

Appendix G: Water Quality Management Statement



Water Quality Management Statement Checklist

Every subdivision, as defined in the Warren County Subdivision, disturbing more than one acre that adds 10,000 ft² of new impervious surfaces shall submit a Water Quality Management Statement. The Statement shall be a narrative with supporting documentation addressing and including the following information:

- Development name and location
- Developer/Owner and Consultant contact information
- Site description
- Description of proposed development
- Total project acreage
- Impervious Area Calculation
 - Square feet or acreage in roadway pavement and sidewalks
 - Estimated square feet or acreage covered by rooftops for houses and accessory structures to be initially constructed
 - Estimated square feet or acreage in driveways and sidewalks
 - Estimated square feet or acreage in parking lot(s)
- A description of the proposed storm water quality and quantity management BMPs to be installed on the project
- A vicinity map, USGS topographic map and Warren County Soil Survey with the development area indicated thereon

Preliminary subdivision plats that do not include a Water Quality Management Statement will not be considered complete and may not be included on the Planning Commission's agenda.

Appendix F: Water Quality Management Plan Checklists

This appendix includes checklists for the following types of development:

- Building permits. Note that the Water Quality Management Plan checklist has been incorporated into the overall Level II Building Permit Review Checklist
- Subdivision. A separate checklist for subdivisions is included (Subdivision Water Quality Plan Review Checklist)

City of Bowling Green
Level II Building Permit Review Checklist
(For sites requiring a grading and drainage plan
and water quality management plan)

Project Name:	
Location:	

General Requirements:

	Y	N	N/A	Are the following included?
1.				Accurate vicinity map at an appropriate scale
2.				North arrow and scale
3.				Bench mark (note datum)
4.				Title block containing:
A.				Name, address, and phone number of Builder/Applicant
B.				Name, address, and phone number of person or firm preparing plot plan
C.				Subdivision name, lot number, block, section, Plat Book and Page Number, etc. If not a subdivision of record, supply deed book and page number.
D.				Street address of site. Include house number obtained by owner from Planning Commission or insert a "blank" in front of the street name. House number will be assigned and inserted on the title block.
5.				Plans stamped by Professional Engineer, Surveyor, or other professional
6.				Revision block denoting dates and revision descriptions

Property Requirements:

	Y	N	N/A	Are the following included?
1.				Property lines labeled with distances and bearings
2.				Total site/lot acreage (acreage and square feet)
3.				Building set back lines
4.				Easements (size, location, type)
5.				Location and size of public utilities and drainage system
6.				Street names and right-of-way width
7.				Frontage on an approved street accepted for public/private maintenance or given preliminary approval by the Planning Commission as a Public/Private Road and currently under construction
8.				Locations of existing buildings, roadways, parking lots or other hardened surfaces including graveled driveways and parking surfaces within the project boundaries. Existing structure location within 0.1 foot (dimensions, disposition, and description) – if any
9.				Existing Contours (1 foot interval)
10.				Property corner elevations (if less than two percent (2%) slope on lot)
11.				PVA map code

Grading:				
	Y	N	N/A	Are the following included?
1.				Total site acreage to be disturbed
2.				All graded slopes at 3:1 or flatter (unless approved by City Engineer)
3.				Proposed contours (1 foot interval)
4.				Note stating, "6 inch fall in 10 feet minimum from building"
Buildings/Structures:				
	Y	N	N/A	Are the following included or been considered?
1.				Proposed finished floor elevations
2.				Existing and proposed ground elevations at corners of proposed structures
3.				Proposed structure or pavement locations (dimensions, description and relation to easements and property lines)
4.				All finished floor elevations, including basement, must be minimum 1.5 feet above the 100-year floodplain elevation for the site.
5.				Structures without basements shall have a minimum finish floor elevation 1.5 feet above the highest finished grade if crawl space is used, or 0.67 feet above for slab foundation.
Streets and Sidewalks:				
	Y	N	N/A	Are the following included or been considered?
1.				Proposed driveway AND sidewalk (location and dimensions) including handicap ramps, if necessary Driveways within the City of Bowling Green must conform to City's Access Management Standards; found at www.bgky.org .
A.				Street sidewalk or curb cuts within the City of Bowling Green require a Right of Way Excavation permit.
B.				Note stating that sidewalks and drive entrances shall be constructed to meet ADA and City standards
C.				
2.				KYTC right-of-way access permit (if on state route)
3.				All markings within public right-of-way must be thermoplastic and signage must meet MUTCD standards
Traffic:				
	Y	N	N/A	Are the following included or been considered?
1.				Traffic Impact Study, requirements found at www.bgky.org
Drainage:				
	Y	N	N/A	Are the following included or been considered?
1.				Certification by licensed surveyor or engineer regarding flood hazard
2.				Summary of impervious cover within project boundaries, including building footprint, driveways, roadways, parking lots, etc.
3.				Existing drainage features, type and invert elevations.
4.				Locations of drainage system features, streams, known sinkholes, drywells, springs, wetlands and/or ponds, floodways and flood zones adjacent to the project boundaries or within 50' of project site.
5.				Note that environmental message for storm water manhole covers, curb inlets, etc is required.
6.				Note that entrances pipes, when needed, shall be minimum of 24 foot – 15 inch pipe with 6 inch minimum cover
7.				Dimensions, location, description, and elevation of proposed drainage structures. If using a drainage swale in lieu of pipe, it shall not impede the flow of water through the ditch and must be graded to follow the ditch side slopes and flow line. If using pipe must have headwall (excluding entrance pipes)
8.				Drainage flow arrows and spot grading elevations as required
9.				Drainage basins that encompass all or a portion of the project, with acreages for each drainage basin identified on the plans or in the calculations submittal. Recorded 100yr. flood elevation for basin included.

Storm Water Detention/Retention:				Are the following included or been considered?
	Y	N	N/A	
1.				Plans correspond to drainage calculations
2.				Drainage study stamped by a professional engineer
3.				Calculations verifying that the detention/retention requirements for the site have been met, assuming zero drawdown for any sinkhole within the project boundaries. Submit copies of software program output, if a software program is used to size the detention/retention facility. Calculations must also be provided to show that the detention/retention facility will not cause downstream flooding. Consideration must be given to peak flow timing for sites that discharge into streams or rivers.
4.				Detailed construction drawings with invert elevations, trash racks, anti-flotation blocks, emergency and primary spillways, and, for large detention/retention facilities, an emergency drain that can drain the facility in 24 hrs.
5.				Detention/retention facility located in a permanent easement
6.				Access easement for maintenance of the detention/retention with grading at 10 ft. wide and 5:1 or flatter slope.
7.				Detention/retention basins have a positive slope towards the outlet control structure (2% recommended)
8.				Detention/retention basin smoothly graded with adequate berms (if applicable) and 3:1 maximum slopes
Water Quality Management Plan				Are the following included or been considered?
	Y	N	N/A	
1.				Will the residential development have <15% total impervious cover? If yes, then answer A-F below
	A			Provide estimate of impervious cover for site
	B			Provide copy of restrictive covenant for site
	C			Are disturbed areas clearly marked on plans and in field?
	D			Are lots 1 ac or more?
	E			Are roof drains disconnected from storm drains and allowed to sheet flow away from footings?
	F			Are existing trees in the sinkhole basin (if present) being protected?
2.				Nonresidential developments: Maintenance and Operation Plan including all BMPs finalized
3.				Design calculations demonstrating 80% TSS reduction and WQv treatment
4.				Are manufactured BMPs included? If so, answer A-B below
	A			Verify that the treatment unit meets required performance standards
	B			Manufacturer's specifications included in calculation package for maintenance and installation
5.				BMPs located in permanent drainage easement with access from public ROW
6.				Infiltration BMPs: Answer A-C below
	A			Infiltration rates for soils
	B			Planting plan for treatment area
	C			Observation wells in treatment area to verify infiltration rate after construction

Erosion Prevention and Sediment Control:				
	Y	N	N/A	
				Are the following erosion prevention and sediment control items included or been considered?
1.				Areas to be disturbed and identified and square feet or acreage shown on plans.
2.				Area disturbed equal an acre or more. (if yes you will need a SWPPP and NOI)
3.				A legend identifying measures, structures, storm water components etc. for each plan sheet.
4.				Location of each structural and non-structural BMP.
5.				Pre-grading plans showing erosion prevention and sediment control for site during the beginning phases of construction.
6.				Final grading plans showing erosion prevention and sediment control for site during the final phase of construction.
7.				Surface waters, drainage systems, and wetlands within a half-mile of the project labeled that can receive storm water runoff from this project.
8.				Locations that are not to be disturbed.
9.				Details shown for all structural and non-structural BMP's shown on the plans with dimensions, specifications, and amount of material needed.
10.				Designated areas for stockpiled soil.
11.				Protection at discharge points where water is leaving the site.
12.				If dewatering is to occur, location of dewatering activity, and dimensions of dewatering basin or structure.
13.				Note directing the construction detention/retention and drainage ditches as first item of construction after perimeter sediment control measures.
	Y	N	N/A	Are the following BMP items included or been considered?
1.				Silt Fence, Straw Waddles, or Fiber Rolls
2.				Stabilized Construction Entrance
3.				Temporary Sediment Traps
4.				Temporary Diversions
5.				Channels and Ditches
6.				Pipes and Swales Inlet and Outlet Protection
7.				Retention Basin with Slope Protection
8.				Check Dams with Spacing and Dimensions
9.				Temporary Seeding
10.				Permanent Seeding
11.				Channel Lining
12.				Slope Stabilization
13.				Dust Control Measures
14.				Straw Mulching, Hydro-seeding, or Erosion Control Blankets

Miscellaneous:				
	Y	N	N/A	
1.				Has a bond (performance and indemnity agreement) been posted?
2.				Does the property have a recorded plat?
3.				Have all variances and zoning regulations been incorporated?
4.				Dumpster location and associated site improvements
5.				Parking requirements for commercial use
6.				Has a note been provided prohibiting changes without prior approval of reviewing agency
Landscaping:				
	Y	N	N/A	
1.				Is the project a single family residence? (If yes, no plan required unless required in the water quality management plan BMPs)
2.				Is the project a duplex residence? (If yes, buffering and screening required)
3.				Is the project non- single family or duplex residence? (If yes, plan required per Section _____)
4.				Has the Plot plan preparer discussed the landscape plan with the CCPC Landscape Architect?
5.				Has a bond (performance and indemnity agreement) been posted?
6.				Has a landscaping surety contract been signed?
7.				Exterior site lighting needs to be shown on landscape plan to avoid conflicts
Zoning Related Issues:				
	Y	N	N/A	
1.				If the property has Binding Elements, have they been checked and compiled with?
Subdivision Platting Related Issues:				
	Y	N	N/A	
1.				
2.				Is there a change in property boundary? If yes, plat recordation needed prior to permit request.
3.				Is there a change or addition of a drainage easement? If yes, plat recordation needed prior to permit request.
4.				Is there a change or addition of other easements, ie utilities? If yes, plat recordation needed prior to permit request.
5.				Plat recorded?
6.				Surety bond in place for drainage improvements?
7.				Construction contract signed for drainage improvements?
8.				Drainage and access easements for Water Quality Management BMPs?
				Non-residential development: recorded Operation and Maintenance Plan?
Note: This checklist is intended to serve as a guideline for plan preparation. Additional items may be required depending on unique conditions.				

City of Bowling Green

Water Quality Management Plan Review Checklist

In addition to the P&Z Subdivision Checklist, the following items must be addressed for the Water Quality Management Plan submitted to the City:

- For residential conservation subdivision design:
 - Total impervious surface must be less than 15%
 - Roof drains must be disconnected from other storm water system components and allowed to sheet flow over vegetation
 - Lots must be 1 acre or more in size

- Break down of estimated impervious surfaces as follows:
 - Estimated square footage covered by roof top (note that square footage of a multi-level building may not be the same as the square footage covered by roof top); For residential developments, this estimate should be based upon the typical size of house to be built.
 - Estimated square footage in roadway
 - Estimated square footage in driveways, patios (not decks) and sidewalks

- Method of restricting the maximum impervious cover on each lot
 - Restrictive covenant
 - Deed restrictions

- Locations of structural and non-structural water quality treatment BMPs
 - Supporting calculations for each BMP
 - Site-specific construction details for each BMP
 - All structural BMPs must be located in dedicated drainage easements with access from a public right-of-way

- Non-residential subdivisions
 - Draft final Operation and Maintenance Plan addressing the long term operation and maintenance of any BMPs on the property
 - Considered water quantity and quality management on a regional basis?
 - Subdivision restrictive covenants to limit imperviousness?

Appendix G: As-Built Inspection Certification

Includes the following:

- Certification checklist
- As-built BMP data collection sheets for PTPs

City of Bowling Green Water Quality As-Built Certification Checklist

Date: _____ Property Owner: _____

Certifying Engineer: _____

Certifying Surveyor: _____

Project Name: _____

Address: _____

This Water Quality As-Built Certification process is necessary in order for a construction or performance bond to be released or for a Certificate of Occupancy to be issued, as described in the Warren County Subdivision Regulations.

CERTIFICATION REQUIREMENTS:

- ✓ **Date**
- _____ A. Submit as-built drawings that meet the minimum requirements of this checklist. Complete the appropriate as-built BMP data sheet (see Appendix H of the SOP).
 - _____ B. Ensure that the BMPs on the project site meet the design requirements established and approved in the Water Quality Management Plan.
 - _____ C. Ensure that all drainage system components, permanent BMPs, and structure access easements are properly delineated on a plat or through deed restrictions.
 - _____ D. Ensure that the Operations and Maintenance Plan for all water quality devices has finalized and recorded at the Warren County Register of Deeds and denoted on the recorded plat or in deed restrictions.
 - _____ E. For Conservation Subdivisions: Ensure that the impervious area estimates in the plans are still accurate to the best of you knowledge. Provide a breakdown of the existing impervious surfaces.
 - _____ F. For Subdivisions: Ensure that the impervious cover restrictions are properly denoted on the recorded plat or in deed restrictions.

General Information

- ✓ **Date/NA**
- _____ 1. Are seal and signature for the certifying engineer and surveyor shown on the as-built drawings?
 - _____ 2. Does the as-built drawing(s) have survey benchmarks or other reference points?
 - _____ 3. Does each as-built plan contain standard plan contents, such as a north arrow, scale, and legend?
 - _____ 4. Is construction complete and have all disturbed areas been stabilized?
 - _____ 5. Are the footprints of all impervious surfaces constructed consistent with the approved Water Quality Management Plan?
 - _____ 6. Was the O&M plan updated to reflect the findings of the as-built? It must also be recorded prior to being submitted with the as-built certification.
 - _____ 6. Do the as-built drawings contain the following statement along with the Registered Land Surveyor's stamp, signature and license number:

I hereby certify that I have surveyed the land boundaries and easements shown hereon in accordance with accuracy requirements for a Category I survey and that the ratio for precision of the unadjusted survey is not less than 1:10,000. I further certify that I have located all natural and manmade features shown hereon in accordance with the current Standards of Practice as adopted by the Kentucky State Board of Licensure for Land Surveyors. I certify the location, elevation and description of these features.

_____ 7. Do the as-built drawings contain the following statement along with the Registered Engineer's stamp, signature and license number:

Based upon site observations and/or information provided by a registered Land Surveyor, I hereby certify that all grading, drainage, structures, and/or systems including facilities and vegetative measures have been completed in substantial conformance with the approved plans and specifications.

As-Built Drawings - Storm Water Quality BMPs

I hereby certify that the stormwater management facility (facilities) shown on the plans and individually identified below has (have) been constructed in accordance with the plans approved by the City of Bowling Green, Public Works, except as noted in red on the "AS BUILT" drawings. Furthermore, the red-noted exceptions do not adversely affect the intended performance of the facility (facilities).

_____	_____
_____	_____
_____	_____

Facility Identification (Identify Each Facility Individually)

Name (Printed)

Signature

Engineers license number

Date

"Certify" means to state or declare a professional opinion based on sufficient and appropriate onsite inspections and material tests conducted during construction

Project name:	BMP ID:
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AS-BUILT DATA FOR FILTERS (SAND FILTERS AND BIORETENTION – PTP-01)

***TO BE COMPLETED BY THE CERTIFYING ENGINEER**

Facility Type:	Design	*As-Built
Filter Bed Area (L x W)		
Filter Bed Surface Elevation		
Filter Inlet Pipe Size/Elevation		
Outlet Pipe (Underdrain) Size/Elevation		
Filter Bed/Planting Media Depth		
Infiltration Rate		
Composition of filter media or planting media		

Additional Considerations:

Forebay/pretreatment area and volume _____

Bioretention planting composition/number/health _____

Geotextile placement location(s) _____

Date accepted by Bowling Green Public Works: _____

Project name:	BMP ID:
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AS-BUILT DATA FOR OPEN CHANNEL SYSTEMS (WET/DRY SWALES PTP-02)

***TO BE COMPLETED BY THE CERTIFYING ENGINEER**

Type of Facility: (circle) Dry Wet	Design	*As-Built
Bottom Width		
Total Length		
WQ Volume		
Number/Type of Check Dams/Weirs		
Longitudinal Slope		
Infiltration Rate (dry swale)		
Underdrain Pipe Size		

Any other data appropriate to the specific BMP: _____

Date accepted by Bowling Green Public Works: _____

Project name:		BMP ID:
AS-BUILT DATA FOR INFILTRATION TRENCHES/BASINS (PTP-05)		
*TO BE COMPLETED BY THE CERTIFYING ENGINEER		
Facility Type	Design	*As-Built
Bottom elevation		
Surface elevation		
Bottom dimensions		
Storage Volume		
Infiltration rate		
Basins: Depth of Stone/Filter Material		
Basins: Stone Size		

Any other data appropriate to the specific BMP: _____

Date accepted by Bowling Green Public Works: _____

Project name:	BMP ID:
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AS-BUILT DATA FOR PONDS/WETLANDS (PTP-03, PTP-04, PTP-08)

*TO BE COMPLETED BY THE CERTIFYING ENGINEER

Facility Type:	Design	*As-Built
WQv Storage Volume		
Detention: for 2.95 in (1 hr, 100 yr storm)		
Retention: for 4.0 in (3 hr, 100 yr storm)		
Principal Spillway Type/Diameter		
Principal Spillway Outlet Elevation		
Emergency Spillway Type		
Emergency Spillway Dimensions		
Emergency Spillway Elevation		
Outlet Protection: Length/Width/Stone Size		

Additional Considerations:

Forebay/pretreatment area and volume _____

Planting composition/number/health _____

Geotextile placement information _____

Drywell protection type _____

Date accepted by Bowling Green Public Works: _____

Project name:		BMP ID:
AS-BUILT DATA FOR WATER QUALITY UNITS AND OIL WATER SEPARATORS (PTP-06, PTP-09) *TO BE COMPLETED BY THE CERTIFYING ENGINEER		
Facility Type/Name:	Design	*As-Built
Drainage Area		
Flow		
Treatment Area		
Bypass structure/pipe		

Additional Considerations:

Cleaning access noted on plans correctly _____

Access to each chamber provided _____

Other BMP specific information _____

Date accepted by Bowling Green Public Works: _____