

POND SITING REPORT

PROPOSED ELEVEN MILE CREEK (GREEN HILLS ROAD TRIBUTARY) DRAINAGE IMPROVEMENTS

**Submitted to
Escambia County**



September 25, 2015

Prepared By



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Eleven Mile Creek

Green Hills Road Tributary

EXECUTIVE SUMMARY

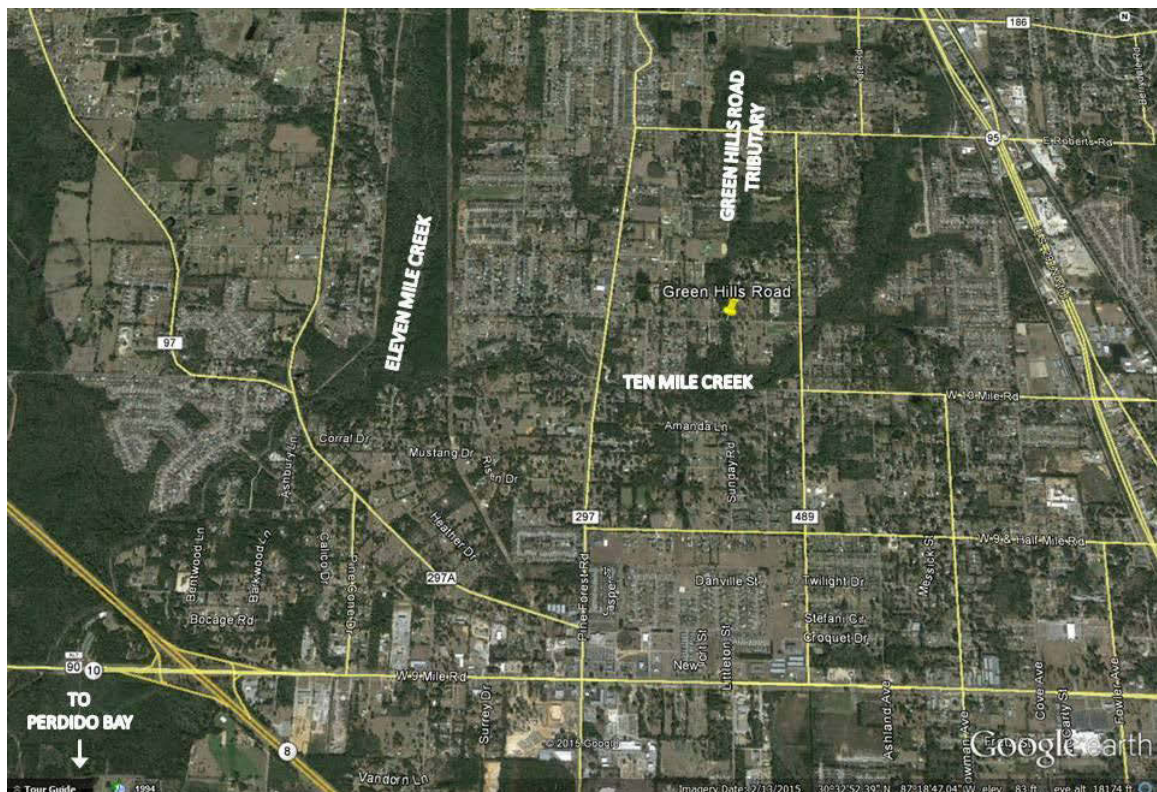
Sigma Consulting Group (SIGMA) has been selected by Escambia County to provide engineering services for the replacement of a pipe culvert on Green Hills Road located in Cantonment, Florida between Pine Forest Road (SR 297) and Stephani Road. The culvert to be replaced was severely damaged in the rain event of April 29/30, 2014 and serves an unnamed tributary of Ten Mile Creek. This tributary flows from north to south and will be referred to as the Green Hills Road tributary for the remainder of this project.

The Eleven Mile Creek Basin Study, which encompasses the drainage area for this project, was completed by Hatch Mott MacDonald (HMM) in 1999 and was later updated by HMM in 2008. According to this report the Ten Mile Creek watershed, and more specific to this project - the Green Hills Road tributary, suffers from a deficiency in stormwater detention and storage volume. This report also states that the Green Hills Road culvert crossing does not accommodate the 25-year storm event failing to meet Escambia County Codes and Standards. Due to the instability of Ten Mile Creek and the sensitivity of flooding issues in the downstream area it is necessary to analyze the Green Hills Road project area for potential detention pond sites and flood plain expansion sites in lieu of increasing the culvert capacity at Green Hills Road.

In order to expedite the repair of the existing culvert this project will be split into two Phases. Phase I of the project is being partially funded by FEMA and will include the design and construction of a replacement culvert which will be hydraulically equivalent to the existing culvert. Phase I will also include hazard mitigation in the form of roadway armoring/revetment. Phase II will include the design and construction of a stormwater detention facility and/or floodplain expansion in the area up gradient of the culvert which is critical to restoring the Green Hills Road culvert to County Codes and Standards.

SITE LOCATION

The Green Hills Road tributary is located on the north side of US 90 (Nine Mile Road), approximately 0.4 miles east of CR 297 (Pine Forest Road) and immediately north of Ten Mile Creek. See below for a Vicinity Map. Runoff from the Green Hills Road tributary enters Perdido Bay via Ten Mile Creek and subsequently Eleven Mile Creek.



EXISTING CONDITIONS

The Green Hills Road culvert serves a 512-acre drainage area which is located in the Eleven Mile Creek watershed. The current roadway and culvert configuration is insufficient to pass the 25-year storm event without the roadway overtopping. In order to restore this culvert crossing to Escambia County Codes and Standards without exacerbating down gradient stream bank stability the existing culvert needs to be replaced with a hydraulically equivalent system and the design and construction of a stormwater

detention facility and/or floodplain expansion will need to be implemented up gradient of the Green Hills Road culvert. Additional information regarding project hydrology and soils can be located in **Appendix A - Hydrology Computation - Soils Map**.

INTERIM CONDITIONS

The interim conditions model was setup as an excerpt from the HMM 2008 study. This excerpt was created and modified by SIGMA to reduce the size of the model and delete extraneous data. The limits of the SIGMA model are from Pine Forest Road (CR 297) eastward including Ten Mile Creek and the Green Hills Road tributary. The SIGMA model was revised to reflect project survey data including revised pipe inverts, roadway overtopping elevation, and roadway overtopping section. This model was used to check the size of the interim culvert and compare existing water surface elevations and flow rates to interim water surface elevations and flow rates. Results are summarized in the tables below. Additional information can be found in **Appendix C - Routing Analysis / Model Comparison**.

Green Hills Road Culvert Crossing

		HMM EXISTING	SIGMA EXISTING	SIGMA INTERIM2
		Max Stage (ft)	Max Stage (ft)	Max Stage (ft)
Downstream	025Y008H	80.37	80.47	80.47
Upstream	025Y008H	85.83	83.40	83.71

		HMM EXISTING	SIGMA EXISTING	SIGMA INTERIM2
		Max Flow (cfs)	Max Flow (cfs)	Max Flow (cfs)
Pipe	025Y008H	429	332	345
Roadway	025Y008H	122	265	253

The replacement culvert will consist of a triple barrel 38" x 65" elliptical reinforced concrete pipe (ERCP) with straight concrete endwalls. The profile of the roadway will be raised and Flexamat, or an approved equivalent product, will be utilized for roadside armoring/revetment. Design of this culvert is complete with construction plans pending. Escambia County has an agreement in place with FEMA for partial funding of this construction.

The residential structure located up gradient of the culvert crossing (980 Green Hills Road) will remain in the 25 year floodplain for every scenario analyzed except alternative PR-02. Residing within the 25 year floodplain equates to a 4% chance of flooding annually. In conjunction with the culvert repair/construction at the Green Hills Road crossing it is recommended that the County purchase this parcel (Parcel # 38-1N-31-3104-000-000) and demolish the structure at 980 Green Hills Road for subsequent floodplain expansion. This floodplain expansion has been analyzed and priced as alternative PR-03 in this report. Additional information regarding cost estimates can be found in **Appendix D - Cost Estimates**.

PROPOSED CONDITIONS

The proposed stormwater detention facilities were located based on aerial imagery, parcel lines, and topography and later reviewed in the field. Large sites which required the least amount of vegetative clearing and spanned fewer numbers of total parcels were preferred. The selected sites were modeled hydraulically to determine the net improvement based on hydraulic conditions.

The table below compares the individual pond sites based on existing versus proposed conditions for water surface elevations and flow rates.

Green Hills Road Proposed Pond Sites

		SIGMA EXISTING	SIGMA PR-01	SIGMA PR-02	SIGMA PR-03
	Simulation	Max Stage (ft)	Max Stage (ft)	Max Stage (ft)	Max Stage (ft)
Downstream	025Y008H	80.47	80.00	79.96	80.55
Upstream	025Y008H	83.40	82.20	81.84	83.68

		SIGMA EXISTING	SIGMA PR-01	SIGMA PR-02	SIGMA PR-03
	Simulation	Max Flow (cfs)	Max Flow (cfs)	Max Flow (cfs)	Max Flow (cfs)
Pipe	025Y008H	332	406	356	344
Roadway	025Y008H	265	0	0	248

The conceptual cost estimates for the proposed pond sites list as follows:

PR-01	One Parcel 14.4 Acre Pond	\$ 2,857,771
PR-02	Two Parcel 20.1 Acre Pond	\$ 4,523,323
PR-03	House Demolition and	\$ 274,963
	One Parcel 1.0 Acre Floodplain Expansion	

RECOMMENDATIONS

The culvert crossing at Green Hills Road will not meet Escambia County Codes and Standards until the culvert repair/replacement and alternative PR-02 construction are complete. SIGMA recommends that the County pursue property acquisition in the following manner for this project:

At a minimum, alternative PR-03 needs to be pursued to eliminate flooding at 980 Green Hills Road and alternative PR-01 or PR-02 needs to be implemented to restore the Green Hills Road culvert crossing to County Codes and Standards and provide relief for the downstream flooding and stream bank stability issues.

Appendix A

Hydrology Computation -

Soils Map -



Made By: P.Heffernan	Date: 3/31/2015	Sheet No. 1 of 1
Checked By:	Date:	Job No. 150203
Green Hills Road Culvert Replacement		
Hydrology		

From HMM Eleven Mile Creek Basin Model

Basin (name)	Area (acres)	Curve # (CN)	A x CN	Tc (minutes)
18OD030B	49.2	69	3394.8	24
18OD040B	53.05	75	3978.75	59
18OD050B	54.81	76	4165.56	42
18OD060B1	63.73	69	4397.37	50
18OD060B2	4.14	67	277.38	48
18OD060B3	2.02	69	139.38	30
18OD070B	30.15	63	1899.45	26
18OD080B	205.02	79	16196.58	96
18OD090B1	22.985	79	1815.815	5
18OD090B2	17.03	81	1379.43	16
18UA30B2	10.19	77	784.63	35

Total Area (acres) = 512
CN (composite) = 75

- Notes:** 1) The data shown above is an excerpt from the Eleven Mile Creek Basin Study (updated 2008) created by Hatch Mott MacDonald.
2) The basin areas included in the table above comprise the contributing area for the Green Hills Road culvert.
3) For additional information regarding the differences in HMM and SIGMA models please refer to Model Comparison Notes.

Node (name)	Simulation	HMM	SIGMA	Difference (cfs)
		Max Inflow (cfs)	Max Inflow (cfs)	
18OD030N	002Y008H	313	279	-34.0
18OD030N	010Y008H	549	485	-64.0
18OD030N	025Y008H	583	603	20.0
18OD030N	100Y008H	795	848	53.0

Soil Map—Escambia County, Florida



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Escambia County, Florida

Survey Area Data: Version 11, Sep 26, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 31, 2015—Mar 7, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Escambia County, Florida (FL033)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
24	Poarch sandy loam, 0 to 2 percent slopes	59.6	13.3%
25	Poarch sandy loam, 2 to 5 percent slopes	38.4	8.6%
26	Poarch sandy loam, 5 to 8 percent slopes	17.5	3.9%
27	Escambia fine sandy loam, 0 to 2 percent slopes	21.2	4.7%
28	Grady loam	1.4	0.3%
30	Perdido sandy loam, 2 to 5 percent slopes	12.5	2.8%
38	Bonifay loamy sand, 0 to 5 percent slopes	27.8	6.2%
39	Bonifay loamy sand, 5 to 8 percent slopes	22.8	5.1%
42	Malbis sandy loam, 2 to 5 percent slopes	20.9	4.7%
49	Dorovan muck and Fluvaquents, frequently flooded	47.3	10.6%
51	Pelham loamy sand, 0 to 2 percent slopes	43.6	9.8%
54	Troup-Poarch complex, 8 to 12 percent slopes	7.5	1.7%
56	Troup-Poarch complex, 5 to 8 percent slopes	14.1	3.2%
59	Notcher fine sandy loam, 0 to 2 percent slopes	9.1	2.0%
60	Notcher fine sandy loam, 2 to 5 percent slopes	51.7	11.6%
61	Notcher fine sandy loam, 5 to 8 percent slopes	29.9	6.7%
62	Bama fine sandy loam, 0 to 2 percent slopes	4.4	1.0%
63	Bama fine sandy loam, 2 to 5 percent slopes	14.0	3.1%
99	Water	3.0	0.7%
Totals for Area of Interest		446.6	100.0%

Appendix B

Pond Sites -

P:\Projects\Director\150203 - Green Hills Road Culvert Replacement\150203 CAD Drawings\DWG\FIGURES\FIG 4-1 (SIGMA).dwg Sep 24, 2015 - 9:35:02AM sigma



P:\Projects\Director\150203 - Green Hills Road Culvert Replacement\150203 CAD Drawings\DWG\FIGURES\FIG 4-1 (SIGMA).dwg Sep 24, 2015 - 9:38:02AM sigma



LEGEND

- Basin Lines
- ICPR Nodes
- ICPR Channel Links
- Existing Water Body

400 0 400 1200

Scale: 1"= 400'



SIGMA
CONSULTING
GROUP, INC.

3208 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 532-7912
CERTIFICATE OF AUTHORIZATION #26889

GREEN HILLS ROAD TRIBUTARY
PROPOSED POND SITE

ESCAMBIA COUNTY, FLORIDA

NO.	REVISION	DATE

THIS DRAWING IS
NOT FOR
CONSTRUCTION

PROPOSED
POND
SITE
PR-03

Project Number:
150203

Date:
AUGUST 2015

Drawn By:
P.M.H.

Designed By:
P.M.H.

Checked By:
J.L.L.

Sheet:

Appendix C

Model Comparison / Routing Analysis -



Made By:	P. Heffernan	Date:	9/21/2015	Sheet No.	1 of 5
Checked By:	J. Lashley	Date:	9/24/2015	Job No.	150203
Green Hills Road Culvert Replacement					
Recommendations					

Recommendations:

- 1) Alternative PR-02 and PR-03 are the recommended alternatives.
- 2) The house located at 980 Green Hills Road will remain in the 25 year floodplain in every scenario except alternative PR-02. Residing within the 25 year floodplain equates to a 4% chance of flooding annually.
- 3) In conjunction with the culvert repair/construction at the Green Hills Road crossing it is recommended that the County purchase this parcel (Parcel # 38-1N-31-3104-000-000) and demolish the structure at 980 Green Hills Road for subsequent floodplain expansion. This floodplain expansion has been analyzed and priced as alternative PR-03 in this report.
- 4) Alternative PR-03 (purchasing 980 Green Hills Road and expanding the floodplain) when analyzed as a standalone alternative, does not provide enough storage volume to keep Green Hills Road from overtopping during the 25 year event and therefore will not meet Escambia County Codes and Standards.
- 5) Alternative PR-01 is a scaled-down version of the pond recommended in alternative PR-02. Although PR-01 does not provide adequate storage volume to keep Green Hills Road from overtopping during the 100 year event.

	Made By:	P. Heffernan	Date:	9/15/2015	Sheet No.	2 of 5
	Checked By:	J. Lashley	Date:	9/24/2015	Job No.	150203
	Green Hills Road Culvert Replacement					
	Model Comparison Notes					

Notes:

- 1) Hatch Mott MacDonald (HMM) results generated from the Eleven Mile Creek Basin Study (updated 2008) created by Hatch Mott MacDonald.
- 2) Sigma Consulting Group (SIGMA) results were generated from an excerpt of the Eleven Mile Creek Basin Study. This excerpt was created and modified by SIGMA to reduce the size of the model and delete extraneous data.
- 3) The limits of the SIGMA model excerpt are Pine Forest Road (CR 297) eastward including Ten Mile Creek and the Green Hills Road tributary.
- 4) The SIGMA model was revised to reflect project survey data. Revised input includes surveyed pipe inverts, roadway overtopping elevation, and roadway overtopping section.
- 5) The design event for this culvert will be the 25-year return period. The critical duration rainfall event was determined to be 8 hours.



Made By:	P. Heffernan	Date:	9/15/2015	Sheet No.	3 of 5
Checked By:	J. Lashley	Date:	9/24/2015	Job No.	150203
Green Hills Road Culvert Replacement - Hydraulic Modeling					
Maximum Stage Comparison					

		HHM EXISTING	SIGMA EXISTING	SIGMA INTERIM	SIGMA INTERIM-2	SIGMA PR-01	SIGMA PR-02	SIGMA PR-03	
	Node	Simulation	Max Stage (ft)	Max Stage (ft)	Max Stage (ft)	Max Stage (ft)	Max Stage (ft)	Max Stage (ft)	
Downstream	18OD020N	002Y008H	79.67	79.72	79.73	79.73	79.40	79.17	79.68
Upstream	18OD030N	002Y008H	82.67	82.37	82.43	82.43	80.21	79.70	82.26
Downstream	18OD020N	010Y008H	80.14	80.29	80.29	80.29	79.85	79.79	80.31
Upstream	18OD030N	010Y008H	84.86	83.24	83.52	83.53	81.56	81.22	83.52
Downstream	18OD020N	025Y008H	80.37	80.47	80.47	80.47	80.00	79.96	80.55
Upstream	18OD030N	025Y008H	85.83	83.40	83.69	83.71	82.20	81.84	83.68
Downstream	18OD020N	100Y008H	80.79	80.97	80.96	80.96	80.50	80.31	80.94
Upstream	18OD030N	100Y008H	87.64	83.74	83.97	84.01	83.11	82.96	83.96
Culvert Size: (2) 42" x 65" (2) 42" x 65"				(3) 38x60 w/out sidewalk	(3) 38x60 w/ sidewalk	conceptual pond 1	conceptual pond 2	conceptual pond 3 including house structure	
Culvert (Type / Material): ACMP ACMP				ERCp	ERCp				

Notes:

- 1) Existing Roadway Overtopping Elevation = 82.65
- 2) Interim and Proposed Roadway Overtopping Elevation = 82.92
- 3) 980 Green Hills Road, FFE = 83.94 (brick and mortar and HVAC electrical approx. 18" below) Elevation = 82.44



Made By:	P. Heffernan	Date:	9/15/2015	Sheet No.	4 of 5
Checked By:	J. Lashley	Date:	9/24/2015	Job No.	150203
Green Hills Road Culvert Replacement - Hydraulic Modeling					
Maximum Flow Comparison (Pipe / Roadway Overtopping Flow)					

		HHM EXISTING	SIGMA EXISTING
Link	Simulation	Max Flow (cfs)	Max Flow (cfs)
Pipe 18OD030P	002Y008H	251	267
Roadway 18OD030W	002Y008H	0	0
Pipe 18OD030P	010Y008H	382	322
Roadway 18OD030W	010Y008H	68	162
Pipe 18OD030P	025Y008H	429	332
Roadway 18OD030W	025Y008H	122	265
Pipe 18OD030P	100Y008H	504	337
Roadway 18OD030W	100Y008H	247	560

Culvert Size: (2) 42" x 65" (2) 42" x 65"

Culvert (Type / Material): ACMP ACMP

SIGMA INTERIM	SIGMA INTERIM-2	SIGMA PR-01	SIGMA PR-02	SIGMA PR-03
Max Flow (cfs)	Max Flow (cfs)	Max Flow (cfs)	Max Flow (cfs)	Max Flow (cfs)
267	267	158	104	254
0	0	0	0	0
335	236	318	272	335
150	150	0	0	151
344	345	406	356	344
255	253	0	0	248
359	361	518	501	358
487	484	95	40	477

(3) 38x60 w/out sidewalk (3) 38x60 w/ sidewalk conceptual pond 1 conceptual pond 2 conceptual pond 3 including house structure

ERCP ERCP

 SIGMA CONSULTING GROUP, INC. ENGINEERING CONSULTANTS	Made By: P. Heffernan	Date: 9/15/2015	Sheet No. 5 of 5
	Checked By: J. Lashley	Date: 9/24/2015	Job No. 150203
	Green Hills Road Culvert Replacement - Hydraulic Modeling Maximum Flow Comparison (Receiving Node)		

		HMM EXISTING	SIGMA EXISTING			SIGMA INTERIM	SIGMA INTERIM-2	SIGMA PR-01	SIGMA PR-02	SIGMA PR-03
Receiving Node		Simulation	Max Inflow (cfs)	Max Inflow (cfs)		Max Inflow (cfs)	Max Inflow (cfs)	Max Inflow (cfs)	Max Inflow (cfs)	Max Inflow (cfs)
Downstream	18OD020N	002Y008H	259	278		277	277	161	106	263
Downstream	18OD020N	010Y008H	466	502		504	504	325	227	504
Downstream	18OD020N	025Y008H	570	619		621	621	418	364	615
Downstream	18OD020N	100Y008H	778	880		878	878	639	553	867
Culvert Size: (2) 42" x 65"				(2) 42" x 65"		(3) 38x60 w/out sidewalk	(3) 38x60 w/ sidewalk	conceptual pond 1	conceptual pond 2	conceptual pond 3 including house structure
Culvert (Type / Material):		ACMP	ACMP			ERCP	ERCP			

Appendix D

Cost Estimates -

 ENGINEERING CONSULTANTS	Made By:	P. Heffernan	Date:	9/21/2015	Sheet No.	1 of 3
	Checked By:	J. Lashley	Date:	9/22/2015	Job No.	150203
	Green Hills Road Culvert Replacement					
	Pond Siting Cost Estimates					

PR-01 (One Parcel 14.4 Acre Pond)

Description	Quantity	Unit	Unit Price	Total
Mobilization	1	LS	\$10,000	\$10,000
Clearing & Grubbing	14.4	AC	\$6,000	\$86,400
36" RCP	50	LF	\$110	\$5,500
Energy Dissipator	1	EA	\$4,500	\$4,500
Inflow Structure	1	EA	\$10,000	\$10,000
Discharge Structure	1	EA	\$20,000	\$20,000
Chain Link Fence	3,220	LF	\$12	\$38,640
Grassing and Stabilization	69,520	SY	\$2	\$139,040
Land Acquisition for Pond	1	LS	\$180,922	\$180,922
Excavation for Pond	264,288	CY	\$7	\$1,850,016
Pond Entrance & Maintenance Berm	5,000	SY	\$4	\$20,000
Subtotal Construction				\$2,365,018
Survey				\$20,000
Geotech				\$10,000
Design				\$75,000
Permitting				\$15,000
Subtotal Project				\$2,485,018
15% Contingency				\$372,753
Project Grand Total				\$2,857,771

Note: The cost estimates in this report are based on conceptual information and will need to be evaluated further in the design phase.

	Made By: P. Heffernan	Date: 9/21/2015	Sheet No. 2 of 3
	Checked By: J. Lashley	Date: 9/22/2015	Job No. 150203
	Green Hills Road Culvert Replacement		
Pond Siting Cost Estimates			

PR-02 (Two Parcel 20.1 Acre Pond)

Description	Quantity	Unit	Unit Price	Total
Mobilization	1	LS	\$10,000	\$10,000
Clearing & Grubbing	20.1	AC	\$6,000	\$120,600
36" RCP	50	LF	\$110	\$5,500
Energy Dissipator	1	EA	\$4,500	\$4,500
Inflow Structure	1	EA	\$10,000	\$10,000
Discharge Structure	1	EA	\$20,000	\$20,000
Chain Link Fence	3,890	LF	\$12	\$46,680
Grassing and Stabilization	97,260	SY	\$2	\$194,520
Land Acquisition for Pond	1	LS	\$242,918	\$242,918
Excavation for Pond	444,878	CY	\$7	\$3,114,146
Pond Entrance & Maintenance Berm	6,115	SY	\$4	\$24,460
Subtotal Construction				\$3,793,324
Survey				\$30,000
Geotech				\$10,000
Design				\$85,000
Permitting				\$15,000
Subtotal Project				\$3,933,324
15% Contingency				\$589,999
Project Grand Total				\$4,523,323

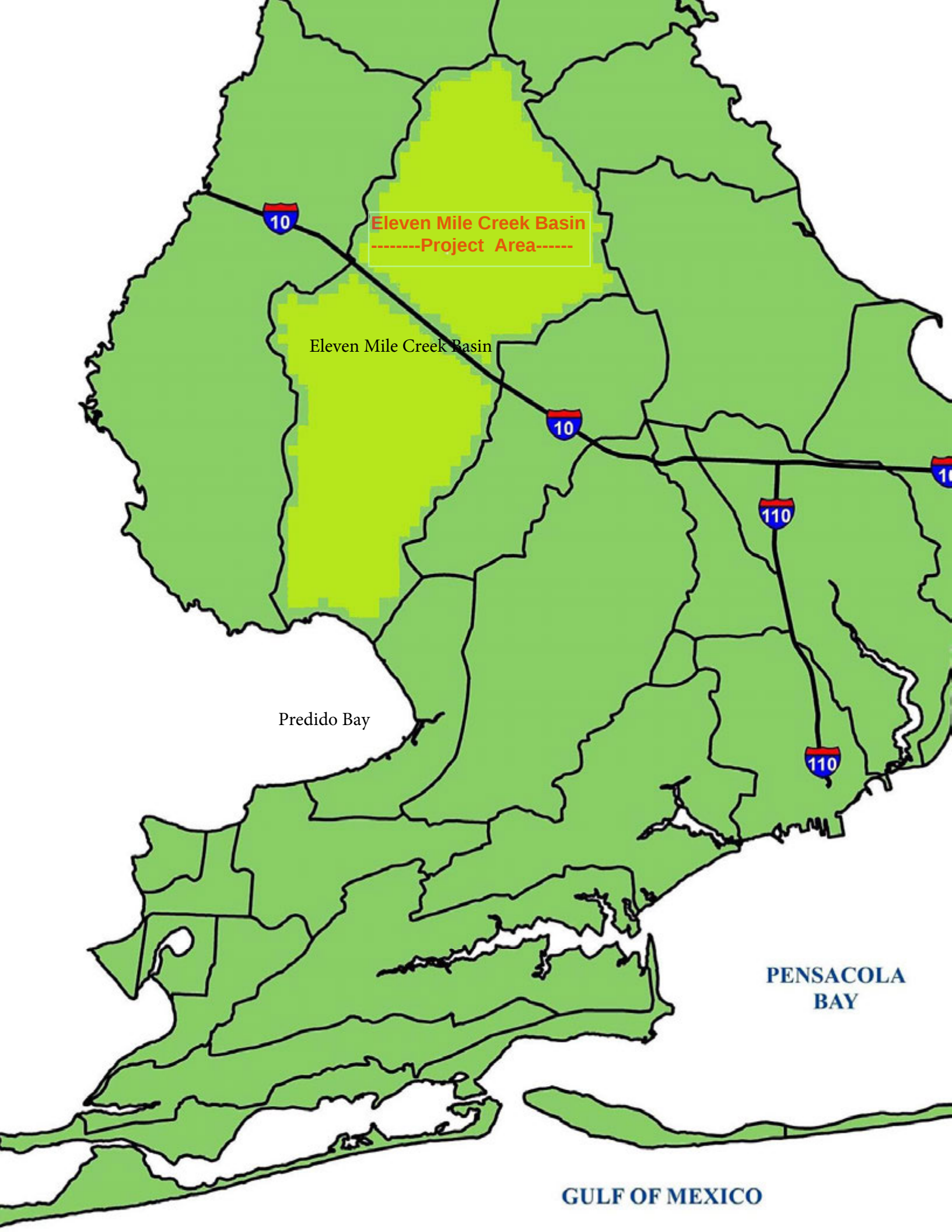
Note: The cost estimates in this report are based on conceptual information and will need to be evaluated further in the design phase.

 ENGINEERING CONSULTANTS	Made By:	P. Heffernan	Date:	9/21/2015	Sheet No.	3 of 3
	Checked By:	J. Lashley	Date:	9/22/2015	Job No.	150203
	Green Hills Road Culvert Replacement					
	Pond Siting Cost Estimates					

PR-03 (House Demolition and One Parcel 1.0 Acre Floodplain Expansion)

Description	Quantity	Unit	Unit Price	Total
Mobilization	1	LS	\$10,000	\$10,000
Clearing & Grubbing	1.0	AC	\$6,000	\$6,000
Grassing and Stabilization	3,540	SY	\$2	\$7,080
Land Acquisition for Pond	1	LS	\$73,648	\$73,648
House Demolition	1	LS	\$50,000	\$50,000
Excavation for Floodplain Expansion	4,430	CY	\$9	\$39,870
Subtotal Construction				\$186,598
Survey				\$7,500
Design				\$30,000
Permitting				\$15,000
Subtotal Project				\$239,098
15% Contingency				\$35,865
Project Grand Total				\$274,963

Note: The cost estimates in this report are based on conceptual information and will need to be evaluated further in the design phase.



Eleven Mile Creek Basin
-----Project Area-----

Eleven Mile Creek Basin

Predido Bay

PENSACOLA
BAY

GULF OF MEXICO