review the history of each sinkhole site and to track any repair or inspection actions related to the site. Repair and inspection data may be changed in the Roadway Sinkhole Access database. The geodatabase information is stored as points (sinkholes less than 6 feet in diameter) or polygons (sinkholes 6 feet or more in diameter). These database features and their records may be viewed, queried or printed using the Sinkholes Map, the ArcReader-published map file that is accessed from the RoadwaySinkholes.mdb database.

The ArcReader map application is installed on staff laptop computers allowing field and desktop use of the GIS information. The spatial data includes: stormwater system structures and pipes, aerial photography, soils group data, fire station locations, Maryland state watershed delineations, hydrography, County roadways, and other GIS data. This application allows data queries to be performed as well as the exporting of map images for digital and hard copy viewing. The data are especially useful for spill response and other watershed protection activities.

Frederick County continues to share its storm drain system data structure with Phase II municipalities within Frederick County to assist in their NPDES stormwater system data collections. This support includes a pre-built stormwater system geodatabase model, metadata files describing the geodatabase and each feature class contained within it, data collection protocols, a NPDES technical presentation, and Frederick County GIS staff contact information.

County staff continued to make extensive improvements to the County's GIS system in 2005. An inventory of GIS holdings is presented in Appendix B. The status of specific data called out in the NPDES permit is listed in Table 4-1. Developable areas and comprehensive planning analyses for the New Market Region to accompany the regional plan update continued in 2005. Staff continued to maintain agricultural preservation property and district data. Additional opportunities to improve water quality exist in these areas. Water and Sewer planning areas were completed in 2004 but the official data will not be released to the public until the ordinance changes and parcels data are available. The pilot parcel project for Frederick County was awarded in 2004. The Department continues its extensive quality control review of the vectorized parcels as they are completed by Planning Region. Frederick County road centerlines are now complete and undergo periodic updates when new plans arrive.

4.2 URBAN BMP/SWM FACILITIES DATABASE

At present, all SWM facilities have been entered into Frederick County's urban BMP database. There are 541 entries in the database, including 30 new facilities completed on or after January 1, 2005. New facilities are entered into the database upon approval of the as-built survey. The entire file is included on the accompanying CD. Example pages may be found in Appendix C. During the past year, the County continued to improve the entire database by updating and editing where necessary to ensure database integrity.

Table 4-1. Status of GIS data required by NPDES permit

| Source Identification Data | Have Data | Have in GIS | Notes, Schedule for Completion by Watershed |
|---|-----------|-------------|--|
| Topographic features | Yes | Yes | Digital Elevation models stored as ASCII text. DEMS were compiled when the County was flown in March 2000 to produce digital orthophotography. The DEMS have been used by County staff to generate 10-foot contours; these contours are not highly accurate and are useful for general planning purposes only. 2-foot contours, DEMs, breaklines, spot elevations to be produced from 2005 Ortho Project. |
| Existing and planned land use based on present zoning or current master plans | Yes | Yes | The zoning data layer is complete but mylars will continue to be official for distribution until the zoning ordinance is changed (scheduled for 2005-2006) and parcel layer is available (see notes on public and private land ownership). Last update 2004 (zoning district boundaries). |
| Public and private land ownership | Yes | Yes | Maryland PropertyView available from MD Office of Planning. A Parcel Pilot project for Tax Map 79 is complete. The Maryland Property View package also contains parcel centroids with State Assessment data. Frederick County has now begun to digitize individual parcels as funds become available for each planning region. The first planning regions will be completed by 2006 and include the first three NPDES priority watersheds. Current parcel project is fully funded with an estimated completion date of 2008. |
| Population density | Yes | Yes | Census tracts and census block groups from 2000 and 1990. Census population data / TIGER files are obtained from the U.S. Census Bureau. |
| Streams | Yes | Yes | Streams and rivers and lakes in shapefile format; complete. 2005 Ortho project data will contain a hydrography database suitable for updating the current County streams information. A dam database created in 2005 from MDE inspected dams data is available for GIS use. |
| Floodplains | Yes | Yes | Floodplains in shapefile format from MD-DNR and hard copies of the FEMA community panels. County may participate in updates over next several years with FEMA. |
| Wetlands | Yes | Yes | Shapefiles from MD-DNR and hard copy DNR color plots by quad sheet. The County also has NWI wetlands. County is also building list of hydric soils from Soil Conservation District maps. Soils database updated from NRCS in 2005. |
| Storm drain systems, including major outfalls, inlets, appurtenant conveyances, and associated drainage areas | Yes | Yes | Digitizing completed in 2004 for all but ponds and drainage areas. This digitizing is underway as part of the QA/QC process. This process will be completed in 2006. |
| Stormwater management facilities | Yes | Yes | SWM Facility Maintenance.mdb from DPW, maintained by Dave Crable. Spatial database editing and management customized for use in ArcGIS in 2005. |
| Sanitary sewer systems | Yes | No | Files are in CADD with plans to add database in GIS once staff available. Water and Sewer service areas were completed in GIS in 2004. The Ballenger Creek Watershed will be completed by 2006 with all watersheds completed by 2010. |

| Table 4-1. Continued | | | |
|---|-----------|-------------|--|
| Source Identification Data | Have Data | Have in GIS | Notes, Schedule for Completion by Watershed |
| Sewage treatment plants | Yes | No | Files in CADD, see sanitary sewer systems above. |
| Industrial operations | Yes | Yes | A database is available and a shapefile created from TIGER Census addresses; will be updated with new county addressing. |
| Hazardous waste sites | Yes | Yes | Database with industrial operations also includes permitted hazardous waste generators. |
| Landfills | Yes | No | This list is maintained by the Division of Utilities and Solid Waste and will need to be georeferenced in a GIS map layer. Debris dumpsites are maintained by the Environmental Compliance Section in DPW and will also need to be georeferenced. The schedule for completion of all landfills is 2006. |
| NPDES permitted sites (both point source and stormwater permittees) | Yes | Yes | Database with industrial operations also includes NPDES permittees. |
| Impervious areas (e.g., roads, parking lots, and rooftops) | Yes | Yes | Method of estimating impervious area employs The Center for Watershed Protection's imperviousness calculations based on land use classifications. County roadway centerlines are complete and updated as required. 2005 Ortho Project may provide planimetric data describing impervious areas. |
| Bridges | Yes | Yes | Consultant previously recorded bridges with >20-foot span. County will GPS bridges spanning 10-20 feet |
| Estimated pollutant loads | Yes | Yes | Prepared annually for NDPEs Annual Report. |
| County properties | Yes | No | Staff compiled a list of county-owned properties to conduct the NPDES Industrial Permit Assessment from several sources including: Frederick County Public Schools' "active" properties (FCPS tracks buildings rather than properties), Frederick County's 2003 Insurance and Property Record Report, Frederick County's Non-Board-of-Education (BOE) Property Inventory from May 2000 (for properties not owned by FCPS), and a list of Frederick County Maintenance Buildings Owned and/or Operated by Frederick County Commissioners from 2001. |
| Sampling locations | Yes | Yes | Sampling locations provided and maintained by the County's NPDES consultant, Versar, Inc. |
| Orthophotography | Yes | Yes | True color, 1:2400 scale, and 1 square foot per pixel. Available for purchase and subject to GIS license agreement. 2005 Ortho Project Ortho Image Specs: 0.5 Ft. Pixels, 1:1200 Mapping Scale, not yet available. |
| Watersheds | Yes | Yes | County has created 20 watershed classifications that were developed by Planning and DPW. Also have Md_Wtrsheds.shp from MD-DNR. |

