

ANNE ARUNDEL COUNTY
URBAN STORMWATER BMP DATABASE – HISTORIC BMP RECORD REVIEW AND UPDATE
CLARIFICATION TO SUBTASK 2.5 DELINEATE BMP DRAINAGE AREA

The goal of this scope of work task is to develop a polygon feature class containing drainage areas for each BMP in the data inventory. The information provided below serves as guidance and clarification for Subtask 2.5 of the Urban Stormwater BMP Database Historic BMP Record Review and Update Scope of Work. Consultants should note that the complete drainage area delineation methodology including QA/QC procedures for this subtask will be developed, in concert with County staff, and documented in the QAPP (See Subtask 1.3 of the full Scope of Work).

Subtask 2.5 Delineate BMP Drainage Area

It is suggested that the following three steps be taken ahead of the drainage area delineation step:

1. Assemble all source data
2. Verify the BMP point locations and annotate the source of that verification data (e.g., grading permit, as-built, aerial photo, field visit)
3. Capture all the tabular data for the database fields from their source documents (e.g., plans, reports)

To delineate the BMP drainage areas the following actions are recommended.

- If the drainage area is delineated on the as-built plans, then the scanned image should be georeferenced and the drainage area polygon boundary digitized from the plans.
- If the drainage area is not available from the historical records, whether because it is not shown on the plans or because the plan records are unavailable, the Consultant should create the drainage area polygon using the ESRI ArcHydro model. The County will provide the consultant with the current models and the associated MXD for this purpose.
 - When using the ArcHydro method, the Consultant may encounter instances where the BMP point location does not fall on the flow accumulation grid. In these cases, the Consultant should **NOT** move the BMP in the point feature class but should **create new fields called X_Hydro and Y_Hydro** and use the location defined in these new fields for modeling only. The consultants should note that these new fields should contain at least 5 decimal places.
- In instances where the drainage area is not on the as-built plans nor can it be created accurately in ArcHydro because the flow accumulation grid is incorrect, the consultant should flag these instances for joint review with the County.
- The consultant will attribute the resulting polygon layer with the source of that polygon (e.g., ArcHydro, as-built plan). The polygon feature class must contain a Primary Key (in addition to FID) and must contain a Foreign Key to link back to the Primary Key in the BMP point feature class.
- The consultant should perform internal QA/QC checks on these data. For instance, the digitized drainage area (from the plans) should "match" the tabular data for that facility within a certain

tolerance value. If it does not, the County anticipates that the consultant will investigate the reasons why and make the appropriate corrections or consult with the County on how to address the discrepancy. Further recommended QC procedures include performing logical checks, for example, a rain barrel should not have a drainage area of 100 acres, and a wet pond should not have a drainage area of several hundred square feet.

- The final resulting drainage area GIS layer must be topologically correct. The consultant will apply appropriate topology rules, developed in consultation with County staff and documented in the QAPP, to identify and address overlapping/nested drainage areas (e.g., within ArcGIS: Must Not Overlap and Must Not Have Gaps).
- Once the final drainage area GIS layer is completed, the Consultant will attribute each BMP drainage area by current County impervious and pervious areas. The County will provide the most recent (e.g., 2014) impervious area coverage for this purpose. The Consultant will join the layers to attribute pervious versus impervious area.

The resulting Countywide Urban BMP drainage area polygon will be a combination of digitized and modeled polygons. Consultants should provide the County with interim deliverables (e.g., a 10% pilot delivery, 60% interim delivery) so the County has an opportunity to review the resulting layer and provide QC and comments.

Additional information regarding the topology rules previously noted, and for purposes of addressing slivers and/or overlapping or nested drainage areas:

Using ArcHydro, a Batch Watershed Delineation generates the full drainage area polygons for each BMP regardless of overlaps in their drainage areas. Batch Subwatershed Delineation generates the nested drainage area polygons for each BMP and will eliminate overlaps. Consultants should be aware that to delineate these subwatershed drainage areas using the ArcHydro model, a BMP point in the X_Hydro and Y_Hydro fields must be created for all the BMPs and that point must fall on the flow accumulation grid.

After preparation of all the data for ArcHydro input, the estimated time necessary to complete the initial and subsequent ArcHydro runs is about 1 week for an area the size of the Severn River watershed. This work effort would include potentially having to run several hundred/thousand drainage areas (depending on the number that are manually digitized versus modeled), QC initial results, correct identified errors, rerun that subset of corrected drainage areas, then compile into a complete GIS drainage area polygon layer.