

*Revised Drainage Calculations for  
City of Clermont and SJRWMD*

***CLERMONT COMMERCE CENTER***  
*(NE Corner of Hancock Road and Trade Ave., Clermont, FL)*

*Prepared by:*

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## 1.0 SUMMARY

The subject site is approximately 9.4 acres. The site is located within Section 34, Township 22 South, Range 26 East within Lake County, Florida. More specifically, the property is located at the northeast corner of Hancock Road and Trade Avenue in Clermont, Florida, 34711. The site is currently undeveloped and is heavily wooded with Oak, Ash and Pine trees. The property slopes from the north, east, west and south property boundaries toward the lowest portion of the project site at the center.

The proposed project includes construction of two warehouse/office buildings, truck court, driveways, parking and stormwater retention ponds. More specifically, the area of the building along the south property line will be 63,000 square feet and the building to the north will be 44,400 square feet for a total floor area of 107,400 square feet. Stormwater runoff from the proposed improvements will be managed through two on-site dry retention ponds. The stormwater management system has been designed to address the pollution abatement criteria and the attenuation of the peak runoff. The design meets or exceeds the requirements of the St. Johns River Water Management District (SJRWMD), and the City of Clermont. The proposed basin summary table below defines the proposed development basins.

The retention ponds will be designed to retain 100% of the stormwater runoff for the 100-year 24-hour storm event; therefore, the pre-development condition was not analyzed. The post development condition was analyzed as two separate drainage basins which are described as the following:

**Table 1: Post Development Basin Summary**

<b>BASIN NAME</b>	<b>A</b>	<b>B</b>
<b>BASIN AREA (AC)</b>	15.471	17.582
<b>IMPERVIOUS AREA (AC)</b>	0.330	9.305*
<b>% IMPERVIOUS</b>	2	53
<b>Tc (MIN.)</b>	73	35
<b>CN</b>	34	69

\*A portion of the impervious area was the semi-pervious stabilized and grassed emergency access road on the north side of the project site.

A summary of the post development impervious and pervious areas for onsite and offsite for each basin is provided in the table below:

ONSITE/OFFSITE IMPERVIOUS AND PERVIOUS AREAS			
ONSITE	Basin A	Basin B	Onsite Total
ONSITE Impervious Area (ac)	0.258	5.697	5.955
ONSITE Pervious Area (ac)	0.747	2.703	3.450
ONSITE Total Areas (ac)	1.005	8.400	9.405
OFFSITE	Basin A	Basin B	Offsite Total
OFFSITE Impervious Area (ac)	0.072	3.608	3.680
OFFSITE Pervious Area (ac)	14.394	5.574	19.968
OFFSITE Total Areas (ac)	14.466	9.182	23.648
ONSITE AND OFFSITE	Basin A	Basin B	Total
COMBINED Impervious Areas (ac)	0.330	9.305	9.635
COMBINED Pervious Areas (ac)	15.141	8.277	23.418
Total	15.471	17.582	33.053

## 1.1 SOILS AND GROUNDWATER

A review of the information published by the United States Department of Agriculture, National Resources Conservation Service website indicates soil types within the project boundaries consist of Candler Fine Sand, 0 to 5 percent slopes (Hydrologic Group A Soil); Candler Fine Sand, 5 to 12 percent slopes (Hydrologic Group A Soil); Lake Fine Sand 0 to 5 percent slopes (Hydrologic Group A Soil).

Professional Service Industries (PSI) completed fourteen standard penetration test borings at the location of the buildings to a depth of 25 feet below ground surface (bgs), three auger borings at the location of the ponds to a depth of 15 feet bgs, and five auger borings at the location of the parking and driveway to a depth of 7 feet bgs. Groundwater was not observed in any of the borings. The estimated normal seasonal high groundwater depth was estimated at 50 feet bgs. Please refer to the Updated Report Geotechnical Engineering Services report dated February 20, 2018, submitted under separate cover. In addition, please refer to the table within the Stormwater Management section of the aforementioned report for stormwater design parameters.

## **1.2 WETLANDS**

No wetlands exist on site. Please refer to the Preliminary Environmental Assessment Report by Bio-Tech Consulting and dated February 1, 2018 submitted under separate cover.

## **1.3 EXISTING DRAINAGE**

The project site contains a landlocked depressed area at the center of the property that collects stormwater runoff from the area within the project boundaries as well stormwater runoff from offsite areas north, south, east and west of the project site.

The offsite area to the east encompasses a portion of the Crothall Laundry Services Facility (building, parking and driveways). The Crothall Laundry Services Facility does not have a stormwater management pond to provide water quality and attenuation. The stormwater runoff from the south portion of the Crothall Laundry Services sheet flows to the west via overland flow to the landlocked depressed area at the center of the project site. The stormwater runoff from the north portion of the Crothall Laundry Services sheet flows to the west via overland flow to an existing 24-inch pipe to the landlocked depressed area at the center of the project site.

The offsite area north of the project site is undeveloped and vegetated with trees and brush. The stormwater runoff from the area north of the project site sheet flows overland to the south toward the landlocked depressed area at the center of the project site.

A portion of the Hancock Road right of way west and southwest of the project site generates stormwater runoff that flows along the east side of Hancock Road and eventually into the landlocked depressed area at the center of the project site.

The offsite area south of the project site is undeveloped and vegetated with trees and brush. The runoff from the area to the south of the project site sheet flows overland north towards an east-west roadside swale along the south side of Trade Avenue. The runoff is directed across Trade Avenue via an existing 30-inch pipe to the landlocked depressed area at the center of the project site.

## **2.0 PROPOSED DEVELOPMENT**

The proposed project includes construction of one 44,400 sf warehouse building on the north side and one 63,000 sf building on the south side of the project site as well as a truck court, driveways, parking and two stormwater retention ponds. Offsite improvements include restriping a portion of Hancock Road, water main connection across (directional

drill) Hancock Road and construction (directional drill) of approximately 1,800 linear feet of sanitary force main along the east side of Hancock Road to make connection with the lift station to the north.

Stormwater runoff from the proposed improvements will be managed through two on-site dry retention ponds. The stormwater management system has been designed to address the pollution abatement criteria and the attenuation of the peak runoff. The design meets or exceeds the requirements of the St. Johns River Water Management District (SJRWMD), and the City of Clermont.

## **2.1 REQUIRED PERMITS AND REVIEWS**

- City of Clermont, Florida
- Lake County, Florida
- St. Johns Water Management District (SJRWMD) Permit

## **2.2 STORMWATER MANAGEMENT**

Stormwater runoff from the basins will be collected within the dry retention ponds located within the south and east portions of the property. The storm water management system is designed to meet or exceed all requirements of City of Apopka and the SJRWMD.

### **2.2.1 BASIN**

Basin A includes an offsite area to the south of Trade Avenue as well as proposed dry retention Pond A located adjacent to Trade Avenue along the south side of the project site. The runoff from the basin flows from south to north towards a roadside swale along the south side of Trade Avenue. The runoff collects in the swale and runs east and west towards a an existing 30-inch pipe. The stormwater runoff from the south side of Trade Avenue is conveyed to the proposed onsite dry retention Pond A located along the north side of Trade Avenue via the existing 30-inch pipe. A post-development drainage map is provided in Appendix A.

Basin B encompasses most of the post developed onsite basin as well as offsite areas east of the site (Crothall Laundry Services), offsite areas west and southwest of the site (east portion of Hancock Road ROW), as well as offsite areas to the north. The runoff from the southwest and west portion (offsite) of Basin B will sheet flow from the southwest and west along the Hancock Road ROW into a proposed inlet along the Hancock Road ROW adjacent the west central project boundary, and the stormwater will be conveyed via onsite secondary stormwater pipes to proposed Pond B located adjacent to the east property boundary. The runoff from

the north portion (offsite) of Basin B will sheet flow from the north to the south and into proposed inlets onsite and the stormwater will be conveyed via secondary stormwater pipes to proposed Pond B. A portion (south portion) of the Crothall Laundry Services property on the east side of Basin B will sheet flow from west to east into proposed Pond B. A portion (north portion) of the Crothall Laundry Services property on the east side of Basin B is conveyed to proposed Pond B via an existing 24-inch storm pipe. The onsite portion of Basin B will sheet flow to the secondary system of inlets and pipes and be routed to proposed Pond B. A post-development drainage map is provided in Appendix A.

### **2.2.2 CN CALCULATIONS**

The USDA National Resources Conservation Service indicates the in-situ soils, which will be retained on site for fill are classified within Hydrologic Group A. The curve number for the pervious areas of the post development drainage basin were based on in-situ soils designated as Hydrologic Group A. The calculations are provided in Appendix B.

### **2.2.3 TIME OF CONCENTRATION**

The post development time of concentration was calculated for the proposed post development drainage basins. The resulting time of concentration is provided in Appendix B.

### **2.2.4 TAILWATER CONDITION**

The onsite stormwater will be retained onsite via the dry retention ponds; therefore, a tailwater condition was not required for the analysis of the stormwater management system.

## **2.3 POLLUTION ABATEMENT VOLUME (PAV)**

Dry retention ponds are utilized for the Best Management Practice (BMP) to reduce the discharge of pollutants associated with stormwater runoff. The following are the PAV (Treatment Volume) requirements:

The PAV requirements for on-line dry retention pond are as follows:

The greater of:

½" of runoff over the basin (on-line)

or  
1- ¼" of runoff over the impervious area (on-line)  
plus  
½" over entire site (on-line).

All PAV is provided within the dry retention ponds. The supporting required and provided PAV calculations are included within Appendix C.

## **2.4 PROPOSED DEVELOPMENT RUNOFF**

The runoff from Basin A will sheet flow from the south to the north towards a swale along the south side of Trade Avenue and across Trade Avenue via an existing 30-inch stormwater pipe into proposed Pond A located along the south side of the project site adjacent to Trade Avenue. The stormwater is treated via percolation through the permeable soils into the shallow ground aquifer. The stormwater analysis for the post development was completed using Ponds (Ver. 3.2). Please refer to Appendix D for an input report, hydrographs, and routing report.

The runoff from the west portion (offsite) of Basin B will sheet flow from the southwest and west along the Hancock Road ROW into a proposed inlet along the Hancock Road ROW adjacent the west central project boundary and the stormwater will be conveyed via secondary stormwater pipes to proposed Pond B located adjacent to the east property boundary. The runoff from the north portion (offsite) of Basin B will sheet flow from the north to the south and into proposed inlets onsite and the stormwater will be conveyed via secondary stormwater pipes to proposed Pond B. The runoff from the east portion (offsite) of Basin B will sheet flow into proposed Pond B. A portion (north portion) of the Crothall Laundry Services property on the east side of Basin B is conveyed to proposed Pond B via an existing 24-inch storm pipe. The onsite portion of Basin B will sheet flow to the secondary system of inlets and pipes and be routed to proposed Pond B.

The stormwater collected within proposed Pond A and Pond B is treated via percolation through the permeable soils into the shallow ground aquifer. The stormwater analysis for the post development was completed using Ponds (Ver. 3.2). Please refer to Appendix D for an input report, hydrographs, and routing report.

No stormwater discharge is proposed from the proposed dry retention ponds.

## **2.5 PAV RECOVERY**

SJRWMD requires that the PAV be recovered within 3 days (72 hours). PSI performed permeability tests within some of the borings completed onsite.



PSI recommended an estimated horizontal saturated hydraulic conductivity of surficial aquifer of 45 ft/day and an estimated vertical unsaturated hydraulic conductivity of surficial aquifer of 30 ft/day within their report. According to the PSI report, a factor of safety was not applied to the above referenced values.

A horizontal saturated hydraulic conductivity of surficial aquifer of 30 ft/day was used for the drawdown analysis of the proposed ponds, which incorporated a factor of safety of 1.5 (vertical unsaturated hydraulic conductivity of surficial aquifer was not used). Please refer to the Updated Geotechnical Engineering Services report by PSI submitted under separate cover. Recovery time at 72 hours was determined by using Ponds (Ver. 3.2). Please see supporting recovery analysis in Appendix D.

## 2.6 CONCLUSION

The design meets or exceeds all requirements of SJRWMD and City of Clermont. An input report and routing results are provided in Appendix D.

The post-development pond stages were determined using PONDSD (Ver. 3.2). Please refer to Appendix D for the input report, and drainage analysis summary. A summary table is provided below:

Pond A	
Top of Bank Elevation (FT)	159.00
Mean Annual Storm Event Maximum Stage without Infiltration	154.17
Mean Annual Storm Event Maximum Stage w/Infiltration	152.00
25 Year 24 Hour Storm Event Maximum Stage w/Infiltration	152.00
100 Year 24 Hour Storm Event Maximum Stage w/Infiltration	152.00
100 Year 24 Hour Storm 14 Day Recovery – Did Pond Recover?	YES
72 Hour Drawdown - Did Pond Recover?	YES

Pond B	
Top of Bank Elevation (FT)	159.00
Mean Annual Storm Event Maximum Stage without Infiltration	152.91
Mean Annual Storm Event Maximum Stage w/Infiltration	145.02
25 Year 24 Hour Storm Event Maximum Stage w/Infiltration	154.47
100 Year 24 Hour Storm Event Maximum Stage w/Infiltration	157.29
100 Year 24 Hour Storm 14 Day Recovery – Did Pond Recover?	YES
72 Hour Drawdown - Did Pond Recover?	YES

## **2.7 WETLAND IMPACTS/MITIGATION**

No wetlands exist on site. Please refer to the Preliminary Environmental Assessment Report by Bio-Tech Consulting and dated February 1, 2018 submitted under separate cover.

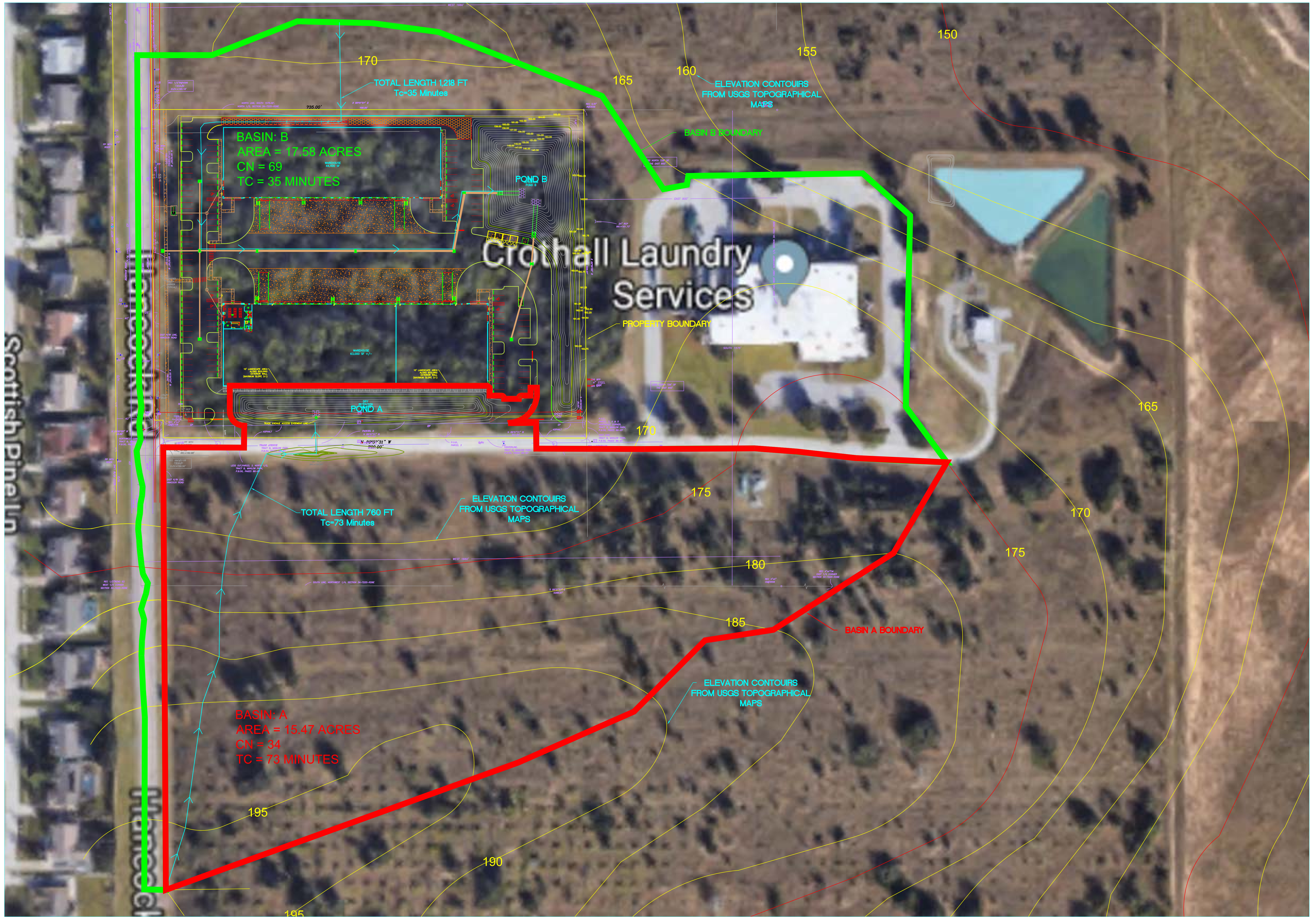
## **3.0 MONITORING**

The proposed project is within the Lake Apopka Hydrologic Basin; therefore, 10 years of monitoring will be conducted following the completion of the construction to show the system is recovering and will not discharge to Lake Apopka or its tributaries.

# **APPENDIX A**

## **POST DRAINAGE BASIN MAP**

Drawing name: \\cnd-server\Projects\2600-MC000\17-300-Clermont-BTS\Exhibits\Post Development Drainage Basin Map Revised.dwg Post Development Drainage Basin Map Nov. 02, 2018 2:28pm by Eric



No.	REVISIONS	DATE	BY

DESIGN ENGINEER:  
 CHAD S. LINN, P.E.  
 FLORIDA REGISTRATION NUMBER:  
 57524

SCALE: AS NOTED  
 DESIGNED BY: EPL  
 DRAWN BY: EPL  
 CHECKED BY: CSL

**POST DRAINAGE BASIN MAP**

**CLERMONT COMMERCE CENTER**  
**HANCOCK ROAD**  
**CLERMONT FLORIDA**  
 FLORIDA  
 LAKE COUNTY

DATE  
 10/9/18  
 PROJECT NO.  
 2600-16-200  
 SHEET NUMBER

**APPENDIX B**

**POST**

**CURVE NUMBER AND TIME**

**OF CONCENTRATION**

**CALCULATIONS**

**CURVE NUMBER**

## CURVE NUMBER WORKSHEET SITE POST-DEVELOPMENT

Basin Name = A

Basin Area = 15.471 acres

AREA	SCS SOIL TYPE	COVER TYPE AND CONDITIONS	CURVE NUMBER	SUB TOTAL
		Grass (Lawns, Parks, Golf Courses, etc.)		
0.919	A	Poor	68.0	0.0
	A	Fair	49.0	0.0
	A	Good	39.0	35.8
		Brush (Brush-Weed-Grass)		
	A	Poor	48.0	0.0
	A	Fair	35.0	0.0
	A	Good	30.0	0.0
		Woods/Grass (Orchard or Tree Farm)		
14.222	A	Poor	57.0	0.0
	A	Fair	43.0	0.0
	A	Good	32.0	455.1
		Woods		
	A	Poor	45.0	0.0
	A	Fair	36.0	0.0
	A	Good	30.0	0.0
0.330	A,B,C,D	Semi-Impervious (Gravel)	78.0	0.0
	A,B,C,D	Impervious (Pavement, Concrete, Roofs)	98.0	32.3

**WEIGHTED CURVE NUMBER = 34**

WEIGHTED CURVE NUMBER = SUM (CN\*AREA) / TOTAL AREA

**CURVE NUMBER WORKSHEET  
SITE POST-DEVELOPMENT**

Basin Name = B

Basin Area = 17.582 acres

AREA	SCS SOIL TYPE	COVER TYPE AND CONDITIONS	CURVE NUMBER	SUB TOTAL
		Grass (Lawns, Parks, Golf Courses, etc.)		
5.205	A	Poor	68.0	0.0
	A	Fair	49.0	0.0
	A	Good	39.0	203.0
		Brush (Brush-Weed-Grass)		
	A	Poor	48.0	0.0
	A	Fair	35.0	0.0
	A	Good	30.0	0.0
		Woods/Grass (Orchard or Tree Farm)		
2.365	A	Poor	57.0	0.0
	A	Fair	43.0	0.0
	A	Good	32.0	75.7
		Woods		
0.707	A	Poor	45.0	0.0
	A	Fair	36.0	0.0
	A	Good	30.0	21.2
0.134	A,B,C,D	Semi-Impervious (Gravel)	78.0	10.5
9.171	A,B,C,D	Impervious (Pavement, Concrete, Roofs)	98.0	898.8

**WEIGHTED CURVE NUMBER = 69**

WEIGHTED CURVE NUMBER = SUM (CN\*AREA) / TOTAL AREA



# **TIME OF CONCENTRATION**

## BASIN A

### CALCULATE POST-DEVELOPMENT T<sub>c</sub> NUMBER

OVERLAND FLOW < 300 ft.

L= 300 FT  
N= 0.8  
S= 0.005

SHALLOW CONC. FLOW > 300 ft.

L= 460 FT  
V= 1.9 FT/SEC

Intensity IN1= 3.5 IN/HR  
IN2= 4 IN/HR  
IN3= 5 IN/HR

SHALLOW CONC. FLOW > 300 ft.

L= 0 FT  
V= 2 FT/SEC

T<sub>c</sub> = T<sub>o</sub> overland flow + T<sub>s</sub> shallow conc. flow

$$T_o = .93 * (L^{.6} * N^{.6}) / (IN^{.4} * S^{.3})$$

T<sub>o1</sub> = 74.01 MIN  
T<sub>o2</sub> = 70.16 MIN  
T<sub>o3</sub> = 64.17 MIN

T<sub>o</sub> avg. = 69.45

$$T_s = L/V$$

T<sub>s</sub> = 4.04

$$T_c = T_o + T_s$$

T<sub>c</sub> = 73.48 => USE 73 MIN  
USE 73 MIN

## BASIN B

### CALCULATE POST-DEVELOPMENT T<sub>c</sub> NUMBER

OVERLAND FLOW < 300 ft.

L= 170 FT  
N= 0.8  
S= 0.032

SHALLOW CONC. FLOW > 300 ft.

L= 203 FT  
V= 1.75 FT/SEC

Intensity

IN1= 3.5 IN/HR  
IN2= 4 IN/HR  
IN3= 5 IN/HR

SHALLOW CONC. FLOW > 300 ft.

L= 130 FT  
V= 1.5 FT/SEC

PIPE FLOW

L= 715 FT  
V= 4 FT/SEC

T<sub>c</sub> = T<sub>o</sub> overland flow + T<sub>s</sub> shallow conc. flow

$$T_o = .93 * (L^{.6} * N^{.6}) / (IN^{.4} * S^{.3})$$

T<sub>o1</sub> = 30.16 MIN  
T<sub>o2</sub> = 28.59 MIN  
T<sub>o3</sub> = 26.15 MIN

T<sub>o</sub> avg. = 28.30

$$T_s = L/V$$

T<sub>s</sub> = 3.38

T<sub>p</sub> = 2.98

$$T_c = T_o + T_s + T_p$$

T<sub>c</sub> = 34.66 => USE 35 MIN  
USE 35 MIN

**APPENDIX C**

**REQUIRED TREATMENT  
VOLUME  
AND  
PROVIDED TREATMENT  
VOLUME CALCULATIONS**

# REQUIRED TREATMENT VOLUME CALCULATIONS BASIN A

11/1/2018

Determine the required Pollution Abatement Volume (PAV) for water quality treatment for the proposed Post Basin for SJRWMD and City of New Smyrna Beach criteria.

**CRITERIA:** The stormwater management system is required to store a minimum volume equal to the first one-half inch of runoff from the developed site or 1.25 inches time the percentage of impervious area plus one-half inch over entire site for online storage only, which ever is greater.

## Site Post Basin – Online Storage

1. Compute the first half inch of runoff from the developed site (Va): Basin = 15.471 AC

$$\begin{aligned}
 &V_a = 0.5 \text{ inch} * \text{developed site} \\
 &V_a = 0.5 \text{ inch} * (1 \text{ foot} / 12 \text{ inches}) = 15.471 \text{ ac} \\
 &\quad \mathbf{V_a = 0.6446 \text{ ac-ft}} \quad \text{for the first half inch of runoff} \\
 &\quad = 28080 \text{ ft}^3
 \end{aligned}$$

$$\begin{aligned}
 &V_b = 0.5 * \text{developed site} \\
 &V_b = 0.5 * (1 \text{ foot} / 12 \text{ inches}) = 15.471 \text{ ac} \\
 &\quad \mathbf{V_b = 0.6446 \text{ ac-ft}} \\
 &\quad = 28080 \text{ ft}^3
 \end{aligned}$$

$$\begin{aligned}
 \text{Total } V_a + V_b &= 0.6446 + 0.6446 = 1.2893 \text{ ac-ft} \quad (\text{Required retention storage}) \\
 &= 56160 \text{ ft}^3
 \end{aligned}$$

2. Compute 1.25 inches times the percentage of impervious (Vb): Impervious = 0.33 AC

$$\begin{aligned}
 &V_c = 1.25 * \text{total impervious} \\
 &V_c = 1.25 * (1 \text{ foot} / 12 \text{ inches}) * 0.33 \\
 &\quad \mathbf{V_c = 0.0344 \text{ ac-ft}} \quad \text{for the first half inch of runoff} \\
 &\quad = 1497 \text{ ft}^3
 \end{aligned}$$

$$\begin{aligned}
 &V_b = 0.5 * \text{developed site} \\
 &V_b = 0.5 * (1 \text{ foot} / 12 \text{ inches}) = 15.471 \text{ ac} \\
 &\quad \mathbf{V_b = 0.6446 \text{ ac-ft}} \\
 &\quad = 28080 \text{ ft}^3
 \end{aligned}$$

$$\begin{aligned}
 \text{Total } V_c + V_b &= 0.0344 + 0.6446 = 0.6790 \text{ ac-ft} \quad (\text{Required retention storage}) \\
 &= 29577 \text{ ft}^3
 \end{aligned}$$

Since the <b>1.29 ac-ft</b> , for one half inch over the site area is <b>&gt; 0.68 ac-ft</b> for 1.25 inches times the impervious area, the required pollution abatement volume is <b>1.29 ac-ft</b>
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# REQUIRED TREATMENT VOLUME CALCULATIONS BASIN B

11/1/2018

Determine the required Pollution Abatement Volume (PAV) for water quality treatment for the proposed Post Basin for SJRWMD and City of New Smyrna Beach criteria.

**CRITERIA:** The stormwater management system is required to store a minimum volume equal to the first one-half inch of runoff from the developed site or 1.25 inches time the percentage of impervious area plus one-half inch over entire site for online storage only, which ever is greater.

## Site Post Basin – Online Storage

1. Compute the first half inch of runoff from the developed site (Va): Basin = 17.582 AC

$$\begin{aligned} & \text{Va} = 0.5 \text{ inch} * \text{developed site} \\ & \text{Va} = 0.5 \text{ inch} * (1 \text{ foot} / 12 \text{ inches}) = 17.582 \text{ ac} \\ & \quad \text{Va} = \quad \mathbf{0.7326} \quad \mathbf{ac-ft} \\ & \quad = \quad 31911 \quad \text{ft}^3 \end{aligned} \quad \begin{array}{l} \\ \\ \\ \text{for the first half inch of runoff} \end{array}$$

$$\begin{aligned} & \text{Vb} = 0.5 * \text{developed site} \\ & \text{Vb} = 0.5 * (1 \text{ foot} / 12 \text{ inches}) = 17.582 \text{ ac} \\ & \quad \text{Vb} = \quad \mathbf{0.7326} \quad \mathbf{ac-ft} \\ & \quad = \quad 31911 \quad \text{ft}^3 \end{aligned}$$

$$\begin{array}{rclclcl} \text{Total Va + Vb} = & \mathbf{0.7326} & + & \mathbf{0.7326} & = & \mathbf{1.4652} & \mathbf{ac-ft} \\ & & & & = & \mathbf{63823} & \mathbf{ft}^3 \end{array} \quad \text{(Required retention storage)}$$

2. Compute 1.25 inches times the percentage of impervious (Vc): Impervious = 9.284 AC

$$\begin{aligned} & \text{Vc} = 1.25 * \text{total impervious} \\ & \text{Vc} = 1.25 * (1 \text{ foot} / 12 \text{ inches}) * 9.284 \\ & \quad \text{Vc} = \quad \mathbf{0.9671} \quad \mathbf{ac-ft} \\ & \quad = \quad 42126 \quad \text{ft}^3 \end{aligned} \quad \begin{array}{l} \\ \\ \\ \text{for the first half inch of runoff} \end{array}$$

$$\begin{aligned} & \text{Vb} = 0.5 * \text{developed site} \\ & \text{Vb} = 0.5 * (1 \text{ foot} / 12 \text{ inches}) = 17.582 \text{ ac} \\ & \quad \text{Vb} = \quad \mathbf{0.7326} \quad \mathbf{ac-ft} \\ & \quad = \quad 31911 \quad \text{ft}^3 \end{aligned}$$

$$\begin{array}{rclclcl} \text{Total Vc + Vb} = & \mathbf{0.9671} & + & \mathbf{0.7326} & = & \mathbf{1.6997} & \mathbf{ac-ft} \\ & & & & = & \mathbf{74037} & \mathbf{ft}^3 \end{array} \quad \text{(Required retention storage)}$$

Since the <b>1.70</b> , ac-ft for 1.25 inch times impervious area is <b>&gt;</b> <b>1.47</b> ac-ft for one-half inches over the developed site, the required pollution abatement volume is <b>1.70</b> ac-ft
--

**PROVIDED POLLUTION ABATEMENT VOLUME CALCULATIONS**

<b>PROPOSED DRY POND A</b>						
Stage	Area (sq.-ft.)	Area (ac.)	Volume (cu.-ft.)	Volume (ac-ft.)	Sum Volume (cu.-ft.)	Sum Volume (ac-ft)
152.00	528	0.01	-	-	-	-
153.00	2328	0.05	1428.00	0.03	1428.00	0.03
154.00	4821	0.11	3574.50	0.08	5002.50	0.11
155.00	7250	0.17	6035.50	0.14	11038.00	0.25
156.00	9696	0.22	8473.00	0.19	19511.00	0.45
157.00	12217	0.28	10956.50	0.25	30467.50	0.70
158.00	14813	0.34	13515.00	0.31	43982.50	1.01
<b>158.78</b>	<b>16892</b>	<b>0.39</b>	<b>12364.95</b>	<b>0.28</b>	<b>56347.45</b>	<b>1.29</b>
159.00	17479	0.40	3780.81	0.09	60128.26	1.38

Therefore **1.29** ac-ft of PAV will be provided in the pond system within the basin at elevation **158.78** FT

**PROVIDED POLLUTION ABATEMENT VOLUME CALCULATIONS**

<b>PROPOSED DRY POND B</b>						
Stage	Area (sq.-ft.)	Area (ac.)	Volume (cu.-ft.)	Volume (ac-ft.)	Sum Volume (cu.-ft.)	Sum Volume (ac-ft)
143.00	3713	0.09	-	-	-	-
144.00	4562	0.10	4137.50	0.09	4137.50	0.09
145.00	5527	0.13	5044.50	0.12	9182.00	0.21
146.00	6583	0.15	6055.00	0.14	15237.00	0.35
147.00	7741	0.18	7162.00	0.16	22399.00	0.51
148.00	8989	0.21	8365.00	0.19	30764.00	0.71
149.00	10374	0.24	9681.50	0.22	40445.50	0.93
150.00	11763	0.27	11068.50	0.25	51514.00	1.18
151.00	13227	0.30	12495.00	0.29	64009.00	1.47
<b>151.73</b>	<b>14490</b>	<b>0.33</b>	<b>10116.70</b>	<b>0.23</b>	<b>74125.70</b>	<b>1.70</b>
152.00	14957	0.34	3975.35	0.09	78101.05	1.79
153.00	16705	0.38	15831.00	0.36	93932.05	2.16
154.00	18563	0.43	17634.00	0.40	111566.05	2.56
155.00	20599	0.47	19581.00	0.45	131147.05	3.01
156.00	23869	0.55	22234.00	0.51	153381.05	3.52
157.00	27356	0.63	25612.50	0.59	178993.55	4.11
158.00	30960	0.71	29158.00	0.67	208151.55	4.78
159.00	34536	0.79	32748.00	0.75	240899.55	5.53

Therefore **1.70** ac-ft of PAV will be provided in the pond system within the basin at elevation **151.73** FT



**POND A**  
**PONDS / ICPR Program**  
**Equivalent Pond Dimensions**

***Input Data***

---

PONDS INPUT DATA

---

Pond Stage Height (h) in feet	7
Volume of Pond (V) in cubic feet	60,129
Effective Perimeter (P) in linear feet	892

<b>Equivalent Length of Pond (L) in feet</b>	426
<b>Equivalent Width of Pond (W) in feet</b>	20

**POND B**  
**PONDS / ICPR Program**  
**Equivalent Pond Dimensions**

***Input Data***

---

PONDS INPUT DATA

---

Pond Stage Height (h) in feet	16
Volume of Pond (V) in cubic feet	240,899
Effective Perimeter (P) in linear feet	1196
<hr/>	
<b>Equivalent Length of Pond (L) in feet</b>	<b>572</b>
<b>Equivalent Width of Pond (W) in feet</b>	<b>26</b>
<hr/>	

# **APPENDIX D**

**POST DEVELOPMENT  
DRAINAGE ANALYSIS  
FOR STORM EVENTS  
MEAN ANNUAL WITHOUT  
INFILTRATION**

**MEAN ANNUAL WITH  
INFILTRATION  
25 YR 24 HR STORM EVENT  
100 YR 24 HR STORM EVENT  
W/ 14 DAY RECOVERY**

**POND A**

**PONDS Version 3.2.0274**  
**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: CLERMONT COMMERCE CENTER

Simulation Description: MEAN ANNUAL WITHOUT INFILTRATION  
MEAN ANNUAL WITH INFILTRATION  
25YR-24HR  
100YR-24HR W/ 14 DAY RECOVERY  
72 HOUR DRAWDOWN

Project Number: 2600-17-300

Engineer : ERIC LAGASSEY

Supervising Engineer: CHAD LINN

Date: 10-09-2018

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 133.00

Water Table Elevation, [WT] (ft datum): 133.10

Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 30.00

Fillable Porosity, [n] (%): 25.00

Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 426.0

Equivalent Pond Width, [W] (ft): 20.0

Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft<sup>2</sup>)</u>
152.00	528.0
153.00	2328.0
154.00	4821.0
155.00	7250.0
156.00	9696.0
157.00	12217.0
158.00	14813.0
159.00	17479.0

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**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 2 :: BASIN A 25YR24HR STORM W/INFILTRATION*

Hydrograph Type:     Inline SCS  
 Modflow Routing:    Routed with infiltration  
 Repetitions:         1

Basin Area (acres)           15.471  
 Time Of Concentration (minutes) 73.0  
 DCIA (%)                    2.5  
 Curve Number                34  
 Design Rainfall Depth (inches) 8.6  
 Design Rainfall Duration (hours) 24.0  
 Shape Factor                 UHG 484  
 Rainfall Distribution         SCS Type II Florida Modified

Initial ground water level (ft datum)   133.10 (default)

Time After  
 Storm Event  
 (days)  
 \_\_\_\_\_  
 30.000

*Scenario 3 :: BASIN A 100YR24HR STORM W/INFILTRATION*

Hydrograph Type:     Inline SCS  
 Modflow Routing:    Routed with infiltration  
 Repetitions:         1

Basin Area (acres)           15.471  
 Time Of Concentration (minutes) 73.0  
 DCIA (%)                    2.5  
 Curve Number                34  
 Design Rainfall Depth (inches) 10.6  
 Design Rainfall Duration (hours) 24.0  
 Shape Factor                 UHG 484  
 Rainfall Distribution         SCS Type II Florida Modified

Initial ground water level (ft datum)   133.10 (default)

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.500	3.500	6.500	9.500	12.500
1.000	4.000	7.000	10.000	13.000
1.500	4.500	7.500	10.500	13.500
2.000	5.000	8.000	11.000	14.000
2.500	5.500	8.500	11.500	
3.000	6.000	9.000	12.000	

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**Summary of Results**    :: Scenario 7 :: BASIN A MEAN ANNUAL STORM WITHOUT INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	0.000	152.00		
Maximum	27.416	154.17		
<b>Inflow</b>				
Rate - Maximum - Positive	12.653		0.5430	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			5849.1
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			5849.1
<b>Infiltration</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			0.0
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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**Retention Pond Recovery - Refined Method**  
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**Summary of Results**    :: Scenario 6 :: BASIN A MEAN ANNUAL STORM W/INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	748.065	134.94		
Maximum	0.000	152.00		
<b>Inflow</b>				
Rate - Maximum - Positive	12.653		0.5430	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			5849.1
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			5849.1
<b>Infiltration</b>				
Rate - Maximum - Positive	12.653		0.5331	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			5849.1
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			5849.1
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.



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**Summary of Results**    :: Scenario 2 :: BASIN A 25YR24HR STORM W/INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	748.065	136.32		
Maximum	0.000	152.00		
<b>Inflow</b>				
Rate - Maximum - Positive	12.978		4.2327	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			62271.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			62271.4
<b>Infiltration</b>				
Rate - Maximum - Positive	12.978		4.1539	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			62271.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			62271.4
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	748.065			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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**Summary of Results**    :: Scenario 3 :: BASIN A 100YR24HR STORM W/INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	364.065	136.89		
Maximum	0.000	152.00		
<b>Inflow</b>				
Rate - Maximum - Positive	12.816		8.7149	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			109161.1
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	364.065			109161.1
<b>Infiltration</b>				
Rate - Maximum - Positive	12.816		8.5330	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	27.902			109161.1
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	364.065			109161.1
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	364.065			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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**Retention Pond Recovery - Refined Method**  
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**Detailed Results**    :: Scenario 3 :: *BASIN A 100YR24HR STORM W/INFILTRATION*

Elapsed Time	Instantaneous Inflow Rate	Outside Recharge	Stage Elevation	Infiltration Rate	Combined Instantaneous Discharge	Cumulative Inflow	Cumulative Infiltration	Combined Cumulative	
0.00	0.0000	0.00000	152.00000	0.00000	0	0.000	0.00000	0	N.A.
0.16	0.0000	0.00000	148.09200	0.00000	0	0.000	0.00000	0	S
0.32	0.0000	0.00000	146.43410	0.00002	0	0.000	0.00000	0	S
0.49	0.0001	0.00000	145.45700	0.00013	0	0.020	0.01988	0	S
0.65	0.0004	0.00000	144.76510	0.00053	0	0.154	0.15396	0	S
0.81	0.0013	0.00000	144.22970	0.00148	0	0.640	0.64000	0	S
0.97	0.0030	0.00000	143.79420	0.00320	0	1.882	1.88187	0	S
1.14	0.0056	0.00000	143.42830	0.00579	0	4.383	4.38326	0	S
1.30	0.0090	0.00000	143.11380	0.00915	0	8.640	8.64032	0	S
1.46	0.0130	0.00000	142.83920	0.01311	0	15.072	15.07214	0	S
1.62	0.0174	0.00000	142.59610	0.01735	0	23.954	23.95379	0	S
1.78	0.0216	0.00000	142.37880	0.02151	0	35.343	35.34262	0	S
1.95	0.0254	0.00000	142.18270	0.02530	0	49.080	49.08045	0	S
2.11	0.0287	0.00000	142.00450	0.02860	0	64.889	64.88876	0	S
2.27	0.0316	0.00000	141.84140	0.03150	0	82.488	82.48753	0	S
2.43	0.0342	0.00000	141.69130	0.03413	0	101.678	101.67750	0	S
2.60	0.0366	0.00000	141.55250	0.03660	0	122.350	122.35000	0	S
2.76	0.0390	0.00000	141.42370	0.03894	0	144.430	144.43020	0	S
2.92	0.0411	0.00000	141.30370	0.04110	0	167.827	167.82670	0	S
3.08	0.0431	0.00000	141.19140	0.04309	0	192.431	192.43130	0	S
3.24	0.0450	0.00000	141.08620	0.04499	0	218.157	218.15680	0	S
3.41	0.0469	0.00000	140.98720	0.04692	0	244.985	244.98530	0	S
3.57	0.0489	0.00000	140.89400	0.04887	0	272.959	272.95900	0	S
3.73	0.0508	0.00000	140.80600	0.05068	0	302.068	302.06840	0	S
3.89	0.0522	0.00000	140.72270	0.05210	0	332.152	332.15210	0	S
4.06	0.0531	0.00000	140.64360	0.05305	0	362.925	362.92500	0	S
4.22	0.0537	0.00000	140.56840	0.05368	0	394.120	394.11950	0	S
4.38	0.0542	0.00000	140.49660	0.05427	0	425.620	425.62040	0	S
4.54	0.0550	0.00000	140.42810	0.05511	0	457.503	457.50280	0	S
4.70	0.0563	0.00000	140.36260	0.05641	0	489.992	489.99180	0	S
4.87	0.0581	0.00000	140.30020	0.05821	0	523.384	523.38390	0	S
5.03	0.0604	0.00000	140.24070	0.06046	0	557.986	557.98630	0	S
5.19	0.0629	0.00000	140.18410	0.06286	0	594.001	594.00140	0	S
5.35	0.0652	0.00000	140.13000	0.06505	0	631.404	631.40440	0	S
5.52	0.0669	0.00000	140.07830	0.06682	0	669.981	669.98140	0	S
5.68	0.0682	0.00000	140.02870	0.06810	0	709.449	709.44890	0	S
5.84	0.0690	0.00000	139.98100	0.06896	0	749.527	749.52720	0	S
6.00	0.0696	0.00000	139.93520	0.06956	0	789.999	789.99860	0	S
6.16	0.0701	0.00000	139.89090	0.07012	0	830.773	830.77260	0	S
6.33	0.0708	0.00000	139.84820	0.07087	0	871.902	871.90190	0	S
6.49	0.0719	0.00000	139.80710	0.07196	0	913.553	913.55260	0	S
6.65	0.0733	0.00000	139.76750	0.07340	0	955.946	955.94630	0	S
6.81	0.0751	0.00000	139.72960	0.07515	0	999.281	999.28090	0	S
6.98	0.0771	0.00000	139.69310	0.07719	0	1043.727	1043.72700	0	S
7.14	0.0794	0.00000	139.65820	0.07943	0	1089.439	1089.43900	0	S
7.30	0.0818	0.00000	139.62480	0.08179	0	1136.503	1136.50300	0	S
7.46	0.0842	0.00000	139.59280	0.08424	0	1184.968	1184.96800	0	S
7.62	0.0868	0.00000	139.56220	0.08673	0	1234.891	1234.89100	0	S
7.79	0.0892	0.00000	139.53300	0.08917	0	1286.269	1286.26900	0	S
7.95	0.0915	0.00000	139.50500	0.09153	0	1339.044	1339.04400	0	S
8.11	0.0938	0.00000	139.47810	0.09385	0	1393.176	1393.17600	0	S
8.27	0.0962	0.00000	139.45240	0.09623	0	1448.666	1448.66600	0	S
8.44	0.0987	0.00000	139.42790	0.09879	0	1505.575	1505.57500	0	S
8.60	0.1016	0.00000	139.40440	0.10165	0	1564.056	1564.05600	0	S
8.76	0.1048	0.00000	139.38220	0.10486	0	1624.301	1624.30100	0	S
8.92	0.1084	0.00000	139.36110	0.10846	0	1686.528	1686.52800	0	S
9.08	0.1124	0.00000	139.34130	0.11238	0	1750.977	1750.97700	0	S
9.25	0.1164	0.00000	139.32270	0.11642	0	1817.786	1817.78600	0	S
9.41	0.1204	0.00000	139.30530	0.12042	0	1886.953	1886.95300	0	S
9.57	0.1244	0.00000	139.28900	0.12439	0	1958.433	1958.43300	0	S
9.73	0.1284	0.00000	139.27390	0.12848	0	2032.237	2032.23700	0	S
9.90	0.1328	0.00000	139.25980	0.13297	0	2108.495	2108.49500	0	S
10.06	0.1379	0.00000	139.24700	0.13820	0	2187.546	2187.54600	0	S
10.22	0.1441	0.00000	139.23550	0.14440	0	2269.908	2269.90800	0	S
10.38	0.1514	0.00000	139.22550	0.15180	0	2356.204	2356.20400	0	S
10.54	0.1602	0.00000	139.21730	0.16065	0	2447.205	2447.20500	0	S
10.71	0.1707	0.00000	139.21110	0.17116	0	2543.839	2543.83900	0	S
10.87	0.1830	0.00000	139.20730	0.18368	0	2647.119	2647.11900	0	S
11.03	0.1980	0.00000	139.20610	0.19890	0	2758.375	2758.37500	0	S
11.19	0.2166	0.00000	139.20820	0.21751	0	2879.437	2879.43700	0	S
11.36	0.2389	0.00000	139.21420	0.24106	0	3012.427	3012.42700	0	S
11.52	0.2699	0.00000	139.22530	0.28428	0	3160.989	3160.98900	0	S
11.68	0.3585	0.00000	139.24860	0.41674	0	3344.469	3344.46900	0	S
11.84	0.6802	0.00000	139.31570	0.81565	0	3647.747	3647.74700	0	S
12.00	1.5438	0.00000	139.50940	1.70314	0	4297.147	4297.14700	0	S

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**Detailed Results (cont.d.)**    :: Scenario 3 :: BASIN A 100YR24HR STORM W/INFILTRATION

Elapsed Time	Instantaneous Inflow Rate	Outside Recharge	Stage Elevation	Infiltration Rate	Combined Instantaneous Discharge	Cumulative Inflow	Cumulative Infiltration	Combined Cumulative	
12.17	3.0448	0.00000	139.94770	3.15552	0	5637.009	5637.00900	0	S
12.33	4.9888	0.00000	140.72120	4.95187	0	7982.798	7982.79800	0	S
12.49	6.7852	0.00000	141.81900	6.65379	0	11420.800	11420.80000	0	S
12.65	8.0560	0.00000	143.12560	7.90304	0	15754.430	15754.43000	0	S
12.82	8.7149	0.00000	144.49620	8.53295	0	20651.550	20651.55000	0	S
12.98	8.6459	0.00000	145.79050	8.50032	0	25720.920	25720.92000	0	S
13.14	7.9945	0.00000	146.89570	7.95243	0	30579.920	30579.92000	0	S
13.30	7.1748	0.00000	147.77190	7.17135	0	35009.360	35009.36000	0	S
13.46	6.3414	0.00000	148.43750	6.35323	0	38956.060	38956.06000	0	S
13.63	5.5554	0.00000	148.92440	5.59089	0	42429.920	42429.92000	0	S
13.79	4.9113	0.00000	149.27170	4.94668	0	45486.210	45486.21000	0	S
13.95	4.4087	0.00000	149.52000	4.43052	0	48207.650	48207.65000	0	S
14.11	3.9934	0.00000	149.69810	4.01129	0	50661.060	50661.06000	0	S
14.28	3.6497	0.00000	149.82390	3.66478	0	52892.840	52892.84000	0	S
14.44	3.3664	0.00000	149.91140	3.37572	0	54941.520	54941.52000	0	S
14.60	3.1205	0.00000	149.96970	3.12913	0	56835.680	56835.68000	0	S
14.76	2.9092	0.00000	150.00520	2.91634	0	58596.340	58596.34000	0	S
14.92	2.7265	0.00000	150.02310	2.73190	0	60241.970	60241.97000	0	S
15.09	2.5654	0.00000	150.02720	2.57119	0	61787.200	61787.20000	0	S
15.25	2.4275	0.00000	150.02070	2.43269	0	63245.120	63245.12000	0	S
15.41	2.3104	0.00000	150.00680	2.31456	0	64628.580	64628.58000	0	S
15.57	2.2100	0.00000	149.98790	2.21336	0	65948.530	65948.53000	0	S
15.74	2.1231	0.00000	149.96580	2.12554	0	67213.780	67213.78000	0	S
15.90	2.0460	0.00000	149.94160	2.04752	0	68431.160	68431.16000	0	S
16.06	1.9750	0.00000	149.91560	1.97585	0	69605.280	69605.28000	0	S
16.22	1.9074	0.00000	149.88800	1.90880	0	70738.950	70738.95000	0	S
16.38	1.8454	0.00000	149.85870	1.84690	0	71834.770	71834.77000	0	S
16.55	1.7894	0.00000	149.82840	1.79099	0	72896.130	72896.13000	0	S
16.71	1.7397	0.00000	149.79750	1.74179	0	73926.650	73926.65000	0	S
16.87	1.6982	0.00000	149.76700	1.69986	0	74930.540	74930.54000	0	S
17.03	1.6632	0.00000	149.73740	1.66446	0	75912.080	75912.08000	0	S
17.20	1.6332	0.00000	149.70950	1.63430	0	76874.630	76874.63000	0	S
17.36	1.6076	0.00000	149.68330	1.60815	0	77820.950	77820.95000	0	S
17.52	1.5842	0.00000	149.65900	1.58369	0	78752.950	78752.95000	0	S
17.68	1.5587	0.00000	149.63600	1.55736	0	79670.690	79670.69000	0	S
17.84	1.5278	0.00000	149.61320	1.52540	0	80571.950	80571.95000	0	S
18.01	1.4873	0.00000	149.58890	1.48632	0	81452.360	81452.36000	0	S
18.17	1.4429	0.00000	149.56180	1.44443	0	82307.980	82307.98000	0	S
18.33	1.4046	0.00000	149.53220	1.40793	0	83139.450	83139.45000	0	S
18.49	1.3796	0.00000	149.50220	1.38206	0	83952.440	83952.44000	0	S
18.66	1.3644	0.00000	149.47370	1.36514	0	84753.700	84753.70000	0	S
18.82	1.3521	0.00000	149.44750	1.35000	0	85546.930	85546.93000	0	S
18.98	1.3314	0.00000	149.42260	1.32936	0	86330.510	86330.51000	0	S
19.14	1.3026	0.00000	149.39700	1.30238	0	87099.630	87099.63000	0	S
19.30	1.2730	0.00000	149.36980	1.27512	0	87851.690	87851.69000	0	S
19.47	1.2519	0.00000	149.34200	1.25459	0	88588.970	88588.97000	0	S
19.63	1.2415	0.00000	149.31540	1.24369	0	89317.050	89317.05000	0	S
19.79	1.2398	0.00000	149.29150	1.24033	0	90041.600	90041.60000	0	S
19.95	1.2402	0.00000	149.27090	1.23910	0	90765.760	90765.76000	0	S
20.12	1.2362	0.00000	149.25290	1.23405	0	91488.870	91488.87000	0	S
20.28	1.2236	0.00000	149.23580	1.22097	0	92207.130	92207.13000	0	S
20.44	1.2004	0.00000	149.21780	1.19838	0	92914.950	92914.95000	0	S
20.60	1.1691	0.00000	149.19710	1.16866	0	93606.840	93606.84000	0	S
20.76	1.1361	0.00000	149.17310	1.13681	0	94279.950	94279.95000	0	S
20.93	1.1060	0.00000	149.14630	1.10726	0	94934.630	94934.63000	0	S
21.09	1.0810	0.00000	149.11770	1.08270	0	95573.230	95573.23000	0	S
21.25	1.0629	0.00000	149.08850	1.06439	0	96199.230	96199.23000	0	S
21.41	1.0508	0.00000	149.05980	1.05189	0	96816.430	96816.43000	0	S
21.58	1.0430	0.00000	149.03250	1.04370	0	97427.840	97427.84000	0	S
21.74	1.0379	0.00000	149.00680	1.03843	0	98035.480	98035.48000	0	S
21.90	1.0349	0.00000	148.98310	1.03523	0	98640.730	98640.73000	0	S
22.06	1.0333	0.00000	148.96130	1.03356	0	99244.630	99244.63000	0	S
22.22	1.0328	0.00000	148.94150	1.03302	0	99847.920	99847.92000	0	S
22.39	1.0332	0.00000	148.92360	1.03324	0	100451.200	100451.20000	0	S
22.55	1.0338	0.00000	148.90760	1.03340	0	101054.700	101054.70000	0	S
22.71	1.0328	0.00000	148.89310	1.03193	0	101658.200	101658.20000	0	S
22.87	1.0283	0.00000	148.87950	1.02697	0	102260.000	102260.00000	0	S
23.04	1.0185	0.00000	148.86580	1.01744	0	102857.700	102857.70000	0	S
23.20	1.0044	0.00000	148.85130	1.00388	0	103448.400	103448.40000	0	S
23.36	0.9881	0.00000	148.83540	0.98783	0	104030.200	104030.20000	0	S
23.52	0.9706	0.00000	148.81800	0.97025	0	104602.200	104602.20000	0	S
23.68	0.9516	0.00000	148.79890	0.95104	0	105163.500	105163.50000	0	S
23.85	0.9303	0.00000	148.77800	0.92901	0	105713.000	105713.00000	0	S
24.01	0.9038	0.00000	148.75450	0.90012	0	106248.600	106248.60000	0	S
24.17	0.8625	0.00000	148.72690	0.85665	0	106764.300	106764.30000	0	S

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**Retention Pond Recovery - Refined Method**  
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**Detailed Results (cont.d.)**    :: Scenario 3 :: BASIN A 100YR24HR STORM W/INFILTRATION

Elapsed Time	Instantaneous Inflow Rate	Outside Recharge	Stage Elevation	Infiltration Rate	Combined Instantaneous Discharge	Cumulative Inflow	Cumulative Infiltration	Combined Cumulative	
24.33	0.7977	0.00000	148.69150	0.78882	0	107249.100	107249.10000	0	S
24.50	0.6973	0.00000	148.64350	0.69110	0	107685.700	107685.70000	0	S
24.66	0.5721	0.00000	148.57800	0.57168	0	108056.300	108056.30000	0	S
24.82	0.4453	0.00000	148.49420	0.44841	0	108353.400	108353.40000	0	S
24.98	0.3310	0.00000	148.39480	0.33605	0	108580.100	108580.10000	0	S
25.14	0.2369	0.00000	148.28400	0.24352	0	108745.900	108745.90000	0	S
25.31	0.1693	0.00000	148.16680	0.17438	0	108864.500	108864.50000	0	S
25.47	0.1221	0.00000	148.04760	0.12537	0	108949.600	108949.60000	0	S
25.63	0.0881	0.00000	147.92910	0.09032	0	109010.900	109010.90000	0	S
25.79	0.0631	0.00000	147.81260	0.06486	0	109055.100	109055.10000	0	S
25.96	0.0452	0.00000	147.69900	0.04645	0	109086.700	109086.70000	0	S
26.12	0.0323	0.00000	147.58880	0.03319	0	109109.300	109109.30000	0	S
26.28	0.0230	0.00000	147.48200	0.02363	0	109125.500	109125.50000	0	S
26.44	0.0163	0.00000	147.37880	0.01677	0	109136.900	109136.90000	0	S
26.60	0.0115	0.00000	147.27910	0.01182	0	109145.100	109145.10000	0	S
26.77	0.0080	0.00000	147.18280	0.00824	0	109150.700	109150.70000	0	S
26.93	0.0055	0.00000	147.08960	0.00564	0	109154.700	109154.70000	0	S
27.09	0.0037	0.00000	146.99940	0.00378	0	109157.300	109157.30000	0	S
27.25	0.0023	0.00000	146.91210	0.00242	0	109159.100	109159.10000	0	S
27.42	0.0013	0.00000	146.82750	0.00142	0	109160.200	109160.20000	0	S
27.58	0.0007	0.00000	146.74540	0.00072	0	109160.800	109160.80000	0	S
27.74	0.0002	0.00000	146.66560	0.00027	0	109161.000	109161.00000	0	S
27.90	0.0000	0.00000	146.58820	0.00005	0	109161.100	109161.10000	0	S
28.06	0.0000	0.00000	146.51280	0.00000	0	109161.100	109161.10000	0	S
40.06	0.0000	0.00000	143.97290	0.00000	0	109161.100	109161.10000	0	S
52.06	0.0000	0.00000	142.49490	0.00000	0	109161.100	109161.10000	0	S
64.06	0.0000	0.00000	141.51380	0.00000	0	109161.100	109161.10000	0	S
76.06	0.0000	0.00000	140.80670	0.00000	0	109161.100	109161.10000	0	S
88.06	0.0000	0.00000	140.26730	0.00000	0	109161.100	109161.10000	0	S
100.06	0.0000	0.00000	139.83840	0.00000	0	109161.100	109161.10000	0	S
112.06	0.0000	0.00000	139.48660	0.00000	0	109161.100	109161.10000	0	S
124.06	0.0000	0.00000	139.19110	0.00000	0	109161.100	109161.10000	0	S
136.06	0.0000	0.00000	138.93800	0.00000	0	109161.100	109161.10000	0	S
148.06	0.0000	0.00000	138.71780	0.00000	0	109161.100	109161.10000	0	S
160.06	0.0000	0.00000	138.52390	0.00000	0	109161.100	109161.10000	0	S
172.06	0.0000	0.00000	138.35130	0.00000	0	109161.100	109161.10000	0	S
184.06	0.0000	0.00000	138.19620	0.00000	0	109161.100	109161.10000	0	S
196.06	0.0000	0.00000	138.05590	0.00000	0	109161.100	109161.10000	0	S
208.06	0.0000	0.00000	137.92800	0.00000	0	109161.100	109161.10000	0	S
220.06	0.0000	0.00000	137.81090	0.00000	0	109161.100	109161.10000	0	S
232.06	0.0000	0.00000	137.70290	0.00000	0	109161.100	109161.10000	0	S
244.06	0.0000	0.00000	137.60300	0.00000	0	109161.100	109161.10000	0	S
256.06	0.0000	0.00000	137.51020	0.00000	0	109161.100	109161.10000	0	S
268.06	0.0000	0.00000	137.42350	0.00000	0	109161.100	109161.10000	0	S
280.06	0.0000	0.00000	137.34250	0.00000	0	109161.100	109161.10000	0	S
292.06	0.0000	0.00000	137.26630	0.00000	0	109161.100	109161.10000	0	S
304.06	0.0000	0.00000	137.19470	0.00000	0	109161.100	109161.10000	0	S
316.06	0.0000	0.00000	137.12700	0.00000	0	109161.100	109161.10000	0	S
328.06	0.0000	0.00000	137.06300	0.00000	0	109161.100	109161.10000	0	S
340.06	0.0000	0.00000	137.00220	0.00000	0	109161.100	109161.10000	0	S
352.06	0.0000	0.00000	136.94450	0.00000	0	109161.100	109161.10000	0	S
364.06	0.0000	0.00000	136.88960	----	----	109161.100	109161.10000	0	N.A.

**POND B**

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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: CLERMONT COMMERCE CENTER

Simulation Description: MEAN ANNUAL WITHOUT INFILTRATION  
MEAN ANNUAL WITH INFILTRATION  
25YR-24HR  
100YR-24HR W/ 14 DAY RECOVERY  
72 HOUR DRAWDOWN

Project Number: 2600-17-300

Engineer : ERIC LAGASSEY

Supervising Engineer: CHAD LINN

Date: 10-09-2018

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 133.00

Water Table Elevation, [WT] (ft datum): 133.10

Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 30.00

Fillable Porosity, [n] (%): 25.00

Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 572.0

Equivalent Pond Width, [W] (ft): 26.0

Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft<sup>2</sup>)</u>
143.00	3713.0
144.00	4562.0
145.00	5527.0
146.00	6583.0
147.00	7741.0
148.00	8989.0
149.00	10374.0
150.00	11763.0
151.00	13227.0
152.00	14957.0
153.00	16705.0
154.00	18563.0
155.00	20599.0
156.00	23869.0
157.00	27356.0

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**Stage vs Area Data (cont'd.)**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
158.00	30960.0
159.00	34536.0



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**Scenario Input Data**

*Scenario 2 :: 25YR24HR STORM W/INFILTRATION*

Hydrograph Type:     Inline SCS  
 Modflow Routing:    Routed with infiltration  
 Repetitions:         1

Basin Area (acres)             17.582  
 Time Of Concentration (minutes) 35.0  
 DCIA (%)                        1.9  
 Curve Number                   69  
 Design Rainfall Depth (inches) 8.6  
 Design Rainfall Duration (hours) 24.0  
 Shape Factor                    UHG 484  
 Rainfall Distribution           SCS Type II Florida Modified

Initial ground water level (ft datum)   133.10 (default)

Time After  
 Storm Event  
 (days)  
 \_\_\_\_\_  
 30.000

*Scenario 3 :: 100YR24HR STORM W/INFILTRATION*

Hydrograph Type:     Inline SCS  
 Modflow Routing:    Routed with infiltration  
 Repetitions:         1

Basin Area (acres)             17.582  
 Time Of Concentration (minutes) 35.0  
 DCIA (%)                        1.9  
 Curve Number                   69  
 Design Rainfall Depth (inches) 10.6  
 Design Rainfall Duration (hours) 24.0  
 Shape Factor                    UHG 484  
 Rainfall Distribution           SCS Type II Florida Modified

Initial ground water level (ft datum)   133.10 (default)

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.500	3.500	6.500	9.500	12.500
1.000	4.000	7.000	10.000	13.000
1.500	4.500	7.500	10.500	13.500
2.000	5.000	8.000	11.000	14.000
2.500	5.500	8.500	11.500	
3.000	6.000	9.000	12.000	

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**Scenario Input Data (cont'd.)**

*Scenario 6 :: MEAN ANNUAL STORM W/INFILTRATION*

Hydrograph Type:     Inline SCS  
Modflow Routing:     Routed with infiltration  
Repetitions:         1

Basin Area (acres)             17.582  
Time Of Concentration (minutes) 35.0  
DCIA (%)                     1.9  
Curve Number                 69  
Design Rainfall Depth (inches) 4.2  
Design Rainfall Duration (hours) 24.0  
Shape Factor                 UHG 484  
Rainfall Distribution         SCS Type II Florida Modified

Initial ground water level (ft datum) 133.10 (default)

Time After  
Storm Event  
(days)  

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30.000

*Scenario 7 :: MEAN ANNUAL STORM WITHOUT INFILTRATION*

Hydrograph Type:     Inline SCS  
• **Modflow Routing:     Routed without infiltration**  
Repetitions:         1

Basin Area (acres)             17.582  
Time Of Concentration (minutes) 35.0  
DCIA (%)                     1.9  
Curve Number                 69  
Design Rainfall Depth (inches) 4.2  
Design Rainfall Duration (hours) 24.0  
Shape Factor                 UHG 484  
Rainfall Distribution         SCS Type II Florida Modified

Initial ground water level (ft datum) 133.10 (default)

Time After  
Storm Event  
(days)  

---

30.000

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**Retention Pond Recovery - Refined Method**  
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**Summary of Results** :: Scenario 7 :: MEAN ANNUAL STORM WITHOUT INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	0.000	143.00		
Maximum	25.744	152.91		
<b>Inflow</b>				
Rate - Maximum - Positive	12.211		12.8449	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	25.900			92406.2
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			92406.2
<b>Infiltration</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			0.0
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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**Summary of Results**    :: Scenario 6 :: MEAN ANNUAL STORM W/INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	745.978	136.33		
Maximum	13.922	145.02		
<b>Inflow</b>				
Rate - Maximum - Positive	12.211		12.8449	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	25.900			92406.2
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			92406.2
<b>Infiltration</b>				
Rate - Maximum - Positive	12.289		12.6597	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	745.978			92406.2
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			92406.2
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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**Summary of Results**    :: Scenario 2 :: 25YR24HR STORM W/INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	7.700	137.74		
Maximum	14.622	154.47		
<b>Inflow</b>				
Rate - Maximum - Positive	12.211		47.5730	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	25.900			314819.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			314819.0
<b>Infiltration</b>				
Rate - Maximum - Positive	11.744		10.4561	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	745.978			314819.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			314819.0
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	745.978			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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**Retention Pond Recovery - Refined Method**  
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**Summary of Results** :: Scenario 3 :: 100YR24HR STORM W/INFILTRATION

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	6.767	137.91		
Maximum	15.011	157.29		
<b>Inflow</b>				
Rate - Maximum - Positive	12.211		64.8177	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	25.900			427913.7
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	361.978			427913.7
<b>Infiltration</b>				
Rate - Maximum - Positive	12.367		11.8088	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	169.978			427913.7
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	361.978			427913.7
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	361.978			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.











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**Retention Pond Recovery - Refined Method**  
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**Detailed Results (cont.d.)**    :: Scenario 3 :: 100YR24HR STORM W/INFILTRATION

Elapsed Time	Instantaneous Inflow Rate	Outside Recharge	Stage Elevation	Infiltration Rate	Combined Instantaneous Discharge	Cumulative Inflow	Cumulative Infiltration	Combined Cumulative	
23.33	2.1003	0.00000	156.67480	2.79885	0	420246.100	249965.10000	0	S
23.41	2.0798	0.00000	156.66730	2.78700	0	420831.300	250747.10000	0	S
23.49	2.0626	0.00000	156.65970	2.77528	0	421411.300	251525.80000	0	S
23.57	2.0447	0.00000	156.65200	2.76362	0	421986.300	252301.30000	0	S
23.64	2.0206	0.00000	156.64420	2.75179	0	422555.400	253073.50000	0	S
23.72	1.9824	0.00000	156.63620	2.73951	0	423115.800	253842.30000	0	S
23.80	1.9320	0.00000	156.62790	2.72667	0	423663.800	254607.60000	0	S
23.88	1.8786	0.00000	156.61920	2.71335	0	424197.300	255369.20000	0	S
23.96	1.8291	0.00000	156.61000	2.69971	0	424716.400	256127.10000	0	S
24.03	1.7766	0.00000	156.60040	2.68559	0	425221.200	256881.10000	0	S
24.11	1.6984	0.00000	156.59020	2.67019	0	425707.700	257631.00000	0	S
24.19	1.5612	0.00000	156.57910	2.65223	0	426164.000	258376.40000	0	S
24.27	1.3504	0.00000	156.56620	2.63067	0	426571.700	259116.30000	0	S
24.34	1.0972	0.00000	156.55110	2.60548	0	426914.300	259849.50000	0	S
24.42	0.8448	0.00000	156.53350	2.57762	0	427186.200	260575.30000	0	S
24.50	0.6208	0.00000	156.51350	2.54842	0	427391.400	261293.00000	0	S
24.58	0.4438	0.00000	156.49170	2.51918	0	427540.400	262002.40000	0	S
24.66	0.3180	0.00000	156.46840	2.49084	0	427647.100	262703.80000	0	S
24.73	0.2294	0.00000	156.44420	2.46379	0	427723.700	263397.30000	0	S
24.81	0.1652	0.00000	156.41930	2.43808	0	427778.900	264083.50000	0	S
24.89	0.1184	0.00000	156.39400	2.41362	0	427818.600	264762.60000	0	S
24.97	0.0848	0.00000	156.36840	2.39032	0	427847.100	265435.10000	0	S
25.04	0.0605	0.00000	156.34270	2.36807	0	427867.400	266101.20000	0	S
25.12	0.0431	0.00000	156.31690	2.34676	0	427881.900	266761.20000	0	S
25.20	0.0305	0.00000	156.29110	2.32630	0	427892.300	267415.40000	0	S
25.28	0.0214	0.00000	156.26530	2.30659	0	427899.500	268064.00000	0	S
25.36	0.0148	0.00000	156.23950	2.28755	0	427904.600	268707.10000	0	S
25.43	0.0102	0.00000	156.21380	2.26911	0	427908.100	269345.00000	0	S
25.51	0.0068	0.00000	156.18810	2.25122	0	427910.400	269977.80000	0	S
25.59	0.0043	0.00000	156.16250	2.23382	0	427912.000	270605.70000	0	S
25.67	0.0024	0.00000	156.13700	2.21687	0	427913.000	271228.70000	0	S
25.74	0.0011	0.00000	156.11160	2.20032	0	427913.400	271847.10000	0	S
25.82	0.0003	0.00000	156.08630	2.18416	0	427913.600	272460.90000	0	S
25.90	0.0000	0.00000	156.06100	2.16836	0	427913.700	273070.30000	0	S
25.98	0.0000	0.00000	156.03580	2.15465	0	427913.700	273675.20000	0	S
37.98	0.0000	0.00000	153.38480	1.00214	0	427913.700	327416.80000	0	S
49.98	0.0000	0.00000	151.27080	0.62335	0	427913.700	360259.70000	0	S
61.98	0.0000	0.00000	149.57490	0.40531	0	427913.700	381274.60000	0	S
73.98	0.0000	0.00000	148.20490	0.27338	0	427913.700	395278.60000	0	S
85.98	0.0000	0.00000	147.07960	0.19005	0	427913.700	404894.60000	0	S
97.98	0.0000	0.00000	146.14660	0.13602	0	427913.700	411699.00000	0	S
109.98	0.0000	0.00000	145.36450	0.09999	0	427913.700	416647.10000	0	S
121.98	0.0000	0.00000	144.70160	0.07534	0	427913.700	420337.80000	0	S
133.98	0.0000	0.00000	144.13390	0.05806	0	427913.700	423156.80000	0	S
145.98	0.0000	0.00000	143.64220	0.04569	0	427913.700	425354.30000	0	S
157.98	0.0000	0.00000	143.21270	0.02962	0	427913.700	427104.60000	0	S
169.98	0.0000	0.00000	142.83470	0.00936	0	427913.700	427913.70000	0	S
181.98	0.0000	0.00000	142.50520	0.00000	0	427913.700	427913.70000	0	S
193.98	0.0000	0.00000	142.21410	0.00000	0	427913.700	427913.70000	0	S
205.98	0.0000	0.00000	141.95350	0.00000	0	427913.700	427913.70000	0	S
217.98	0.0000	0.00000	141.71800	0.00000	0	427913.700	427913.70000	0	S
229.98	0.0000	0.00000	141.50360	0.00000	0	427913.700	427913.70000	0	S
241.98	0.0000	0.00000	141.30710	0.00000	0	427913.700	427913.70000	0	S
253.98	0.0000	0.00000	141.12600	0.00000	0	427913.700	427913.70000	0	S
265.98	0.0000	0.00000	140.95830	0.00000	0	427913.700	427913.70000	0	S
277.98	0.0000	0.00000	140.80240	0.00000	0	427913.700	427913.70000	0	S
289.98	0.0000	0.00000	140.65670	0.00000	0	427913.700	427913.70000	0	S
301.98	0.0000	0.00000	140.52020	0.00000	0	427913.700	427913.70000	0	S
313.98	0.0000	0.00000	140.39200	0.00000	0	427913.700	427913.70000	0	S
325.98	0.0000	0.00000	140.27100	0.00000	0	427913.700	427913.70000	0	S
337.98	0.0000	0.00000	140.15680	0.00000	0	427913.700	427913.70000	0	S
349.98	0.0000	0.00000	140.04850	0.00000	0	427913.700	427913.70000	0	S
361.98	0.0000	0.00000	139.94570	----	----	427913.700	427913.70000	0	N.A.

# **APPENDIX E**

## **POST DEVELOPMENT DRAINAGE ANALYSIS FOR 72 HOUR RECOVERY**

**POND A**

**PONDS Version 3.2.0274**  
**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: CLERMONT COMMERCE CENTER

Simulation Description: MEAN ANNUAL WITHOUT INFILTRATION  
MEAN ANNUAL WITH INFILTRATION  
25YR-24HR  
100YR-24HR W/ 14 DAY RECOVERY  
72 HOUR DRAWDOWN

Project Number: 2600-17-300

Engineer : ERIC LAGASSEY

Supervising Engineer: CHAD LINN

Date: 10-09-2018

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 133.00

Water Table Elevation, [WT] (ft datum): 133.10

Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 30.00

Fillable Porosity, [n] (%): 25.00

Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 426.0

Equivalent Pond Width, [W] (ft): 20.0

Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft<sup>2</sup>)</u>
152.00	528.0
153.00	2328.0
154.00	4821.0
155.00	7250.0
156.00	9696.0
157.00	12217.0
158.00	14813.0
159.00	17479.0

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**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 4 :: 72 Hour Drawdown*

Hydrograph Type: Slug Load  
Modflow Routing: Routed with infiltration

Treatment Volume (ft<sup>3</sup>) 56160

Initial ground water level (ft datum) 133.10 (default)

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.100	2.000
0.250	2.500
0.500	3.000
1.000	3.500
1.500	4.000

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**Retention Pond Recovery - Refined Method**  
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**Summary of Results**    :: Scenario 4 :: 72 Hour Drawdown

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	96.000	137.96		
Maximum	0.002	158.77		
<b>Inflow</b>				
Rate - Maximum - Positive	0.002		9360.0000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			56160.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			56160.0
<b>Infiltration</b>				
Rate - Maximum - Positive	2.400		3.8784	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	6.000			56160.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			56160.0
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	36.000	140.29		56160.0
72 Hour Stage and Infiltration Volume	72.000	138.55		56160.0



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**Retention Pond Recovery - Refined Method**  
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**Detailed Results**    :: Scenario 4 :: 72 Hour Drawdown

Elapsed Time	Instantaneous Inflow Rate	Outside Recharge	Stage Elevation	Infiltration Rate	Combined Instantaneous Discharge	Cumulative Inflow	Cumulative Infiltration	Combined Cumulative	
0.00	9360.0000	0.00000	152.00000	0.88589	0	0.000	0.00000	0	N.A.
0.00	9360.0000	0.00000	158.76860	0.89358	0	56160.000	5.33841	0	S
2.40	0.0000	0.00000	152.60430	3.87838	0	56160.000	55512.32000	0	S
6.00	0.0000	0.00000	146.84290	0.03123	0	56160.000	56160.00000	0	S
12.00	0.0000	0.00000	143.82020	0.00000	0	56160.000	56160.00000	0	S
24.00	0.0000	0.00000	141.51860	0.00000	0	56160.000	56160.00000	0	S
36.00	0.0000	0.00000	140.29120	0.00000	0	56160.000	56160.00000	0	S
48.00	0.0000	0.00000	139.51180	0.00000	0	56160.000	56160.00000	0	S
60.00	0.0000	0.00000	138.96280	0.00000	0	56160.000	56160.00000	0	S
72.00	0.0000	0.00000	138.54890	0.00000	0	56160.000	56160.00000	0	S
84.00	0.0000	0.00000	138.22210	0.00000	0	56160.000	56160.00000	0	S
96.00	0.0000	0.00000	137.95500	----	----	56160.000	56160.00000	0	N.A.

**POND B**

**PONDS Version 3.2.0274**  
**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: CLERMONT COMMERCE CENTER

Simulation Description: MEAN ANNUAL WITHOUT INFILTRATION  
MEAN ANNUAL WITH INFILTRATION  
25YR-24HR  
100YR-24HR W/ 14 DAY RECOVERY  
72 HOUR DRAWDOWN

Project Number: 2600-17-300

Engineer : ERIC LAGASSEY

Supervising Engineer: CHAD LINN

Date: 10-09-2018

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 133.00

Water Table Elevation, [WT] (ft datum): 133.10

Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 30.00

Fillable Porosity, [n] (%): 25.00

Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 572.0

Equivalent Pond Width, [W] (ft): 26.0

Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft<sup>2</sup>)</u>
143.00	3713.0
144.00	4562.0
145.00	5527.0
146.00	6583.0
147.00	7741.0
148.00	8989.0
149.00	10374.0
150.00	11763.0
151.00	13227.0
152.00	14957.0
153.00	16705.0
154.00	18563.0
155.00	20599.0
156.00	23869.0
157.00	27356.0

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**Retention Pond Recovery - Refined Method**  
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**Stage vs Area Data (cont'd.)**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
158.00	30960.0
159.00	34536.0

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**Scenario Input Data**

*Scenario 4 :: 72 Hour Drawdown*

Hydrograph Type: Slug Load  
Modflow Routing: Routed with infiltration

Treatment Volume (ft<sup>3</sup>) 73999

Initial ground water level (ft datum) 133.10 (default)

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.100	2.000
0.250	2.500
0.500	3.000
1.000	3.500
1.500	4.000

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**Summary of Results**    :: Scenario 4 :: 72 Hour Drawdown

	Time (hours)	Stage (ft datum)	Rate (ft <sup>3</sup> /s)	Volume (ft <sup>3</sup> )
<b>Stage</b>				
Minimum	96.000	137.60		
Maximum	0.002	151.72		
<b>Inflow</b>				
Rate - Maximum - Positive	0.002		12333.1700	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			73999.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			73999.0
<b>Infiltration</b>				
Rate - Maximum - Positive	2.400		3.8202	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	12.000			73999.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			73999.0
<b>Combined Discharge</b>				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
<b>Discharge Structure 1 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 2 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Discharge Structure 3 - inactive</b>				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
<b>Pollution Abatement:</b>				
36 Hour Stage and Infiltration Volume	36.000	139.65		73999.0
72 Hour Stage and Infiltration Volume	72.000	138.12		73999.0

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**Retention Pond Recovery - Refined Method**  
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**Detailed Results**    :: Scenario 4 :: 72 Hour Drawdown

Elapsed Time	Instantaneous Inflow Rate	Outside Recharge	Stage Elevation	Infiltration Rate	Combined Instantaneous Discharge	Cumulative Inflow	Cumulative Infiltration	Combined Cumulative	
0.00	12333.1700	0.00000	143.00000	1.62407	0	0.000	0.00000	0	N.A.
0.00	12333.1700	0.00000	151.72060	1.62937	0	73999.000	9.76031	0	S
2.40	0.0000	0.00000	147.56280	3.82019	0	73999.000	47045.69000	0	S
6.00	0.0000	0.00000	144.98620	1.01879	0	73999.000	64893.30000	0	S
12.00	0.0000	0.00000	142.69890	0.28104	0	73999.000	73999.00000	0	S
24.00	0.0000	0.00000	140.71030	0.00000	0	73999.000	73999.00000	0	S
36.00	0.0000	0.00000	139.64610	0.00000	0	73999.000	73999.00000	0	S
48.00	0.0000	0.00000	138.96620	0.00000	0	73999.000	73999.00000	0	S
60.00	0.0000	0.00000	138.48480	0.00000	0	73999.000	73999.00000	0	S
72.00	0.0000	0.00000	138.12040	0.00000	0	73999.000	73999.00000	0	S
84.00	0.0000	0.00000	137.83170	0.00000	0	73999.000	73999.00000	0	S
96.00	0.0000	0.00000	137.59510	----	----	73999.000	73999.00000	0	N.A.

# **APPENDIX F**

## **ADDITIONAL INFORMATION PER RAI**



## Aquifer Elevation Calculation

The boring numbers associated with determining the aquifer elevation as seen in the Updated Report Geotechnical Engineering Services dated February 20, 2018, by Professional Services Industries (PSI) and submitted under separate cover are Borings B-11, B-12, PB-1, PB-2 and PB-3. Based on the boring locations superimposed on the surveyed elevations the following borings and corresponding ground surface elevations are shown below:

Boring Number	Ground Surface Elevation
B-11	155.75
B-12	154.00
PB-1	161.25
PB-2	158.25
PB-3	160.75

The average ground surface elevation for the 5 borings is:

TOTAL	790.00
AVERAGE	158.00

The aquifer depth recommended within the aforementioned report is 25 feet below ground surface.

Based on the recommended aquifer depth the corresponding elevation used in the PONDS analysis is

$$158 - 25 = 133.00$$

## DCIA FOR POND AREA

### POND A

The required PAV volume for Pond A =	1.29 ac-ft
The pond stage elevation associated with the provided PAV volume =	158.78
The pond area at the provided PAV provided elevation =	0.39 ac
The total area for Basin A =	15.471 ac
The DCIA used I the PONDS program to account for the pond =	2.5%

### POND B

The required PAV volume for Pond A =	1.70 ac-ft
The pond stage elevation associated with the provided PAV volume =	151.73
The pond area at the provided PAV provided elevation =	0.33 ac
The total area for Basin A =	17.582 ac
The DCIA used I the PONDS program to account for the pond =	1.9%