

# Redevelopment

# 11

## 11.1 Introduction

Design standards for new development sites have been established in previous chapters of this document. Redevelopment sites, however, often present unique challenges and circumstances, especially related to stormwater management. Redevelopment of a site (or portion of a previously developed site) might involve utilization of existing stormwater management features, modification or replacement of existing stormwater management features, or under special circumstances perhaps qualify for a variance from stormwater detention requirements.

### 11.1.1 Purpose

This chapter has been prepared to provide guidelines for redevelopment, specifically addressing stormwater management and detention requirements. The guidelines presented in this chapter are intended to maintain consistency with current development standards and regulations (as references below in Section 11.1.2), but expand on requirements that are specific to redevelopment sites. Section 11.2.4 below provides guidelines for stormwater management based on the “50 percent rule”, which explains requirements if redevelopment involves land disturbance that is greater than, or less than 50 percent of the overall site.

This chapter also establishes a process for requesting a variance from stormwater detention requirements (see Sections 11.3 and 11.4). The variance process requires that certain conditions be met in order to qualify for “fee in lieu” of detention.

### 11.1.2 Regulatory Background and References

Stormwater management for redevelopment sites shall meet the standards and specifications set forth within the documents referenced below. In addition, detention storage requirements for redevelopment shall follow the 50 percent rule as described in Section 11.2.4.

- All applicable chapters within this *Stormwater Systems and Facilities Installation Standards and Specifications (SSFISS)* – formerly referred to as the Stormwater Management Design Manual
- *Gwinnett County Development Regulations* – latest edition.

Redevelopment shall also maintain compliance with other applicable ordinances, resolutions, regulations and amendments, which can be found on the Gwinnett County Planning and Development website at:

<https://www.gwinnettcountry.com/portal/gwinnett/Departments/PlanningandDevelopment/DocumentsandRegulations>

### **11.1.3 Definition of Redevelopment**

Redevelopment is **defined as** development on a previously developed site; but excludes ordinary maintenance activities, remodeling of existing building interiors, resurfacing of paved areas, and exterior building changes or improvements which do not materially increase or concentrate storm water runoff, or cause additional nonpoint source pollution.

## **11.2 Design Requirements for Redevelopment**

Similar to new development, stormwater management for redevelopment must be designed taking into account water quality treatment, channel protection, and peak flow attenuation requirements. These elements are discussed briefly below, with references made to other chapters within this *SSFISS* for specific requirements and guidelines.

### **11.2.1 Water Quality Treatment**

Water Quality Volume (WQV) must be provided for all redevelopment sites, and shall be equal to the runoff from the project site resulting from 1.2 inches of rainfall. See Chapter 8 for best management practices available to achieve the required WQV, and instructions on use of the Performance Criterion Tool/Stormwater Quality Performance Review Form to achieve the required total suspended solids (TSS) removal. For redevelopment projects involving disturbance of more than 50 percent of the site, TSS removal performance must be evaluated for the entire site. When less than 50 percent of a site is disturbed for redevelopment, TSS removal performance must be demonstrated for the disturbed area only. See Section 11.4.2 for additional stormwater detention requirements based on the 50 percent rule.

Water quality treatment for redevelopment may require construction of new water quality treatment facilities, modifications to existing facilities, or retrofitting existing detention facilities to provide the necessary WQV. These scenarios are discussed further in Section 11.2.4.

### **11.2.2 Channel Protection**

Channel protection volume (CPV) must also be provided for redevelopment sites, similar to requirements for new development. CPV is typically achieved in combination with the required detention volume (see Section 11.2.3 below), with the outlet structure designed to detain the 1-year storm event for 24 hours. Sizing the CPV orifice for the appropriate release rate is described in Section 6.3.2.

### **11.2.3 Detention**

In general, detention requirements for redevelopment are similar to requirements for new development. Detention facilities for redevelopment should be designed to attenuate stormwater runoff for the 1- through 100-year storm events by 1) reducing peak discharge rates to the pre-

development condition, and 2) detaining the release of the 1-yr stormwater for a minimum of 24 hours. Guidelines for providing the required detention volume are provided in Chapter 6. With redevelopment, however, the percentage of the site proposed to be disturbed for redevelopment/improvement is the basis used to determine the required peak flow attenuation. Detention may be accomplished using a variety of methods aimed at reducing peak stormwater discharge rates and achieving the required detention time and acceptable methods are discussed in Chapter 6. Detention methods may include the following, with multiple methods potentially used in combination:

- Normally-dry basins, whether excavated or created by damming a natural drainage feature, or a combination of both methods,
- Lakes and ponds, whether excavated or created by damming a natural drainage feature, or a combination of both methods,
- Parking lot facilities,
- Underground facilities, and,
- Roof top facilities.

Design Criteria for each of these detention methods, whether used separately or in combination, are described in section 6.3.

### **Selecting an Appropriate Method for Detention**

When selecting an appropriate method to achieve the required detention volume and peak discharge attenuation, the following conditions should be considered.

1. *The type of redevelopment for which the detention facility is being provided.* In general both wet and dry detention basins often require a significant amount of available land on which to construct the storage facility. As such, these types of facilities are well-suited for residential, institutional, recreational, and certain industrial and/or commercial redevelopment sites; but might not be appropriate for more densely developed sites (due to the amount of impervious coverage and lack of available open space). Underground detention should be considered when available open space is limited, or other site constraints exist. Parking lot and/or roof top detention facilities should also be considered for storing stormwater runoff generated from relatively small areas (typically for a portion of the parking lot or roof top upon which the detention facility is located), and should be considered for use in combination with other detention methods when additional peak flow attenuation is required.
2. *The percentage of the site proposed to be disturbed for redevelopment.* Because of the potential impacts that redevelopment might have on downstream properties, the “50 percent rule” (see Section 11.2.4) has been established to set guidelines for redeveloped site detention, based on the percentage of the proposed to be disturbed. In general, the greater the percentage of a site to be disturbed, the greater the potential to increase peak discharge from the site and adversely impact downstream properties. To address these potential impacts, guidelines have been established to minimize potential impacts through

peak discharge regulation. The method of detention selected for a redeveloped site should be done so taking into consideration the guidelines provided in Section 11.2.4.

3. *The volume of stormwater runoff to be detained/stored.* The required peak flow attenuation is always an important consideration in selecting an appropriate detention method. Detention storage capacity is typically greatest when wet detention (lakes or ponds) are used, but may be limited by available open space, topographic conditions, regulatory considerations or other site constraints. Dry detention basins and underground storage typically store less volume than wet detention basins, but usually provide more storage than parking lot or roof top facilities. Utilizing multiple detention methods is often practical.
4. *The origin and magnitude of flows to be managed.* Consideration should also be given to the origin and magnitude of stormwater runoff to be managed. Large detention systems (including wet detention, dry detention, and underground storage) are appropriate methods for capturing significant runoff volume and high peak flows. These systems can be designed to dampen peak velocities and disperse energy through the use of plunge pools, forebays, or other structural controls designed to receive high rates of flow. In contrast, parking lot and roof top facilities are typically designed to manage peak flows generated from a limited drainage area.
5. *Topographic opportunities and limitations.* Topographic conditions might either enhance or limit detention system effectiveness. Nearly flat or gently sloping sites generally provide more options in terms of available detention areas and alternative methods of detention. Steep slopes within a redevelopment site, however, might limit the ability to capture the necessary runoff volume and also limit the amount of storage volume that can be provided. Detention volume achieved through surface storage systems (including wet detention, dry detention, and parking lot facilities) can be compromised within a steeply sloping site, and could require significant grading, side slopes, and possible use of retaining walls in order to achieve the required storage volume. Roof top storage and underground detention should be considered for such cases.
6. *Safety Considerations.* For safety reasons, design criteria have been established for wet and dry detention systems including restrictions on side slopes, stormwater storage depth, safety shelves, and perimeter fencing. Safety must also be considered in the design of parking lot storage to avoid inundation within parking spaces, travel lanes, or areas accessible to the public. Roof top storage must be designed with consideration given to potential clogging of conveyances and down drain systems. Regardless of the detention method(s) used, public safety must be considered for both the redevelopment site, and for off-site areas potentially impacted by stormwater discharges.
7. *Maintenance requirements.* Periodic inspection and maintenance will be necessary regardless of the method of detention used. A list of typical maintenance activities required for each type of detention is provided in Section 8.3.2.2. Selection and design of detention facilities should be made with these required maintenance activities considered.

## 11.2.4 Stormwater Detention and the 50 Percent Rule

Existing stormwater management facilities for redevelopment sites may range from nearly non-existent to fully functional and compliant with current regulations. This section has been prepared to establish minimum stormwater management guidelines for redevelopment given the variability in possible existing conditions, stormwater management requirements for new development, and considering the potential impact that redevelopment might have on both the redeveloped site and surrounding properties. For these reasons, the “50 percent rule” has been established, with stormwater management requirements based upon the percentage of the site proposed to be disturbed for redevelopment.

Regardless of the percent of the site being disturbed for redevelopment, water quality treatment shall be provided and the required WQV shall be in accordance with Section 11.2.1 above. Water quality treatment may be provided through the construction of new facilities, or may be provided using existing water quality treatment or detention facilities. If existing facilities are being used for water quality treatment, requirements established in Section 11.2.4.3 below shall apply.

### 11.2.4.1 When Disturbing < 50 Percent of a Site for Redevelopment

Channel protection (1-year storm) and flood protection (2- through 25-year storms) shall be provided as required by these regulations **for the disturbed area**, and existing impervious areas which are disturbed shall be treated as forest in the pre-developed analysis. In order to determine the required channel protection and flood protection volumes, stormwater runoff resulting from the following assumed hydrologic conditions must be evaluated:

- Pre-redeveloped conditions analysis for the 1- through 25-year storms, with runoff hydrographs prepared for the disturbed portion of the site, assuming the impervious areas are in a forested condition,
- Post-redeveloped conditions analysis for the 1- through 25-year storms, with runoff hydrographs prepared for the disturbed portion of the site, using proposed redeveloped conditions, and
- Existing conditions analysis for the 1- through 25-year storms, with runoff hydrographs prepared for the disturbed portion of the site, using current conditions (required only if a variance from stormwater detention is requested in accordance with Sections 11.3 and 11.4 below).

Should a variance from stormwater detention be requested, the post-redeveloped conditions analysis (2<sup>nd</sup> item above) must demonstrate that peak flows are not increased compared to existing conditions (3<sup>rd</sup> item above).

### 11.2.4.2 When Disturbing $\geq$ 50 Percent of a Site for Redevelopment

Channel protection (1-year storm) and flood protection (2- through 25-year storms) shall be provided as required by these regulations. Stormwater management facilities (and the associated hydrology report) shall be prepared **for the entire site**, and existing impervious areas shall be treated as forest in the pre-developed analysis. In order to determine the required channel

protection and flood protection volumes, stormwater runoff resulting from the following assumed hydrologic conditions must be evaluated:

- Pre-redeveloped conditions analysis for the 1- through 25-year storms, with runoff hydrographs prepared for the entire site, assuming the impervious areas are in a forested condition,
- Post-redeveloped conditions analysis for the 1- through 25-year storms, with runoff hydrographs prepared for the entire site, using proposed redeveloped conditions, and
- Existing conditions analysis for the 1- through 25-year storms, with runoff hydrographs prepared for the entire site, using current conditions (required only if a variance from stormwater detention is requested in accordance with Sections 11.3 and 11.4 below).

Should a variance from stormwater detention be requested, the post-redeveloped conditions analysis (2<sup>nd</sup> item above) must demonstrate that peak flows are not increased compared to existing conditions (3<sup>rd</sup> item above).

#### 11.2.4.3 Use of Existing Stormwater Management Facilities for Water Quality Treatment

When using existing stormwater management facilities to provide water quality treatment for redevelopment, the following conditions shall apply.

##### Re-Use or Retrofitting of Existing Water Quality Treatment Facilities

If water quality treatment for a proposed development is provided in an existing water quality facility then water quality treatment conforming to the current regulations must be provided for the entire original project basin.

##### Re-Use or Retrofitting of Existing Detention Facilities

If water quality treatment for a proposed development is to be provided in an existing detention basin then treatment must be provided for the entire original project basin. A modification to the 25-year detention requirement may be granted for the purpose of retrofitting the detention pond to meet current water quality regulations. Granting of a modification will meet the intent and purpose of the current regulations when:

- The detention requirements of the current regulations are provided in the facility for the 1- year, 2-year, 5-year and 10-year storm. For a retrofitted basin, the volume of the 1-year storm shall be based on the original project area being detained instead of the total area draining to the basin;
- The water quality requirements of the current regulations are provided for the original project area in the facility;
- The ponding limits create a hardship if no modification is granted; and,
- The outlet structure meets the requirements of the current regulations.

## 11.3 Variance from Stormwater Detention Requirements

Under certain conditions, a variance from stormwater detention requirements (i.e. channel protection volume and 2- through 25-year detention requirements) may be requested by the applicant. These conditions are described below in Section 11.3.1, but do not relieve the applicant from providing the required WQV described in Section 11.2.1. Water quality treatment shall be required for all redevelopment sites regardless of the approval of a variance as described in this section. If approved, the variance allows the applicant to pay a fee in lieu of detention, as described below.

### 11.3.1 Conditions under which a Variance from Stormwater Detention may be Requested

The following appeals and variance procedures shall apply to an applicant who cannot meet the requirements for providing detention required by the *Gwinnett County SSFISS* for the 1-year storm (channel protection) and larger storms. A variance will only be considered when a hardship is shown meeting the conditions listed below. It should be noted, however, that properties under the following zoning classifications are not eligible for variances: R-75, R-75 CSO, R-100, R-100 CSO, R-140, R-200 and RA-200.

In granting a variance for relief from the provisions of the *SSFISS*, all technical evaluations, all relevant factors, all standards specified in other sections of the *SSFISS*, and the following items shall be considered. The applicant shall address the following considerations in the application.

- 1) the site or topographic conditions are substantially severe;
- 2) the concentration of peak flow has an adverse impact on the downstream property owner and evidence that environmental impacts have been avoided or minimized to the fullest extent possible;
- 3) the modification is mitigated using the procedure and redevelopment tool established in the *Gwinnett County SSFISS*;
- 4) the compatibility of the proposed use with the most current unified plan;
- 5) any other reasonable information related to the project that the *Department of Planning and Development* may deem necessary to effectively evaluate the variance request; and
- 6) consistency with other laws, codes, regulations, or model ordinances.

### 11.3.2 Fee in Lieu of Detention

If a variance from stormwater detention is granted (in accordance with Section 11.3.1 and Section 11.4 below), the applicant will be required to pay a “fee in lieu of detention”. The fee is initially calculated by the applicant utilizing the *Redevelopment Evaluation Tool* (see Figure 11-1). The fee is based on the required storage volume and a cost of \$3.20 per cubic foot of storage. Payments will be made to the Stormwater Utility Operating Fund as the purpose of that dedicated funding source is to inspect and assess the integrity of existing stormwater infrastructure. The tool

requires the applicant to provide general information, site information, and variance request information as described below.

The applicant must provide a hydrology report that calculates the runoff for three conditions, forested, existing and proposed. The report must show that the peak flows for the developed condition not exceed the existing condition. The variance request can only be for the detention volume required to reduce the peak from existing conditions to forested conditions. Water quality for the site must be provided. A hydrology report is required to determine the volume required to provide water quality, the detention volume necessary so that peak flow under proposed conditions is less than or equal to existing conditions, and the detention volume necessary so that the peak flow for the proposed condition is equal to or less than the forested condition.

#### General Information

All data entry fields are required to be completed by the applicant. Sample data entry is shown on Figure 11-1.

#### Site Information

All white cells within this section indicate information to be provided by the applicant. Required information is listed below, and sample input shown on Figure 11-1.

TSS Loading Rate (lb/ac/yr) – This is the TSS loading rate calculated from the Stormwater Quality Performance Review Form

Drainage Areas (ac) – Enter site drainage area for each development condition (forested, existing developed, and proposed redeveloped)

Impervious Areas (ac) – Enter impervious area for existing developed site and proposed redeveloped site

Curve Number (CN) – Enter CN for existing developed site and for proposed redeveloped site

Time of Concentration (minutes) – Enter time of concentration for site drainage area to point of off-site discharge

Required Water Quality Volume (ft<sup>3</sup>) – Enter the required water quality volume as calculated by the authorized registered professional.

#### Variance Request Information

The detention volumes entered in this section of the form by the applicant are used to calculate the variance request. In this section, the following information is required:

Proposed Facility Volume (ft<sup>3</sup>) – Enter the storage proposed for the 25-yr storm event including water quality and channel protection, which reflects the minimum value to



return runoff conditions from the redeveloped to the existing developed condition. Express in terms of cubic feet. This volume cannot be less than the required WQV. Supporting calculations must be provided.

Required Facility Volume (ft<sup>3</sup>) - Enter the storage required for the 25-yr storm event including water quality and channel protection, to return runoff conditions from the redeveloped condition to the forested condition. Express in terms of cubic feet. This volume cannot be less than the required WQV. Supporting calculations must be provided.

The remainder of this section of the tool uses the information entered by the applicant to automatically calculate the variance request volume. Detention volume variance (and associated cost) is calculated for two separate conditions; 1) when water quality is included as part of the overall detention facility, and 2) when water quality is provided in a separate facility. Example calculations under both scenarios are provided in Figure 11-1.



### Redevelopment Evaluation Tool

Curve Number Increases

\*\*\*Enter values in white cells only. Yellow cells are calculated values.

\*\*\*A separate form is required for each drainage basin

#### General Information:

Date:	3/20/2011
District/ Lant Lot/ Parcel:	1 001 001
Permit/ Case Number (i.e. SBV):	1111
Basin / Pond Identifier:	P-1
Project Name:	Development One
Applicant Name:	John Smith
Applicant Phone Number:	555-555-5555

#### Site Information:

	Required	Proposed Redeveloped
TSS Loading Rate (lb/ac/yr)	850	841

	Forested	Existing Developed	Proposed Redeveloped
Drainage Area (acre)	0.5	0.50	0.50
Impervious Area (acre)	0	0.35	0.41
Curve Number	55	85	90
Time of Concentration (minutes)	20	6	6
Required Water Quality Volume (ft <sup>3</sup> )	-	-	1,717

#### Variance Request Information:

	Total 25-yr Facility Volume (ft <sup>3</sup> ) <sup>(1)</sup>
(A) Proposed Facility Volume	2,211
(B) Required Facility Volume	7,164

<sup>(1)</sup> Total 25-yr Facility Volume cannot be less than the required Water Quality Volume

For Use When Water Quality is Included in the BMP	
(B - A) Variance Request Volume (ft <sup>3</sup> )	4953
Cost (\$/ft <sup>3</sup> )	\$3.20
<b>Total Cost</b>	<b>\$15,850</b>

For Use When Water Quality is Stand Alone	
(B - A) + 1/2 Required Water Quality Volume (ft <sup>3</sup> )	5812
Cost (\$/ft <sup>3</sup> )	\$3.20
<b>Total Cost</b>	<b>\$18,597</b>

Enter the storage proposed for the 25-yr storm event including water quality and channel protection, which reflects the minimum value to return runoff conditions from the redeveloped to the existing developed condition. Express in terms of cubic feet.

Enter the storage required for the 25-yr storm event including water quality and channel protection, to return runoff conditions from the redeveloped to the forested condition. Express in terms of cubic feet.

**Figure 11-1**  
**Sample Redevelopment Evaluation Tool Data Entry**

## 11.4 Stormwater Detention Variance Process

Variance requests from the requirements of the *SSFISS* shall be submitted on an application form as prescribed by the Director of the *Department of Planning and Development* or the Director's designee, along with such fees as shall be established by the *Board of Commissioners*. The Director of the *Department of Planning and Development* or the Director's designee shall coordinate the review of each variance request with all other affected County departments and shall forward such comments or recommendation as may be received to the *Board of Construction Adjustments and Appeals* for action in their normal course of business. The review must include a recommendation from the *Department of Planning and Development - Stormwater Plan Review Section*. Fees

The following items are necessary to process a variance application:

1. Application Form  
Please complete all portions of this form. The application must be signed and the signatures notarized by both the applicant and the property owner. Incomplete applications cannot be processed.
2. Application Fee  
The application fee is \$200.00 and is non-refundable. Please make check payable to Gwinnett County.
3. Letter of Intent  
The Letter of Intent should explain what is proposed and why you, the applicant, believes the request is justified. The Letter of Intent shall be a clearly identified, separate document.
4. Site Plan and Boundary Survey  
Provide two (2) full size copies of the site plan and boundary survey. Also provide one (1) 8 ½ X 11 reduction of both the site plan and boundary survey.
5. Plan Review Comments  
Attach any plan review comments prepared by county staff (if applicable).
6. Hydrology Report  
Provide all necessary documentations, including but not limited to drainage area maps, hydrological analysis, and generated runoff hydrographs supporting to variance request. Also, see hydrology report requirements described in Section 11.3.1.
7. Redevelopment Evaluation Tool  
Provide a copy of the fully completed Redevelopment Evaluation Tool. This tool assists the applicant in 1) determining the detention volume necessary to reduce peak stormwater

discharge to an acceptable condition (see 50% Rule, SSFISS Section 11.2.3), and 2) estimating the associated fee in lieu of detention.

8. Additional Plans and Documentation

Submit additional plans as necessary to support the application, or additional information that may be helpful for the Board of Construction Adjustments and Appeals and staff to make a decision. Please provide two (2) full size and one (1) 8 ½ X 11 reduction of all plans.

9. Additional Requirements

Submit any additional documents, plans or studies as may be required by the Department of Planning and Development - Stormwater Plan Review Section.

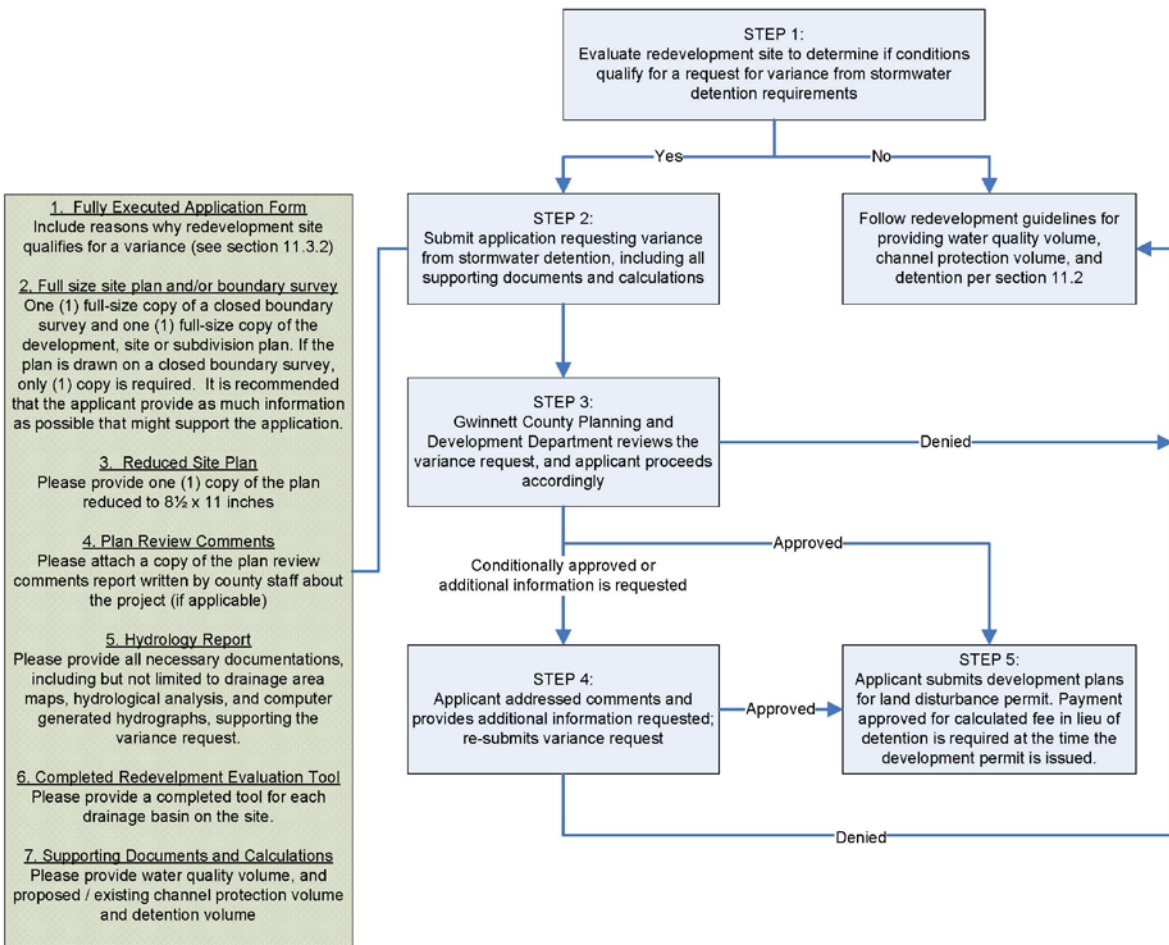


Figure 11-2  
Variance Process Flow Chart

Note: Any person adversely affected by the decision of the *Department of Planning and Development* or designee shall have the right to appeal the decision of the *Board of Construction Adjustments and Appeals* in their normal course of business. Please contact the *Department of Planning and Development* at 678-518-6000 for variance application guideline information.

## 11.5 Variance Request Examples

This section includes diagrams and sample Redevelopment Evaluation Tool data entry for hypothetical variance requests, assuming four separate scenarios including:

- when the curve number increases due to redevelopment,
- when the curve number decreases due to redevelopment
- when curve number remains the same