# Town of Perdido Beach Comprehensive Drainage Master Plan

TOWN OF PERDIDO BEACH PROJECT NO. 636502.AV
BALDWIN COUNTY, ALABAMA
May 2017

FUNDING FOR THIS PROJECT WAS PROVIDED BY THE ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES STATE LANDS DIVISION, COASTAL SECTION, AS PART OF A GRANT FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT, AWARD # NA15NOS4190139

Prepared By

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# Table of Contents

# Glossary

A (area) – drainage area in a watershed

C (runoff coefficient) – dimensionless value used to describe the function of the cover of the watershed or drainage area

I (rainfall intensity) – amount of rain expressed in inches per hour

GPS (global positioning system) – is a satellite-based system that can be used to locate positions anywhere on the earth.

L (length) – distant in feet from the most remote point in a watershed to the watershed outlet.

LIDAR (light detection and ranging) – surveying technology that measures distance by illuminating a target with a laser light.

Q (peak flow) – peak flow in cubic feet per second of a drainage area

S (average overland slope) – difference in elevation between two points

$T_c$ (time of concentration) – time needed for water to flow from the most remote point in a watershed to the watershed outlet. It is a function of the topography, geology, and land use within the watershed.

# Executive Summary

The Town of Perdido Beach is located between Palmetto Creek, Soldier Creek, and Perdido Bay, in the southeastern region of Baldwin County, Alabama. The town was incorporated in 2009 and presently has a population of approximately 631 permanent residents per the 2015 Census Estimate, as well as a large number of home owners and property owners who live elsewhere and claim Perdido Beach as their home away from home.

Town Council began in 2008 to preserve the town, the land, and all those who inhabit it. Since then, the Town of Perdido Beach has adopted a Master Plan in 2013 and has contracted Volkert, Inc. to develop a Comprehensive Drainage Master Plan for the Town of Perdido Beach as a part of this effort. Funding for this Comprehensive Drainage Master Plan was provided by the Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section, in part by a grant from the National Oceanic and Atmospheric Administration, and the Town of Perdido Beach.

The drainage study scope was to study the existing mapping to establish an understanding of the overall drainage patterns. With this information, a model of existing drainage flow patterns within their respective sub-basins was developed. Extensive field reviews were completed to compare what was shown in the model versus what was seen in the field. This information was used to analyze the existing drainage infrastructure. With the results from this analysis, critical areas were identified and recommendations made. LIDAR (light detection and ranging), in the form of 1-foot and 5-foot contours, was used to separate the Town of Perdido Beach into 18 major basins with a total of 556.1 acres of storm water runoff.

# Project Information

## Scope of Services:

The scope of this project was to develop an inventory of the existing drainage structures within the Town of Perdido Beach and to study the existing mapping to establish an understanding of the overall drainage patterns. With this information, a model of existing drainage flow patterns within their respective sub-basins was developed. Extensive field reviews were completed to make sure what was shown in the model represented what was seen in the field. This information was used to do a cursory analysis of the existing drainage infrastructure. With the results from this analysis, critical areas were identified and recommendations made to improve the flow of stormwater through the town. It should be noted that a detailed survey and design will need to be performed as the Town of Perdido Beach obtains funds to make the proposed improvements. LIDAR, in the form of 1-foot and 5-foot contours, was used to separate the Town of Perdido Beach into 18 major basins with a total of 556.1 acres of storm water runoff. Infrastructure information was gathered by GPSing existing conditions.

## Design Criteria

For this study, all pipes were analyzed in the existing conditions. The results of this analysis determined what structures need maintenance and what structures need to be upgraded. All existing and proposed pipe culverts crossing a road were analyzed for the 50-year storm and then checked for the 100-year storm to make sure it was not overtopping the road. All existing pipes under driveways and all roadside ditches were analyzed for the 10-year storm. Recommended pipe sizes are shown as round reinforced concrete pipe, but equivalent pipe sizes can be used. The proposed ditch typical section is a 2-foot-deep, 4-foot bottom ditch with a 4:1 front slope and a 3:1 back slope. The proposed swale typical section is 2-foot-deep with 4:1 front and back slopes. Regrading and shaping of existing ditches must conform to these two typical sections to adequately convey the runoff. It is recommended that permission may need to be obtained from property owners for construction of proposed infrastructure. Any pipe proposed in the future is recommended to be a minimum 18” RCP for maintenance purposes. See typical section in appendix for details of the proposed ditch and swale.

## Existing Conditions:

The majority of the existing pipes and ditches within the Town of Perdido Beach need immediate attention. Most of the pipes either lack the capacity to carry the runoff based on the 10-year or 50-year storm event or are damaged and/or filled with sediment. The ditches are also undersized and/or filled with sediment. A complete list of these pipes and ditches can be found in the corresponding basin overview section in the Appendix.

# Data Collection

Listed below are items used to develop the Town of Perdido Beach Comprehensive Drainage Master Plan.

- Town of Perdido Beach Ordinance 2011-02 and Scope of Services provided by the Town of Perdido Beach defined the requirements of the drainage study. Immediate and future improvements were reviewed from onsite investigations taking into consideration of green/low impact methods.

- The town's Subdivision Regulations and Master Plan was taken into consideration when the drainage study was performed, specifically existing and future development that will impact the town's drainage systems.

- LIDAR, light detection and ranging in the form of Contour Mapping is a rapid, cost-effective source of high-accuracy, high-density elevation data for many traditional topographic mapping applications. This technology allows large area topographic surveys to be completed significantly faster and at a reduced cost compared to traditional methods by illuminating a target with a laser light. The LIDAR used to define the drainage basins and sub-basins within the town were 1-foot and 5-foot LIDAR contours.

- Town limits were provided to Volkert, Inc. by the Town of Perdido Beach to specify the drainage study area.

- GPS, Global Positioning System, surveying was used to set control points. The control points were then utilized to get the location and invert elevations of all the existing pipes. Elevation of some pipes could not be obtained due to the amount of sediment in the pipes. During the site inspections and surveying, culverts were visually inspected, noted for their size and material type, and photographed. Ditches were also noted for their approximate top width, bottom width, approximate slopes, and conditions.

- Site photos were taken of all the culverts within the town limits. These photos show the existing condition of the culverts. Some of the qualities taken into consideration were whether the culvert is in good shape, if there is damage, or if there is sedimentation build-up.

# Data Analysis

The Rational Method was used to determine the peak runoff volumes. The ALHYDRO program was used to obtain the values for the intensity equation that was used to calculate the flow. The Rational Method estimates peak runoff using: intensity-duration-frequency (IDF) curves for a given location, a runoff coefficient based upon the characteristics of the basin, and the area of the basin expressed in acres.

The Rational Formula in US Customary units is:

Q=C i A

where

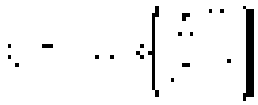
Q is design flow rate (cfs)

C is rational coefficient for drainage area

i is rainfall intensity (inches/hour)

A is drainage area (acres)

The Time of Concentration formula used was the Kirpich formula.



Where

$T_c$ is time of concentration in minutes

L is length of overland flow in feet

S is average overland slope in ft/ft

A standard drainage coefficient "C" chart was used in the calculations for obtaining the basin and sub-basin flows. See chart below.

| C VALUES | |
|---|---|
| PAVED | 0.90 |
| RESIDENTIAL | 0.50 |
| GRASS | 0.35 |
| WOODS | 0.25 |

Existing and proposed culverts and ditches were designed using Bentley's StormCad V8i(SS4). StormCad provides comprehensive modeling for the design and analysis of storm sewer systems using the peak flow method (Rational Method).

# Results and Recommendations

Analysis results, basin maps, summaries, cost estimates, pictures, and available public involvement comments are located under each drainage basin overview section in the Appendix.

## Immediate Improvements:

Immediate improvements are items that need prompt attention so the existing systems can be minimally functional. For the most part, these issues include sediment removal from pipes and ditches and some minimal ditch regrading. Within the drainage basins where these issues are identified, it is recommended that low impact designs be implemented and installed.

## Future Improvements:

Future improvements are improvements to the existing systems so the systems can function at the appropriate storm event. These improvements include pipe upsizing, extensive ditch regrading, new pipe, new ditches, and/or new outfalls. Within the drainage basins where these issues are identified, it is recommended that low impact designs be implemented and installed. These improvements will be prioritized by basin.

## Low Impact Development:

Low impact development (LID) is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial, and industrial settings. LID employs principles such as preserving and recreating natural landscape features and minimizing impervious surfaces to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product. Practices that adhere to these LID principles include bioretention facilities, rain gardens, vegetated rooftops, rainwater harvesting (rain barrels and cisterns), and permeable pavements. A natural design is to have a sodded swale or ditch. A fully vegetated swale or ditch can be used allowing certain types of native vegetation to slow runoff, treat runoff, and provide an optic view of the system.

## Basin Priority:

All basins were analyzed and prioritized. The priority chart lists a summary of the cost estimate for each basin. Cost did not factor into the prioritization of the basins. Basin prioritization was strictly on an as needed basis and where known drainage issues exist. Some of the items

considered included undersized pipes, locations where pipes are needed, drainage conveyances, and new outfalls being required. Typically, the larger the basin, the higher the cost and the more drainage structures, the higher the cost. See the following basin priority chart.

| BASIN PRIORITY CHART | |
|---|---|
| BASIN # | COST ESTIMATE |
| 15 | $214,293.75 |
| 11 | $86,422.50 |
| 7 | $242,646.00 |
| 13 | $187,507.75 |
| 10 | $282,508.25 |
| 9 | $166,126.75 |
| 4 | $205,527.25 |
| 17 | $67,429.50 |
| 6 | $73,929.75 |
| 8 | $129,748.00 |
| 1 | $98,688.75 |
| 3 | $63,674.00 |
| 12 | $41,193.75 |
| 2 | $94,158.50 |
| 16 | $44,785.00 |
| 18 | $47,208.25 |
| 14 | $41,648.00 |
| 5 | ------- |

**Cost Estimate:**

The cost estimates are only a best guess of what the costs and fees for each basin were estimated to be based upon current information available. These fees are not all inclusive and unit costs could vary in the actual design phase of the project or projects. The cost estimates are based upon the improvements that became apparent during the cursory review performed for this study. Costs could vary once the more detailed survey and design are performed.

# DITCH TYPICALS

STANDARD DITCH




STANDARD SWALE

# DITCH TYPICALS

VOLKERT

CONSTRUCTION DRAWINGS

SCALE: NONE

# PRIORITY CHART

| BASIN PRIORITY CHART | |
|---|---|
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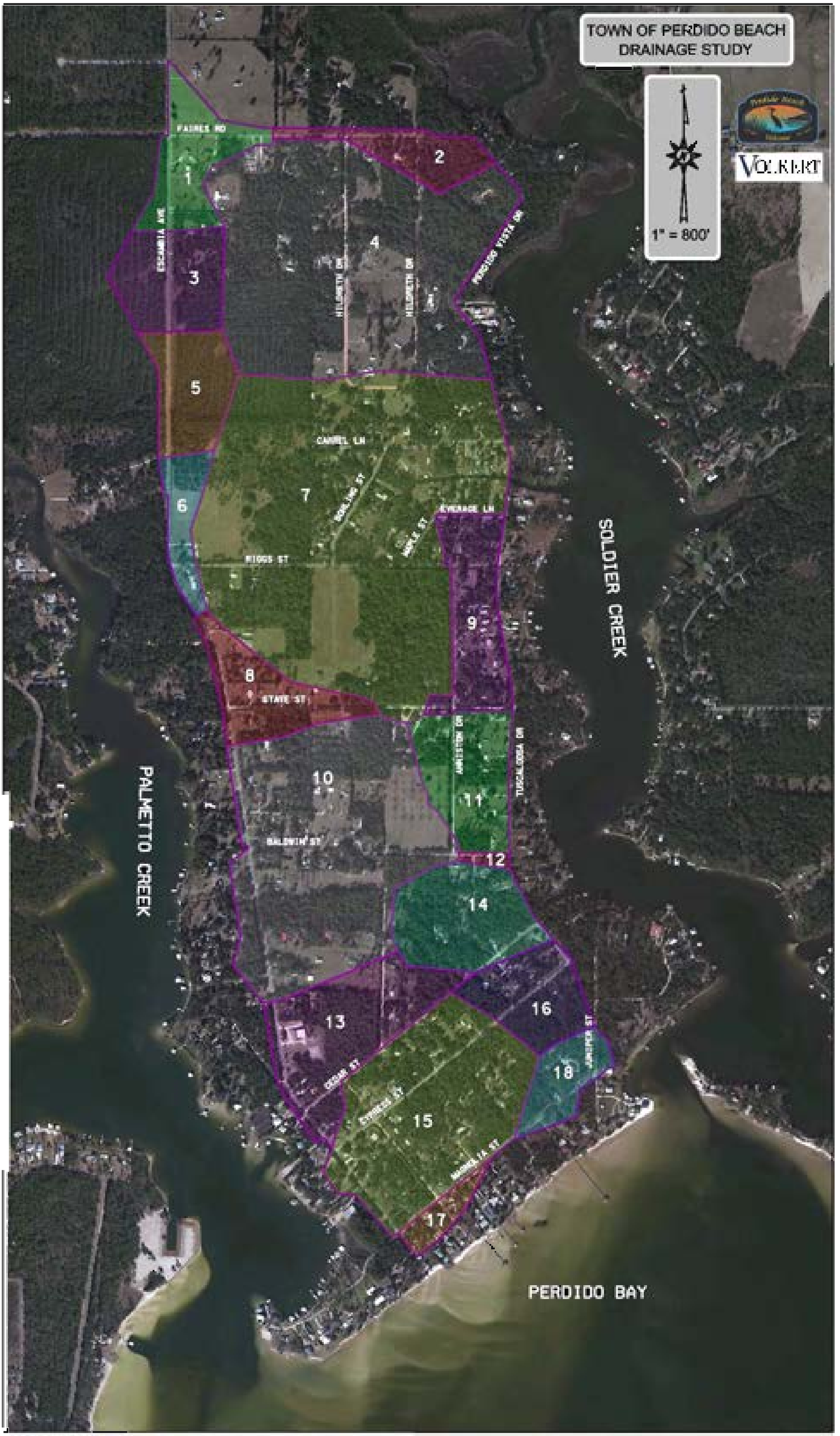
| 14 | $41,648.00 |
| 5 | ------- |

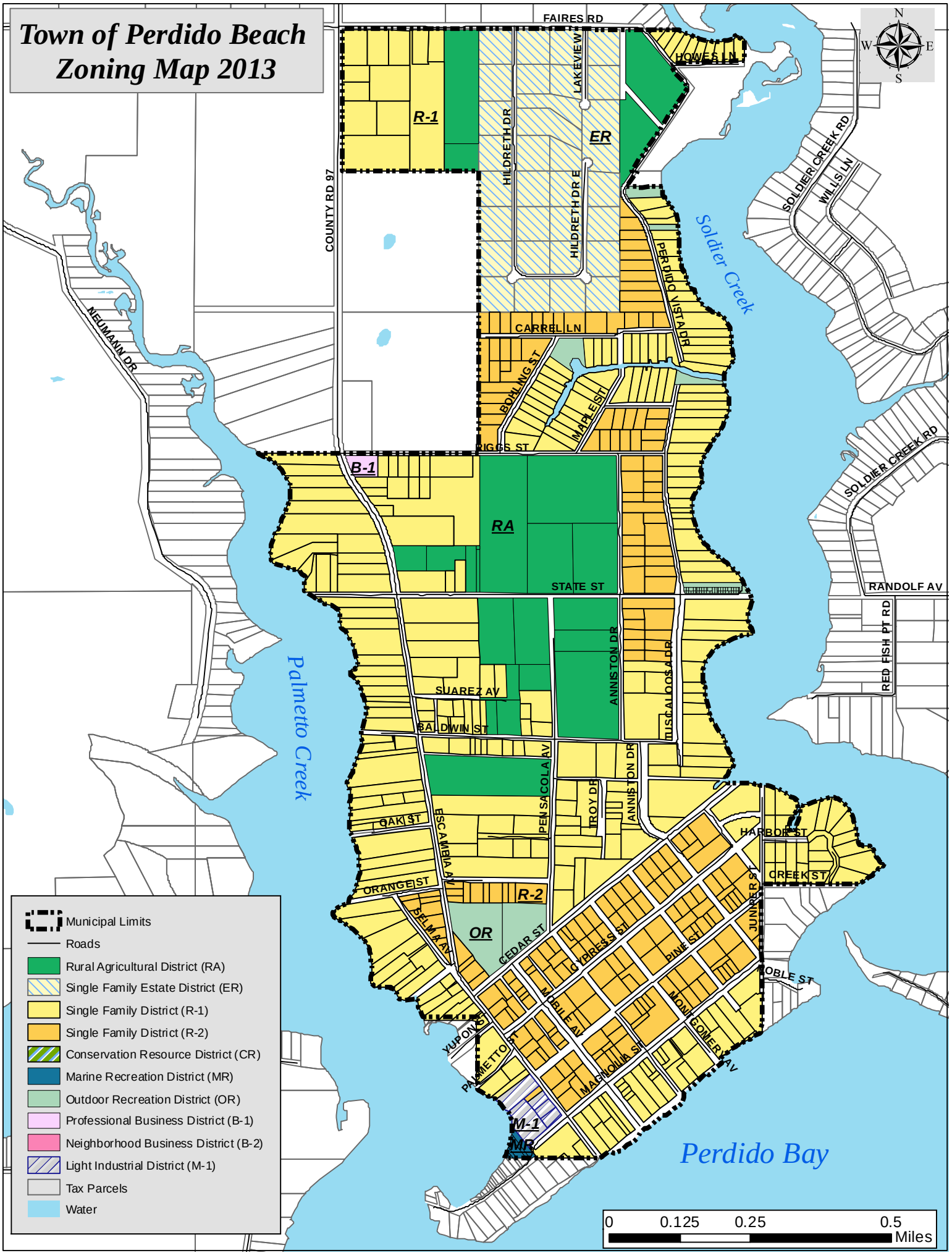
# OVERALL DRAINAGE BASIN MAP

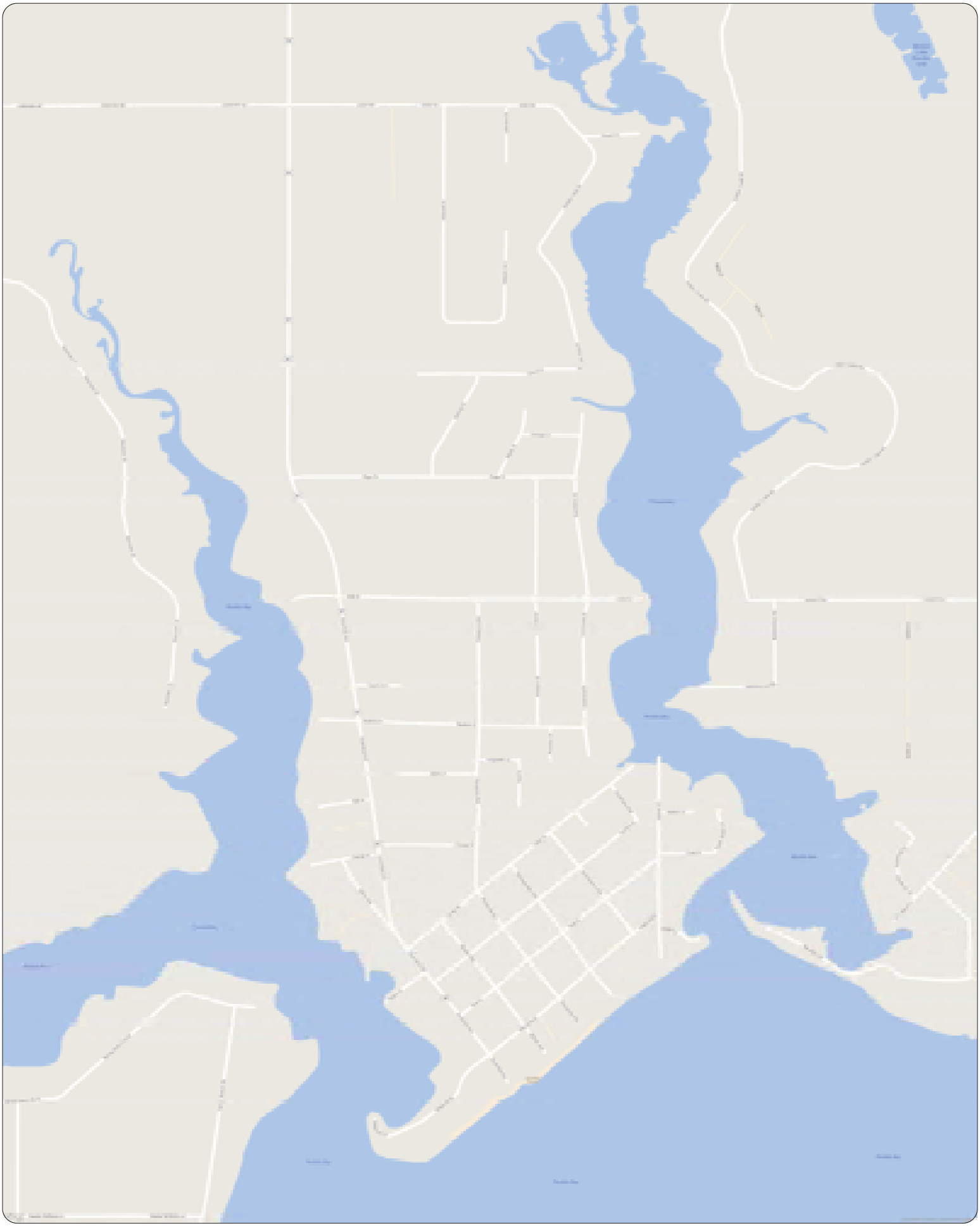

TOWN OF PERDIDO BEACH
DRAINAGE STUDY
1" = 800'
VOLKERT
PAIRES RD
SR 173
HILLCREST DR
CARREL LN
RIGGS ST
EVERAGE LN
STATE ST
BALDWIN ST
SOLDIER CREEK
PALMETTO CREEK
PERDIDO BAY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

# QUAD MAP


TOWN OF PERDIDO BEACH
DRAINAGE STUDY
1" = 800'
VOLKERT
Soldier
Creek
Creek
Perdido
Beach
Perdido
Beach
7
7
17
18
18
19

# LOCATION MAP


Town of Perdido Beach
Zoning Map 2013
FAIRES RD
HOWES LN
LAKEVIEW
HILDRETH DR
HILDRETH DR E
R-1
ER
COUNTY RD 97
NEUMANN DR
SOLDIER CREEK RD
WILLIS LN
Soldier Creek
PERDIDO VISTA DR
CARREL LN
BOWLING ST
MAPLE ST
RIGGS ST
B-1
RA
STATE ST
RANDOLF AV
RED FISH PT RD
Palmetto Creek
SUAREZ AV
BALDWIN ST
ANNISTON DR
MUSCALOOSA DR
PENSACOLA AV
TROY DR
OAK ST
ESCAMBIA AV
ORANGE ST
SELMA AV
R-2
OR
CEDAR ST
HARBOR ST
CREEK ST
JUNIPER ST
CYPRESS ST
PINE ST
MOBILE AV
MONTGOMERY AV
MAGNOLIA ST
YUPON ST
PALMETTO ST
M-1
MR
Perdido Bay
Municipal Limits
Roads
Rural Agricultural District (RA)
Single Family Estate District (ER)
Single Family District (R-1)
Single Family District (R-2)
Conservation Resource District (CR)
Marine Recreation District (MR)
Outdoor Recreation District (OR)
Professional Business District (B-1)
Neighborhood Business District (B-2)
Light Industrial District (M-1)
Tax Parcels
Water
0 0.125 0.25 0.5
Miles
N
W
E
S



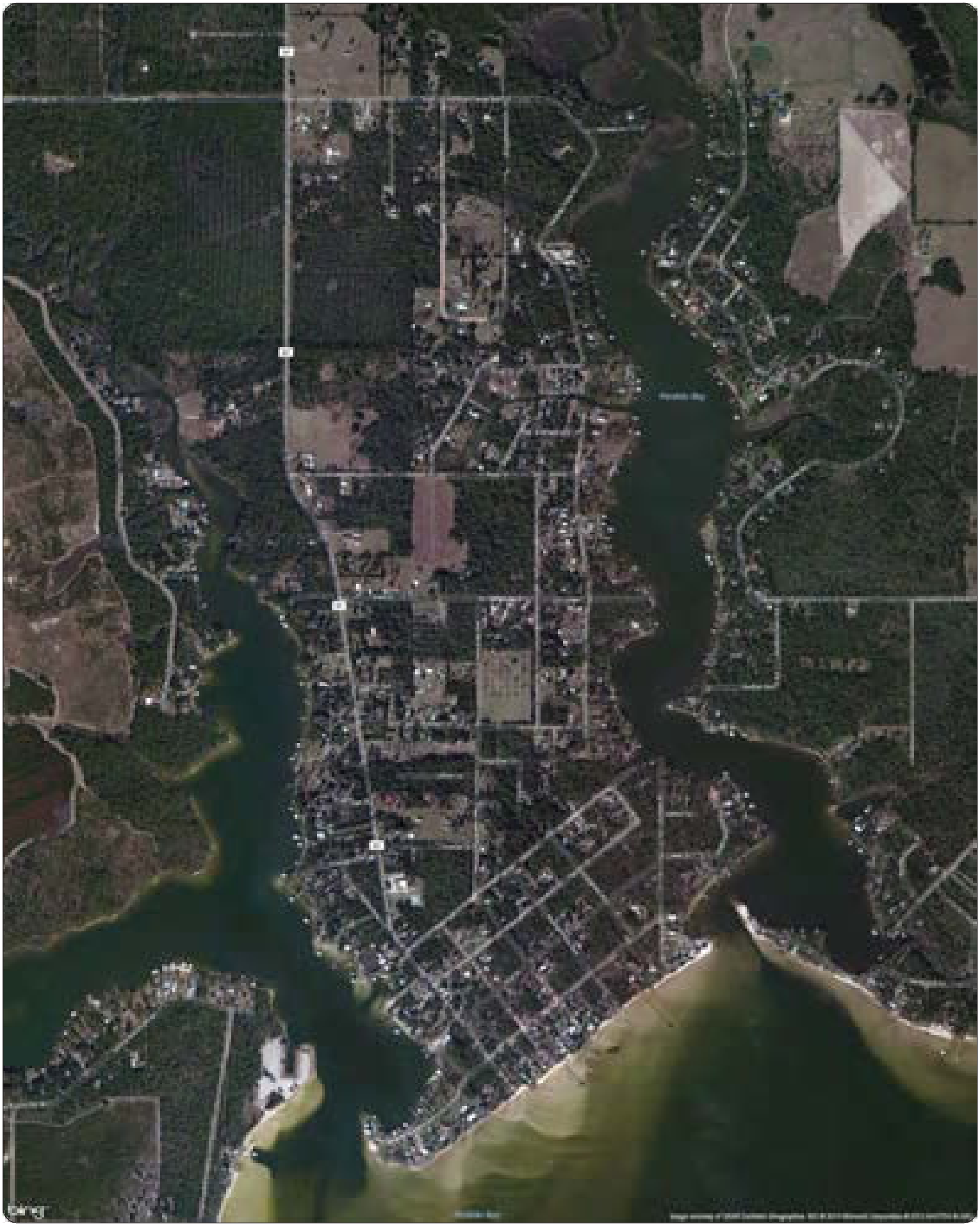
VOLKERT

0 500 1,000 2,000 Feet

1 inch = 300 feet

# PERDIDO BEACH

Path: H:\Projects\634500.AV Town of Perdido Beach\Mapping\GIS\Overall Public.mxd



VOLKERT

0 500 1,000 2,000 Feet

1 inch = 600 feet

Note: This map is for presentation use only and not to be used for construction purposes.

# PERDIDO BEACH

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# DRAINAGE AREAS

# DRAINAGE AREAS

**PROJECT NO.:**
**DESCRIPTION:**
**DATE:**

| DRAINAGE AREA NUMBER | AREA PAVED (SF) | AREA PAVED (AC.) | AREA GRASSED (SF) | AREA GRASSED (AC.) | AREA WOODED (SF) | AREA WOODED (AC.) | OTHER AREA (SF) | OTHER AREA (AC.) | TOTAL AREA (AC.) | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 0.000 | | 0.000 | | | | | | |
| 1.01 | 1121 | 0.026 | 4486 | 0.103 | | 0.000 | | 0.000 | 0.129 | 0.46 |
| 1.02 | 773 | 0.018 | 3046 | 0.070 | | 0.000 | | 0.000 | 0.088 | 0.46 |
| 1.03 | 2742 | 0.063 | 11 | 0.000 | | 0.000 | | 0.000 | 0.063 | 0.90 |
| 1.04 | 673 | 0.015 | 2693 | 0.062 | | 0.000 | | 0.000 | 0.077 | 0.46 |
| 1.05 | 3955 | 0.091 | 15819 | 0.363 | | 0.000 | | 0.000 | 0.454 | 0.46 |
| 1.06 | 3460 | 0.079 | 34133 | 0.784 | | 0.000 | | 0.000 | 0.863 | 0.40 |
| 1.07 | 5012 | 0.115 | 257516 | 5.912 | | 0.000 | | 0.000 | 6.027 | 0.36 |
| 1.08 | 439 | 0.010 | 38284 | 0.879 | | 0.000 | | 0.000 | 0.889 | 0.36 |
| 1.09 | 2093 | 0.048 | 58554 | 1.344 | | 0.000 | | 0.000 | 1.392 | 0.37 |
| 1.10 | 10691 | 0.245 | 131738 | 3.024 | | 0.000 | | 0.000 | 3.270 | 0.39 |
| 1.11 | 17969 | 0.413 | 237721 | 5.457 | | 0.000 | | 0.000 | 5.870 | 0.39 |
| 2.01 | 7222 | 0.166 | 41493 | 0.953 | | 0.000 | | 0.000 | 1.118 | 0.43 |
| 2.02 | 2696 | 0.062 | 6657 | 0.153 | | 0.000 | | 0.000 | 0.215 | 0.51 |
| 2.03 | 4075 | 0.094 | 10062 | 0.231 | | 0.000 | | 0.000 | 0.325 | 0.51 |
| 2.04 | 5942 | 0.136 | 30268 | 0.695 | | 0.000 | | 0.000 | 0.831 | 0.44 |
| 2.05 | 1850 | 0.042 | 6788 | 0.156 | | 0.000 | | 0.000 | 0.198 | 0.47 |
| 2.06 | 6594 | 0.151 | 34574 | 0.794 | | 0.000 | | 0.000 | 0.945 | 0.44 |
| 2.07 | 61 | 0.001 | | 0.000 | 63775 | 1.464 | | 0.000 | 1.465 | 0.25 |
| 2.08 | | 0.000 | | 0.000 | 47290 | 1.086 | | 0.000 | 1.086 | 0.25 |
| 2.09 | 277 | 0.006 | 5422 | 0.124 | | 0.000 | | 0.000 | 0.131 | 0.38 |
| 2.10 | 3444 | 0.079 | | 0.000 | 180103 | 4.135 | | 0.000 | 4.214 | 0.26 |
| 2.11 | 4585 | 0.105 | | 0.000 | 78054 | 1.792 | | 0.000 | 1.897 | 0.29 |
| 3.01 | 951 | 0.022 | 50596 | 1.162 | | 0.000 | | 0.000 | 1.183 | 0.36 |
| 3.02 | 1534 | 0.035 | 64702 | 1.485 | | 0.000 | | 0.000 | 1.521 | 0.36 |
| 3.03 | 4487 | 0.103 | 95475 | 2.192 | | 0.000 | | 0.000 | 2.295 | 0.37 |
| 3.04 | | 0.000 | 188899 | 4.337 | | 0.000 | | 0.000 | 4.337 | 0.35 |
| 3.05 | 4293 | 0.099 | 74520 | 1.711 | | 0.000 | | 0.000 | 1.809 | 0.38 |
| 3.06 | 6949 | 0.160 | 228116 | 5.237 | | 0.000 | | 0.000 | 5.396 | 0.37 |
| 3.07 | 4319 | 0.099 | 171197 | 3.930 | | 0.000 | | 0.000 | 4.029 | 0.36 |
| 4.01 | | 0.000 | | 0.000 | 108356 | 2.488 | | 0.000 | 2.488 | 0.25 |
| 4.02 | | 0.000 | 9114 | 0.209 | 196097 | 4.502 | | 0.000 | 4.711 | 0.25 |
| 4.03 | | 0.000 | 209512 | 4.810 | 760135 | 17.450 | | 0.000 | 22.260 | 0.27 |
| 4.04 | | 0.000 | | 0.000 | 333765 | 7.662 | | 0.000 | 7.662 | 0.25 |
| 4.05 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | 0.000 | 0.00 |
| 4.06 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | 0.000 | 0.00 |
| 4.07 | | 0.000 | 23908 | 0.549 | | 0.000 | | 0.000 | 0.549 | 0.35 |
| 4.08 | | 0.000 | 134810 | 3.095 | | 0.000 | | 0.000 | 3.095 | 0.35 |
| 4.09 | 11114 | 0.255 | | 0.000 | 358615 | 8.233 | | 0.000 | 8.488 | 0.27 |
| 4.10 | 3183 | 0.073 | 549467 | 12.614 | 975960 | 22.405 | | 0.000 | 35.092 | 0.29 |
| 4.11 | 4376 | 0.100 | | 0.000 | 188042 | 4.317 | | 0.000 | 4.417 | 0.26 |
| 4.12 | 4991 | 0.115 | | 0.000 | 254722 | 5.848 | | 0.000 | 5.962 | 0.26 |
| 4.13 | | 0.000 | 30833 | 0.708 | | 0.000 | | 0.000 | 0.708 | 0.35 |
| 4.14 | | 0.000 | 24885 | 0.571 | | 0.000 | | 0.000 | 0.571 | 0.35 |
| 5.01 | 6472 | 0.149 | | 0.000 | 224892 | 5.163 | | 0.000 | 5.311 | 0.27 |
| 5.02 | | 0.000 | | 0.000 | 193450 | 4.441 | | 0.000 | 4.441 | 0.25 |
| 5.03 | 7496 | 0.172 | | 0.000 | 202450 | 4.648 | | 0.000 | 4.820 | 0.27 |
| 5.04 | 6469 | 0.149 | | 0.000 | 74336 | 1.707 | | 0.000 | 1.855 | 0.30 |
| 5.05 | 7518 | 0.173 | | 0.000 | 47396 | 1.088 | | 0.000 | 1.261 | 0.34 |
| 6.01 | 9785 | 0.225 | 130726 | 3.001 | 117634 | 2.701 | | 0.000 | 5.926 | 0.33 |
| 6.02 | 5018 | 0.115 | 41278 | 0.948 | | 0.000 | | 0.000 | 1.063 | 0.41 |
| 6.03 | 2740 | 0.063 | 15751 | 0.362 | | 0.000 | | 0.000 | 0.424 | 0.43 |
| 6.04 | 6399 | 0.147 | 63162 | 1.450 | | 0.000 | | 0.000 | 1.597 | 0.40 |
| 6.05 | 4134 | 0.095 | 17668 | 0.406 | | 0.000 | | 0.000 | 0.501 | 0.45 |
| 7.01 | 5746 | 0.132 | 203684 | 4.676 | 152837 | 3.509 | 209249 | 4.804 | 13.120 | 0.38 |
| 7.02 | 5246 | 0.120 | 83921 | 1.927 | | 0.000 | 136752 | 3.139 | 5.186 | 0.45 |
| 7.03 | 2991 | 0.069 | 1448 | 0.033 | 48820 | 1.121 | 46111 | 1.059 | 2.281 | 0.39 |
| 7.04 | 2961 | 0.068 | 830 | 0.019 | 68736 | 1.578 | | 0.000 | 1.665 | 0.28 |
| 7.05 | 6236 | 0.143 | 20497 | 0.471 | 262034 | 6.015 | | 0.000 | 6.629 | 0.27 |
| 7.06 | 10465 | 0.240 | | 0.000 | | 0.000 | 114168 | 2.621 | 2.861 | 0.53 |
| 7.07 | 4876 | 0.112 | 15030 | 0.345 | | 0.000 | | 0.000 | 0.457 | 0.48 |
| 7.08 | 10839 | 0.249 | | 0.000 | 774772 | 17.786 | 64215 | 1.474 | 19.509 | 0.28 |
| 7.09 | 8220 | 0.189 | 30146 | 0.692 | | 0.000 | | 0.000 | 0.881 | 0.47 |
| 7.10 | 1309 | 0.030 | 12722 | 0.292 | 255624 | 5.868 | 21699 | 0.498 | 6.689 | 0.28 |
| 7.11 | 14238 | 0.327 | 410380 | 9.421 | 268134 | 6.156 | | 0.000 | 15.903 | 0.32 |
| 7.12 | 616 | 0.014 | 1663 | 0.038 | | 0.000 | | 0.000 | 0.052 | 0.50 |
| 7.13 | 3341 | 0.077 | | 0.000 | 24949 | 0.573 | | 0.000 | 0.649 | 0.33 |
| 7.14 | 2137 | 0.049 | | 0.000 | | 0.000 | 78945 | 1.812 | 1.861 | 0.51 |
| 7.15 | 865 | 0.020 | | 0.000 | 85157 | 1.955 | | 0.000 | 1.975 | 0.26 |
| 7.16 | 5685 | 0.131 | 146240 | 3.357 | 368143 | 8.451 | | 0.000 | 11.939 | 0.29 |
| 7.17 | 5985 | 0.137 | 189120 | 4.342 | 87288 | 2.004 | | 0.000 | 6.483 | 0.33 |
| 7.18 | | 0.000 | 326102 | 7.486 | 682262 | 15.663 | | 0.000 | 23.149 | 0.28 |
| 7.19 | 761 | 0.017 | | 0.000 | 127166 | 2.919 | | 0.000 | 2.937 | 0.25 |
| 7.20 | 9039 | 0.208 | | 0.000 | 366381 | 8.411 | | 0.000 | 8.618 | 0.27 |
| 7.21 | 4121 | 0.095 | 8125 | 0.187 | 68357 | 1.569 | | 0.000 | 1.850 | 0.29 |
| 7.22 | 4740 | 0.109 | 4740 | 0.109 | | 0.000 | | 0.000 | 0.218 | 0.63 |
| 7.23 | 5150 | 0.118 | 10332 | 0.237 | | 0.000 | | 0.000 | 0.355 | 0.53 |
| 7.24 | 5487 | 0.126 | 9870 | 0.227 | | 0.000 | | 0.000 | 0.353 | 0.55 |
| 7.25 | 3772 | 0.087 | 7079 | 0.163 | | 0.000 | | 0.000 | 0.249 | 0.54 |
| 8.01 | 1388 | 0.032 | 12241 | 0.281 | | 0.000 | | 0.000 | 0.313 | 0.41 |
| 8.02 | 846 | 0.019 | 5922 | 0.136 | | 0.000 | | 0.000 | 0.155 | 0.42 |
| 8.03 | 2949 | 0.068 | 36881 | 0.847 | | 0.000 | | 0.000 | 0.914 | 0.39 |
| 8.04 | 526 | 0.012 | 43255 | 0.993 | | 0.000 | | 0.000 | 1.005 | 0.36 |
| 8.05 | 2557 | 0.059 | 111248 | 2.554 | | 0.000 | | 0.000 | 2.613 | 0.36 |
| 8.06 | 2379 | 0.055 | 189668 | 4.354 | 17940 | 0.412 | | 0.000 | 4.821 | 0.35 |

| INPUT C VALUES | |
|---|---|
| C PAVED | 0.9 |
| C GRASS | 0.35 |
| C WOOD | 0.25 |
| C OTHER | 0.5 |

**INTENSITY EQUATION COORDINATES FROM HYDRO RUN (GIVEN BY ALDOT)**

| YEAR | A | B | M |
|---|---|---|---|
| 2 | 37.72 | 7.89 | 0.653 |
| 5 | 39.17 | 7.9 | 0.614 |
| 10 | 44.17 | 7.98 | 0.618 |
| 25 | 49.08 | 8.01 | 0.608 |
| 50 | 52.84 | 8.02 | 0.6 |
| 100 | 56.99 | 8.04 | 0.596 |

THIS CURVE IS FOR TOWN OF PERDIDO BEACH, AL

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.07 | 2158 | 0.050 | 2380 | 0.055 | | 0.000 | | 0.000 | 0.104 | 0.61 |
| 8.08 | 1045 | 0.024 | 1682 | 0.039 | | 0.000 | | 0.000 | 0.063 | 0.56 |
| 8.09 | 1958 | 0.045 | 4272 | 0.098 | | 0.000 | | 0.000 | 0.143 | 0.52 |
| 8.10 | 8708 | 0.200 | 20376 | 0.468 | | 0.000 | | 0.000 | 0.668 | 0.51 |
| 8.11 | 12930 | 0.297 | 33072 | 0.759 | | 0.000 | | 0.000 | 1.056 | 0.50 |
| 8.12 | 3787 | 0.087 | 71834 | 1.649 | 136918 | 3.143 | | 0.000 | 4.879 | 0.30 |
| 8.13 | 1118 | 0.026 | | 0.000 | 24129 | 0.554 | | 0.000 | 0.580 | 0.28 |
| 8.14 | 2791 | 0.064 | | 0.000 | 11187 | 0.257 | | 0.000 | 0.321 | 0.38 |
| 8.15 | 5039 | 0.116 | | 0.000 | 24185 | 0.555 | | 0.000 | 0.671 | 0.36 |
| 8.16 | 2699 | 0.062 | | 0.000 | 10893 | 0.250 | | 0.000 | 0.312 | 0.38 |
| 8.17 | 2749 | 0.063 | 9210 | 0.211 | | 0.000 | | 0.000 | 0.275 | 0.48 |
| 8.18 | 1783 | 0.041 | 6580 | 0.151 | | 0.000 | | 0.000 | 0.192 | 0.47 |
| 9.01 | 1445 | 0.033 | 2655 | 0.061 | | 0.000 | | 0.000 | 0.094 | 0.54 |
| 9.02 | 1391 | 0.032 | 2636 | 0.061 | | 0.000 | | 0.000 | 0.092 | 0.54 |
| 9.03 | 774 | 0.018 | 1434 | 0.033 | | 0.000 | | 0.000 | 0.051 | 0.54 |
| 9.04 | 3023 | 0.069 | 4849 | 0.111 | | 0.000 | | 0.000 | 0.181 | 0.56 |
| 9.05 | 3153 | 0.072 | | 0.000 | | 0.000 | 62426 | 1.433 | 1.505 | 0.52 |
| 9.06 | 3227 | 0.074 | | 0.000 | | 0.000 | 60493 | 1.389 | 1.463 | 0.52 |
| 9.07 | 4944 | 0.113 | | 0.000 | | 0.000 | 98107 | 2.252 | 2.366 | 0.52 |
| 9.08 | 6257 | 0.144 | 11913 | 0.273 | | 0.000 | | 0.000 | 0.417 | 0.54 |
| 9.09 | 1768 | 0.041 | 3700 | 0.085 | | 0.000 | | 0.000 | 0.126 | 0.53 |
| 9.10 | 1724 | 0.040 | 3197 | 0.073 | | 0.000 | | 0.000 | 0.113 | 0.54 |
| 9.11 | 2008 | 0.046 | 3145 | 0.072 | | 0.000 | | 0.000 | 0.118 | 0.56 |
| 9.12 | | 0.000 | 62111 | 1.426 | | 0.000 | | 0.000 | 1.426 | 0.35 |
| 9.13 | | 0.000 | | 0.000 | 25049 | 0.575 | | 0.000 | 0.575 | 0.25 |
| 9.14 | 358 | 0.008 | 14976 | 0.344 | | 0.000 | | 0.000 | 0.352 | 0.36 |
| 9.15 | 3935 | 0.090 | | 0.000 | | 0.000 | 140557 | 3.227 | 3.317 | 0.51 |
| 9.16 | 515 | 0.012 | | 0.000 | | 0.000 | 19736 | 0.453 | 0.465 | 0.51 |
| 9.17 | 1184 | 0.027 | | 0.000 | | 0.000 | 44987 | 1.033 | 1.060 | 0.51 |
| 9.18 | 1165 | 0.027 | | 0.000 | | 0.000 | 40150 | 0.922 | 0.948 | 0.51 |
| 9.19 | 2930 | 0.067 | | 0.000 | | 0.000 | 99085 | 2.275 | 2.342 | 0.51 |
| 9.20 | 1252 | 0.029 | | 0.000 | | 0.000 | 42347 | 0.972 | 1.001 | 0.51 |
| 9.21 | 1485 | 0.034 | | 0.000 | | 0.000 | 48551 | 1.115 | 1.149 | 0.51 |
| 9.22 | 1025 | 0.024 | | 0.000 | | 0.000 | 33083 | 0.759 | 0.783 | 0.51 |
| 9.23 | 1097 | 0.025 | | 0.000 | | 0.000 | 35633 | 0.818 | 0.843 | 0.51 |
| 9.24 | 686 | 0.016 | | 0.000 | | 0.000 | 18575 | 0.426 | 0.442 | 0.51 |
| 9.25 | | 0.000 | 17502 | 0.402 | | 0.000 | | 0.000 | 0.402 | 0.35 |
| 9.26 | | 0.000 | 15686 | 0.360 | | 0.000 | | 0.000 | 0.360 | 0.35 |
| 10.01 | 4697 | 0.108 | | 0.000 | 29483 | 0.677 | 108958 | 2.501 | 3.286 | 0.46 |
| 10.02 | 2469 | 0.057 | | 0.000 | 14393 | 0.330 | 65400 | 1.501 | 1.888 | 0.47 |
| 10.03 | 474 | 0.011 | | 0.000 | | 0.000 | 17712 | 0.407 | 0.417 | 0.51 |
| 10.04 | | 0.000 | | 0.000 | | 0.000 | 21978 | 0.505 | 0.505 | 0.50 |
| 10.05 | 1659 | 0.038 | | 0.000 | | 0.000 | 10259 | 0.236 | 0.274 | 0.56 |
| 10.06 | 1224 | 0.028 | | 0.000 | | 0.000 | 36041 | 0.827 | 0.855 | 0.51 |
| 10.07 | 992 | 0.023 | | 0.000 | | 0.000 | 29004 | 0.666 | 0.689 | 0.51 |
| 10.08 | 625 | 0.014 | 6178 | 0.142 | | 0.000 | | 0.000 | 0.156 | 0.40 |
| 10.09 | 7441 | 0.171 | 73963 | 1.698 | | 0.000 | | 0.000 | 1.869 | 0.40 |
| 10.10 | 1068 | 0.025 | 40694 | 0.934 | | 0.000 | | 0.000 | 0.959 | 0.36 |
| 10.11 | 1825 | 0.042 | 36078 | 0.828 | | 0.000 | 11385 | 0.261 | 1.131 | 0.41 |
| 10.12 | 1795 | 0.041 | 35400 | 0.813 | | 0.000 | 23052 | 0.529 | 1.383 | 0.42 |
| 10.13 | 2494 | 0.057 | 33122 | 0.760 | 7783 | 0.179 | 24089 | 0.553 | 1.549 | 0.41 |
| 10.14 | 2127 | 0.049 | 208822 | 4.794 | 176383 | 4.049 | 106983 | 2.456 | 11.348 | 0.35 |
| 10.15 | 556 | 0.013 | | 0.000 | 226852 | 5.208 | 109593 | 2.516 | 7.736 | 0.33 |
| 10.16 | 976 | 0.022 | | 0.000 | 307829 | 7.067 | 58405 | 1.341 | 8.430 | 0.29 |
| 10.17 | 2627 | 0.060 | | 0.000 | | 0.000 | 155157 | 3.562 | 3.622 | 0.51 |
| 10.18 | 1996 | 0.046 | | 0.000 | | 0.000 | 37020 | 0.850 | 0.896 | 0.52 |
| 10.19 | 2401 | 0.055 | | 0.000 | | 0.000 | 8045 | 0.185 | 0.240 | 0.59 |
| 10.20 | 10188 | 0.234 | | 0.000 | | 0.000 | 73895 | 1.696 | 1.930 | 0.55 |
| 10.21 | 481 | 0.011 | | 0.000 | | 0.000 | 40104 | 0.921 | 0.932 | 0.50 |
| 10.22 | 781 | 0.018 | | 0.000 | | 0.000 | 3663 | 0.084 | 0.102 | 0.57 |
| 10.23 | 418 | 0.010 | | 0.000 | | 0.000 | 922 | 0.021 | 0.031 | 0.62 |
| 10.24 | 507 | 0.012 | | 0.000 | | 0.000 | 735 | 0.017 | 0.029 | 0.66 |
| 10.25 | 2081 | 0.048 | | 0.000 | | 0.000 | 21648 | 0.497 | 0.545 | 0.54 |
| 10.26 | 602 | 0.014 | | 0.000 | | 0.000 | 1561 | 0.036 | 0.050 | 0.61 |
| 10.27 | 4091 | 0.094 | | 0.000 | | 0.000 | 8267 | 0.190 | 0.284 | 0.63 |
| 10.28 | 2050 | 0.047 | | 0.000 | | 0.000 | 2042 | 0.047 | 0.094 | 0.70 |
| 10.29 | 1458 | 0.033 | 99846 | 2.292 | 128006 | 2.939 | 123936 | 2.845 | 8.109 | 0.37 |
| 10.30 | 15527 | 0.356 | 67832 | 1.557 | 450418 | 10.340 | 517220 | 11.874 | 24.128 | 0.39 |
| 10.31 | 874 | 0.020 | 3282 | 0.075 | | 0.000 | | 0.000 | 0.095 | 0.47 |
| 10.32 | 1952 | 0.045 | 7292 | 0.167 | | 0.000 | | 0.000 | 0.212 | 0.47 |
| 10.33 | 1930 | 0.044 | 7204 | 0.165 | | 0.000 | | 0.000 | 0.210 | 0.47 |
| 10.34 | 1340 | 0.031 | 4997 | 0.115 | | 0.000 | | 0.000 | 0.145 | 0.47 |
| 10.35 | 266 | 0.006 | 991 | 0.023 | | 0.000 | | 0.000 | 0.029 | 0.47 |
| 10.36 | 2008 | 0.046 | 7484 | 0.172 | | 0.000 | | 0.000 | 0.218 | 0.47 |
| 10.37 | 1142 | 0.026 | 4255 | 0.098 | | 0.000 | | 0.000 | 0.124 | 0.47 |
| 10.38 | 1837 | 0.042 | 6839 | 0.157 | | 0.000 | | 0.000 | 0.199 | 0.47 |
| 10.39 | 560 | 0.013 | 1736 | 0.040 | | 0.000 | | 0.000 | 0.053 | 0.48 |
| 10.40 | 1150 | 0.026 | 14843 | 0.341 | | 0.000 | | 0.000 | 0.367 | 0.39 |
| 10.41 | 833 | 0.019 | 13012 | 0.299 | | 0.000 | | 0.000 | 0.318 | 0.38 |
| 10.42 | 14694 | 0.337 | | 0.000 | 243086 | 5.580 | | 0.000 | 5.918 | 0.29 |
| 11.01 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | 0.000 | 0.00 |
| 11.02 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | 0.000 | 0.00 |
| 11.03 | | 0.000 | | 0.000 | 189546 | 4.351 | | 0.000 | 4.351 | 0.25 |
| 11.04 | | 0.000 | 28711 | 0.659 | | 0.000 | | 0.000 | 0.659 | 0.35 |
| 11.05 | | 0.000 | 113950 | 2.616 | | 0.000 | | 0.000 | 2.616 | 0.35 |
| 11.06 | | 0.000 | 34300 | 0.787 | | 0.000 | | 0.000 | 0.787 | 0.35 |
| 11.07 | 4015 | 0.092 | 58943 | 1.353 | 71008 | 1.630 | | 0.000 | 3.075 | 0.31 |
| 11.08 | 2345 | 0.054 | | 0.000 | | 0.000 | 107799 | 2.475 | 2.529 | 0.51 |
| 11.09 | 2449 | 0.056 | | 0.000 | 51896 | 1.191 | 44205 | 1.015 | 2.262 | 0.38 |
| 11.10 | 2035 | 0.047 | | 0.000 | 42815 | 0.983 | 38161 | 0.876 | 1.906 | 0.38 |
| 11.11 | 1303 | 0.030 | | 0.000 | | 0.000 | 50327 | 1.155 | 1.185 | 0.51 |
| 11.12 | 2764 | 0.063 | | 0.000 | | 0.000 | 109230 | 2.508 | 2.571 | 0.51 |
| 11.13 | 940 | 0.022 | | 0.000 | | 0.000 | 30231 | 0.694 | 0.716 | 0.51 |
| 12.01 | 5915 | 0.136 | 7930 | 0.182 | | 0.000 | | 0.000 | 0.318 | 0.58 |
| 12.02 | 5669 | 0.130 | 36192 | 0.831 | | 0.000 | | 0.000 | 0.961 | 0.42 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.01 | 7163 | 0.164 | 62100 | 1.426 | 174787 | 4.013 | 94699 | 2.174 | 7.777 | 0.35 |
| 13.02 | 1473 | 0.034 | 4746 | 0.109 | 36525 | 0.838 | 28564 | 0.656 | 1.637 | 0.37 |
| 13.03 | 1586 | 0.036 | 3980 | 0.091 | 41399 | 0.950 | 27026 | 0.620 | 1.699 | 0.36 |
| 13.04 | 1806 | 0.041 | 4279 | 0.098 | 56585 | 1.299 | 30753 | 0.706 | 2.145 | 0.35 |
| 13.05 | 11221 | 0.258 | 156213 | 3.586 | 154828 | 3.554 | | 0.000 | 7.398 | 0.32 |
| 13.06 | | 0.000 | 37350 | 0.857 | | 0.000 | | 0.000 | 0.857 | 0.35 |
| 13.07 | | 0.000 | 43313 | 0.994 | | 0.000 | | 0.000 | 0.994 | 0.35 |
| 13.08 | 10229 | 0.235 | 10618 | 0.244 | 267711 | 6.146 | 20972 | 0.481 | 7.106 | 0.29 |
| 13.09 | 3951 | 0.091 | 25652 | 0.589 | | 0.000 | | 0.000 | 0.680 | 0.42 |
| 13.10 | 5638 | 0.129 | | 0.000 | 81216 | 1.864 | | 0.000 | 1.994 | 0.29 |
| 13.11 | 10959 | 0.252 | | 0.000 | 61231 | 1.406 | | 0.000 | 1.657 | 0.35 |
| 13.12 | 1695 | 0.039 | 7339 | 0.168 | | 0.000 | | 0.000 | 0.207 | 0.45 |
| 13.13 | 861 | 0.020 | 4342 | 0.100 | | 0.000 | | 0.000 | 0.119 | 0.44 |
| 13.14 | 3224 | 0.074 | | 0.000 | 18174 | 0.417 | | 0.000 | 0.491 | 0.35 |
| 14.01 | 6935 | 0.159 | 37509 | 0.861 | | 0.000 | | 0.000 | 1.020 | 0.44 |
| 14.02 | 6972 | 0.160 | 13477 | 0.309 | 35898 | 0.824 | | 0.000 | 1.294 | 0.35 |
| 14.03 | 1958 | 0.045 | 18224 | 0.418 | | 0.000 | | 0.000 | 0.463 | 0.40 |
| 15.01 | 5032 | 0.116 | | 0.000 | | 0.000 | 62521 | 1.435 | 1.551 | 0.53 |
| 15.02 | | 0.000 | | 0.000 | 39941 | 0.917 | | 0.000 | 0.917 | 0.25 |
| 15.03 | 7381 | 0.169 | | 0.000 | 277681 | 6.375 | 92248 | 2.118 | 8.662 | 0.32 |
| 15.04 | 689 | 0.016 | | 0.000 | | 0.000 | 30995 | 0.712 | 0.727 | 0.51 |
| 15.05 | 6640 | 0.152 | | 0.000 | | 0.000 | 233206 | 5.354 | 5.506 | 0.51 |
| 15.06 | 11562 | 0.265 | | 0.000 | 702146 | 16.119 | | 0.000 | 16.384 | 0.26 |
| 15.07 | 3430 | 0.079 | | 0.000 | 159903 | 3.671 | | 0.000 | 3.750 | 0.26 |
| 15.08 | 3805 | 0.087 | | 0.000 | 169066 | 3.881 | | 0.000 | 3.969 | 0.26 |
| 15.09 | 5951 | 0.137 | | 0.000 | 264660 | 6.076 | | 0.000 | 6.212 | 0.26 |
| 15.10 | 1286 | 0.030 | | 0.000 | 57097 | 1.311 | | 0.000 | 1.340 | 0.26 |
| 15.11 | 10716 | 0.246 | | 0.000 | | 0.000 | 223401 | 5.129 | 5.375 | 0.52 |
| 15.12 | 1479 | 0.034 | | 0.000 | | 0.000 | 50488 | 1.159 | 1.193 | 0.51 |
| 15.13 | 7871 | 0.181 | | 0.000 | | 0.000 | 107729 | 2.473 | 2.654 | 0.53 |
| 15.14 | 3545 | 0.081 | 46006 | 1.056 | | 0.000 | | 0.000 | 1.138 | 0.39 |
| 15.15 | 1989 | 0.046 | 26972 | 0.619 | | 0.000 | | 0.000 | 0.665 | 0.39 |
| 15.16 | 925 | 0.021 | 5944 | 0.136 | | 0.000 | | 0.000 | 0.158 | 0.42 |
| 15.17 | 609 | 0.014 | 3751 | 0.086 | | 0.000 | | 0.000 | 0.100 | 0.43 |
| 15.18 | 300 | 0.007 | 1803 | 0.041 | | 0.000 | | 0.000 | 0.048 | 0.43 |
| 15.19 | 1017 | 0.023 | 5871 | 0.135 | | 0.000 | | 0.000 | 0.158 | 0.43 |
| 15.20 | 1201 | 0.028 | 6464 | 0.148 | | 0.000 | | 0.000 | 0.176 | 0.44 |
| 15.21 | 2275 | 0.052 | 10898 | 0.250 | | 0.000 | | 0.000 | 0.302 | 0.44 |
| 16.01 | 7104 | 0.163 | | 0.000 | 92320 | 2.119 | 218610 | 5.019 | 7.301 | 0.44 |
| 16.02 | 948 | 0.022 | 39167 | 0.899 | | 0.000 | | 0.000 | 0.921 | 0.36 |
| 16.03 | 2913 | 0.067 | 9994 | 0.229 | | 0.000 | | 0.000 | 0.296 | 0.47 |
| 17.01 | 6887 | 0.158 | | 0.000 | | 0.000 | 82767 | 1.900 | 2.058 | 0.53 |
| 17.02 | 884 | 0.020 | | 0.000 | | 0.000 | 12955 | 0.297 | 0.318 | 0.53 |
| 17.03 | 901 | 0.021 | | 0.000 | | 0.000 | 23627 | 0.542 | 0.563 | 0.51 |
| 17.04 | 1274 | 0.029 | | 0.000 | | 0.000 | 32009 | 0.735 | 0.764 | 0.52 |
| 17.05 | 685 | 0.016 | | 0.000 | | 0.000 | 20387 | 0.468 | 0.484 | 0.51 |
| 17.06 | 1585 | 0.036 | | 0.000 | | 0.000 | 39690 | 0.911 | 0.948 | 0.52 |
| 18.01 | 8705 | 0.200 | | 0.000 | 201191 | 4.619 | | 0.000 | 4.819 | 0.28 |
| 18.02 | 1520 | 0.035 | | 0.000 | 104464 | 2.398 | | 0.000 | 2.433 | 0.26 |
| 18.03 | 416 | 0.010 | | 0.000 | 24709 | 0.567 | | 0.000 | 0.577 | 0.26 |
| 18.04 | 10467 | 0.240 | | 0.000 | 75564 | 1.735 | | 0.000 | 1.975 | 0.33 |

# BASIN 1

**Basin 1:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas on the east side and wooded areas on the west side of Escambia Avenue. This basin runs to the high point along the western portion of Faires Road for about 1000 feet and for about 900 feet down Escambia Avenue. This basin has approximately 19.38 contributing acres of stormwater.

Proposed Improvements: Pipes 1.1-1.4 have the capacity to handle the design flow. These pipes need minimal pipe cleaning and the existing swale running through these pipes needs minimal regrading to achieve positive flow. Pipe 1.5 is a 22”x13” RCP and does not have the capacity to handle the design flow. This pipe needs to be a DBL 24” RCP. Pipes 1.6 and 1.7 do not have the capacity to handle the design flow. These two pipes, along with the open sided inlet needs to be replaced with one 36” RCP crossing under Escambia Avenue. Pipe 1.8 is an 18” HDPE and does not have the capacity to handle the design flow. This pipe needs to be replaced with a DBL 24” RCP. Pipes 1.9-1.10 have the capacity to handle the design flow. These pipes need cleaning and the majority of the ditches that run parallel to Escambia Avenue on the east and west side will need minimal regrading to achieve positive flow. Upstream and downstream of Pipe 1.8, the ditch will need to be regraded to the standard 4’ bottom ditch.

FAIRES RD

ESCAMBIA AVE

1.01

1.02

1.03

1.04

1.05

1.06

1.07

1.08

1.09

1.10

1.11

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

TOWN OF PERDIDO BEACH
CAMPGROUND IMPROVEMENTS
MASTER PLAN

TOWN OF PERDIDO BEACH

BASIN

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 1.1 | 22" X13" RCP | 0.54 | | PASS | PIPE OK |
| 1.2 | 22" X13" RCP | 0.84 | | PASS | PIPE OK |
| 1.3 | 18" HDPE | 2.86 | | PASS | PIPE OK |
| 1.4 | 22" X13" RCP | 3.08 | | PASS | PIPE OK |
| 1.5 | 22" X13" RCP | | 12.37 | FAIL | DBL 24" RCP |
| 1.6 | 22" X13" RCP | | 15.67 | FAIL | 36" RCP |
| 1.7 | 18" RCP | | 22.7 | FAIL | ---------- |
| 1.8 | 18" HDPE | 15.19 | | FAIL | DBL 24" RCP |
| 1.9 | 15" HDPE | 4.45 | | PASS | PIPE OK |
| 1.10 | 18" HDPE | 2.79 | | PASS | PIPE OK |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 1

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 147 | 206D-000 | LF | REMOVING PIPE | $8.00 | $1,176.00 |
| 1817 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $12,719.00 |
| 44 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $396.00 |
| 4 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $120.00 |
| 39 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $468.00 |
| 39 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $29.25 |
| 2 | 405A-000 | GAL | TACK COAT | $4.50 | $9.00 |
| 3 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $240.00 |
| 6 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $480.00 |
| 154 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $9,240.00 |
| 120 | 530A-004 | LF | 36" ROADWAY PIPE (CLASS 3 R.C.) | $75.00 | $9,000.00 |
| 154 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $2,310.00 |
| 4667 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $21,001.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $1,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $4,000.00 | $4,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $9,500.00 | $9,500.00 |
| 1 | 1007-000 | LS | BID SERVICES | $8,000.00 | $8,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $9,500.00 | $9,500.00 |
| **TOTAL** | | | | | **$98,688.75** |

1.1 us

1.1 ds

1.2 us

1.2 ds

1.3 us

1.3 ds

1.4 us

1.4 ds

1.5 us

1.5 ds

1.6 us

1.7 us

1.7 ds

1.8 us

1.8 ds

1.9 us

1.9 ds

1.10 us

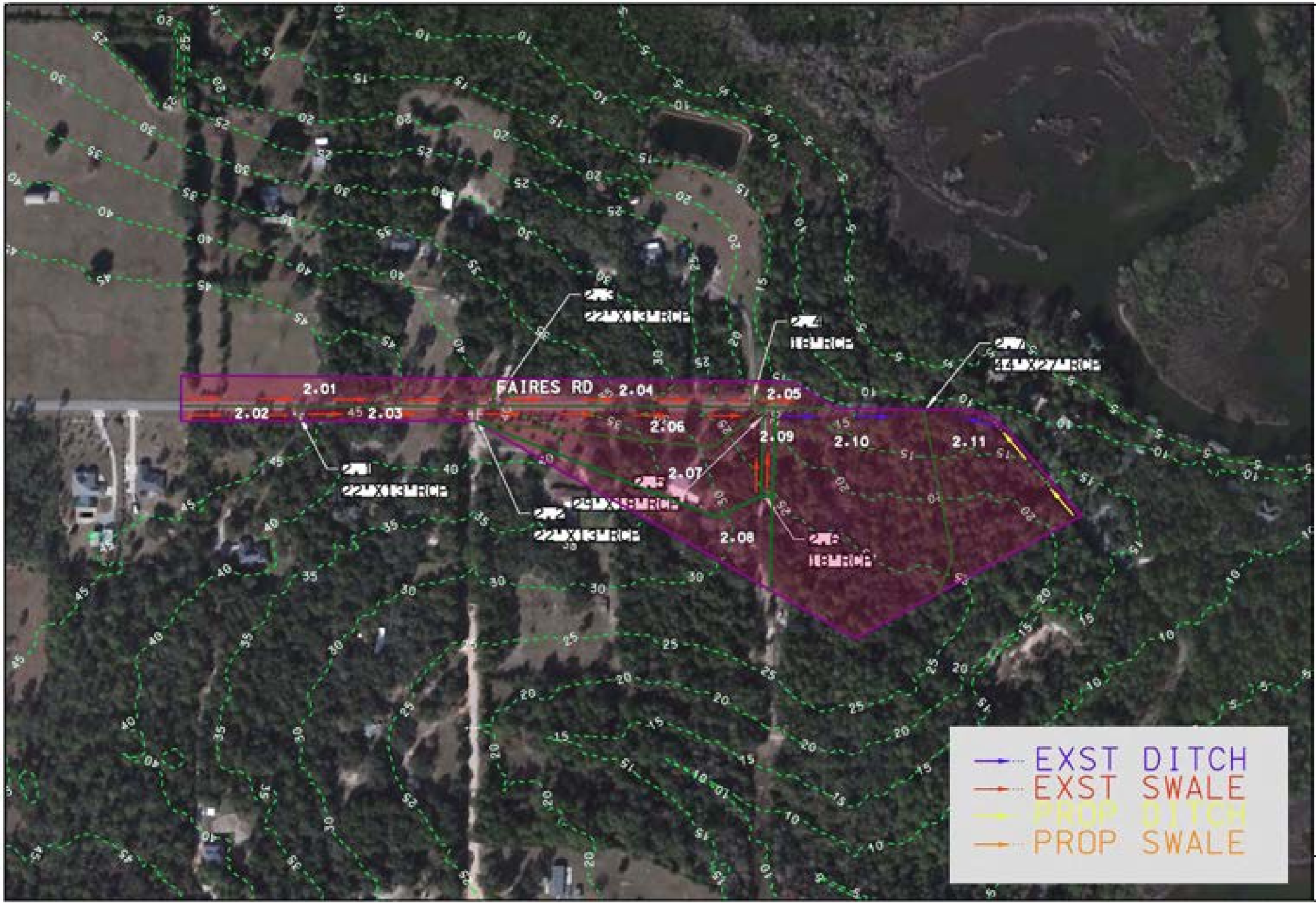
1.10 ds

# BASIN 2

**Basin 2:**

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas with a small section of grassed areas. This basin runs along Faires Road where Basin 1 ends to the high point around the curve at the northern most end of the basin which is approximately 450 feet past the culvert. This basin has approximately 12.43 contributing acres of stormwater.

Proposed Improvements: All seven pipes in this basin have the capacity to handle the design flow. Pipes 2.1-2.4 need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes. Pipes 2.5-2.7 appear to be in good condition. The swales on both sides of Faires Road to Lakeview Drive and the ditch on the south side of Faires Road from Lakeview Drive to the culvert appear to need minimal regrading. A ditch will need to be constructed from past the culvert and around the curve on Faires Road to the high point.


FAIRES RD
2.01
2.02
2.03
2.04
2.05
2.06
2.07
2.08
2.09
2.10
2.11
EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE
VOLKERT
BASIN 2

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 2.1 | 22" X13" RCP | 0.95 | | PASS | 18" RCP |
| 2.2 | 22" X13" RCP | | 2.68 | PASS | 18" RCP |
| 2.3 | 22" X13" RCP | 3.52 | | PASS | 18" RCP |
| 2.4 | 18" RCP | 5.81 | | PASS | 18" RCP |
| 2.5 | 29" X18" RCP | | 8.87 | PASS | PIPE OK |
| 2.6 | 18" RCP | 1.84 | | PASS | PIPE OK |
| 2.7 | 44" X27" RCP | | 54.8 | PASS | PIPE OK |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 2

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 119 | 206D-000 | LF | REMOVING PIPE | $8.00 | $952.00 |
| 2108 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $14,756.00 |
| 100 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $900.00 |
| 119 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $5,355.00 |
| 223 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $3,345.00 |
| 5989 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $26,950.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 4 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $4,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $3,000.00 | $3,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $9,200.00 | $9,200.00 |
| 1 | 1007-000 | LS | BID SERVICES | $8,000.00 | $8,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $9,200.00 | $9,200.00 |
| **TOTAL** | | | | | **$94,158.50** |

2.1 us

2.1 ds

2.2 us


2.2 ds

2.3 us

2.3 ds

2.4 us

2.4 ds

2.5 us

2.5 ds

2.6 us

2.6 ds

2.7 us

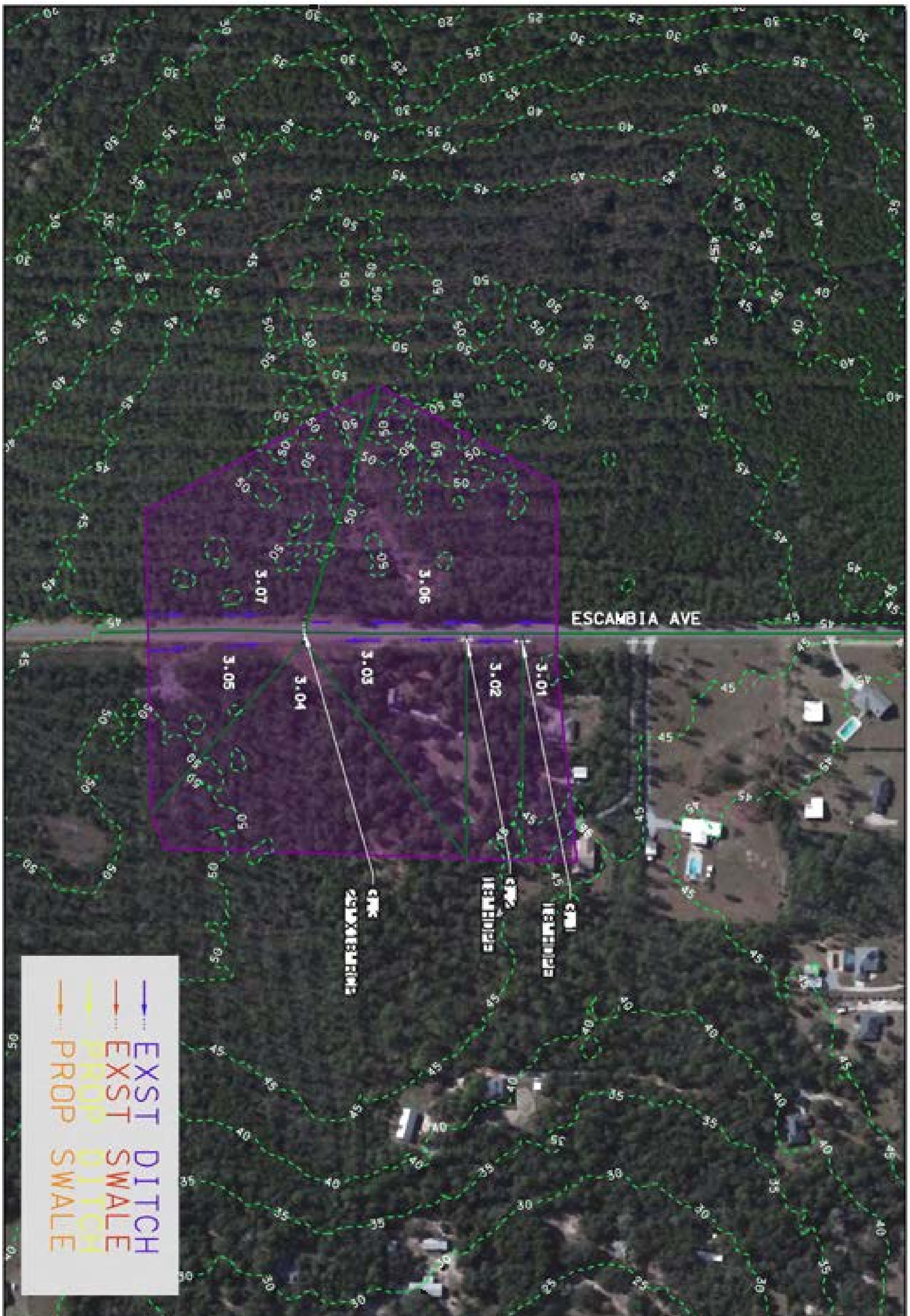
2.7 ds

# BASIN 3

**Basin 3:**

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas on both sides of Escambia Avenue. This basin runs along Escambia Avenue where Basin 1 ends to the adjacent high point approximately 1000 feet away. This basin has approximately 20.57 contributing acres of stormwater.

Proposed Improvements: Pipes 3.1-3.2 have the capacity to handle the design flow. These pipes need minimal pipe cleaning and the existing ditch running through these pipes needs minimal, if any, regrading to achieve positive flow. Pipe 3.3 is a 29”x18” arch pipe and does not have the capacity to handle the design flow. This pipe needs to be replaced with a 30” RCP. The existing ditches running parallel to Escambia Avenue on the east and west sides will need minimal, if any, regrading to achieve positive flow.




TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PERDIDO BEACH

VOLKERT

NOT FOR CONSTRUCTION

0 100 200

BASIN 1

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 3.1 | 18" HDPE | 2.29 | | PASS | PIPE OK |
| 3.2 | 18" HDPE | 4.02 | | PASS | PIPE OK |
| 3.3 | 29" X18" RCP | | 25.18 | FAIL | 30" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 3

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 41 | 206D-000 | LF | REMOVING PIPE | $8.00 | $328.00 |
| 1558 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $10,906.00 |
| 39 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $351.00 |
| 4 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $120.00 |
| 40 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $480.00 |
| 40 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $30.00 |
| 2 | 405A-000 | GAL | TACK COAT | $4.50 | $9.00 |
| 3 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $240.00 |
| 6 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $480.00 |
| 50 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $3,250.00 |
| 52 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $780.00 |
| 3800 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $17,100.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $5,800.00 | $5,800.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $5,800.00 | $5,800.00 |
| **TOTAL** | | | | | **$63,674.00** |

3.1 us

3.1 ds

3.2 us

3.2 ds

3.3 us

3.3 ds

# BASIN 4

**Basin 4:**

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas with a patch of grassed area between both sides of Hildreth Drive. This basin runs along the ridge east of Escambia Avenue where Basins 1, 3, and 5 end to the east to Soldier Creek. The northernmost portion of this basin reaches to the point where Basins 1 and 2 end and the southernmost portion of this basin reaches the point where Basin 7 ends on the north side of the portion of Hildreth Drive that runs parallel to Faires Road. This basin has approximately 115.09 contributing acres of stormwater.

Proposed Improvements: This is such a large area the improvements will be broken down by streets starting from the western end of the basin heading east. Pipe 4.1 does not have the capacity to handle the design flow. This existing 18" pipe will need to be upsized to a DBL 30" RCP. Standard ditches need to be graded on the east and west side of Hildreth Drive from Faires Road to the culvert and from the high point on the west side to the culvert. The high point is located where the tree is in the middle of the road. Approximately 285 feet down the road from the high point is another low point. Proposed pipe 4.3, a DBL 24" RCP, will need to be placed here to channel the fairly large overland flow into a proposed ditch from this point back to the pipe 4.1. At this junction, the water runs through a natural channel from pipe 4.1 to pipe 4.2 that crosses Perdido Vista Drive and continues on to Soldier Creek. A proposed swale will need to be constructed on the west side of the eastern leg of Hildreth Drive. This proposed swale will channel the overland flow from between the west and east sides of Hildreth Drive to the natural flow channel that drains from pipe 4.1 to pipe 4.2.

Pipe 4.2 does not have the capacity to handle the design flow. This existing 57"x38" pipe will need to be upsized to DBL 42" RCP. On Perdido Vista Drive, a proposed ditch needs to be constructed on the west side and a proposed swale needs to be constructed on the east side from where Basin 2 ends to pipe 4.2. On the south side of pipe 4.2, a proposed ditch will need to be constructed from approximately the curve back to pipe 4.2. During a field review, it was noted that the area to the west of the curve was very wet. A proposed ditch needs to be constructed on the west side of Perdido Vista Drive from the high point approximately 600 feet north of Carrel Lane to this low lying area. Proposed pipe 4.4, a 24" RCP, will need to be constructed to convey this water from the west side of the road to the east side of the road and into Soldier Creek. This piece of property is privately owned. For any work done on this property, a construction easement will need to be obtained and some site grading will need to be done to direct the water to flow to the ditch and into proposed pipe 4.4.

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

4.01
4.02
4.03
4.04
4.09
4.10
4.13
4.14

HILDRETH DR

PERDIDO VISTA DR

VOLKERT

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

HILDRETH DR

HILDRETH DR

PERDIDO VISTA DR

CARREL LN

4.03

4.04

4.05

4.06

4.07

4.08

4.10

4.11

4.12

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 4.1 | 18" RCP | | 63.61 | FAIL | DBL 30" RCP |
| 4.2 | 58"x36" CMP | | 155.03 | FAIL | DBL 42" RCP |
| 4.3 | | | 42.14 | | DBL 24" RCP |
| 4.4 | | | 16.04 | | 24" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 4

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 105 | 206D-000 | LF | REMOVING PIPE | $8.00 | $840.00 |
| 5122 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $35,854.00 |
| 80 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $720.00 |
| 7 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $210.00 |
| 57 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $684.00 |
| 57 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $42.75 |
| 3 | 405A-000 | GAL | TACK COAT | $4.50 | $13.50 |
| 5 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $400.00 |
| 9 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $720.00 |
| 60 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $2,700.00 |
| 272 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $16,320.00 |
| 70 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $4,550.00 |
| 140 | 530A-005 | LF | 42" ROADWAY PIPE (CLASS 3 R.C.) | $90.00 | $12,600.00 |
| 12994 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $58,473.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $25,000.00 | $25,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $5,000.00 | $5,000.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $13,900.00 | $13,900.00 |
| 1 | 1007-000 | LS | BID SERVICES | $10,000.00 | $10,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $3,000.00 | $3,000.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $10,000.00 | $10,000.00 |
| **TOTAL** | | | | | **$205,527.25** |

4.1 us

4.1 ds

4.2 us

4.2 ds

Comment Form
Public Involvement Meeting
Project: Town of Pendola Beach Stormwater Management Plan

Name: _____

Address (Street, City, State, ZIP): _____

Telephone Number: _____

Email Address: _____

Public Meeting Attended (Location): _____ Date Completed (Submitted Within 10 Days): _____

Interest in Project: ☐ Property Owner ☐ Resident ☐ Business Owner ☐ Public Official ☐ Other: _____

General Comments:

_____

_____

_____

_____

Please describe your experience with the meeting format and materials:

_____

_____

_____

_____

Suggestions for improving future public involvement:

_____

_____

_____

_____

Please mail or email this form to the address below by April 15, 2026.

Harbor Consultants, P.C. – Civil Division
Attn: Public Involvement
[illegible]
Pendola Beach, [illegible]
[illegible]

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name
Address (Street, City, State, Zip)
Telephone Number
Email Address

Public Meeting Attended: Location For Carpentry Saturday, March 19, 2016

Interest in Project: Property Owner (Year)
Local Business Owner
Public Official
Other

General Comments

Provide location and explain known drainage issues

Comments regarding the development of a stormwater management plan.

Suggestions for ways to improve public input

Please return this form at the registration desk tonight, drop off at the open hall, email to the following email, or mail to the following address by April 8, 2016

Norman R. Sheridan, P.E., D.W.R.E.
Volkert, Inc.
P.O. Box 7434
Mobile, AL 36670
Norman.sheridan@volkert.com

Comment Form
Public Involvement Meeting
Project: Town of Pond da Beach Stormwater Management Plan

Name:
Address (Street, City, State, Zip)
Telephone Number:
E-mail Address:

Public Meeting Attendance Location: Fire Department, Saturday March 14, 2015

Interest in Project: Property Owner (resident) / Local Business Owner / Public Official / Other

General Comments

Provide location and explain known drainage issues:

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight (sign-in at the town hall), email to the following email or mail to the following address by April 3, 2015:

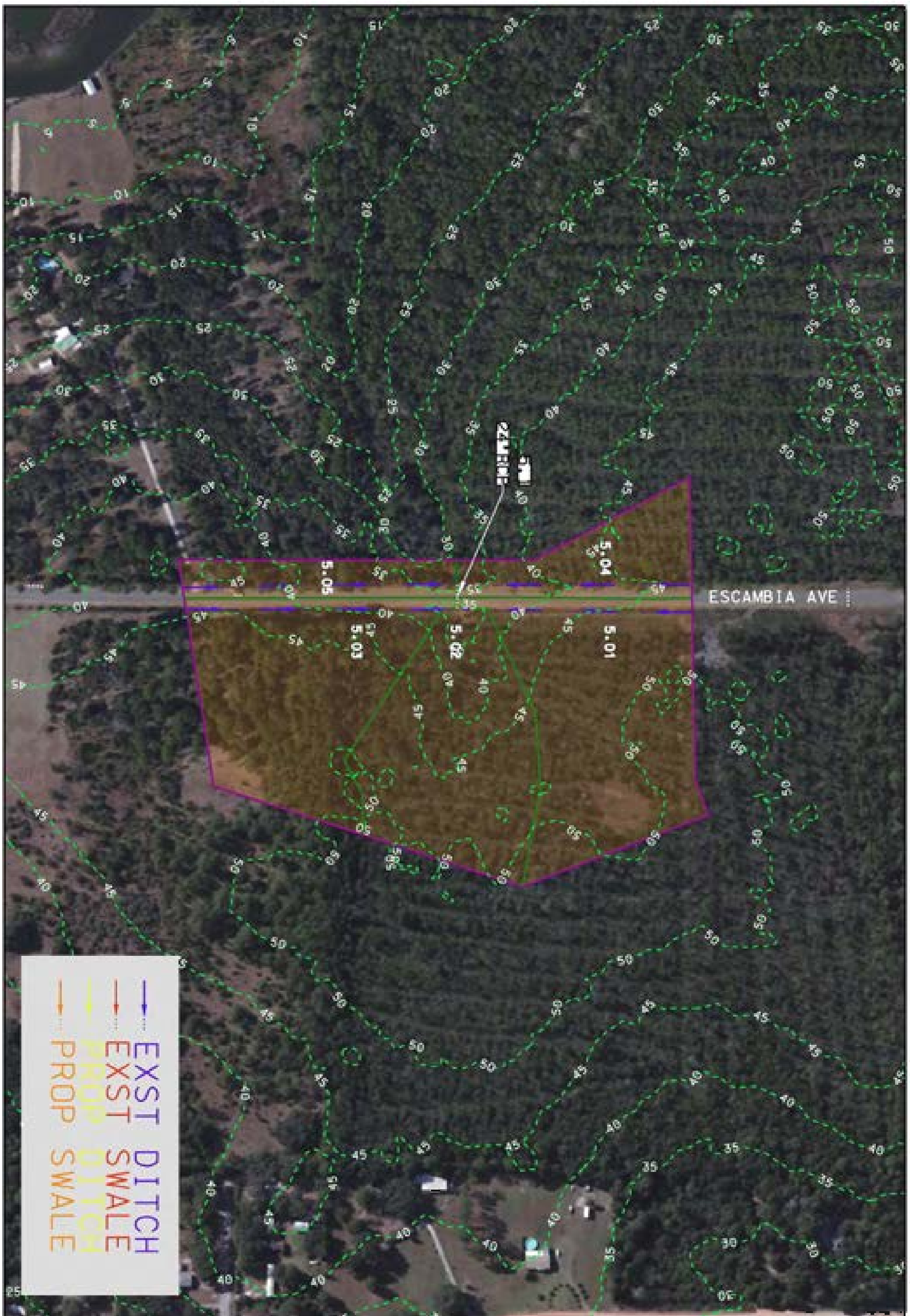
Kamran Richardson, P.E., CPESC
Volkert Inc
P.O. Box 7434
Mobile, AL 36670
kamran.richardson@volkert.com

# BASIN 5

**Basin 5:**

Characteristics: This basin is made up of mainly wooded areas on both sides of Escambia Avenue. This basin runs along Escambia Avenue where Basin 3 ends to the adjacent high point approximately 1200 feet away. This basin has approximately 17.69 contributing acres of stormwater.

Proposed Improvements: Existing pipe 5.1 in this basin has the capacity to handle the design flow. Upon inspection, this pipe looks to be in good condition. The existing ditches have positive flow and capacity. A minimal maintenance issue would be to remove the small amount of sediment buildup at the outlet end of the pipe. Otherwise, no improvements to this basin are needed.




TOWN OF PONCE DE LEON
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PONCE DE LEON

VOLKERT

NOT TO BE USED FOR CONSTRUCTION

0 400 800

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 5.1 | 18" RCP | | 27.79 | PASS | PIPE OK |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

5.1 us

5.1 ds

# BASIN 6

**Basin 6:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas and a small wooded area section to the north. This basin runs along Escambia Avenue where Basin 5 ends to the adjacent high point approximately 550 feet past Riggs Street. This basin has approximately 9.51 contributing acres of stormwater.

Proposed Improvements: Pipe 6.1 has the capacity to handle the design flow. Upon inspection, this pipe is in good condition. For maintenance, this pipe will need to be replaced with an 18" RCP for minimum pipe size recommendation. The existing ditch that runs to this pipe needs minimal regrading. Pipe 6.2 is a 15" RCP and does not have the capacity to handle the design flow. This pipe needs to be replaced with an 18" RCP. The upstream ditch of pipe 6.2 is in good shape. The ditch running from pipe 6.2 to pipe 6.3 needs minimal regrading at pipe 6.3 for positive drainage. Pipes 6.3-6.5 do not have the capacity to handle the design flow. Originally pipes 6.3 and 6.4 collect water in the ditch and run under Riggs Street to a junction box under Riggs Street and outfalls through pipe 6.5. Since these three pipes are under sized, the system will be replaced. The proposed 18" RCP, replacement of pipe 6.3 and 6.4, pipe under Riggs Street will flow from south of Riggs Street to north of Riggs Street. From there the proposed 30" RCP, pipe 6.5, will cross Escambia Avenue from east to west. Reconfiguring the system this way will allow for easier maintenance to the system since the existing junction box doesn't have access now. The ditch south of Riggs Street is in good shape. Minimal work will need to be done at the new pipe crossing.

ESCAMBIA AVE

RIGGS ST

6.05

6.01

6.02

6.03

6.04

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

TOWN OF PONCE DE LEON
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PONCE DE LEON

BASIN C

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 6.1 | 18"x11" RCP | 1.79 | | PASS | 18" RCP |
| 6.2 | 15" RCP | 9.78 | | FAIL | 18" RCP |
| 6.3 | 15" RCP | | 14.87 | FAIL | 18" RCP |
| 6.4 | 15" RCP | | 7.69 | FAIL | |
| 6.5 | 15" RCP | | 19.96 | FAIL | 30" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 6

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 135 | 206D-000 | LF | REMOVING PIPE | $8.00 | $1,080.00 |
| 1529 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $10,703.00 |
| 60 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $540.00 |
| 6 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $180.00 |
| 63 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $756.00 |
| 63 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $47.25 |
| 3 | 405A-000 | GAL | TACK COAT | $4.50 | $13.50 |
| 5 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $400.00 |
| 10 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $800.00 |
| 86 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $3,870.00 |
| 55 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $3,575.00 |
| 42 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $630.00 |
| 3730 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $16,785.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $1,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $4,500.00 | $4,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $6,750.00 | $6,750.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $6,800.00 | $6,800.00 |
| **TOTAL** | | | | | **$73,929.75** |

6.1 us

6.1 ds

6.2 us

6.2 ds

6.3 us

6.4 us

6.5 ds

# BASIN 7

**Basin 7:**

Characteristics: This basin is made up of existing single family residential houses with grassed and wooded areas. This basin is a large area in the center of the town limits. It is bordered by basin 4-6 and 8-11. It spans an area from east of Escambia Avenue to south of Hildreth Drive to Perdido Vista Drive to north of Everage Lane to west of Anniston Drive and north of State Street. This basin has approximately 161.50 contributing acres of stormwater.

Proposed Improvements: This is such a large area the improvements will be broken down by streets starting from the northern end of the basin heading south. A proposed ditch needs to be constructed on the west side of Perdido Vista Drive from the high point approximately 600 feet north of Carrel Lane to Carrel Lane where proposed pipe 7.16, size 36" RCP, will be constructed under Carrel Lane into a proposed ditch that will outfall to the boating channel to the south. The far northern section of the basin drains toward Carrel Lane. Approximately 600 feet down Carrel Lane west of Perdido Vista Drive is a high point. Regrade the existing swale on the north side of Carrel Lane from the high point towards Perdido Vista Drive. This will drain to proposed pipe 7.16. Pipe 7.10 falls in this range and does not have the capacity to handle the design storm. This existing 15" pipe will need to be replaced with a 24" RCP. A proposed swale needs to be constructed on the other side of the high point on Carrel Lane to the intersection of Carrel Lane and Bohling Street. At the intersection proposed pipe 7.19, size 30" RCP, will be constructed from the north side of Carrel Lane to the south side of Carrel Lane. This pipe will convey the water from the home owners' yards to the boating channel to the south. Approximately 450 feet down Bohling Street from Carrel Lane is another high point. From this point the water will drain back to the intersection of Bohling Street and Carrel Lane. Proposed swales need to be constructed on both sides of Bohling Street to the proposed pipe 7.18. Pipe 7.11, that falls in this range, does not have the capacity to drain the design storm. This existing 15" pipe will need to be replaced with an 18" RCP. Proposed pipe 7.18, size 24" RCP, needs to be constructed to convey the water from the west side of Bohling Street to the east side of Bohling Street. This pipe will convey the water to the boating channel to the south. A construction easement will need to be acquired to construct a ditch/swale to convey the water from pipes 7.18 and 7.19 to the boating channel. From the high point on Bohling Street, proposed swales need to be constructed on the west and east side to channel the water to Riggs Street. Pipes 7.12-7.15, that fall within this range, do not have the capacity to handle the design flow. These existing 18"x11" pipes will need to be upsized to an 18" RCP. An immediate concern is to clean out the existing pipes and regrade the ditches to achieve positive flow.

Approximately 250 feet east of Escambia Avenue up Riggs Street is a high point. From this point east, the existing ditch on the north side of Riggs Street is in good shape. This ditch runs to pipe 7.5. Pipe 7.5 does not have the capacity to handle the design flow. The existing 18" pipe needs to be upsized to a 30" RCP. Just down from pipe 7.5 is pipe 7.6. This pipe runs under Bohling Street and does not have the capacity to handle the design flow coming down Riggs Street and Bohling Street. This existing 29"x18" pipe needs to be upgraded to a DBL 36". Regrade the

ditches in the area around pipes 7.5 and 7.6 to insure positive drainage. Some regrading from Bohling Street to the culvert crossing, pipe 7.7, will need to be done. Pipe 7.7 has the capacity to handle the design flow. The ditches on the south side of Riggs Street from the high point are in good shape between pipes 7.1-7.2. These pipes have the capacity to handle the design flow. Pipes 7.3-7.4 do not have the capacity to handle the design flow. The existing 15" pipes need to be upsized to an 18" RCP and DBL 18" RCP respectively. Regrade the existing ditch upstream and downstream of pipes 7.3 and 7.4 to pipe 7.7 to insure positive drainage. There is another high point at approximately Anniston Drive.

Grade a swale along the west side of Anniston Drive from State Street to Riggs Street. Minimal regrading, if any, needs to be done along the south side of Riggs Street from Anniston Drive to pipe 7.7. On the north side of Riggs Street, water drains down from high point on Maple Street to Riggs Street. Pipes 7.8 and 7.9 have the capacity to handle the design flow. Pipe 7.8 needs to be updated for minimum pipe size recommendation. Regrade the swale from Maple Street to pipe 7.7 for positive drainage and to eliminate flooding issues and add Pipe 7.17, proposed 18" RCP, under the driveway just west of Maple Street.

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

CARREL LN
BOHLING ST
RIGGS ST
MAPLE SP.23
EVERAGE LN
7.01
7.02
7.03
7.04
7.05
7.06
7.07
7.08
7.09
7.10
7.11
7.21
7.22
7.24
7.25

VOLKERT

TOWN OF PERRY
LIVINGSTON COUNTY
NEW YORK

TOWN OF PERRY FLEET

7.12
7.13
7.14
7.15
7.16
7.17
7.18
7.19
7.20
RIGGS ST
STATE ST
ANNISTON DR

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 7.1 | 18" HDPE | 0.24 | | PASS | PIPE OK |
| 7.2 | 15" HDPE | 1.99 | | PASS | PIPE OK |
| 7.3 | 15" RCP | 9.25 | | FAIL | 18" RCP |
| 7.4 | 15" RCP | 12.54 | | FAIL | DBL 18" RCP |
| 7.5 | 18" CMP | 24.79 | | FAIL | 30" RCP |
| 7.6 | 29"x18" CMP | | 72.38 | FAIL | DBL 36" RCP |
| 7.7 | DBL 36" | | 110.9 | PASS | PIPE OK |
| 7.8 | 18"x11" RCP | | 9.92 | PASS | 18" RCP |
| 7.9 | 18" HDPE | 0.73 | | PASS | PIPE OK |
| 7.10 | 15" HDPE | 17.91 | | FAIL | 24" RCP |
| 7.11 | 15" HDPE | 1.65 | | FAIL | 18" RCP |
| 7.12 | 18"x11" RCP | 2.78 | | FAIL | 18" RCP |
| 7.13 | 18"x11" RCP | 2.71 | | FAIL | 18" RCP |
| 7.14 | 18"x11" RCP | 2.69 | | FAIL | 18" RCP |
| 7.15 | 18"x11" RCP | 2.65 | | FAIL | 18" RCP |
| 7.16 | | | 35.43 | | 36" RCP |
| 7.17 | | 10.68 | | | 18" RCP |
| 7.18 | | | 11.07 | | 24" RCP |
| 7.19 | | | 31.67 | | 30" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 7

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 304 | 206D-000 | LF | REMOVING PIPE | $8.00 | $2,432.00 |
| 5990 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $41,930.00 |
| 169 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $1,521.00 |
| 16 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $480.00 |
| 144 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $1,728.00 |
| 144 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $108.00 |
| 7 | 405A-000 | GAL | TACK COAT | $4.50 | $31.50 |
| 12 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $960.00 |
| 23 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $1,840.00 |
| 258 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $11,610.00 |
| 80 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $4,800.00 |
| 74 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $4,810.00 |
| 124 | 530A-004 | LF | 36" ROADWAY PIPE (CLASS 3 R.C.) | $75.00 | $9,300.00 |
| 165 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $2,475.00 |
| 16049 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $72,220.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 9 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $9,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $25,000.00 | $25,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $17,900.00 | $17,900.00 |
| 1 | 1007-000 | LS | BID SERVICES | $12,000.00 | $12,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $4,500.00 | $4,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $10,000.00 | $10,000.00 |
| **TOTAL** | | | | | **$242,646.00** |

7.1 us

7.1 ds

7.2 us

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7.3 us

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7.4 us

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7.5 us

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7.7 us 1

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7.11 us

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7.12 ds

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7.13 ds

7.14 us

7.14 ds

7.15 us

7.15 ds

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name [illegible]
Address (Street, City, State, Zip) [illegible]

Telephone Number [illegible]
E-mail Address: [illegible]

Public Meeting Attendance Location: Fire Department (Saturday March 19, 2016)

Involved in Project: Property Owner/Tenant [ ] Public Official [ ]
Local Business Owner [ ] Other [ ]

General Comments:
[illegible]

Provide location and explain known drainage issues:
[illegible]

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form or the registration card you got when you signed in at the following email or mail to the following address by April 8, 2016

Kamran Richardson, P.E., CPESC
Volkert, Inc.
P.O. Box 7434
Mobile, AL 36670
kamran.richardson@volkert.com

30665 Carrel Lane

Perdido Beach, AL 36530


30665 Carrel Lane
Perdido Beach, AL 36530

# BASIN 8

**Basin 8:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas and a couple of small wooded area sections. This basin runs along Escambia Avenue where Basin 6 ends to the adjacent high point approximately 350 feet south of State Street to approximately 1350 feet east on State Street from Escambia Avenue. This basin has approximately 19.08 contributing acres of stormwater.

Proposed Improvements: Pipes 8.3 and 8.6 have the capacity to handle the design flow. These two pipes are located on the west side of Escambia Avenue. Upon field inspection, pipe 8.33 needs minimal pipe cleaning and the existing ditch running through this pipe needs minimal, if any, regrading to achieve positive flow. Pipe 8.6 also needs cleaning and the downstream ditch needs regrading for positive drainage to pipe 8.9, the outfall. Pipes 8.8 and 8.10 are also on this side of Escambia Avenue on the other side of the outfall. These pipes have the capacity to handle the design flow. Pipe 8.8 needs to be replaced with an 18" RCP due to minimum pipe size recommendation and pipe 8.10 needs cleaning and the ditches need extensive regrading to the outfall.

Pipes 8.1, 8.2, 8.4, 8.5, and 8.7 are located on the east side of Escambia Avenue. Pipes 8.1, 8.2, 8.4, and 8.5 have the capacity to handle the design flow. These pipes need cleaning and the ditch needs to be regraded to pipe 8.9, the outfall. Pipe 8.7 needs to be upgraded to a 24" RCP. Pipes 8.11 and 8.12 are also on this side of Escambia Avenue on the other side of the outfall. Pipe 8.11 has the capacity to handle the flow, but should be replaced with an 18" due to minimum pipe size recommendation. Pipe 8.12 does not have the capacity to handle the design flow. This pipe needs to be replaced with a 24" pipe which runs under State Street. The outfall pipe 8.9 does not have the capacity to handle the design flow. The existing 24" needs to be upgraded to a 36" RCP. A more extensive study will need to be done on the outfall, which outlets to the west of Escambia Avenue, in the design phase to see if any modifications will need to be made to the pipe or the outlet ditches.

Proposed ditches will need to be constructed on both sides of State Street from the high point towards Escambia Avenue. Pipes 8.13-8.16 have the capacity to handle the flow, but these pipes need cleaning and the existing ditches downstream need regrading for positive drainage.

8.01
8.02
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8.17
8.12
8.18
8.13
STATE ST
ESCAMBIA AVE
EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE
VOLKERT
TOWN OF PERDIDO BEACH
CONCEPTUAL DRAINAGE
MASTER PLAN
TOWN OF PERDIDO BEACH

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 8.1 | 18" RCP | 1.12 | | PASS | PIPE OK |
| 8.2 | 18" HPDE | 1.67 | | PASS | PIPE OK |
| 8.3 | 18" HPDE | 1.05 | | PASS | PIPE OK |
| 8.4 | 24" CMP | 4.51 | | PASS | PIPE OK |
| 8.5 | 18" RCP | 6.9 | | PASS | PIPE OK |
| 8.6 | 18" HPDE | 2.6 | | PASS | PIPE OK |
| 8.7 | 18" RCP | 13.7 | | FAIL | 24" RCP |
| 8.8 | 15" HPDE | 1.78 | | PASS | 18" RCP |
| 8.9 | 24" RCP | | 45.04 | FAIL | 36" RCP |
| 8.10 | 15" RCP | 0.77 | | PASS | PIPE OK |
| 8.11 | 18"x11" RCP | 1.46 | | PASS | 18" RCP |
| 8.12 | 22"X14" RCP | | 15.65 | FAIL | 24" RCP |
| 8.13 | 18" RCP | 3.74 | | PASS | PIPE OK |
| 8.14 | 18" RCP | 3.35 | | PASS | PIPE OK |
| 8.15 | 18" HPDE | 3.13 | | PASS | PIPE OK |
| 8.16 | 18" HPDE | 2.64 | | PASS | PIPE OK |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 8

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 146 | 206D-000 | LF | REMOVING PIPE | $8.00 | $1,168.00 |
| 3977 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $27,839.00 |
| 49 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $441.00 |
| 5 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $150.00 |
| 44 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $528.00 |
| 44 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $33.00 |
| 2 | 405A-000 | GAL | TACK COAT | $4.50 | $9.00 |
| 4 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $320.00 |
| 7 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $560.00 |
| 50 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $2,250.00 |
| 58 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $3,480.00 |
| 38 | 530A-004 | LF | 36" ROADWAY PIPE (CLASS 3 R.C.) | $75.00 | $2,850.00 |
| 298 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $4,470.00 |
| 9700 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $43,650.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 3 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $3,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $4,500.00 | $4,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $9,500.00 | $9,500.00 |
| 1 | 1007-000 | LS | BID SERVICES | $8,000.00 | $8,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $7,500.00 | $7,500.00 |
| **TOTAL** | | | | | **$129,748.00** |

8.1 us

8.1 ds

8.2 us

8.2 ds

8.3 us

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8.4 us

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8.7 us

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8.10 us

8.10 ds

8.11 us

8.11 ds

8.12 us N

8.12 us S

8.13 us

8.13 ds

8.14 us

8.14 ds

8.15 us

8.15 ds

8.16 us

8.16 ds

# BASIN 9

**Basin 9:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed areas and a wooded area section to the south. This basin is bordered by basin 7 and basin 11. It covers just north of Riggs Street to State Street to Tuscaloosa Drive. This basin has approximately 21.98 contributing acres of stormwater.

Proposed Improvements: Proposed swales need to be graded along the north and south side of Everage Lane. Pipes 9.1-9.4 fall within this range and have the capacity to handle the design flow. Pipes 9.2 and 9.4 will need to be replaced for minimum pipe size recommendation and all the pipes will need to be cleaned and the swale constructed for positive drainage which will flow north along the west side of Tuscaloosa Drive to the boating channel. A construction easement will need to be acquired to construct a swale to convey the water from proposed pipe 9.23 to the boating channel. A swale will also need to be constructed along the north side of Riggs Street from the high point to Tuscaloosa Drive and onto proposed pipe 9.23 that crosses under Everage Lane.

A proposed swale will need to be constructed along the east side of Anniston Street from State Street to Riggs Street and a swale constructed along the south side of Riggs Street to Tuscaloosa Drive. Pipes 9.5-9.6 fall in this range and have the capacity to handle the design flow. These pipes need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes.

The existing drainage pattern for this basin has all the water running north down a ditch on the west side of Tuscaloosa from State Street to Riggs Street where it ponds in the radius return until it overflows the roadway. The proposed drainage schematic recommends rerouting the water in a ditch to a new outfall approximately 400 feet south of Riggs Street along Tuscaloosa Drive. A drainage easement will need to be acquired to outfall the water into Soldier Creek. The proposed ditches will flow from Riggs Street to the new outfall. The existing ditch will be used from State Street to the new outfall. Pipes 9.7-9.15 do not have the capacity to handle the design flow in their current condition nor in the proposed drainage schematic. All these pipes will need to be upsized. Pipe 9.7 will be replaced with an 18" RCP. Pipes 9.8-9.9 will be replaced with a 24" RCP. Pipe 9.10 will be replaced with proposed pipes 9.20-9.22. A 30" RCP will run from each side of the existing pipe to a junction box in the middle and then into a 30" RCP that outfalls across the street.

There is a high point approximately 250 feet west of Anniston Drive on State Street. The existing drainage pattern has the water running down the middle of State Street and across Tuscaloosa Drive. The proposed drainage schematic has proposed swales running down State Street to Tuscaloosa Drive. The existing pipes, 9.16-9.17, under Anniston Drive have the capacity to handle the design flow. These pipes need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the

purpose of this drainage study, the assumption was to replace the pipes. The water running down the swales on State Street will drain to proposed pipe 9.18 that runs under State Street from the north to the south, then across Tuscaloosa Drive in proposed pipe 9.19, and finally down a proposed ditch on State Street to Soldier Creek. These two pipes are proposed size 18" RCP.

CARREL LN

BOHLING ST

EVERAGE LN

MAPLE ST

RIGGS ST

TUSCALOOSA DR

9.01 9.02 9.03 9.04
9.05 9.06
9.07
9.08
9.09 9.10 9.11
9.24
9.23
9.22
9.21
9.20

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PERDIDO BEACH

BASIN 9

STATE ST

ANNISTON DR

TUSCALOOSA DR

9.19

9.18

9.17

9.16

9.15

9.12

9.13

9.14

9.26

9.25

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

TOWN OF PRATTVILLE, ALABAMA
COMPREHENSIVE DRAINAGE PLAN
MASTER PLAN

TOWN OF PRATTVILLE, ALABAMA

BASIN 2

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 9.1 | 15" CMP | 0.42 | | PASS | PIPE OK |
| 9.2 | 17"x13" CMP | 0.79 | | PASS | 18" RCP |
| 9.3 | 15" CMP | 0.98 | | PASS | PIPE OK |
| 9.4 | 18"x11" RCP | 5.45 | | PASS | 18" RCP |
| 9.5 | 15" CMP | 3.42 | | PASS | 18" RCP |
| 9.6 | 21"x15" CMP | 3.74 | | PASS | 18" RCP |
| 9.7 | 15" CMP | 39.02 | | FAIL | 18" RCP |
| 9.8 | 18" HDPE | 36.75 | | FAIL | 24" RCP |
| 9.9 | 18" RCP | 34.55 | | FAIL | 24" RCP |
| 9.10 | 18" RCP | 31.13 | | FAIL | SEE PIPES 20-22 |
| 9.11 | 15" HDPE | 27.88 | | FAIL | DBL 24" RCP |
| 9.12 | 15" CMP | 20.71 | | FAIL | 24" RCP |
| 9.13 | 15" CMP | 17.53 | | FAIL | 24" RCP |
| 9.14 | 15" CMP | 13.94 | | FAIL | 24" RCP |
| 9.15 | 15" RCP | 12.28 | | FAIL | 24" RCP |
| 9.16 | 22"X13" RCP | | 1.56 | PASS | 18" RCP |
| 9.17 | 22"X13" RCP | | 1.52 | PASS | 18" RCP |
| 9.18 | | | 2.77 | | 18" RCP |
| 9.19 | | | 5.49 | | 18" RCP |
| 9.20 | | 30.9 | | | 30" RCP |
| 9.21 | | 13.05 | | | 30" RCP |
| 9.22 | | | 50.02 | | 30" RCP |
| 9.23 | | 19.83 | | | 24" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 9

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 481 | 206D-000 | LF | REMOVING PIPE | $8.00 | $3,848.00 |
| 3021 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $21,147.00 |
| 93 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $837.00 |
| 10 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $300.00 |
| 99 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $1,188.00 |
| 99 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $74.25 |
| 5 | 405A-000 | GAL | TACK COAT | $4.50 | $22.50 |
| 8 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $640.00 |
| 16 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $1,280.00 |
| 275 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $12,375.00 |
| 248 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $14,880.00 |
| 173 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $11,245.00 |
| 43 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $645.00 |
| 8310 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $37,395.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 15 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $15,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $6,500.00 | $6,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $11,250.00 | $11,250.00 |
| 1 | 1007-000 | LS | BID SERVICES | $8,000.00 | $8,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $10,000.00 | $10,000.00 |
| **TOTAL** | | | | | **$166,126.75** |

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# BASIN 10

**Basin 10:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is bordered by basins 7, 8, 11, 13, and 14 and covers south of State Street to west of Anniston Drive to approximately 1400 feet south of Baldwin Street to Pensacola Avenue. This basin has approximately 91.35 contributing acres of stormwater.

Proposed Improvements: This is such a large area the improvements will be broken down by streets starting from the western end of the basin heading east. The existing ditch on the west side of Escambia Avenue from the high point to the outfall at pipe 13 needs to either be regraded or reconstructed in various sections of the ditch. Pipes 10.1-10.2, 10.4-10.6, 10.9, and 10.11 fall within this range and have the capacity to handle the design flow. A proposed ditch needs to be constructed on the west side of Escambia Avenue from the high point approximately 1400 feet south of Baldwin Street to the outfall at pipe 10.14. Pipes 10.16, 10.18, and 10.19 fall within this range. Pipes 10.18-10.19 do not have the capacity to handle the design flow. These existing 15" pipes need to be replaced with an 18" RCP. Pipe 10.16 has the capacity to handle the design flow but needs to be cleaned and then inspected to determine the condition of the pipe. Upon inspection, the decision can be made to keep or replace the pipe. For the purpose of this drainage study, the assumption was to replace the pipe.

The existing ditch on the east side of Escambia Avenue from the high point to the outfall at pipe 10.13 needs to either be regraded or reconstructed in various sections of the ditch. Pipes 10.3, 10.7, 10.8, 10.10, and 10.12 fall within this range and do not have the capacity to handle the design flow. Pipes 10.3 and 10.7 need to be replaced with an 18" RCP and pipes 10.8, 10.10, and 10.12 need to be replaced with a 24" RCP. Suarez Avenue falls along this range also. A proposed swale will need to be constructed on both sides approximately 125-150 feet up Suarez Avenue from Escambia Avenue to channel the water along each side of Suarez Avenue and not down the middle of the road. A proposed ditch needs to be constructed on the east side of Escambia Avenue from the high point approximately 1400 feet south of Baldwin Street to the outfall at pipe 10.14. Pipe 10.17 falls within this range and does not have the capacity to handle the design flow. This pipe needs to be replaced with a 30" RCP.

From the high point at Anniston Drive on Baldwin Street, the existing ditch on the south side will need minimal regrading and maintenance to Pensacola Avenue. From Pensacola Avenue to approximately 350 feet west, a proposed ditch will need to be constructed. From this point, the existing ditch will need minimal regrading and maintenance to Escambia Avenue. Pipes 10.20, 10.24, 10.26, 10.28-10.31, 10.33, and 10.37 all fall within this range. Pipes 10.24, 10.26, and 10.33 do not have the capacity to handle the design flow. These pipes need to be replaced with an 18" RCP. Pipes 10.20, 10.28-10.31, and 10.37 have the capacity to handle the design flow and will require minimal cleaning. From the high point at Anniston Drive on Baldwin Street, the existing ditch on the north side will need minimal regrading and maintenance to Escambia Avenue. Pipes 10.21-10.23, 10.25, 10.27, 10.32, 10.34-10.36, and 10.38 all fall within this range. Pipe 10.38 is a proposed pipe that runs under Anniston Drive that conveys the flow from

proposed swales on Anniston Drive. Pipes 10.21-10.23, 10.25, and 10.32 do not have the capacity to handle the design flow. Pipes 10.21-10.22 need to be replaced with a DBL 30" RCP, pipes 10.23 and 10.25 need to be replaced with a DBL 24" RCP, and pipe 10.32 needs to be replaced with a 24" RCP. Pipes 10.27 and 10.34-10.36 have the capacity to handle the design flow and require minimal cleaning.

There are two crossings under Escambia Avenue at Baldwin Street. Pipe 10.13 is the northern most crossing and pipe 10.14 is the southernmost crossing. Neither pipe has the capacity to handle the design flow. Pipe 10.13 needs to be replaced with a DBL 36" RCP and pipe 10.14 and 10.15 need to be replaced with a 30" RCP. The proposed ditch coming from pipes 10.12, 10.17, 10.20, and 10.21 to the outfall pipes needs to be 2.5 feet deep to contain the design flow.

STATE ST

ESCAMBIA AVE

SUAREZ AVE

BALDWIN ST

ANNISTON DR

10.31 10.01 10.32 10.33 10.34 10.02 10.35 10.03 10.36 10.04 10.05 10.37 10.06 10.38 10.07 10.18 10.17 10.16 10.15 10.14 10.13 10.12 10.11 10.10 10.09 10.08 10.28 10.27 10.25 10.24 10.22 10.23 10.21 10.20 10.19 10.29 10.26 10.40 10.41 10.30 10.42

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

TOWN OF PENSACOLA, FLORIDA
COMPREHENSIVE DRAINAGE MASTER PLAN

BASIN


TOWN OF PONCE DE LEON
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PONCE DE LEON

VOLKERT

NOT FOR CONSTRUCTION

0 400 800

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 10.1 | 15" RCP | 0.39 | | PASS | PIPE OK |
| 10.2 | 18" RCP | 1.18 | | PASS | PIPE OK |
| 10.3 | 15" CMP | 9 | | FAIL | 18" RCP |
| 10.4 | 22"x14" RCP | 1.88 | | PASS | PIPE OK |
| 10.5 | 15" RCP | 2.35 | | PASS | PIPE OK |
| 10.6 | 18" RCP | 2.45 | | PASS | PIPE OK |
| 10.7 | 18"X11" CMP | 14 | | FAIL | 18" RCP |
| 10.8 | 22"x13" RCP | | 21.27 | FAIL | 24" RCP |
| 10.9 | 18" RCP | 3.09 | | PASS | PIPE OK |
| 10.10 | 18" HDPE | 17.36 | | FAIL | 24" RCP |
| 10.11 | 18" RCP | 3.45 | | PASS | PIPE OK |
| 10.12 | 18" HDPE | 19.64 | | FAIL | 24" RCP |
| 10.13 | 58"X36" CMP | | 124.31 | FAIL | DBL 36" RCP |
| 10.14 | 30" RCP/30" HDPE | | 78.98 | FAIL | 36" RCP |
| 10.15 | 24" HDPE | 51.54 | | FAIL | |
| 10.16 | 18" RCP | 9.57 | | PASS | 18" RCP |
| 10.17 | 18" RCP | 39.48 | | FAIL | 30" RCP |
| 10.18 | 15" RCP | 9.01 | | FAIL | 18" RCP |
| 10.19 | 15" RCP | 8.48 | | FAIL | 18" RCP |
| 10.20 | 24" RCP | 11.87 | | PASS | PIPE OK |
| 10.21 | 29"x18" CMP | 75.14 | | FAIL | DBL 30" RCP |
| 10.22 | 42"x29" CMP/18" RCP | 66.01 | | FAIL | DBL 30" RCP |
| 10.23 | DBL 18" RCP/24" RCP | 52.57 | | FAIL | DBL 24" RCP |
| 10.24 | 18"x11" RCP | 13.38 | | FAIL | 18" RCP |
| 10.25 | DBL 18" RCP/24" RCP | 38.39 | | FAIL | DBL 24" RCP |
| 10.26 | 18"x11" RCP | 13.24 | | FAIL | 18" RCP |
| 10.27 | 24" RCP | 16.89 | | PASS | PIPE OK |
| 10.28 | 18" HDPE | 12.79 | | PASS | PIPE OK |
| 10.29 | 18" HDPE | 12.7 | | PASS | PIPE OK |
| 10.30 | 18" HDPE | 12.6 | | PASS | PIPE OK |
| 10.31 | 18" HDPE | 12.27 | | PASS | PIPE OK |
| 10.32 | 18" RCP | 13.28 | | FAIL | 24" RCP |
| 10.33 | 15" HDPE | 8.89 | | FAIL | 18" RCP |
| 10.34 | 18" HDPE | 9.88 | | PASS | PIPE OK |
| 10.35 | 24" RCP | 7.19 | | PASS | PIPE OK |
| 10.36 | 29"x18" RCP | 5.08 | | PASS | PIPE OK |
| 10.37 | 18" HDPE | 1.21 | | PASS | PIPE OK |
| 10.38 | | 0.54 | | | 18" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 10

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 535 | 206D-000 | LF | REMOVING PIPE | $8.00 | $4,280.00 |
| 7348 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $51,436.00 |
| 80 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $720.00 |
| 7 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $210.00 |
| 65 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $780.00 |
| 65 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $48.75 |
| 3 | 405A-000 | GAL | TACK COAT | $4.50 | $13.50 |
| 5 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $400.00 |
| 11 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $880.00 |
| 306 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $13,770.00 |
| 176 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $10,560.00 |
| 107 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $6,955.00 |
| 129 | 530A-004 | LF | 36" ROADWAY PIPE (CLASS 3 R.C.) | $75.00 | $9,675.00 |
| 532 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $7,980.00 |
| 18000 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $81,000.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 20 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $20,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $20,000.00 | $20,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $21,300.00 | $21,300.00 |
| 1 | 1007-000 | LS | BID SERVICES | $12,000.00 | $12,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $10,000.00 | $10,000.00 |
| **TOTAL** | | | | | **$282,508.25** |

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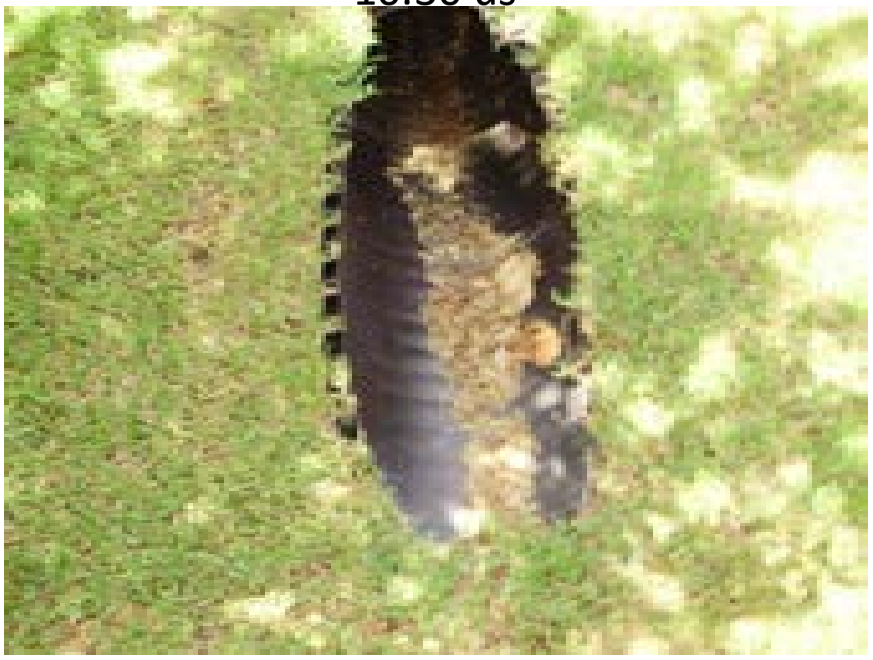

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Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Steve Love

Address (Street, City, State, Zip): 8547 Escambia Ave, Perdido Beach 36530-6122

Telephone Number: 251-861-7903

E-mail Address:
[illegible]

Public Meeting Attendance Location: Fire Department (Saturday, March 19, 2016; 9:00am)

Interest in Project: Property Owner

Public Official, Planning Commission

General Comments: Thanks for the presentations.
Topography maps would be helpful at next meeting.

Provide location and explain known drainage issues:
Water Runs off and under Escambia to Holly Street where it runs into the creek please review for any drainage issues.

Comments regarding the development of a stormwater management plan.
Please be as transparent as possible to prevent friction with some residents and elected officials.

Suggestions for ways to improve public input: Have forms and questionnaires either on your website or towns for people to fill out. Some property owners live out of town and this would be a good way for them to participate

Please return this form to the sign-in desk tonight, drop off at the town hall, email to the following email, or mail to the following address by April 8, 2016

Kramer Richardson, P.E., CPESC
Volkert, Inc.
P.O. Box 7430
Mobile, AL 36670
kramer.richardson@volkert.com

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Steve Love

Address (Street, City, State, Zip): 8863 Escambia Ave, Perdido Beach 36530-6172

Telephone Number: 251-961-1801

E-mail Address:
steve.love@gulftel.com

Public Meeting Attendance Location: Fire Department Saturday, March 19, 2016; 2:00pm

Interest in Project: Property Owner and Tax Payer

Local Business Owner

Public Official: Planning Commission

Other

General Comments: Thanks for the property tax map. Topography maps would be helpful at next meeting

Provide location and explain known drainage issues: I live on North East corner of Escambia and Suarez. Water runs out of field behind my house down our driveway into Suarez. Each time we have a heavy rain it washes a trench across and down the south side of Suarez washing dirt and gravel into the street and neighbors yard.

Comments regarding the development of a stormwater management plan: Please be as transparent as possible to prevent friction with some residents and elected officials

Suggestions for ways to improve public input: Have forms and questionnaires either on your website or towns for people to fill out. Some property owners live out of town and this would be a good way for them to participate

Please return this form to the registration desk tonight, drop off at the town hall, e-mail to the following e-mail, or mail to the following address by April 20th:

Hammer Richardson, P.L.L.C. (PLSC)
Consultants
P.O. Box 7424
Mobile, AL 36670

Comment Form
Public Involvement Meeting
Project: Town of Meridian Basics Stormwater Management Plan

Name:

Address (Street, City, State, Zip):

Telephone Number:

E-mail Address:

Public Involvement Meeting Location:

Interest in Project: Property Owner/Tenant / Meridian Council Member
Local Business Owner / Other

General Comments:

Provide location and explain known drainage issues:

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration table tonight, drop off at the town hall, email or mail to the following address by April 5, 2016:

Harrison Richardson, P.E., CFM
Volkert, Inc.
P.O. Box 7758
Meridian, ID 83680
harrison.richardson@volkert.com

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name:

Address (Street, City, State, Zip):

Telephone Number:

E-mail Address:

Public Meeting Attendance Location: Perdido Beach Community Center — Fax Comments by March 19, 2015 to:

Interest in Project: Property Owner/Tenant / HOA Business Owner — Public Official / Other

Comments/Concerns:

Provide location and explain any specific drainage issues:

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form at the registration desk tonight, drop off at the town hall, email to the following email, or mail to the following address by April 6, 2015:

Kathleen Richardson, P.E., CPESC
Volkert, Inc.
P.O. Box 7430
Mobile, AL 36670
kathleen.richardson@volkert.com

Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530
Sheet 1 of 6

# Town of Perdido Beach Comments and Concerns

August 1, 2013
DATE

Carl & Holly Hance JR
YOUR NAME

30520 Baldwin ST Perdido Beach, AL 36530
STREET# STREET TOWN STATE ZIP
*YOUR ADDRESS*

Holly_Hance@Yahoo.com
Holly.S.Hance.1029@Statefarm.com
EMAIL ADDRESS

Alternate 251-424-1114
Primary 850-982-6142
PRIMARY AND ALTERNATE PHONE

30530 Baldwin St Perdido Beach AL 36530
STREET # STREET TOWN STATE ZIP
*PHYSICAL ADDRESS OF PROPERTY CONCERN*

*ARE YOU THE OWNER* *YES* X *NO* ☐ *(Please Explain)*

DESCRIBE YOUR CONCERNS Location: Pensacola Ave & Baldwin ST. Poor Drainage Maintenance

There is a berm of dirt at the intersection of Pensacola Ave & Baldwin St blocking the drainage ditch causing the rain run off to flow down Baldwin St. and spill into our driveway. This is causing washouts and and flooding in our yard. The drainage ditch is dry East of our property.

SIGNATURE 8/1/13 FORM RECEIVED BY TOWN CLERK (DATE)

YOU MAY MAIL, EMAIL OR FAX THE FILLED OUT FORM TO:
9212 CO RD 97-PERDIDO BEACH, AL 36530
OR FAX TO (251) 962-2206
OFFICE PHONE (251) 962-2200
CLERK@TOWNOFPERDIDOBEACH.ORG

USE ADDITIONAL SHEETS IF NECESSARY

RECEIVED BY _____ PUBLIC WORKS DEPT _____
(DATE)

Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530


Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530
Sheet 3 of 6

Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530


drainage ditch dry

Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530

Carl & Holly Hance Jr
30520 Baldwin St
Perdido Beach, Al 36530


# BASIN 11

**Basin 11:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin runs from State Street where Basin 9 ends to west of Anniston Drive where Basin 10 ends to north of Baldwin Street where Basin 12 ends and on to the east to Soldier Creek. This basin has approximately 22.66 contributing acres of stormwater.

Proposed Improvements: This basin all drains to Pipe 11.5, the outfall. From the high point on each end of Anniston Drive, the water drains to the low spot or sag which is approximately 600 feet south of State Street. At the sag, the existing ditches do not have a cross drain to convey the water to the outfall. Proposed pipe 11.1, a 24" RCP, will need to be constructed under Anniston Drive to convey the water. From here, the water will drain down a proposed ditch to Pipe 11.5. A drainage easement will need to be acquired to construct the proposed ditch. Like Anniston Drive, the water drains from State Street and from Baldwin Street to the sag on Tuscaloosa Drive. Pipes 11.2, 11.3, 11.4, 11.6, 11.7, and 11.8 all drain to Pipe 11.5, the outfall. Pipes 11.2, 11.3, and 11.8 have the capacity to handle the design flow and pipes 11.4-11.7 do not have the capacity to handle the design flow. These pipes will need to be upsized. Pipes 11.2 and 11.3 need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipe. Pipes 11.4, 11.6, and 11.7 do not have the capacity to handle the design flow and will be upsized to a 24" RCP. Pipe 11.5 does not have the capacity to handle the design flow. It will need to be upsized to a DBL 30" RCP. There is an existing drainage easement from outfall pipe 11.5 to Soldier Creek. Using this easement, a drainage ditch needs to be constructed from the outfall to Soldier Creek for drainage purposes.

STATE ST

BALDWIN ST

ANNISTON DR

TUSCALOOSA DR

11.03

11.04

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11.12

11.13

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

TOWN OF PIEDMONT, ALABAMA

BASIN

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 11.1 | | | | | 24" RCP |
| 11.2 | 17"x13" CMP | 3.07 | | PASS | 18" RCP |
| 11.3 | 18" HDPE | 13.58 | | PASS | 18" RCP |
| 11.4 | 18" RCP | 17.81 | | FAIL | 24" RCP |
| 11.5 | 28"x20" CMP | | 71.23 | FAIL | DBL 30" RCP |
| 11.6 | 15" HDPE | 22.31 | | FAIL | 24" RCP |
| 11.7 | 15" CMP/18" CMP | 16.66 | | FAIL | 24" RCP |
| 11.8 | 15" HDPE | 7.27 | | PASS | PIPE OK |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 11

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 193 | 206D-000 | LF | REMOVING PIPE | $8.00 | $1,544.00 |
| 994 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $6,958.00 |
| 33 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $297.00 |
| 4 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $120.00 |
| 30 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $360.00 |
| 30 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $22.50 |
| 1 | 405A-000 | GAL | TACK COAT | $4.50 | $4.50 |
| 2 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $160.00 |
| 5 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $400.00 |
| 48 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $2,160.00 |
| 127 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $7,620.00 |
| 82 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $5,330.00 |
| 161 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $2,415.00 |
| 3007 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $13,531.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 6 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $6,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $6,500.00 | $6,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $7,800.00 | $7,800.00 |
| 1 | 1007-000 | LS | BID SERVICES | $8,000.00 | $8,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $7,700.00 | $7,700.00 |
| **TOTAL** | | | | | **$86,422.50** |

11.2 us

11.2 ds

11.3 us

11.3 ds

11.4 us

11.4 ds

11.5 us

11.5 ds

11.6 us

11.6 ds

11.7 us

11.7 ds

11.8 us

11.8a

11.8b

11.8 ds

Comment Form
Public Involvement Meeting
Project: Town of Pond Beach Stormwater Management Plan

Name: Ray Ellis

Address (Street, City, State, Zip): 8204 Anniston Dr

Telephone Number: 757-202-0128

Email Address:

Public Meeting Attendance Location: Fire Department Saturday March 19 2016

Interest in Project: Property Owner/Tenant; Local Business Owner; Public Official; Other:

General Comments:

Provide location and explain known drainage issues:
Sandbar Dr between Oakhurst & State St at the pond in... Department of water conservation dig a ditch to allow water to flow to the ocean. Culvert at the drainage ditch should be installed to help the water flow faster & prevent flooding.

Comments regarding the development of a stormwater management plan:
Stormwater fees should be discouraged as a method to protect property & environment. County should be responsible for all projects they create & flow after planning to avoid these problems

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight, drop off at municipal building, or mail to the following address by April 2, 2016

Jennifer Richardson, P.E., CFESC
Volkert, Inc.
P.O. Box 7616
Mobile, AL 36670
Email: richardson@volkert.com

Comment Form
Public Involvement Meeting
Project: Town of Redondo Beach Stormwater Management Plan

Name: [illegible]

Address: Street, City, State, Zip:

[illegible]

Telephone Number: [illegible]

E-mail Address: [illegible]

Public Meeting Attended: Location: Fire Department Date: March 19, 2018

Interest in Project: Property Owner/Tenant [illegible] Public Official
Local Business Owner Other

General Comments:

[illegible] Beryl St between Belle Ave St and Flora St. They are the lowest point in the area and all runoff must exit to the south at Beryl St. It was stated that the County will be contacted and said that [illegible] to the ocean. [illegible] Flora St [illegible] Beryl St [illegible] no longer [illegible]

Provide location and details of known drainage issues:

[illegible]

Storm water management facility opportunities: Existing [illegible] Flora St [illegible] [illegible]

Comments regarding the development of a stormwater management plan:

[illegible]

Suggestions for ways to improve public input:

[illegible]

Please return this form to the registration desk tonight, drop off at the Public Works counter, or mail to the following address by April 6, 2018:

Kamran Rahmanian, P.E., CFM, CPSWQ
[illegible]
P.O. Box [illegible]
[illegible], AL 35[illegible]
kamran.rahmanian@[illegible].com

# BASIN 12

**Basin 12:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin runs from Anniston Drive east to Tuscaloosa Drive down Baldwin Street. This basin has approximately 1.28 contributing acres of stormwater.

Proposed Improvements: Proposed swales will need to be constructed down both sides of Baldwin Street. Pipe 12.1 falls within this range. It has the capacity to handle the design storm and will need to be cleaned. The water running down the south side of Baldwin Street will be piped under Tuscaloosa Drive by proposed pipe 12.4, an 18" RCP and will run down an existing ditch to Soldier Creek. The water on north side of Baldwin Street will pipe under Baldwin St by proposed pipe 12.3, an 18" RCP. The water will then flow through proposed pipe 12.4 to the existing ditch to Soldier Creek

BALDWIN ST

ANNISTON DR

TUSCALOOSA DR

12.01

12.02

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PERDIDO BEACH

BASIN

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 12.1 | 15" HDPE | 3.33 | | PASS | PIPE OK |
| 12.2 | 15" RCP | | 1.63 | PASS | 18" RCP |
| 12.3 | | | 1.63 | | 18" RCP |
| 12.4 | | | 3.95 | | 18" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 12

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 26 | 206D-000 | LF | REMOVING PIPE | $8.00 | $208.00 |
| 738 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $5,166.00 |
| 27 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $243.00 |
| 4 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $120.00 |
| 41 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $492.00 |
| 41 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $30.75 |
| 2 | 405A-000 | GAL | TACK COAT | $4.50 | $9.00 |
| 3 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $240.00 |
| 7 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $560.00 |
| 69 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $3,105.00 |
| 28 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $420.00 |
| 1800 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $8,100.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $2,000.00 | $2,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $3,500.00 | $3,500.00 |
| **TOTAL** | | | | | **$41,193.75** |

12.1 us

12.1 ds

12.2 us

12.2 ds

12.3 us

# BASIN 13

**Basin 13:**

Characteristics: This basin is made up of existing single family residential houses and the Volunteer Fire Department with mainly grassed and wooded areas. This basin runs from approximately 1100 feet north of Cedar Street where Basin 10 ends to approximately 400 feet south of Cedar Street. There is a high point on Cedar Street approximately 2100 feet east of Escambia Avenue and a high point up Pensacola Avenue approximately 850 feet north of Cedar Street. This basin has approximately 34.76 contributing acres of stormwater.

Proposed Improvements: A proposed ditch needs to be constructed on the west side of Escambia Avenue from the high point to pipe 13.4. At this point, a proposed easement needs to be obtained to outlet the water in a proposed ditch to Palmetto Creek or a more extensive study will need to be done at the current location in the design phase to determine the capacity of the current natural retention pond to see if expanding the retention pond is the better alternative. The existing ditch from the other high point to the new proposed outfall needs regrading. Pipes 13.4, 13.6, and 13.7 fall within this range and do not have the capacity to handle the design flow. They will need to be replaced with a DBL 30" RCP, a 24" RCP, and an 18" RCP respectively. On the east side of Escambia Avenue just south of the Volunteer Fire Department, a proposed ditch needs to be constructed. Pipes 13.1-13.3 fall within this range and do not have the capacity to handle the design flow. These three pipes need to be replaced with a 24" RCP. This proposed ditch will run to pipe 13.5. This pipe will need to be relocated to the proposed outfall that outlets to Palmetto Creek. A proposed ditch needs to be constructed on the other side of pipe 13.5 from the high point on Escambia Avenue. Pipe 13.8 falls within this range. The existing pipe has the capacity to handle the design flow. Pipe 13.8 needs to be cleaned and then inspected to see the condition of the pipe. Upon inspection, the decision can be made to keep or replace the pipe. For the purpose of this drainage study, the assumption was to replace the pipe. Pipe 13.5 does not have the capacity to handle the design flow and will need to be replaced with a DBL 30" RCP.

Proposed ditches will need to be constructed on both sides of Pensacola Avenue from the high point to Cedar Street. Proposed pipe 13.9 will need to be constructed under Pensacola Avenue to channel the water from one side of Pensacola Avenue to the other side. A proposed swale will need to be constructed on the north side of Cedar Street from the high point to Pensacola Avenue and then a proposed ditch will need to be constructed from Pensacola Avenue down Cedar Street to pipe 13.5, which crosses under Escambia Avenue. A proposed swale will also need to be constructed about 400 feet down Cedar Street on the south side.

ESCAMBIA AVE

PENSACOLA AVE

CEDAR ST

CYPRESS ST

13.01

13.02

13.03

13.04

13.05

13.06

13.07

13.08

13.09

13.10

13.11

13.12

13.13

13.14

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

TOWN OF PONCE DE LEON
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PONCE DE LEON

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 13.1 | 15" RCP | 14.62 | | FAIL | 24" RCP |
| 13.2 | 18"x11" RCP | 17.69 | | FAIL | 24" RCP |
| 13.3 | 15" HDPE | 20.71 | | FAIL | 24" RCP |
| 13.4 | 24" HDPE | | 71.66 | FAIL | DBL 30 RCP |
| 13.5 | 24" RCP | 55.24 | | FAIL | DBL 30 RCP |
| 13.6 | 18" CMP | 1.84 | | FAIL | 24" RCP |
| 13.7 | 15" HDPE | 1.45 | | FAIL | 18" RCP |
| 13.8 | 29"x18" RCP | 5.55 | | PASS | 24" RCP |
| 13.9 | | 17.94 | | | 24" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 13

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 232 | 206D-000 | LF | REMOVING PIPE | $8.00 | $1,856.00 |
| 4825 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $33,775.00 |
| 49 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $441.00 |
| 5 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $150.00 |
| 47 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $564.00 |
| 47 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $35.25 |
| 2 | 405A-000 | GAL | TACK COAT | $4.50 | $9.00 |
| 4 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $320.00 |
| 8 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $640.00 |
| 24 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $1,080.00 |
| 268 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $16,080.00 |
| 130 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $8,450.00 |
| 12135 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $54,607.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 7 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $7,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $20,000.00 | $20,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $3,000.00 | $3,000.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $12,500.00 | $12,500.00 |
| 1 | 1007-000 | LS | BID SERVICES | $10,000.00 | $10,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $10,000.00 | $10,000.00 |
| **TOTAL** | | | | | **$187,507.75** |

13.1 us

13.1 ds

13.2 us

13.2 ds

13.3 us

13.3 ds

13.4 us N

13.4 us S

13.5 us

13.5 ds

13.6 us

13.6 ds

13.7 us

13.7 ds

13.8 us

13.8 ds

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Charles + Sharon Odell
Address (Street, City, State, Zip): 8110 E Columbia Avenue Perdido Beach, AL
Mailing address: 3049 Spanish Lake Spanish Fort, AL 36527
Telephone Number: 251-458-7835
E-mail Address: Vanbuddy@att.net

Public Meeting Attendance Location: Fire Department Saturday, March 19 2016:

Interest in Project: (Property Owner) Tenant: X
Local Business Owner:
Public Office Title:

General Comments:

Provide location and explain known drainage issues.
We are on the corner of E Columbia Ave and Cedar St. Water flows down Cedar St from high points of land. Pools down the driveway and under the house. Also when it rains heavily, like the April drill, there is approximately three feet of standing water in our front yard.

Comments regarding the development of a stormwater management plan:
The City needs to have a comprehensive stormwater drainage plan. Thanks!

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight, drop off at the town hall, email to the following email or mail to the following address by April 8, 2016

Kamran Richardson, P.E., CPESC
Volkert, Inc
P.O. Box 7434
Mobile, AL 36670
kamran.richardson@volkert.com

# BASIN 14

**Basin 14:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is bordered by 10, 12, 13, and 16. It covers just south of Baldwin Street to east of Pensacola Avenue to the northern tip of Cedar Street. This basin has approximately 25.97 contributing acres of stormwater.

Proposed Improvements: Pipe 14.1 has the capacity to handle the design flow. This pipe needs minimal pipe cleaning and the existing swale running on the south side through this pipe needs minimal regrading to achieve positive flow. A proposed swale needs to be constructed on the north side of Cedar Street to the outfall and on the west side of Tuscaloosa Avenue to the outfall.

PENSACOLA AVE

CEDAR ST

CYPRESS ST

TUSCALOOSA AVE

14.01

14.02

14.03

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

TOWN OF PONCE DE LEON
CONSTRUCTION DRAWINGS
WATER PLAN

TOWN OF PONCE DE LEON

SHEET 12

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 14.1 | 29"x18" RCP | | 6.52 | PASS | PIPE OK |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 14

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 682 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $4,774.00 |
| 100 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $900.00 |
| 43 | 534E-001 | LF | CLEANING EXISTING PIPE (LESS THAN OR EQUAL TO 48" HORIZONTAL OPENING) | $15.00 | $645.00 |
| 2062 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $9,279.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $5,000.00 | $5,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $3,050.00 | $3,050.00 |
| **TOTAL** | | | | | **$41,648.00** |

14.1 us

14.1 ds

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Name: Oliver Guilford - Beverly Currie
Address (Street, City, State, Zip): 8931 Tuscaloosa Dr.
Perdido Beach FL 36530
Telephone Number: 251-981-3366
E-mail Address: oliverguilford@yahoo.com

Public Meeting Attendance Location: Fire Department Thursday June 30 2016 ✓

Interest in Project: Property Owner/Tenant ✓ Public Official
Local Business Owner Other

General Comments

Projects Ideas and explain known drainage issues

Just off Spanish Circle on Loop between Cedar & Ponce

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight, drop off at the town hall, email to the following email, or mail to the following address by July 15 2016

Kamryn Richardson, P.E. CPESC
Volkert, Inc
P.O. Box 7454
Mobile AL 36670
kamryn.richardson@volkert.com

# BASIN 15

**Basin 15:**

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas and small patches of grassed areas. This basin is bordered by 13, 14, 16, 17, and 18. It covers south of Cedar Street to north of Magnolia Street. This basin has approximately 61.29 contributing acres of stormwater.

Proposed Improvements: This is such a large area the improvements will be broken down by streets. A proposed ditch needs to be constructed on the west side of Escambia from Cypress Street to Magnolia Street. Pipes 15.1, 15.2, 15.3, 15.5, 15.6, 15.7, and 15.9 fall in this range. All of these pipes can handle the design flow and all of these pipes need to be cleaned and then inspected to determine the condition of the pipes. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes. A proposed ditch will need to be constructed on the east side of Escambia Avenue approximately 300 feet south of Cypress Street to Magnolia Street. Pipes 15.4, 15.8, and 15.14 fall in this range. Pipe 15.14 is completely filled with sediment and in the proposed drainage scheme, not needed. Pipes 15.4 and 15.8 do not have the capacity to handle the design flow. These pipes will need to be replaced with a 24" RCP and a 30" RCP respectively.

A proposed ditch needs to be constructed on the north side of Cypress Street from Escambia Avenue to Mobile Avenue. From the high point on Cypress Street approximately 1400 feet east of Mobile Avenue, a ditch needs to be constructed on the north side of Cypress Street to Mobile Avenue. Pipes 15.15-15.16 fall in this range. These pipes do not have the capacity to handle the design flow. They need to be replaced with 24" RCP. Proposed pipe 15.17 needs to be constructed from the east side of Mobile Avenue to the west side of Mobile Avenue and then proposed pipe 15.18 needs to be constructed from the outlet of pipe 15.17 across Cypress Street to the south. From the outlet of pipe 15.18, a 2.5 feet deep proposed ditch will need to be construct down the west side of Mobile Avenue to Magnolia Street.

A proposed ditch needs to be constructed from the high point on Magnolia Street to Escambia Avenue. Pipes 15.11-15.13 fall in this range. None of these pipes can handle the design flow and will need to be replaced. Pipe 15.13 needs to be a 24" RCP and pipes 11-12 need to be a 30" RCP. The proposed ditch from pipe 15.12 to Escambia Avenue needs to be 2.5 feet deep. Pipe 15.10, the outfall pipe, runs under Escambia Avenue and cannot handle the design flow. This pipe will need to be replaced with a DBL 36" RCP so the water can be conveyed down the exiting ditch to the receiving wetland area.

CYPRESS ST

ESCAMBIA AVE

MOBILE AVE

MAGNOLIA ST

15.01

15.02

15.03

15.06

15.07

15.08

15.09

15.10

15.11

15.12

15.13

15.14

15.15

15.16

15.17

15.18

15.19

15.20

15.21

EXST DITCH

EXST SWALE

PROP DITCH

PROP SWALE

VOLKERT

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PERDIDO BEACH

BASIN

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

CEDAR ST

CYPRESS ST

CEDAR ST

15.03

15.04

15.05

15.06

VOLKERT

TOWN OF PONCE INLET
VOLUSIA COUNTY, FLORIDA
WATERSHED PLAN

TOWN OF PONCE INLET

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 15.1 | 18"x11" CMP | 3.4 | | PASS | 18" RCP |
| 15.2 | 15" RCP | 5.21 | | PASS | 18" RCP |
| 15.3 | 15" RCP | 5.13 | | PASS | 18" RCP |
| 15.4 | 15" RCP | 16.9 | | FAIL | 24" RCP |
| 15.5 | 18" RCP | 5.37 | | PASS | 18" RCP |
| 15.6 | 18" RCP | 5.49 | | PASS | 18" RCP |
| 15.7 | 18" HDPE | 5.82 | | PASS | 18" RCP |
| 15.8 | 15" RCP | 20.26 | | FAIL | 30" RCP |
| 15.9 | 22"x13" RCP | 6.17 | | PASS | 18" RCP |
| 15.10 | 18" RCP | | 88.77 | FAIL | DBL 36" RCP |
| 15.11 | 15" RCP | | 35.54 | FAIL | 30" RCP |
| 15.12 | 18"x11" RCP | 22.45 | | FAIL | 30" RCP |
| 15.13 | 15" RCP | | 24.6 | FAIL | 24" RCP |
| 15.14 | COMPLETELY FILLED | | | FAIL | --- |
| 15.15 | 18"x11" RCP | 16.52 | | FAIL | 24" RCP |
| 15.16 | 18"x11" RCP | 14.65 | | FAIL | 24" RCP |
| 15.17 | | | 33.97 | | 30" RCP |
| 15.18 | | | 39.7 | | 30" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 15

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 473 | 206D-000 | LF | REMOVING PIPE | $8.00 | $3,784.00 |
| 4797 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $33,579.00 |
| 143 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $1,287.00 |
| 13 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $390.00 |
| 117 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $1,404.00 |
| 117 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $87.75 |
| 6 | 405A-000 | GAL | TACK COAT | $4.50 | $27.00 |
| 10 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $800.00 |
| 19 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $1,520.00 |
| 182 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $8,190.00 |
| 111 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $6,660.00 |
| 201 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $13,065.00 |
| 118 | 530A-004 | LF | 36" ROADWAY PIPE (CLASS 3 R.C.) | $75.00 | $8,850.00 |
| 11700 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $52,650.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 14 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $14,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $20,000.00 | $20,000.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $15,000.00 | $15,000.00 |
| 1 | 1007-000 | LS | BID SERVICES | $12,000.00 | $12,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $3,000.00 | $3,000.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $10,000.00 | $10,000.00 |
| **TOTAL** | | | | | **$214,293.75** |

15.1 us

15.1 ds

15.2 us

15.2 ds

15.3 us

15.3 ds

15.4 us

15.4 ds

15.5 us

15.5 ds

15.6 us

15.6 ds

15.7 us

15.7 ds

15.8 us

15.8 ds

15.9 us

15.9 ds

15.10 us

15.10 ds

15.11 us

15.11 ds

15.12 us

15.12 ds

15.13 us

15.13 ds

15.14 us

15.14 ds

15.15 us

15.15 ds

15.16 us

15.16 ds

8306 Mobile Ave
Perdido Beach, Al 36530

8306 Mobile Ave
Perdido Beach, Al 36530

8306 Mobile Ave
Perdido Beach, Al 36530

# BASIN 16

**Basin 16:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is bordered by 13, 14, 15, and 18. It covers just south of Cedar Street to the high point approximately 2000 feet east of Escambia Avenue to a high point approximately 500 feet south of Cypress Street. This basin has approximately 17.89 contributing acres of stormwater.

Proposed Improvements: Pipe 16.1 does not have the capacity to handle the design flow. This pipe needs to be replaced with a 30" RCP. A proposed ditch needs to be constructed on the north side of Cypress Street to the outfall while a proposed swale needs to be constructed on the west side of Tuscaloosa Avenue to the outfall.

CEDAR ST

TUSCALOOSA AVE

CYPRESS ST

JUNIPER ST

16.01

16.02

16.03

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

TOWN OF PONCE INLET
COMPREHENSIVE DRAINAGE
MASTER PLAN

BASIN 16

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 16.1 | 29"x18" RCP | | 23.61 | FAIL | 30" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 16

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 60 | 206D-000 | LF | REMOVING PIPE | $8.00 | $480.00 |
| 719 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $5,033.00 |
| 24 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $216.00 |
| 3 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $90.00 |
| 24 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $288.00 |
| 24 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $18.00 |
| 1 | 405A-000 | GAL | TACK COAT | $4.50 | $4.50 |
| 2 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $160.00 |
| 4 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $320.00 |
| 60 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $3,900.00 |
| 1839 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $8,275.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $4,500.00 | $4,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $3,500.00 | $3,500.00 |
| **TOTAL** | | | | | **$44,785.00** |

16.1 us

16.1 ds

# BASIN 17

**Basin 17:**

Characteristics: This basin is made up of existing single family residential houses with mainly grassed and wooded areas. This basin is south of Magnolia Street to a high point approximately 1125 feet east of Escambia Avenue. This basin has approximately 5.13 contributing acres of stormwater.

Proposed Improvements: Pipe 17.1 is completely filled. A proposed swell will need to be constructed from approximately 300 feet east of Mobile Avenue. Proposed pipe 17.2 will need to be constructed to convey the water from the east side of Mobile Avenue to the west side of Mobile Avenue. A proposed ditch will need to be constructed from Mobile Avenue to Escambia Avenue. Pipes 17.2-17.5 in this range, will be 24" RCP constructed under the driveways with a proposed pipe 17.6, a 30" RCP, constructed under Escambia Avenue to convey the water into the existing ditch.

CYPRESS ST

MOBILE AVE

MAGNOLIA ST

ESCAMBIA AVE

17.01

17.02

17.03

17.04

17.05

17.06

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

PERDIDO BAY

VOLKERT

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

BASIN 17

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 17.1 | COMPLETELY FILLED | 18.7 | | | 24" RCP |
| 17.2 | | 9.92 | | | 18" RCP |
| 17.3 | | 11.18 | | | 24" RCP |
| 17.4 | | 13.4 | | | 24" RCP |
| 17.5 | | 16.25 | | | 24" RCP |
| 17.6 | | | 27.07 | | 30" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 17

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 40 | 206D-000 | LF | REMOVING PIPE | $8.00 | $320.00 |
| 861 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $6,027.00 |
| 16 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $144.00 |
| 2 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $60.00 |
| 16 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $192.00 |
| 16 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $12.00 |
| 1 | 405A-000 | GAL | TACK COAT | $4.50 | $4.50 |
| 1 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $80.00 |
| 3 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $240.00 |
| 40 | 530A-001 | LF | 18" ROADWAY PIPE (CLASS 3 R.C.) | $45.00 | $1,800.00 |
| 160 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $9,600.00 |
| 60 | 530A-003 | LF | 30" ROADWAY PIPE (CLASS 3 R.C.) | $65.00 | $3,900.00 |
| 2100 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $9,450.00 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 5 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $5,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $4,500.00 | $4,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $5,800.00 | $5,800.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $5,800.00 | $5,800.00 |
| **TOTAL** | | | | | **$67,429.50** |

17.1 us

17.1 ds

Comment Form
Public Involvement Meeting
Project: Town of Perdido Beach Stormwater Management Plan

Author: [illegible]
Address/Street, City, State, Zip: [illegible]

Telephone Number: [illegible]
E-mail Address: [illegible]

Public Meeting Attendance Location: Fire Department Saturday, March 19, 2016

Interest in Project: Property Owner/Tenant / Local Business Owner / Public Official / Other

General Comments:

[illegible]

Provide location and any other known drainage issues:

[illegible]

Comments regarding the development of a stormwater management plan:

Suggestions for ways to improve public input:

Please return this form to the registration desk tonight or to an official in the town hall or email to me the following address by April 5, 2016:

Kamran Richardson, P.E., CPESC
Volkert, Inc.
P.O. Box 7404
Mobile, AL 36670
kamran.richardson@volkert.com

# BASIN 18

**Basin 18:**

Characteristics: This basin is made up of existing single family residential houses with mainly wooded areas and small patches of grassed areas. This basin is located from the high point on Magnolia Street to a high point approximately 450 feet north of Magnolia Street to Juniper Street with a small area south of Magnolia Street. This basin has approximately 11.02 contributing acres of stormwater.

Proposed Improvements: An existing swale on the north side of Magnolia Street will need minimal regrading to the outlet at pipe 18.3. Pipe 18.1 falls in this range and has the capacity to handle the design storm. An existing swale on the south side of Magnolia Street will need minimal regrading to pipe 18.2 where the water crosses under Magnolia Street to the north side swale. Pipe 18.2 has the capacity to handle the design flow. Pipes 18.1-18.2 need to be cleaned and then inspected to see the condition of the pipe. Upon inspection, the decision can be made to keep or replace the pipes. For the purpose of this drainage study, the assumption was to replace the pipes. The outfall pipe, pipe 18.3, does not have the capacity to handle the design flow. It will need to be replaced with a DBL 24" RCP to convey the water into the outfall channel and not overtopping the road. The outfall channel could potentially need some minimal regrading,

CEDAR ST

JUNIPER ST

CYPRESS ST

MAGNOLIA ST

18.03

18.02

18.01

18.04

EXST DITCH
EXST SWALE
PROP DITCH
PROP SWALE

VOLKERT

TOWN OF PONTE VEDRA BEACH
COMPREHENSIVE DRAINAGE
MASTER PLAN

TOWN OF PONTE VEDRA BEACH

EXHIBIT 10

| PIPE # | EX. PIPE SIZE | DISCHARGE (10 YR) (cfs) | DISCHARGE (50 YR) (cfs) | PASS/FAIL | DESIGN PIPE SIZE |
|---|---|---|---|---|---|
| 18.1 | 18" RCP | 5.98 | | PASS | 18" RCP |
| 18.2 | 22"x13" RCP | | 4.24 | PASS | 18" RCP |
| 18.3 | 22"x13" RCP | | 15.69 | FAIL | DBL 24" RCP |

50 YR STORM EVENT IS USED FOR ALL CROSSDRAINS, 10 YR STORM EVENT IS USED FOR ALL DRIVEWAY PIPES

TOWN OF PERDIDO BEACH
COMPREHENSIVE DRAINAGE MASTER PLAN
Volkert Project No. 636502.AV
BASIN 18

| QUANTITY | ITEM NO. | UNIT | ITEM | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| 95 | 206D-000 | LF | REMOVING PIPE | $8.00 | $760.00 |
| 253 | 210A-000 | CY | UNCLASSIFIED EXCAVATION | $7.00 | $1,771.00 |
| 31 | 210D-001 | CY | BORROW EXCAVATION (LOOSE TRUCKBED MEASUREMENT) | $9.00 | $279.00 |
| 4 | 214B-001 | CY | FOUNDATION BACKFILL, COMMERCIAL | $30.00 | $120.00 |
| 37 | 301A-012 | SY | CRUSHED AGGREGATE BASE COURSE, TYPE B, PLANT MIXED, 6" COMPACTED THICKNESS | $12.00 | $444.00 |
| 37 | 401A-000 | SY | BITUMINOUS TREATMENT A | $0.75 | $27.75 |
| 2 | 405A-000 | GAL | TACK COAT | $4.50 | $9.00 |
| 3 | 429-A | TON | IMPROVED BITUMINOUS CONCRETE WEARING SURFACE LAYER, 3/4" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $240.00 |
| 6 | 429-B | TON | IMPROVED BITUMINOUS CONCRETE UPPER BINDER LAYER, 1" MAX. AGG. SIZE, ESAL RANGE C/D | $80.00 | $480.00 |
| 120 | 530A-002 | LF | 24" ROADWAY PIPE (CLASS 3 R.C.) | $60.00 | $7,200.00 |
| 1995 | 654A-000 | SY | SOLID SODDING (MATCH EXISTING) | $4.50 | $8,977.50 |
| 1 | 1001-000 | LS | TRAFFIC CONTROL | $2,500.00 | $2,500.00 |
| 1 | 1002-000 | LS | EROSION CONTROL | $2,000.00 | $2,000.00 |
| 1 | 1003-000 | EA | DRIVEWAY REPAIR | $1,000.00 | $1,000.00 |
| 1 | 1004-000 | LS | SURVEY SERVICES | $3,500.00 | $3,500.00 |
| 1 | 1005-000 | LS | ENVIRONMENTAL SERVICES | $2,500.00 | $2,500.00 |
| 1 | 1006-000 | LS | ENGINEERING SERVICES | $4,000.00 | $4,000.00 |
| 1 | 1007-000 | LS | BID SERVICES | $6,000.00 | $6,000.00 |
| 1 | 1008-000 | LS | GEOTECHNICAL SERVICES | $1,500.00 | $1,500.00 |
| 1 | 1009-000 | LS | CEI SERVICES | $3,900.00 | $3,900.00 |
| **TOTAL** | | | | | **$47,208.25** |

18.1 us

18.1 ds

18.2 us

18.2 ds

18.3 us

18.3 ds

# Level 1 Wetland Assessment

# *Subsection Level One Wetland Assessment*

**890 ± Acre Town of Perdido Beach**
**Perdido Beach, Alabama**
**Volkert Contract No. 636500.AE**

*Prepared for*

**Town of Perdido Beach**
**Mayor Patsy Parker**
**9212 County Road 87**
**Perdido Beach, AL 36530**

**May 17, 2016**

*Prepared by*

**VOLKERT, INC.**
**316 South McKenzie Street**
**Foley, Alabama 36535**
**(251) 968-7551**

# *TABLE OF CONTENTS*



# *APPENDIX*

## 1.0 PURPOSE

The purpose of this subsection level one wetland assessment was to formulate the probability as to whether or not jurisdictional wetlands and waters of the United States (U.S.) occur, and to what extent they occur, on approximately 890 acres known as the Town of Perdido Beach, Alabama. The survey area is located in Township 8 South, Range 6 East, Sections 7 and 18 of the Orange Beach and Perdido Bay, Alabama USGS topographic quadrangle maps. As this determination is a subsection level one, no detailed delineation field work was performed; however, a windshield survey of the general project area was conducted. When a subsection level one determines the presence of wetlands or waters of the U.S., then field reconnaissance is necessary to delineate the actual wetland limits so they can be mapped and officially verified by the U.S. Army Corps of Engineers (COE).

## 2.0 METHODS

Several sources of information were gathered, such as the USGS 7.5 minute quadrangle maps of Orange Beach and Perdido Bay, Alabama, the National Wetland Inventory map, the Baldwin County wetlands assessment GIS data, the NRCS soil data information for Baldwin County, the NRCS 2015 aerial photo and the Baldwin County lidar contour data for the project site.

For each source researched for this level of determination a demarcation line was established. These sources have varying levels of accuracy and as such produced differing results. The level of probability for a wetland or a water of the U.S. to exist was highest where multiple sources overlap and less probable where only one source was represented.

**Source 1: USGS 7.5 minute quadrangle map of Orange Beach and Perdido Bay, Alabama.**

Appendix A, Data Source 1, showed that it is unlikely that there would be a perennial or intermittent stream or tributaries within the survey area. There are a few associated wetlands or mud flats mapped along the water's edge to the eastern and southern shores of the survey area. In the north west portion of the survey area there is a small lake identified and to the east of the lake it shows the man made canal that empties into Soldier Creek to the east. The quadrangle map also shows that there is a high ground ridge that runs generally down the middle of the survey site and storm water runoff generally flows west to Palmetto Creek, east to Soldier Creek, and south to Perdido Bay.

**Source 2: National Wetland Inventory Map (NWI).**

This wetland data was downloaded from the U.S. Fish and Wildlife's website, http://www.fws.gov/wetlands/. According to the NWI Map, Appendix A, Data Source 2, there are two broad wetland types identified within the property boundary. The most dominant wetland type found to be within the survey area is Estuarine and Marine Wetlands and the other is Freshwater Emergent Wetland. Estuarine and Marine Wetlands are usually tidally influenced and are typically found along the shore line of various types of brackish or saltwater waterbodies such as bays, sloughs and estuarine rivers. Freshwater Emergent Wetlands typically occur along the banks and shores of freshwater ponds, lakes, rivers and streams. Both of these wetland types are emergent in nature and do not have a developed canopy or midstory component.

**Source 3: Baldwin County Wetlands Assessment GIS Data.**

This wetland data layer was created by the Baldwin County Planning and Zoning Department using available aerial photography and available spatial data. According to the Baldwin County Wetlands Assessment data layer, Appendix A,

Data Source 3, the wetlands on the subject property are hydrogeomorphically characterized as one of three different types: riverine, fringe, or depressional. The Baldwin County Planning and Zoning's Baldwin County Wetland Conservation Plan web page, http://www.outdooralabama.com/sites/default/files/images/file/Weeks_Bay/Baldwin_wetlands.pdf classifies each wetland type as follows:

Riverine wetlands are found to occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are overbank flow from the channel or subsurface hydrologic connections between the stream channel and adjacent wetlands.

Fringe wetlands are located adjacent to a large body of water, most typically the Gulf of Mexico or a large bay system, and they receive frequent and regular two-way flow from astronomic tides or from wind-driven water level fluctuation. The dominant fringe wetlands in Baldwin County are salt marshes.

Depressional wetlands are wetlands located in a depression in the landscape, and they have a very small catchment area for surface runoff. Depressional wetlands in Baldwin County can include interdunal swales along Fort Morgan and Grady ponds located throughout the agricultural areas in the southern half of the county.

**Source 4: NRCS soil data for Baldwin County**

The soil survey information used in this analysis was downloaded from the NRCS Soil Data Mart and the soil interpretations were gathered from the ***Soil Survey of Baldwin County, Alabama (1964)***. There are six soil classes found within the subject property boundary limits that are identified as hydric, Appendix A, Data Source 4. They are Bibb and Mantachie soils, local alluvium (Bb), Coastal Beaches (Co), Grady soils (Gr), Plummer loamy sand, 0 to 5 percent slopes (PmB), Tidal marsh (Td) and Wet loamy alluvial land (Wm).

**Source 5: NRCS 2015 aerial photo**

Another good indicator of where wetlands may occur is a distinct change in vegetation density. Abrupt changes in color or canopy density can indicate the difference between upland and wetland plant communities. Also, depending on the canopy density, streams, lakes, and tidally influenced mud flats can also be easily identified on the aerial. The 2015 aerial photo clearly shows the large canal system in the northern half of the survey area with a connection to Soldier Creek. There are also several tidally influenced emergent fringe wetlands that show up on the aerial photography. Most of these wetlands are in the southwestern portion of the property along Palmetto Creek and along the northeast portion of the survey site along Soldier Creek, Appendix A, Data Source 5.

**Source 6: Baldwin County Lidar Data**

Lidar contour data is collected through the use of aircraft-mounted lasers that record elevation measurements. From this data, areas with gradual to no relief located at the bottoms of steep topography features can usually be identified as potential wetland areas and streams. Appendix A, Data Source 6, showed the Baldwin County lidar information for the subject property overlain on the USGS 7.5 minute quadrangle maps.

**Cumulative Map Results**: Appendix A, Cumulative Site Map, is a comprehensive map showing the correlation between the USGS 7.5 minute quadrangle maps of Orange Beach and Perdido Bay, Alabama, the National Wetland Inventory map, the Baldwin County wetlands assessment GIS data, the NRCS soil data information for Baldwin County, the NRCS 2015 aerial photo and the Baldwin County lidar contour data. The highest level of probability for wetlands and waters of the U.S. to exist is where these sources would overlap;

however, wetlands and waters may still exist in areas where only one source is represented. This map was used as a guide for the windshield survey verification.

## 3.0 WINDSHIELD SURVEY

A windshield survey of the property boundary was conducted on May 13, 2016. During the survey, some areas where data sources overlapped as depicted in the Cumulative Map were identified as jurisdictional wetlands or waters of the U.S. The extent of wetland boundaries or waters of the U.S. was not determined at this level of investigation.

## 4.0 CONCLUSION

As a result of this assessment, it has been determined that jurisdictional wetlands are present within the survey area. A jurisdictional determination should be performed and verified by the U.S. Army Corps of Engineers prior to conducting any land disturbing activities on the subject property.

# APPENDIX A
# FIGURES

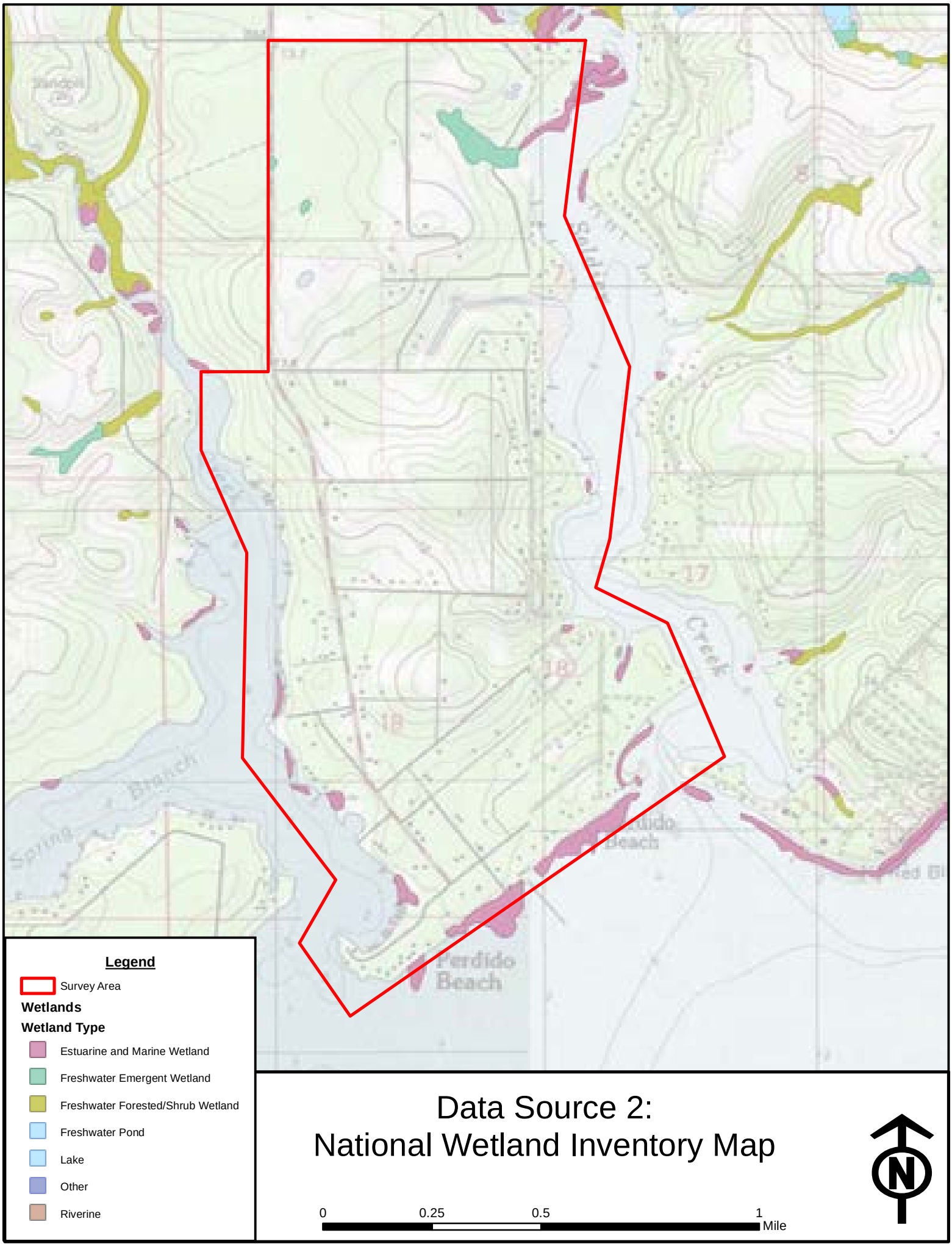

Data Source 1:
Orange Beach and Perdido Bay
USGS Topographic Quadrangle Maps

**Legend**

Survey Area

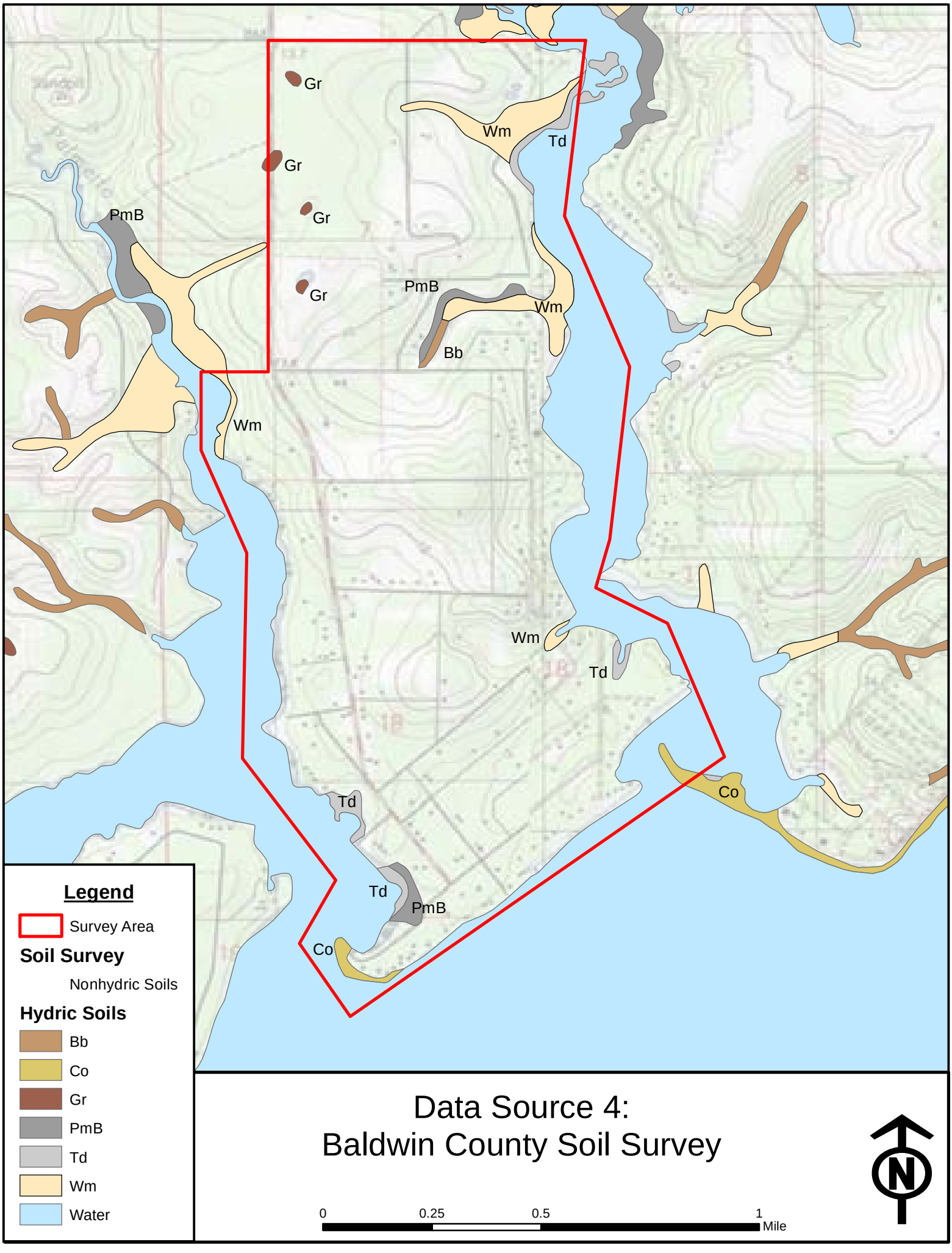
0 0.25 0.5 1 Mile

N




# Data Source 2:
# National Wetland Inventory Map


# Data Source 3:
# Baldwin County Wetland Assessment


Gr
Gr
Gr
Gr
Wm
Td
PmB
PmB
Wm
Bb
Wm
Wm
Td
Td
Co
Td
PmB
Co
Legend
Survey Area
Soil Survey
Nonhydric Soils
Hydric Soils
Bb
Co
Gr
PmB
Td
Wm
Water
Data Source 4:
Baldwin County Soil Survey
0
0.25
0.5
1
Mile
N

Data Source 5:
2015 NRCS Aerial

**Legend**

Survey Area

0 0.25 0.5 1 Mile

N


**Legend**

Survey Area

LIDAR Contours

# Data Source 6:
# Baldwin County Lidar Contour Data

0 0.25 0.5 1 Mile

N

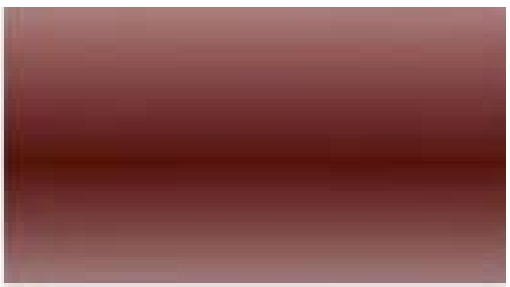

# Cumulative Site Map

**Legend**

Survey Area

0 0.25 0.5 1 Mile

N




VOLKERT