

# Existing and Future Flowrate Analysis

for

# *Outdoor Man Boat and RV Storage*

4818 Hill Road  
Land Lots 899, 19th District,  
Powder Springs, Cobb County, Georgia

Prepared for:

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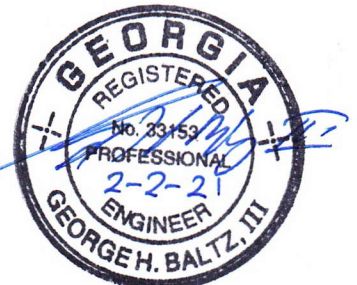
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CVE Project Number: 18-025

Date: 2-2-2021



## Project Summary

### General Description

The subject property is located in Land Lot 899 of the 19<sup>th</sup> District, in the City of Powder Springs, in Cobb County, Georgia. The property is located at 4818 Hill Road. The proposed project calls for the stabilization and grading of an existing site and the construction of a parking lot for large vehicle storage. Part of the site is located within A zone (A, AE, SHAED ZONE X) as defined by FIRM company panel number 13067C0177 G, dated December 16, 2008 for unincorporated Cobb County, Georgia.

Powder Springs Creek is on the northern portion of the property and runoff from the site discharges directly into the creek onsite. The purpose of this report is to show the existing and future 100-yr flow rates for the site combined with the pre-developed and post-developed flowrates for the proposed outdoor parking storage area. This report is to show compliance with Cobb County Code Sec. 50-128. Development fees.



Aerial Photo of the Site

## Modeling Summary

The existing parcel is in the Powder Springs Creek basin. The disturbed area is 5.96 acres. Powder springs Creek is on the Northern end of the property. Powder Springs Creek is a studied creek per the FEMA Flood insurance study number 13067CV001D dated March 4th, 2013. As shown in the study, directly downstream of the site is the confluence of Powder Springs Creek and Florence Branch. At that point, the basin for the creek is 22.90 square miles.

The flowrates for the Powder Springs Creek basin was provided by the City of Powder Springs. The data was provided in HEC-1 data files. The confluence point of Powder Springs Creek and Florence Branch is designated in the HEC-1 as the P013CC element. The existing and future flow were extracted. The modeling output is attached here and compared with published FIS study results.

**TABLE 2 - SUMMARY OF DISCHARGES (continued)**

Flooding Source and Location	Drainage Area (square miles)	10-Percent- Annual-Chance	2-Percent- Annual-Chance	Peak Discharges (cubic feet per second)		0.2-Percent- Annual-Chance
				1-Percent-Annual- Chance		
				Existing	Future	
<b>POWDER SPRINGS CREEK</b>						
At confluence with Sweetwater Creek	28.00	3,752	5,777	6,313	7,439	8,367
At Oglesby Road Southeast	25.40	3,631	5,660	6,198	7,289	8,230
At Lewis Road Southeast	24.20	3,615	5,640	6,178	7,260	8,202
<b>P013CC</b> Just downstream of Florence Branch	22.90	3,599	5,643	<b>6,189</b>	<b>7,209</b>	8,157
At Elliot Road Southwest	15.20	2,981	4,671	5,111	6,051	6,698
At Moon Road Southwest	10.00	2,141	3,349	3,860	4,473	5,070
At MacFarland Road Southwest/State Highway360	9.10	1,980	3,225	3,721	4,301	4,875
Just upstream of confluence with Mill Creek No. 1	6.50	1,595	2,510	2,830	3,283	3,706

## HEC-1 Model Existing Flow Conditions

INTERPOLATED HYDROGRAPH AT P013CC						
PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
(CFS)	(HR)	6-HR	24-HR	72-HR	99.95-HR	
<b>6,189</b>	16.05	(CFS) 5,676	3,180	1,695	1,342	
		(INCHES) 2.319	5.197	8.315	9.134	
		(AC-FT) 2,814	6,308	10,094	11,087	
CUMULATIVE AREA = 22.76 SQ MI						

NOTE: EXTRACTED FROM MODEL OUTPUT FILE

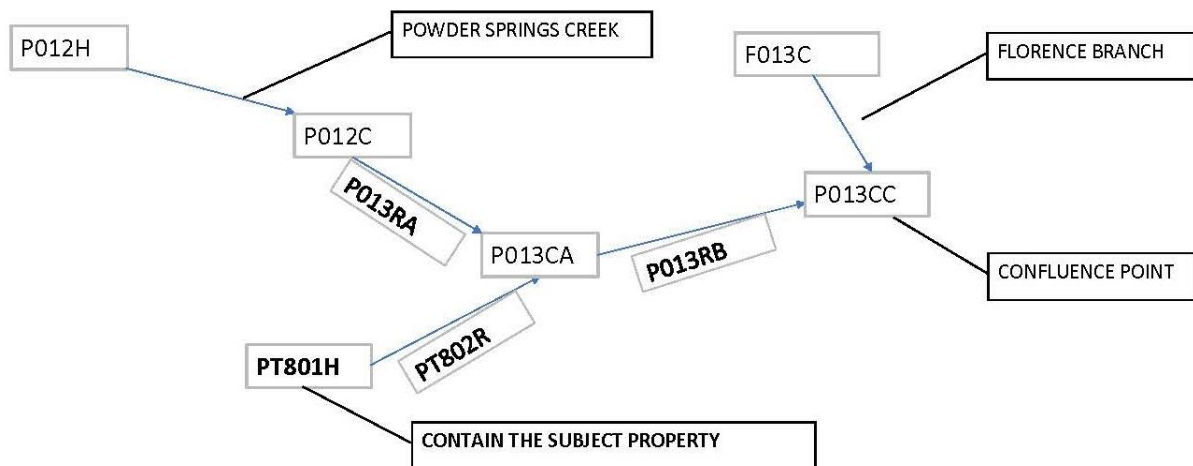
## HEC-1 Model Future Flow Conditions

INTERPOLATED HYDROGRAPH AT P013CC						
PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
(CFS)	(HR)		6-HR	24-HR	72-HR	99.95-HR
7,209	15.95	(CFS)	6,636	3,665	1,996	1,591
		(INCHES)	2.711	5.989	9.792	10.829
		(AC-FT)	3,291	7,270	11,886	13,145
CUMULATIVE AREA = 22.76 SQ MI						

NOTE: EXTRACTED FROM MODEL OUTPUT FILE

Once the existing conditions were established, a model was created to show the drainage basins both on the Powder Springs Creek and the Branch that extends south across the property.

HEC-1 MODEL DIAGRAM AND LOCATION OF THE SUBJECT PROPERTY



### Node PT801H:

This is the flowrate node on the subject property that the parking addition will discharge into. The existing drainage area is 0.22 square miles with an existing curve number of 72.83 and a lag time of 0.40 hours. The future curve number is 78.90 with a lag time of 0.33 hours.

The proposed impervious area for the site is approximately 3.95 acres. To model conservatively what the post developed flows are, an area of 5.00 acres of impervious area were extracted and replaced in the node of the model with the following conditions below.

EXISTING Conditions				
PRE TOTAL REVISED	Pre Onsite Area	PRE from HEC-1	Post Onsite Area	POST TOTAL REVISED
140.8 acres	5 acres	135.8 acres	5 acres	140.8 acres
72.83 curve number	55 curve number	73.49 curve number	98 curve number	74.36 curve number

Future Conditions				
PRE TOTAL REVISED	Pre Onsite Area	PRE from HEC-1	Post Onsite Area	POST TOTAL REVISED
140.8 acres	5 acres	135.8 acres	5 acres	140.8 acres
78.9 curve number	55 curve number	79.41 curve number	98 curve number	80.07 curve number

The existing conditions scenario showed an overall curve number increase from 72.83 in pre-developed condition to 74.36 for the post developed conditions. The future conditions scenario showed an overall curve number increase from 78.9 in pre-developed condition to 80.07 for the post developed conditions.

### Modeling Results

The data from the table above was re-run in HEC-1 to show the impact to the flowrate at node P013CC, which is the confluence of Florence Branch and Powder Springs Creek as shown on the FIS report. The results are below.

HEC-1 Model: Existing Flow Condition Pre-Developed Scenario

INTERPOLATED HYDROGRAPH AT P013CC						
PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	99.95-HR
6,189	16.05	(CFS)	5,676	3,180	1,695	1,342
		(INCHES)	2.319	5.197	8.315	9.134
		(AC-FT)	2,814	6,308	10,094	11,087
CUMULATIVE AREA = 22.76 SQ MI						

HEC-1 Model: Existing Flow Condition Post-Developed Scenario

INTERPOLATED HYDROGRAPH AT P013CC						
PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	99.95-HR
6,189	16.05	(CFS)	5,677	3,182	1,696	1,343
		(INCHES)	2.319	5.199	8.319	9.139
		(AC-FT)	2,815	6,311	10,098	11,093
CUMULATIVE AREA = 22.76 SQ MI						

**HEC-1 Model: Future Flow Condition Pre-Developed Scenario**

INTERPOLATED HYDROGRAPH AT P013CC						
PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	99.95-HR
7,209	15.95	(CFS)	6,636	3,665	1,996	1,591
		(INCHES)	2.711	5.989	9.792	10.829
		(AC-FT)	3,291	7,270	11,886	13,145
CUMULATIVE AREA = 22.76 SQ MI						

**HEC-1 Model: Future Flow Condition Post-Developed Scenario**

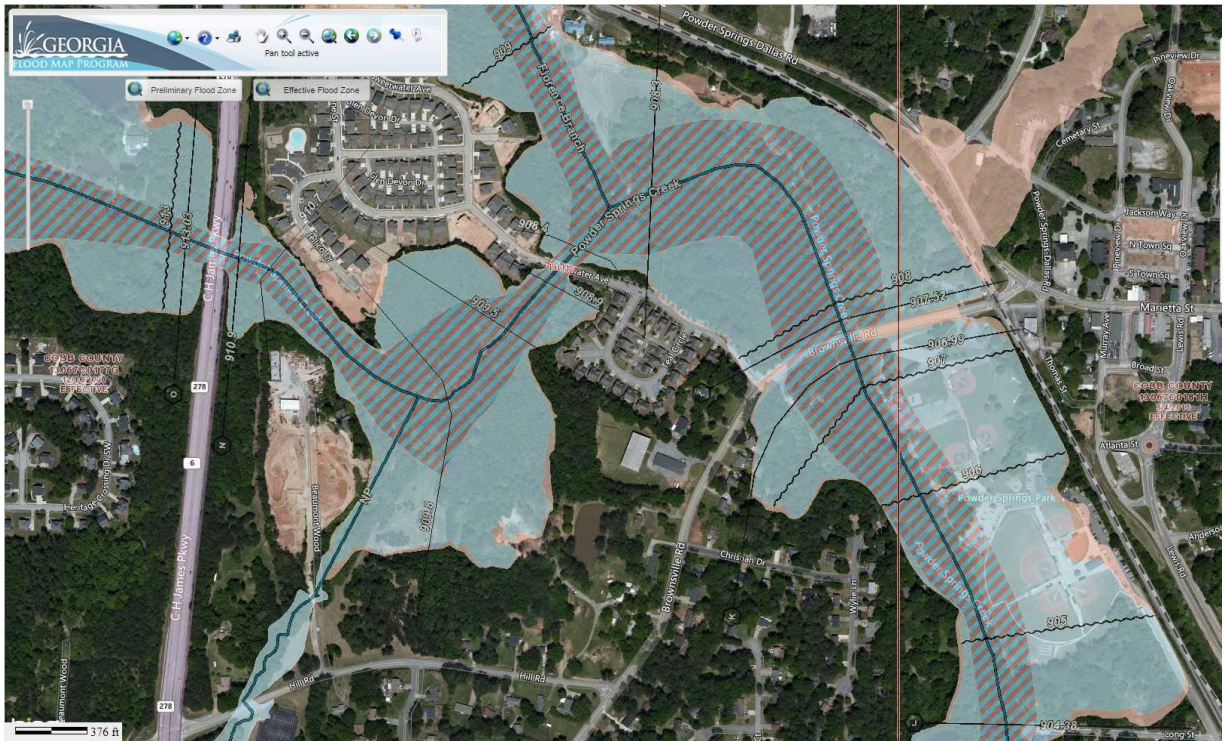
INTERPOLATED HYDROGRAPH AT P013CC						
PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	99.95-HR
7,209	15.95	(CFS)	6,637	3,666	1,997	1,592
		(INCHES)	2.711	5.991	9.795	10.832
		(AC-FT)	3,291	7,272	11,890	13,149
CUMULATIVE AREA = 22.76 SQ MI						

Based on the above tables, there is no increase to the 100-yr flowrate for the existing and future flow conditions model with reducing the curve number of 5 onsite acres to 55 and then raising the same 5 acres to 98.

**Downstream flooding impacts.**

To determine potential downstream flooding impacts, the GIS images are below to determine if there are any homes in the floodplain for half a mile to a mile downstream. Shown below are two images of the downstream flood maps with the aerial mapping turned on. It is approximately 6300 feet to the Lewis road crossing, which is over a mile away. Powder Springs Park is in the flood zone. There appears to be no private structures in the floodplain.





Downstream Flood Map 1



Downstream Flood Map 2

## **Conclusion**

During the City Council meeting on February 1<sup>st</sup>, there were two points that were brought up as concerns to the allowance for the detention waiver. The first was that the possibility that removing the stormwater detention from the property would increase the downstream flowrates and cause an increase in flooding. As shown from the data in this report, the addition of 5 acres of impervious will not increase the downstream flooding. The second concern was water quality due to the type of vehicle storage and the potential for contents to get into the waters of the state downstream. As shown on the site plan, a variance for stormwater detention will be for stormwater quantity only and the construction will still be required to provide water quality and Total suspended solid removal consistent with the requirements of the Georgia Stormwater Management Manual.