RUN-ON/RUN-OFF CONTROL SYSTEM PLAN

RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN

St. Johns River Power Park
Byproduct Storage Area B Phase I Development

Submitted to: St. Johns River Power Park
11201 New Berlin Road
Jacksonville, FL 32226

Submitted by: Golder Associates, Inc.
9428 Baymeadows Road, Suite 400
Jacksonville, FL 32256

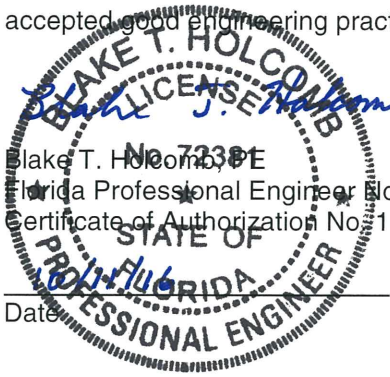
October 2016 **15-26356**

A world of capabilities delivered locally

Golder Associates

PROFESSIONAL ENGINEER CERTIFICATION

I, Blake T. Holcomb, being a registered Professional Engineer in the state of Florida, do hereby certify to the best of my knowledge, information, and belief, that the information contained in this Run-On and Run-Off Control System Plan dated October 11, 2016 was conducted in accordance with the requirements of 40 CFR §257.81, is true and correct, and had been prepared in accordance with recognized and generally accepted good engineering practices.



Blake T. Holcomb, PE
Florida Professional Engineer No. 72381
Certificate of Authorization No. 1670

Date

Golder Associates

Table of Contents

List of Figures

List of Appendices

1.0 INTRODUCTION

This Run-On and Run-Off Control System (ROROCS) Plan was prepared for the Phase I development of Area B Byproduct Storage Area (Area B BSA) at the St. Johns River Power Park in Duval County, Florida, in accordance with the requirements of the federal coal combustion residual (CCR) rule[1]. This ROROCS plan documents how the facility's run-on and run-off control systems have been designed and constructed to meet the requirements of §257.81 and is supported by appropriate engineering calculations and modeling analysis that is included herein. This Plan is included in the facility's operating records in accordance with §257.105(g)(3).

2.0 REGULATORY REQUIREMENTS

2.1 Federal CCR Rule

The federal CCR Rule under 40 CFR Part 257 requires that the owner or operator of a new and existing CCR landfill must prepare an initial ROROCS which documents how the run-on and run-off control systems meet the following requirements as outlined in 40 CFR 257.81(a):

- A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from the 25-year, 24-hour storm event.
- A run-off control system from the active portion of the CCR unit to collect and control the peak discharge from the 25-year, 24-hour storm event.

The active portion is defined by 40 CFR 257.53 as the part of the CCR unit that has received or is receiving CCR or non-CCR waste and has not completed closure in accordance with 40 CFR Part 257.102. The entire Phase I development of Area B BSA is considered active.

3.0 DESIGN METHODOLOGIES

3.1 Design Storm

The existing run-on and run-off control systems were designed for hydraulic capacity for at least the 25-year, 24-hour storm event as required by local and federal regulations. Site-specific precipitation estimates were obtained from Natural Resource Conservation Service (NRCS) 24-hour rainfall maps and the Soil Conservation Service Florida Modified Type II Rainfall Distribution was used. The 25-year, 24-hour storm event generates approximately 8.5 inches of precipitation at SJRPP.

3.2 Hydrologic Calculation and Stormwater Routing Methods

Hydrology calculations were completed using NRCS methods. Time of concentration values were calculated for each basin by dividing the flow paths into sheet flow and shallow concentration segments.

[1] 40 Code of Federal Regulations (CFR) Part 257, Subtitle D

The time of concentration calculations are for the contact water and non-contact water models are presented in Appendix A and B, respectively.

Composite curve numbers (CN) were calculated for each basin within the contact and non-contact water models (see Appendix A and B, respectively). CCR material was assumed to perform hydrologically consistent with bare soil conditions, which conservatively correlates to a CN of 86. Final cover material was assumed to perform hydrologically consistent with open space with good vegetative condition, which correlates to a CN of 61. A CN of 98 was used for impervious surfaces. Hydrologic soil group B was assumed for curve number computations.

Stormwater discharge and flow routing calculations were performed using the Streamline Technologies Interconnected Pond Routing (ICPR) stormwater modeling software. The ICPR model operates using three key elements that include basins, nodes and links. The basins represent the hydrological information for each drainage basin. Stage-area data (or depressional storage areas) within each drainage basin was input into nodes. The nodal warning stages correlate to the maximum stage that can be reached within the depressional storage areas before overtopping occurs (e.g. top of bank elevation). The nodal warning stages vary for each drainage basin node. Nodes are interconnected by links and the links represent the existing or proposed culverts/pipes and pumps for flow routing.

4.0 RUN-ON CONTROL

Run-on is defined as stormwater that may flow towards the active portion of the Area B BSA. Based on the topography of the Area B BSA and surrounding topography, run-on potential is low. Area B BSA is topographically higher than surrounding areas and is surrounded by berms and a network of stormwater collection areas. The perimeter berms and stormwater collection areas (ditches, swales, and ponds) would intercept run-on flows. The Area B BSA topography and surrounding area topography are shown on Figure 1.

5.0 RUN-OFF CONTROL

Run-off is defined as stormwater that falls on and flows off of Area B BSA. This includes run-off from the active byproduct placement areas and intermediate cover areas. There are two-types of stormwater run-off at Area B BSA:

- Contact water (stormwater run-off that has contacted CCR); and
- Non-contract stormwater (run-off that has not contacted CCR).

Contact water run-off and non-contact stormwater run-off are managed separately as addressed in the following sections:

5.1 Contact Water Run-Off

Contact water is collected either within the Area B BSA footprint or in a stormwater swale located directly to the north of the Area B BSA footprint. The interior Phase I development is graded to drain to the northwest corner of the footprint to a portable contact water pump station capable of pumping water from the contact water footprint and the northern swale. Contact water runoff that flows into the northern swale or that collects within the Area B BSA footprint is transferred at the contact water pump station to the permanent contact water ponds located to the northwest of the Area B BSA development or directly to the SJRPP industrial wastewater facility for processing prior to discharge under SJRPP's National Pollutant Discharge Elimination System permit. The current configuration of the Area B BSA was analyzed for contact water management, since it has the largest open active area that can generate contact water (see Figure 2). As Area B BSA develops further, the area producing contact water run-off will decrease.

The drainage area and depressional storage area for the Area B BSA footprint and the northern swale were modeled in ICPR. Routing of contact water runoff from these areas to the permanent contact water ponds was simulated by pumping from the Area B BSA Phase I footprint first followed by pumping from the northern swale. The current portable pump station is capable of pumping the contact water runoff volume from the 25-year, 24-hour storm event to the permanent contact water ponds within 61 hours. The ICPR nodal diagram model inputs and results for the contact water configuration are provided in Appendix A.

The modeling results indicate that the existing Area B BSA contact water management system has adequate capacity to collect, manage and route flows from the 25-year, 24-hour return period as warning stages were not exceeded at any of the basin nodes (no overtopping occurs). The nodal peak staging results and available freeboard for each basin node are summarized below:

Node	Description	Peak Stage (feet)	Warning Stage (feet)	Freeboard 25-year, 24-hour Storm (feet)
1	Area B Footprint Digressional Area	19.53	20.00	0.47
2	Northern Swale	12.36	13.00	0.64
3	Contact Water Ponds	16.93	18.00	1.07

5.2 Non-Contact Stormwater Run-Off

The final cover configuration Area B BSA was analyzed for non-contact stormwater run-off management as it would generate the highest volume of stormwater run-off. As the Area B BSA development progresses, the exterior side-slopes will be covered with intermediate soil cover. At 20-foot (vertical) intervals, 2-foot deep, 10-foot wide benches (backwardly inclined channels) will be constructed, with approximately 0.5 percent longitudinal slope that outlet to the perimeter ditch system via downcomer pipes (18-inch

diameter), spaced approximately 500 feet apart. The perimeter ditch system will convey stormwater either to Pond A or Pond B via culverts. Non-contact stormwater will eventually discharge via infiltration to the water table or (under peak storm conditions) through control structures. Pond B may discharge under peak storm conditions via an overflow weir and associated channel to Pond A. Pond A will discharge under peak storm conditions via an overflow weir or control structure to an unnamed tributary of Clapboard Creek. The final cover configuration consists of six drainage basins and associated depressional storage areas that are interconnected by a series of pipes directing runoff ultimately to Pond B and Pond A. Pond A, Pond B and the Pond A outfall were modeled as Node 1, Node 2 and Node 7, respectively. The ICPR nodal diagram, model inputs, and results for the non-contact stormwater run-off configuration are presented in Appendix B.

The modeling results indicate that the final cover stormwater management system for Area B BSA has adequate capacity to collect, manage and route flows from the 25-year, 24-hour return period as warning stages were not exceeded at any of the basin nodes (no overtopping). The nodal peak staging results and available freeboard for each sub-area are summarized below:

Node	Description	Peak Stage (feet)	Warning Stage (feet)	Freeboard 25-year, 24-hour Storm (feet)
1	Pond A Basin	9.09	12.00	2.91
2	Final Cover East Slope and Perimeter Ditch	10.68	13.00	2.32
3	Final Cover South Slope and Perimeter Ditch	13.45	17.00	3.55
4	Final Cover West Slope and Perimeter Ditch	13.13	16.00	2.87
5	Final Cover North Slope and Swale	10.96	12.00	1.04
6	Pond B Basin	9.64	14.00	4.36

6.0 CLOSING

As required by 40 CFR 257.81, the Area B BSA run-on control system has the capacity to prevent flow onto the active portion of the CCR unit during the peak discharge from a 25-year, 24-hour storm, and the run-off control system has the capacity to collect, manage and route flows resulting from a 25-year, 24-hour storm.

GOLDER ASSOCIATES, INC.

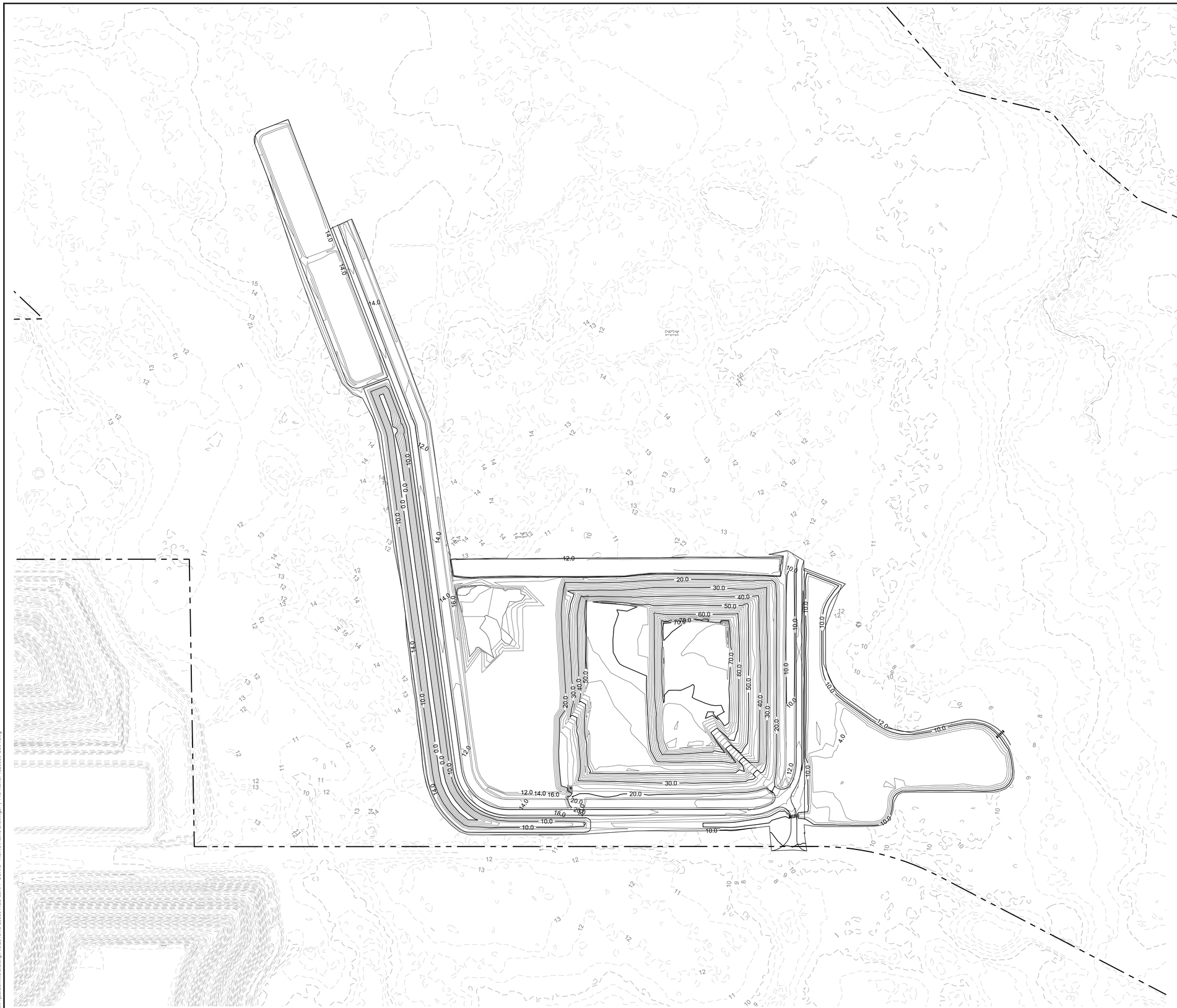
Blake T. Holcomb, PE
Senior Project Engineer

Samuel F. Stafford, PE
Senior Project Engineer

Gregory M. Powell, PE, PhD
Practice Leader and Principal

FN: G:\Projects\15-\15-26356\Task 0800 ROROCS\Final\SJRPP ROROCS Plan.docx

FIGURES



LEGEND

PROPERTY BOUNDARY

EXISTING CONTOUR (FDEM DATA). SEE NOTE 5

REFERENCES

SURVEY SOURCES

1. RICHARD A. MILLER & ASSOCIATES, DATED 02/03/2009.
2. PUTNAL & ASSOCIATES, DATED JUN. 20, 2011.
3. JOHNSON SURVEYING & MAPPING, INC., DATED JUNE 10, 2014.
4. B.V. & ASSOCIATES, INC., DATED DECEMBER 28, 2015
5. FLORIDA DIVISION OF EMERGENCY MANAGEMENT, PUBLISH DATE 2009/02/11, TITLED "DUVAL COUNTY 2FT CONTOUR LINES".

NOTES

1. HORIZONTAL DATUM IS BASED ON NAD83 FLORIDA, EAST ZONE
2. VERTICAL DATUM BASED NGVD29 WITH THE FOLLOWING CONVERSION FROM NAVD88:

   a.) NAVD88 + 1.086' = NGVD29 (FOR SJRPP SITE)

0 200 400
SCALE FEET

CLIENT
ST JOHNS RIVER POWER PARK
JACKSONVILLE, DUVAL COUNTY, FLORIDA

CONSULTANT

Golder Associates

YYYY-MM-DD	2016-09-30
DESIGNED	BTH
PREPARED	BCL
REVIEWED	SFS
APPROVED	GMP

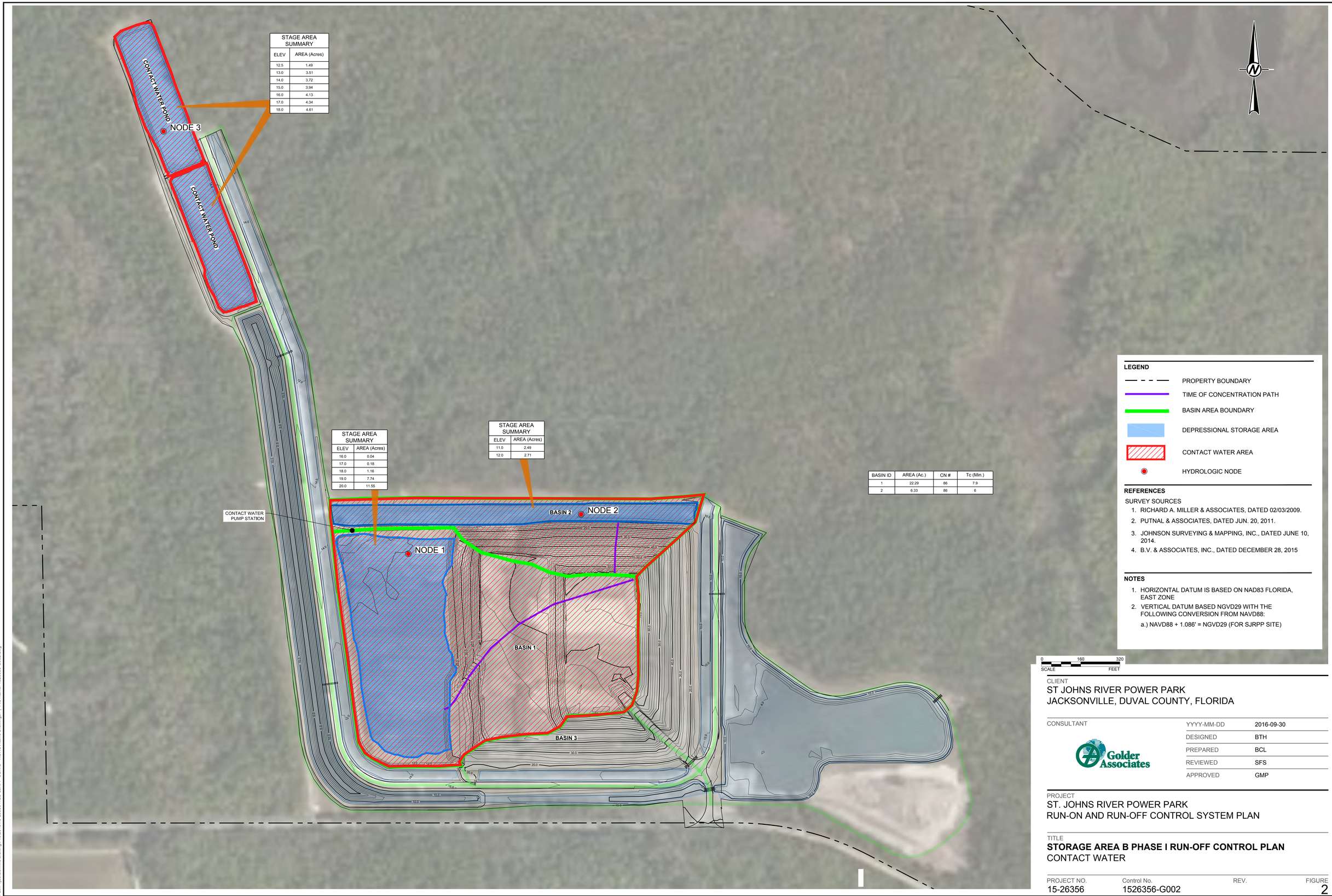
PROJECT
ST. JOHNS RIVER POWER PARK
RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN

TITLE
STORAGE AREA B PHASE I RUN-ON CONTROL PLAN

PROJECT NO.	Control No.	REV.	FIGURE
15-26356	1526356-G001		1

0 1in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: \\jacksonville\drafting\File\2016\15-26356 HGS SJRPP CCR\G - RORO\Active Drawings\ | File Name: 1526356-G001.dwg



CLIENT
ST JOHNS RIVER POWER PARK
JACKSONVILLE, DUVAL COUNTY, FLORIDA

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-09-30
DESIGNED	BTH
PREPARED	BCL
REVIEWED	SFS
APPROVED	GMP

PROJECT
ST. JOHNS RIVER POWER PARK
RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN

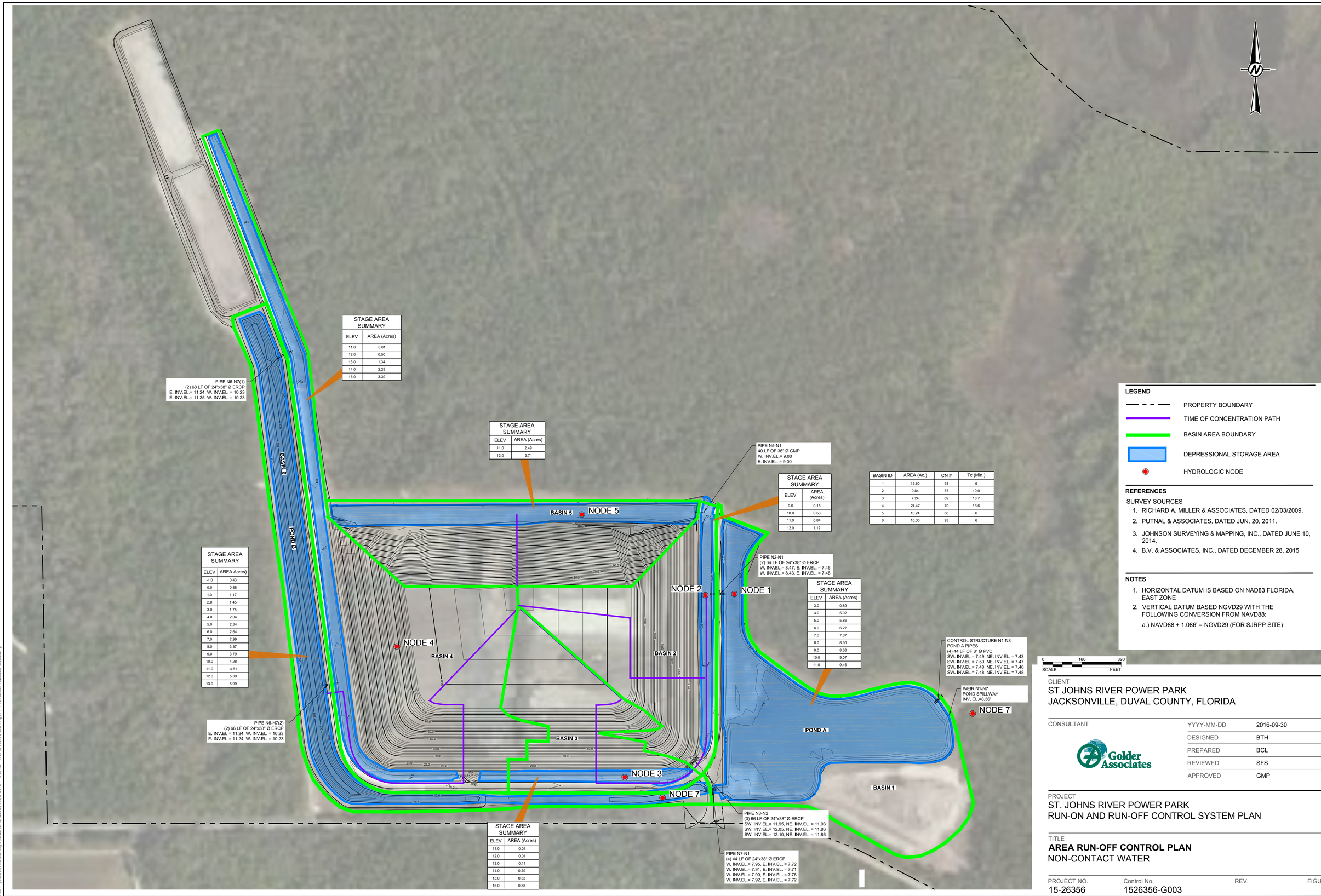
TITLE
STORAGE AREA B PHASE I RUN-OFF CONTROL PLAN
CONTACT WATER

PROJECT NO.	Control No.	REV.	FIGURE
15-26356	1526356-G002		2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 1 in

Path: \\jacksonville\drafting\File\2015\15-26356 HGS SJRPP CCR\G - RORO\Active Drawings\ | File Name: 1526356-G002.dwg



STAGE AREA SUMMARY	
ELEV	AREA (Acres)
11.0	0.01
12.0	0.50
13.0	1.34
14.0	2.29
15.0	3.39

STAGE AREA SUMMARY	
ELEV	AREA (Acres)
11.0	2.49
12.0	2.71

STAGE AREA SUMMARY	
ELEV	AREA (Acres)
9.0	0.15
10.0	0.53
11.0	0.84
12.0	1.12

STAGE AREA SUMMARY	
ELEV	AREA Acres)
-1.0	0.43
0.0	0.88
1.0	1.17
2.0	1.45
3.0	1.75
4.0	2.04
5.0	2.34
6.0	2.64
7.0	2.99
8.0	3.37
9.0	3.79
10.0	4.28
11.0	4.81
12.0	5.30
13.0	5.99

STAGE AREA SUMMARY	
ELEV	AREA (Acres)
3.0	0.89
4.0	5.02
5.0	5.86
6.0	6.27
7.0	7.67
8.0	8.30
9.0	8.68
10.0	9.07
11.0	9.46

STAGE AREA SUMMARY	
ELEV	AREA (Acres)
11.0	0.01
12.0	0.01
13.0	0.11
14.0	0.29
15.0	0.53
16.0	0.88

BASIN ID	AREA (Ac.)	CN #	Tc (Min.)
1	15.60	93	6
2	9.84	67	19.0
3	7.24	69	18.7
4	24.47	70	18.6
5	10.24	68	6
6	10.30	93	6

LEGEND

- PROPERTY BOUNDARY
- TIME OF CONCENTRATION PATH
- BASIN AREA BOUNDARY
- DEPRESSIONAL STORAGE AREA
- HYDROLOGIC NODE

REFERENCES

SURVEY SOURCES

1. RICHARD A. MILLER & ASSOCIATES, DATED 02/03/2009.
2. PUTNAL & ASSOCIATES, DATED JUN. 20, 2011.
3. JOHNSON SURVEYING & MAPPING, INC., DATED JUNE 10, 2014.
4. B.V. & ASSOCIATES, INC., DATED DECEMBER 28, 2015

NOTES

1. HORIZONTAL DATUM IS BASED ON NAD83 FLORIDA, EAST ZONE
2. VERTICAL DATUM BASED NGVD29 WITH THE FOLLOWING CONVERSION FROM NAVD88:

   a.) NAVD88 + 1.086' = NGVD29 (FOR SJRPP SITE)

0 160 320
SCALE FEET

CLIENT
ST JOHNS RIVER POWER PARK
JACKSONVILLE, DUVAL COUNTY, FLORIDA

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-09-30
DESIGNED	BTH
PREPARED	BCL
REVIEWED	SFS
APPROVED	GMP

PROJECT
ST. JOHNS RIVER POWER PARK
RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN

TITLE
AREA RUN-OFF CONTROL PLAN
NON-CONTACT WATER

PROJECT NO.	Control No.	REV.	FIGURE
15-26356	1526356-G003		3

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: \\jacksonville\drafting\Files\2015\15-26356 HGS SJRPP CCR\G - RO\RO\Active Drawings\ | File Name: 1526356-G003.dwg

APPENDIX A
CONTACT WATER RUN-OFF CALCULATIONS AND MODEL

Time of Concentration Calculations

Hydrology calculations were completed using NRCS methods. Time of concentration values were calculated for each basin by dividing the flow paths into different segments based on overland flow characteristics. The travel times for each flow path were summed to get a time of concentration. The flow paths were divided into the following categories:

1. Sheet Flow – the maximum sheet flow distance used was 300 feet. The SCS equation for overland flow using Manning's equation was used and is shown below:

$$T_t = \frac{(0.007)(n*L)^{0.8}}{P_2^{0.5}(S)^{0.4}}$$, where:

T_t = Travel Time (min.)
n = Manning's n
L = Flow path length (ft.)
P_2 = 2-year, 24-hour rainfall (in.)
S = Flow path slope (ft./ft.)

2. Shallow Concentrated Flow –concentrated overland flow towards channels. The equation for shallow concentrated flow is shown below:

$$T_t = \frac{L}{V} * \frac{1}{60}$$, where:

T_t = Travel Time (min.)
L = Flow path length (ft.)
v = Flow velocity (feet/second)

Time of concentration calculations for each basin are presented in Table 1.

Composite Curve Number Calculations

CCR material was assumed to perform hydrologically consistent with bare soil conditions, which correlates to runoff curve number values ranging from 77 to 94 depending on the hydrologic soil group. Final cover material was assumed to perform hydrologically consistent with Open Space, Good Condition (grass cover > 75%), which correlates to runoff curve number values ranging from 39 to 80 depending on the hydrologic soil group. Hydrologic soil group B was assumed for curve number computations.

Composite curve number calculations for each basin are presented in Table 1.

TABLE 1
St. Johns River Power Park Run-on and Run-off Control System Plan
CURVE NUMBER & TIME OF CONCENTRATION SUMMARY
Storage Area B Phase I
Contact Water Runoff

Basin Description 1 22.29 ac.

CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
0.00	Impervious	B	98	0.0%	0
22.29	Bare Soil	B	86	100.0%	86
Total: 22.29	**OK**		Weighted SCS CN =		86

Tc:

*First Time of Concentration segment less than 300-ft was calculated using the TR-55 formula for sheet flow (cultivated soils - residue cover ≤ 20%)

*The remaining segments were calculated using the TR-55 velocity vs. slope criteria for shallow concentrated flow

Mannings n	$P_{2\text{-yr},24\text{-hr}}$ (in.)	Slope (ft./ft.)
0.06	5	0.07

Dist. (ft)		Vel. (fps)	Time (min.)
300	Sheet Flow		5.5
672	Shallow Concentrated Flow	4.60	2.4
Total: 972			
		Time of Concentration =	7.9 min.

Basin Description 2 6.33 ac.

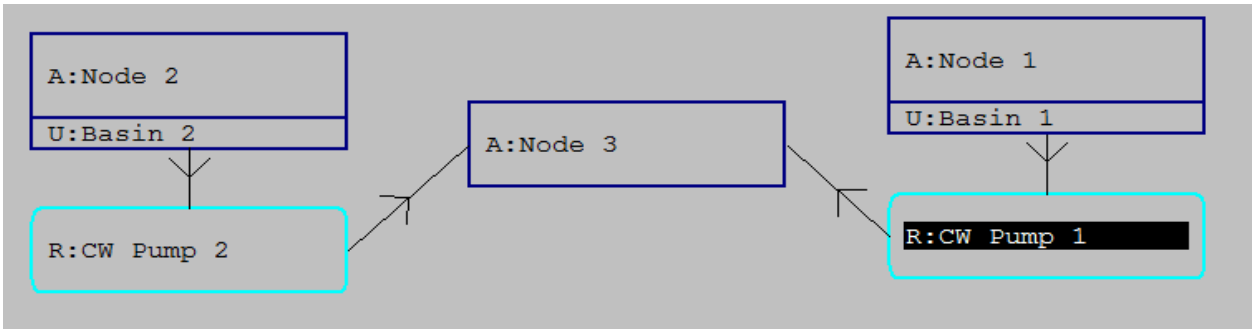
CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
0.00	Impervious	B	98	0.0%	0
6.33	Bare Soil	B	86	100.0%	86
Total: 6.33	**OK**		Weighted SCS CN =		86

Tc:

*The minimum TR-55 Time of Concentration of 0.1 hours (6 minutes) was used for this basin.

Contact Water ICPR Nodal Diagram



Contact Water ICPR Model Inputs

```
================================================================================
==== Basins ====================================================================
================================================================================

        Name: Basin 1                Node: Node 1                Status: Onsite
       Group: 25-24                  Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                 Peaking Factor: 256.0
         Rainfall File: Flmod              Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.500                Time of Conc(min): 7.90
           Area(ac): 22.290                    Time Shift(hrs): 0.00
        Curve Number: 86.00               Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00

--------------------------------------------------------------------------------------------------
        Name: Basin 2                Node: Node 2                Status: Onsite
       Group: 25-24                  Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                 Peaking Factor: 256.0
         Rainfall File: Flmod              Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.500                Time of Conc(min): 6.00
           Area(ac): 6.330                     Time Shift(hrs): 0.00
        Curve Number: 86.00               Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00


================================================================================
==== Nodes =====================================================================
================================================================================

     Name: Node 1             Base Flow(cfs): 0.000         Init Stage(ft): 16.000
    Group: 25-24                                           Warn Stage(ft): 20.000
     Type: Stage/Area

     Stage(ft)        Area(ac)
-------------- ---------------
        16.000          0.0400
        17.000          0.1800
        18.000          1.1600
        19.000          7.7400
        20.000         11.5500

--------------------------------------------------------------------------------
     Name: Node 2             Base Flow(cfs): 0.000         Init Stage(ft): 11.000
    Group: 25-24                                           Warn Stage(ft): 13.000
     Type: Stage/Area

     Stage(ft)        Area(ac)
-------------- ---------------
        11.000          2.4900
        12.000          2.7100

--------------------------------------------------------------------------------
     Name: Node 3             Base Flow(cfs): 0.000         Init Stage(ft): 12.500
    Group: 25-24                                           Warn Stage(ft): 18.000
     Type: Stage/Area

     Stage(ft)        Area(ac)
-------------- ---------------
        12.500          1.4900
        13.000          3.5100
        14.000          3.7200
        15.000          3.9400
        16.000          4.1300
        17.000          4.3400
        18.000          4.6100
```

```
================================================================================
==== Operating Tables ==========================================================
================================================================================

      Name: CW Pump 1           Group: 25-24
      Type: Rating Curve
  Function: Time vs. Discharge

      Time(hrs)  Discharge(cfs)
--------------- ---------------
          12.90            0.00
          13.00            3.30
          60.00            3.30
          60.01            0.00

--------------------------------------------------------------------------------
      Name: CW Pump 2           Group: 25-24
      Type: Rating Curve
  Function: Time vs. Discharge

      Time(hrs)  Discharge(cfs)
--------------- ---------------
          60.01            0.00
          60.02            3.30
          74.00            3.30
          74.01            0.00

================================================================================
==== Rating Curves =============================================================
================================================================================

         Name: CW Pump 1           From Node: Node 1                 Count: 1
        Group: 25-24                 To Node: Node 3                  Flow: Positive

              TABLE           ELEV ON(ft)     ELEV OFF(ft)
           #1: CW Pump 1      0.000           0.000
           #2:                0.000           0.000
           #3:                0.000           0.000
           #4:                0.000           0.000

--------------------------------------------------------------------------------
         Name: CW Pump 2           From Node: Node 2                 Count: 1
        Group: 25-24                 To Node: Node 3                  Flow: Positive

              TABLE           ELEV ON(ft)     ELEV OFF(ft)
           #1: CW Pump 2      0.000           0.000
           #2:                0.000           0.000
           #3:                0.000           0.000
           #4:                0.000           0.000

================================================================================
==== Hydrology Simulations =====================================================
================================================================================

         Name: 25-24
     Filename: G:\Projects\15-\15-26356\Task 0800 ROROCS\Calcs\25-24.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 8.50

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00
```

```
================================================================================
==== Routing Simulations ======================================================
================================================================================

         Name: 25-24               Hydrology Sim: 25-24
     Filename: G:\Projects\15-\15-26356\Task 0800 ROROCS\Calcs\25-24.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 96.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         15.000

Group           Run
--------------- -----
25-24           Yes
```

Contact Water ICPR Model Results

Name	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Node 1	25-24	18.67	19.53	20.00	0.0050	425899	12.00	110.01	13.00	3.30
Node 2	25-24	24.67	12.36	13.00	0.0039	121515	12.00	33.89	60.02	3.30
Node 3	25-24	74.02	16.93	18.00	0.0030	188385	13.00	3.30	0.00	0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
25-24	0.00	0.0	0.0	0.0	0.0	0.00
25-24	0.25	0.0	0.0	-0.0	0.0	9999.99
25-24	0.51	0.0	0.0	-0.0	0.0	9999.99
25-24	0.76	0.0	0.0	-0.0	0.0	9999.99
25-24	1.02	0.0	0.0	-0.0	0.0	9999.99
25-24	1.27	0.0	0.0	-0.0	0.0	9999.99
25-24	1.52	0.9	0.0	0.9	0.0	0.00
25-24	1.77	62.1	0.0	62.1	0.0	0.00
25-24	2.02	271.8	0.0	271.8	0.0	0.00
25-24	2.27	656.2	0.0	656.2	0.0	0.00
25-24	2.52	1210.5	0.0	1210.5	0.0	0.00
25-24	2.77	1913.9	0.0	1913.9	0.0	0.00
25-24	3.02	2751.0	0.0	2751.0	0.0	0.00
25-24	3.27	3754.1	0.0	3754.1	0.0	0.00
25-24	3.52	4919.2	0.0	4919.2	0.0	0.00
25-24	3.77	6207.9	0.0	6207.9	0.0	0.00
25-24	4.02	7603.9	0.0	7603.9	0.0	0.00
25-24	4.27	9195.9	0.0	9195.9	0.0	0.00
25-24	4.52	10971.9	0.0	10971.9	0.0	0.00
25-24	4.77	12861.9	0.0	12861.9	0.0	0.00
25-24	5.02	14844.2	0.0	14844.2	0.0	0.00
25-24	5.27	16973.4	0.0	16973.4	0.0	0.00
25-24	5.52	19236.6	0.0	19236.6	0.0	0.00
25-24	5.77	21586.2	0.0	21586.2	0.0	0.00
25-24	6.02	24008.2	0.0	24008.2	0.0	0.00
25-24	6.27	26708.3	0.0	26708.3	0.0	0.00
25-24	6.52	29657.2	0.0	29657.2	0.0	0.00
25-24	6.77	32710.3	0.0	32710.3	0.0	0.00
25-24	7.02	35851.9	0.0	35851.9	0.0	0.00
25-24	7.27	39351.6	0.0	39351.6	0.0	0.00
25-24	7.50	43032.6	0.0	43032.6	0.0	0.00
25-24	7.75	47119.0	0.0	47119.0	0.0	0.00
25-24	8.00	51498.8	0.0	51498.8	0.0	0.00
25-24	8.25	56489.8	0.3	56489.5	0.0	0.00
25-24	8.50	61972.4	1.4	61971.1	0.0	0.00
25-24	8.75	68297.9	4.3	68293.7	0.0	0.00
25-24	9.01	75478.9	10.8	75468.1	0.0	0.00
25-24	9.25	83021.9	22.7	82999.2	0.0	0.00
25-24	9.51	91623.5	44.4	91579.2	0.0	0.00
25-24	9.76	100974.7	78.0	100896.7	0.0	0.00
25-24	10.01	111414.6	129.9	111284.7	0.0	0.00
25-24	10.26	123435.1	206.2	123229.0	0.0	0.00
25-24	10.50	136964.9	315.9	136649.0	0.0	0.00
25-24	10.76	153849.0	482.8	153366.3	0.0	0.00
25-24	11.00	172624.6	712.4	171912.2	0.0	0.00
25-24	11.26	194165.1	1048.0	193117.1	0.0	0.00
25-24	11.50	224443.6	1502.6	222940.9	0.0	0.00
25-24	11.75	306280.5	2233.8	304046.7	0.0	0.00
25-24	12.00	496405.4	3735.3	492670.1	0.0	0.00
25-24	12.25	715536.3	6596.4	708939.8	0.0	0.00
25-24	12.50	865636.4	16877.8	848758.6	0.0	0.00
25-24	12.75	958239.9	38485.3	919754.6	0.0	0.00
25-24	13.00	1024239.1	71159.6	953079.5	0.0	0.00
25-24	13.25	1073859.6	112023.8	961835.8	-0.0	-0.00
25-24	13.50	1113710.5	159664.2	954046.4	-0.0	-0.00

25-24	13.75	1145362.7	210155.2	935207.5	-0.0	-0.00
25-24	14.00	1172169.6	263132.3	909037.3	-0.0	-0.00
25-24	14.25	1195521.8	314604.5	880917.3	-0.0	-0.00
25-24	14.50	1216843.5	364265.5	852578.0	-0.0	-0.00
25-24	14.75	1236337.7	411294.7	825043.0	-0.0	-0.00
25-24	15.01	1254840.5	457141.7	797698.8	-0.0	-0.00
25-24	15.25	1271772.7	498617.7	773155.0	-0.0	-0.00
25-24	15.50	1288022.8	537301.7	750721.2	-0.0	-0.00
25-24	15.75	1303424.6	573374.6	730050.0	-0.0	-0.00
25-24	16.00	1317912.7	606877.3	711035.5	-0.0	-0.00
25-24	16.25	1331824.2	638124.4	693699.9	-0.0	-0.00
25-24	16.50	1345044.4	666914.2	678130.2	-0.0	-0.00
25-24	16.75	1357712.2	693733.2	663979.0	0.0	0.00
25-24	17.00	1369836.2	718783.5	651052.7	0.0	0.00
25-24	17.25	1381740.4	742265.7	639474.8	0.0	0.00
25-24	17.50	1393552.3	764369.0	629183.2	0.0	0.00
25-24	17.75	1404700.4	785243.2	619457.2	0.0	0.00
25-24	18.00	1414957.4	804958.3	609999.1	0.0	0.00
25-24	18.25	1425192.5	823617.1	601575.4	0.0	0.00
25-24	18.50	1435734.1	841362.8	594371.4	0.0	0.00
25-24	18.75	1445741.0	858295.9	587445.2	0.0	0.00
25-24	19.00	1454957.0	874544.0	580413.0	0.0	0.00
25-24	19.26	1464417.1	890411.5	574005.5	0.0	0.00
25-24	19.50	1473527.8	904565.5	568962.3	0.0	0.00
25-24	19.75	1482803.5	918765.0	564038.5	0.0	0.00
25-24	20.00	1491664.1	932435.3	559228.8	0.0	0.00
25-24	20.25	1500067.9	945603.9	554464.0	0.0	0.00
25-24	20.50	1507985.3	958278.6	549706.7	0.0	0.00
25-24	20.75	1515711.6	970483.8	545227.8	0.0	0.00
25-24	21.00	1523450.6	982408.0	541042.6	0.0	0.00
25-24	21.26	1531254.8	994141.8	537113.0	0.0	0.00
25-24	21.51	1538817.8	1005216.2	533601.6	0.0	0.00
25-24	21.76	1546371.1	1015971.1	530400.0	0.0	0.00
25-24	22.01	1553923.2	1026430.8	527492.4	0.0	0.00
25-24	22.26	1561480.0	1036622.6	524857.3	0.0	0.00
25-24	22.51	1569040.6	1046572.9	522467.6	0.0	0.00
25-24	22.76	1576272.0	1056297.4	519974.6	0.0	0.00
25-24	23.01	1583081.8	1065782.9	517298.9	0.0	0.00
25-24	23.26	1589728.6	1075028.9	514699.7	0.0	0.00
25-24	23.51	1596302.0	1084047.4	512254.6	0.0	0.00
25-24	23.76	1602499.9	1092845.5	509654.4	0.0	0.00
25-24	24.01	1608238.4	1101406.9	506831.5	0.0	0.00
25-24	24.25	1611917.1	1109312.2	502604.9	0.0	0.00
25-24	24.50	1613558.1	1117192.3	496365.8	0.0	0.00
25-24	24.75	1614350.5	1124585.2	489765.3	0.0	0.00
25-24	25.01	1614794.5	1131631.3	483163.2	0.0	0.00
25-24	25.25	1615005.7	1138021.4	476984.3	0.0	0.00
25-24	25.51	1615086.8	1144104.7	470982.1	0.0	0.00
25-24	25.76	1615105.7	1149856.1	465249.6	0.0	0.00
25-24	26.00	1615106.1	1154969.2	460136.9	0.0	0.00
25-24	26.25	1615106.1	1159896.0	455210.1	0.0	0.00
25-24	26.50	1615106.1	1164524.2	450581.9	0.0	0.00
25-24	26.75	1615106.1	1168884.2	446221.9	0.0	0.00
25-24	27.00	1615106.1	1173003.5	442102.6	0.0	0.00
25-24	27.25	1615106.1	1176907.2	438199.0	0.0	0.00
25-24	27.50	1615106.1	1180618.5	434487.6	0.0	0.00
25-24	27.75	1615106.1	1184158.9	430947.2	0.0	0.00
25-24	28.00	1615106.1	1187548.2	427557.9	0.0	0.00
25-24	28.25	1615106.1	1190805.4	424300.7	0.0	0.00
25-24	28.50	1615106.1	1193949.0	421157.1	0.0	0.00
25-24	28.75	1615106.1	1196998.0	418108.1	0.0	0.00
25-24	29.00	1615106.1	1199974.2	415131.9	0.0	0.00
25-24	29.25	1615106.1	1202910.0	412196.1	0.0	0.00
25-24	29.50	1615106.1	1205819.3	409286.9	0.0	0.00
25-24	29.75	1615106.1	1208702.3	406403.8	0.0	0.00
25-24	30.00	1615106.1	1211559.3	403546.8	0.0	0.00
25-24	30.25	1615106.1	1214390.6	400715.5	-0.0	-0.00
25-24	30.50	1615106.1	1217196.3	397909.8	-0.0	-0.00
25-24	30.75	1615106.1	1219976.9	395129.2	-0.0	-0.00
25-24	31.00	1615106.1	1222732.5	392373.6	-0.0	-0.00
25-24	31.25	1615106.1	1225463.4	389642.7	-0.0	-0.00
25-24	31.50	1615106.1	1228169.9	386936.2	0.0	0.00
25-24	31.75	1615106.1	1230852.2	384253.9	-0.0	-0.00
25-24	32.00	1615106.1	1233510.5	381595.6	-0.0	-0.00
25-24	32.25	1615106.1	1236145.1	378961.0	-0.0	-0.00

25-24	32.50	1615106.1	1238756.2	376349.9	-0.0	-0.00
25-24	32.75	1615106.1	1241344.1	373762.0	-0.0	-0.00
25-24	33.00	1615106.1	1243908.8	371197.3	-0.0	-0.00
25-24	33.25	1615106.1	1246450.7	368655.4	-0.0	-0.00
25-24	33.50	1615106.1	1248970.0	366136.1	-0.0	-0.00
25-24	33.75	1615106.1	1251466.9	363639.2	-0.0	-0.00
25-24	34.00	1615106.1	1253941.6	361164.5	-0.0	-0.00
25-24	34.25	1615106.1	1256394.4	358711.7	-0.0	-0.00
25-24	34.50	1615106.1	1258825.6	356280.5	-0.0	-0.00
25-24	34.75	1615106.1	1261235.4	353870.7	-0.0	-0.00
25-24	35.00	1615106.1	1263623.9	351482.2	-0.0	-0.00
25-24	35.25	1615106.1	1265991.2	349114.9	-0.0	-0.00
25-24	35.50	1615106.1	1268337.5	346768.7	-0.0	-0.00
25-24	35.75	1615106.1	1270663.0	344443.1	-0.0	-0.00
25-24	36.00	1615106.1	1272967.9	342138.2	-0.0	-0.00
25-24	36.25	1615106.1	1275252.5	339853.6	-0.0	-0.00
25-24	36.50	1615106.1	1277517.1	337589.0	-0.0	-0.00
25-24	36.75	1615106.1	1279762.1	335344.0	-0.0	-0.00
25-24	37.00	1615106.1	1281987.7	333118.4	-0.0	-0.00
25-24	37.25	1615106.1	1284194.5	330911.6	-0.0	-0.00
25-24	37.50	1615106.1	1286382.3	328723.8	-0.0	-0.00
25-24	37.75	1615106.1	1288551.6	326554.5	-0.0	-0.00
25-24	38.00	1615106.1	1290702.3	324403.8	-0.0	-0.00
25-24	38.25	1615106.1	1292834.7	322271.4	-0.0	-0.00
25-24	38.50	1615106.1	1294948.6	320157.5	-0.0	-0.00
25-24	38.75	1615106.1	1297044.4	318061.7	-0.0	-0.00
25-24	39.00	1615106.1	1299122.0	315984.1	-0.0	-0.00
25-24	39.25	1615106.1	1301183.0	313923.1	-0.0	-0.00
25-24	39.50	1615106.1	1303230.3	311875.8	-0.0	-0.00
25-24	39.75	1615106.1	1305262.8	309843.3	-0.0	-0.00
25-24	40.00	1615106.1	1307282.7	307823.4	-0.0	-0.00
25-24	40.25	1615106.1	1309290.3	305815.8	-0.0	-0.00
25-24	40.50	1615106.1	1311285.8	303820.4	-0.0	-0.00
25-24	40.75	1615106.1	1313273.9	301832.2	-0.0	-0.00
25-24	41.00	1615106.1	1315251.0	299855.1	-0.0	-0.00
25-24	41.25	1615106.1	1317214.9	297891.3	-0.0	-0.00
25-24	41.50	1615106.1	1319164.6	295941.6	-0.0	-0.00
25-24	41.75	1615106.1	1321099.7	294006.4	-0.0	-0.00
25-24	42.00	1615106.1	1323019.7	292086.4	0.0	0.00
25-24	42.25	1615106.1	1324924.4	290181.7	0.0	0.00
25-24	42.50	1615106.1	1326813.6	288292.5	0.0	0.00
25-24	42.75	1615106.1	1328687.0	286419.1	0.0	0.00
25-24	43.00	1615106.1	1330544.6	284561.5	0.0	0.00
25-24	43.25	1615106.1	1332386.1	282720.0	0.0	0.00
25-24	43.50	1615106.1	1334211.6	280894.5	-0.0	-0.00
25-24	43.75	1615106.1	1336020.8	279085.3	0.0	0.00
25-24	44.00	1615106.1	1337813.9	277292.2	-0.0	-0.00
25-24	44.25	1615106.1	1339590.6	275515.5	-0.0	-0.00
25-24	44.50	1615106.1	1341351.3	273754.8	-0.0	-0.00
25-24	44.75	1615106.1	1343095.5	272010.6	-0.0	-0.00
25-24	45.00	1615106.1	1344823.5	270282.7	-0.0	-0.00
25-24	45.25	1615106.1	1346535.4	268570.7	-0.0	-0.00
25-24	45.50	1615106.1	1348231.0	266875.2	-0.0	-0.00
25-24	45.75	1615106.1	1349910.8	265195.3	-0.0	-0.00
25-24	46.00	1615106.1	1351574.7	263531.4	-0.0	-0.00
25-24	46.25	1615106.1	1353222.8	261883.4	-0.0	-0.00
25-24	46.50	1615106.1	1354855.3	260250.9	-0.0	-0.00
25-24	46.75	1615106.1	1356471.8	258634.3	-0.0	-0.00
25-24	47.00	1615106.1	1358073.3	257032.8	-0.0	-0.00
25-24	47.25	1615106.1	1359658.9	255447.2	-0.0	-0.00
25-24	47.50	1615106.1	1361229.6	253876.5	-0.0	-0.00
25-24	47.75	1615106.1	1362784.6	252321.5	-0.0	-0.00
25-24	48.00	1615106.1	1364324.7	250781.4	-0.0	-0.00
25-24	48.25	1615106.1	1365849.5	249256.6	-0.0	-0.00
25-24	48.50	1615106.1	1367359.3	247746.9	-0.0	-0.00
25-24	48.75	1615106.1	1368854.1	246252.1	-0.0	-0.00
25-24	49.00	1615106.1	1370334.3	244771.8	-0.0	-0.00
25-24	49.25	1615106.1	1371799.7	243306.4	-0.0	-0.00
25-24	49.50	1615106.1	1373250.4	241855.7	-0.0	-0.00
25-24	49.75	1615106.1	1374687.1	240419.1	-0.0	-0.00
25-24	50.00	1615106.1	1376109.1	238997.0	-0.0	-0.00
25-24	50.25	1615106.1	1377516.9	237589.2	-0.0	-0.00
25-24	50.50	1615106.1	1378910.5	236195.6	-0.0	-0.00
25-24	50.75	1615106.1	1380290.2	234815.9	-0.0	-0.00
25-24	51.00	1615106.1	1381655.9	233450.2	-0.0	-0.00

25-24	51.25	1615106.1	1383007.7	232098.4	-0.0	-0.00
25-24	51.50	1615106.1	1384345.6	230760.5	-0.0	-0.00
25-24	51.75	1615106.1	1385670.2	229435.9	-0.0	-0.00
25-24	52.00	1615106.1	1386981.1	228125.0	-0.0	-0.00
25-24	52.25	1615106.1	1388278.6	226827.5	-0.0	-0.00
25-24	52.50	1615106.1	1389562.8	225543.3	-0.0	-0.00
25-24	52.75	1615106.1	1390833.7	224272.4	-0.0	-0.00
25-24	53.00	1615106.1	1392091.8	223014.3	-0.0	-0.00
25-24	53.25	1615106.1	1393336.9	221769.3	-0.0	-0.00
25-24	53.50	1615106.1	1394569.2	220536.9	-0.0	-0.00
25-24	53.75	1615106.1	1395788.8	219317.3	-0.0	-0.00
25-24	54.00	1615106.1	1396995.8	218110.4	-0.0	-0.00
25-24	54.25	1615106.1	1398190.1	216916.0	-0.0	-0.00
25-24	54.50	1615106.1	1399372.4	215733.7	-0.0	-0.00
25-24	54.75	1615106.1	1400542.7	214563.4	-0.0	-0.00
25-24	55.00	1615106.1	1401700.8	213405.3	-0.0	-0.00
25-24	55.25	1615106.1	1402846.9	212259.2	-0.0	-0.00
25-24	55.50	1615106.1	1403981.4	211124.7	-0.0	-0.00
25-24	55.75	1615106.1	1405104.3	210001.8	-0.0	-0.00
25-24	56.00	1615106.1	1406215.4	208890.8	-0.0	-0.00
25-24	56.25	1615106.1	1407315.0	207791.1	-0.0	-0.00
25-24	56.50	1615106.1	1408403.4	206702.8	-0.0	-0.00
25-24	56.75	1615106.1	1409480.9	205625.2	-0.0	-0.00
25-24	57.00	1615106.1	1410547.4	204558.8	-0.0	-0.00
25-24	57.25	1615106.1	1411602.8	203503.3	-0.0	-0.00
25-24	57.50	1615106.1	1412647.4	202458.7	-0.0	-0.00
25-24	57.75	1615106.1	1413681.4	201424.7	-0.0	-0.00
25-24	58.00	1615106.1	1414705.1	200401.0	-0.0	-0.00
25-24	58.25	1615106.1	1415718.3	199387.9	-0.0	-0.00
25-24	58.50	1615106.1	1416720.9	198385.2	-0.0	-0.00
25-24	58.75	1615106.1	1417713.4	197392.7	-0.0	-0.00
25-24	59.00	1615106.1	1418695.8	196410.3	-0.0	-0.00
25-24	59.25	1615106.1	1419668.3	195437.9	-0.0	-0.00
25-24	59.50	1615106.1	1420631.0	194475.1	-0.0	-0.00
25-24	59.75	1615106.1	1421584.0	193522.1	-0.0	-0.00
25-24	60.00	1615106.1	1422527.3	192578.8	-0.0	-0.00
25-24	60.25	1615106.1	1423461.2	191645.0	-0.0	-0.00
25-24	60.50	1615106.1	1424385.6	190720.5	-0.0	-0.00
25-24	60.75	1615106.1	1425300.8	189805.3	-0.0	-0.00
25-24	61.00	1615106.1	1426206.8	188899.3	-0.0	-0.00
25-24	61.25	1615106.1	1427103.8	188002.4	-0.0	-0.00
25-24	61.50	1615106.1	1427991.8	187114.3	-0.0	-0.00
25-24	61.75	1615106.1	1428871.1	186235.0	-0.0	-0.00
25-24	62.00	1615106.1	1429741.8	185364.3	-0.0	-0.00
25-24	62.25	1615106.1	1430603.8	184502.3	-0.0	-0.00
25-24	62.50	1615106.1	1431457.4	183648.7	-0.0	-0.00
25-24	62.75	1615106.1	1432302.4	182803.7	-0.0	-0.00
25-24	63.00	1615106.1	1433139.1	181967.0	-0.0	-0.00
25-24	63.25	1615106.1	1433967.7	181138.4	-0.0	-0.00
25-24	63.50	1615106.1	1434788.2	180318.0	-0.0	-0.00
25-24	63.75	1615106.1	1435600.6	179505.5	-0.0	-0.00
25-24	64.00	1615106.1	1436405.4	178700.7	-0.0	-0.00
25-24	64.25	1615106.1	1437202.5	177903.6	-0.0	-0.00
25-24	64.50	1615106.1	1437991.8	177114.3	-0.0	-0.00
25-24	64.75	1615106.1	1438773.4	176332.8	-0.0	-0.00
25-24	65.00	1615106.1	1439547.5	175558.6	-0.0	-0.00
25-24	65.25	1615106.1	1440314.2	174791.9	-0.0	-0.00
25-24	65.50	1615106.1	1441073.5	174032.6	-0.0	-0.00
25-24	65.75	1615106.1	1441825.5	173280.7	-0.0	-0.00
25-24	66.00	1615106.1	1442570.4	172535.7	-0.0	-0.00
25-24	66.25	1615106.1	1443308.1	171798.0	-0.0	-0.00
25-24	66.50	1615106.1	1444038.9	171067.2	-0.0	-0.00
25-24	66.75	1615106.1	1444762.9	170343.3	-0.0	-0.00
25-24	67.00	1615106.1	1445480.1	169626.0	-0.0	-0.00
25-24	67.25	1615106.1	1446190.5	168915.6	-0.0	-0.00
25-24	67.50	1615106.1	1446894.3	168211.8	-0.0	-0.00
25-24	67.75	1615106.1	1447591.4	167514.7	-0.0	-0.00
25-24	68.00	1615106.1	1448282.2	166823.9	-0.0	-0.00
25-24	68.25	1615106.1	1448966.5	166139.6	-0.0	-0.00
25-24	68.50	1615106.1	1449644.4	165461.7	-0.0	-0.00
25-24	68.75	1615106.1	1450316.0	164790.1	-0.0	-0.00
25-24	69.00	1615106.1	1450981.5	164124.6	-0.0	-0.00
25-24	69.25	1615106.1	1451640.9	163465.2	-0.0	-0.00
25-24	69.50	1615106.1	1452294.3	162811.8	-0.0	-0.00
25-24	69.75	1615106.1	1452941.7	162164.4	-0.0	-0.00

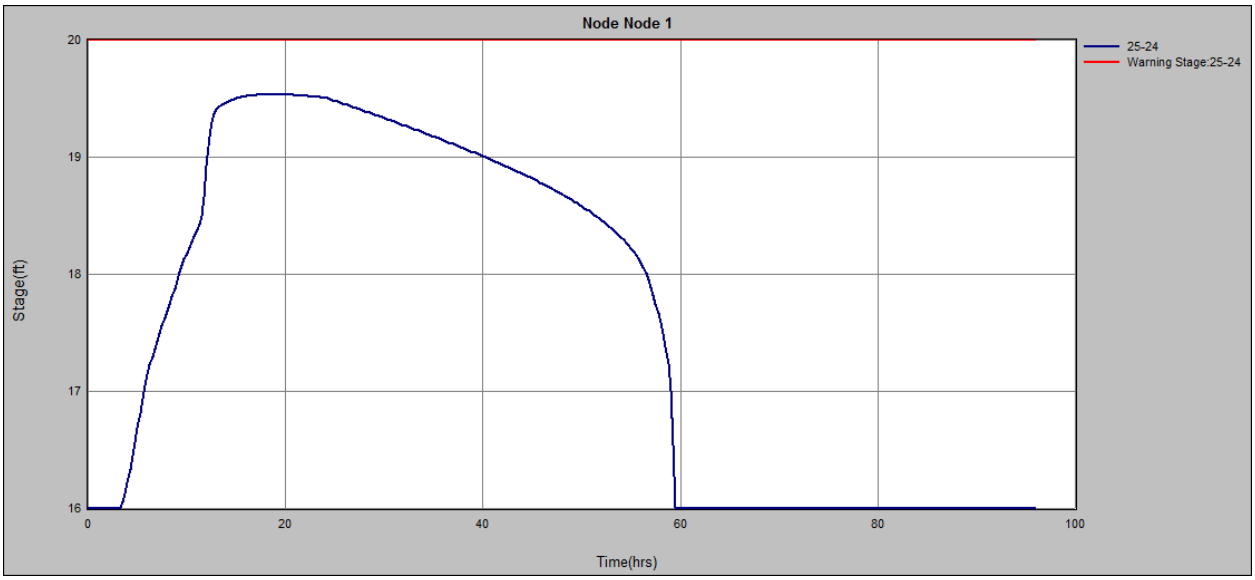
25-24	70.00	1615106.1	1453583.2	161522.9	-0.0	-0.00
25-24	70.25	1615106.1	1454219.0	160887.1	-0.0	-0.00
25-24	70.50	1615106.1	1454849.2	160257.0	-0.0	-0.00
25-24	70.75	1615106.1	1455473.6	159632.5	-0.0	-0.00
25-24	71.00	1615106.1	1456092.4	159013.7	-0.0	-0.00
25-24	71.25	1615106.1	1456705.6	158400.5	-0.0	-0.00
25-24	71.50	1615106.1	1457313.3	157792.8	-0.0	-0.00
25-24	71.75	1615106.1	1457915.6	157190.5	-0.0	-0.00
25-24	72.00	1615106.1	1458512.4	156593.7	-0.0	-0.00
25-24	72.25	1615106.1	1459104.0	156002.1	-0.0	-0.00
25-24	72.50	1615106.1	1459690.3	155415.8	-0.0	-0.00
25-24	72.75	1615106.1	1460271.4	154834.7	-0.0	-0.00
25-24	73.00	1615106.1	1460847.5	154258.6	-0.0	-0.00
25-24	73.25	1615106.1	1461418.5	153687.6	-0.0	-0.00
25-24	73.50	1615106.1	1461984.6	153121.6	-0.0	-0.00
25-24	73.75	1615106.1	1462545.6	152560.5	-0.0	-0.00
25-24	74.00	1615106.1	1463101.7	152004.4	-0.0	-0.00
25-24	74.25	1615106.1	1463653.0	151453.1	-0.0	-0.00
25-24	74.50	1615106.1	1464199.6	150906.5	-0.0	-0.00
25-24	74.75	1615106.1	1464741.4	150364.7	-0.0	-0.00
25-24	75.00	1615106.1	1465278.5	149827.6	-0.0	-0.00
25-24	75.25	1615106.1	1465811.0	149295.1	-0.0	-0.00
25-24	75.50	1615106.1	1466339.0	148767.1	-0.0	-0.00
25-24	75.75	1615106.1	1466862.5	148243.6	-0.0	-0.00
25-24	76.00	1615106.1	1467381.6	147724.5	-0.0	-0.00
25-24	76.25	1615106.1	1467896.3	147209.8	-0.0	-0.00
25-24	76.50	1615106.1	1468406.6	146699.5	-0.0	-0.00
25-24	76.75	1615106.1	1468912.7	146193.5	-0.0	-0.00
25-24	77.00	1615106.1	1469414.4	145691.8	-0.0	-0.00
25-24	77.25	1615106.1	1469911.9	145194.3	-0.0	-0.00
25-24	77.50	1615106.1	1470405.2	144700.9	-0.0	-0.00
25-24	77.75	1615106.1	1470894.5	144211.6	-0.0	-0.00
25-24	78.00	1615106.1	1471379.8	143726.3	-0.0	-0.00
25-24	78.25	1615106.1	1471861.0	143245.1	-0.0	-0.00
25-24	78.50	1615106.1	1472338.3	142767.8	-0.0	-0.00
25-24	78.75	1615106.1	1472811.6	142294.5	-0.0	-0.00
25-24	79.00	1615106.1	1473281.0	141825.1	-0.0	-0.00
25-24	79.25	1615106.1	1473746.6	141359.5	-0.0	-0.00
25-24	79.50	1615106.1	1474208.4	140897.7	-0.0	-0.00
25-24	79.75	1615106.1	1474666.5	140439.6	-0.0	-0.00
25-24	80.00	1615106.1	1475121.0	139985.1	-0.0	-0.00
25-24	80.25	1615106.1	1475571.8	139534.3	-0.0	-0.00
25-24	80.50	1615106.1	1476019.0	139087.1	-0.0	-0.00
25-24	80.75	1615106.1	1476462.5	138643.6	-0.0	-0.00
25-24	81.00	1615106.1	1476902.5	138203.6	-0.0	-0.00
25-24	81.25	1615106.1	1477339.0	137767.1	-0.0	-0.00
25-24	81.50	1615106.1	1477772.0	137334.1	-0.0	-0.00
25-24	81.75	1615106.1	1478201.7	136904.4	-0.0	-0.00
25-24	82.00	1615106.1	1478628.0	136478.1	-0.0	-0.00
25-24	82.25	1615106.1	1479051.0	136055.1	-0.0	-0.00
25-24	82.50	1615106.1	1479470.7	135635.5	-0.0	-0.00
25-24	82.75	1615106.1	1479887.0	135219.1	-0.0	-0.00
25-24	83.00	1615106.1	1480300.1	134806.1	-0.0	-0.00
25-24	83.25	1615106.1	1480709.9	134396.2	-0.0	-0.00
25-24	83.50	1615106.1	1481116.6	133989.6	-0.0	-0.00
25-24	83.75	1615106.1	1481520.1	133586.0	-0.0	-0.00
25-24	84.00	1615106.1	1481920.6	133185.5	-0.0	-0.00
25-24	84.25	1615106.1	1482318.0	132788.1	-0.0	-0.00
25-24	84.50	1615106.1	1482712.3	132393.8	-0.0	-0.00
25-24	84.75	1615106.1	1483103.6	132002.6	-0.0	-0.00
25-24	85.00	1615106.1	1483491.8	131614.3	-0.0	-0.00
25-24	85.25	1615106.1	1483877.0	131229.1	-0.0	-0.00
25-24	85.50	1615106.1	1484259.3	130846.8	-0.0	-0.00
25-24	85.75	1615106.1	1484638.7	130467.4	-0.0	-0.00
25-24	86.00	1615106.1	1485015.2	130090.9	-0.0	-0.00
25-24	86.25	1615106.1	1485389.0	129717.2	-0.0	-0.00
25-24	86.50	1615106.1	1485759.8	129346.3	-0.0	-0.00
25-24	86.75	1615106.1	1486127.9	128978.2	-0.0	-0.00
25-24	87.00	1615106.1	1486493.3	128612.9	-0.0	-0.00
25-24	87.25	1615106.1	1486855.9	128250.2	-0.0	-0.00
25-24	87.50	1615106.1	1487215.9	127890.2	-0.0	-0.00
25-24	87.75	1615106.1	1487573.3	127532.8	-0.0	-0.00
25-24	88.00	1615106.1	1487928.0	127178.1	-0.0	-0.00
25-24	88.25	1615106.1	1488280.1	126826.0	-0.0	-0.00
25-24	88.50	1615106.1	1488629.6	126476.5	-0.0	-0.00

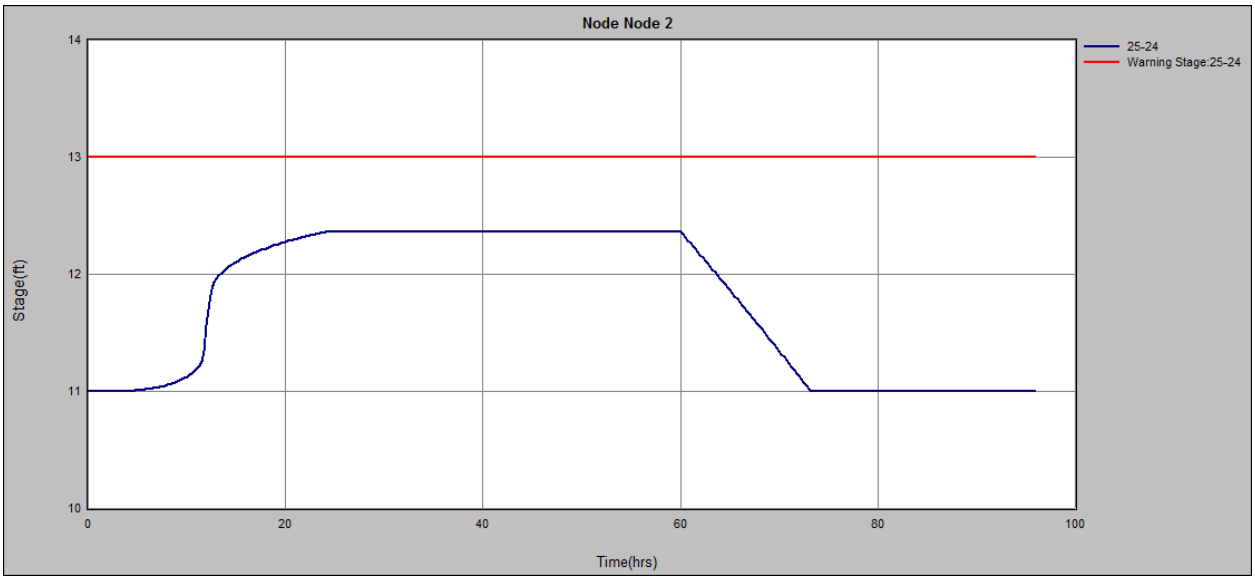
25-24	88.75	1615106.1	1488976.4	126129.7	-0.0	-0.00
25-24	89.00	1615106.1	1489320.8	125785.4	-0.0	-0.00
25-24	89.25	1615106.1	1489662.5	125443.6	-0.0	-0.00
25-24	89.50	1615106.1	1490001.9	125104.2	-0.0	-0.00
25-24	89.75	1615106.1	1490338.8	124767.4	-0.0	-0.00
25-24	90.00	1615106.1	1490673.2	124432.9	-0.0	-0.00
25-24	90.25	1615106.1	1491005.3	124100.8	-0.0	-0.00
25-24	90.50	1615106.1	1491335.0	123771.1	-0.0	-0.00
25-24	90.75	1615106.1	1491662.4	123443.7	-0.0	-0.00
25-24	91.00	1615106.1	1491987.5	123118.6	-0.0	-0.00
25-24	91.25	1615106.1	1492310.2	122795.9	-0.0	-0.00
25-24	91.50	1615106.1	1492630.7	122475.4	-0.0	-0.00
25-24	91.75	1615106.1	1492948.8	122157.3	-0.0	-0.00
25-24	92.00	1615106.1	1493264.7	121841.4	-0.0	-0.00
25-24	92.25	1615106.1	1493578.4	121527.8	-0.0	-0.00
25-24	92.50	1615106.1	1493889.8	121216.3	-0.0	-0.00
25-24	92.75	1615106.1	1494199.1	120907.0	-0.0	-0.00
25-24	93.00	1615106.1	1494506.2	120599.9	-0.0	-0.00
25-24	93.25	1615106.1	1494811.2	120294.9	-0.0	-0.00
25-24	93.50	1615106.1	1495114.1	119992.0	-0.0	-0.00
25-24	93.75	1615106.1	1495414.9	119691.2	-0.0	-0.00
25-24	94.00	1615106.1	1495713.6	119392.5	-0.0	-0.00
25-24	94.25	1615106.1	1496010.3	119095.8	-0.0	-0.00
25-24	94.50	1615106.1	1496305.0	118801.1	-0.0	-0.00
25-24	94.75	1615106.1	1496597.8	118508.3	-0.0	-0.00
25-24	95.00	1615106.1	1496888.6	118217.6	-0.0	-0.00
25-24	95.25	1615106.1	1497177.3	117928.8	-0.0	-0.00
25-24	95.50	1615106.1	1497464.2	117641.9	-0.0	-0.00
25-24	95.75	1615106.1	1497749.0	117357.1	-0.0	-0.00
25-24	96.00	1615106.1	1498032.0	117074.1	-0.0	-0.00
25-24	96.01	1615106.1	1498032.0	117074.1	-0.0	-0.00

Contact Water ICPR Model - Contact Water Pumping Results

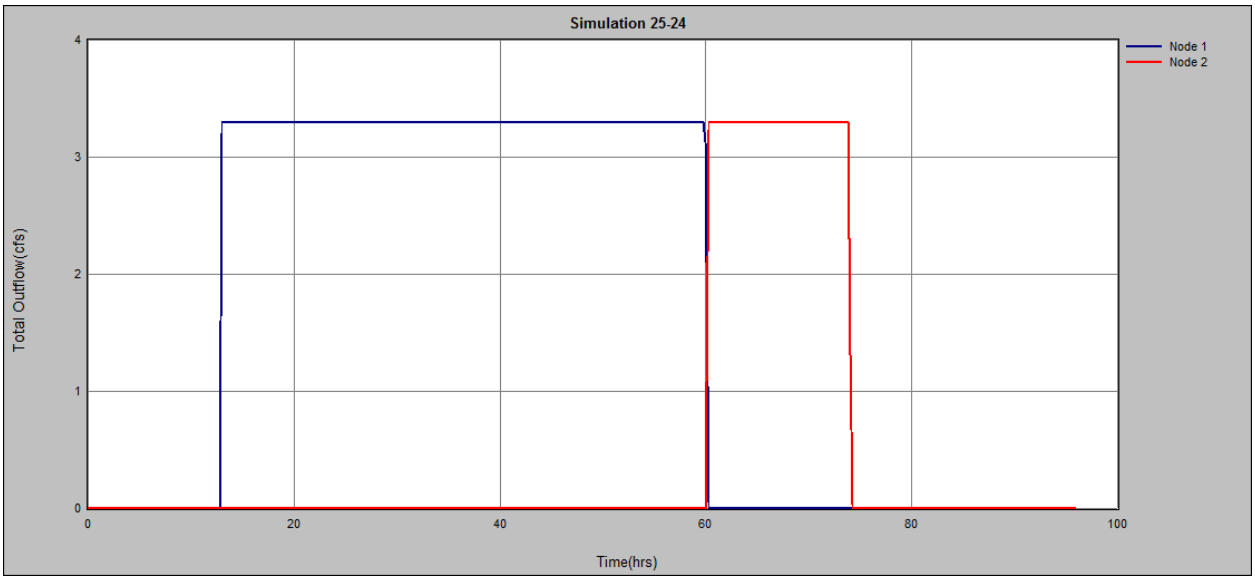
Using the estimated contact water runoff volumes from Basin 1 and Basin 2 and the contact water pump station flow rate, Golder estimated that Basin 1 could be emptied in approximately 47 hours and Basin 2 could be emptied in approximately 14 hours for a total estimated pumping time of 61 hours. Golder estimated a response time of 13 hours following the beginning of the 25-year, 24-hour storm event. Therefore, the contact water pump station operation began at a time of 13 hours. The pumping results for Basin Node 1 and Basin Node 2, which were simulated in ICPR, are summarized below:

Contact Water Pump Link	Runoff Volume (acre-feet)	Flow Rate (cfs)	Start Time (hours)	End Time (hours)	Operational Time (hours)
CW Pump 1	12.66	3.3	13	60	47
CW Pump 2	3.56	3.3	60	74	14





Appendix A


Simulation 25-24
Node 1
Node 2
Total Outflow (cfs)
Time(hrs)
0
1
2
3
4
0
20
40
60
80
100

APPENDIX B
NON-CONTACT WATER RUN-OFF CALCULATIONS AND MODEL

Time of Concentration Calculations

Hydrology calculations were completed using NRCS methods. Time of concentration values were calculated for each basin by dividing the flow paths into different segments based on overland flow characteristics. The travel times for each flow path were summed to get a time of concentration. The flow paths were divided into the following categories:

1. Sheet Flow – the maximum sheet flow distance used was 300 feet. The SCS equation for overland flow using Manning's equation was used and is shown below:

$$T_t = \frac{(0.007)(n*L)^{0.8}}{P_2^{0.5}(S)^{0.4}}$$, where:

T_t = Travel Time (min.)
n = Manning's n
L = Flow path length (ft.)
P_2 = 2-year, 24-hour rainfall (in.)
S = Flow path slope (ft./ft.)

2. Shallow Concentrated Flow –concentrated overland flow towards channels. The equation for shallow concentrated flow is shown below:

$$T_t = \frac{L}{V} * \frac{1}{60}$$, where:

T_t = Travel Time (min.)
L = Flow path length (ft.)
v = Flow velocity (feet/second)

Time of concentration calculations for each basin are presented in Table 2.

Composite Curve Number Calculations

CCR material was assumed to perform hydrologically consistent with bare soil conditions, which correlates to runoff curve number values ranging from 77 to 94 depending on the hydrologic soil group. Final cover material was assumed to perform hydrologically consistent with Open Space, Good Condition (grass cover > 75%), which correlates to runoff curve number values ranging from 39 to 80 depending on the hydrologic soil group. Hydrologic soil group B was assumed for curve number computations.

Composite curve number calculations for each basin are presented in Table 2.

TABLE 2
St. Johns River Power Park Non-Contact Stormwater Run-off Control System Plan
CURVE NUMBER & TIME OF CONCENTRATION SUMMARY
Storage Area B Phase I
Non-Contact Water Runoff

Basin Description 1 15.60 ac.

CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
9.46	Impervious	B	98	60.6%	59
6.14	Bare Soil	B	86	39.4%	34
Total: 15.60	**OK**		Weighted SCS CN =		93

Tc:

*The minimum TR-55 Time of Concentration of 0.1 hours (6 minutes) was used for this basin.

Basin Description 2 9.84 ac.

CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
1.52	Impervious	B	98	15.4%	15
8.32	Final Cover	B	61	84.6%	52
Total: 9.84	**OK**		Weighted SCS CN =		67

Tc:

*First Time of Concentration segment less than 300-ft was calculated using the TR-55 formula for sheet flow (cultivated soils - residue cover ≤ 20%)

*The remaining segments were calculated using the TR-55 velocity vs. slope criteria for shallow concentrated flow

Mannings n	$P_{2\text{-yr},24\text{-hr}}$ (in.)	Slope (ft./ft.)
0.06	5	0.02
0.06	5	0.005

Dist. (ft)		Vel. (fps)	Time (min.)
300	Sheet Flow		15.8
410	Shallow Concentrated Flow	2.10	3.3
Total: 710			
		Time of Concentration =	19.0 min.

Basin Description 3 7.24 ac.

CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
1.55	Impervious	B	98	21.4%	21
5.69	Final Cover	B	61	78.6%	48
Total: 7.24	**OK**		Weighted SCS CN =		69

Tc:

*First Time of Concentration segment less than 300-ft was calculated using the TR-55 formula for sheet flow (cultivated soils - residue cover ≤ 20%)

*The remaining segments were calculated using the TR-55 velocity vs. slope criteria for shallow concentrated flow

Mannings n	$P_{2\text{-yr},24\text{-hr}}$ (in.)	Slope (ft./ft.)
0.06	5	0.02
0.06	5	0.005

Dist. (ft)		Vel. (fps)	Time (min.)
300	Sheet Flow		15.8
362	Shallow Concentrated Flow	2.10	2.9
Total: 662			
		Time of Concentration =	18.7 min.

TABLE 2
St. Johns River Power Park Non-Contact Stormwater Run-off Control System Plan
CURVE NUMBER & TIME OF CONCENTRATION SUMMARY
Storage Area B Phase I
Non-Contact Water Runoff

Basin Description 4 24.47 ac.

CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
6.00	Bare Soil	B	98	24.5%	24
18.47	Final Cover	B	61	75.5%	46

Total: 24.47 **OK** Weighted SCS CN = 70

Tc:

*First Time of Concentration segment less than 300-ft was calculated using the TR-55 formula for sheet flow (cultivated soils - residue cover ≤ 20%)

*The remaining segments were calculated using the TR-55 velocity vs. slope criteria for shallow concentrated flow

	Mannings n	$P_{2\text{-yr},24\text{-hr}}$ (in.)	Slope (ft./ft.)
Top	0.06	5	0.02
Rim Ditch	0.06	5	0.005

Dist. (ft)		Vel. (fps)	Time (min.)
300	Sheet Flow		15.8
357	Shallow Concentrated Flow	2.10	2.8
Total: 657			

Time of Concentration = 18.6 min.

Basin Description 5 10.24 ac.

CN:

Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
2.04	Impervious	B	98	20.0%	20
8.20	Final Cover	B	61	80.0%	49

Total: 10.24 **OK** Weighted SCS CN = 68

Tc:

*The minimum TR-55 Time of Concentration of 0.1 hours (6 minutes) was used for this basin.

Basin Description 6 10.30 ac.

CN:

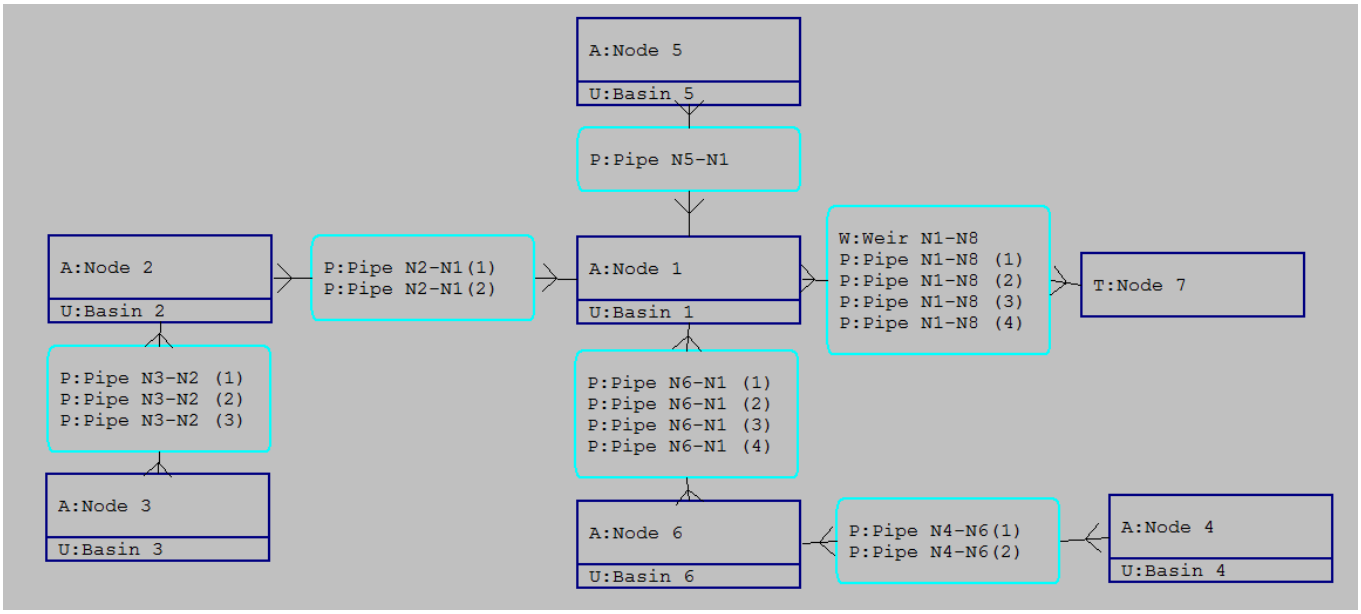
Ac.	Land Cover	Soil Type	SCS CN	%	Weight %
5.99	Impervious	B	98	58.2%	57
4.31	Bare Soil	B	86	41.8%	36

Total: 10.30 **OK** Weighted SCS CN = 93

Tc:

*The minimum TR-55 Time of Concentration of 0.1 hours (6 minutes) was used for this basin.

Non-Contact Water ICPR Nodal Diagram



Non-Contact Water ICPR Model Inputs

```
================================================================================
==== Basins ====================================================================
================================================================================

         Name: Basin 1                 Node: Node 1                Status: Onsite
        Group: 25-24                   Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.500                Time of Conc(min): 6.00
                Area(ac): 15.600                Time Shift(hrs): 0.00
           Curve Number: 93.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00

--------------------------------------------------------------------------------
         Name: Basin 2                 Node: Node 2                Status: Onsite
        Group: 25-24                   Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.500                Time of Conc(min): 19.00
                Area(ac): 9.840                 Time Shift(hrs): 0.00
           Curve Number: 67.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00

--------------------------------------------------------------------------------
         Name: Basin 3                 Node: Node 3                Status: Onsite
        Group: 25-24                   Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.500                Time of Conc(min): 18.70
                Area(ac): 7.240                 Time Shift(hrs): 0.00
           Curve Number: 69.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00

--------------------------------------------------------------------------------
         Name: Basin 4                 Node: Node 4                Status: Onsite
        Group: 25-24                   Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.500                Time of Conc(min): 18.60
                Area(ac): 24.470                Time Shift(hrs): 0.00
           Curve Number: 70.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00

--------------------------------------------------------------------------------
         Name: Basin 5                 Node: Node 5                Status: Onsite
        Group: 25-24                   Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.500                Time of Conc(min): 6.00
                Area(ac): 10.240                Time Shift(hrs): 0.00
           Curve Number: 68.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


--------------------------------------------------------------------------------
         Name: Basin 6                 Node: Node 6                Status: Onsite
        Group: 25-24                   Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.500                Time of Conc(min): 6.00
                Area(ac): 10.300                Time Shift(hrs): 0.00
           Curve Number: 93.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00
```

```
================================================================================================
==== Nodes =====================================================================================
================================================================================================

      Name: Node 1              Base Flow(cfs): 0.000          Init Stage(ft): 7.400
     Group: 25-24                                            Warn Stage(ft): 12.000
      Type: Stage/Area

      Stage(ft)        Area(ac)
--------------- ---------------
          3.000          0.8900
          4.000          5.0200
          5.000          5.8600
          6.000          6.2700
          7.000          7.8700
          8.000          8.3000
          9.000          8.6800
         10.000          9.0700
         11.000          9.4600

------------------------------------------------------------------------------------------------
      Name: Node 2              Base Flow(cfs): 0.000          Init Stage(ft): 9.000
     Group: 25-24                                            Warn Stage(ft): 13.000
      Type: Stage/Area

      Stage(ft)        Area(ac)
--------------- ---------------
          9.000          0.1500
         10.000          0.5300
         11.000          0.8400
         12.000          1.1200

------------------------------------------------------------------------------------------------
      Name: Node 3              Base Flow(cfs): 0.000          Init Stage(ft): 11.000
     Group: 25-24                                            Warn Stage(ft): 17.000
      Type: Stage/Area

      Stage(ft)        Area(ac)
--------------- ---------------
         11.000          0.0100
         12.000          0.0100
         13.000          0.1100
         14.000          0.2900
         15.000          0.5300
         16.000          0.8800

------------------------------------------------------------------------------------------------
      Name: Node 4              Base Flow(cfs): 0.000          Init Stage(ft): 11.000
     Group: 25-24                                            Warn Stage(ft): 16.000
      Type: Stage/Area

      Stage(ft)        Area(ac)
--------------- ---------------
         11.000          0.0100
         12.000          0.5000
         13.000          1.3400
         14.000          2.2900
         15.000          3.3900

------------------------------------------------------------------------------------------------
      Name: Node 5              Base Flow(cfs): 0.000          Init Stage(ft): 9.000
     Group: 25-24                                            Warn Stage(ft): 12.000
      Type: Stage/Area

      Stage(ft)        Area(ac)
--------------- ---------------
          9.000          0.0100
         10.000          0.0100
         11.000          2.4900
         12.000          2.7100
```

Name: Node 6 Base Flow(cfs): 0.000 Init Stage(ft): 7.900
Group: 25-24 Warn Stage(ft): 14.000
Type: Stage/Area

Stage(ft)	Area(ac)
-1.000	0.4300
0.000	0.8800
1.000	1.1700
2.000	1.4500
3.000	1.7500
4.000	2.0400
5.000	2.3400
6.000	2.6400
7.000	2.9900
8.000	3.3700
9.000	3.7900
10.000	4.2800
11.000	4.8100
12.000	5.3000
13.000	5.9900

Name: Node 7 Base Flow(cfs): 0.000 Init Stage(ft): 7.000
Group: 25-24 Warn Stage(ft): 7.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	7.000
30.00	7.000

==========

Cross Sections

==========

Name: X-SEC N9-N5 Group: 25-24
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	14.000	0.060000
2.000	12.000	0.060000
878.000	12.000	0.060000
880.000	12.000	0.060000

==========

Pipes

==========

Name: Pipe N1-N8 (1) From Node: Node 1 Length(ft): 44.00
Group: 25-24 To Node: Node 7 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM	
Geometry:	Circular	Circular	Solution Algorithm: Most Restrictive
Span(in):	8.00	8.00	Flow: Both
Rise(in):	8.00	8.00	Entrance Loss Coef: 0.00
Invert(ft):	7.490	7.430	Exit Loss Coef: 1.00
Manning's N:	0.011000	0.011000	Bend Loss Coef: 0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
			Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

```
---------------------------------------------------------------------------------------------------
         Name: Pipe N1-N8 (2)      From Node: Node 1             Length(ft): 44.00
        Group: 25-24                 To Node: Node 7                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                             Flow: Both
     Span(in): 8.00           8.00                      Entrance Loss Coef: 0.00
     Rise(in): 8.00           8.00                          Exit Loss Coef: 1.00
   Invert(ft): 7.500          7.470                         Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N1-N8 (3)      From Node: Node 1             Length(ft): 44.00
        Group: 25-24                 To Node: Node 7                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                             Flow: Both
     Span(in): 8.00           8.00                      Entrance Loss Coef: 0.00
     Rise(in): 8.00           8.00                          Exit Loss Coef: 1.00
   Invert(ft): 7.480          7.460                         Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N1-N8 (4)      From Node: Node 1             Length(ft): 44.00
        Group: 25-24                 To Node: Node 7                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                             Flow: Both
     Span(in): 8.00           8.00                      Entrance Loss Coef: 0.00
     Rise(in): 8.00           8.00                          Exit Loss Coef: 1.00
   Invert(ft): 7.480          7.480                         Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Circular Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N2-N1(1)       From Node: Node 2             Length(ft): 64.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                         Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 8.470          7.450                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting
```

```
---------------------------------------------------------------------------------------------------
         Name: Pipe N2-N1(2)       From Node: Node 2             Length(ft): 64.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                            Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 8.430          7.460                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N3-N2 (1)      From Node: Node 3             Length(ft): 66.00
        Group: 25-24                 To Node: Node 2                  Count: 1
                                                            Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 11.950         11.930                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N3-N2 (2)      From Node: Node 3             Length(ft): 66.00
        Group: 25-24                 To Node: Node 2                  Count: 1
                                                            Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 12.050         11.860                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N3-N2 (3)      From Node: Node 3             Length(ft): 66.00
        Group: 25-24                 To Node: Node 2                  Count: 1
                                                            Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 12.100         11.860                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting
```

```
---------------------------------------------------------------------------------------------------
         Name: Pipe N4-N6(1)       From Node: Node 4             Length(ft): 68.00
        Group: 25-24                 To Node: Node 6                  Count: 2
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 11.250         10.230                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N4-N6(2)       From Node: Node 4             Length(ft): 66.00
        Group: 25-24                 To Node: Node 6                  Count: 2
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 11.240         10.230                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N5-N1          From Node: Node 5             Length(ft): 40.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                            Flow: Both
     Span(in): 36.00          36.00                     Entrance Loss Coef: 0.00
     Rise(in): 36.00          36.00                         Exit Loss Coef: 1.00
   Invert(ft): 9.000          9.000                         Bend Loss Coef: 0.00
  Manning's N: 0.025000       0.025000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description: Circular CMP: Projecting

Downstream FHWA Inlet Edge Description: Circular CMP: Projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N6-N1 (1)      From Node: Node 6             Length(ft): 44.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 7.950          7.720                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting
```

```
---------------------------------------------------------------------------------------------------
         Name: Pipe N6-N1 (2)      From Node: Node 6             Length(ft): 44.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 7.910          7.710                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N6-N1 (3)      From Node: Node 6             Length(ft): 44.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 7.900          7.760                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

---------------------------------------------------------------------------------------------------
         Name: Pipe N6-N1 (4)      From Node: Node 6             Length(ft): 44.00
        Group: 25-24                 To Node: Node 1                  Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Vert Ellipse   Vert Ellipse                        Flow: Both
     Span(in): 24.00          24.00                     Entrance Loss Coef: 0.00
     Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
   Invert(ft): 7.920          7.720                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None

Upstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

Downstream FHWA Inlet Edge Description: Vertical Ellipse Concrete: Groove end projecting

===================================================================================================
==== Weirs ========================================================================================
===================================================================================================

         Name: Weir N1-N8          From Node: Node 1
        Group: 25-24                 To Node: Node 7
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Trapezoidal

            Bottom Width(ft): 24.00
       Left Side Slope(h/v): 3.00
      Right Side Slope(h/v): 3.00
                  Invert(ft): 8.360
      Control Elevation(ft): 8.360
     Struct Opening Dim(ft): 9999.00
                                        TABLE
             Bottom Clip(ft): 0.000
                Top Clip(ft): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600
```

```
================================================================================
==== Hydrology Simulations =====================================================
================================================================================

         Name: 25-24
     Filename: G:\Projects\15-\15-26356\Task 0800 ROROCS\Calcs\25-24.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 8.50

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

================================================================================
==== Routing Simulations =======================================================
================================================================================

         Name: 25-24              Hydrology Sim: 25-24
     Filename: G:\Projects\15-\15-26356\Task 0800 ROROCS\Calcs\25-24.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 96.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         15.000

Group           Run
--------------- -----
25-24           Yes
```

Non-Contact Water ICPR Model Results

Name	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Node 1	25-24	13.90	9.09	12.00	0.0028	379964	12.00	126.60	13.90	57.91
Node 2	25-24	12.54	10.68	13.00	-0.0062	32508	12.19	39.94	12.53	31.37
Node 3	25-24	12.27	13.45	17.00	0.0050	8486	12.17	18.27	12.27	17.22
Node 4	25-24	12.48	13.13	16.00	0.0050	63883	12.17	63.44	12.48	47.91
Node 5	25-24	12.50	10.96	12.00	-0.0050	104213	12.00	39.35	12.50	11.97
Node 6	25-24	13.16	9.64	14.00	0.0029	179237	12.00	85.25	13.32	38.05
Node 7	25-24	0.00	7.00	7.00	0.0000	3	13.90	57.91	0.00	0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
25-24	0.00	0.0	0.0	0.0	0.0	0.00
25-24	0.25	0.0	0.0	-0.0	0.0	9999.99
25-24	0.51	0.0	0.0	-0.0	0.0	9999.99
25-24	0.76	0.0	0.0	-0.0	0.0	9999.99
25-24	1.02	0.0	0.0	-0.0	0.0	9999.99
25-24	1.27	0.0	0.0	-0.0	0.0	9999.99
25-24	1.52	0.9	0.0	0.9	0.0	0.00
25-24	1.77	62.1	0.0	62.1	0.0	0.00
25-24	2.02	271.8	0.0	271.8	0.0	0.00
25-24	2.27	656.2	0.0	656.2	0.0	0.00
25-24	2.52	1210.5	0.0	1210.5	0.0	0.00
25-24	2.77	1913.9	0.0	1913.9	0.0	0.00
25-24	3.02	2751.0	0.0	2751.0	0.0	0.00
25-24	3.27	3754.1	0.0	3754.1	0.0	0.00
25-24	3.52	4919.2	0.0	4919.2	0.0	0.00
25-24	3.77	6207.9	0.0	6207.9	0.0	0.00
25-24	4.02	7603.9	0.0	7603.9	0.0	0.00
25-24	4.27	9195.9	0.0	9195.9	0.0	0.00
25-24	4.52	10971.9	0.0	10971.9	0.0	0.00
25-24	4.77	12861.9	0.0	12861.9	0.0	0.00
25-24	5.02	14844.2	0.0	14844.2	0.0	0.00
25-24	5.27	16973.4	0.0	16973.4	0.0	0.00
25-24	5.52	19236.6	0.0	19236.6	0.0	0.00
25-24	5.77	21586.2	0.0	21586.2	0.0	0.00
25-24	6.02	24008.2	0.0	24008.2	0.0	0.00
25-24	6.27	26708.3	0.0	26708.3	0.0	0.00
25-24	6.52	29657.2	0.0	29657.2	0.0	0.00
25-24	6.77	32710.3	0.0	32710.3	0.0	0.00
25-24	7.02	35851.9	0.0	35851.9	0.0	0.00
25-24	7.27	39351.6	0.0	39351.6	0.0	0.00
25-24	7.50	43032.6	0.0	43032.6	0.0	0.00
25-24	7.75	47119.0	0.0	47119.0	0.0	0.00
25-24	8.00	51498.8	0.0	51498.8	0.0	0.00
25-24	8.25	56489.8	0.3	56489.5	0.0	0.00
25-24	8.50	61972.4	1.4	61971.1	0.0	0.00
25-24	8.75	68297.9	4.3	68293.7	0.0	0.00
25-24	9.01	75478.9	10.8	75468.1	0.0	0.00
25-24	9.25	83021.9	22.7	82999.2	0.0	0.00
25-24	9.51	91623.5	44.4	91579.2	0.0	0.00
25-24	9.76	100974.7	78.0	100896.7	0.0	0.00
25-24	10.01	111414.6	129.9	111284.7	0.0	0.00
25-24	10.26	123435.1	206.2	123229.0	0.0	0.00
25-24	10.50	136964.9	315.9	136649.0	0.0	0.00
25-24	10.76	153849.0	482.8	153366.3	0.0	0.00
25-24	11.00	172624.6	712.4	171912.2	0.0	0.00
25-24	11.26	194165.1	1048.0	193117.1	0.0	0.00
25-24	11.50	224443.6	1502.6	222940.9	0.0	0.00
25-24	11.75	306280.5	2233.8	304046.7	0.0	0.00
25-24	12.00	496405.4	3735.3	492670.1	0.0	0.00
25-24	12.25	715536.3	6596.4	708939.8	0.0	0.00
25-24	12.50	865636.4	16877.8	848758.6	0.0	0.00
25-24	12.75	958239.9	38485.3	919754.6	0.0	0.00
25-24	13.00	1024239.1	71159.6	953079.5	0.0	0.00
25-24	13.25	1073859.6	112023.8	961835.8	-0.0	-0.00

25-24	13.50	1113710.5	159664.2	954046.4	-0.0	-0.00
25-24	13.75	1145362.7	210155.2	935207.5	-0.0	-0.00
25-24	14.00	1172169.6	263132.3	909037.3	-0.0	-0.00
25-24	14.25	1195521.8	314604.5	880917.3	-0.0	-0.00
25-24	14.50	1216843.5	364265.5	852578.0	-0.0	-0.00
25-24	14.75	1236337.7	411294.7	825043.0	-0.0	-0.00
25-24	15.01	1254840.5	457141.7	797698.8	-0.0	-0.00
25-24	15.25	1271772.7	498617.7	773155.0	-0.0	-0.00
25-24	15.50	1288022.8	537301.7	750721.2	-0.0	-0.00
25-24	15.75	1303424.6	573374.6	730050.0	-0.0	-0.00
25-24	16.00	1317912.7	606877.3	711035.5	-0.0	-0.00
25-24	16.25	1331824.2	638124.4	693699.9	-0.0	-0.00
25-24	16.50	1345044.4	666914.2	678130.2	-0.0	-0.00
25-24	16.75	1357712.2	693733.2	663979.0	0.0	0.00
25-24	17.00	1369836.2	718783.5	651052.7	0.0	0.00
25-24	17.25	1381740.4	742265.7	639474.8	0.0	0.00
25-24	17.50	1393552.3	764369.0	629183.2	0.0	0.00
25-24	17.75	1404700.4	785243.2	619457.2	0.0	0.00
25-24	18.00	1414957.4	804958.3	609999.1	0.0	0.00
25-24	18.25	1425192.5	823617.1	601575.4	0.0	0.00
25-24	18.50	1435734.1	841362.8	594371.4	0.0	0.00
25-24	18.75	1445741.0	858295.9	587445.2	0.0	0.00
25-24	19.00	1454957.0	874544.0	580413.0	0.0	0.00
25-24	19.26	1464417.1	890411.5	574005.5	0.0	0.00
25-24	19.50	1473527.8	904565.5	568962.3	0.0	0.00
25-24	19.75	1482803.5	918765.0	564038.5	0.0	0.00
25-24	20.00	1491664.1	932435.3	559228.8	0.0	0.00
25-24	20.25	1500067.9	945603.9	554464.0	0.0	0.00
25-24	20.50	1507985.3	958278.6	549706.7	0.0	0.00
25-24	20.75	1515711.6	970483.8	545227.8	0.0	0.00
25-24	21.00	1523450.6	982408.0	541042.6	0.0	0.00
25-24	21.26	1531254.8	994141.8	537113.0	0.0	0.00
25-24	21.51	1538817.8	1005216.2	533601.6	0.0	0.00
25-24	21.76	1546371.1	1015971.1	530400.0	0.0	0.00
25-24	22.01	1553923.2	1026430.8	527492.4	0.0	0.00
25-24	22.26	1561480.0	1036622.6	524857.3	0.0	0.00
25-24	22.51	1569040.6	1046572.9	522467.6	0.0	0.00
25-24	22.76	1576272.0	1056297.4	519974.6	0.0	0.00
25-24	23.01	1583081.8	1065782.9	517298.9	0.0	0.00
25-24	23.26	1589728.6	1075028.9	514699.7	0.0	0.00
25-24	23.51	1596302.0	1084047.4	512254.6	0.0	0.00
25-24	23.76	1602499.9	1092845.5	509654.4	0.0	0.00
25-24	24.01	1608238.4	1101406.9	506831.5	0.0	0.00
25-24	24.25	1611917.1	1109312.2	502604.9	0.0	0.00
25-24	24.50	1613558.1	1117192.3	496365.8	0.0	0.00
25-24	24.75	1614350.5	1124585.2	489765.3	0.0	0.00
25-24	25.01	1614794.5	1131631.3	483163.2	0.0	0.00
25-24	25.25	1615005.7	1138021.4	476984.3	0.0	0.00
25-24	25.51	1615086.8	1144104.7	470982.1	0.0	0.00
25-24	25.76	1615105.7	1149856.1	465249.6	0.0	0.00
25-24	26.00	1615106.1	1154969.2	460136.9	0.0	0.00
25-24	26.25	1615106.1	1159896.0	455210.1	0.0	0.00
25-24	26.50	1615106.1	1164524.2	450581.9	0.0	0.00
25-24	26.75	1615106.1	1168884.2	446221.9	0.0	0.00
25-24	27.00	1615106.1	1173003.5	442102.6	0.0	0.00
25-24	27.25	1615106.1	1176907.2	438199.0	0.0	0.00
25-24	27.50	1615106.1	1180618.5	434487.6	0.0	0.00
25-24	27.75	1615106.1	1184158.9	430947.2	0.0	0.00
25-24	28.00	1615106.1	1187548.2	427557.9	0.0	0.00
25-24	28.25	1615106.1	1190805.4	424300.7	0.0	0.00
25-24	28.50	1615106.1	1193949.0	421157.1	0.0	0.00
25-24	28.75	1615106.1	1196998.0	418108.1	0.0	0.00
25-24	29.00	1615106.1	1199974.2	415131.9	0.0	0.00
25-24	29.25	1615106.1	1202910.0	412196.1	0.0	0.00
25-24	29.50	1615106.1	1205819.3	409286.9	0.0	0.00
25-24	29.75	1615106.1	1208702.3	406403.8	0.0	0.00
25-24	30.00	1615106.1	1211559.3	403546.8	0.0	0.00
25-24	30.25	1615106.1	1214390.6	400715.5	-0.0	-0.00
25-24	30.50	1615106.1	1217196.3	397909.8	-0.0	-0.00
25-24	30.75	1615106.1	1219976.9	395129.2	-0.0	-0.00
25-24	31.00	1615106.1	1222732.5	392373.6	-0.0	-0.00
25-24	31.25	1615106.1	1225463.4	389642.7	-0.0	-0.00
25-24	31.50	1615106.1	1228169.9	386936.2	0.0	0.00
25-24	31.75	1615106.1	1230852.2	384253.9	-0.0	-0.00
25-24	32.00	1615106.1	1233510.5	381595.6	-0.0	-0.00

25-24	32.25	1615106.1	1236145.1	378961.0	-0.0	-0.00
25-24	32.50	1615106.1	1238756.2	376349.9	-0.0	-0.00
25-24	32.75	1615106.1	1241344.1	373762.0	-0.0	-0.00
25-24	33.00	1615106.1	1243908.8	371197.3	-0.0	-0.00
25-24	33.25	1615106.1	1246450.7	368655.4	-0.0	-0.00
25-24	33.50	1615106.1	1248970.0	366136.1	-0.0	-0.00
25-24	33.75	1615106.1	1251466.9	363639.2	-0.0	-0.00
25-24	34.00	1615106.1	1253941.6	361164.5	-0.0	-0.00
25-24	34.25	1615106.1	1256394.4	358711.7	-0.0	-0.00
25-24	34.50	1615106.1	1258825.6	356280.5	-0.0	-0.00
25-24	34.75	1615106.1	1261235.4	353870.7	-0.0	-0.00
25-24	35.00	1615106.1	1263623.9	351482.2	-0.0	-0.00
25-24	35.25	1615106.1	1265991.2	349114.9	-0.0	-0.00
25-24	35.50	1615106.1	1268337.5	346768.7	-0.0	-0.00
25-24	35.75	1615106.1	1270663.0	344443.1	-0.0	-0.00
25-24	36.00	1615106.1	1272967.9	342138.2	-0.0	-0.00
25-24	36.25	1615106.1	1275252.5	339853.6	-0.0	-0.00
25-24	36.50	1615106.1	1277517.1	337589.0	-0.0	-0.00
25-24	36.75	1615106.1	1279762.1	335344.0	-0.0	-0.00
25-24	37.00	1615106.1	1281987.7	333118.4	-0.0	-0.00
25-24	37.25	1615106.1	1284194.5	330911.6	-0.0	-0.00
25-24	37.50	1615106.1	1286382.3	328723.8	-0.0	-0.00
25-24	37.75	1615106.1	1288551.6	326554.5	-0.0	-0.00
25-24	38.00	1615106.1	1290702.3	324403.8	-0.0	-0.00
25-24	38.25	1615106.1	1292834.7	322271.4	-0.0	-0.00
25-24	38.50	1615106.1	1294948.6	320157.5	-0.0	-0.00
25-24	38.75	1615106.1	1297044.4	318061.7	-0.0	-0.00
25-24	39.00	1615106.1	1299122.0	315984.1	-0.0	-0.00
25-24	39.25	1615106.1	1301183.0	313923.1	-0.0	-0.00
25-24	39.50	1615106.1	1303230.3	311875.8	-0.0	-0.00
25-24	39.75	1615106.1	1305262.8	309843.3	-0.0	-0.00
25-24	40.00	1615106.1	1307282.7	307823.4	-0.0	-0.00
25-24	40.25	1615106.1	1309290.3	305815.8	-0.0	-0.00
25-24	40.50	1615106.1	1311285.8	303820.4	-0.0	-0.00
25-24	40.75	1615106.1	1313273.9	301832.2	-0.0	-0.00
25-24	41.00	1615106.1	1315251.0	299855.1	-0.0	-0.00
25-24	41.25	1615106.1	1317214.9	297891.3	-0.0	-0.00
25-24	41.50	1615106.1	1319164.6	295941.6	-0.0	-0.00
25-24	41.75	1615106.1	1321099.7	294006.4	-0.0	-0.00
25-24	42.00	1615106.1	1323019.7	292086.4	0.0	0.00
25-24	42.25	1615106.1	1324924.4	290181.7	0.0	0.00
25-24	42.50	1615106.1	1326813.6	288292.5	0.0	0.00
25-24	42.75	1615106.1	1328687.0	286419.1	0.0	0.00
25-24	43.00	1615106.1	1330544.6	284561.5	0.0	0.00
25-24	43.25	1615106.1	1332386.1	282720.0	0.0	0.00
25-24	43.50	1615106.1	1334211.6	280894.5	-0.0	-0.00
25-24	43.75	1615106.1	1336020.8	279085.3	0.0	0.00
25-24	44.00	1615106.1	1337813.9	277292.2	-0.0	-0.00
25-24	44.25	1615106.1	1339590.6	275515.5	-0.0	-0.00
25-24	44.50	1615106.1	1341351.3	273754.8	-0.0	-0.00
25-24	44.75	1615106.1	1343095.5	272010.6	-0.0	-0.00
25-24	45.00	1615106.1	1344823.5	270282.7	-0.0	-0.00
25-24	45.25	1615106.1	1346535.4	268570.7	-0.0	-0.00
25-24	45.50	1615106.1	1348231.0	266875.2	-0.0	-0.00
25-24	45.75	1615106.1	1349910.8	265195.3	-0.0	-0.00
25-24	46.00	1615106.1	1351574.7	263531.4	-0.0	-0.00
25-24	46.25	1615106.1	1353222.8	261883.4	-0.0	-0.00
25-24	46.50	1615106.1	1354855.3	260250.9	-0.0	-0.00
25-24	46.75	1615106.1	1356471.8	258634.3	-0.0	-0.00
25-24	47.00	1615106.1	1358073.3	257032.8	-0.0	-0.00
25-24	47.25	1615106.1	1359658.9	255447.2	-0.0	-0.00
25-24	47.50	1615106.1	1361229.6	253876.5	-0.0	-0.00
25-24	47.75	1615106.1	1362784.6	252321.5	-0.0	-0.00
25-24	48.00	1615106.1	1364324.7	250781.4	-0.0	-0.00
25-24	48.25	1615106.1	1365849.5	249256.6	-0.0	-0.00
25-24	48.50	1615106.1	1367359.3	247746.9	-0.0	-0.00
25-24	48.75	1615106.1	1368854.1	246252.1	-0.0	-0.00
25-24	49.00	1615106.1	1370334.3	244771.8	-0.0	-0.00
25-24	49.25	1615106.1	1371799.7	243306.4	-0.0	-0.00
25-24	49.50	1615106.1	1373250.4	241855.7	-0.0	-0.00
25-24	49.75	1615106.1	1374687.1	240419.1	-0.0	-0.00
25-24	50.00	1615106.1	1376109.1	238997.0	-0.0	-0.00
25-24	50.25	1615106.1	1377516.9	237589.2	-0.0	-0.00
25-24	50.50	1615106.1	1378910.5	236195.6	-0.0	-0.00
25-24	50.75	1615106.1	1380290.2	234815.9	-0.0	-0.00

25-24	51.00	1615106.1	1381655.9	233450.2	-0.0	-0.00
25-24	51.25	1615106.1	1383007.7	232098.4	-0.0	-0.00
25-24	51.50	1615106.1	1384345.6	230760.5	-0.0	-0.00
25-24	51.75	1615106.1	1385670.2	229435.9	-0.0	-0.00
25-24	52.00	1615106.1	1386981.1	228125.0	-0.0	-0.00
25-24	52.25	1615106.1	1388278.6	226827.5	-0.0	-0.00
25-24	52.50	1615106.1	1389562.8	225543.3	-0.0	-0.00
25-24	52.75	1615106.1	1390833.7	224272.4	-0.0	-0.00
25-24	53.00	1615106.1	1392091.8	223014.3	-0.0	-0.00
25-24	53.25	1615106.1	1393336.9	221769.3	-0.0	-0.00
25-24	53.50	1615106.1	1394569.2	220536.9	-0.0	-0.00
25-24	53.75	1615106.1	1395788.8	219317.3	-0.0	-0.00
25-24	54.00	1615106.1	1396995.8	218110.4	-0.0	-0.00
25-24	54.25	1615106.1	1398190.1	216916.0	-0.0	-0.00
25-24	54.50	1615106.1	1399372.4	215733.7	-0.0	-0.00
25-24	54.75	1615106.1	1400542.7	214563.4	-0.0	-0.00
25-24	55.00	1615106.1	1401700.8	213405.3	-0.0	-0.00
25-24	55.25	1615106.1	1402846.9	212259.2	-0.0	-0.00
25-24	55.50	1615106.1	1403981.4	211124.7	-0.0	-0.00
25-24	55.75	1615106.1	1405104.3	210001.8	-0.0	-0.00
25-24	56.00	1615106.1	1406215.4	208890.8	-0.0	-0.00
25-24	56.25	1615106.1	1407315.0	207791.1	-0.0	-0.00
25-24	56.50	1615106.1	1408403.4	206702.8	-0.0	-0.00
25-24	56.75	1615106.1	1409480.9	205625.2	-0.0	-0.00
25-24	57.00	1615106.1	1410547.4	204558.8	-0.0	-0.00
25-24	57.25	1615106.1	1411602.8	203503.3	-0.0	-0.00
25-24	57.50	1615106.1	1412647.4	202458.7	-0.0	-0.00
25-24	57.75	1615106.1	1413681.4	201424.7	-0.0	-0.00
25-24	58.00	1615106.1	1414705.1	200401.0	-0.0	-0.00
25-24	58.25	1615106.1	1415718.3	199387.9	-0.0	-0.00
25-24	58.50	1615106.1	1416720.9	198385.2	-0.0	-0.00
25-24	58.75	1615106.1	1417713.4	197392.7	-0.0	-0.00
25-24	59.00	1615106.1	1418695.8	196410.3	-0.0	-0.00
25-24	59.25	1615106.1	1419668.3	195437.9	-0.0	-0.00
25-24	59.50	1615106.1	1420631.0	194475.1	-0.0	-0.00
25-24	59.75	1615106.1	1421584.0	193522.1	-0.0	-0.00
25-24	60.00	1615106.1	1422527.3	192578.8	-0.0	-0.00
25-24	60.25	1615106.1	1423461.2	191645.0	-0.0	-0.00
25-24	60.50	1615106.1	1424385.6	190720.5	-0.0	-0.00
25-24	60.75	1615106.1	1425300.8	189805.3	-0.0	-0.00
25-24	61.00	1615106.1	1426206.8	188899.3	-0.0	-0.00
25-24	61.25	1615106.1	1427103.8	188002.4	-0.0	-0.00
25-24	61.50	1615106.1	1427991.8	187114.3	-0.0	-0.00
25-24	61.75	1615106.1	1428871.1	186235.0	-0.0	-0.00
25-24	62.00	1615106.1	1429741.8	185364.3	-0.0	-0.00
25-24	62.25	1615106.1	1430603.8	184502.3	-0.0	-0.00
25-24	62.50	1615106.1	1431457.4	183648.7	-0.0	-0.00
25-24	62.75	1615106.1	1432302.4	182803.7	-0.0	-0.00
25-24	63.00	1615106.1	1433139.1	181967.0	-0.0	-0.00
25-24	63.25	1615106.1	1433967.7	181138.4	-0.0	-0.00
25-24	63.50	1615106.1	1434788.2	180318.0	-0.0	-0.00
25-24	63.75	1615106.1	1435600.6	179505.5	-0.0	-0.00
25-24	64.00	1615106.1	1436405.4	178700.7	-0.0	-0.00
25-24	64.25	1615106.1	1437202.5	177903.6	-0.0	-0.00
25-24	64.50	1615106.1	1437991.8	177114.3	-0.0	-0.00
25-24	64.75	1615106.1	1438773.4	176332.8	-0.0	-0.00
25-24	65.00	1615106.1	1439547.5	175558.6	-0.0	-0.00
25-24	65.25	1615106.1	1440314.2	174791.9	-0.0	-0.00
25-24	65.50	1615106.1	1441073.5	174032.6	-0.0	-0.00
25-24	65.75	1615106.1	1441825.5	173280.7	-0.0	-0.00
25-24	66.00	1615106.1	1442570.4	172535.7	-0.0	-0.00
25-24	66.25	1615106.1	1443308.1	171798.0	-0.0	-0.00
25-24	66.50	1615106.1	1444038.9	171067.2	-0.0	-0.00
25-24	66.75	1615106.1	1444762.9	170343.3	-0.0	-0.00
25-24	67.00	1615106.1	1445480.1	169626.0	-0.0	-0.00
25-24	67.25	1615106.1	1446190.5	168915.6	-0.0	-0.00
25-24	67.50	1615106.1	1446894.3	168211.8	-0.0	-0.00
25-24	67.75	1615106.1	1447591.4	167514.7	-0.0	-0.00
25-24	68.00	1615106.1	1448282.2	166823.9	-0.0	-0.00
25-24	68.25	1615106.1	1448966.5	166139.6	-0.0	-0.00
25-24	68.50	1615106.1	1449644.4	165461.7	-0.0	-0.00
25-24	68.75	1615106.1	1450316.0	164790.1	-0.0	-0.00
25-24	69.00	1615106.1	1450981.5	164124.6	-0.0	-0.00
25-24	69.25	1615106.1	1451640.9	163465.2	-0.0	-0.00
25-24	69.50	1615106.1	1452294.3	162811.8	-0.0	-0.00

25-24	69.75	1615106.1	1452941.7	162164.4	-0.0	-0.00
25-24	70.00	1615106.1	1453583.2	161522.9	-0.0	-0.00
25-24	70.25	1615106.1	1454219.0	160887.1	-0.0	-0.00
25-24	70.50	1615106.1	1454849.2	160257.0	-0.0	-0.00
25-24	70.75	1615106.1	1455473.6	159632.5	-0.0	-0.00
25-24	71.00	1615106.1	1456092.4	159013.7	-0.0	-0.00
25-24	71.25	1615106.1	1456705.6	158400.5	-0.0	-0.00
25-24	71.50	1615106.1	1457313.3	157792.8	-0.0	-0.00
25-24	71.75	1615106.1	1457915.6	157190.5	-0.0	-0.00
25-24	72.00	1615106.1	1458512.4	156593.7	-0.0	-0.00
25-24	72.25	1615106.1	1459104.0	156002.1	-0.0	-0.00
25-24	72.50	1615106.1	1459690.3	155415.8	-0.0	-0.00
25-24	72.75	1615106.1	1460271.4	154834.7	-0.0	-0.00
25-24	73.00	1615106.1	1460847.5	154258.6	-0.0	-0.00
25-24	73.25	1615106.1	1461418.5	153687.6	-0.0	-0.00
25-24	73.50	1615106.1	1461984.6	153121.6	-0.0	-0.00
25-24	73.75	1615106.1	1462545.6	152560.5	-0.0	-0.00
25-24	74.00	1615106.1	1463101.7	152004.4	-0.0	-0.00
25-24	74.25	1615106.1	1463653.0	151453.1	-0.0	-0.00
25-24	74.50	1615106.1	1464199.6	150906.5	-0.0	-0.00
25-24	74.75	1615106.1	1464741.4	150364.7	-0.0	-0.00
25-24	75.00	1615106.1	1465278.5	149827.6	-0.0	-0.00
25-24	75.25	1615106.1	1465811.0	149295.1	-0.0	-0.00
25-24	75.50	1615106.1	1466339.0	148767.1	-0.0	-0.00
25-24	75.75	1615106.1	1466862.5	148243.6	-0.0	-0.00
25-24	76.00	1615106.1	1467381.6	147724.5	-0.0	-0.00
25-24	76.25	1615106.1	1467896.3	147209.8	-0.0	-0.00
25-24	76.50	1615106.1	1468406.6	146699.5	-0.0	-0.00
25-24	76.75	1615106.1	1468912.7	146193.5	-0.0	-0.00
25-24	77.00	1615106.1	1469414.4	145691.8	-0.0	-0.00
25-24	77.25	1615106.1	1469911.9	145194.3	-0.0	-0.00
25-24	77.50	1615106.1	1470405.2	144700.9	-0.0	-0.00
25-24	77.75	1615106.1	1470894.5	144211.6	-0.0	-0.00
25-24	78.00	1615106.1	1471379.8	143726.3	-0.0	-0.00
25-24	78.25	1615106.1	1471861.0	143245.1	-0.0	-0.00
25-24	78.50	1615106.1	1472338.3	142767.8	-0.0	-0.00
25-24	78.75	1615106.1	1472811.6	142294.5	-0.0	-0.00
25-24	79.00	1615106.1	1473281.0	141825.1	-0.0	-0.00
25-24	79.25	1615106.1	1473746.6	141359.5	-0.0	-0.00
25-24	79.50	1615106.1	1474208.4	140897.7	-0.0	-0.00
25-24	79.75	1615106.1	1474666.5	140439.6	-0.0	-0.00
25-24	80.00	1615106.1	1475121.0	139985.1	-0.0	-0.00
25-24	80.25	1615106.1	1475571.8	139534.3	-0.0	-0.00
25-24	80.50	1615106.1	1476019.0	139087.1	-0.0	-0.00
25-24	80.75	1615106.1	1476462.5	138643.6	-0.0	-0.00
25-24	81.00	1615106.1	1476902.5	138203.6	-0.0	-0.00
25-24	81.25	1615106.1	1477339.0	137767.1	-0.0	-0.00
25-24	81.50	1615106.1	1477772.0	137334.1	-0.0	-0.00
25-24	81.75	1615106.1	1478201.7	136904.4	-0.0	-0.00
25-24	82.00	1615106.1	1478628.0	136478.1	-0.0	-0.00
25-24	82.25	1615106.1	1479051.0	136055.1	-0.0	-0.00
25-24	82.50	1615106.1	1479470.7	135635.5	-0.0	-0.00
25-24	82.75	1615106.1	1479887.0	135219.1	-0.0	-0.00
25-24	83.00	1615106.1	1480300.1	134806.1	-0.0	-0.00
25-24	83.25	1615106.1	1480709.9	134396.2	-0.0	-0.00
25-24	83.50	1615106.1	1481116.6	133989.6	-0.0	-0.00
25-24	83.75	1615106.1	1481520.1	133586.0	-0.0	-0.00
25-24	84.00	1615106.1	1481920.6	133185.5	-0.0	-0.00
25-24	84.25	1615106.1	1482318.0	132788.1	-0.0	-0.00
25-24	84.50	1615106.1	1482712.3	132393.8	-0.0	-0.00
25-24	84.75	1615106.1	1483103.6	132002.6	-0.0	-0.00
25-24	85.00	1615106.1	1483491.8	131614.3	-0.0	-0.00
25-24	85.25	1615106.1	1483877.0	131229.1	-0.0	-0.00
25-24	85.50	1615106.1	1484259.3	130846.8	-0.0	-0.00
25-24	85.75	1615106.1	1484638.7	130467.4	-0.0	-0.00
25-24	86.00	1615106.1	1485015.2	130090.9	-0.0	-0.00
25-24	86.25	1615106.1	1485389.0	129717.2	-0.0	-0.00
25-24	86.50	1615106.1	1485759.8	129346.3	-0.0	-0.00
25-24	86.75	1615106.1	1486127.9	128978.2	-0.0	-0.00
25-24	87.00	1615106.1	1486493.3	128612.9	-0.0	-0.00
25-24	87.25	1615106.1	1486855.9	128250.2	-0.0	-0.00
25-24	87.50	1615106.1	1487215.9	127890.2	-0.0	-0.00
25-24	87.75	1615106.1	1487573.3	127532.8	-0.0	-0.00
25-24	88.00	1615106.1	1487928.0	127178.1	-0.0	-0.00
25-24	88.25	1615106.1	1488280.1	126826.0	-0.0	-0.00

25-24	88.50	1615106.1	1488629.6	126476.5	-0.0	-0.00
25-24	88.75	1615106.1	1488976.4	126129.7	-0.0	-0.00
25-24	89.00	1615106.1	1489320.8	125785.4	-0.0	-0.00
25-24	89.25	1615106.1	1489662.5	125443.6	-0.0	-0.00
25-24	89.50	1615106.1	1490001.9	125104.2	-0.0	-0.00
25-24	89.75	1615106.1	1490338.8	124767.4	-0.0	-0.00
25-24	90.00	1615106.1	1490673.2	124432.9	-0.0	-0.00
25-24	90.25	1615106.1	1491005.3	124100.8	-0.0	-0.00
25-24	90.50	1615106.1	1491335.0	123771.1	-0.0	-0.00
25-24	90.75	1615106.1	1491662.4	123443.7	-0.0	-0.00
25-24	91.00	1615106.1	1491987.5	123118.6	-0.0	-0.00
25-24	91.25	1615106.1	1492310.2	122795.9	-0.0	-0.00
25-24	91.50	1615106.1	1492630.7	122475.4	-0.0	-0.00
25-24	91.75	1615106.1	1492948.8	122157.3	-0.0	-0.00
25-24	92.00	1615106.1	1493264.7	121841.4	-0.0	-0.00
25-24	92.25	1615106.1	1493578.4	121527.8	-0.0	-0.00
25-24	92.50	1615106.1	1493889.8	121216.3	-0.0	-0.00
25-24	92.75	1615106.1	1494199.1	120907.0	-0.0	-0.00
25-24	93.00	1615106.1	1494506.2	120599.9	-0.0	-0.00
25-24	93.25	1615106.1	1494811.2	120294.9	-0.0	-0.00
25-24	93.50	1615106.1	1495114.1	119992.0	-0.0	-0.00
25-24	93.75	1615106.1	1495414.9	119691.2	-0.0	-0.00
25-24	94.00	1615106.1	1495713.6	119392.5	-0.0	-0.00
25-24	94.25	1615106.1	1496010.3	119095.8	-0.0	-0.00
25-24	94.50	1615106.1	1496305.0	118801.1	-0.0	-0.00
25-24	94.75	1615106.1	1496597.8	118508.3	-0.0	-0.00
25-24	95.00	1615106.1	1496888.6	118217.6	-0.0	-0.00
25-24	95.25	1615106.1	1497177.3	117928.8	-0.0	-0.00
25-24	95.50	1615106.1	1497464.2	117641.9	-0.0	-0.00
25-24	95.75	1615106.1	1497749.0	117357.1	-0.0	-0.00
25-24	96.00	1615106.1	1498032.0	117074.1	-0.0	-0.00
25-24	96.01	1615106.1	1498032.0	117074.1	-0.0	-0.00