

A decorative graphic consisting of a large outer circle, a medium inner circle, and a small innermost circle. A horizontal line and a vertical line intersect at the center of the circles, forming a crosshair. The top-left and bottom-right quadrants of the innermost circle are shaded in a light blue color.

APPENDIX E

**CALHOUN COUNTY MEETING
PRESENTATIONS AND SIGN IN SHEETS**

Calhoun County Regional Wastewater Facility Study



Project Kick-off Meeting

Calhoun County Courthouse
October 21, 2010

SUSAN K. ROTH, P.E., PMP

WATER AND WASTEWATER CONSULTING

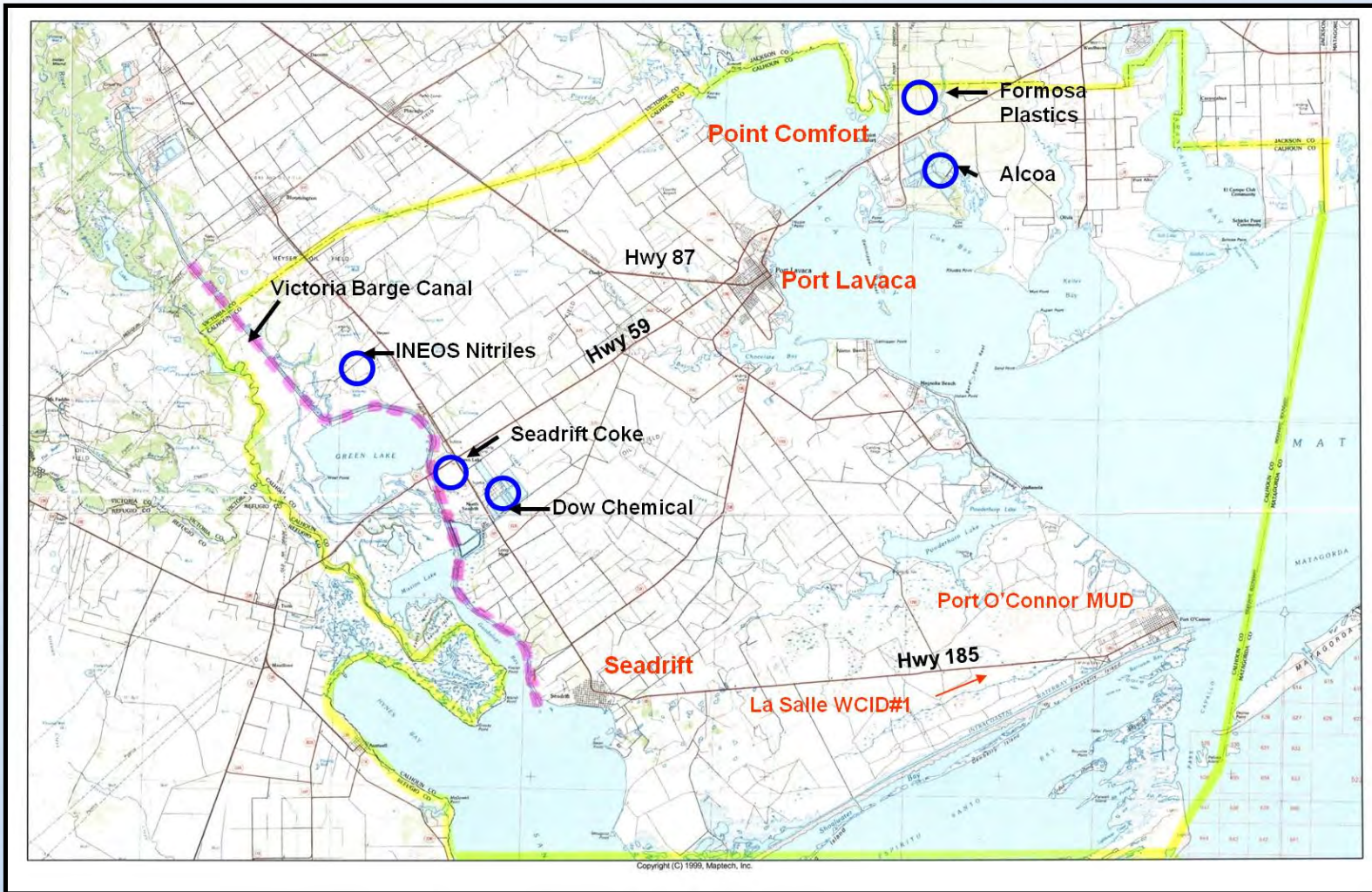
Presentation Outline

- ◆ **TWDB Program Overview**
- ◆ **Study Area**
- ◆ **Project Participants**
- ◆ **Scope of Work**
- ◆ **Project Schedule**
- ◆ **In-kind Service Contributions**
- ◆ **Project Data Request**
- ◆ **Roundtable Discussion**

TWDB Program Overview

- ◆ **Background**
- ◆ **History**
- ◆ **Purpose of Regional Facility Program**
- ◆ **Financing Options**

Calhoun County



Project Participants

- ◆ **Texas Water Development Board**
- ◆ **GBRA (primary applicant)**
- ◆ **Calhoun County**
- ◆ **Calhoun County Economic Development Corporation**
- ◆ **City of Seadrift**
- ◆ **City of Point Comfort**
- ◆ **City of Port Lavaca**
- ◆ **Alcoa**
- ◆ **Dow Chemical**
- ◆ **Formosa Plastics**
- ◆ **INEOS Nitriles**
- ◆ **Seadrift Coke**

Scope of Work

- ◆ **Service Area Description – Data Collection**
- ◆ **Wastewater System Flows**
- ◆ **Collection System Alternatives**
- ◆ **Treatment System Alternatives**
- ◆ **Operation and Reuse Alternatives**
- ◆ **Environmental Assessment**
- ◆ **Implementation Schedule**
- ◆ **Cost Estimates for Scenarios**
- ◆ **Funding Options**
- ◆ **Water Conservation/Drought Management Plans**

Project Timeline

- ◆ **Project Kick-off Meeting (October 21, 2010)**
- ◆ **Second Meeting (January 2011)**
 - Discuss population/wastewater flow data and various regional collection, treatment and reuse alternatives
- ◆ **Third Meeting (April 2011)**
 - Discuss detailed analysis and evaluation of final alternatives for regional collection, treatment and reuse
- ◆ **Fourth Meeting (July 2011)**
 - Discuss comments on Draft Report
- ◆ **Submit Draft Final Report to TWDB (no later than August 31, 2011)**

In-kind Service Contributions

Project Data Request

Roundtable Discussion: Project Expectations

Q&A Discussion

Project Contacts:

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Bryan Serold
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MEETING SIGN-IN SHEET

Regional Wastewater Facility Study Group	Meeting Date: October 21, 2010
	Place/Room: Courthouse

Name	Title	Agency	Phone	Fax	E-Mail
BRYAN SEROLD	OPERATIONS MANAGER	GBRA	361/575-6366	575-2267	bserold@gbra.org
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Herb Wittliff	Manager	"	"	"	hwittliff@gbra.org
CHRISTINE A. HOOD	McSadrift JUDGE	Seadrift Municipality	361 705-2218 (2208)		seadriftjudge@tisd.net
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James Lee Murphy	Executive mgr. water resources	GBRA	830-379-5822		smurphy@gbra.org
Chris Guszos		City of Point Comfort	987 2661		
Charlotte Felkins	City Secretary	City of Point Comfort	(361) 987-2661	361-987-2798	pccomfort@tisd.net
Bruce Gertner	environmental manager	Seadrift C&LP	361 676-2508		bgertner@seadriftcoke.com
Bob WALLACE	FPC		987-7440		

MEETING SIGN-IN SHEET

Regional Wastewater Facility Study Group

Meeting Date: October 21, 2010

Place/Room: Courthouse

Name	Title	Agency	Phone	Fax	E-Mail
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Susan Lotu	President				
Tom Schmitt		Urban Eng	301-578-9836 578-9836	576-4836	tschmitt@urbanvictoria.com
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NEIL E. FRITZSCH	COUNTY COMMISSIONER	CALHOUN CO	361-893-5346	361-893-5309	neil.fritsch@calhouncotx.org
Parren Gurley	D. of P.W.	PORT LAUACA	361-552-3347	552-1481	dgurley@PORTLAUACA.org

Calhoun County Regional Wastewater Facility Study



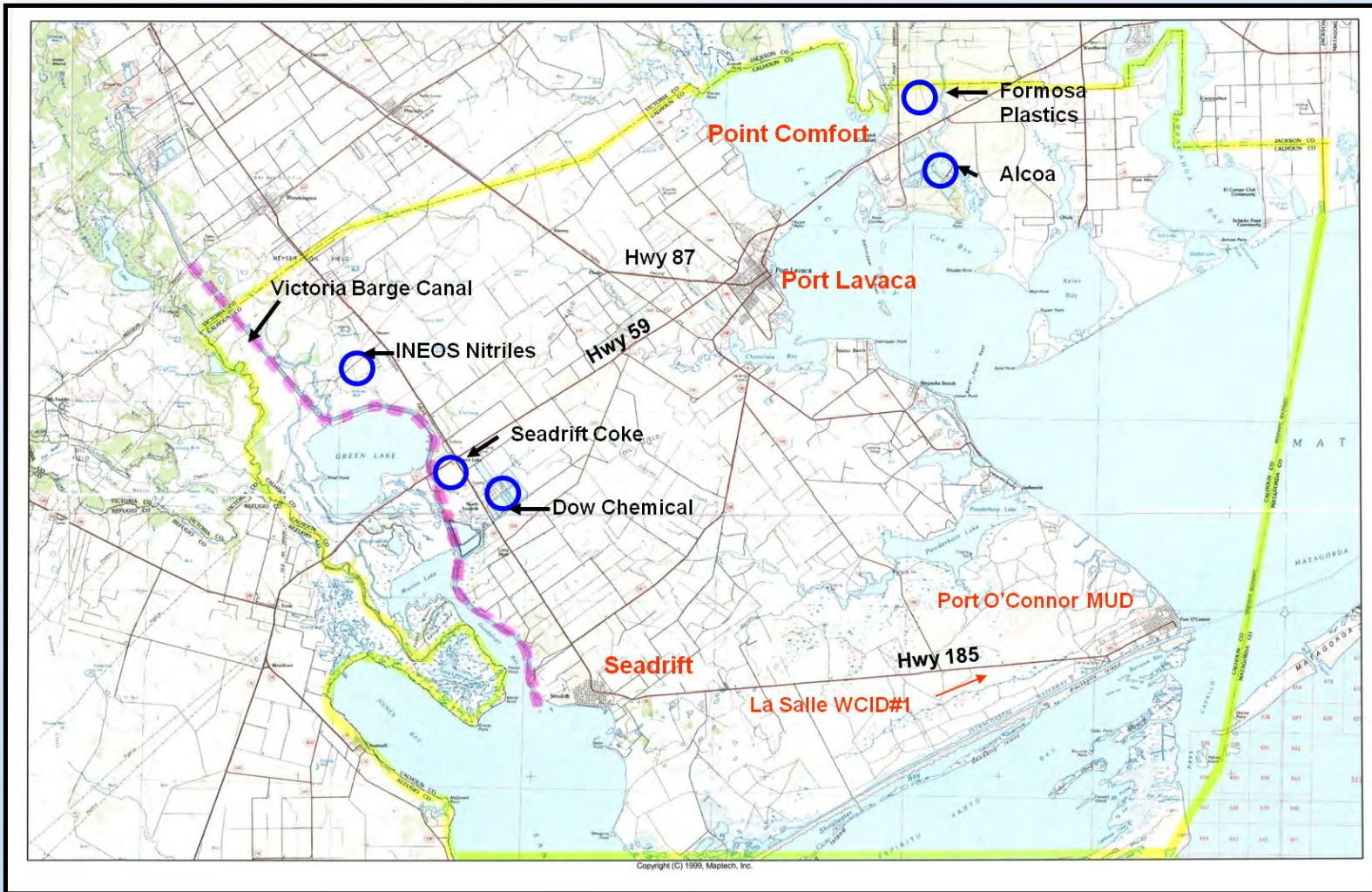
Project Meeting

**Alcoa World Alumina – Point Comfort
February 10, 2011**

Presentation Outline

- ◆ **Project Overview**
- ◆ **Project Schedule**
- ◆ **Data Collection Activities**
- ◆ **General Observations – Study Area**
- ◆ **Preliminary Regional Alternatives**
- ◆ **Breakout Session**
- ◆ **Small Group Reports**

Calhoun County



Project Participants

- ◆ **Texas Water Development Board**
- ◆ **GBRA (primary applicant)**
- ◆ **Calhoun County**
- ◆ **Calhoun County Economic Development Corporation**
- ◆ **City of Seadrift**
- ◆ **City of Point Comfort**
- ◆ **City of Port Lavaca**
- ◆ **Alcoa**
- ◆ **Dow Chemical**
- ◆ **Formosa Plastics**
- ◆ **INEOS Nitriles**
- ◆ **Seadrift Coke**

Scope of Work

- ◆ **Service Area Description – Data Collection**
- ◆ **Wastewater System Flows**
- ◆ **Collection System Alternatives**
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- ◆ **Funding Options**
- ◆ **Water Conservation/Drought Management Plans**

Project Timeline

- ◆ **Project Kick-off Meeting (October 21, 2010)**
- ◆ **Second Meeting (February 10, 2011)**
 - Discuss population/wastewater flow data and various regional collection, treatment and reuse alternatives
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Data Collection Activities

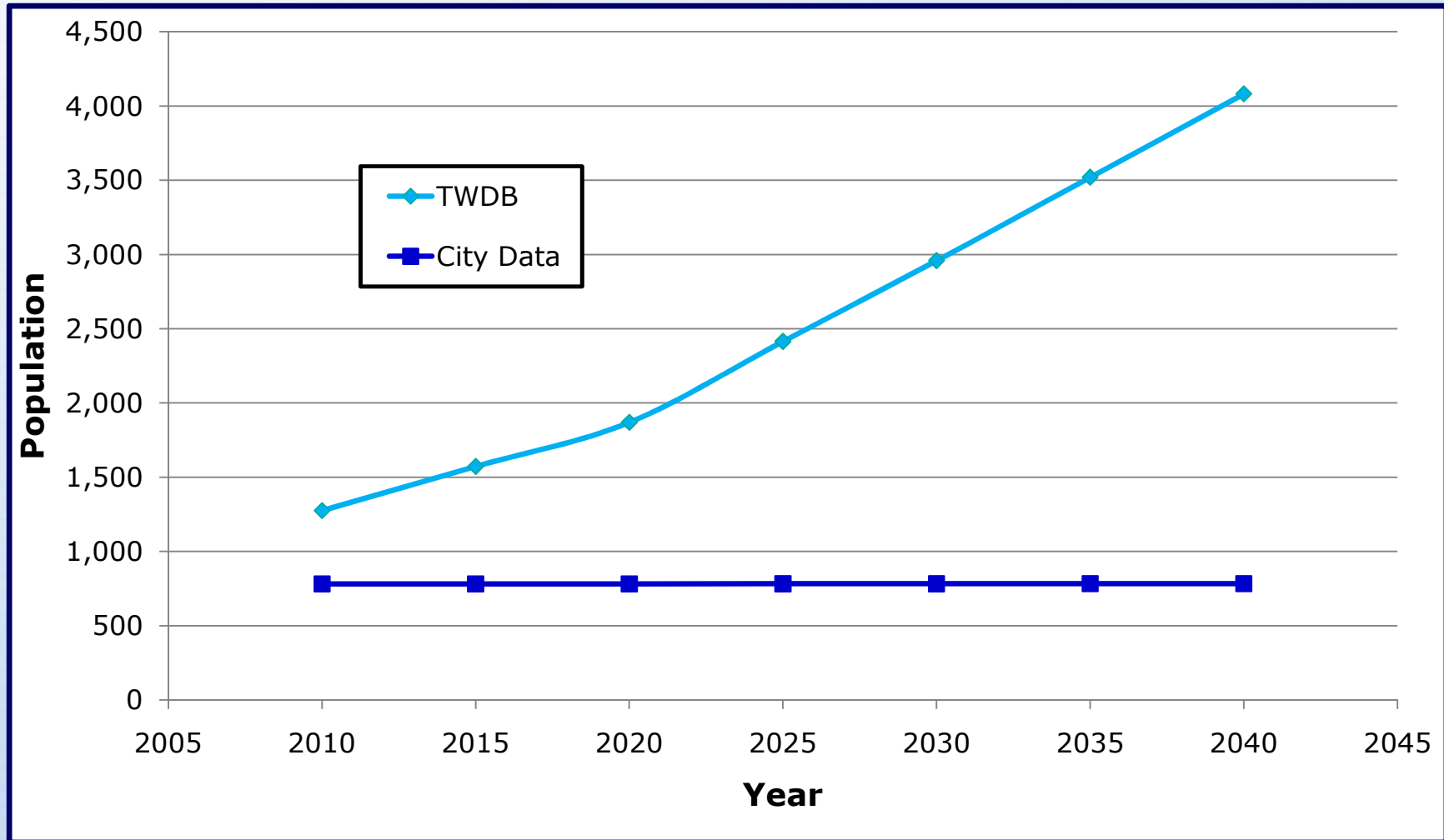
- ◆ **Summaries of system information**
- ◆ **Maps of existing wastewater infrastructure (i.e. treatment plants, lift stations, etc.)**
- ◆ **Current population and growth projections**
- ◆ **Monthly flow data from WWTPs**
- ◆ **Utility development agreements**
- ◆ **Build-out schedules and conceptual plans of future developments**

Population & Projection Data

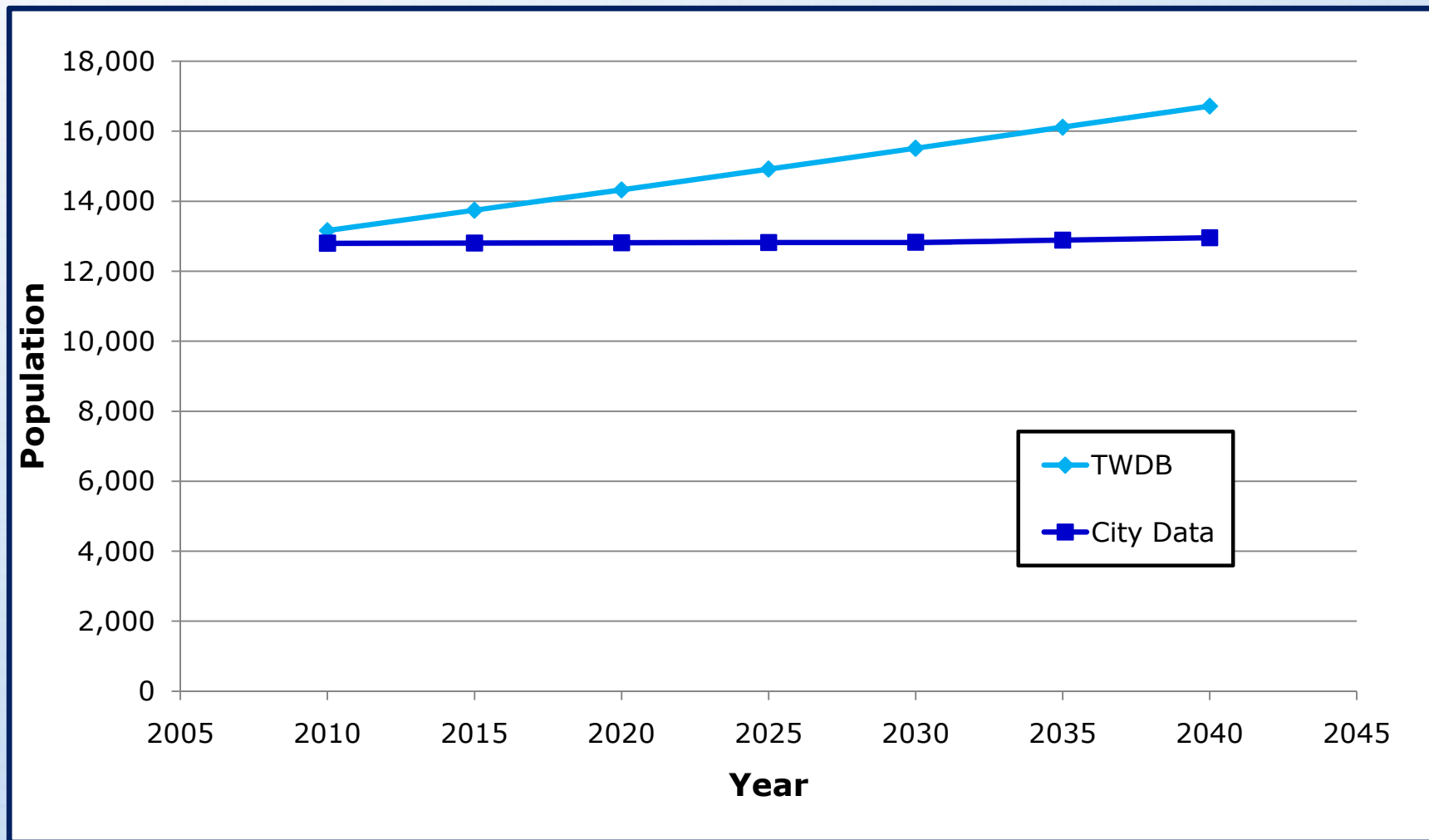
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* Data provided by the Entity

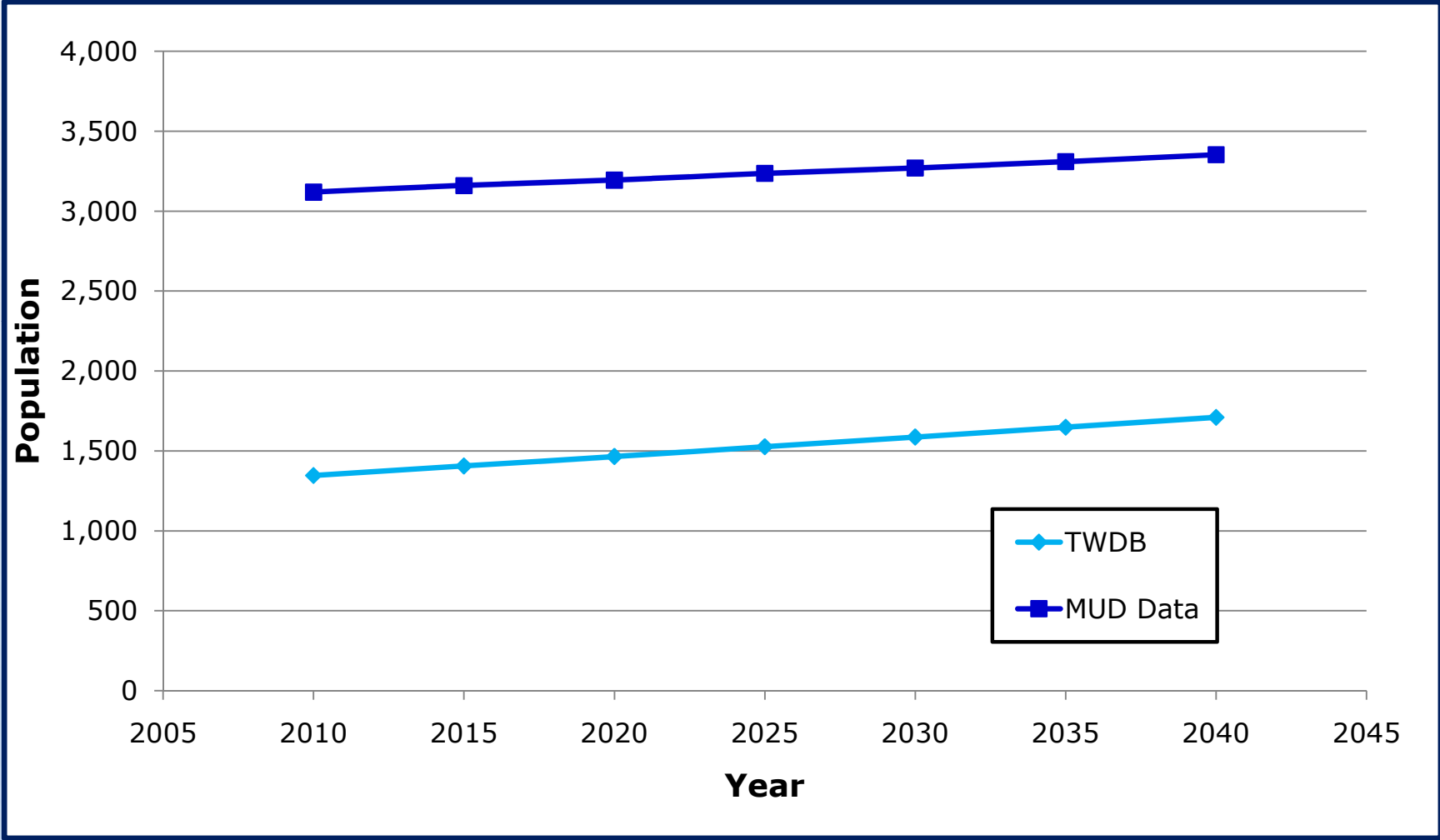
Point Comfort Population Projections: Comparison of TWDB & City Data



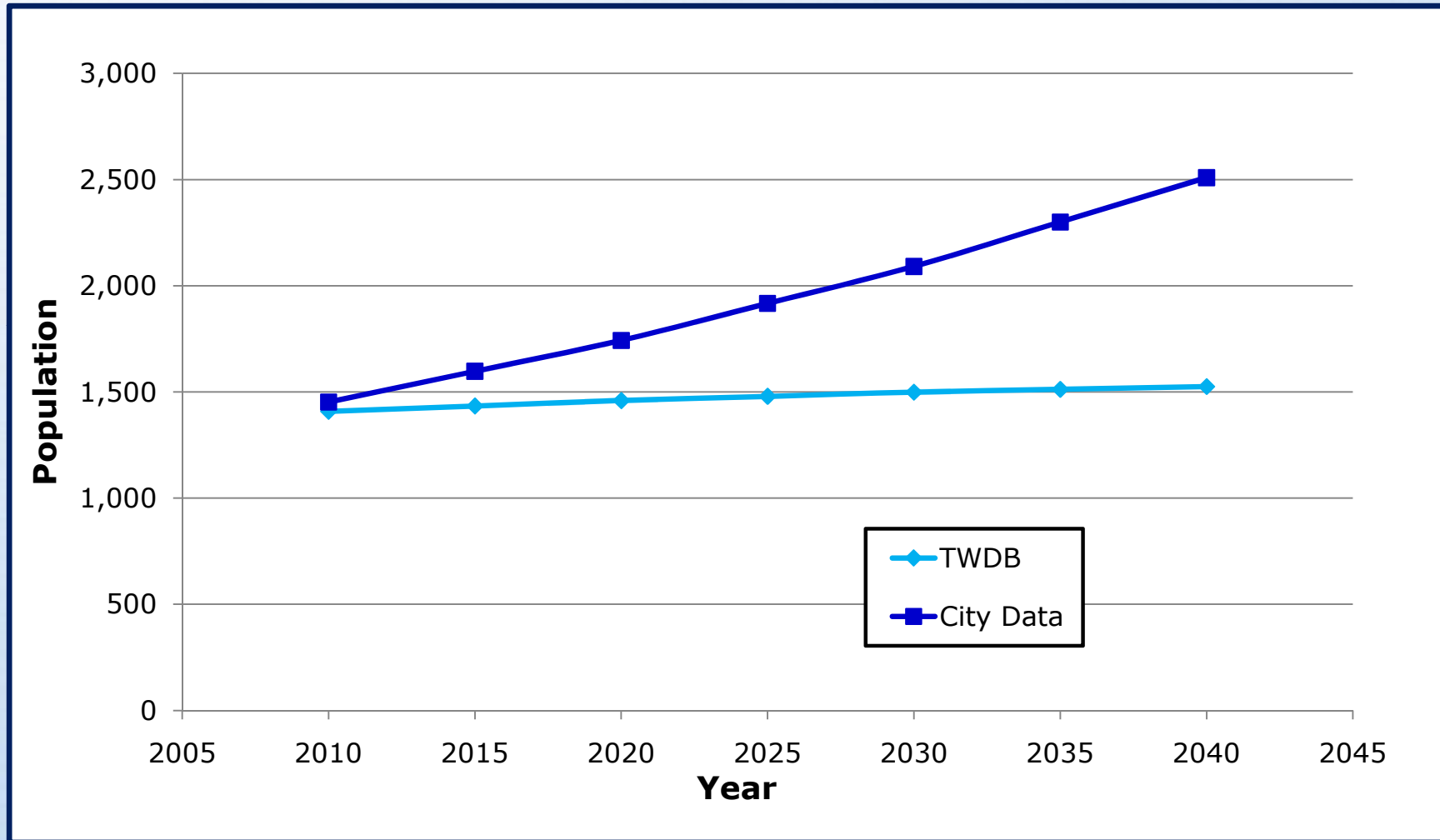
Port Lavaca Population Projections: Comparison of TWDB & City Data



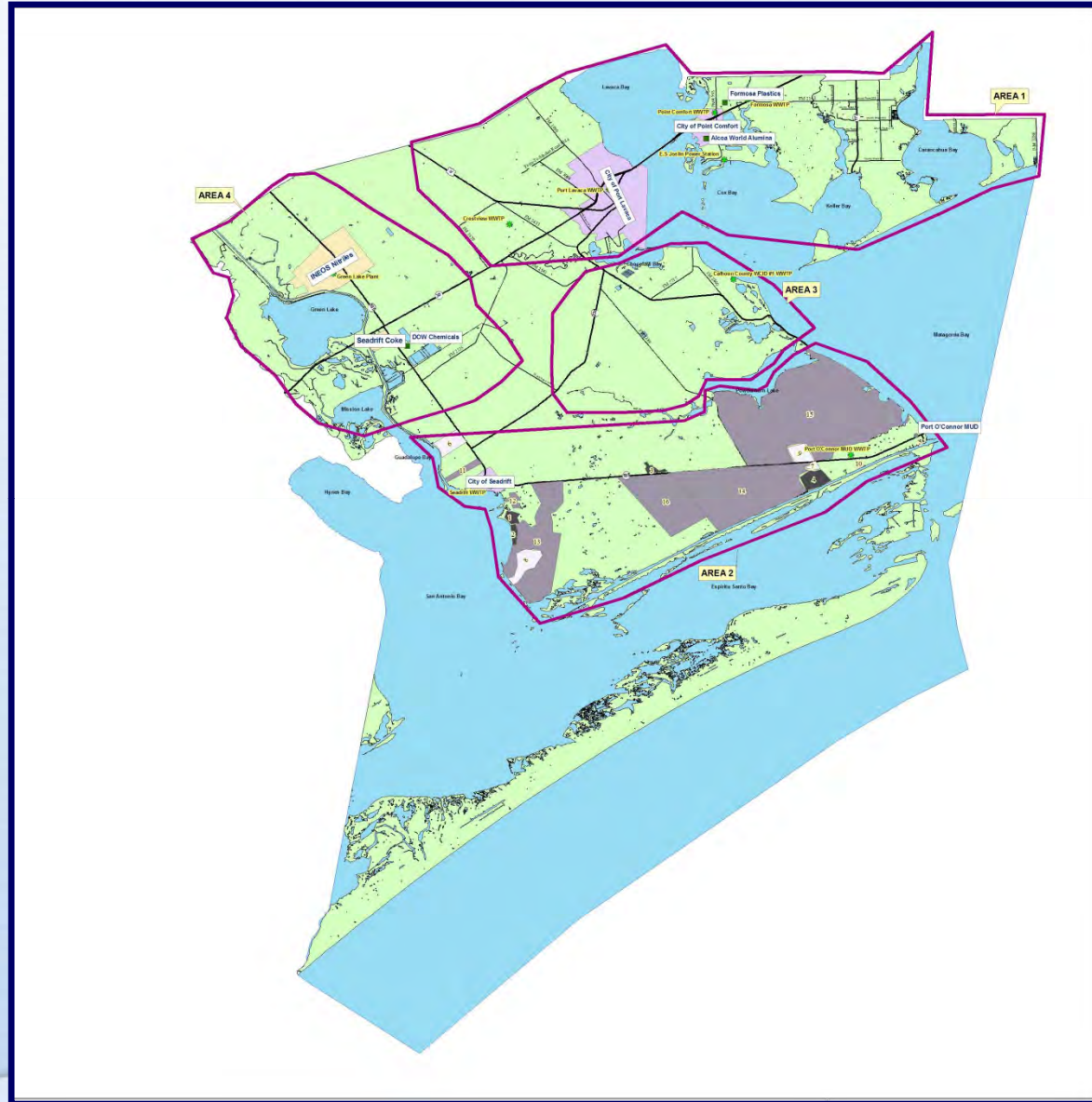
Port O'Connor Population Projections: Comparison of TWDB & MUD Data



Seadrift Population Projections: Comparison of TWDB & City Data



Study Area – Regional Concept



Study Area Overview

AREA 1A

- ◆ City of Port Lavaca
- ◆ Crestview Subdivision
- ◆ Meadow Brook Park
- ◆ Shady Acres
- ◆ Hackberry Junction
- ◆ Bowman Development
- ◆ Matson Subdivision
- ◆ Bay Meadows
- ◆ Shoreline Acres
- ◆ Royal Estates
- ◆ Double Subdivision
- ◆ Six Mile Subdivision

AREA 1B

- ◆ City of Point Comfort
- ◆ Alcoa
- ◆ Formosa Plastics
- ◆ Olivia
- ◆ Port Alto WSC
(North & South)
- ◆ Campbell Carancahua
Beach Subdivision
- ◆ El Campo Club
Community
- ◆ Schicke Point Community

Study Area Overview

AREA 2

- ◆ **City of Seadrift**
- ◆ **Port O'Connor MUD**
- ◆ **Swan Point Landing**
- ◆ **Falcon Point**
- ◆ **Costa Grande Development (I-V)**
- ◆ **Powder Horn Ranch**
- ◆ **Lane Road Development**
- ◆ **The Sanctuary**

AREA 3

- ◆ **Magnolia Beach**
- ◆ **Indianola**
- ◆ **Baypoint Subdivision**
- ◆ **Alamo Beach**

AREA 4

- ◆ **Dow Chemical**
- ◆ **Seadrift Coke**
- ◆ **INEOS Nitriles**

Study Area Observations

AREA 1

- ◆ **Area 1A and 1B divided by Lavaca Bay;**
- ◆ **Declining population growth in Cities of Point Comfort and Port Lavaca;**
- ◆ **Industrial Companies in Area 1B interested in using treated effluent to supplement their water supply;**
- ◆ **Number of small subdivisions with failing septic systems;**
- ◆ **Developments to date have been low density;**

Study Area Observations (Cont.)

AREA 2

- ◆ **Infrastructure needed along Highway 185 to provide wastewater service to future developments;**

AREA 3

- ◆ **Area separated from Area 1 by Chocolate Bay and Area 2 by Powderhorn Lake;**
- ◆ **Number of small subdivisions with failing septic systems;**
- ◆ **Developments to date have been low density;**

Study Area Observations (Cont.)

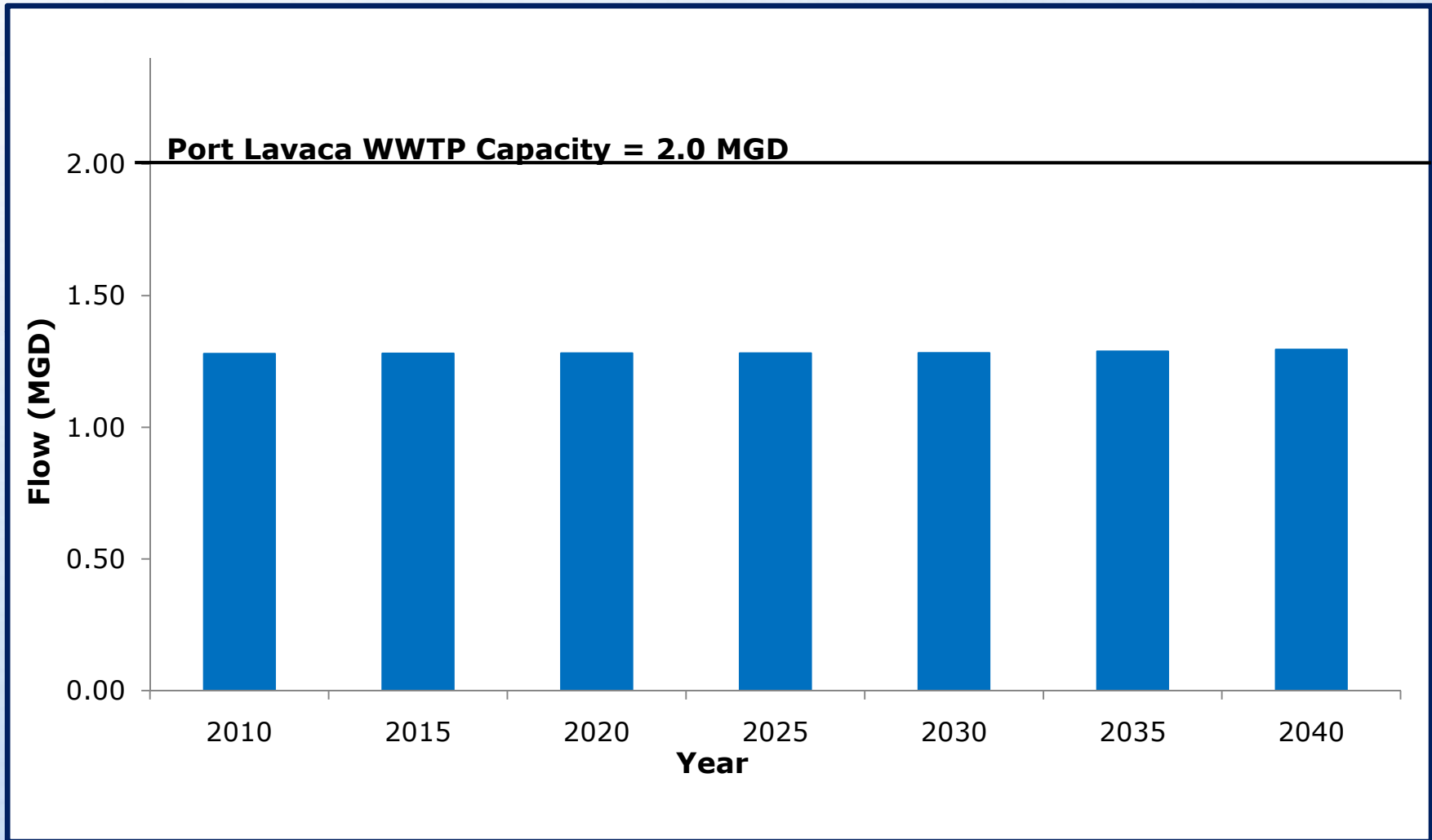
AREA 4

- ◆ **Industrial Companies interested in exploring treated effluent for additional water supply;**
- ◆ **Large tract of land (4,000 acres) located adjacent to INEOS Nitriles and without centralized wastewater utilities;**
- ◆ **Few subdivisions developed in area;**

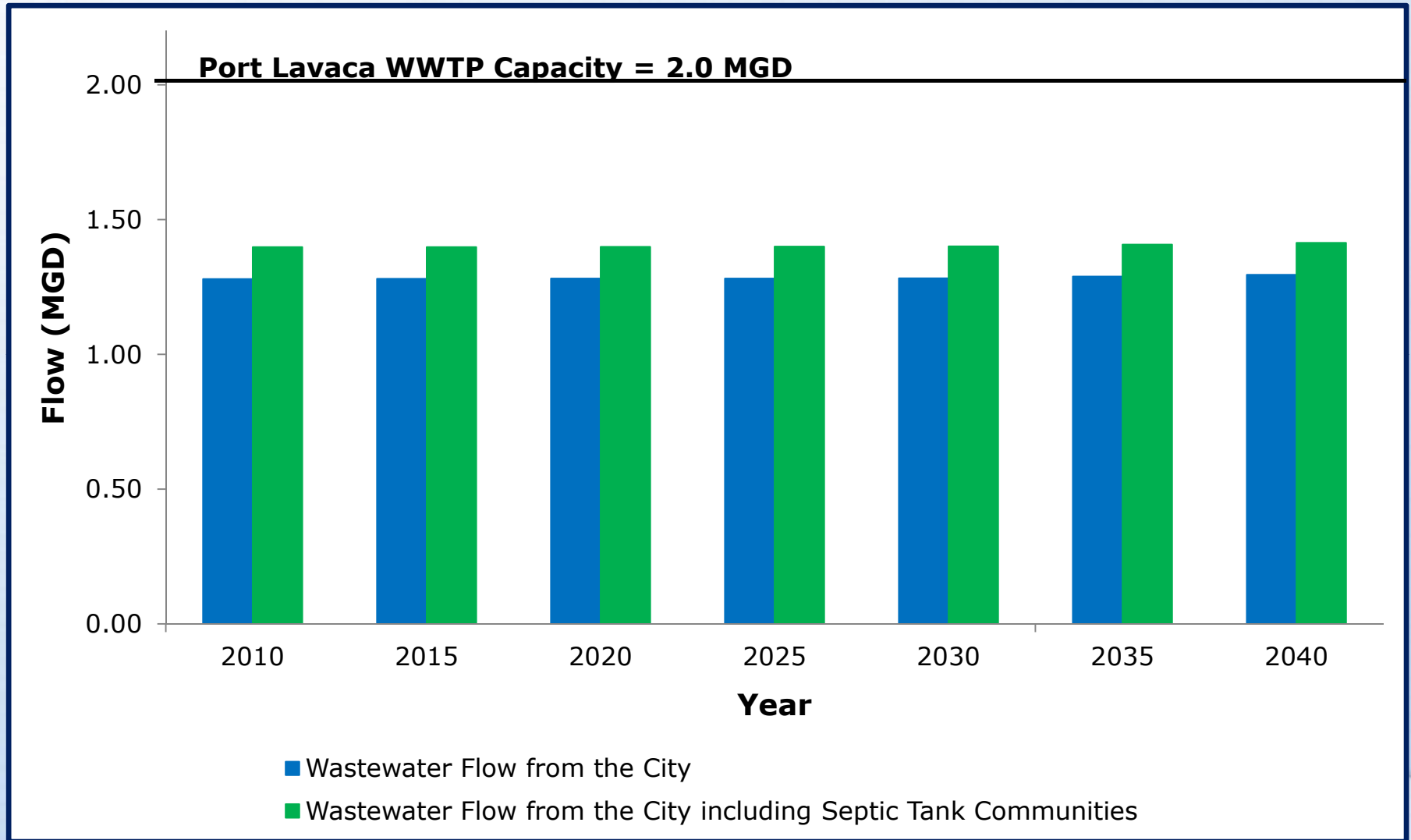
Study Area Overview - Potential Regional Assets

- ◆ **Excess wastewater treatment plant capacity at the Cities of Point Comfort and Port Lavaca**
- ◆ **Magnolia Beach WWTP/collection system**
- ◆ **Excess wastewater treatment plant capacity at the City of Seadrift and Port O'Connor MUD; WWTPs located on the west and east ends of Highway 185**

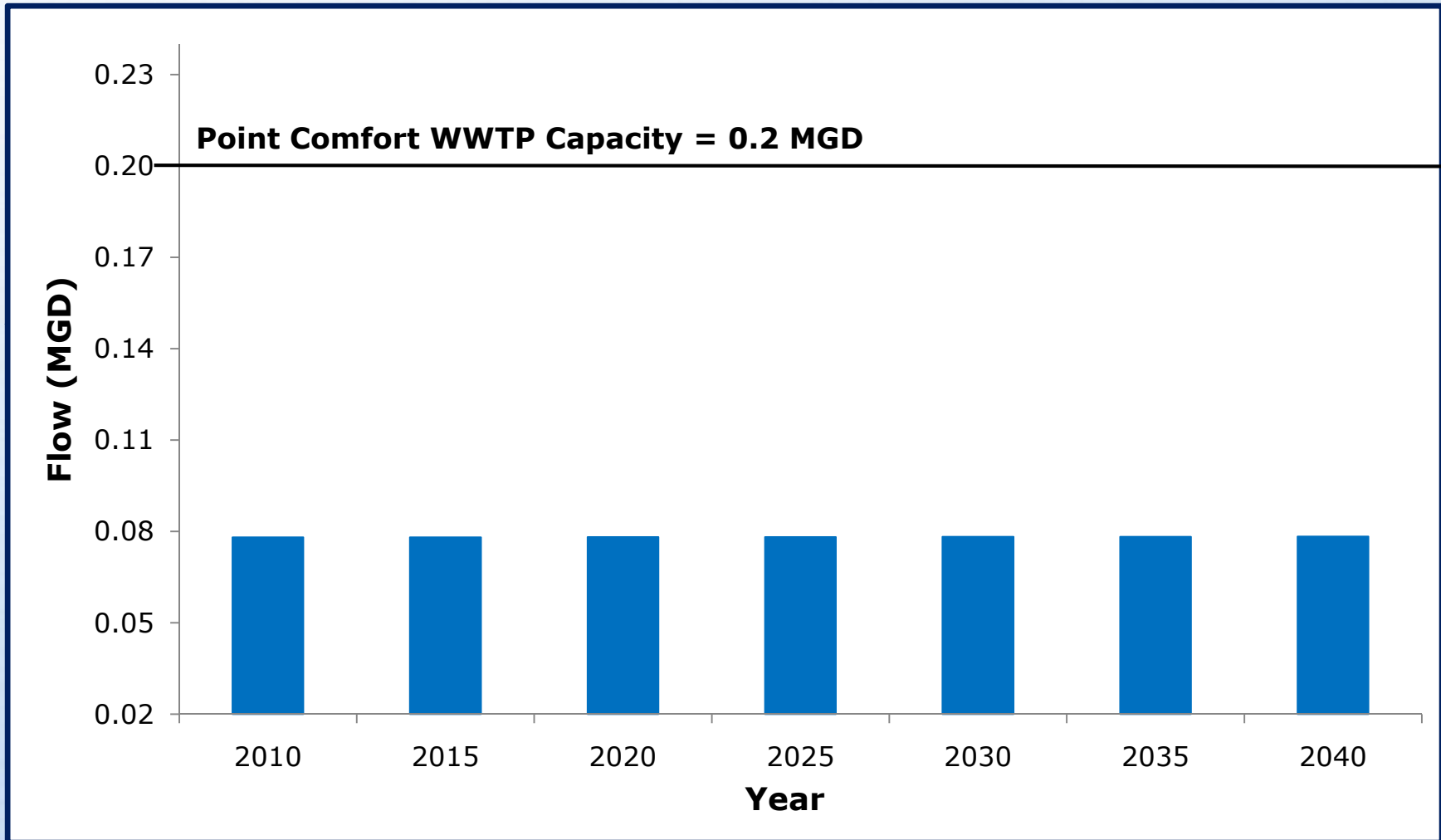
City of Port Lavaca: Wastewater Flow Projections



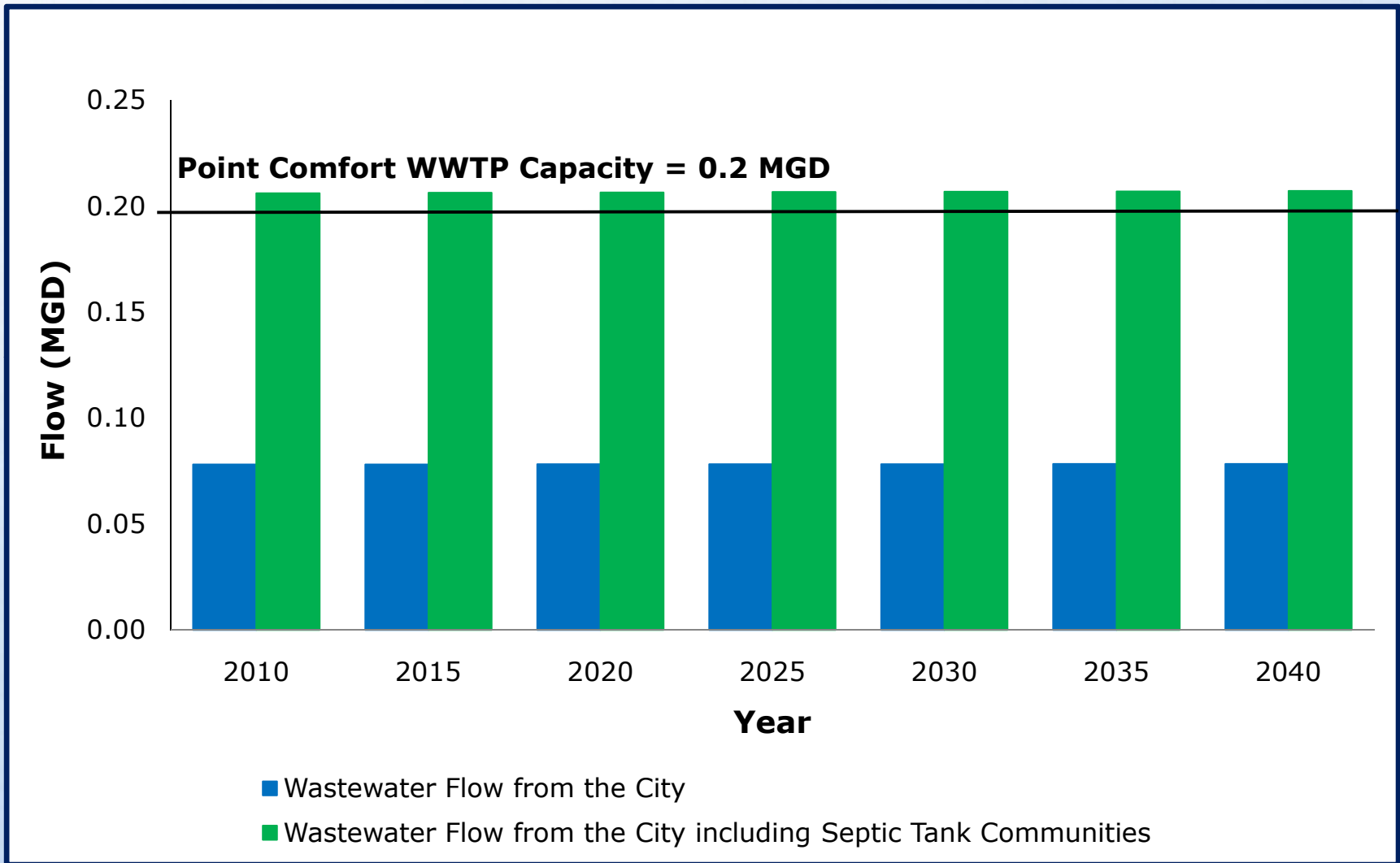
Wastewater Flow Projections: Area 1A



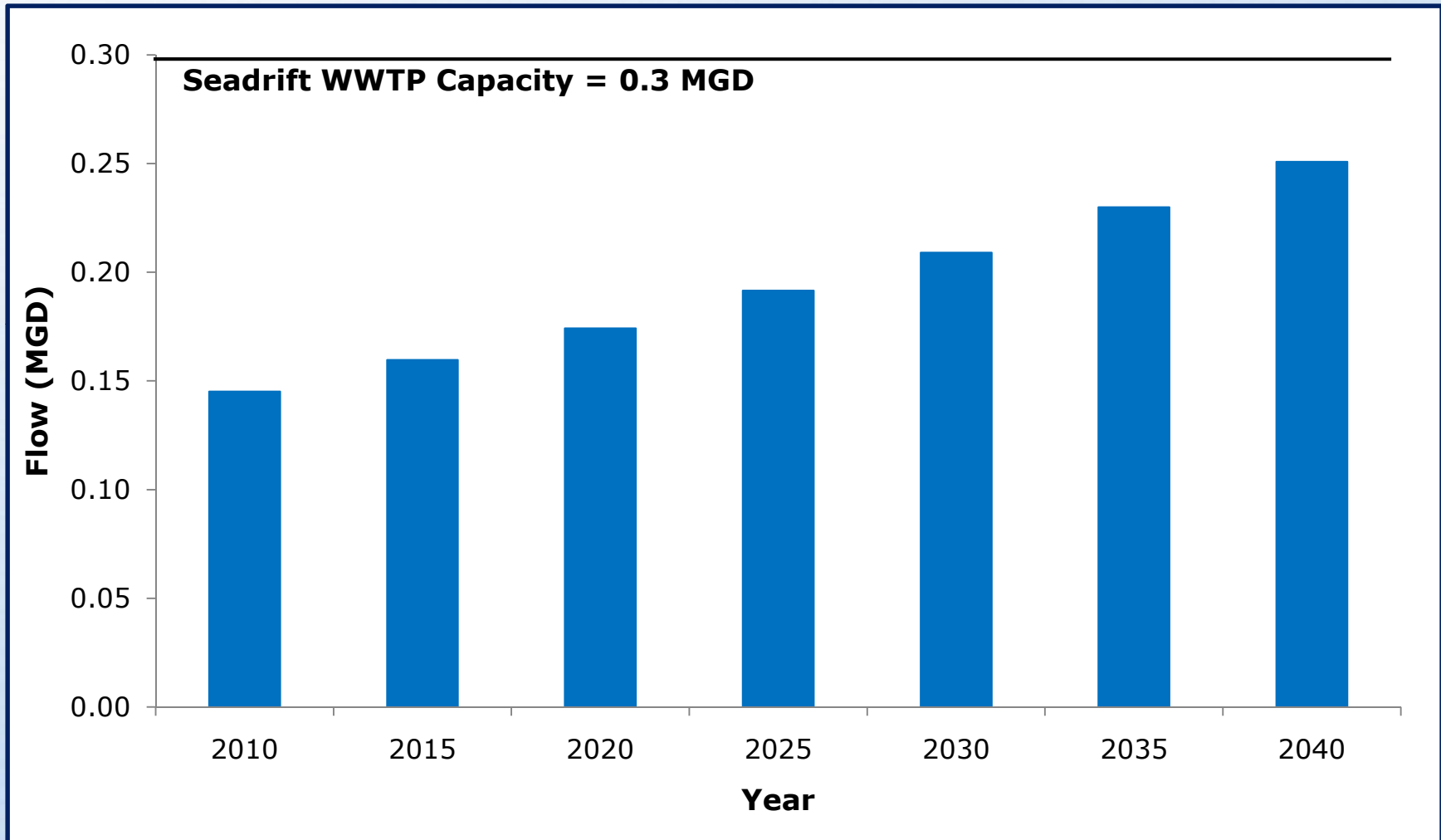
City of Point Comfort: Wastewater Flow Projections



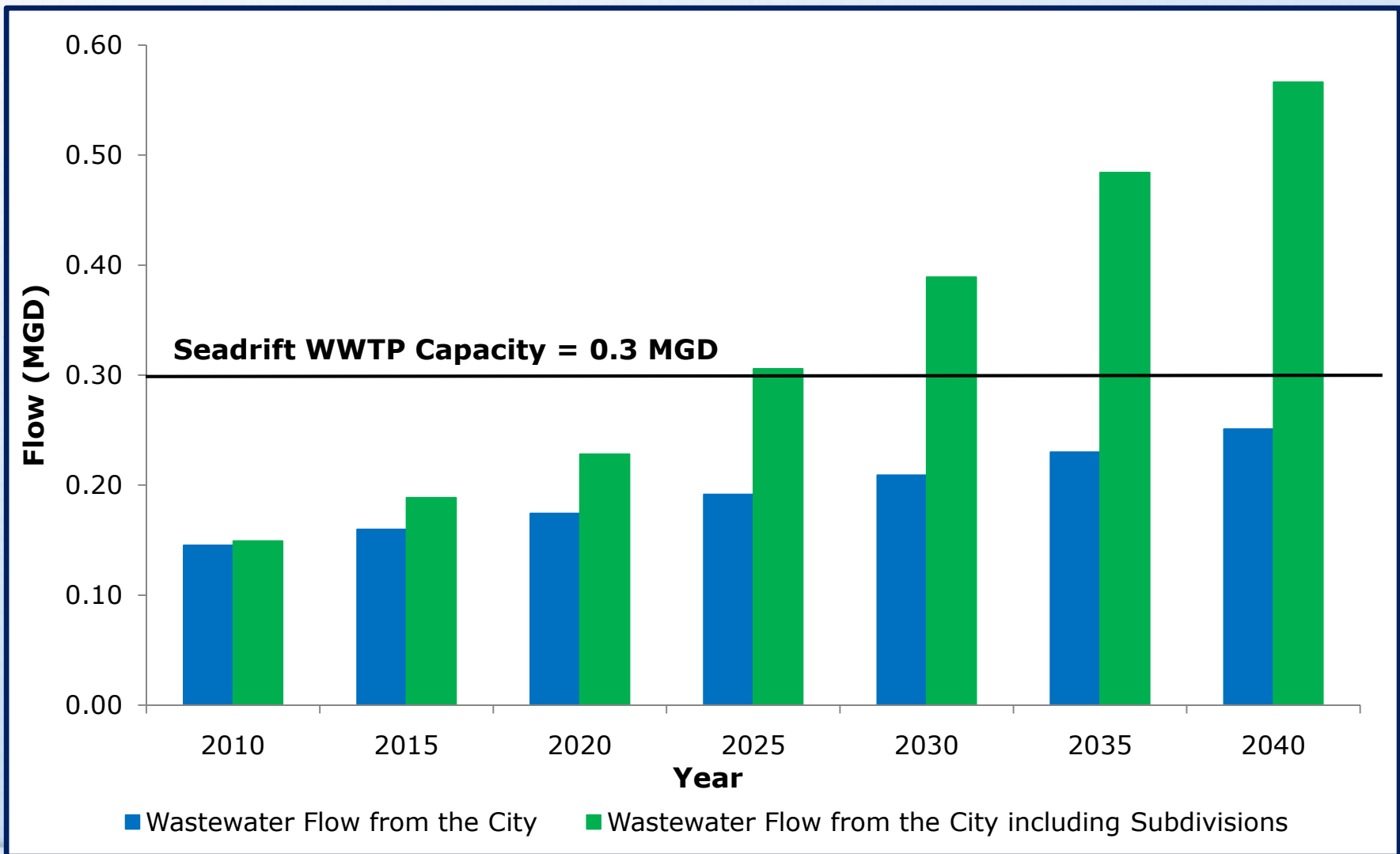
Wastewater Flow Projections: Area 1B



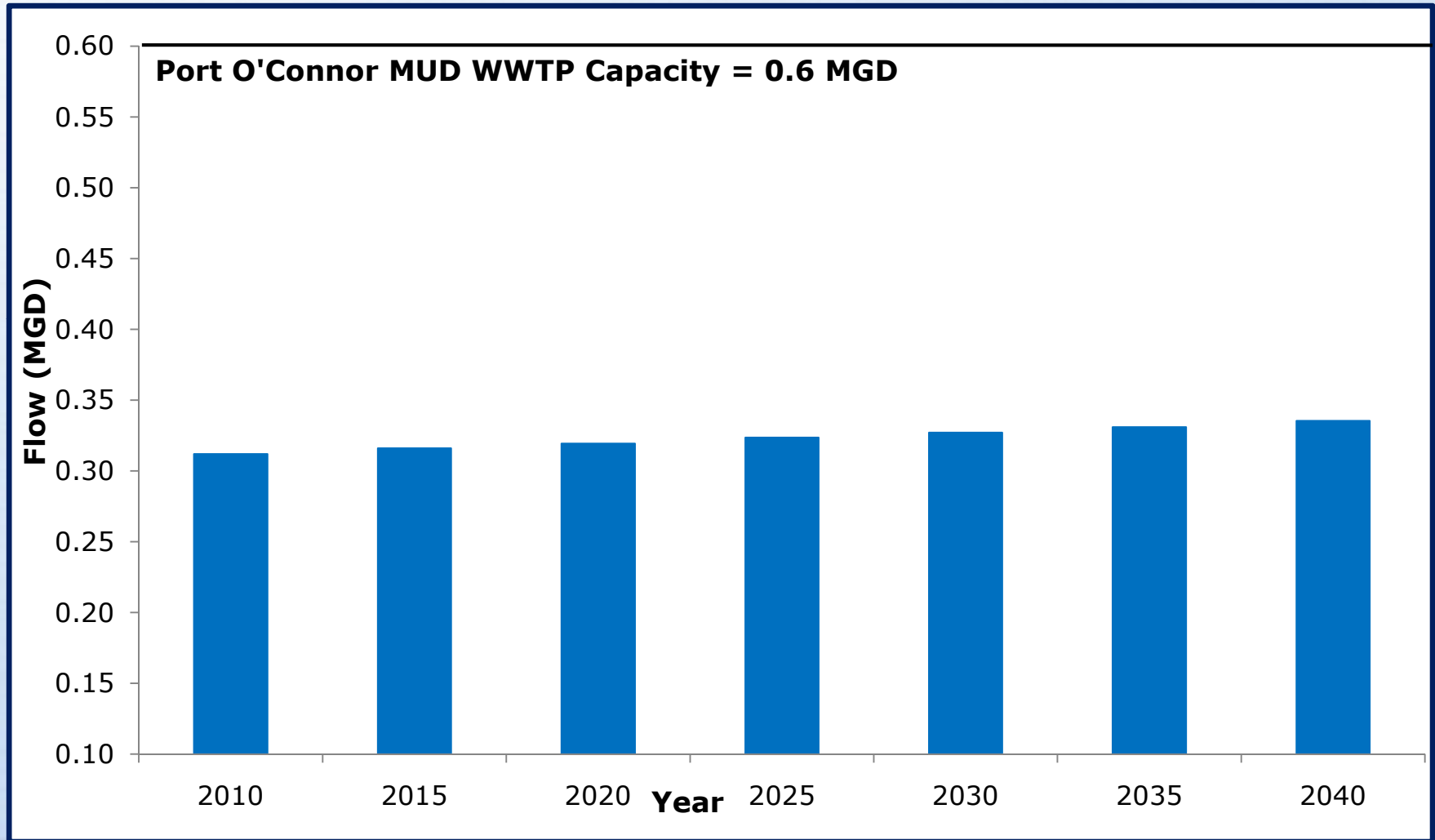
City of Seadrift: Wastewater Flow Projections



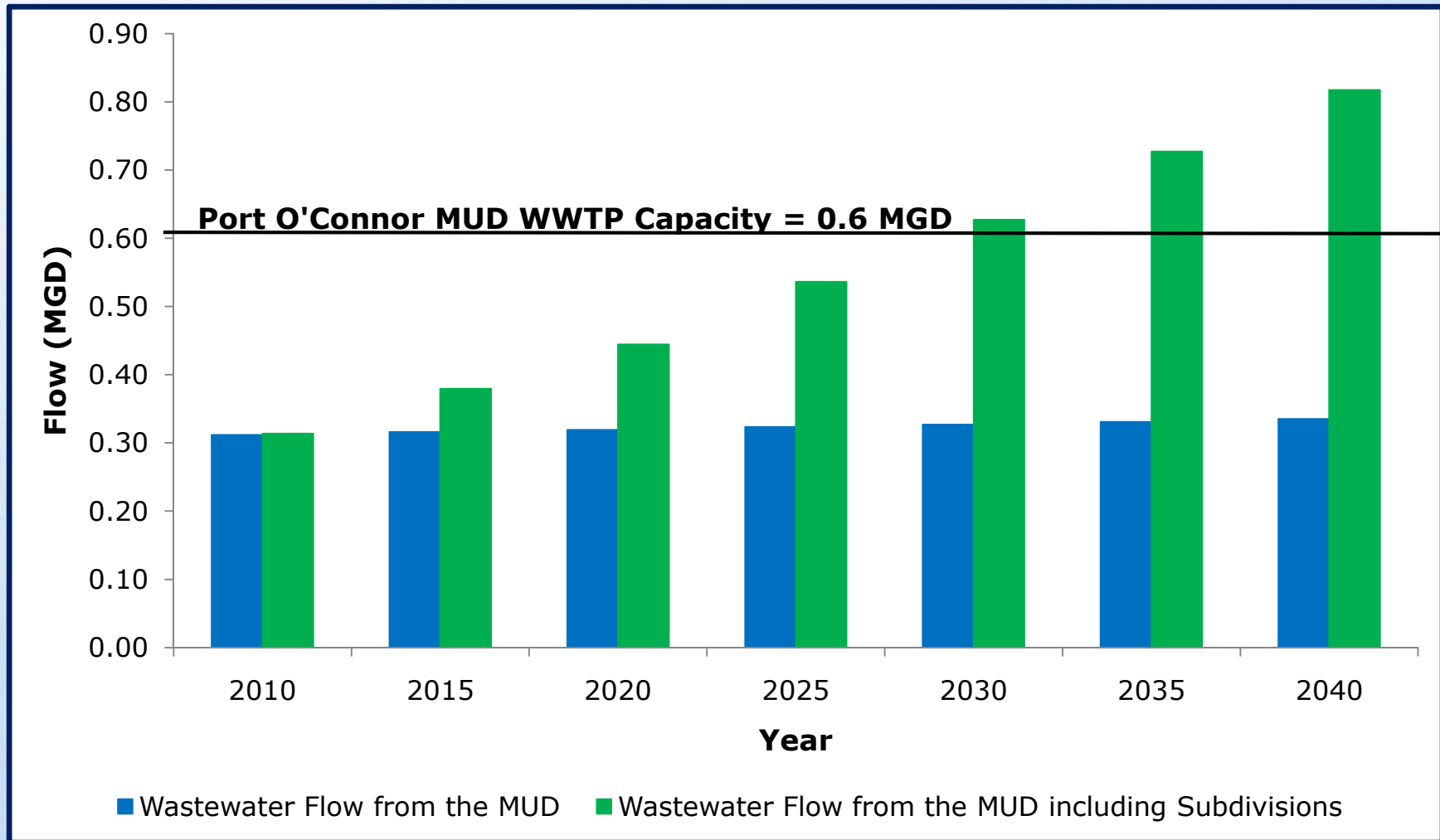
Wastewater Flow Projections: City of Seadrift - Area 2



Port O'Connor MUD: Wastewater Flow Projections



Wastewater Flow Projections: Port O'Connor MUD - Area 2



Study Area Overview - Potential Regional Assets

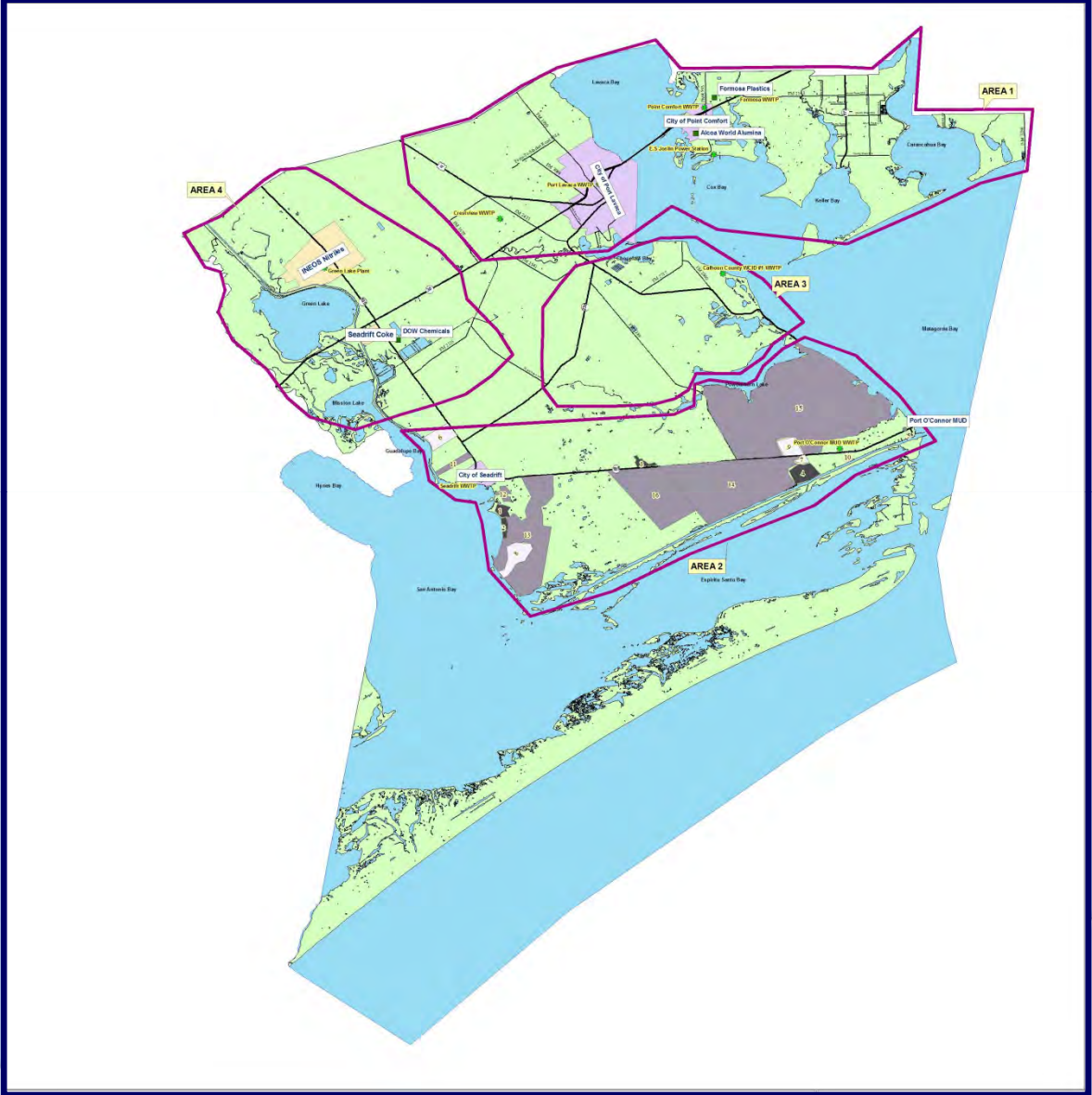
- ◆ **Excess wastewater treatment plant capacity at the Cities of Point Comfort and Port Lavaca**
- ◆ **Magnolia Beach WWTP/collection system**
- ◆ **Excess wastewater treatment plant capacity at the City of Seadrift and Port O'Connor MUD; WWTPs located on the west and east ends of Highway 185**
- ◆ **Wastewater main from Port O'Connor MUD WWTP along Highway 185 to The Sanctuary Development**

Study Area Overview - Potential Regional Assets (Cont.)

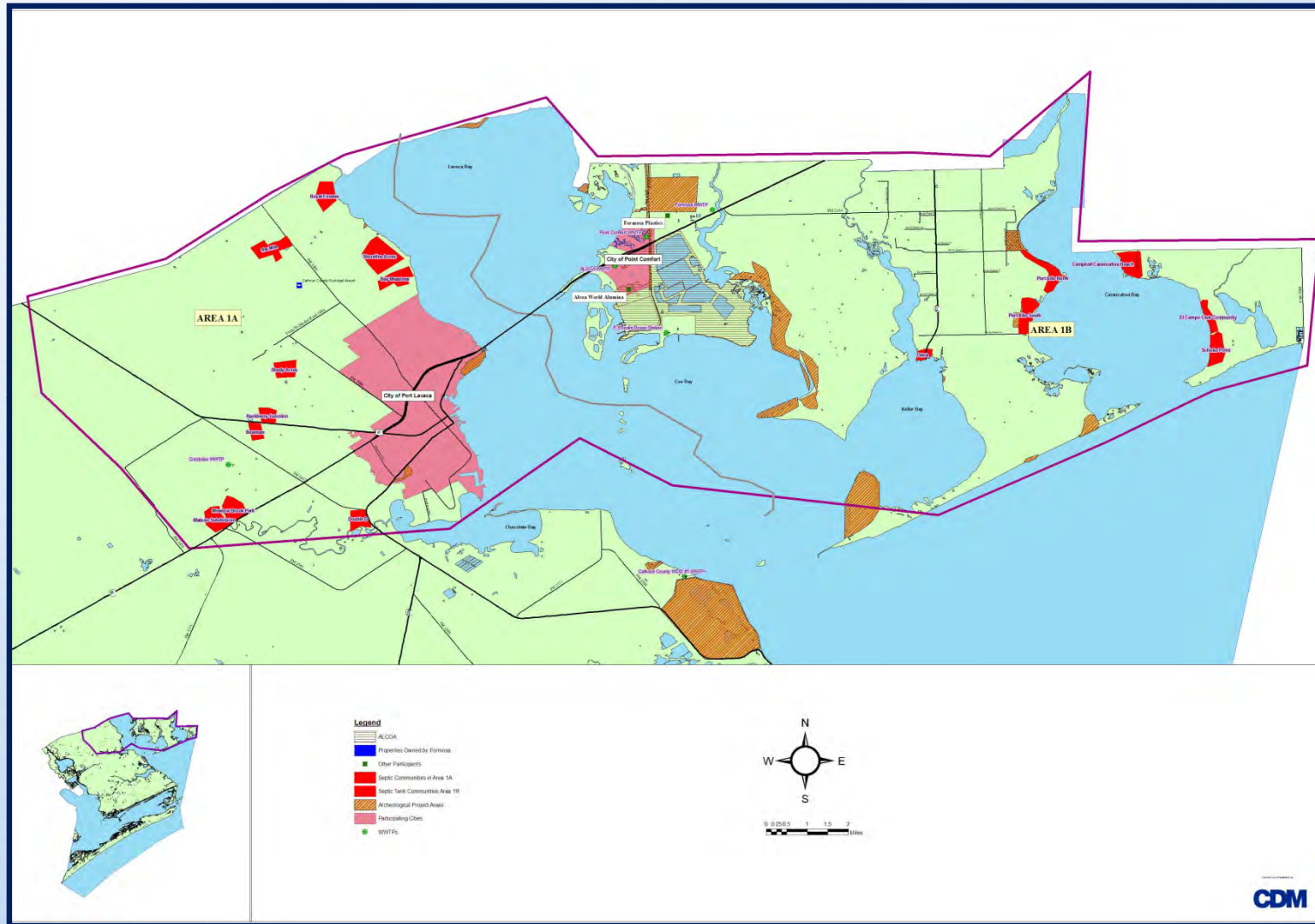
- ◆ **Large developments planned in the southern end of Calhoun County (stimulus for regional systems)**
- ◆ **Crestview WWTP and collection system located near City of Port Lavaca**
- ◆ **Numerous small developments located near City of Port Lavaca (regional opportunities)**
- ◆ **Large tract of land (4,000 acres) located adjacent to INEOS Nitriles that needs centralized wastewater service**

Preliminary Regional Alternatives

Study Area Overview



Area No. 1 Regional Options



Area No. 1A & 1B Regional Options

Wastewater Service

- 1) City of Port Lavaca provide wastewater service to Royal Estates, Shoreline Acres, Bay Meadows, Double D, Shady Acres, Meadow Brook Park, Bowman, Hackberry Junction, Matson Subdivision & Six Mile Area**
- 2) Install small package plant to serve Royal Estates, Shoreline Acres, Bay Meadows & Six Mile Area**
- 3) Crestview WWTP extend service to Meadow Brook Park, Bowman, Hackberry Junction & Matson Subdivision**
- 4) Install small package plant to serve Olivia and Port Alto WSC**

Area No. 1A & 1B Regional Options

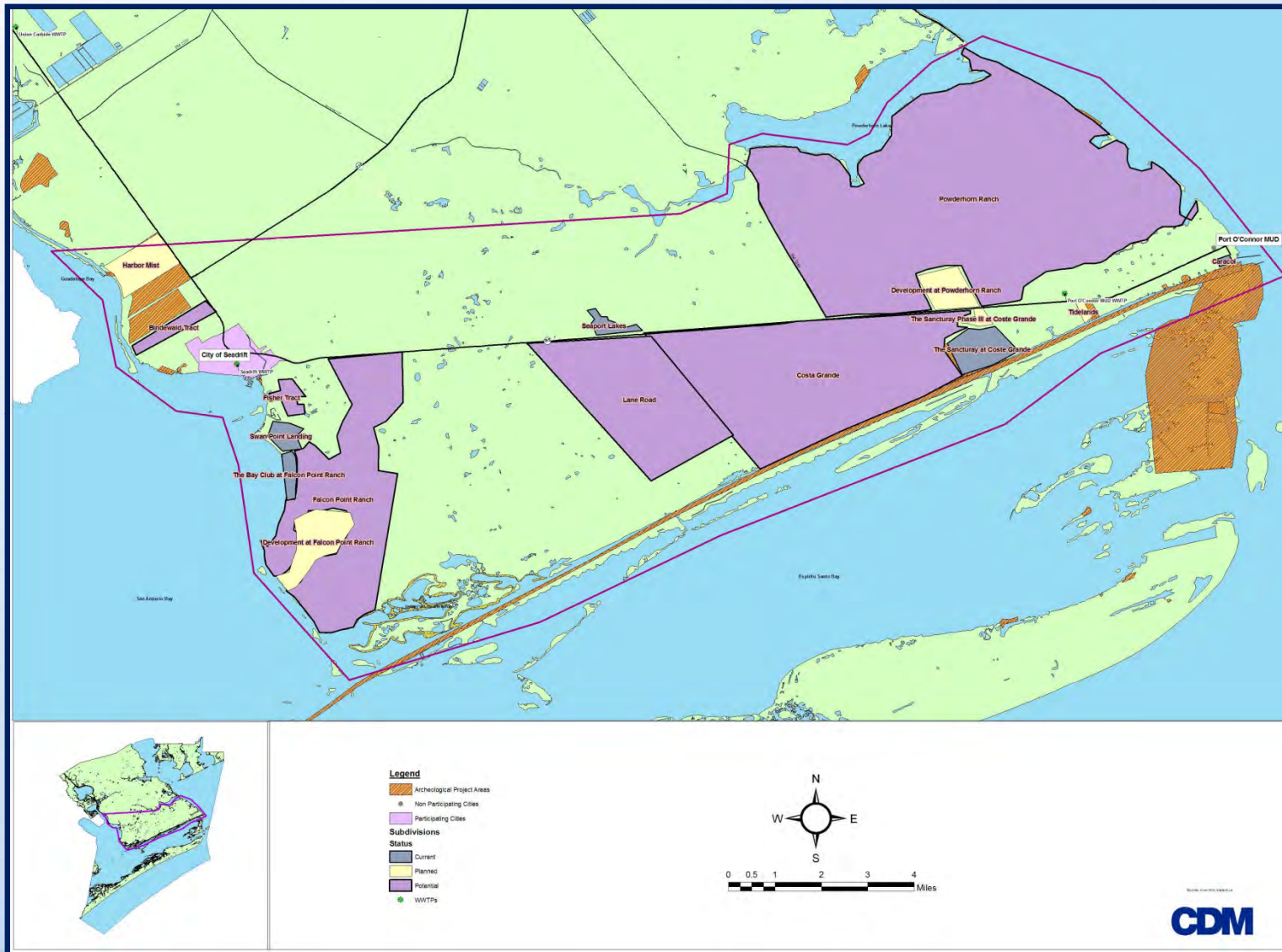
Wastewater Service (Cont.)

- 5) City of Point Comfort provide centralized wastewater service to Port Alto WSC, Olivia, and other developments in the area**
- 6) Install small package plant to serve Campbell Carancahua Beach Subdivision, El Campo Club Community & Schicke Point Community**

Reclaimed Water

- 1) Stand-alone alternative**
- 2) Formosa Plastics and Alcoa receive treated effluent/reuse from Cities of Point Comfort and Port Lavaca**

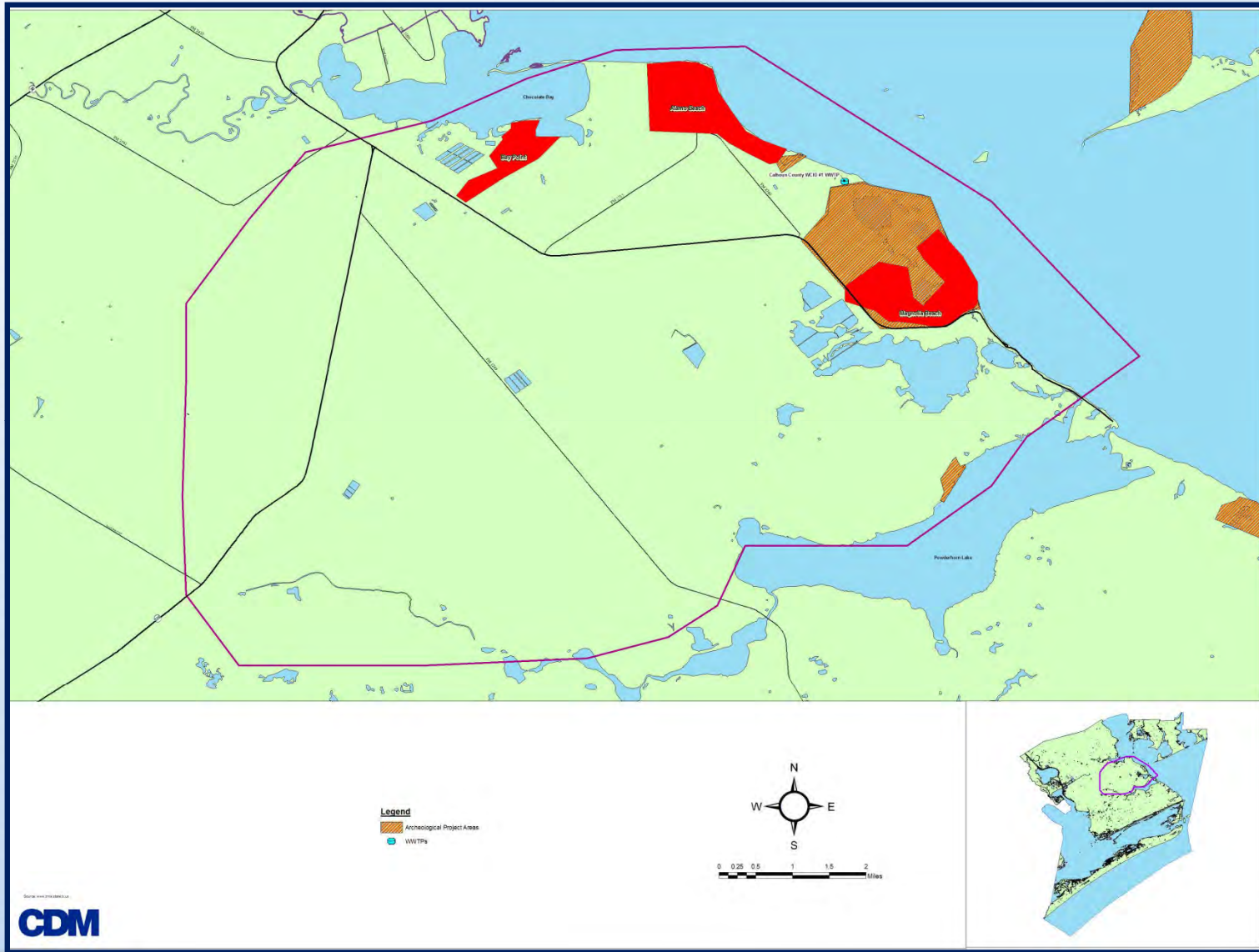
Area No. 2 Regional Options



Area No. 2 Regional Options

- 1) a. City of Seadrift serve Swan Point Landing, Falcon Point and others located in close proximity**
- b. Port O'Connor MUD extend wastewater service west along Highway 185 to Lane Road Development, The Sanctuary, Powder Horn Ranch & Costa Grande**
- 2) City of Seadrift and Port O'Connor MUD provide wastewater service to their existing areas; install package plant near Lane Road Development to serve developments along Highway 185**

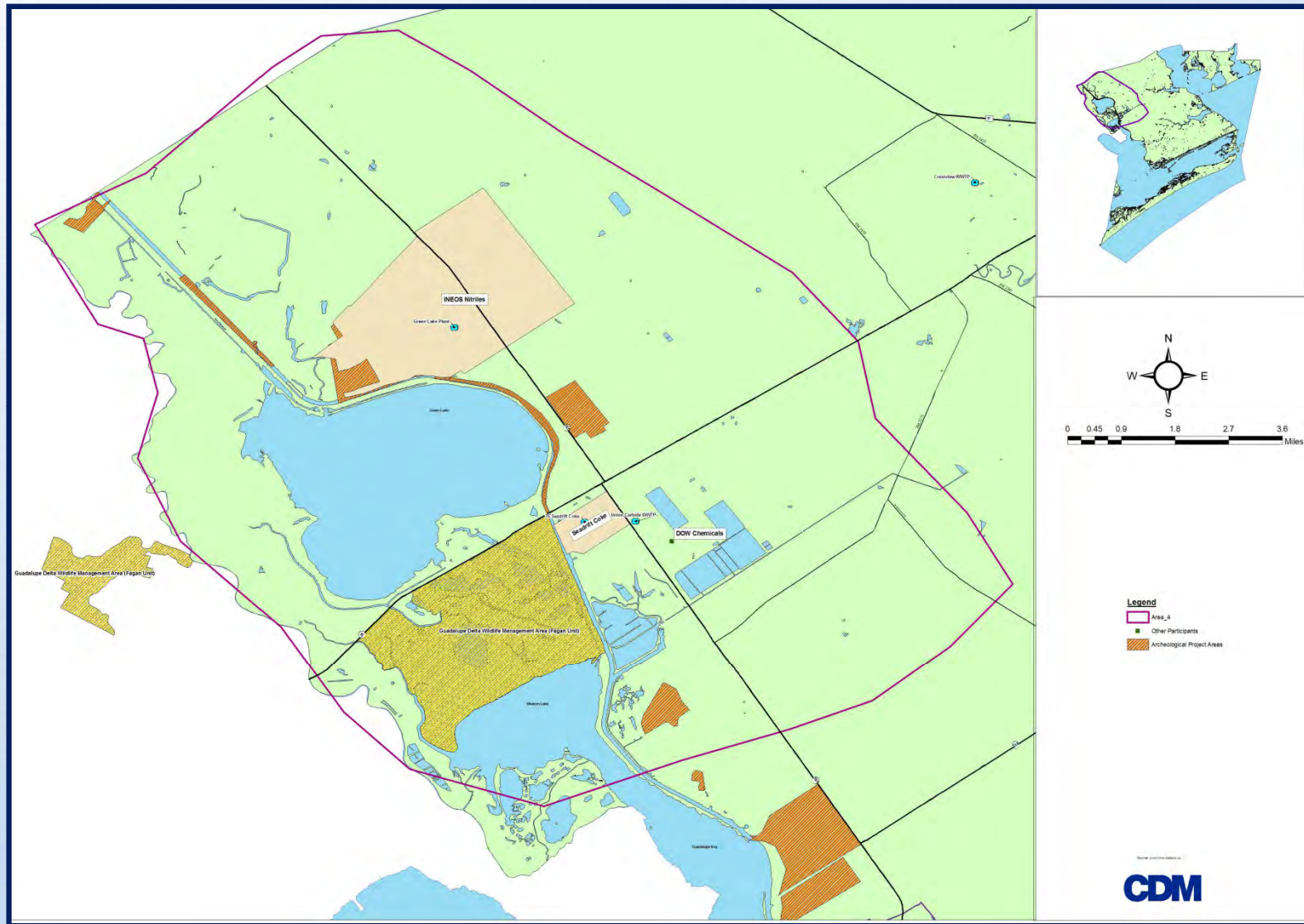
Area No. 3 Regional Options



Area No. 3 Regional Options

- 1) Magnolia Beach WWTP expand its system to serve Indianola, Alamo Beach, Baypoint Subdivision and other areas on septic systems**

Area No. 4 Regional Options



Area No. 4 Regional Options

- 1) Construct small package plant to provide centralized wastewater service to 4,000 acre site adjacent to INEOS Nitriles**
- 2) Seadrift Coke and Dow Chemical receive treated effluent/reuse from City of Seadrift and new INEOS Nitriles package plant**

Breakout Session by Areas

FACILITATORS

- ❖ **Area No. 1 & 1A (Allen Woelke)**
- ❖ **Area No. 2 (Tom Schmidt)**
- ❖ **Area No. 3 (Matt Glaze)**
- ❖ **Area No. 4 (Susan Roth)**

Study Area Overview

AREA 1A

- ◆ **City of Port Lavaca**
- ◆ **Crestview Subdivision**
- ◆ **Meadow Brook Park**
- ◆ **Shady Acres**
- ◆ **Hackberry Junction**
- ◆ **Bowman Development**
- ◆ **Matson Subdivision**
- ◆ **Bay Meadows**
- ◆ **Shoreline Acres**
- ◆ **Royal Estates**
- ◆ **Double Subdivision**
- ◆ **Six Mile Subdivision**

AREA 1B

- ◆ **City of Point Comfort**
- ◆ **Alcoa**
- ◆ **Formosa Plastics**
- ◆ **Olivia**
- ◆ **Port Alto WSC
(North & South)**
- ◆ **Campbell Carancahua
Beach Subdivision**
- ◆ **El Campo Club
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- ◆ **Schicke Point Community**

Study Area Overview

AREA 2

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AREA 3

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- ◆ Baypoint Subdivision
- ◆ Alamo Beach

AREA 4

- ◆ Dow Chemical
- ◆ Seadrift Coke
- ◆ INEOS Nitriles

Project Contacts

Project Contacts:

Susan K. Roth, P.E.
Susan Roth Consulting, LLC
(512) 796-6692
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Bryan Serold
GBRA, Lower Basin Manager
(361) 575-6366
bserold@gbra.org

**Calhoun County Regional Wastewater Facility Study
Project Meeting
February 10, 2011**

Name	Title	City/Entity	Phone Number	Email Address
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Tom Engelgau		Alcoa	361-987-6954	tom.engelgau@alcoa.com
DAVID MEESEY		TSPB	512-936-0852	
Vern Lussy		Calhoun County	361-212-9656	Vern.Lussy@calhouncounty.org
Oscar Peña		Port Lavaca	361-552-3347	oscar@portlavaca.org
Jung Ahn		PORT LAVACA	361-552-6130	
Mike Pfeiffer		Calhoun County	361-553-4600	Mike.Pfeiffer@calhouncounty.org
CHRISTINE A. HOOP		Seadrift	361-785-2218	seadriftjudge@twid.net
TERRELL JONES		Seadrift	4	4
Nelda Benavides		Tom Chemical Co	361-652-2500	benavinf2@dow.com
Bruce Gertner	Technical Manager	Seadrift Coke LA	361-551-4580	bgertner@seadriftcoke.com
Allen Woelke		CDM	512-346-1100	woelkead@cdm.com
Tom Schmidt		Urban Eng	361-578-9836	Tschmidt@Urbanvictoria.com
DAVID ROBERTS	ATTY	CCFDC	361-552-2971	david@portlavacagalaw.com
NEIL FRITSCH	Commissioner	CALHOUN County	361-893-5346	neil.fritsch@calhouncounty.org
Bob WALLACE	Dis. Mgr. of	FORWJSA	361-987-7440	
BRYAN SEROLD	OPERATIONS MGR.	GBRA	361-575-6366	bserold@gbra.org
STEPHANIE SHALLY	Chief Operator	GBRA	361-552-9751	Sshally@gbra.org
Chris CSU9203	operator	City of Point Comfort	361-987-2661	
Herb Wittliff	Manager	GBRA	361-552-9751	hwittliff@gbra.org
Alex Marshall	President	Cal. Co. EDC / GBRA	361-553-7600	ammarshall@calhouncounty.org
Susan Roth		Susan Roth Consulting	512-796-6692	susan@srrothconsulting.com

Calhoun County Regional Wastewater Facility Study



Project Meeting

**Dow Chemical – Port Lavaca Site
May 19, 2011**

Presentation Outline

- ◆ **Project Timeline & Recap**
- ◆ **Population Projections**
- ◆ **Analysis of Final Alternatives**
- ◆ **Wastewater Reuse Findings**
- ◆ **Capital and O&M Cost Estimates**
- ◆ **Preliminary Conclusions & Summary**
- ◆ **Q&A Discussion**
- ◆ **Next Steps**

Scope of Work

- ◆ **Service Area Description – Data Collection**
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Project Timeline

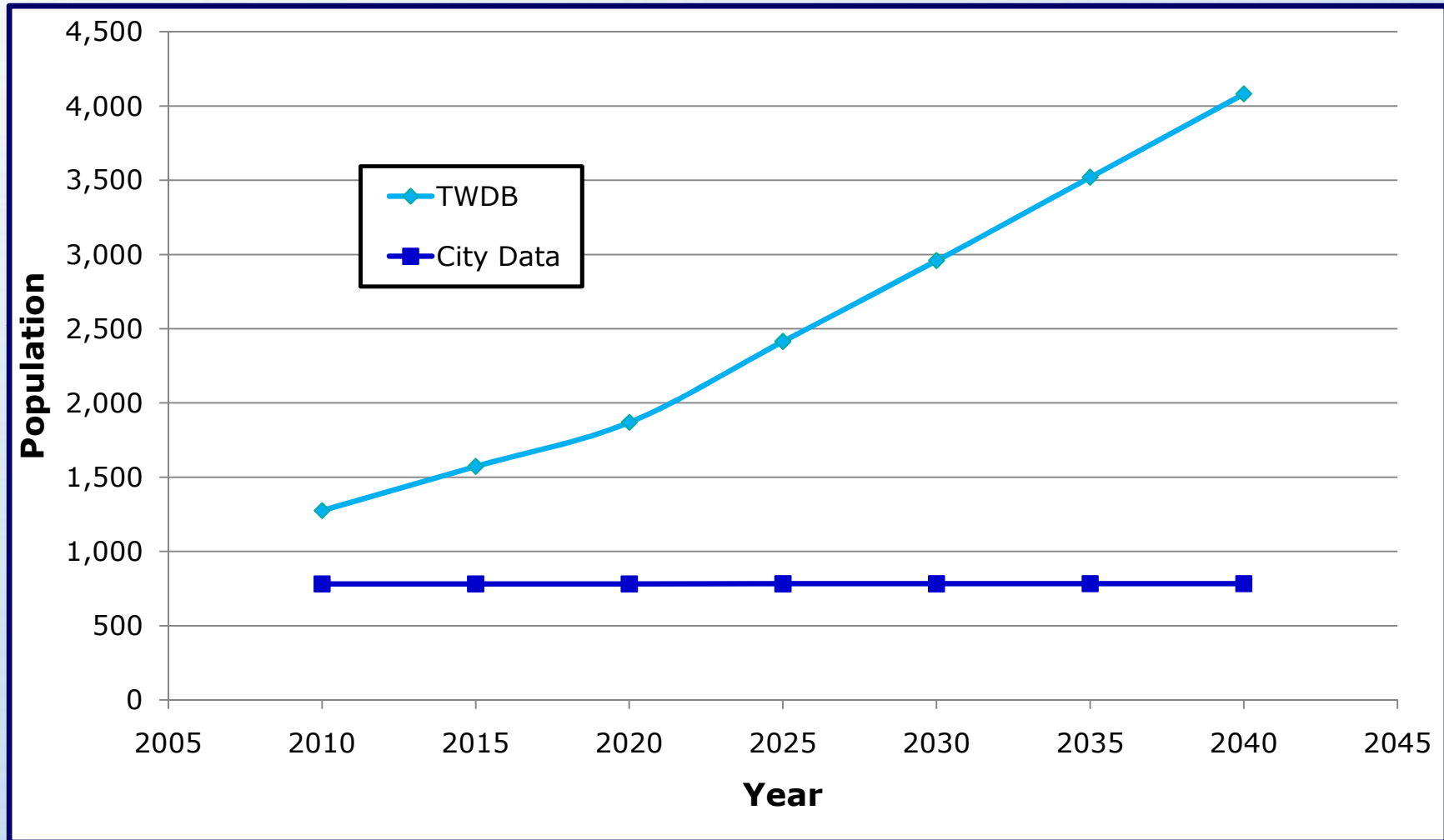
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Population & Projection Data

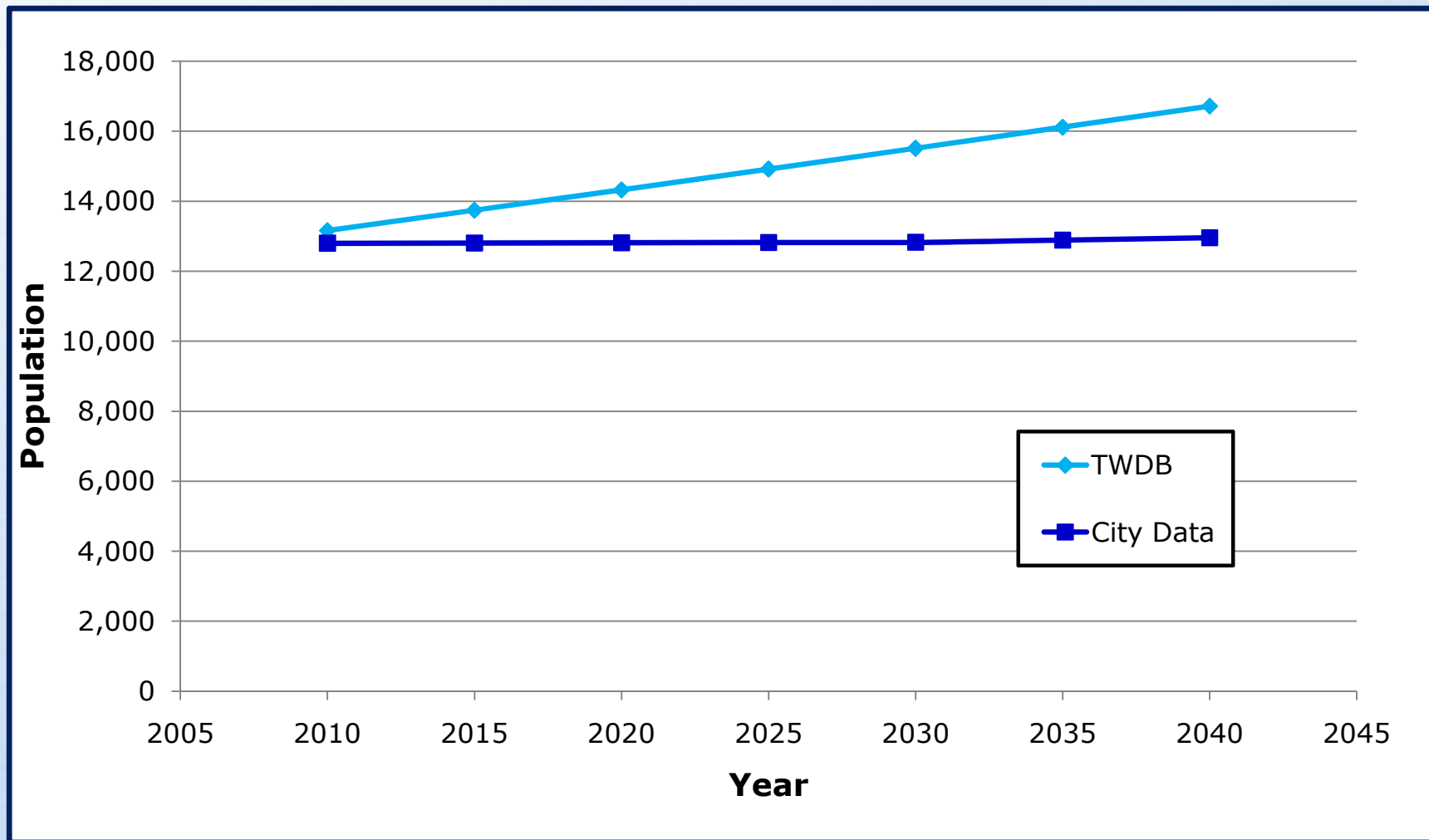
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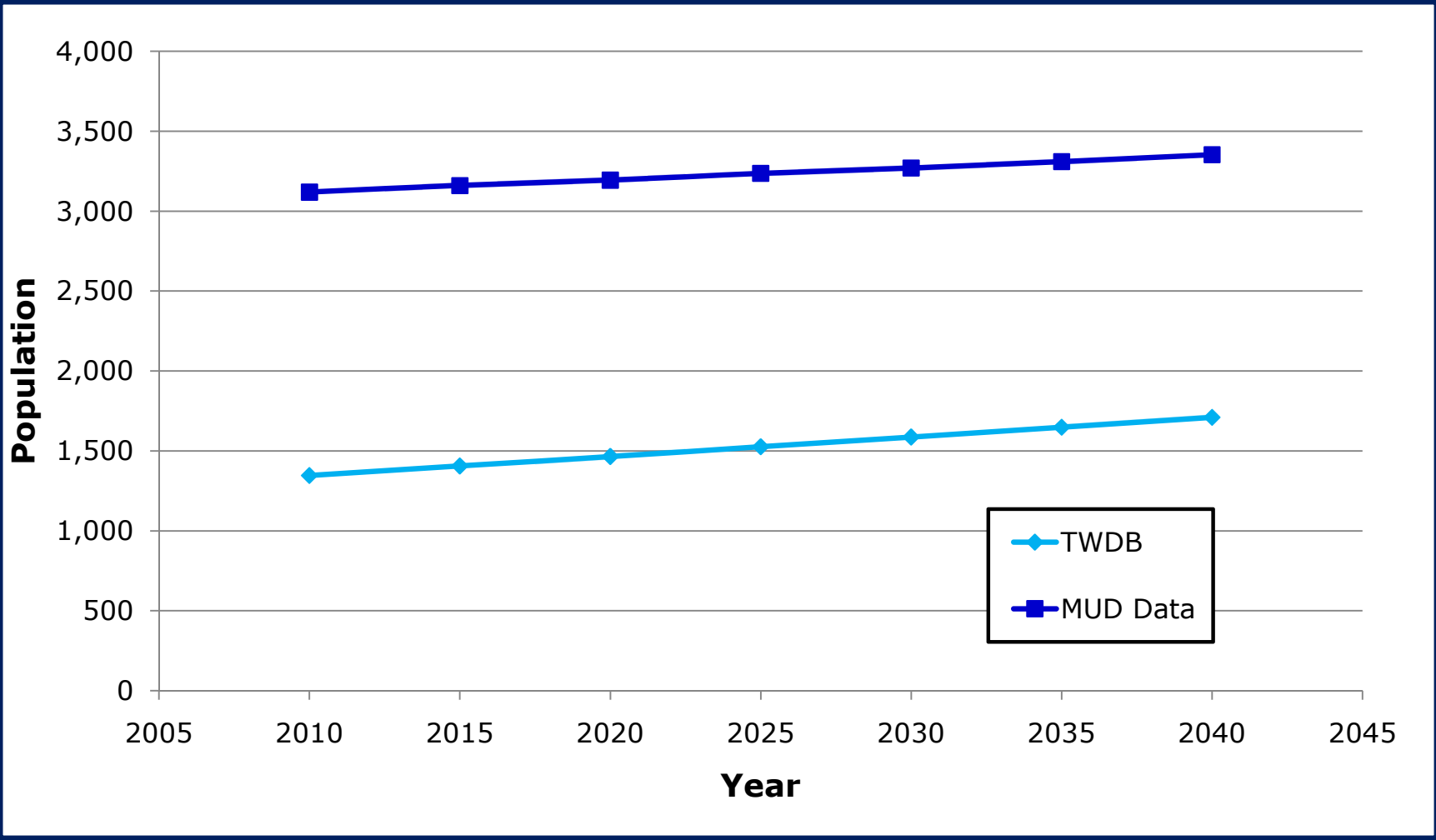
Point Comfort Population Projections: Comparison of TWDB & City Data



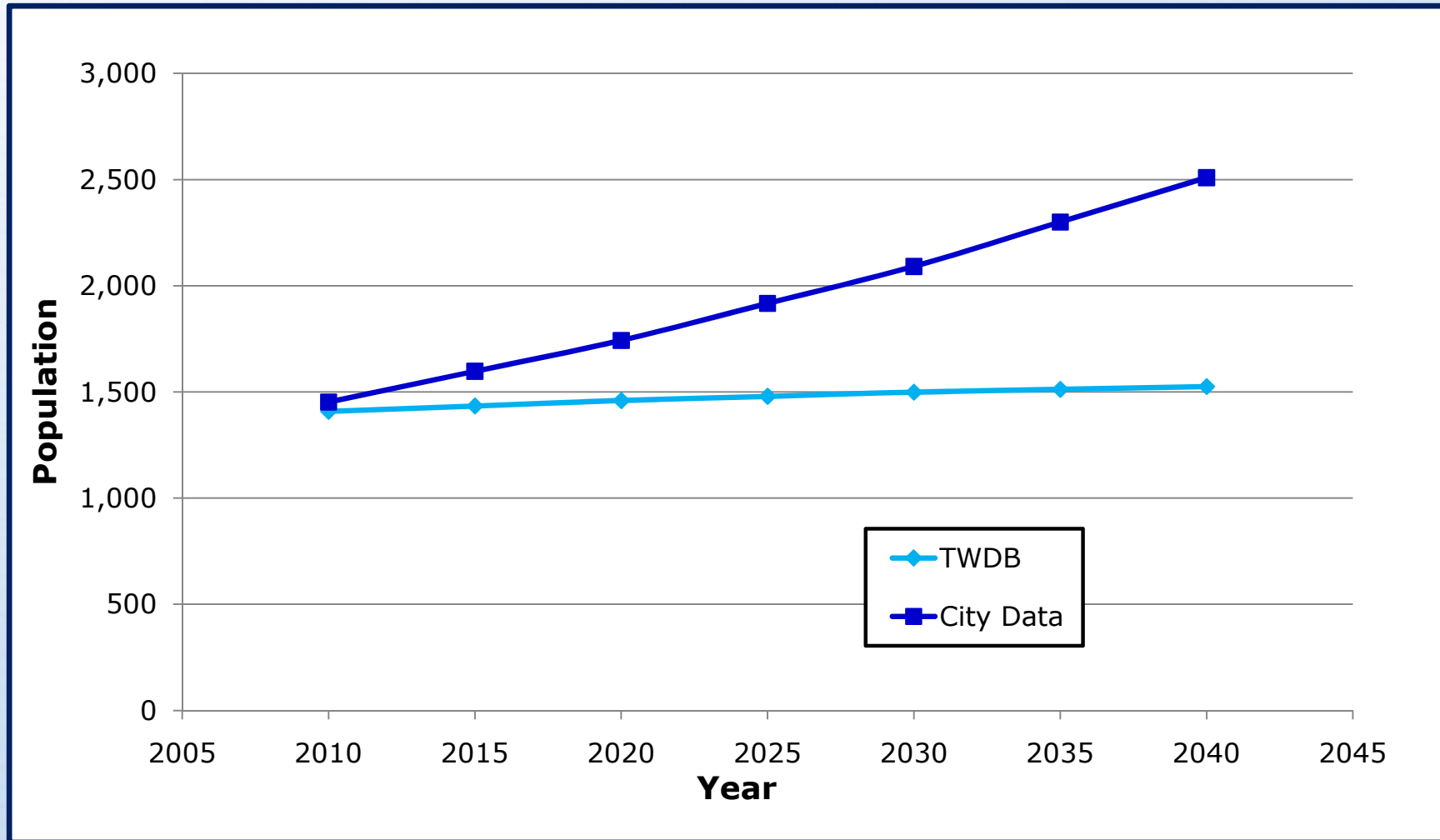
Port Lavaca Population Projections: Comparison of TWDB & City Data



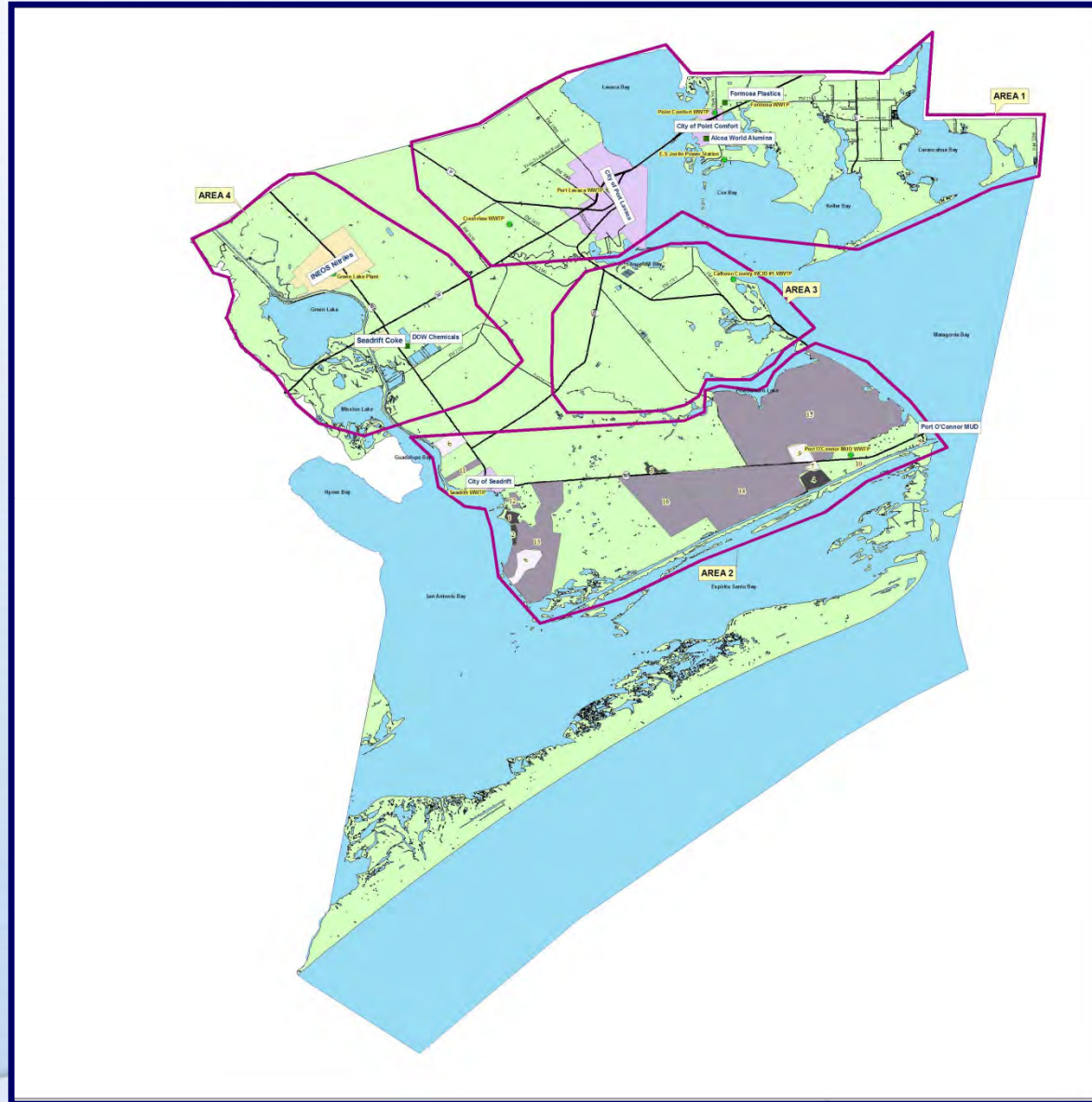
Port O'Connor Population Projections: Comparison of TWDB & MUD Data



Seadrift Population Projections: Comparison of TWDB & City Data



Study Area – Regional Concept



Study Area Overview

AREA 1A

- ◆ City of Port Lavaca
- ◆ Crestview Subdivision
- ◆ Meadow Brook Park
- ◆ Shady Acres
- ◆ Hackberry Junction
- ◆ Bowman Development
- ◆ Matson Subdivision
- ◆ Bay Meadows
- ◆ Shoreline Acres
- ◆ Royal Estates
- ◆ Double Subdivision
- ◆ Six Mile Subdivision

AREA 1B

- ◆ City of Point Comfort
- ◆ Alcoa
- ◆ Formosa Plastics
- ◆ Olivia
- ◆ Port Alto WSC
(North & South)
- ◆ Campbell Carancahua
Beach Subdivision
- ◆ El Campo Club
Community
- ◆ Schicke Point Community

Study Area Overview

AREA 2

- ◆ **City of Seadrift**
- ◆ **Port O'Connor MUD**
- ◆ **Swan Point Landing**
- ◆ **Falcon Point**
- ◆ **Costa Grande Development (I-V)**
- ◆ **Powder Horn Ranch**
- ◆ **Lane Road Development**
- ◆ **The Sanctuary**

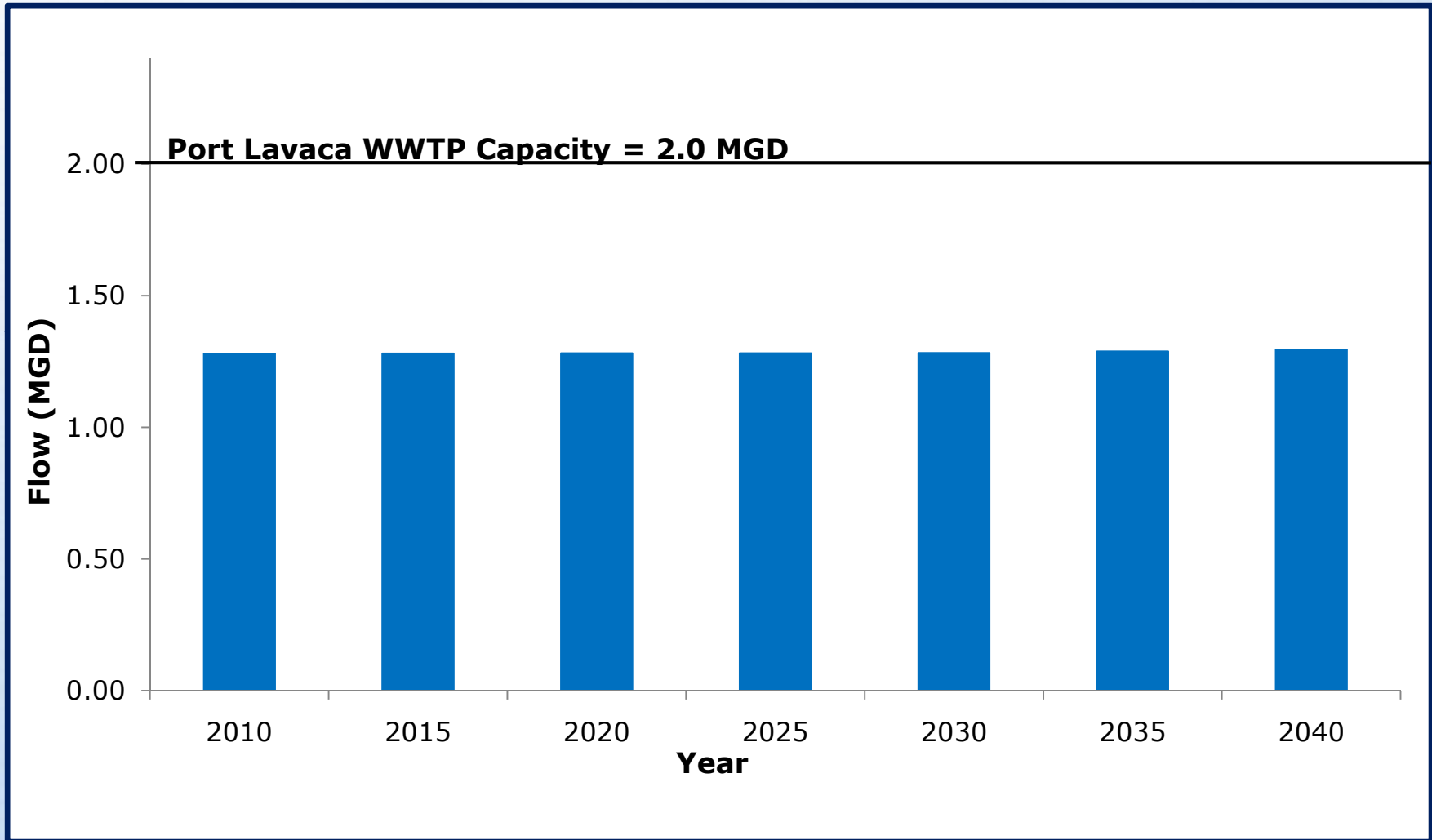
AREA 3

- ◆ **Magnolia Beach**
- ◆ **Indianola**
- ◆ **Baypoint Subdivision**
- ◆ **Alamo Beach**

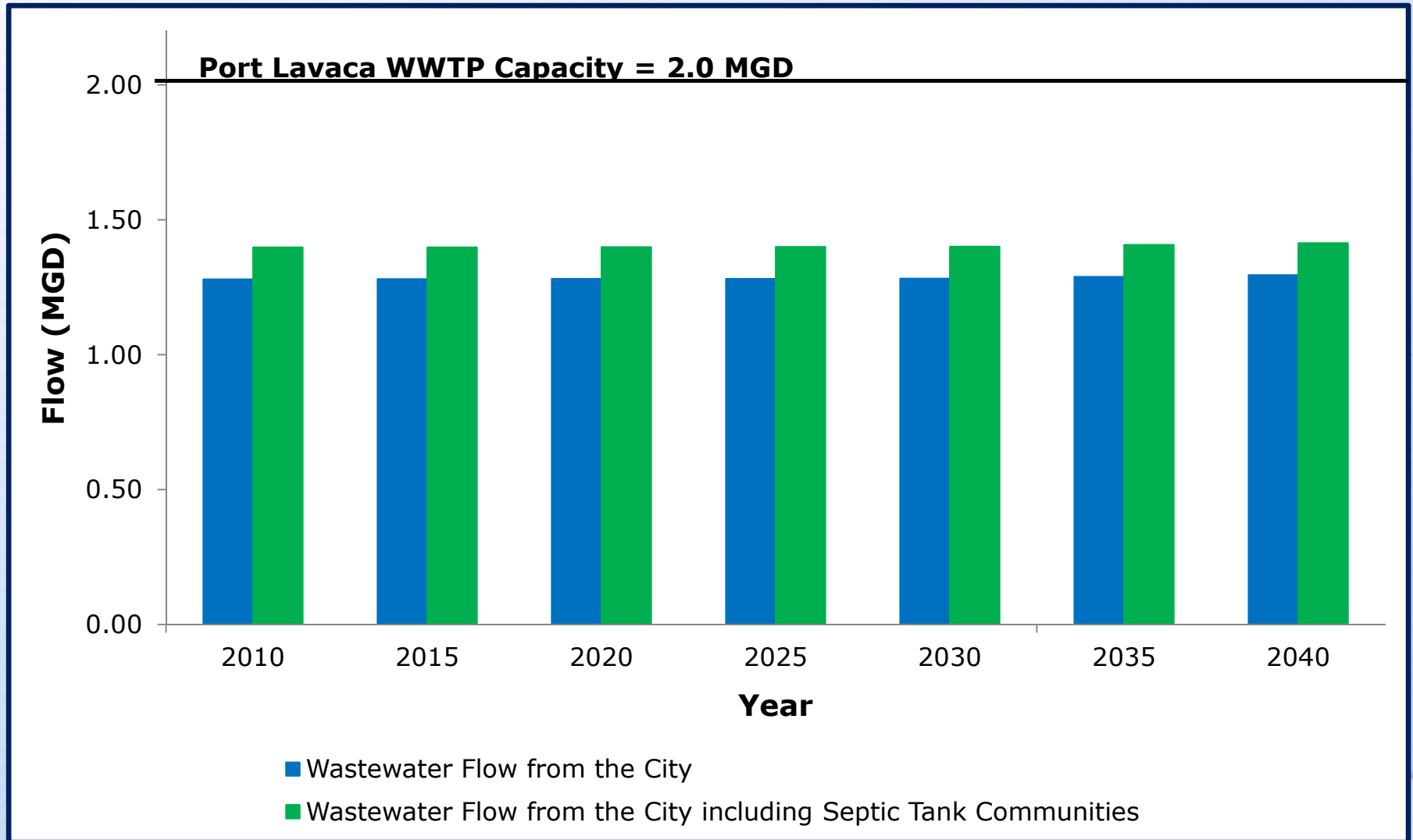
AREA 4

- ◆ **Dow Chemical**
- ◆ **Seadrift Coke**
- ◆ **INEOS Nitriles**

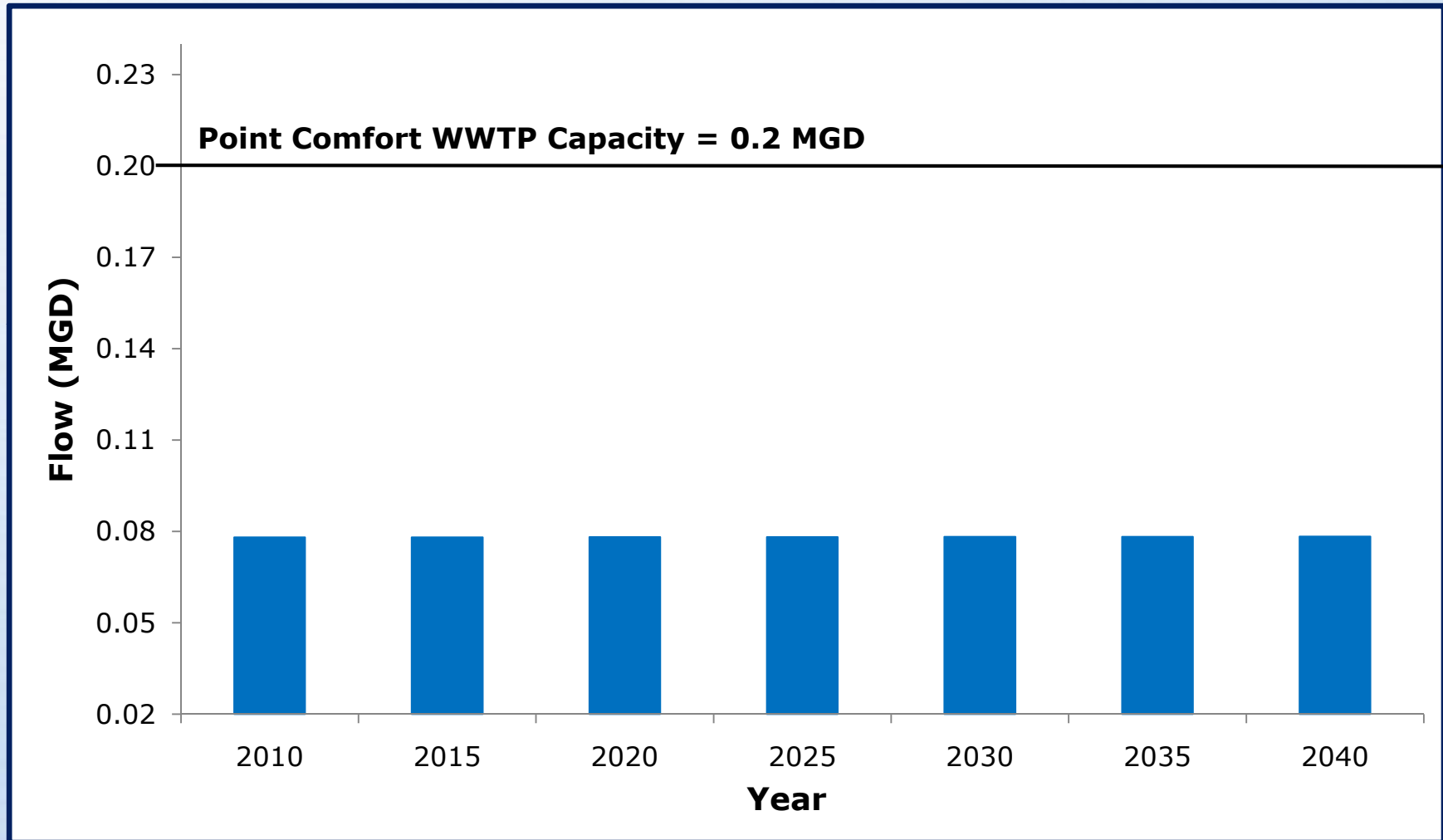
City of Port Lavaca: Wastewater Flow Projections



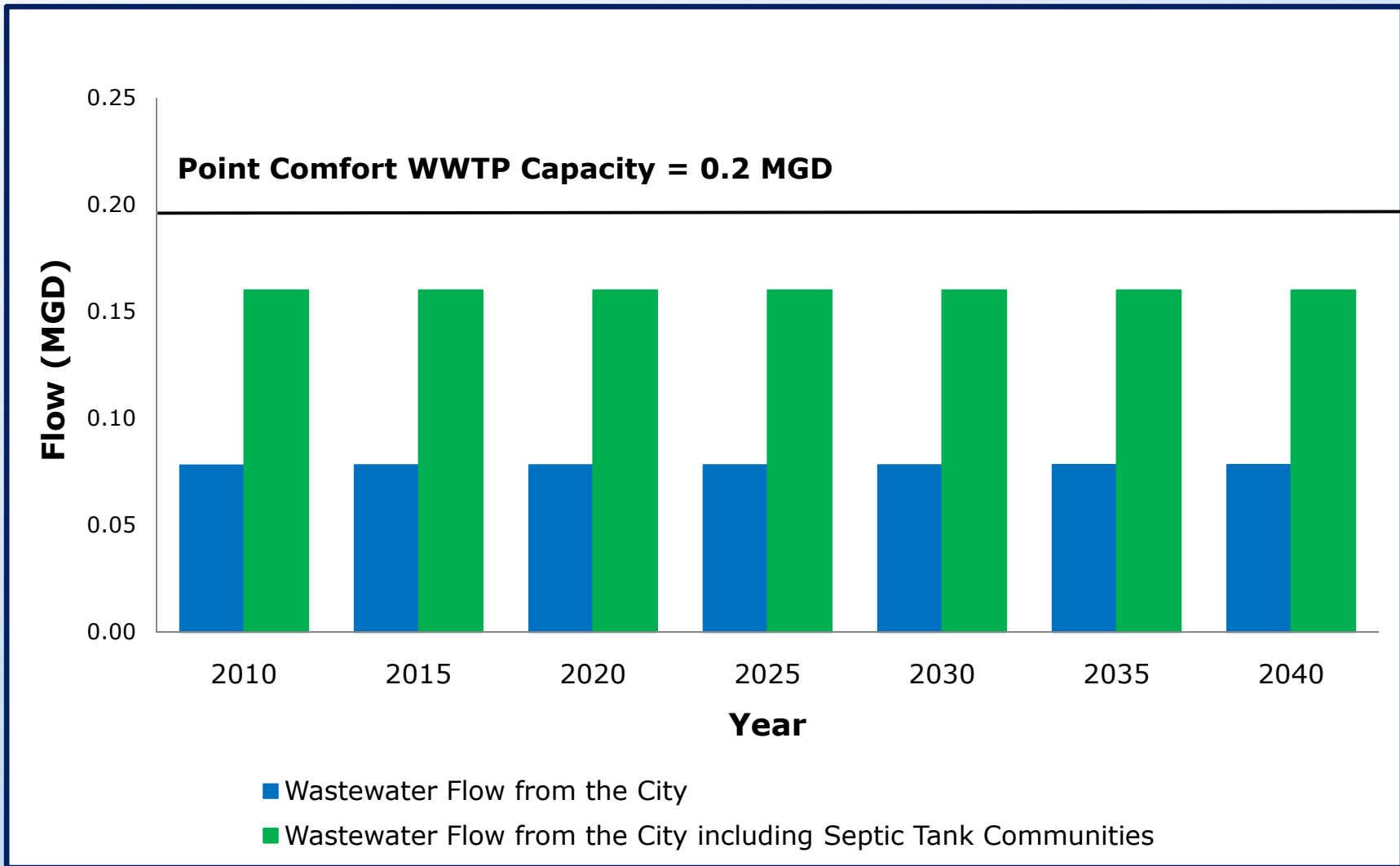
Wastewater Flow Projections: Area 1A



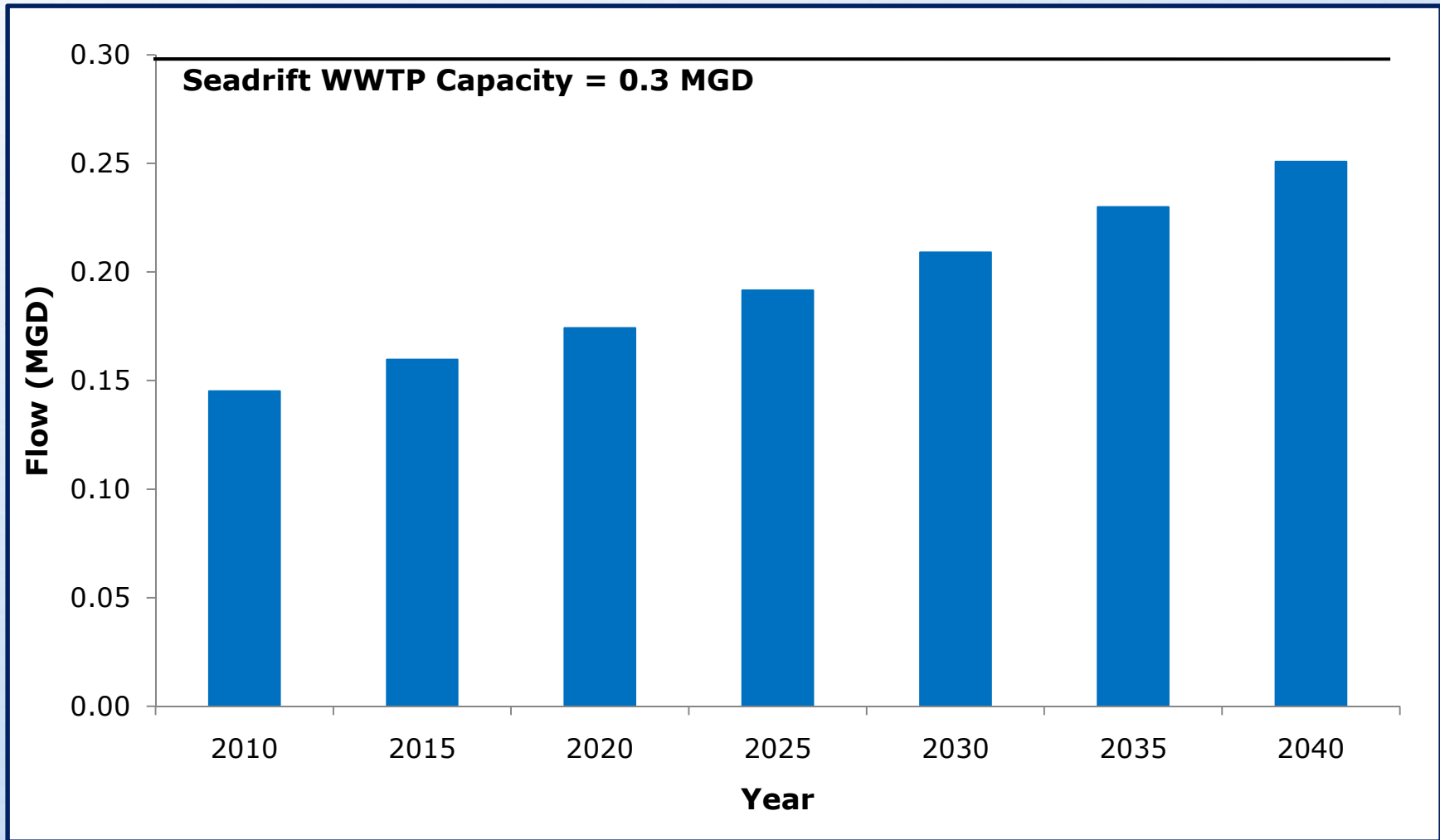
City of Point Comfort: Wastewater Flow Projections



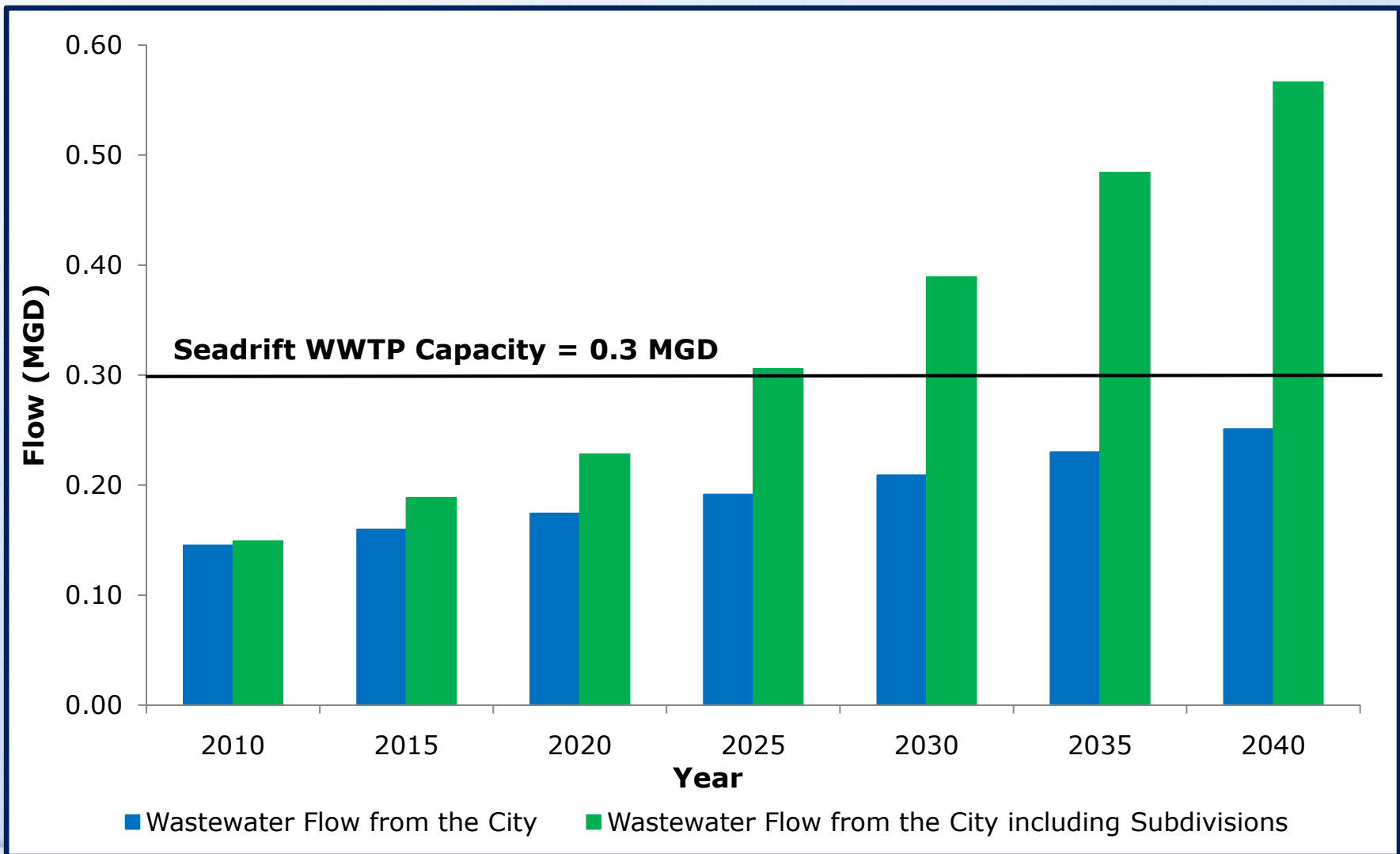
Wastewater Flow Projections: Area 1B



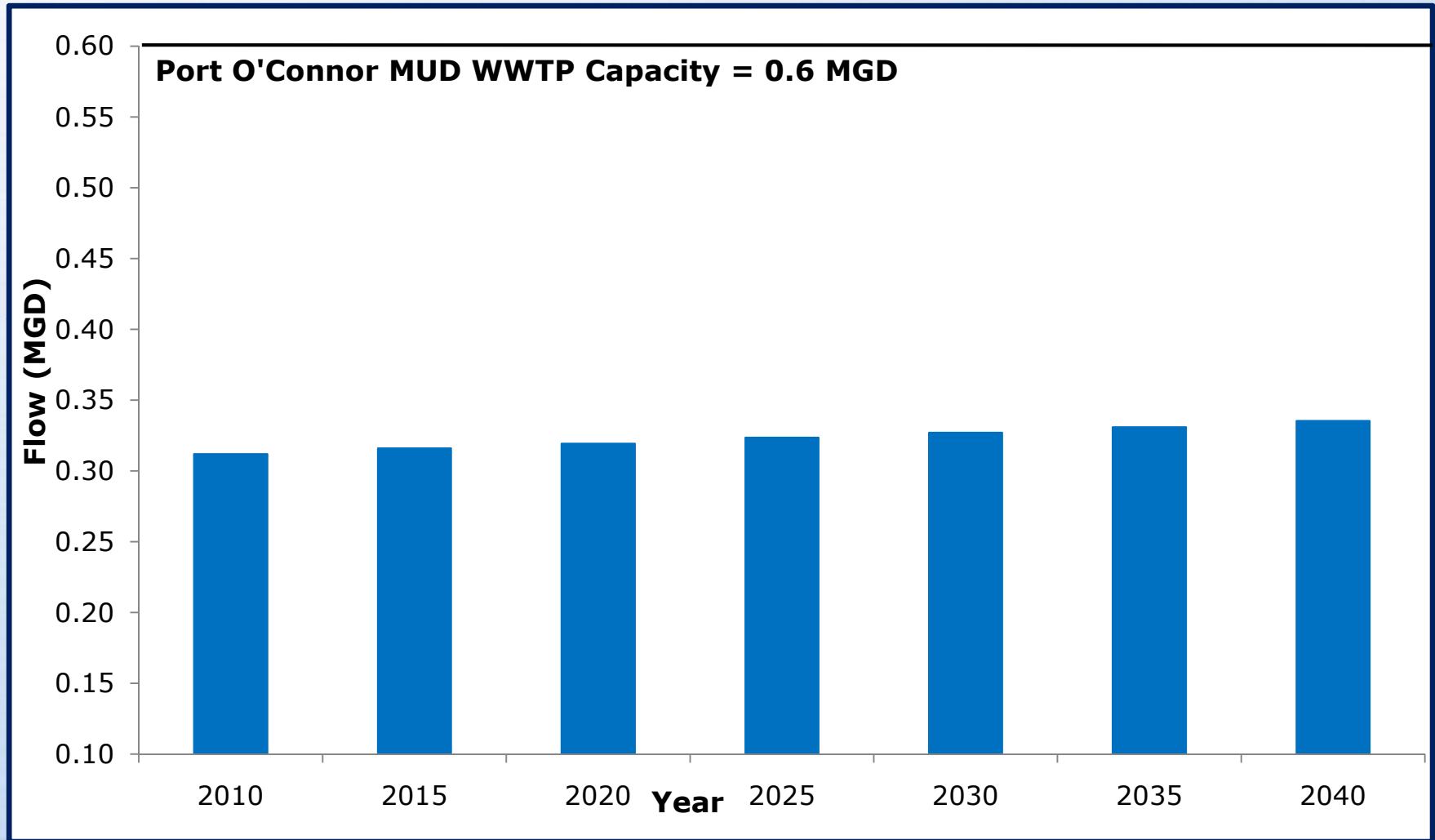
City of Seadrift: Wastewater Flow Projections



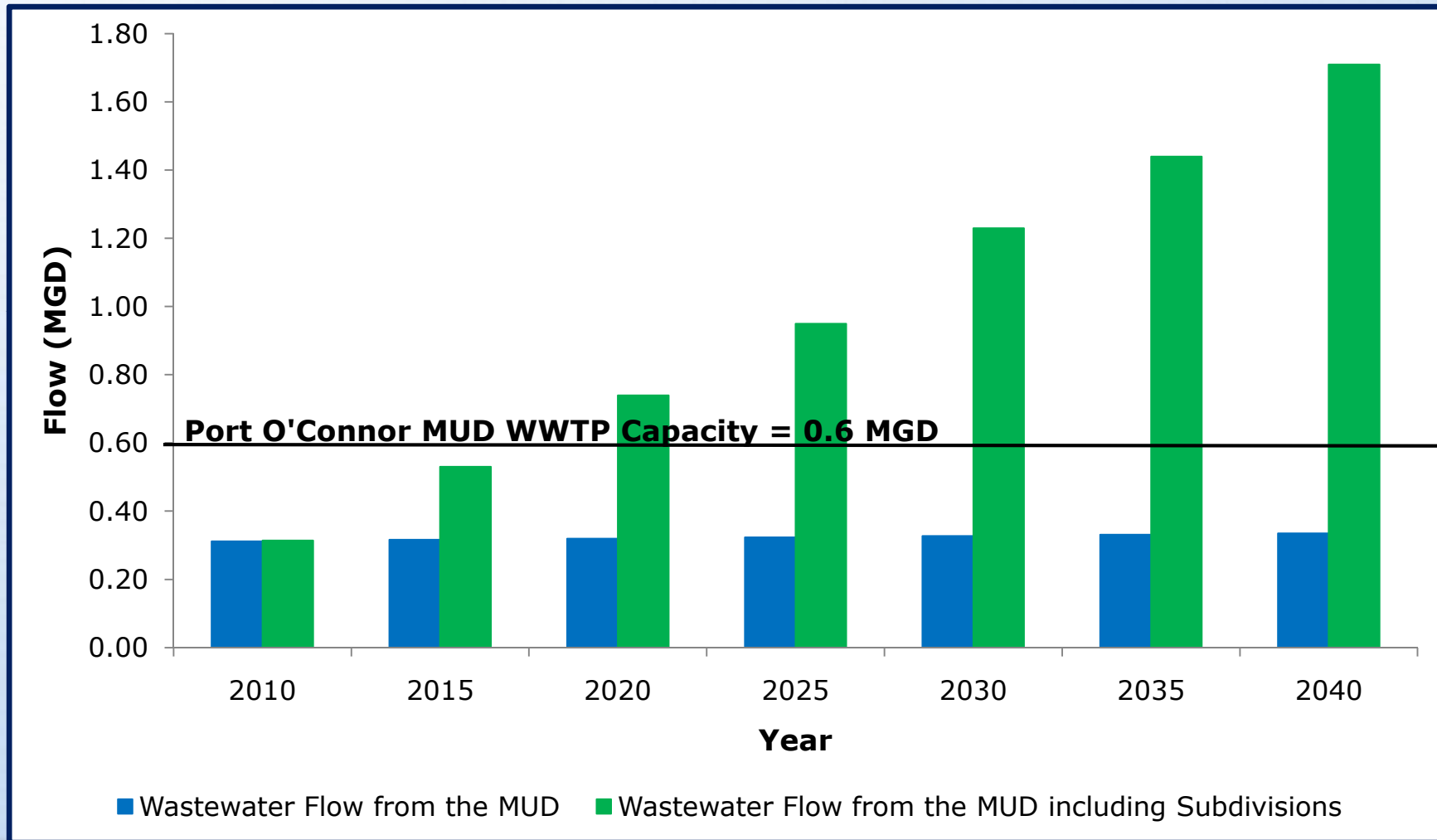
Wastewater Flow Projections: City of Seadrift - Area 2



Port O'Connor MUD: Wastewater Flow Projections

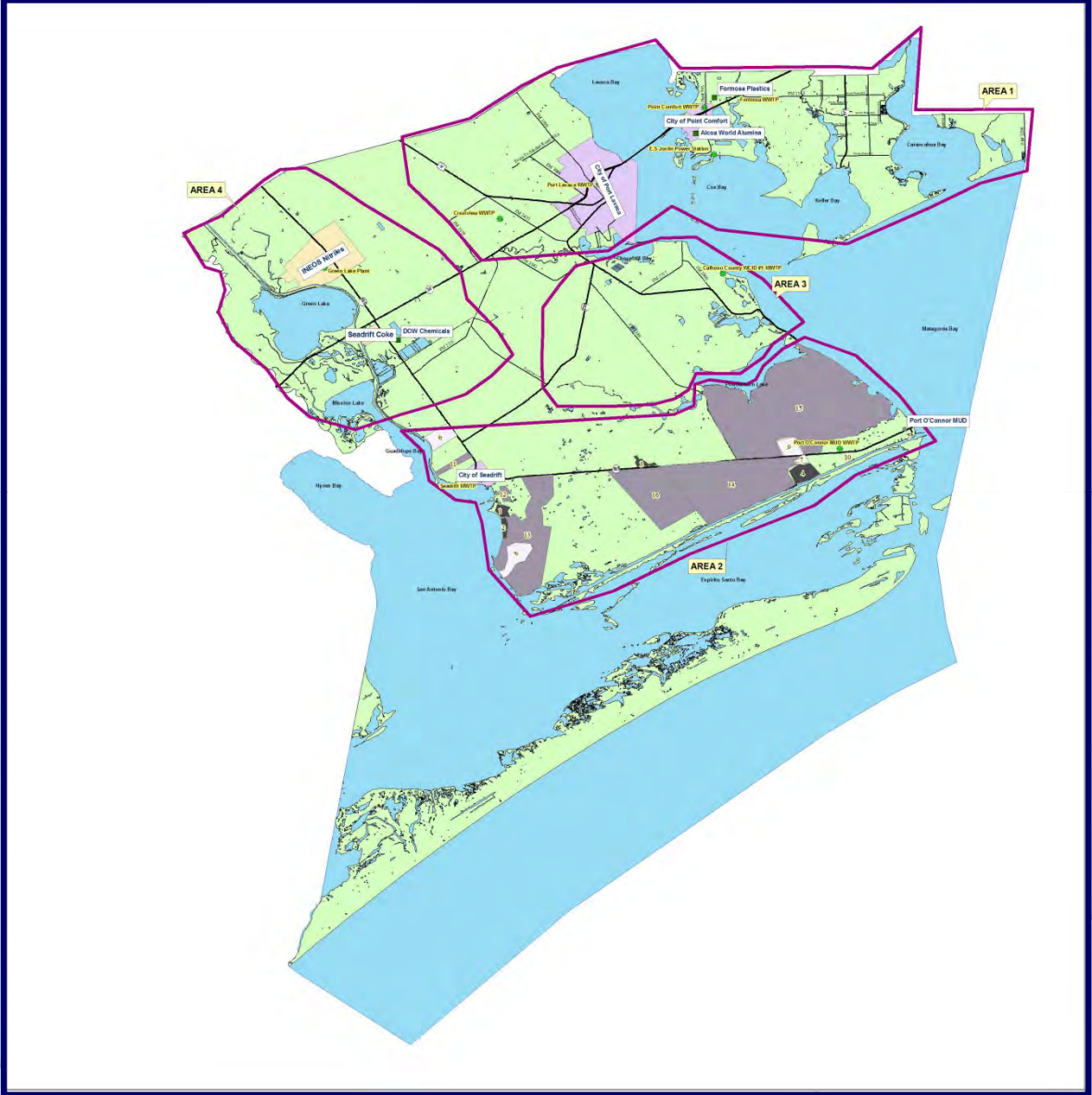


Wastewater Flow Projections: Port O'Connor MUD - Area 2

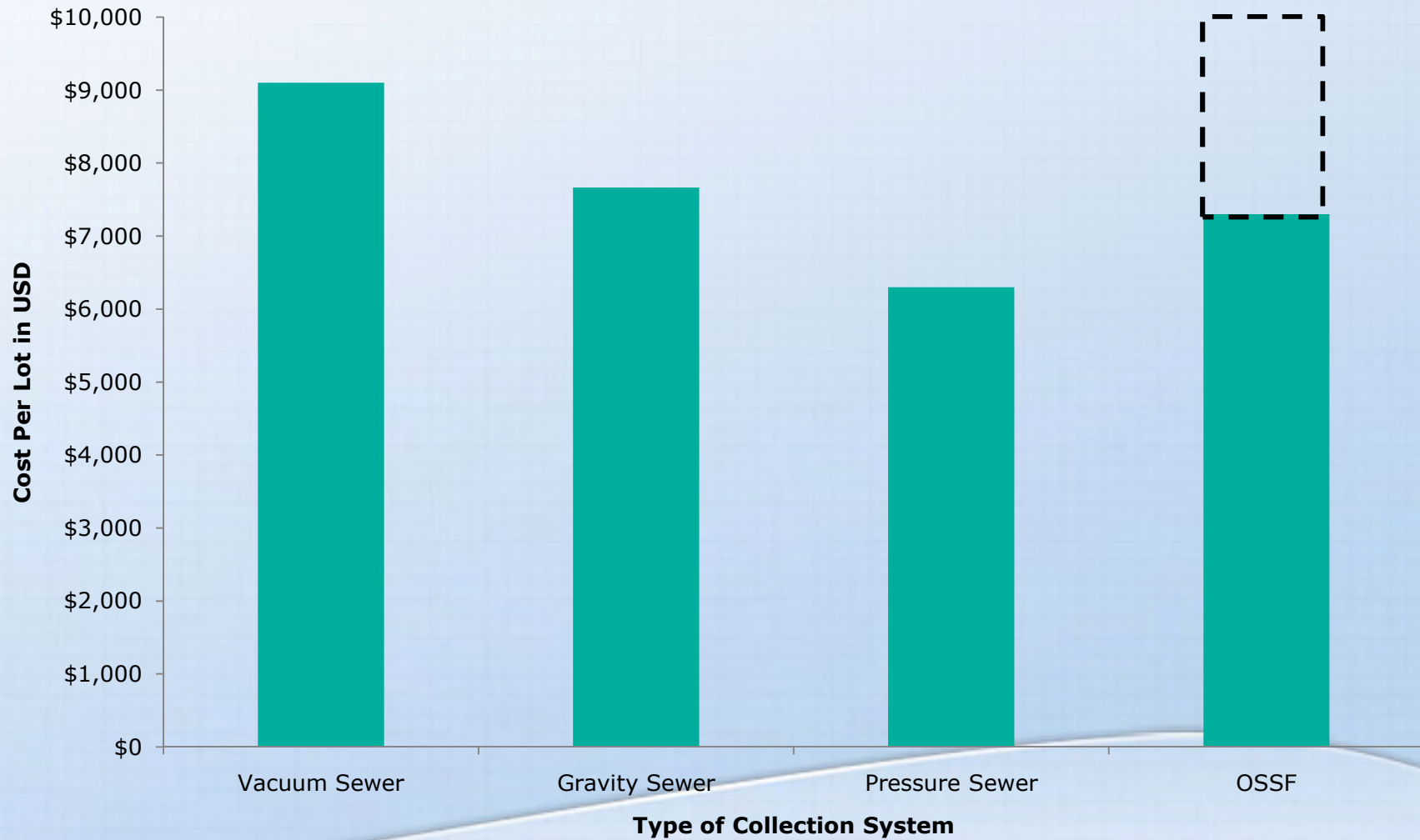


Analysis of Final Regional Alternatives

Study Area Overview



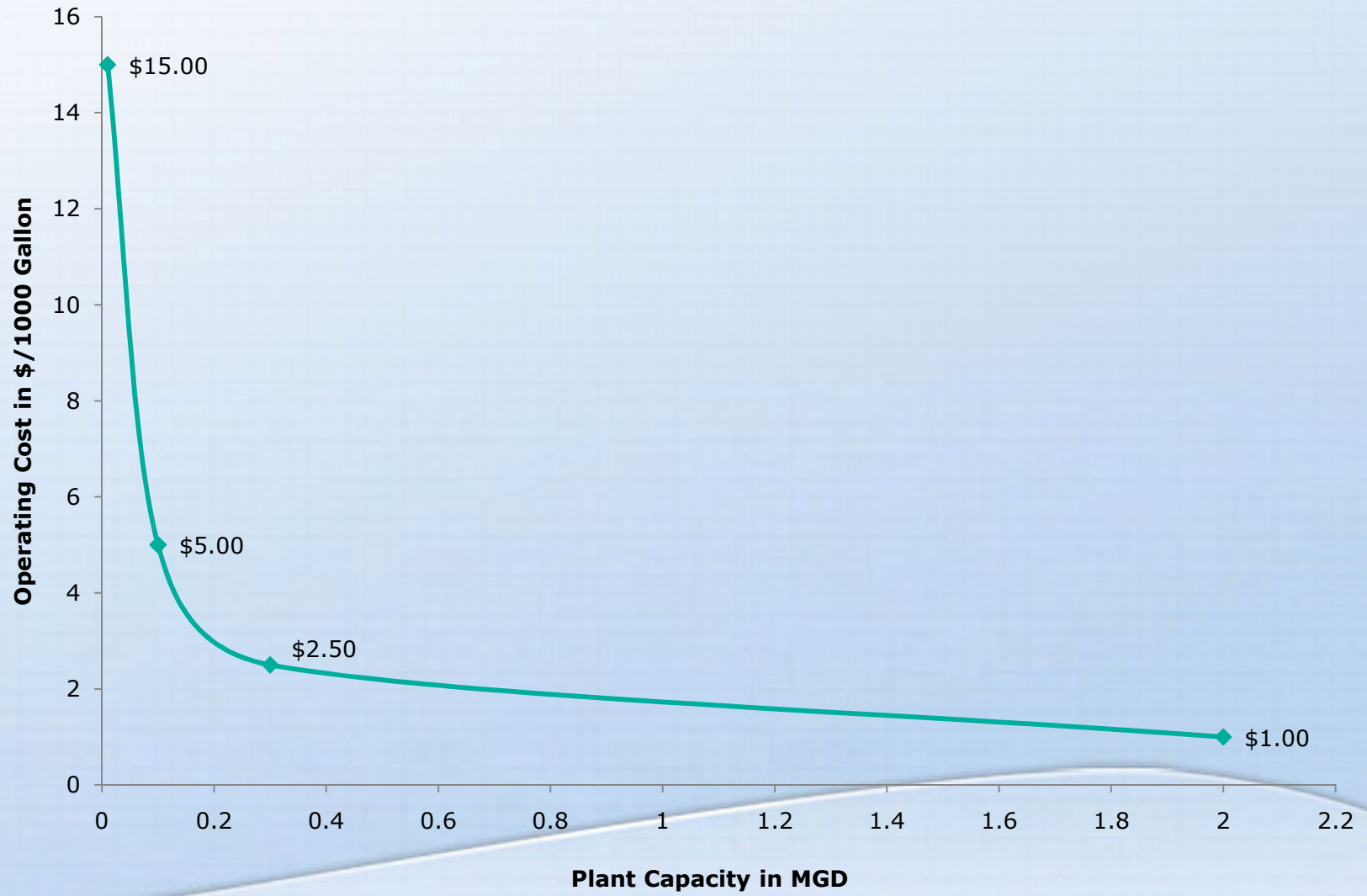
Collection System Alternatives



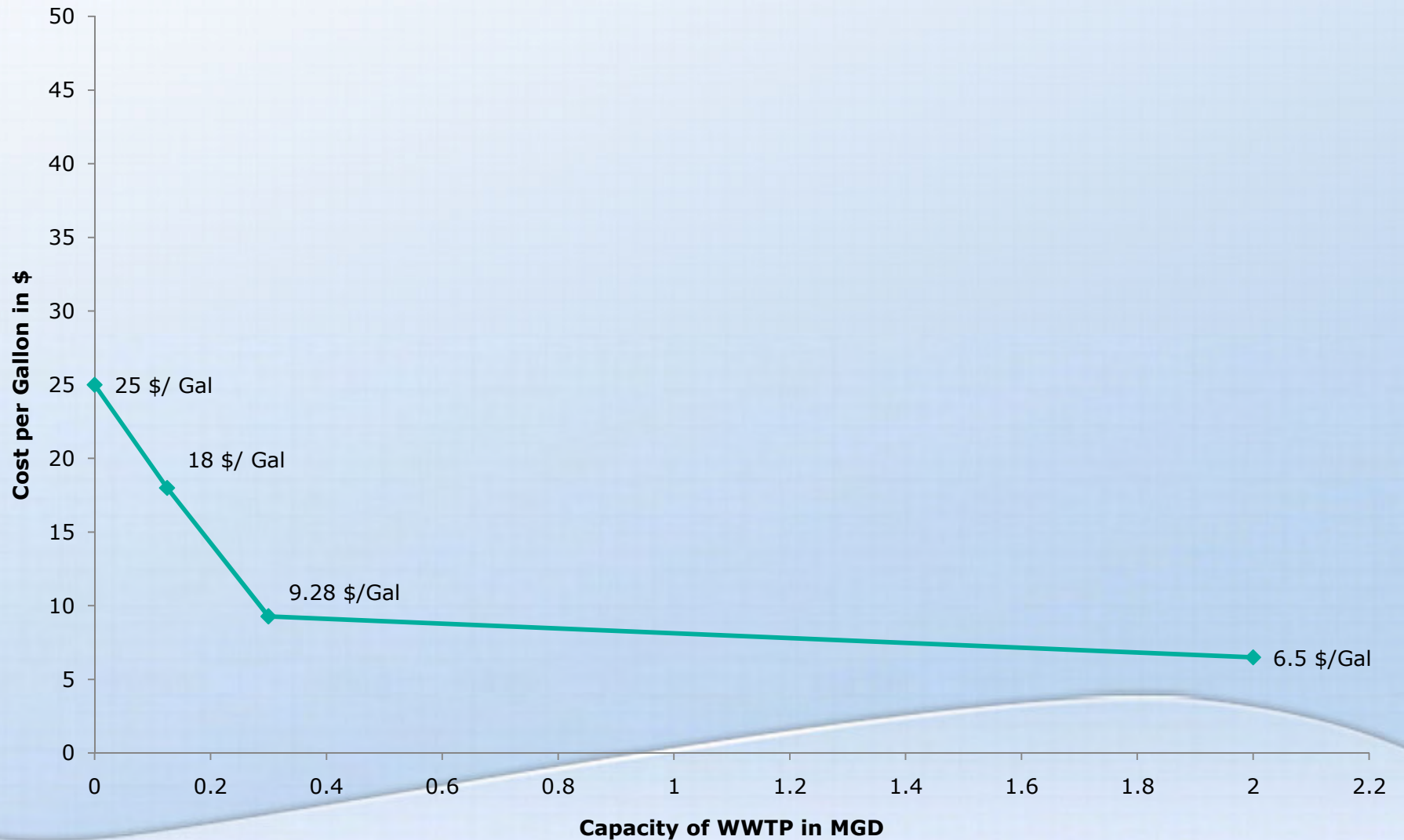
Assumptions for Cost Estimate

- ◆ **Pressure Sewer System**
- ◆ **Areas 1A, 1B & 3 assumed to qualify for Rural TWDB Loan (40 years, 3.92% interest)**
- ◆ **Contingency 15%**
- ◆ **Professional Services 20%**
- ◆ **City of Port Lavaca Sewer Fee: \$14 for first 2000 Gallons and \$4.90/1000 gallon after that**
- ◆ **For users outside city limits, wastewater rate is 1.5 times that of user within city limit**
- ◆ **O&M Cost: Graph in Next Slide**
- ◆ **Treatment Cost: See Graph**

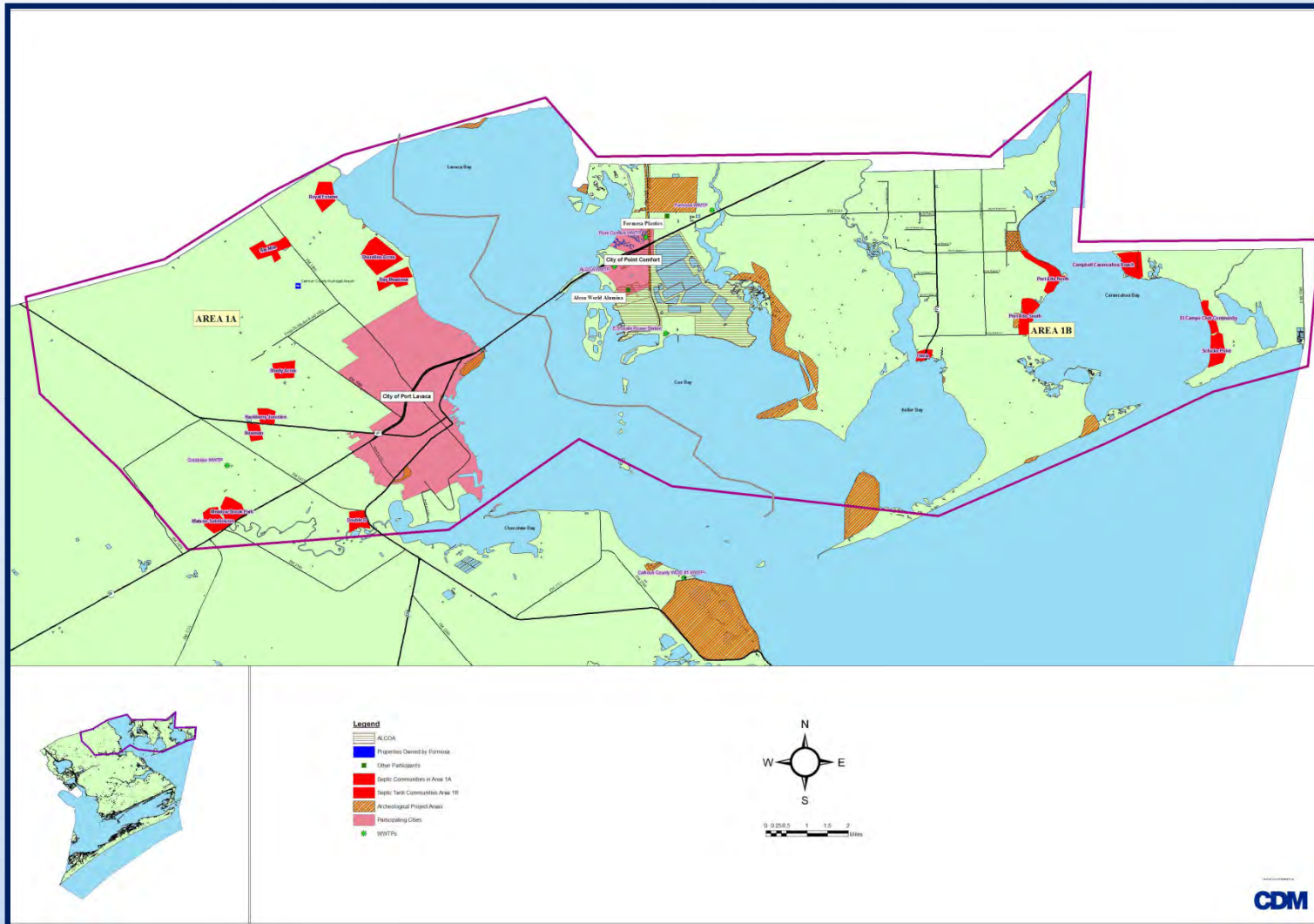
O&M Cost for WWTP Operation



Capacity of WWTP vs. Cost per Gallon



Area No. 1 Regional Options



Area No. 1A & 1B Regional Options

Wastewater Service

- 1) City of Port Lavaca provide wastewater service to Royal Estates, Shoreline Acres, Bay Meadows, Double D, Shady Acres, Meadow Brook Park, Bowman, Hackberry Junction, Matson Subdivision & Six Mile Area**
- 2) Install small package plant to serve Royal Estates, Shoreline Acres, Bay Meadows & Six Mile Area**
- 3) Crestview WWTP extend service to Meadow Brook Park, Bowman, Hackberry Junction & Matson Subdivision**
- 4) Install small package plant to serve Olivia and Port Alto WSC**

Area No. 1A & 1B Regional Options

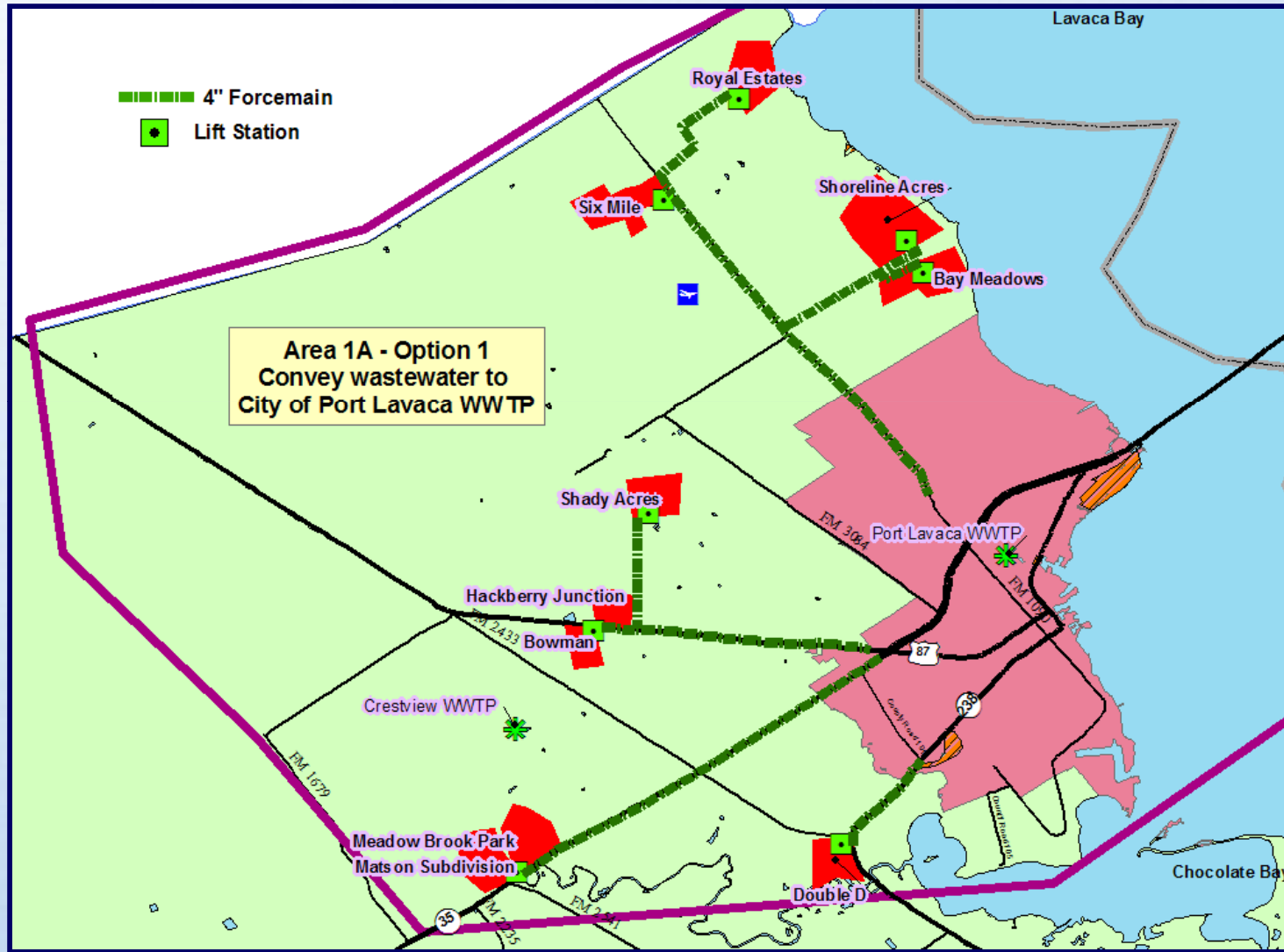
Wastewater Service (Cont.)

- 5) City of Point Comfort provide centralized wastewater service to Port Alto WSC, Olivia, and other developments in the area**
- 6) Install small package plant to serve Campbell Carancahua Beach Subdivision, El Campo Club Community & Schicke Point Community**

Reclaimed Water

- 1) Stand-alone alternative**
- 2) Formosa Plastics and Alcoa receive treated effluent/reuse from Cities of Point Comfort and Port Lavaca**

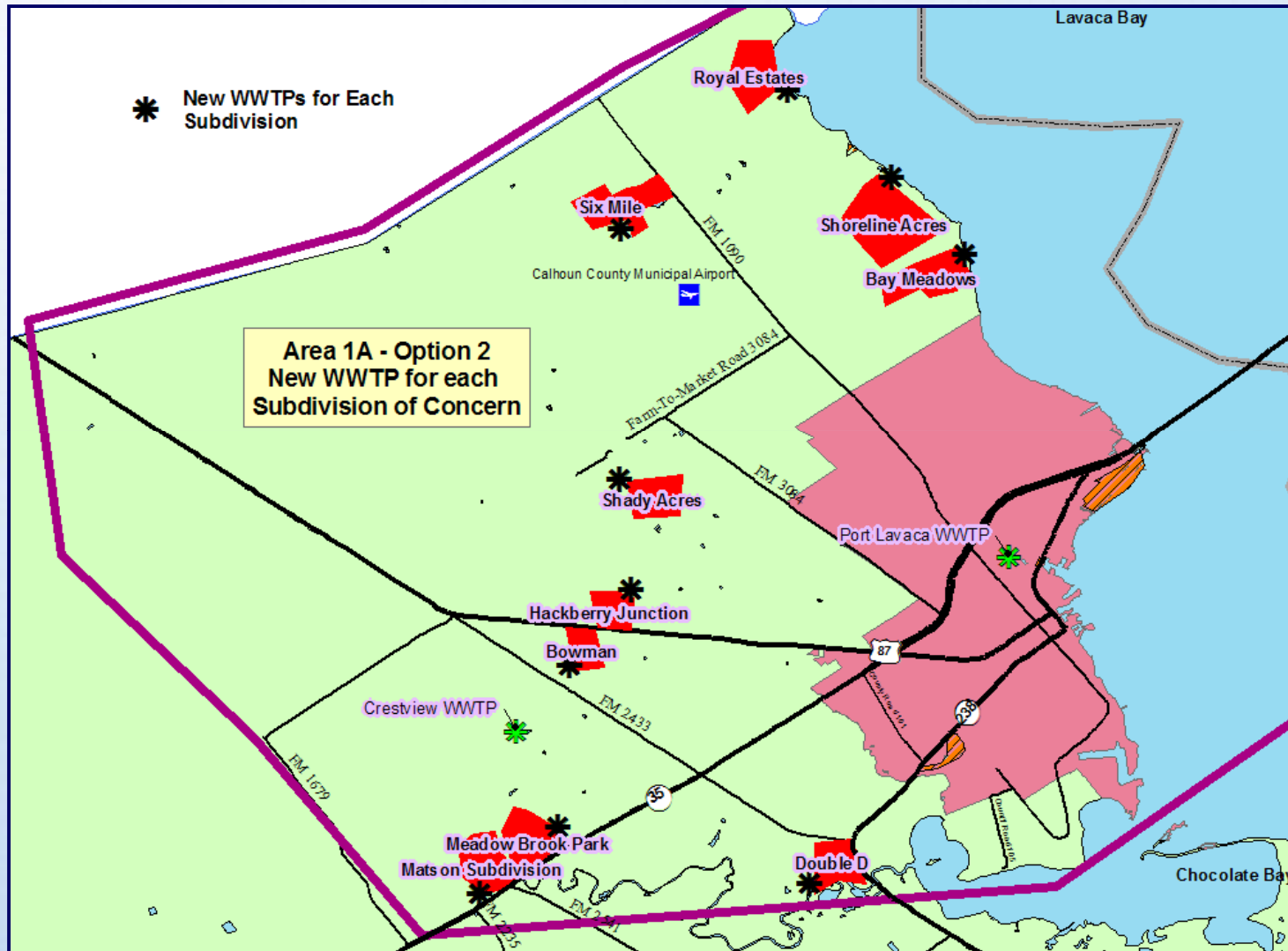
Area 1A – Option 1



Cost Estimate for Option 1

	Double D	Matson	Meadow Brook	Royal Estate	Shoreline Acres	Six Mile	Hackberry Junction	Bay Meadows	Bowman	Shady Acres
Lots	90	50	55	38	80	90	39	45	32	43
Flow (MGD)	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01
Collection System \$	\$567,000.00	\$315,000.00	\$346,500.00	\$239,400.00	\$504,000.00	\$567,000.00	\$245,700.00	\$283,500.00	\$201,600.00	\$270,900.00
Force Main (4")	\$150,000.00	\$250,000.00	\$250,000.00	\$275,000.00	\$100,000.00	\$125,000.00	\$112,500.00	\$100,000.00	\$112,500.00	\$245,000.00
Force Main (6")	\$0.00	\$0.00	\$0.00	\$90,000.00	\$90,000.00	\$90,000.00	\$0.00	\$90,000.00	\$0.00	\$0.00
Lift Station (<0.50 MGD)	\$250,000.00	\$125,000.00	\$125,000.00	\$250,000.00	\$250,000.00	\$250,000.00	\$125,000.00	\$250,000.00	\$125,000.00	\$250,000.00
Subtotal	\$967,000.00	\$690,000.00	\$721,500.00	\$854,400.00	\$944,000.00	\$1,032,000.00	\$483,200.00	\$723,500.00	\$439,100.00	\$765,900.00
Contingencies (15%)	\$145,050.00	\$103,500.00	\$108,225.00	\$128,160.00	\$141,600.00	\$154,800.00	\$72,480.00	\$108,525.00	\$65,865.00	\$114,885.00
Subtotal	\$1,112,050.00	\$793,500.00	\$829,725.00	\$982,560.00	\$1,085,600.00	\$1,186,800.00	\$555,680.00	\$832,025.00	\$504,965.00	\$880,785.00
Professional Services (20%)	\$222,410.00	\$158,700.00	\$165,945.00	\$196,512.00	\$217,120.00	\$237,360.00	\$111,136.00	\$166,405.00	\$100,993.00	\$176,157.00
Subtotal	\$1,334,460.00	\$952,200.00	\$995,670.00	\$1,179,072.00	\$1,302,720.00	\$1,424,160.00	\$666,816.00	\$998,430.00	\$605,958.00	\$1,056,942.00
Total Capital Cost	\$1,334,460.00	\$952,200.00	\$995,670.00	\$1,179,072.00	\$1,302,720.00	\$1,424,160.00	\$666,816.00	\$998,430.00	\$605,958.00	\$1,056,942.00
Capital Cost/Lot	\$14,827.33	\$19,044.00	\$18,103.09	\$31,028.21	\$16,284.00	\$15,824.00	\$17,097.85	\$22,187.33	\$18,936.19	\$24,580.05
Annual Payment in \$	\$66,621.04	\$47,537.24	\$49,707.42	\$58,863.51	\$65,036.46	\$71,099.18	\$33,289.85	\$49,845.21	\$30,251.60	\$52,766.34
Electricity Cost for Operating LS in \$/yr	\$429.92	\$238.85	\$262.73	\$181.52	\$382.15	\$429.92	\$186.30	\$214.96	\$152.86	\$205.41
Monthly Payment/ Lot at full development	\$62.08	\$79.63	\$75.71	\$129.48	\$68.14	\$66.23	\$71.53	\$92.70	\$79.18	\$102.66
City Sewer Fee per Lot per month	\$61.43	\$61.43	\$61.43	\$61.43	\$61.43	\$61.43	\$61.43	\$61.43	\$61.43	\$61.43
Total Monthly Payment per lot	\$123.51	\$141.05	\$137.14	\$190.91	\$129.57	\$127.66	\$132.96	\$154.13	\$140.60	\$164.08

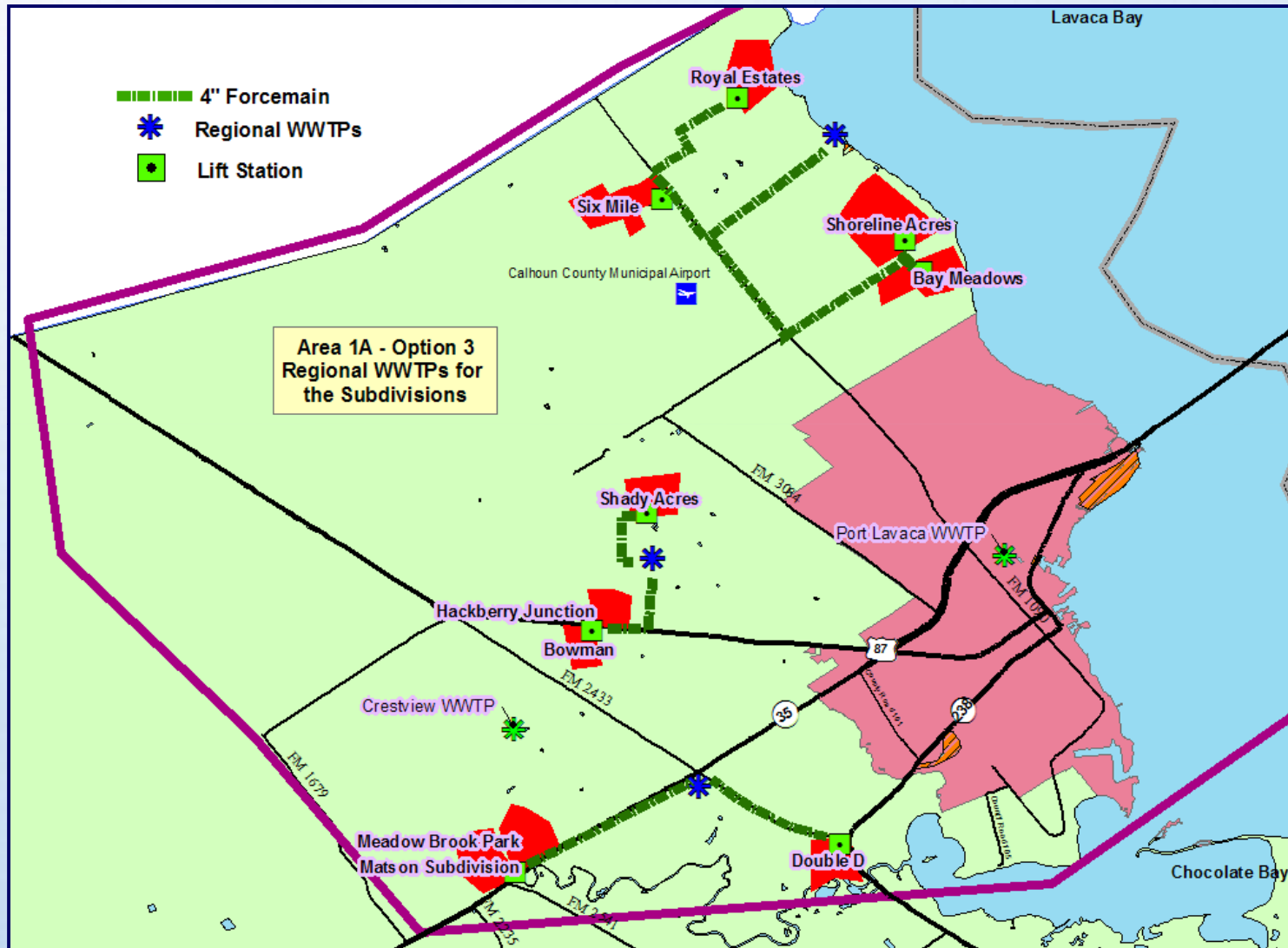
Area 1A – Option 2



Cost Estimate for Option 2

	Double D	Matson	Meadow Brook	Royal Estate	Shoreline Acres	Six Mile	Hackberry Junction	Bay Meadows	Bowman	Shady Acres
Lots	90	50	55	38	80	90	39	45	32	43
Plant Capacity (MGD)	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01
Treatment Cost in \$	\$540,000.00	\$312,500.00	\$343,750.00	\$237,500.00	\$480,000.00	\$540,000.00	\$243,750.00	\$281,250.00	\$200,000.00	\$268,750.00
Collection Cost in \$	\$567,000.00	\$315,000.00	\$346,500.00	\$239,400.00	\$504,000.00	\$567,000.00	\$245,700.00	\$283,500.00	\$201,600.00	\$270,900.00
Subtotal	\$1,107,000.00	\$627,500.00	\$690,250.00	\$476,900.00	\$984,000.00	\$1,107,000.00	\$489,450.00	\$564,750.00	\$401,600.00	\$539,650.00
Contingencies (15%)	\$166,050.00	\$94,125.00	\$103,537.50	\$71,535.00	\$147,600.00	\$166,050.00	\$73,417.50	\$84,712.50	\$60,240.00	\$80,947.50
Subtotal	\$1,273,050.00	\$721,625.00	\$793,787.50	\$548,435.00	\$1,131,600.00	\$1,273,050.00	\$562,867.50	\$649,462.50	\$461,840.00	\$620,597.50
Professional Services (20%)	\$254,610.00	\$144,325.00	\$158,757.50	\$109,687.00	\$226,320.00	\$254,610.00	\$112,573.50	\$129,892.50	\$92,368.00	\$124,119.50
Subtotal	\$1,527,660.00	\$865,950.00	\$952,545.00	\$658,122.00	\$1,357,920.00	\$1,527,660.00	\$675,441.00	\$779,355.00	\$554,208.00	\$744,717.00
Total Capital Cost	\$1,527,660.00	\$865,950.00	\$952,545.00	\$658,122.00	\$1,357,920.00	\$1,527,660.00	\$675,441.00	\$779,355.00	\$554,208.00	\$744,717.00
Capital Cost/Lot	\$16,974.00	\$17,319.00	\$17,319.00	\$17,319.00	\$16,974.00	\$16,974.00	\$17,319.00	\$17,319.00	\$17,319.00	\$17,319.00
Annual Payment in \$	\$76,266.28	\$43,231.34	\$47,554.47	\$32,855.81	\$67,792.24	\$76,266.28	\$33,720.44	\$38,908.20	\$27,668.05	\$37,178.95
O & M Cost in \$	\$114,975.00	\$68,437.50	\$75,281.25	\$52,012.50	\$102,200.00	\$114,975.00	\$53,381.25	\$61,593.75	\$43,800.00	\$58,856.25
Monthly Payment/ Lot at full development	\$177.08	\$186.11	\$186.11	\$186.11	\$177.08	\$177.08	\$186.11	\$186.11	\$186.11	\$186.11

Area 1A – Option 3



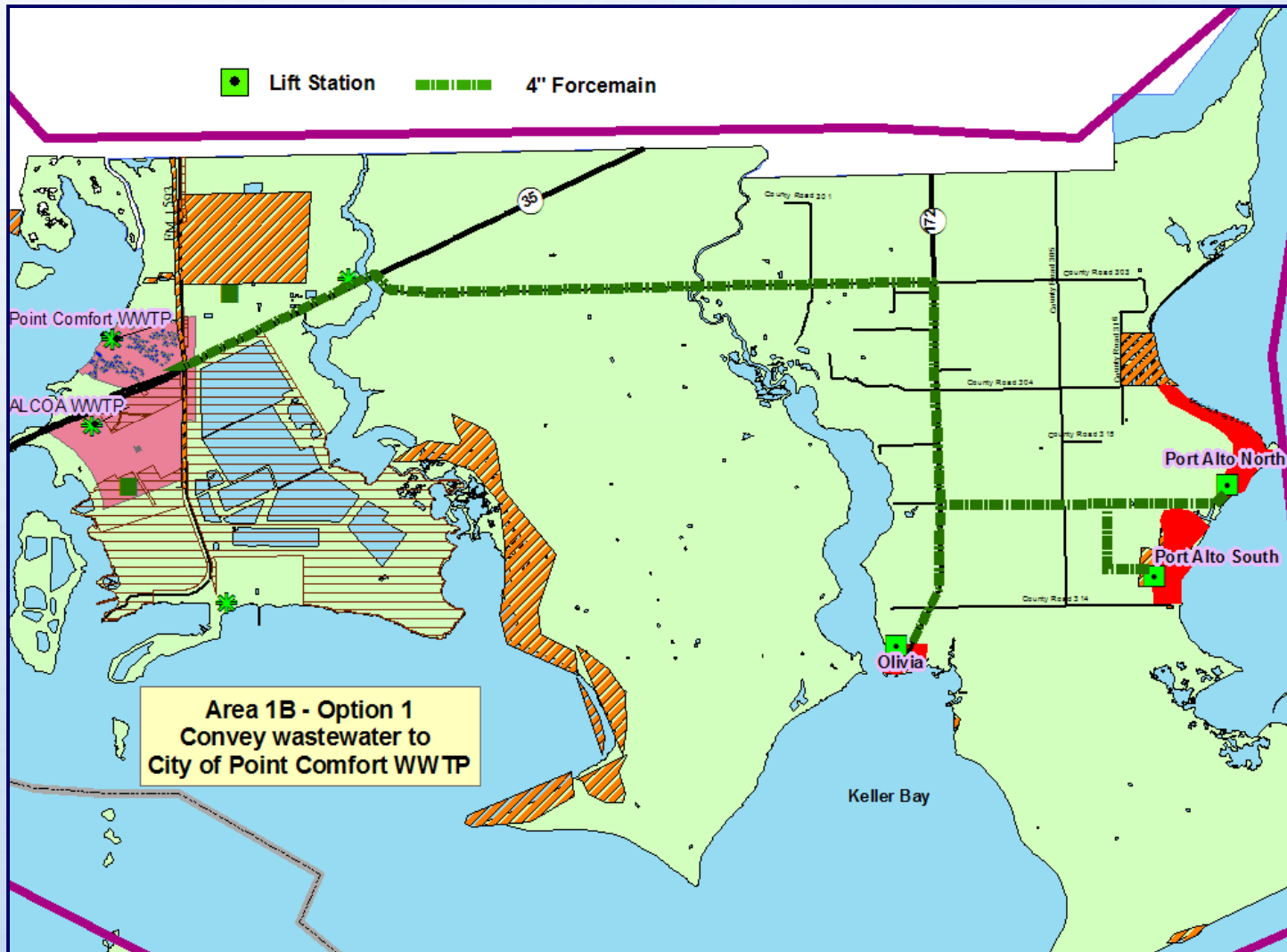
Cost Estimate for Option 3

	Double D	Matson	Meadow Brook	Bowman	Hackberry Junction	Shady Acres	Bay Meadows	Royal Estate	Shoreline Acres	Six Mile
Lots	90	50	55	32	39	43	45	38	80	90
Plant Capacity (MGD)	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Regional Plant Capacity	0.05			0.03			0.06			
Treatment Cost in \$	\$1,072,500.00			\$641,250.00			\$1,328,250.00			
Treatment Cost in \$/subdivision	\$495,000.00	\$275,000.00	\$302,500.00	\$180,000.00	\$219,375.00	\$241,875.00	\$236,250.00	\$199,500.00	\$420,000.00	\$472,500.00
Forcemain/Lift Station cost in \$	\$450,000.00	\$250,000.00	\$250,000.00	\$225,000.00	\$225,000.00	\$350,000.00	\$450,000.00	\$450,000.00	\$450,000.00	\$375,000.00
Collection Cost in \$	\$567,000.00	\$315,000.00	\$346,500.00	\$201,600.00	\$245,700.00	\$270,900.00	\$283,500.00	\$239,400.00	\$504,000.00	\$567,000.00
Subtotal	\$1,512,000.00	\$840,000.00	\$899,000.00	\$606,600.00	\$690,075.00	\$862,775.00	\$969,750.00	\$888,900.00	\$1,374,000.00	\$1,414,500.00
Contingencies (15%)	\$226,800.00	\$126,000.00	\$134,850.00	\$90,990.00	\$103,511.25	\$129,416.25	\$145,462.50	\$133,335.00	\$206,100.00	\$212,175.00
Subtotal	\$1,738,800.00	\$966,000.00	\$1,033,850.00	\$697,590.00	\$793,586.25	\$992,191.25	\$1,115,212.50	\$1,022,235.00	\$1,580,100.00	\$1,626,675.00
Professional Services (20%)	\$347,760.00	\$193,200.00	\$206,770.00	\$139,518.00	\$158,717.25	\$198,438.25	\$223,042.50	\$204,447.00	\$316,020.00	\$325,335.00
Subtotal	\$2,086,560.00	\$1,159,200.00	\$1,240,620.00	\$837,108.00	\$952,303.50	\$1,190,629.50	\$1,338,255.00	\$1,226,682.00	\$1,896,120.00	\$1,952,010.00
Total Capital Cost	\$2,086,560.00	\$1,159,200.00	\$1,240,620.00	\$837,108.00	\$952,303.50	\$1,190,629.50	\$1,338,255.00	\$1,226,682.00	\$1,896,120.00	\$1,952,010.00
Capital Cost/Lot	\$23,184.00	\$23,184.00	\$22,556.73	\$26,159.63	\$24,418.04	\$27,689.06	\$29,739.00	\$32,281.11	\$23,701.50	\$21,689.00
Annual Payment in \$	\$104,168.57	\$57,871.43	\$61,936.21	\$41,791.44	\$47,542.41	\$59,440.50	\$66,810.50	\$61,240.37	\$94,661.12	\$97,451.35
Electricity Cost for Operating Lsin \$/yr	\$429.92	\$238.85	\$262.73	\$152.86	\$186.30	\$205.41	\$214.96	\$181.52	\$382.15	\$429.92
O & M Cost in \$	\$65,700.00	\$36,500.00	\$40,150.00	\$24,820.00	\$30,249.38	\$33,351.88	\$26,690.63	\$22,538.75	\$47,450.00	\$53,381.25
Monthly Payment/ Lot at full developemnt	\$157.35	\$157.40	\$154.78	\$173.64	\$166.36	\$179.96	\$173.27	\$183.87	\$148.10	\$139.72

Assumptions

- ◆ **City of Port Lavaca Sewer Fee was adopted for Area 1B**

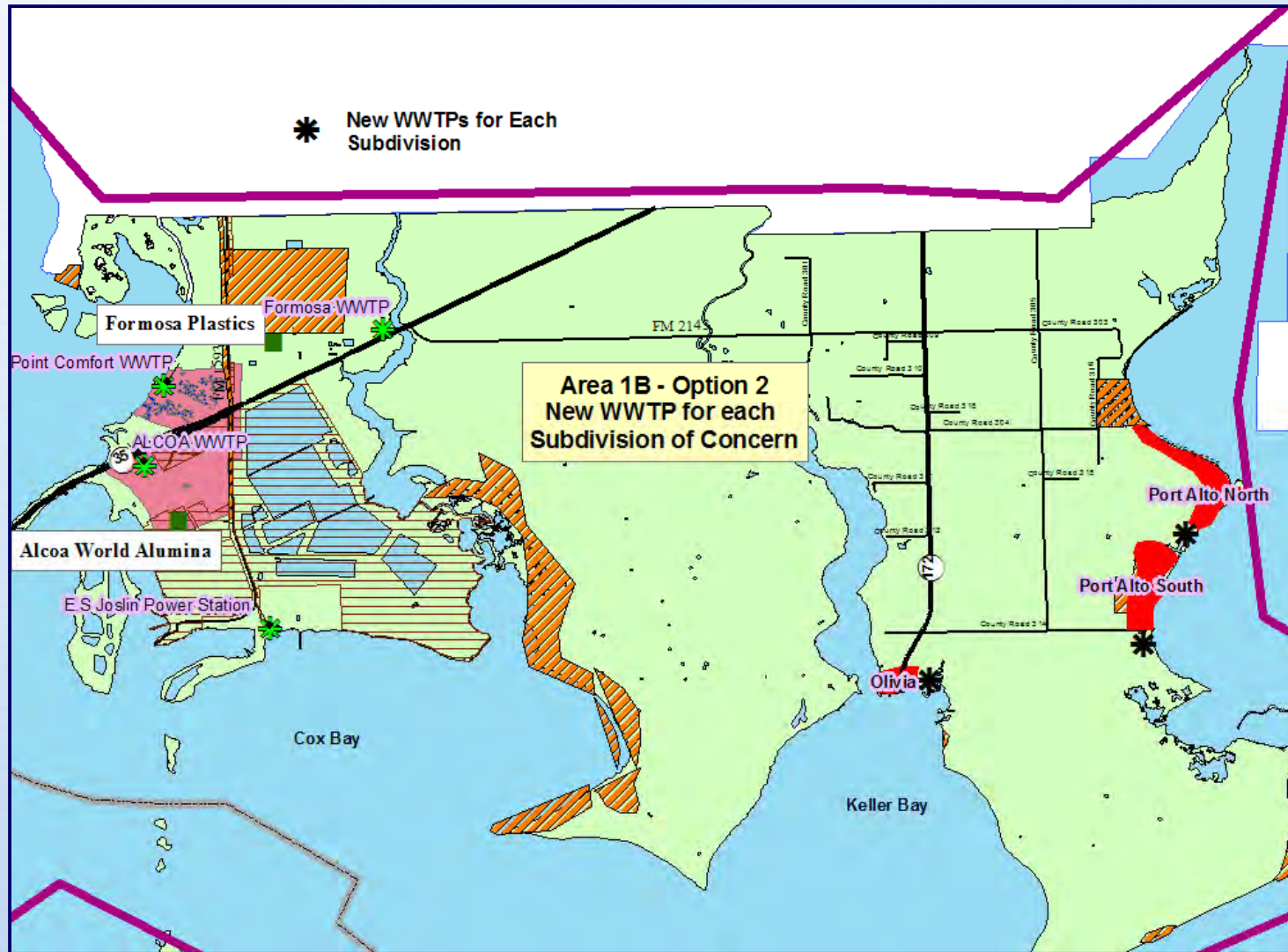
Area 1B - Option 1



Cost Estimate for Option 1

	Port Alto South	Port Alto North	Olivia
Lots	118	140	68
Flow (MGD)	0.03	0.04	0.02
Collection System \$	\$743,400.00	\$882,000.00	\$428,400.00
Force Main (4")	\$700,000.00	\$700,000.00	\$725,000.00
Lift Station (<0.50 MGD)	\$250,000.00	\$250,000.00	\$250,000.00
Subtotal	\$1,693,400.00	\$1,832,000.00	\$1,403,400.00
Contingencies (15%)	\$254,010.00	\$274,800.00	\$210,510.00
Subtotal	\$1,947,410.00	\$2,106,800.00	\$1,613,910.00
Professional Services (20%)	\$389,482.00	\$421,360.00	\$322,782.00
Subtotal	\$2,336,892.00	\$2,528,160.00	\$1,936,692.00
Total Capital Cost	\$2,336,892.00	\$2,528,160.00	\$1,936,692.00
Capital Cost/Lot	\$19,804.17	\$18,058.29	\$28,480.76
Annual Payment in \$	\$116,666.04	\$126,214.83	\$96,686.62
Electricity Cost for operating LS in \$/yr	\$563.68	\$668.77	\$324.83
Monthly Payment/ Lot at full development	\$82.79	\$75.53	\$118.89
City Sewer Fee Per Lot	\$61.43	\$61.43	\$61.43
Total Monthly Fee	\$144.21	\$136.95	\$180.31

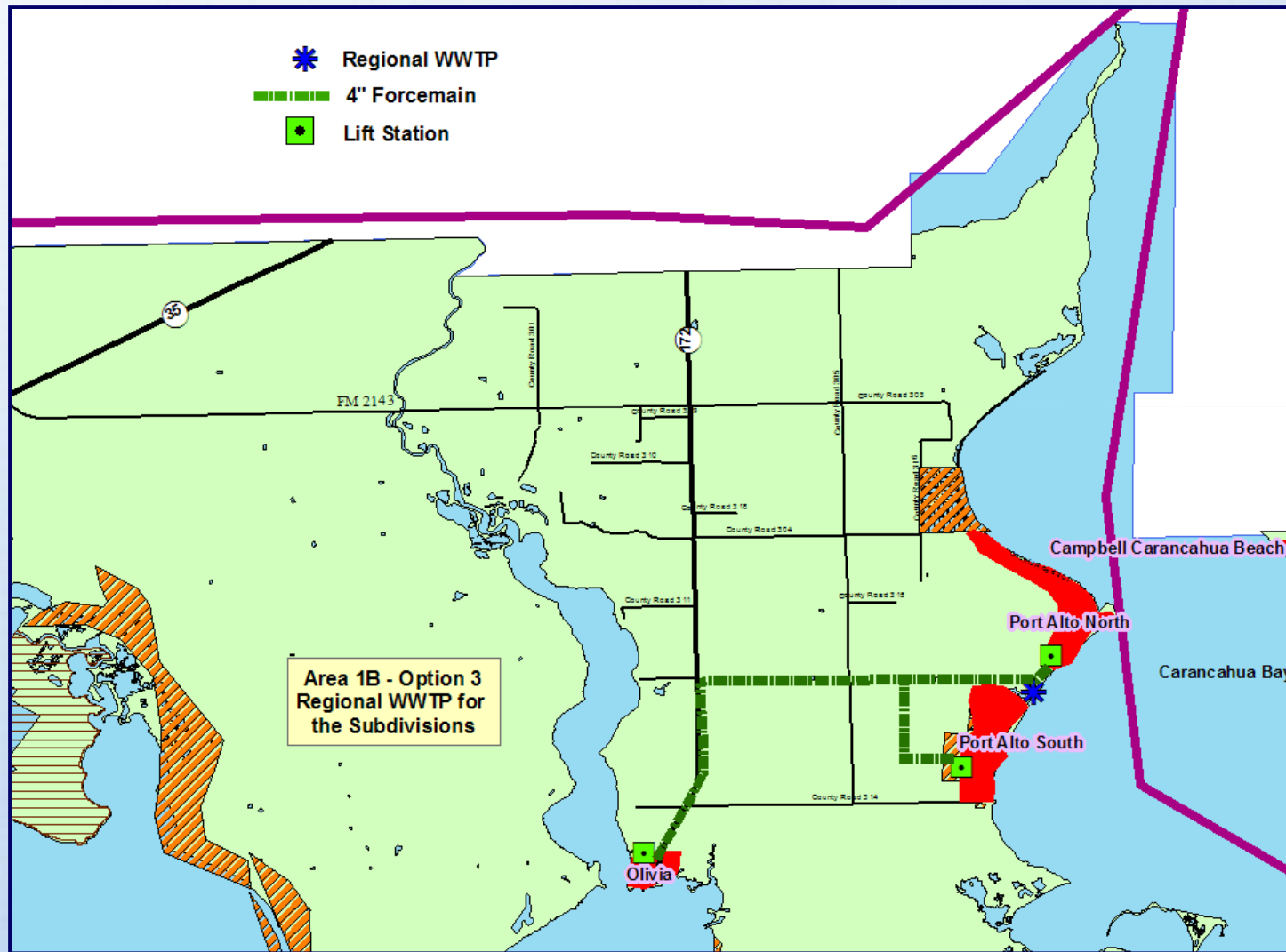
Area 1B – Option 2



Cost Estimate for Option 2

	Port Alto South	Port Alto North	Olivia
Lots	118	140	68
Plant Capacity (MGD)	0.03	0.04	0.02
Treatment Cost in \$	\$678,500.00	\$787,500.00	\$408,000.00
Collection Cost in \$	\$743,400.00	\$882,000.00	\$428,400.00
Subtotal	\$1,421,900.00	\$1,669,500.00	\$836,400.00
Contingencies (15%)	\$213,285.00	\$250,425.00	\$125,460.00
Subtotal	\$1,635,185.00	\$1,919,925.00	\$961,860.00
Professional Services (20%)	\$327,037.00	\$383,985.00	\$192,372.00
Subtotal	\$1,962,222.00	\$2,303,910.00	\$1,154,232.00
Total Capital Cost	\$1,962,222.00	\$2,303,910.00	\$1,154,232.00
Capital Cost/Lot	\$16,629.00	\$16,456.50	\$16,974.00
Annual Payment in \$	\$97,961.17	\$115,019.46	\$57,623.41
O & M Cost in \$	\$107,675.00	\$123,917.50	\$86,870.00
Monthly Payment/ Lot at full development	\$145.22	\$142.22	\$177.08

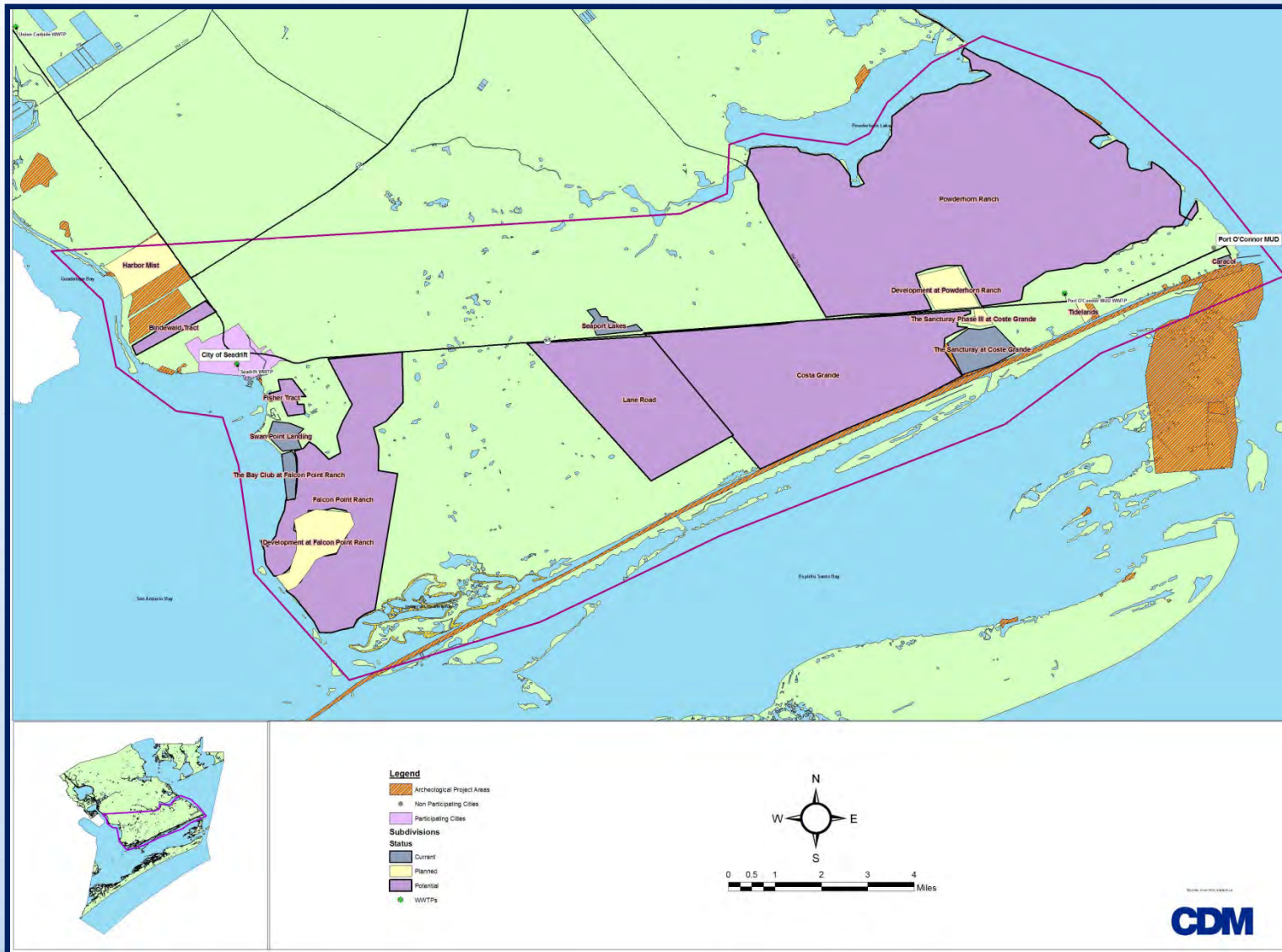
Area 1B – Option 3



Cost Estimate for Option 3

	Port Alto South	Port Alto North	Olivia
Lots	118	140	68
Plant Capacity (MGD)	0.03	0.04	0.02
Regional Plant Capacity	0.08		
Treatment Cost in \$	\$1,630,000.00		
Treatment Cost in \$/Subdivision	\$590,000.00	\$700,000.00	\$340,000.00
Forcemain/Lift Station cost in \$	\$275,000.00	\$275,000.00	\$550,000.00
Collection Cost in \$	\$743,400.00	\$882,000.00	\$428,400.00
Subtotal	\$1,608,400.00	\$1,857,000.00	\$1,318,400.00
Contingencies (15%)	\$241,260.00	\$278,550.00	\$197,760.00
Subtotal	\$1,849,660.00	\$2,135,550.00	\$1,516,160.00
Professional Services (20%)	\$369,932.00	\$427,110.00	\$303,232.00
Subtotal	\$2,219,592.00	\$2,562,660.00	\$1,819,392.00
Total Capital Cost	\$2,219,592.00	\$2,562,660.00	\$1,819,392.00
Capital Cost/Lot	\$18,810.10	\$18,304.71	\$26,755.76
Annual Payment in \$	\$110,810.01	\$127,937.19	\$90,830.59
Electricity Cost for operating LS in \$/yr	\$563.68	\$668.77	\$324.83
O & M Cost in \$	\$43,070.00	\$51,100.00	\$24,820.00
Monthly Payment/ Lot at full development	\$109.07	\$106.97	\$142.13

Area No. 2 Regional Options



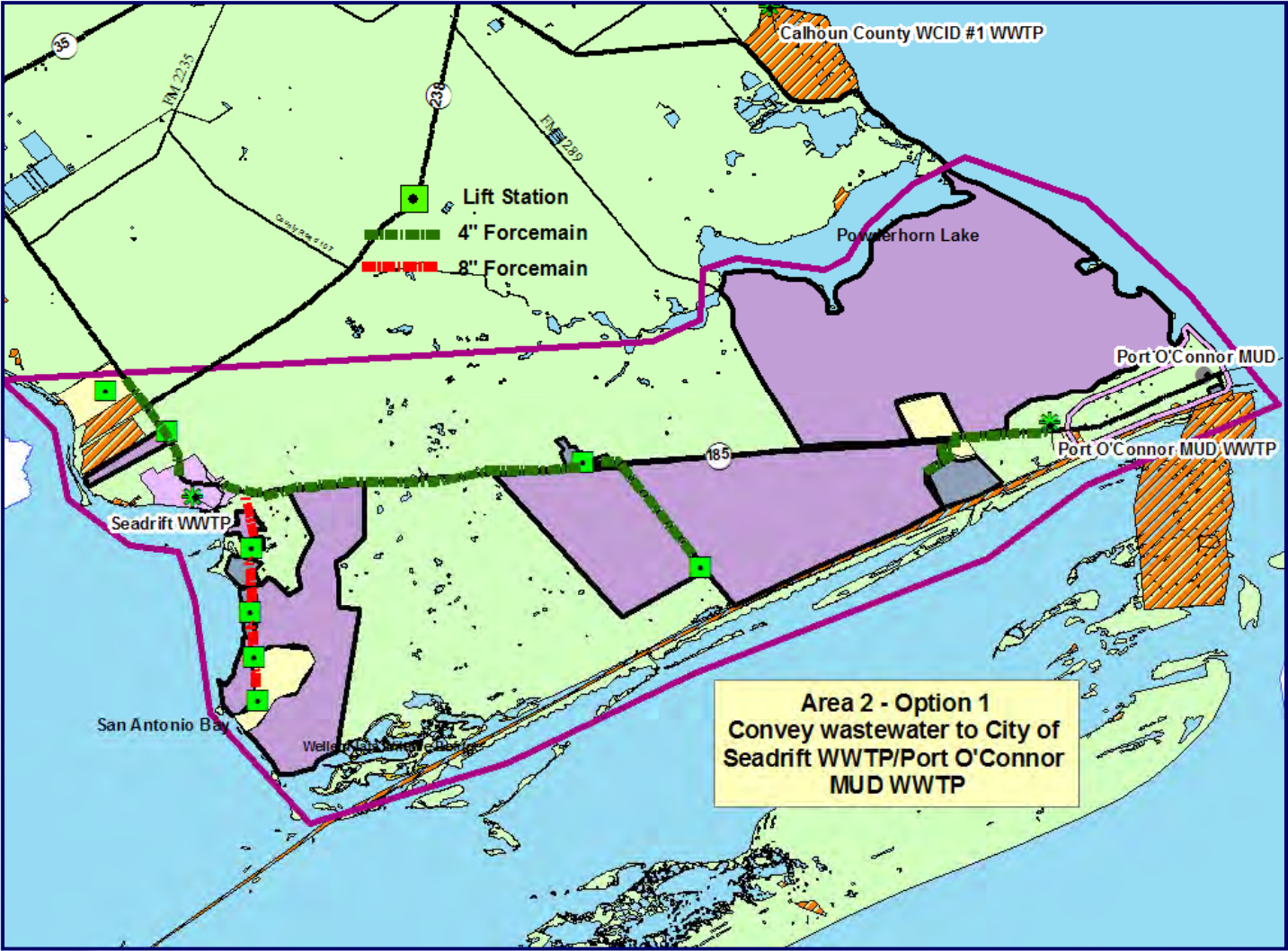
Assumptions

- ◆ **TWDB Funding option of 22 years and 5.5% interest rate was used to calculate Cost**
- ◆ **All cost have been calculated for subdivisions at full development**

Area No. 2 Regional Options

- 1) a. City of Seadrift serve Swan Point Landing, Falcon Point and others located in close proximity**
- b. Port O'Connor MUD extend wastewater service west along Highway 185 to Lane Road Development, The Sanctuary, Powder Horn Ranch & Costa Grande**
- 2) City of Seadrift and Port O'Connor MUD provide wastewater service to their existing areas; install package plant near Lane Road Development to serve developments along Highway 185**

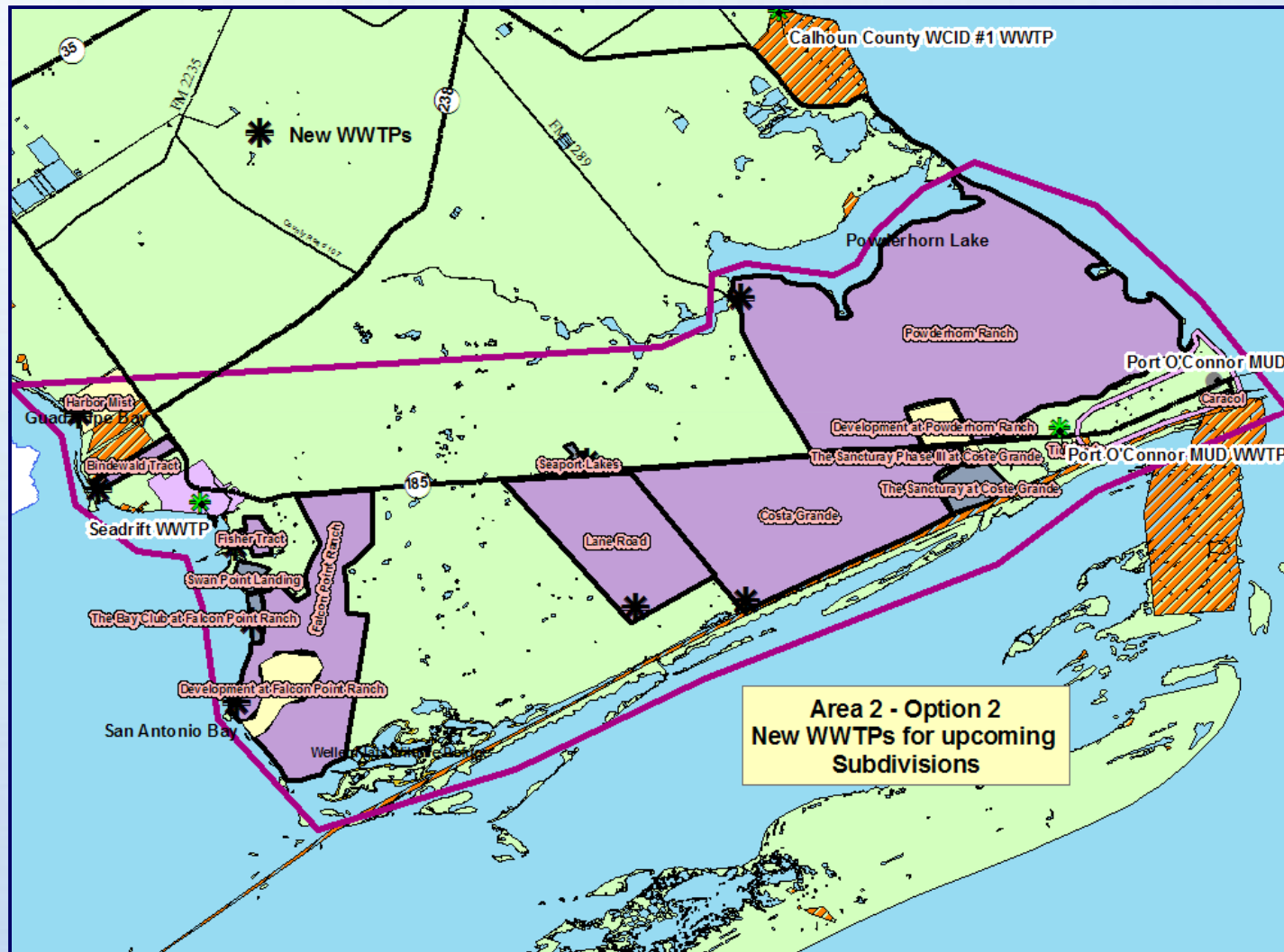
Area 2 – Option 1



Cost Estimate for Option 1

	Harbor Mist	Bindewald	Fisher	Swan Point Landing	Falcon Point	Seaport Lakes	Lane Road	Costa Grande	Powderhorn
Lots	225	300	300	89	1608	56	375	8900	500
Plant Capacity (MGD)	0.06	0.08	0.08	0.02	0.40	0.01	0.09	2.23	0.13
Collection Cost in \$	\$1,417,500.00	\$1,890,000.00	\$1,890,000.00	\$560,700.00	\$10,130,400.00	\$352,800.00	\$2,362,500.00	\$56,070,000.00	\$3,150,000.00
Lift Station/Forcemain Cost in \$	\$362,500.00	\$342,500.00	\$407,500.00	\$565,000.00	\$390,000.00	\$475,000.00	\$350,000.00	\$250,000.00	\$250,000.00
Subtotal	\$1,780,000.00	\$2,232,500.00	\$2,297,500.00	\$1,125,700.00	\$10,520,400.00	\$827,800.00	\$2,712,500.00	\$56,320,000.00	\$3,400,000.00
Contingencies (15%)	\$267,000.00	\$334,875.00	\$344,625.00	\$168,855.00	\$1,578,060.00	\$124,170.00	\$406,875.00	\$8,448,000.00	\$510,000.00
Subtotal	\$2,047,000.00	\$2,567,375.00	\$2,642,125.00	\$1,294,555.00	\$12,098,460.00	\$951,970.00	\$3,119,375.00	\$64,768,000.00	\$3,910,000.00
Professional Services (20%)	\$409,400.00	\$513,475.00	\$528,425.00	\$258,911.00	\$2,419,692.00	\$190,394.00	\$623,875.00	\$12,953,600.00	\$782,000.00
Subtotal	\$2,456,400.00	\$3,080,850.00	\$3,170,550.00	\$1,553,466.00	\$14,518,152.00	\$1,142,364.00	\$3,743,250.00	\$77,721,600.00	\$4,692,000.00
Total Capital Cost	\$2,456,400.00	\$3,080,850.00	\$3,170,550.00	\$1,553,466.00	\$14,518,152.00	\$1,142,364.00	\$3,743,250.00	\$77,721,600.00	\$4,692,000.00
Capital Cost/Lot	\$10,917.33	\$10,269.50	\$10,568.50	\$17,454.67	\$9,028.70	\$20,399.36	\$9,982.00	\$8,732.76	\$9,384.00
Annual Payment in \$	\$195,213.13	\$244,838.94	\$251,967.51	\$123,455.86	\$1,153,775.43	\$90,785.07	\$297,480.69	\$6,176,631.30	\$372,879.02
Electricity Cost for operating LS in \$/yr	\$1,074.80	\$1,433.07	\$1,433.07	\$425.14	\$7,681.27	\$267.51	\$1,791.34	\$42,514.48	\$2,388.45
Monthly Payment/ Lot at full development	\$129.62	\$125.33	\$127.31	\$172.92	\$117.12	\$192.42	\$123.43	\$115.16	\$119.47
City Sewer Fee/Lot	\$26.75	\$26.75	\$26.75	\$26.75	\$26.75	\$26.75	\$26.75	\$26.75	\$26.75
Total Monthly Payment per Lot	\$156.37	\$152.08	\$154.06	\$199.67	\$143.87	\$219.17	\$150.18	\$141.91	\$146.22

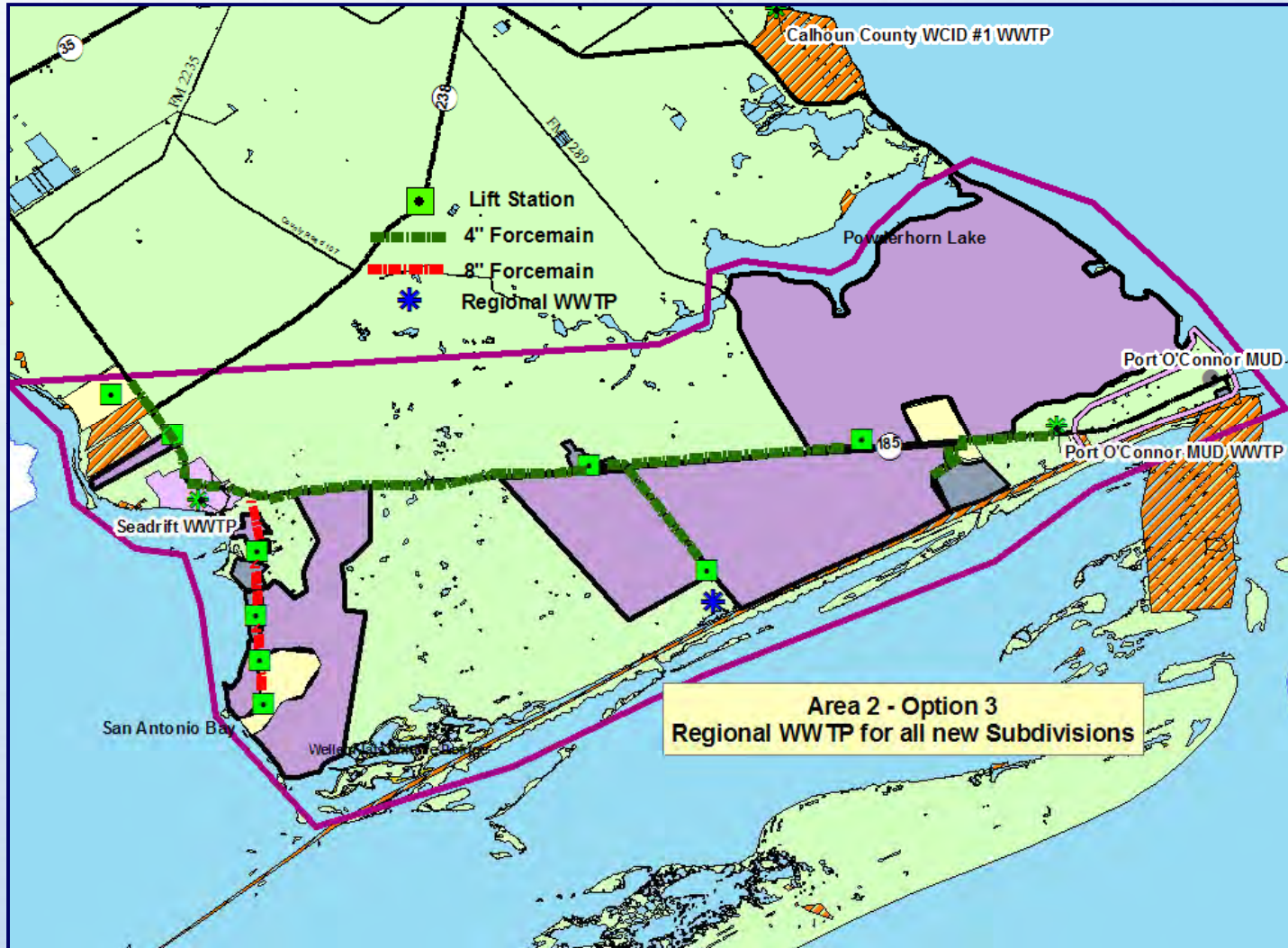
Area 2 – Option 2



Cost Estimate for Option 2

	Harbor Mist	Bindewald	Fisher	Swan Point Landing	Falcon Point	Seaport Lakes	Lane Road	Costa Grande	Powderhorn
Lots	225	300	300	89	1608	56	375	8900	500
Plant Capacity (MGD)	0.06	0.08	0.08	0.02	0.40	0.01	0.09	2.23	0.13
Treatment Cost in \$	\$1,237,500.00	\$1,500,000.00	\$1,500,000.00	\$534,000.00	\$3,618,000.00	\$350,000.00	\$2,015,625.00	\$13,350,000.00	\$2,250,000.00
Collection Cost in \$	\$1,417,500.00	\$1,890,000.00	\$1,890,000.00	\$560,700.00	\$10,130,400.00	\$352,800.00	\$2,362,500.00	\$56,070,000.00	\$3,150,000.00
Subtotal	\$2,655,000.00	\$3,390,000.00	\$3,390,000.00	\$1,094,700.00	\$13,748,400.00	\$702,800.00	\$4,378,125.00	\$69,420,000.00	\$5,400,000.00
Contingencies (15%)	\$398,250.00	\$508,500.00	\$508,500.00	\$164,205.00	\$2,062,260.00	\$105,420.00	\$656,718.75	\$10,413,000.00	\$810,000.00
Subtotal	\$3,053,250.00	\$3,898,500.00	\$3,898,500.00	\$1,258,905.00	\$15,810,660.00	\$808,220.00	\$5,034,843.75	\$79,833,000.00	\$6,210,000.00
Professional Services (20%)	\$610,650.00	\$779,700.00	\$779,700.00	\$251,781.00	\$3,162,132.00	\$161,644.00	\$1,006,968.75	\$15,966,600.00	\$1,242,000.00
Subtotal	\$3,663,900.00	\$4,678,200.00	\$4,678,200.00	\$1,510,686.00	\$18,972,792.00	\$969,864.00	\$6,041,812.50	\$95,799,600.00	\$7,452,000.00
Total Capital Cost	\$3,663,900.00	\$4,678,200.00	\$4,678,200.00	\$1,510,686.00	\$18,972,792.00	\$969,864.00	\$6,041,812.50	\$95,799,600.00	\$7,452,000.00
Capital Cost/Lot	\$16,284.00	\$15,594.00	\$15,594.00	\$16,974.00	\$11,799.00	\$17,319.00	\$16,111.50	\$10,764.00	\$14,904.00
Annual Payment in \$	\$291,174.65	\$371,782.32	\$371,782.32	\$120,056.08	\$1,507,791.15	\$77,076.29	\$480,150.28	\$7,613,312.23	\$592,219.62
O & M Cost in \$	\$133,453.13	\$164,250.00	\$164,250.00	\$117,758.13	\$293,460.00	\$76,650.00	\$181,359.38	\$812,125.00	\$182,500.00
Monthly Payment/ Lot at full development	\$157.27	\$148.90	\$148.90	\$222.67	\$93.35	\$228.76	\$147.00	\$78.89	\$129.12

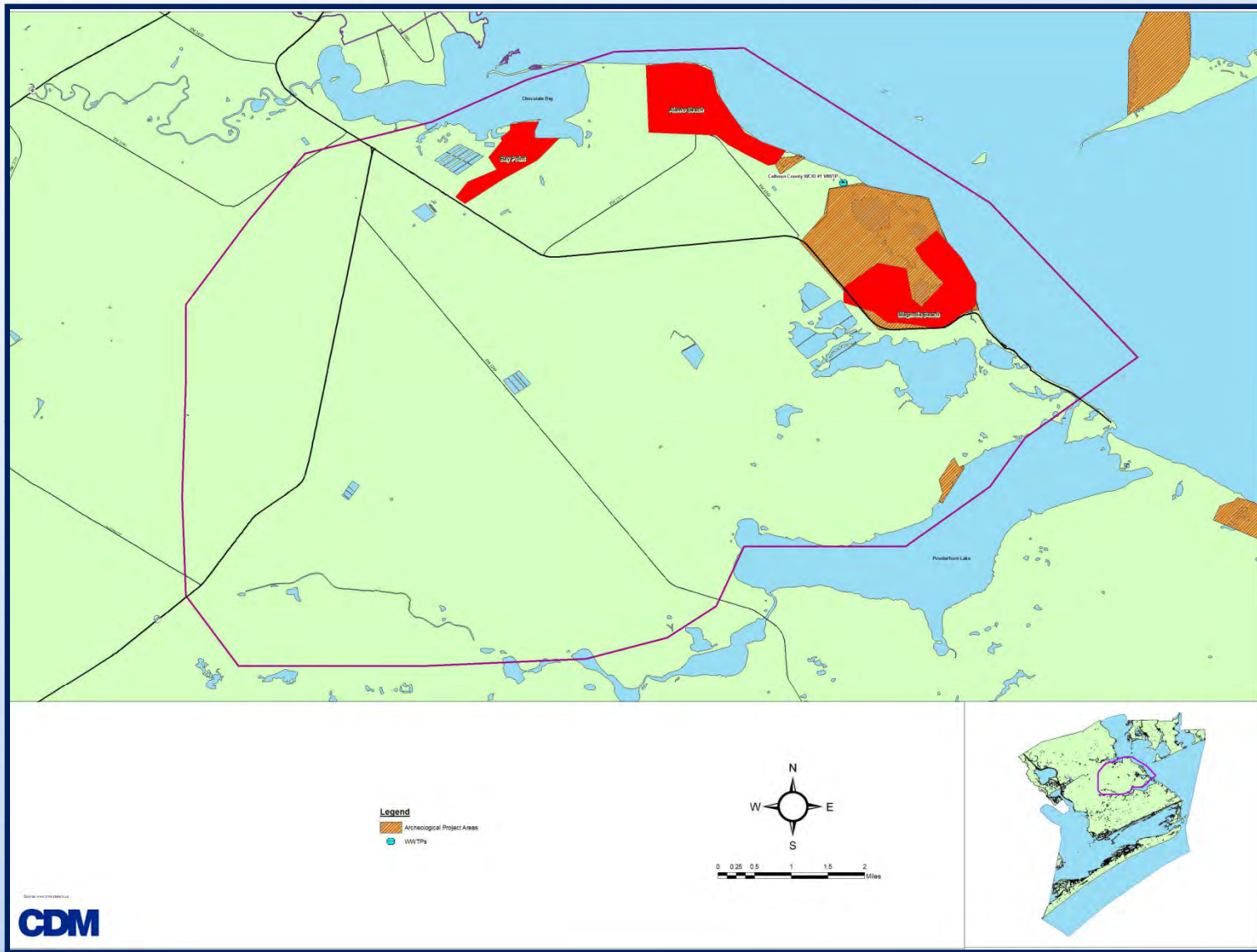
Area 2 - Option 3



Cost Estimate for Option 3

	Harbor Mist	Bindewald	Fisher	Swan Point Landing	Falcon Point	Seaport Lakes	Lane Road	Costa Grande	Powderhorn
Lots	225	300	300	89	1608	56	375	8900	500
Plant Capacity (MGD)	0.06	0.08	0.08	0.02	0.40	0.01	0.09	2.23	0.13
Total Plant Capacity (MGD)	3.09								
Total Treatment Cost in \$	\$15,441,250.00								
Treatment Cost in \$	\$281,250.00	\$375,000.00	\$375,000.00	\$111,250.00	\$2,010,000.00	\$70,000.00	\$468,750.00	\$11,125,000.00	\$625,000.00
Collection Cost in \$	\$1,417,500.00	\$1,890,000.00	\$1,890,000.00	\$560,700.00	\$10,130,400.00	\$352,800.00	\$2,362,500.00	\$56,070,000.00	\$3,150,000.00
Lift Station/Forcemain Cost in \$	\$475,000.00	\$450,000.00	\$515,000.00	\$515,000.00	\$795,000.00	\$350,000.00	\$325,000.00	\$375,000.00	\$1,000,000.00
Subtotal	\$2,173,750.00	\$2,715,000.00	\$2,780,000.00	\$1,186,950.00	\$12,935,400.00	\$772,800.00	\$3,156,250.00	\$67,570,000.00	\$4,775,000.00
Contingencies (15%)	\$326,062.50	\$407,250.00	\$417,000.00	\$178,042.50	\$1,940,310.00	\$115,920.00	\$473,437.50	\$10,135,500.00	\$716,250.00
Subtotal	\$2,499,812.50	\$3,122,250.00	\$3,197,000.00	\$1,364,992.50	\$14,875,710.00	\$888,720.00	\$3,629,687.50	\$77,705,500.00	\$5,491,250.00
Professional Services (20%)	\$499,962.50	\$624,450.00	\$639,400.00	\$272,998.50	\$2,975,142.00	\$177,744.00	\$725,937.50	\$15,541,100.00	\$1,098,250.00
Subtotal	\$2,999,775.00	\$3,746,700.00	\$3,836,400.00	\$1,637,991.00	\$17,850,852.00	\$1,066,464.00	\$4,355,625.00	\$93,246,600.00	\$6,589,500.00
Total Capital Cost	\$2,999,775.00	\$3,746,700.00	\$3,836,400.00	\$1,637,991.00	\$17,850,852.00	\$1,066,464.00	\$4,355,625.00	\$93,246,600.00	\$6,589,500.00
Capital Cost/Lot	\$13,332.33	\$12,489.00	\$12,788.00	\$18,404.39	\$11,101.28	\$19,044.00	\$11,615.00	\$10,477.15	\$13,179.00
Annual Payment in \$	\$238,395.81	\$297,754.86	\$304,883.43	\$130,173.16	\$1,418,629.20	\$84,753.21	\$346,146.88	\$7,410,422.18	\$523,675.68
Electricity Cost for operating LS in \$/yr	\$1,074.80	\$1,433.07	\$1,433.07	\$425.14	\$7,681.27	\$267.51	\$1,791.34	\$42,514.48	\$2,388.45
O & M Cost in \$	\$20,531.25	\$27,375.00	\$27,375.00	\$8,121.25	\$146,730.00	\$5,110.00	\$34,218.75	\$812,125.00	\$45,625.00
Monthly Payment/ Lot at full development	\$96.30	\$90.71	\$92.69	\$129.89	\$81.52	\$134.12	\$84.92	\$77.39	\$95.28

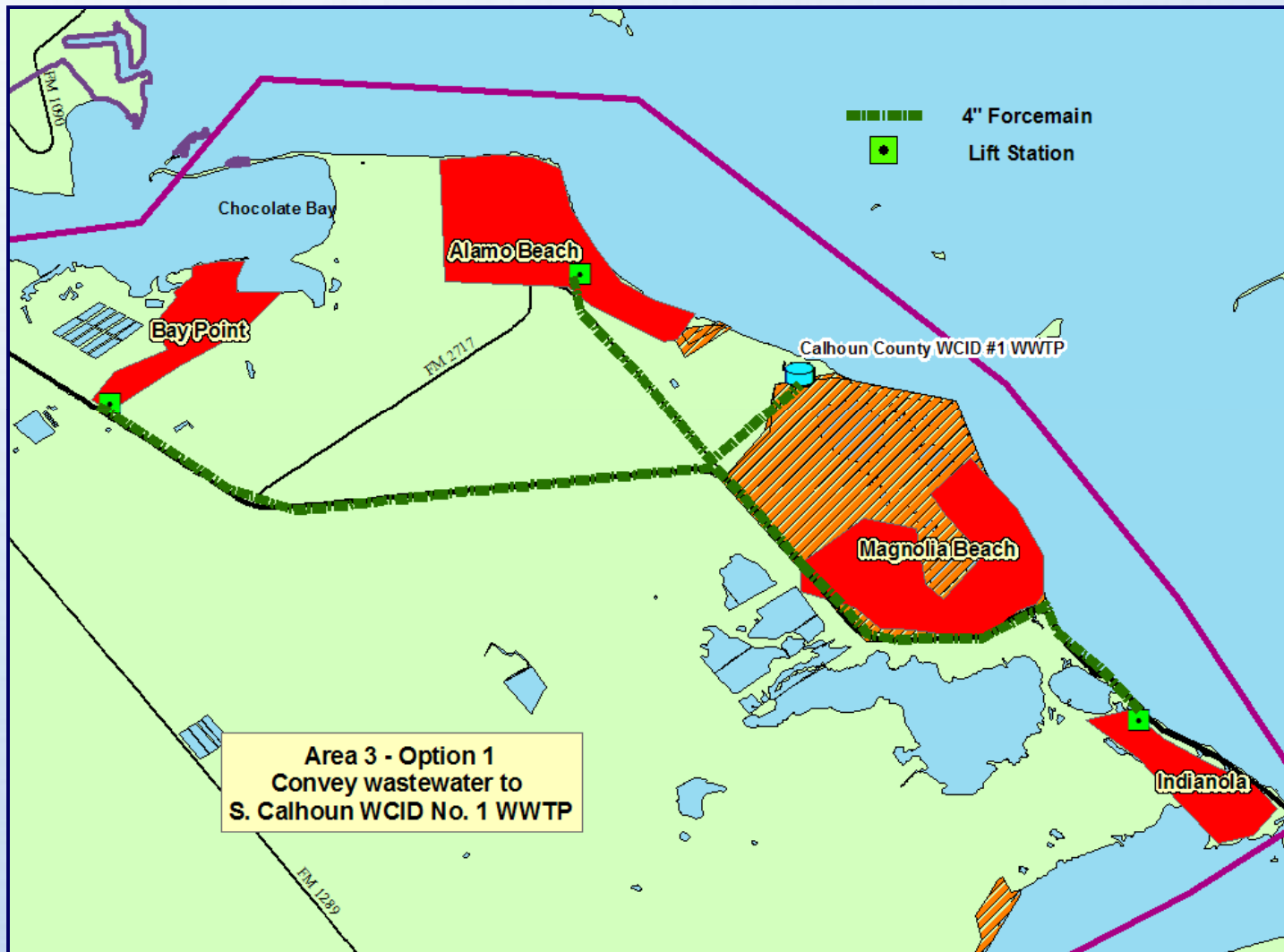
Area No. 3 Regional Options



Area No. 3 Regional Options

- 1) Magnolia Beach WWTP expand its system to serve Indianola, Alamo Beach, Baypoint Subdivision and other areas on septic systems**

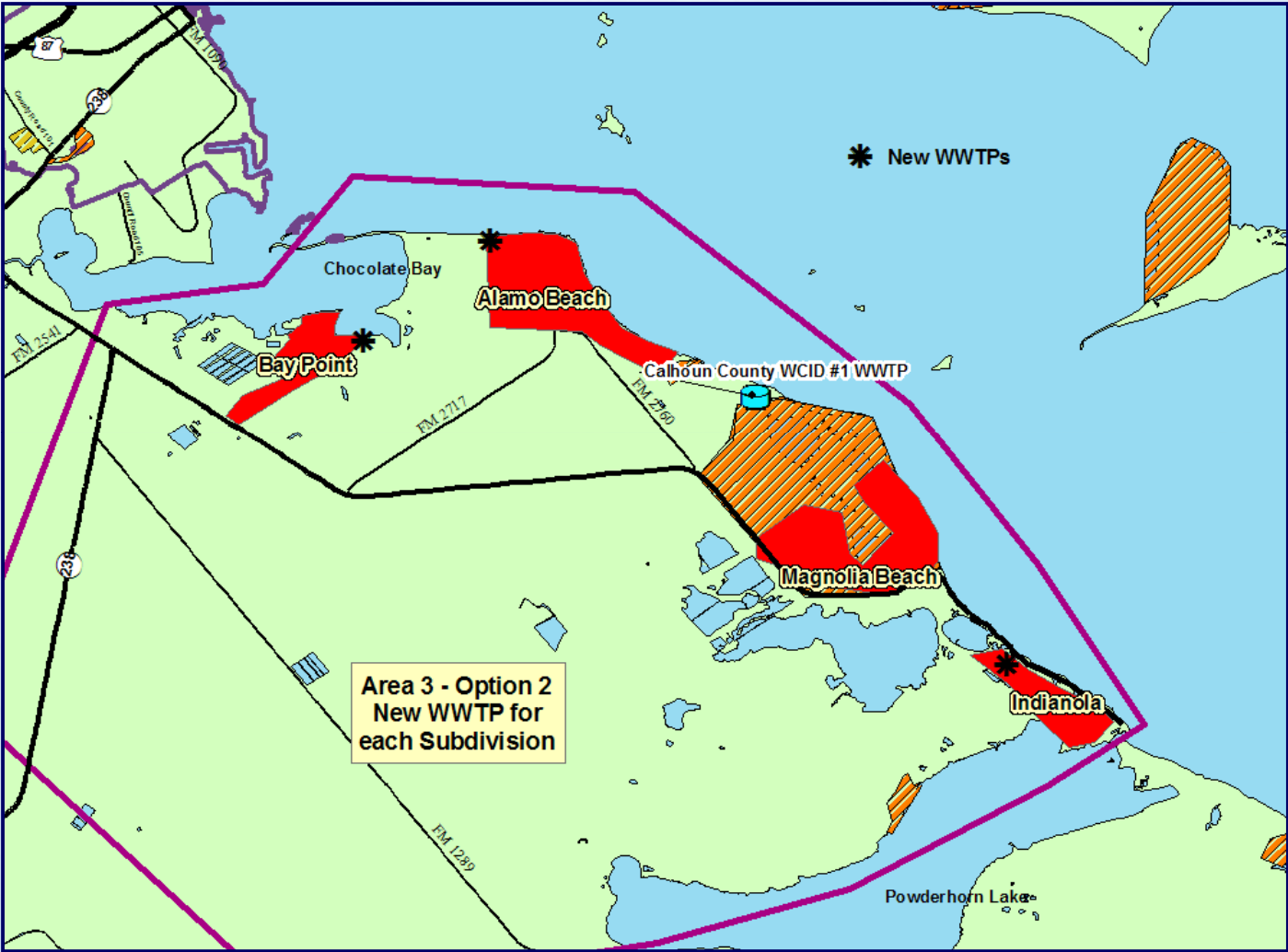
Area 3 - Option 1



Cost Estimate for Option 1

	Indianola	Alamo Beach	Bay Point
Lots	133	85	100
Flow (MGD)	0.03	0.02	0.03
Collection System \$	\$837,900.00	\$535,500.00	\$630,000.00
Force Main (4")	\$750,000.00	\$187,500.00	\$187,500.00
Lift Station (<0.50 MGD)	\$250,000.00	\$250,000.00	\$250,000.00
Subtotal	\$1,837,900.00	\$973,000.00	\$1,067,500.00
Contingencies (15%)	\$275,685.00	\$145,950.00	\$160,125.00
Subtotal	\$2,113,585.00	\$1,118,950.00	\$1,227,625.00
Professional Services (20%)	\$422,717.00	\$223,790.00	\$245,525.00
Subtotal	\$2,536,302.00	\$1,342,740.00	\$1,473,150.00
Total Capital Cost	\$2,536,302.00	\$1,342,740.00	\$1,473,150.00
Capital Cost/Lot	\$19,069.94	\$15,796.94	\$14,731.50
Annual Payment in \$	\$126,621.31	\$67,034.40	\$73,544.94
Electricity Cost for operating LS in \$/yr	\$635.33	\$406.04	\$477.69
Monthly Payment/ Lot at full development	\$79.73	\$66.12	\$61.69
City Sewer Fee Per Lot	\$61.43	\$61.43	\$61.43
Total Monthly Fee	\$141.16	\$127.54	\$123.11

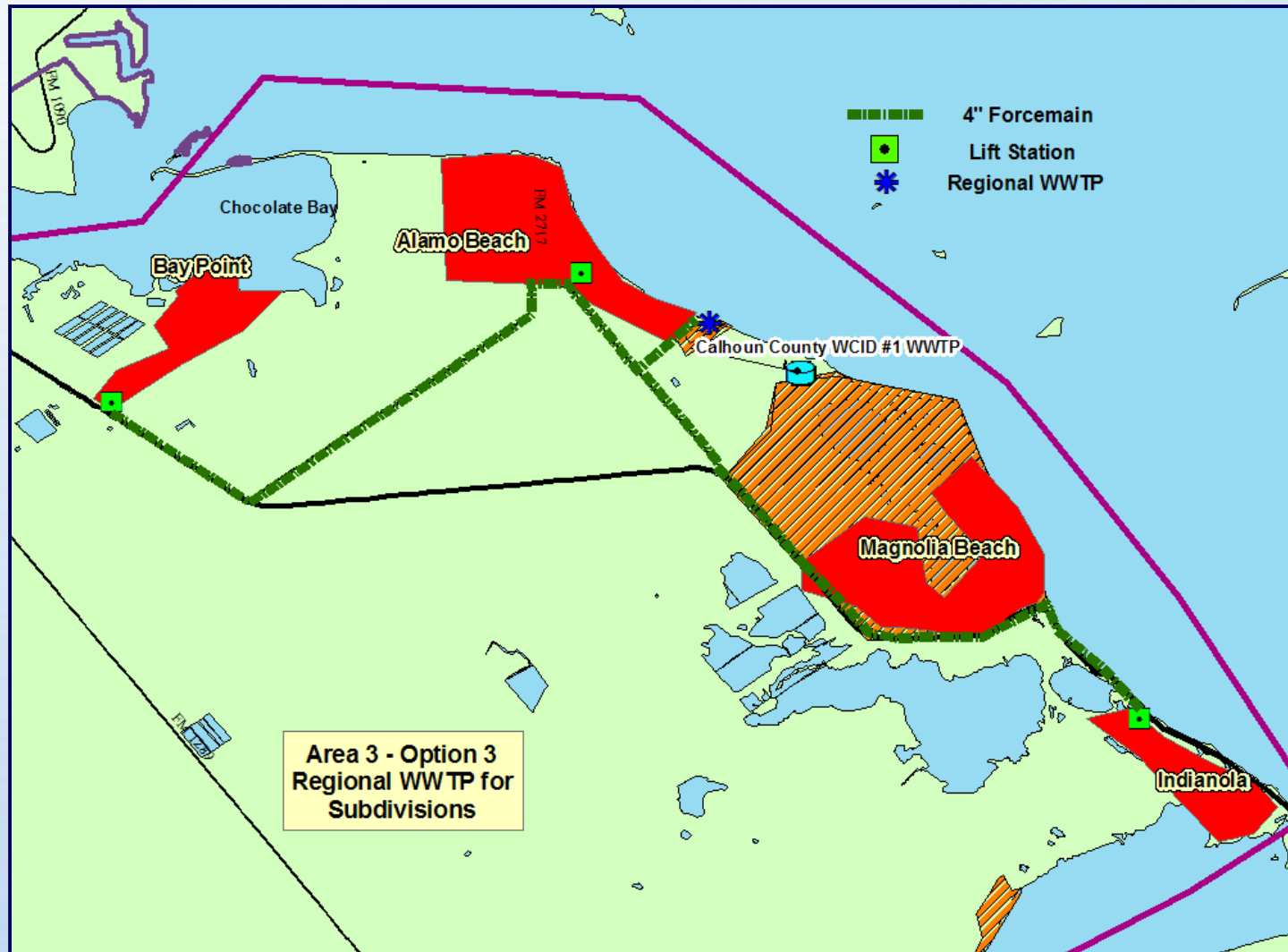
Area 3 – Option 2



Cost Estimate for Option 2

	Indianola	Alamo Beach	Bay Point
Lots	133	85	100
Plant Capacity (MGD)	0.03	0.02	0.03
Treatment Cost in \$	\$748,125.00	\$510,000.00	\$600,000.00
Collection Cost in \$	\$837,900.00	\$535,500.00	\$630,000.00
Subtotal	\$1,586,025.00	\$1,045,500.00	\$1,230,000.00
Contingencies (15%)	\$237,903.75	\$156,825.00	\$184,500.00
Subtotal	\$1,823,928.75	\$1,202,325.00	\$1,414,500.00
Professional Services (20%)	\$364,785.75	\$240,465.00	\$282,900.00
Subtotal	\$2,188,714.50	\$1,442,790.00	\$1,697,400.00
Total Capital Cost	\$2,188,714.50	\$1,442,790.00	\$1,697,400.00
Capital Cost/Lot	\$16,456.50	\$16,974.00	\$16,974.00
Annual Payment in \$	\$109,268.49	\$72,029.26	\$84,740.31
O & M Cost in \$	\$97,090.00	\$69,806.25	\$82,125.00
Monthly Payment/ Lot at full development	\$129.30	\$139.05	\$139.05

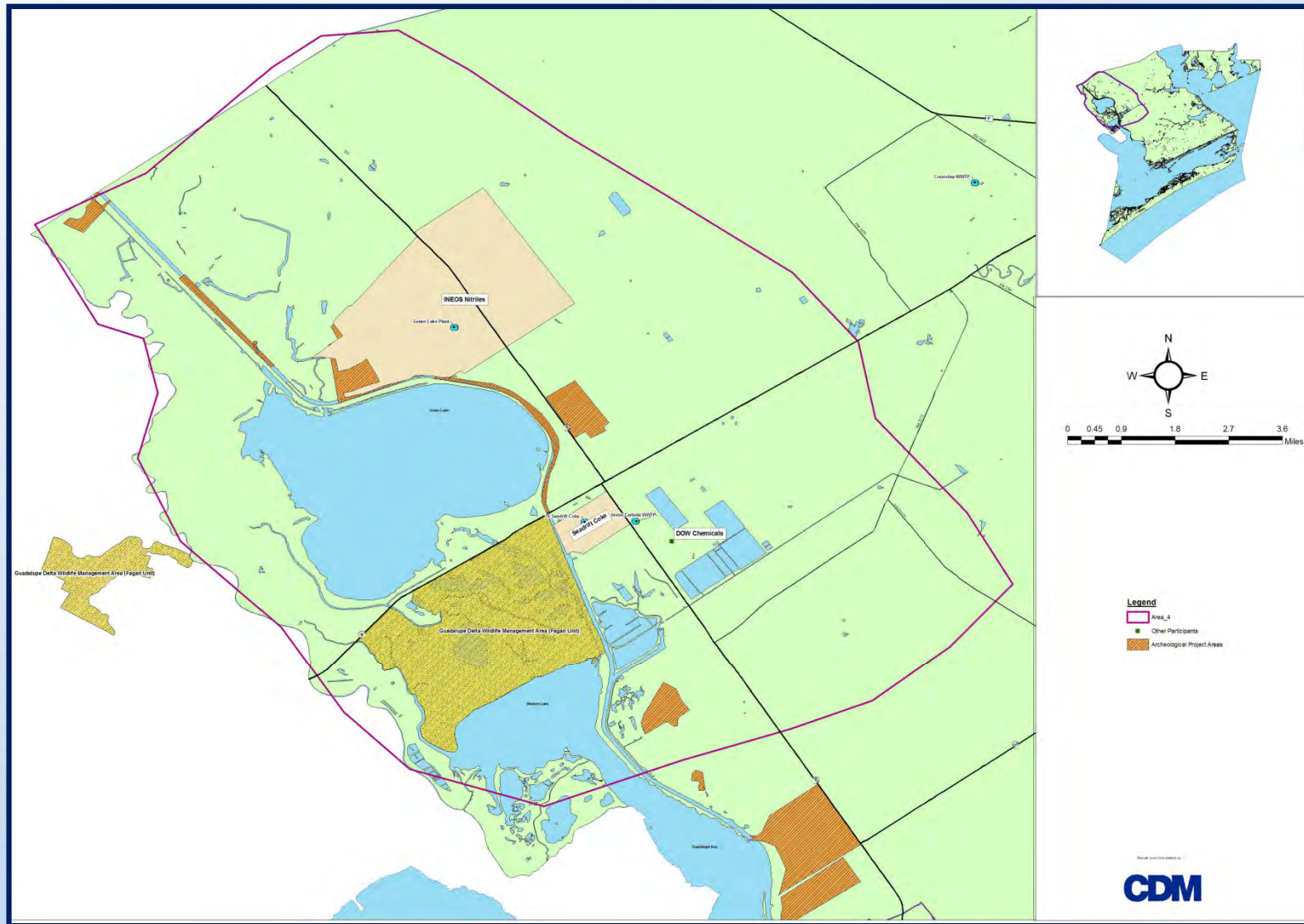
Area 3 - Option 3



Cost Estimate for Option 3

	Indianola	Alamo Beach	Bay Point
Lots	133	85	100
Plant Capacity (MGD)	0.03	0.02	0.03
Regional Plant Capacity	0.08		
Treatment Cost in \$	\$1,590,000.00		
Treatment Cost in \$/Subdivision	\$665,000.00	\$425,000.00	\$500,000.00
Forcemain/Lift Station cost in \$	\$1,000,000.00	\$437,500.00	\$437,500.00
Collection Cost in \$	\$837,900.00	\$535,500.00	\$630,000.00
Subtotal	\$2,502,900.00	\$1,398,000.00	\$1,567,500.00
Contingencies (15%)	\$375,435.00	\$209,700.00	\$235,125.00
Subtotal	\$2,878,335.00	\$1,607,700.00	\$1,802,625.00
Professional Services (20%)	\$575,667.00	\$321,540.00	\$360,525.00
Subtotal	\$3,454,002.00	\$1,929,240.00	\$2,163,150.00
Total Capital Cost	\$3,454,002.00	\$1,929,240.00	\$2,163,150.00
Capital Cost/Lot	\$25,969.94	\$22,696.94	\$21,631.50
Annual Payment in \$	\$172,436.19	\$96,314.59	\$107,992.22
Electricity Cost for operating LS in \$/yr	\$635.33	\$406.04	\$477.69
O & M Cost in \$	\$60,681.25	\$38,781.25	\$45,625.00
Monthly Payment/ Lot at full development	\$146.46	\$132.84	\$128.41

Area No. 4 Regional Options



Area No. 4 Regional Options

- 1) Construct small package plant to provide centralized wastewater service to 300 acre site adjacent to INEOS Nitriles**
- 2) Seadrift Coke, Dow Chemical and INEOS Nitriles receive treated effluent/reuse**

Preferred Options

- ◆ **Area 1A – All subdivisions of concern convey flow to City of Port Lavaca WWTP**
- ◆ **Area 1B – Regional WWTP for Olivia, Port Alto North & South Subdivisions**
- ◆ **Area 2 – Regional WWTP for all new Subdivisions between City of Seadrift and Port O' Connor**

Reclaimed Water Options

	Pump to Formosa/ALCOA	Pump to DOW/ Ineos Nitrile
Pipeline Cost in \$	\$8,368,750.00	\$5,695,000.00
Lift Station Cost in \$	\$450,000.00	\$450,000.00
Subtotal	\$8,818,750.00	\$6,145,000.00
Contingencies (15%)	\$1,322,812.50	\$921,750.00
Subtotal	\$10,141,562.50	\$7,066,750.00
Professional Services (20%)	\$2,028,312.50	\$1,413,350.00
Subtotal	\$12,169,875.00	\$8,480,100.00
Total Capital Cost in \$	\$12,170,000.00	\$8,481,000.00
Annual Payment in \$	\$967,164.89	\$673,995.52
Annual Electrical Cost \$	\$17,200.00	\$34,250.00
Total Annual Cost \$	\$984,364.89	\$708,245.52
Annual Cost per Acre foot \$	\$878.90	\$632.36

Project Contacts

Project Contacts:

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susan@srothconsulting.com

Bryan Serold
GBRA, Lower Basin Manager
(361) 575-6366
bserold@gbra.org

Calhoun County Regional Wastewater Facility Study



Project Meeting

**Dow Chemical – Port Lavaca Site
August 11, 2011**

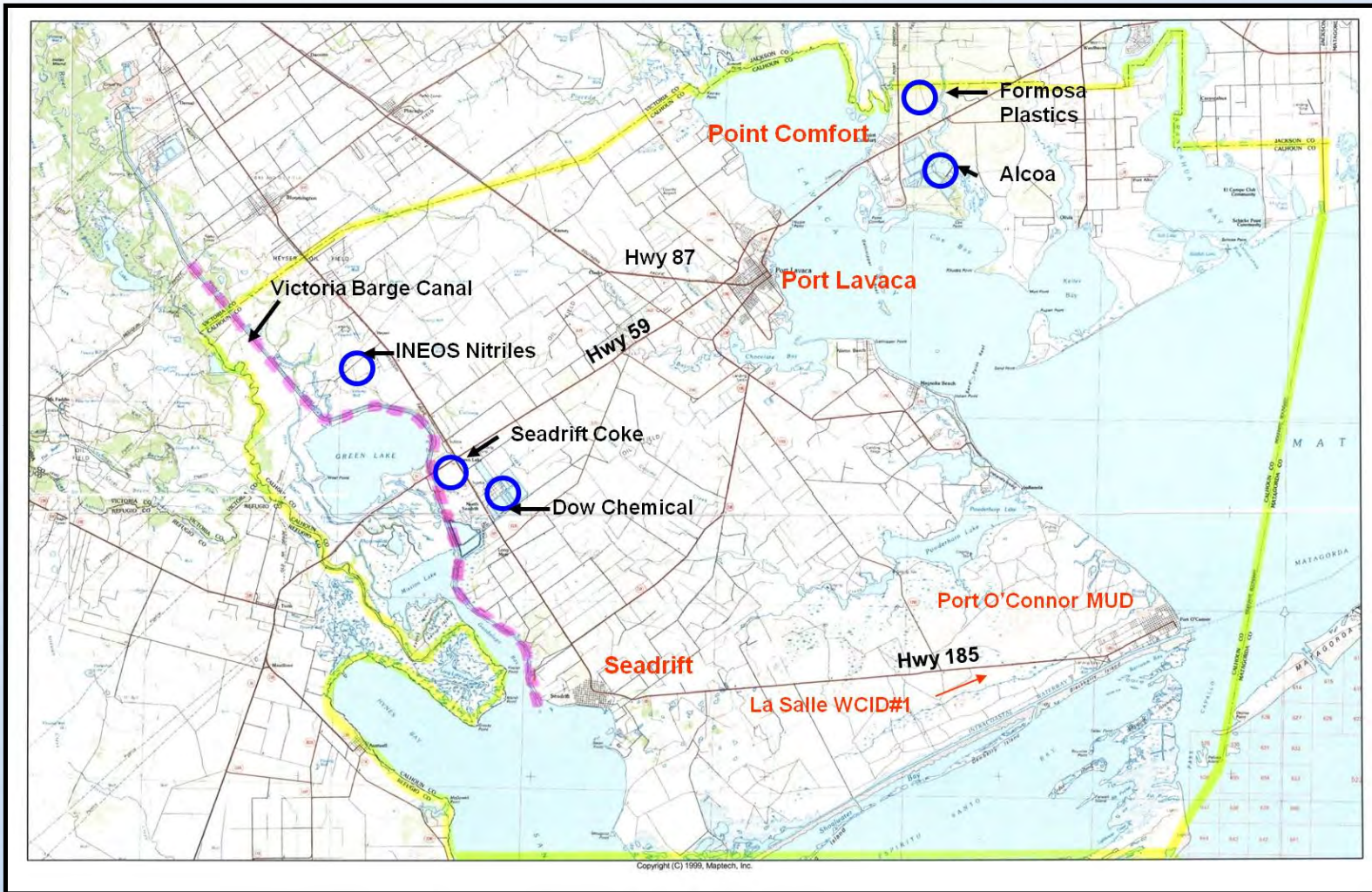
Presentation Outline

- ◆ **Project Overview & Schedule**
- ◆ **Highlights of Initial Draft Report**
- ◆ **Industrial Water & Wastewater Findings**
- ◆ **Funding Opportunities**
- ◆ **Q&A Discussion**
- ◆ **Next Steps**

Project Participants

- ◆ **Texas Water Development Board**
- ◆ **GBRA (primary applicant)**
- ◆ **Calhoun County**
- ◆ **Calhoun County Economic Development Corporation**
- ◆ **City of Seadrift**
- ◆ **City of Point Comfort**
- ◆ **City of Port Lavaca**
- ◆ **Alcoa**
- ◆ **Dow Chemical**
- ◆ **Formosa Plastics Company**
- ◆ **INEOS Nitriles**
- ◆ **Seadrift Coke, L.P.**

Calhoun County



Study Focus Areas

- ◆ **Feasibility of developing regional wastewater collection and treatment to replace and/or supplement the multiple systems currently in service;**
- ◆ **Options for smaller wastewater systems that no longer want to be in the utility business;**
- ◆ **Evaluate alternatives to decommission failing septic systems and connect to a larger wastewater system; and,**
- ◆ **Investigate wastewater reuse on a regional level to serve the study area.**

Scope of Work

- ◆ **Population and Wastewater Flow Projections**
- ◆ **Collection System Alternatives**
- ◆ **Treatment System Alternatives**
- ◆ **Operation and Reuse Alternatives**
- ◆ **Environmental Assessment**
- ◆ **Implementation Schedule**
- ◆ **Cost Estimates and Recommendations**
- ◆ **Funding Options**
- ◆ **Water Conservation/Drought Management Plans**

Project Timeline

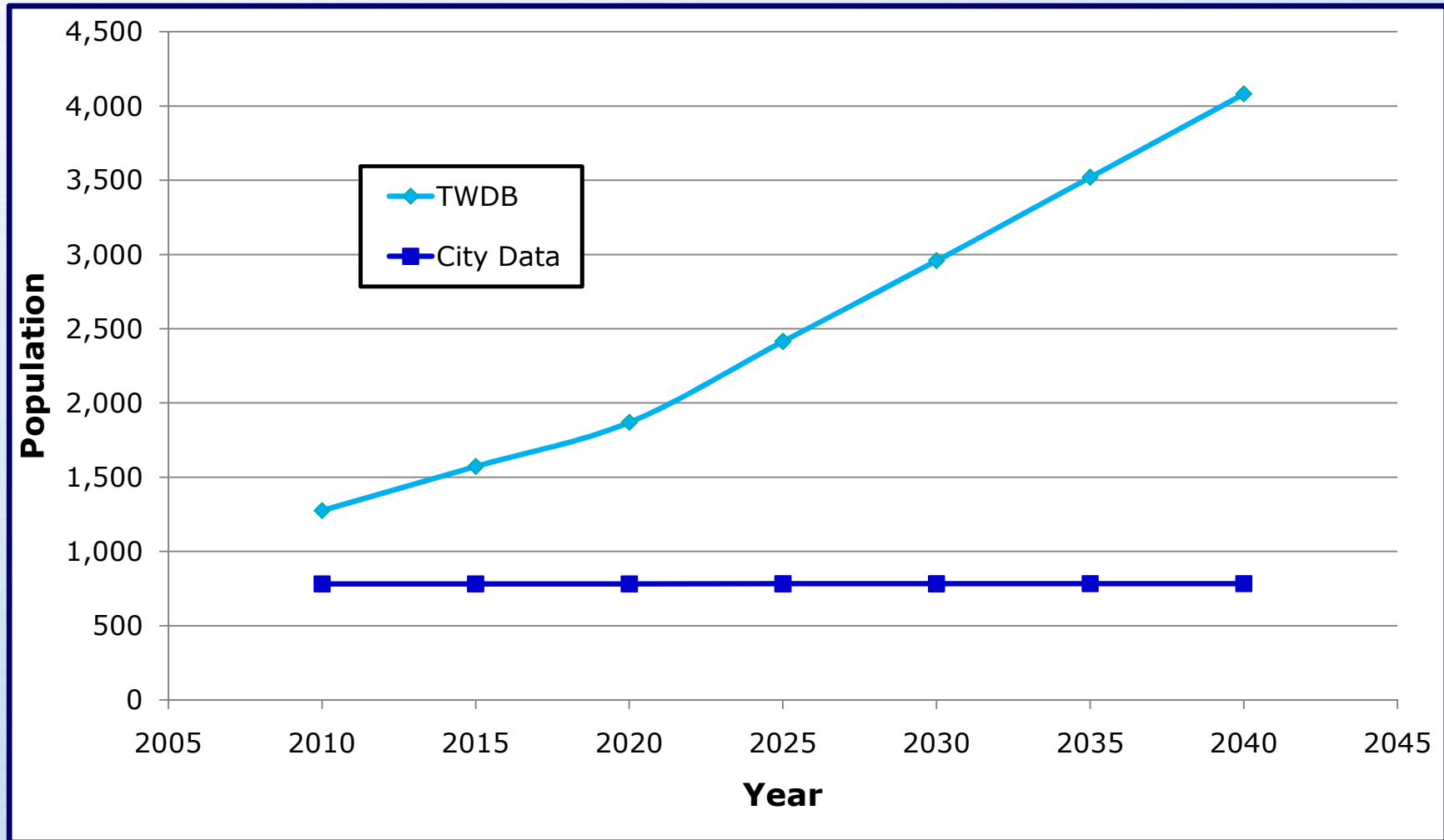
- ◆ **Project Kick-off Meeting (October 21, 2010)**
- ◆ **Second Meeting (February 10, 2011)**
 - Discuss population/wastewater flow data and various regional collection, treatment and reuse alternatives
- ◆ **Third Meeting (May 19, 2011)**
 - Discuss detailed analysis and evaluation of final alternatives for regional collection, treatment and reuse
- ◆ **Fourth Meeting (August 11, 2011)**
 - Discuss comments on Draft Report
- ◆ **Submit Draft Final Report to TWDB (no later than August 31, 2011)**

Initial Draft Report

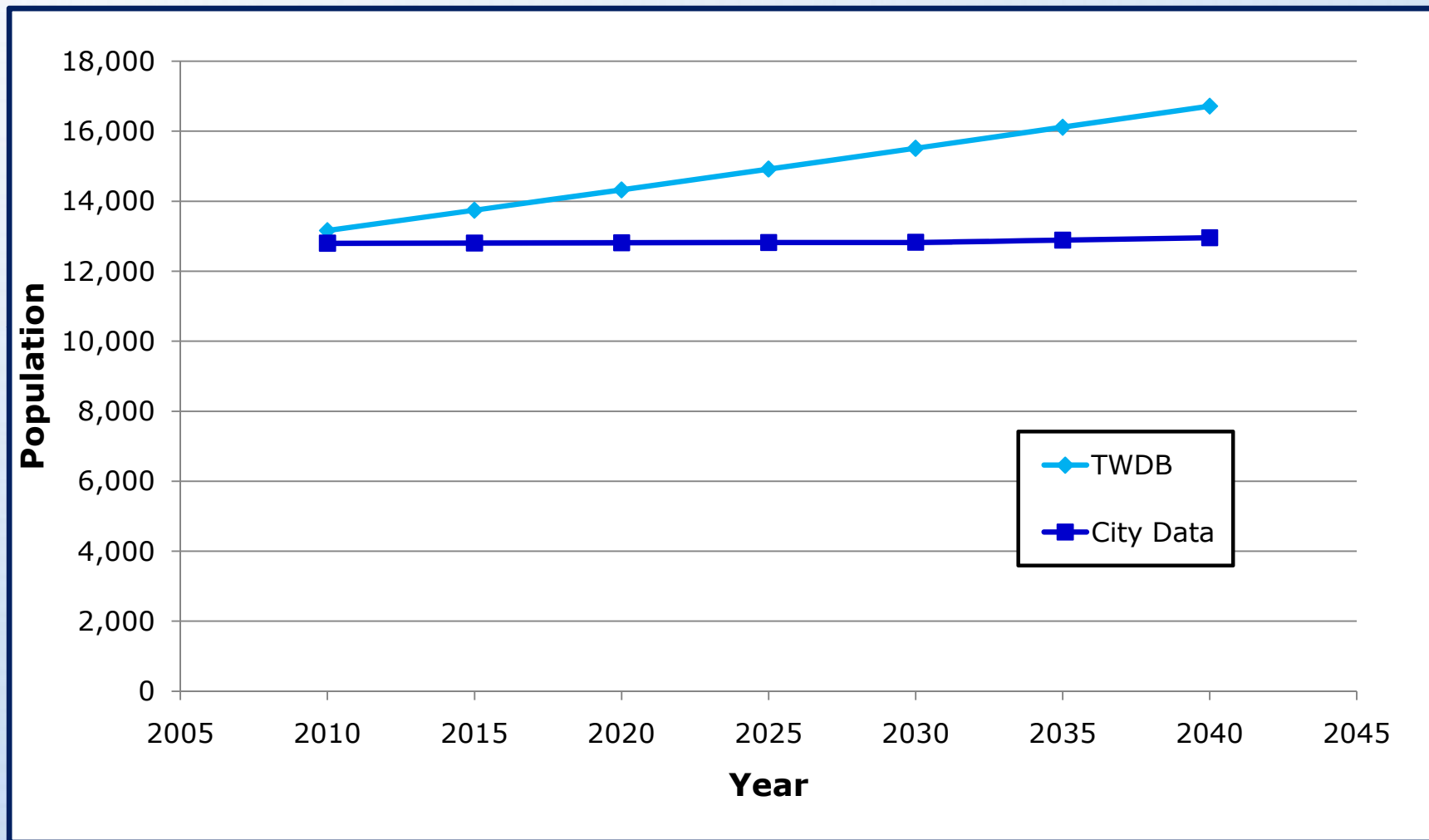
Population & Growth Projections

Entity	Growth Rate	2010	2015	2020	2025	2030	2035	2040
City of Point Comfort								
TWDB Projections	4.0%	1,276	1,573	1,870	2,415	2,959	3,520	4,081
City's Projections	0.1%	781	781	782	782	783	783	783
City of Port Lavaca								
TWDB Projections	0.8%	13,163	13,744	14,325	14,919	15,513	16,115	16,717
City's Projections	0.1%	12,800	12,806	12,813	12,819	12,826	12,890	12,954
City of Seadrift								
TWDB Projections	0.3%	1,408	1,434	1,459	1,479	1,499	1,512	1,525
City's Projections	2.0%	1,452	1,597	1,742	1,917	2,091	2,300	2,509
Port O'Connor MUD								
TWDB Projections	0.8%	1,346	1,406	1,465	1,526	1,587	1,649	1,710
MUD's Projections	1.0%	3,119	3,160	3,194	3,236	3,270	3,310	3,353

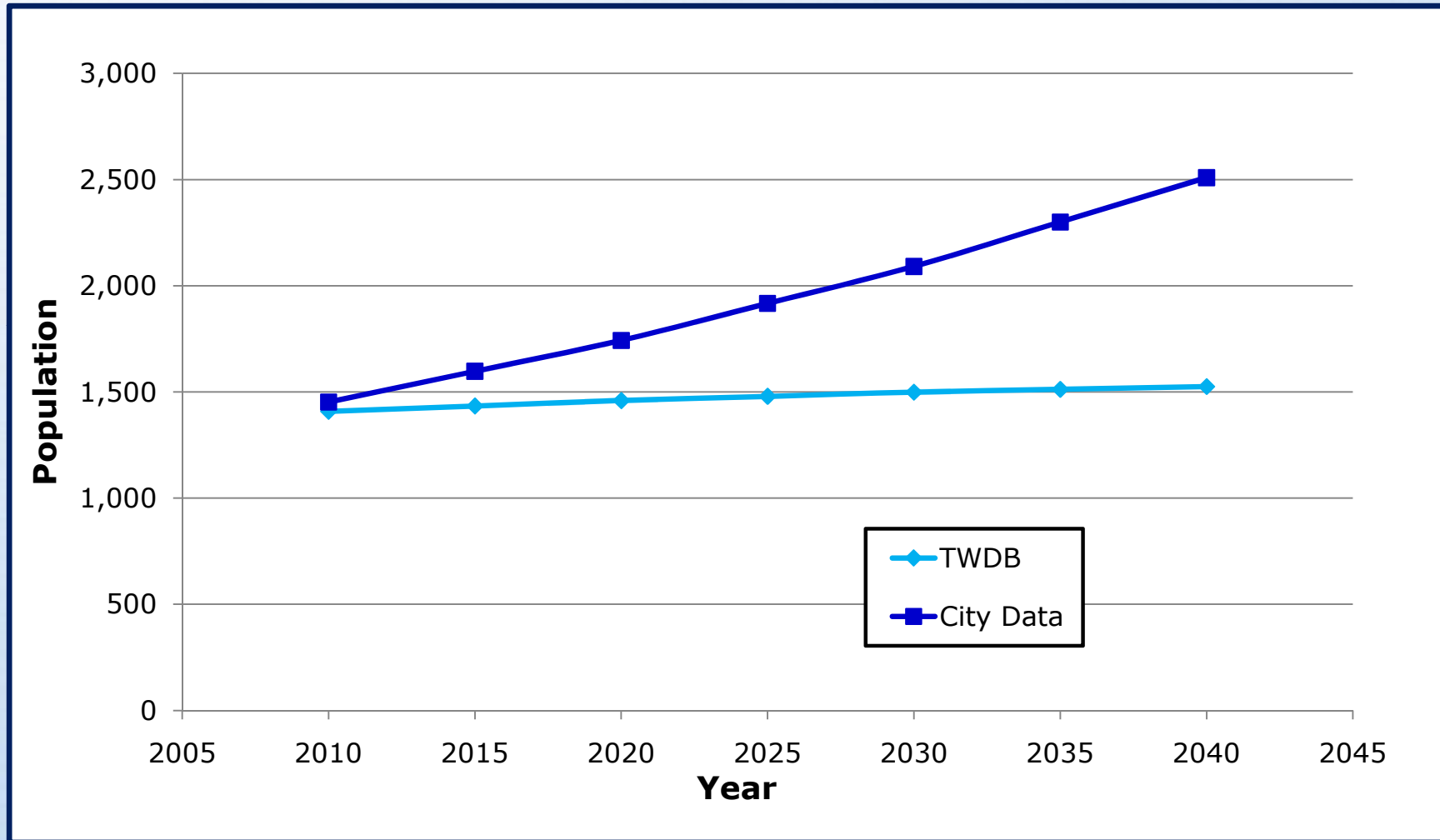
Point Comfort Population Projections: Comparison of TWDB & City Data



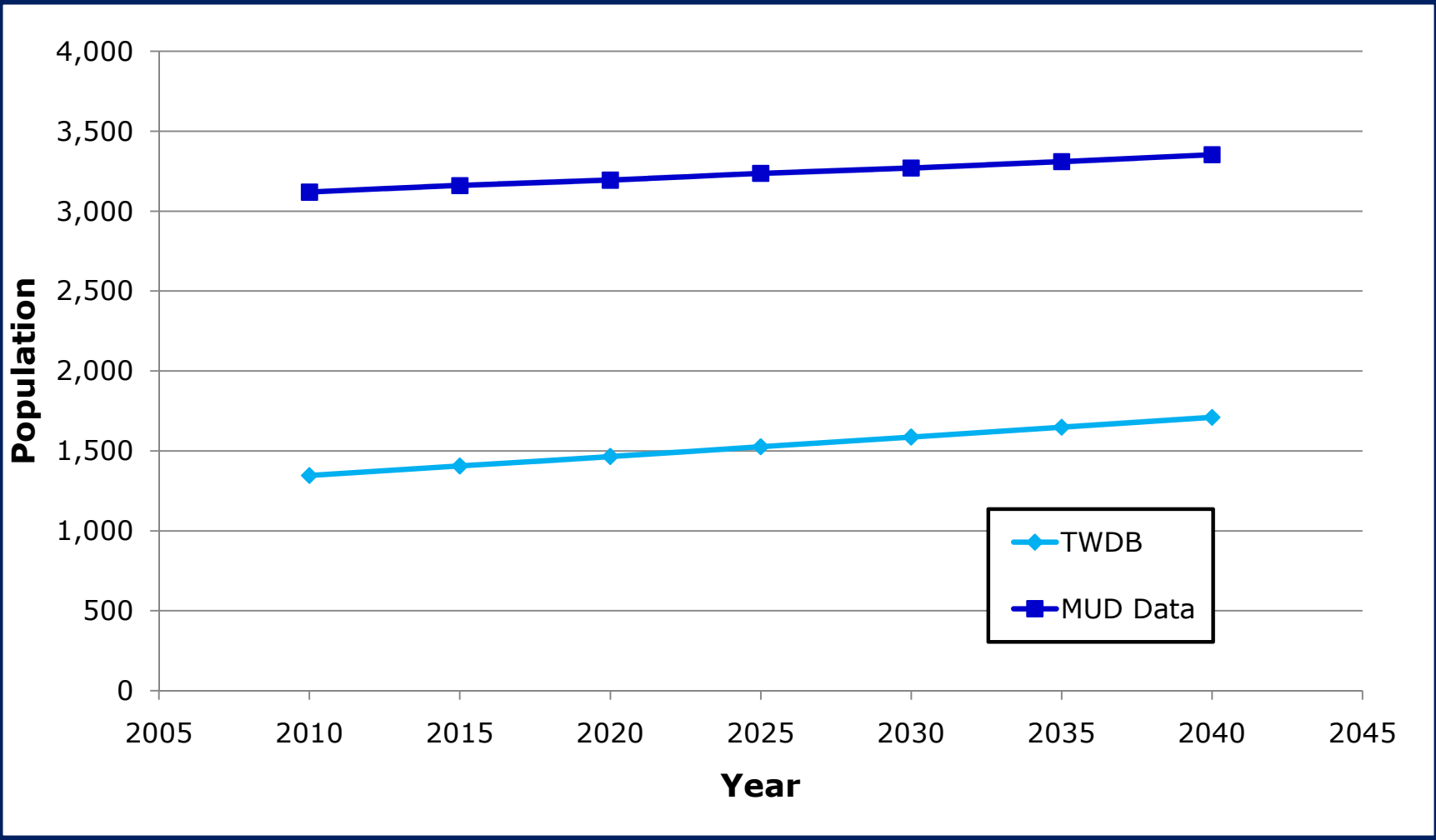
Port Lavaca Population Projections: Comparison of TWDB & City Data



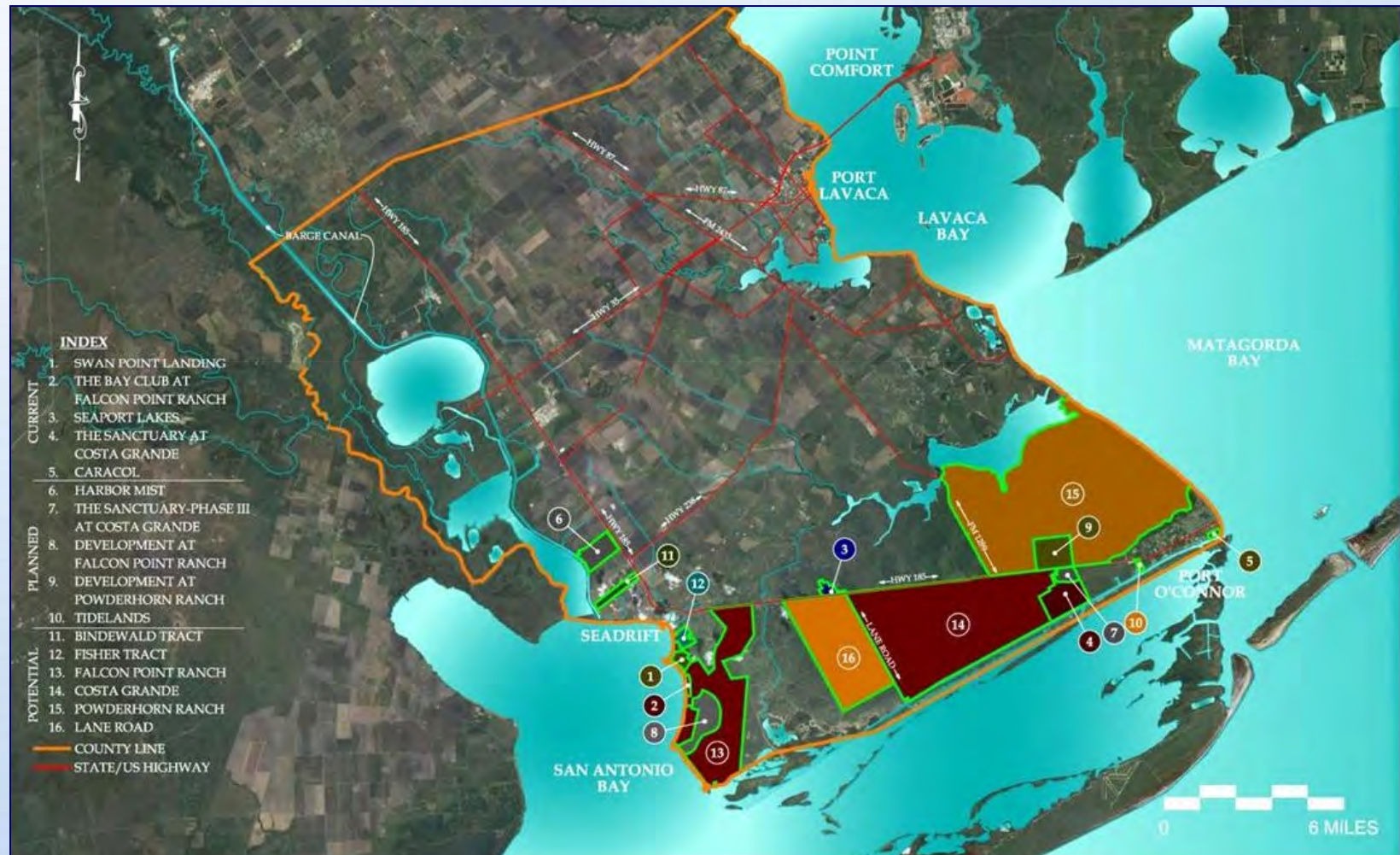
Seadrift Population Projections: Comparison of TWDB & City Data



Port O'Connor Population Projections: Comparison of TWDB & MUD Data



Current, Planned & Potential Subdivisions



Proposed Subdivision Units

Dev No.	Proposed Development	Estimated Number of Units (Full Development Assumed to be in 2060)
1	Swan Point Landing	89
2	The Bay Club @ Falcon Point	108
3	Seaport Lakes	56
4	Sanctuary at Costa Grande	767
5	Caracol	74
6	Harbor Mist	225
7	Sanctuary-Phase III at Costa Grande	300
8/13	Falcon Point Ranch Phase I	1500
10	Tidelands	82
11	Bindewald Tract	300
12	Fisher Tract	300
9/15	Powderhorn Ranch	500
14	Costa Grande	8900
16	Lane Road	300

Existing Wastewater Facilities

City of Point Comfort WWTP



WWTP Name	Permitted Average Flow in MGD	Permitted 2-hr Peak Flow in MGD	BOD/TSS in mg/L
City of Point Comfort WWTP	0.2	0.5	20/20

City of Port Lavaca WWTP



WWTP Name	Permitted Average Flow in MGD	Permitted 2-hr Peak Flow in MGD	BOD/TSS in mg/L
City of Port Lavaca WWTP	2	7.65	20/20

City of Seadrift WWTP



WWTP Name	Permitted Average Flow in MGD	Permitted 2-hr Peak Flow in MGD	BOD/TSS in mg/L
City of Seadrift WWTP	0.3	0.6	20/20

Port O'Connor MUD WWTP



WWTP Name	Permitted Average Flow in MGD	Permitted 2-hr Peak Flow in MGD	BOD/TSS/Ammonia in mg/L
Port O'Connor MUD WWTP	0.6	1.8	10/15/3

Crestview WWTP



WWTP Name	Permitted Average Flow in MGD	Permitted 2-hr Peak Flow in MGD	BOD/TSS in mg/L
Crestview WWTP	0.03	0.09	20/20

Southern Central Calhoun County WCID No. 1 WWTP



WWTP Name	Permitted Average Flow in MGD	Permitted 2-hr Peak Flow in MGD	BOD/TSS in mg/L
Southern Central Calhoun County WCID No.1 WWTP	0.075	0.262	20/20

Final Regional Alternatives

Study Area – Regional Concept



Study Area Overview

AREA 1A

- ◆ City of Port Lavaca
- ◆ Crestview Subdivision
- ◆ Meadow Brook Park
- ◆ Shady Acres
- ◆ Hackberry Junction
- ◆ Bowman Development
- ◆ Matson Subdivision
- ◆ Bay Meadows
- ◆ Shoreline Acres
- ◆ Royal Estates
- ◆ Double Subdivision
- ◆ Six Mile Subdivision

AREA 1B

- ◆ City of Point Comfort
- ◆ Alcoa
- ◆ Formosa Plastics
- ◆ Olivia
- ◆ Port Alto WSC
(North & South)
- ◆ **Campbell Carancahua
Beach Subdivision**
- ◆ **El Campo Club
Community**
- ◆ **Schicke Point Community**

Study Area Overview

AREA 2

- ◆ City of Seadrift
- ◆ Port O'Connor MUD
- ◆ Swan Point Landing
- ◆ Falcon Point
- ◆ Costa Grande Development (I-V)
- ◆ Powder Horn Ranch
- ◆ Lane Road Development
- ◆ The Sanctuary

AREA 3

- ◆ Magnolia Beach
- ◆ Indianola
- ◆ Baypoint Subdivision
- ◆ Alamo Beach

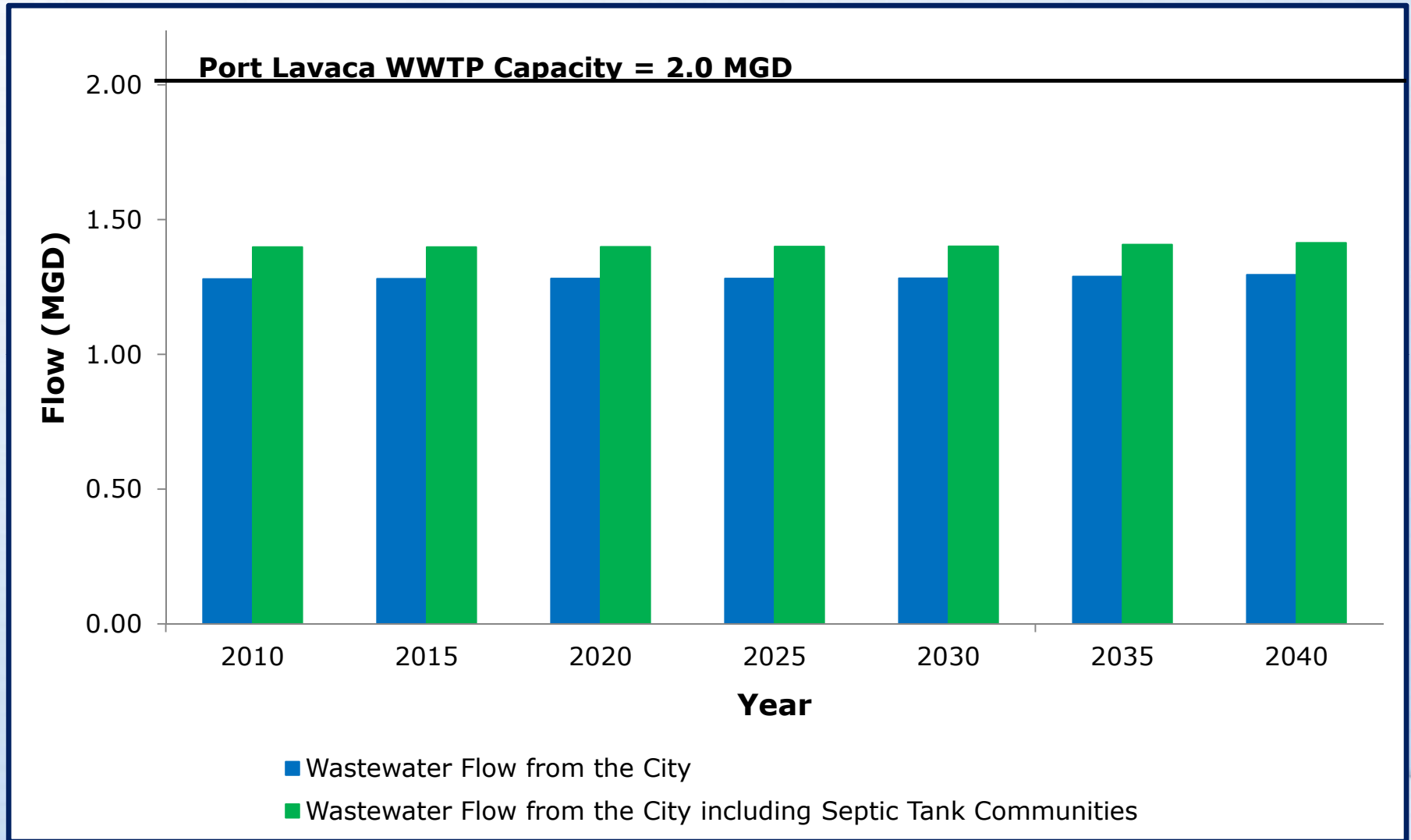
AREA 4

- ◆ Dow Chemical
- ◆ Seadrift Coke
- ◆ INEOS Nitriles

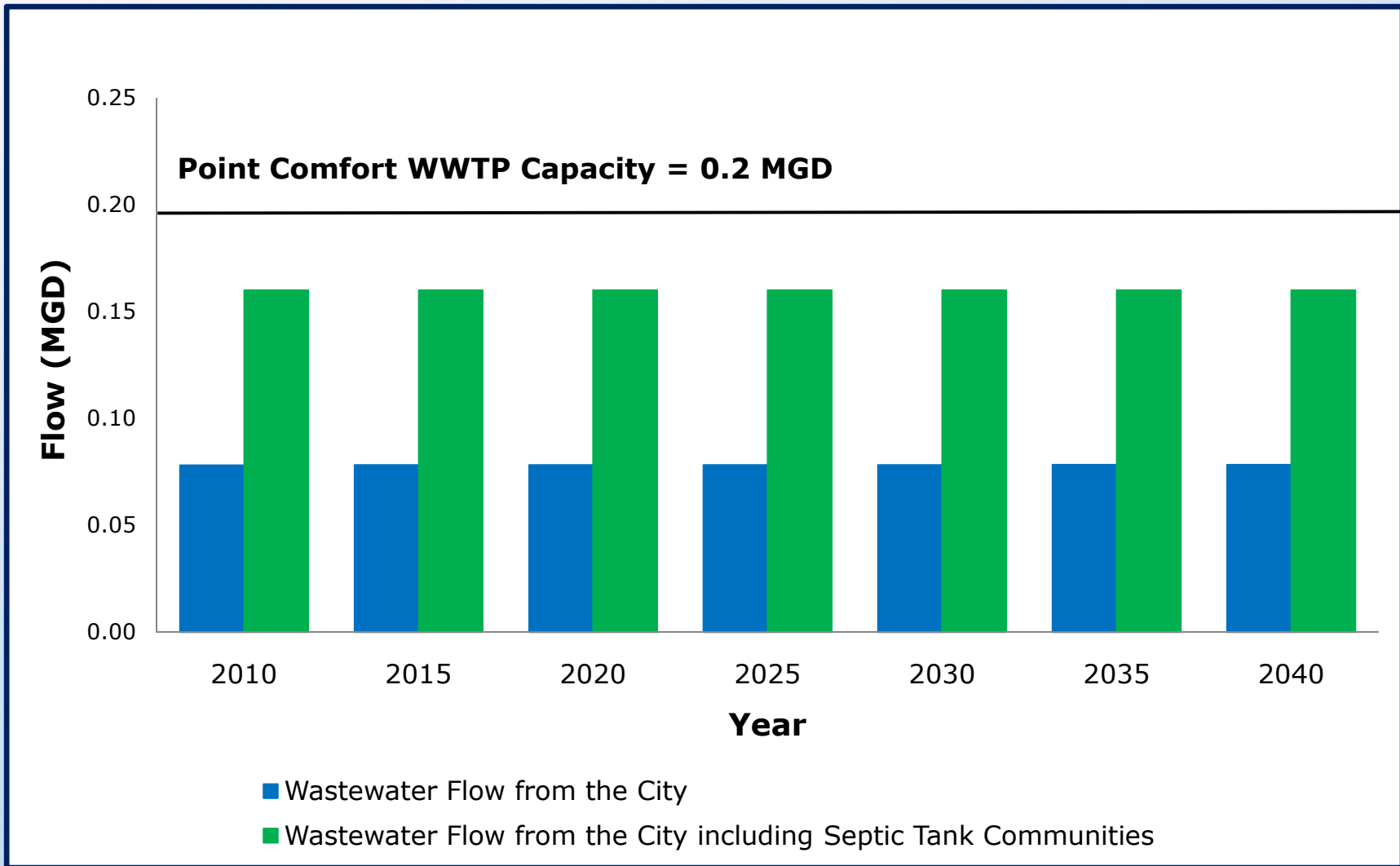
Wastewater Flow Projections: Design Criteria

- ◆ **For subdivisions, the LUE (Living Unit Equivalent) was assumed to be 2.5 persons per lot based on U.S Census Data for Calhoun County.**
- ◆ **Wastewater production rate was assumed to 100 gallon per capita per day (gpcd).**
- ◆ **For the cities, population growth and gpcd were used to calculate the future flow.**
- ◆ **For the subdivisions, number of lots, LUE's and gpcd were used to calculate the future flows.**

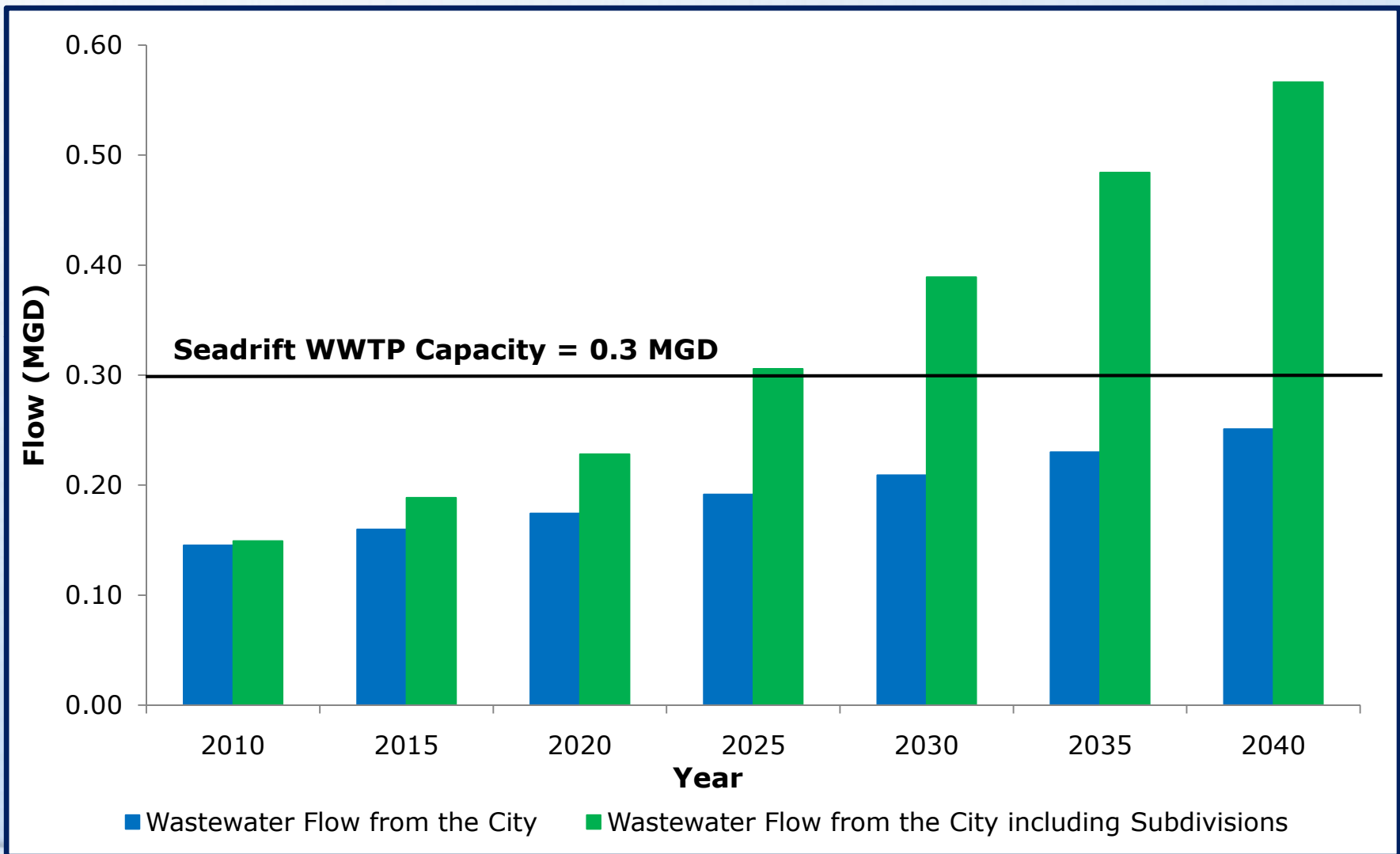
Wastewater Flow Projections: Area 1A



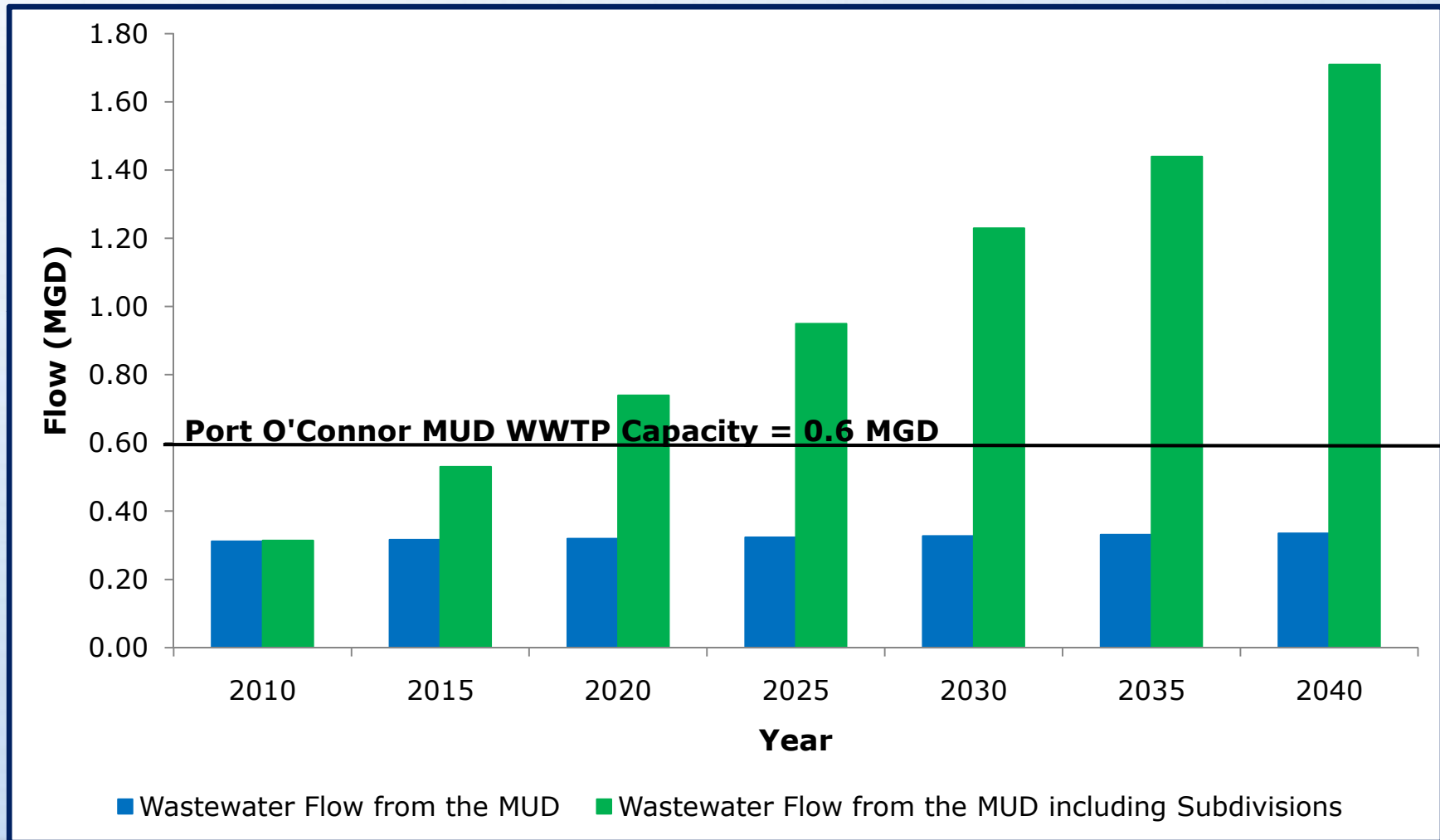
Wastewater Flow Projections: Area 1B



Wastewater Flow Projections: City of Seadrift - Area 2



Wastewater Flow Projections: Port O'Connor MUD - Area 2



Development of Final Regional Alternatives

Collection System Alternatives

- ◆ **Vacuum Sewer System**
- ◆ **Gravity Sewer System**
- ◆ **Pressure Sewer System**
- ◆ **On-Site Sewage Facility (OSSF)**

Vacuum Sewer System

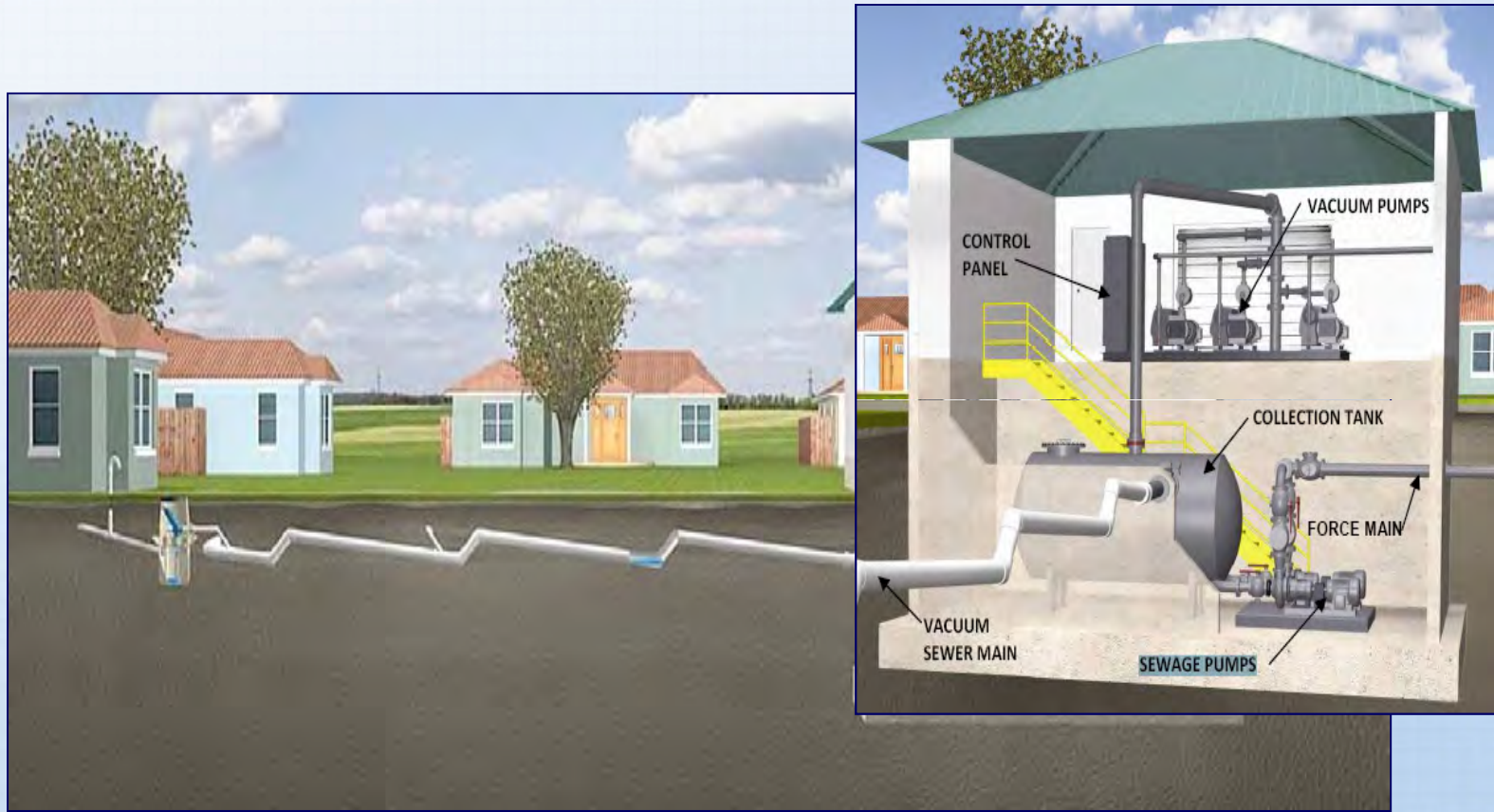
Advantages

- ◆ Fewer I/I problems than gravity sewer
- ◆ Generate less odors
- ◆ Wastewater is completely contained
- ◆ The Sanctuary (future subdivision planned for Area 2) utilizes vacuum sewer system

Disadvantages

- ◆ Better for MUDs or Cities to operate and maintain
- ◆ High upfront cost
- ◆ Not conducive to incremental cost for construction

Vacuum Sewer System (Cont.)



Gravity Sewer System

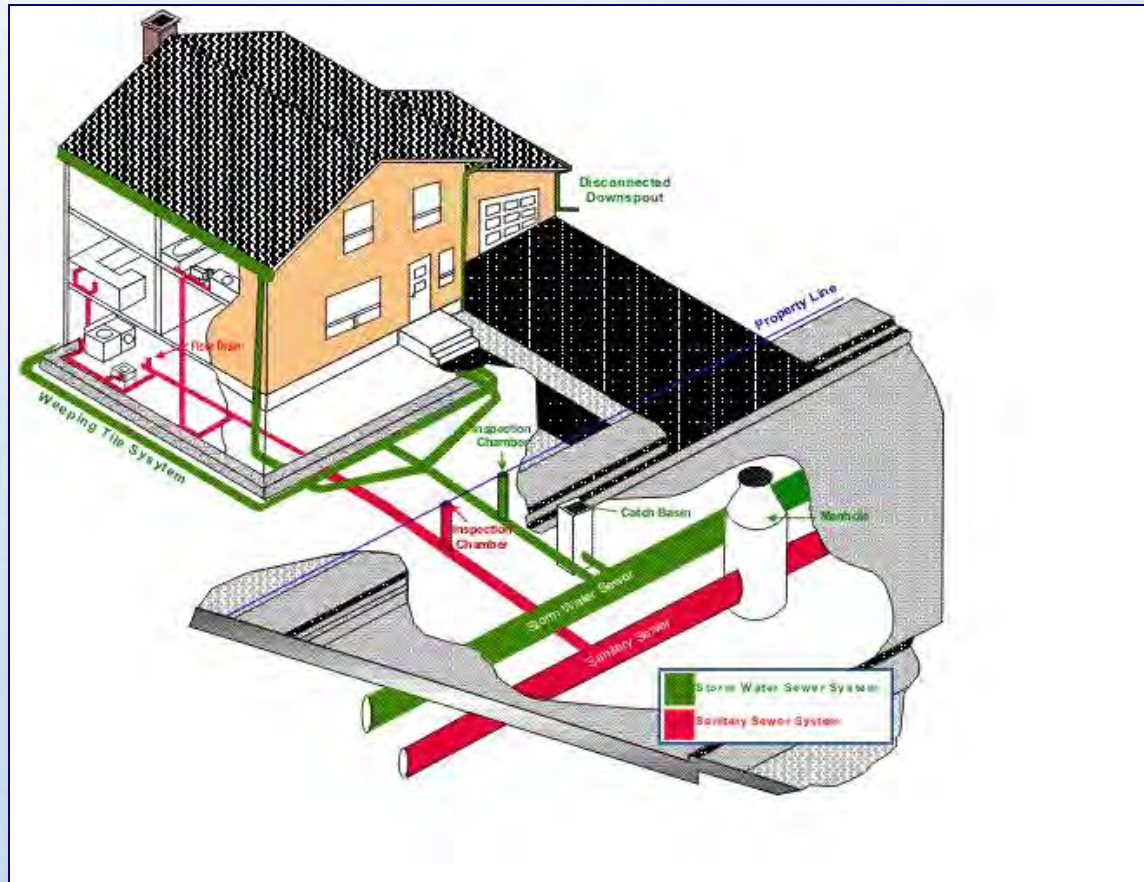
Advantages

- ◆ Proven, effective and widely used
- ◆ Does not require individual household attention and maintenance
- ◆ Access for maintenance is relatively easy

Disadvantages

- ◆ High groundwater levels render high construction cost
- ◆ Wastewater collection systems must be installed within specified slope to provide minimum solids-carrying velocity

Gravity Sewer System (Cont.)



Pressure Sewer System

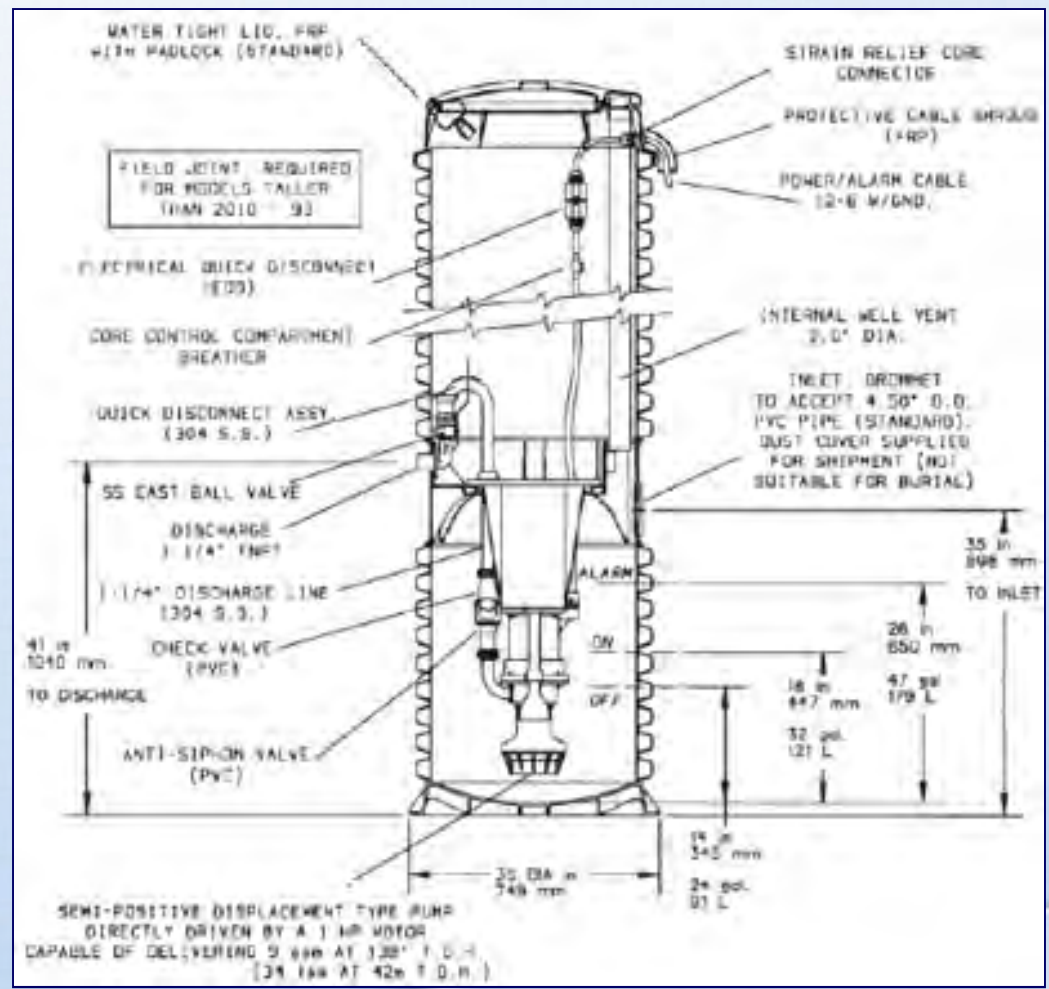
Advantages

- ◆ Can be retrofitted
- ◆ Can be built incrementally
- ◆ Low upfront cost
- ◆ I/I will not be a factor

Disadvantages

- ◆ Odor control stations will be required
- ◆ Smaller pipe size is not conducive to inspection inside if damaged
- ◆ Air release valves throughout the system are required to avoid air traps, which could reduce system capacity

Pressure Sewer System (Cont.)



On-Site Sewage Facilities (OSSF)

Advantages

- ◆ **Cost effective option (systems recommended for study area would be typically anaerobic)**

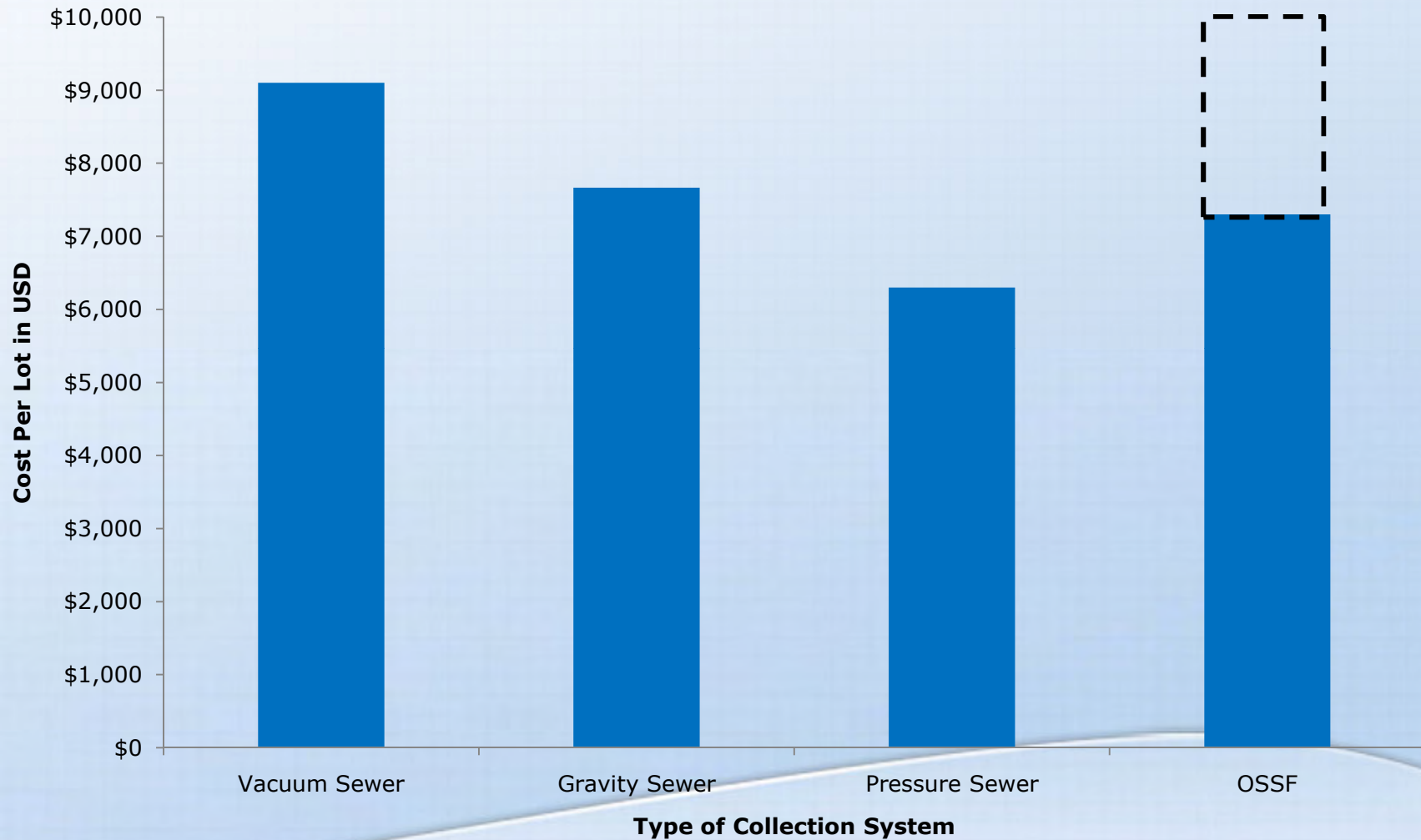
Disadvantages

- ◆ **If an OSSF fails, potential for public exposure to raw sewage is high**
- ◆ **Failing OSSFs will also potentially cause wastewater pooling**

On-Site Sewage Facilities (Cont.)



Collection System Alternatives



Treatment Alternatives

Package & Regional WWTPs

Advantages

- ◆ Will avoid pumping over long distance to local WWTP
- ◆ Will avoid construction of lift station and electrical costs
- ◆ Effluent can be recycled as needed

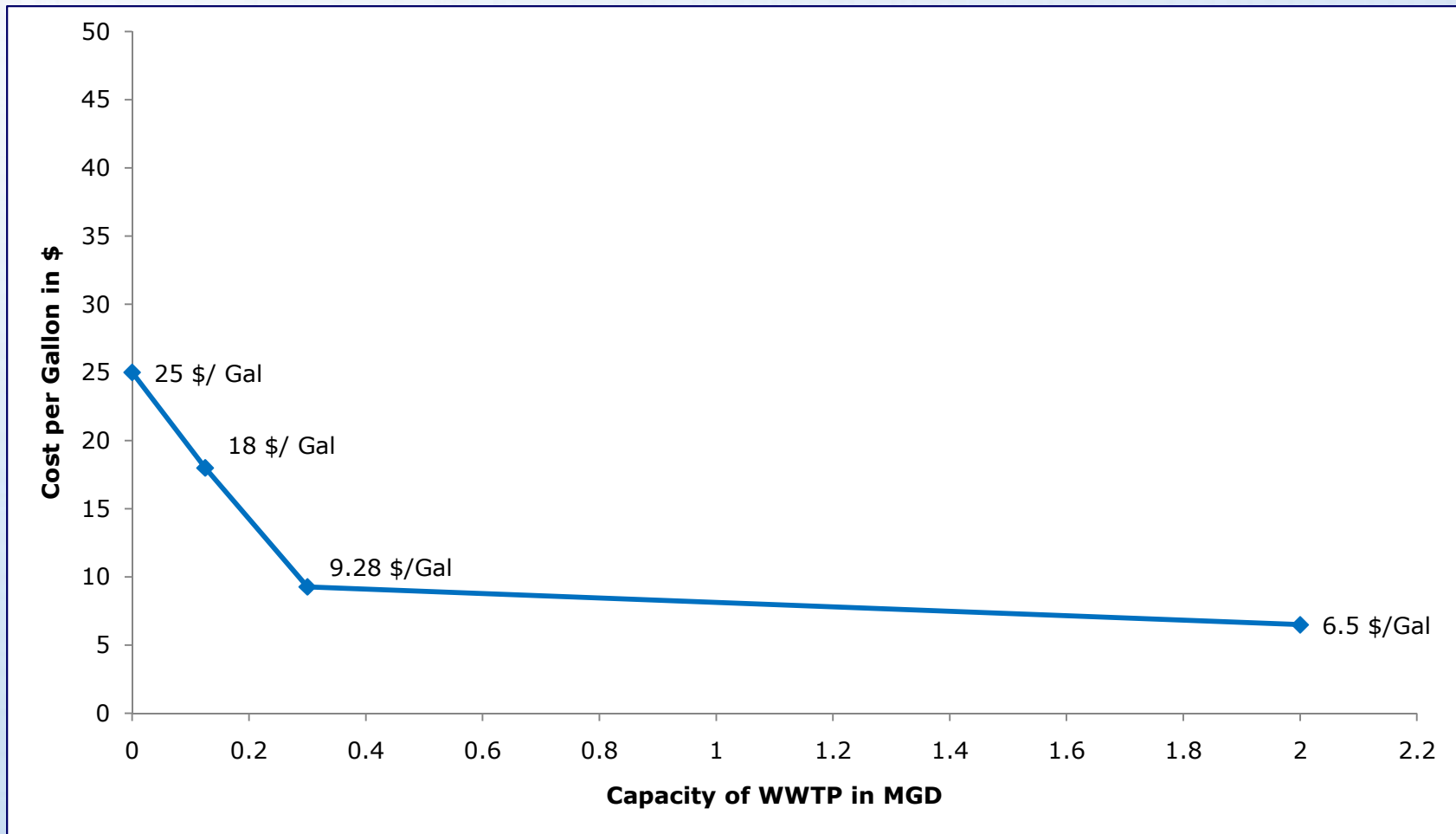
Disadvantages

- ◆ Requires constant attention for permit compliance
- ◆ Construction and treatment costs will be higher than a large capacity WWTP
- ◆ Potential discharge violation penalties

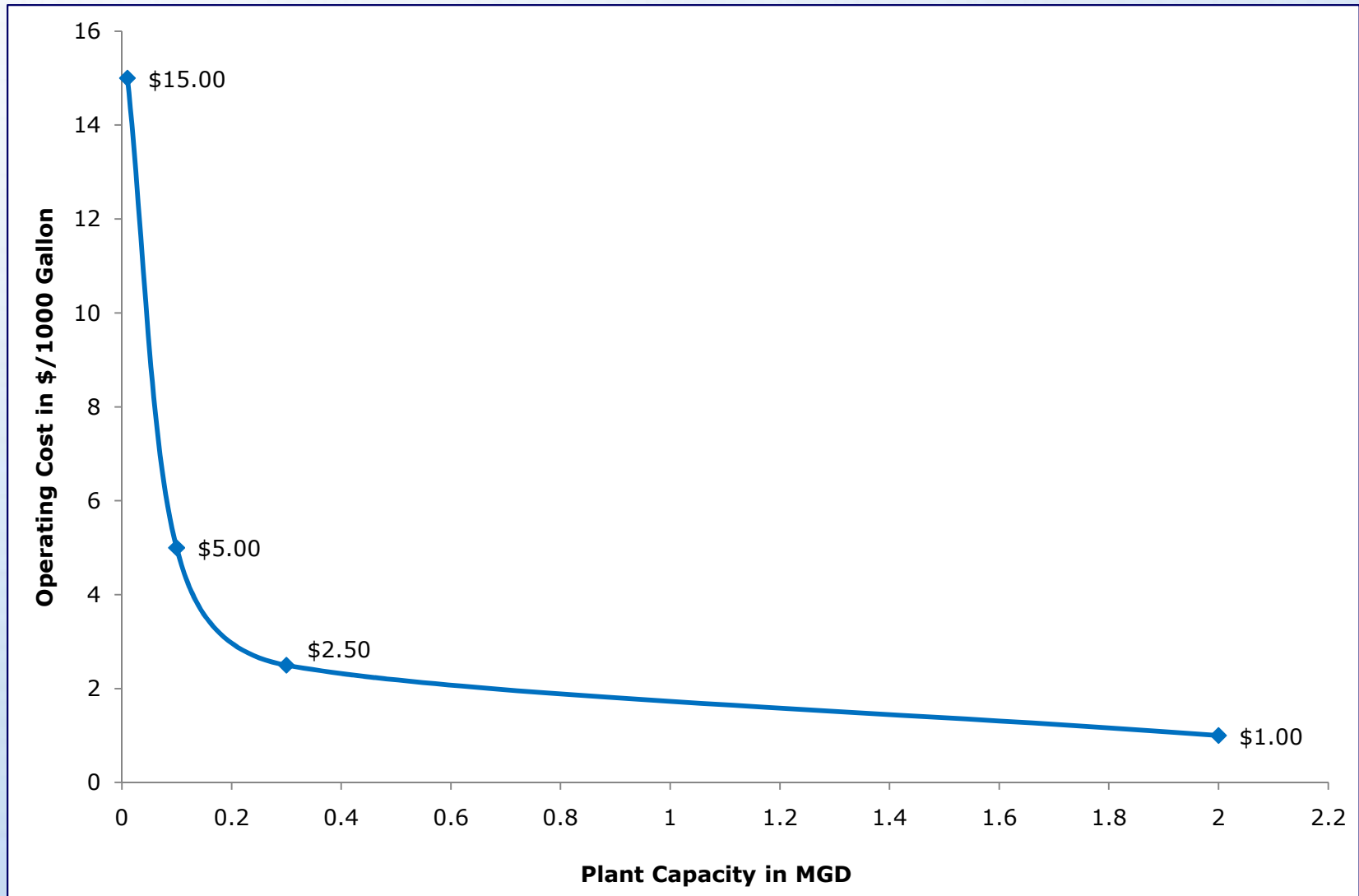
Assumptions for Cost Estimates

- ◆ **Pressure Sewer System**
- ◆ **Areas 1A, 1B & 3 assumed to qualify for Rural TWDB Loan (40 years; 3.92% interest)**
- ◆ **Contingency 15%**
- ◆ **Professional Services 20%**
- ◆ **City of Port Lavaca Sewer Fee: \$14 for first 2000 Gallons and \$4.90 per 1000 gallons afterwards**
- ◆ **For users outside city limits, wastewater rate is 1.5 times that of user within city limit**

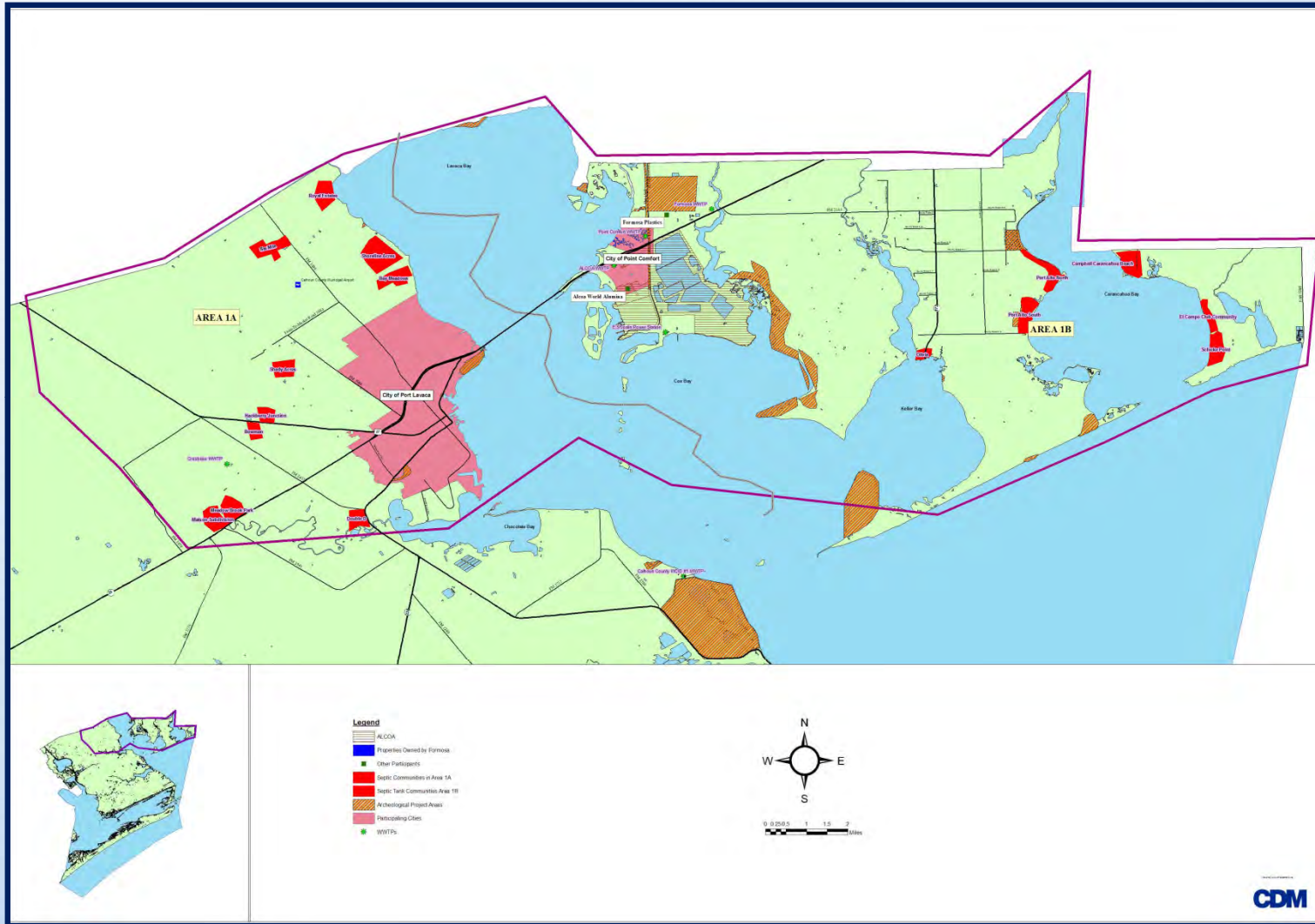
Capacity of WWTP vs. Cost per Gallon



O&M Cost for WWTP Operation



Area No. 1 Regional Options



Area No. 1A & 1B Regional Options

Wastewater Service

- 1) City of Port Lavaca provide wastewater service to Royal Estates, Shoreline Acres, Bay Meadows, Double D, Shady Acres, Meadow Brook Park, Bowman, Hackberry Junction, Matson Subdivision & Six Mile Area**
- 2) Install small package plant to serve Royal Estates, Shoreline Acres, Bay Meadows & Six Mile Area**
- 3) Crestview WWTP extend service to Meadow Brook Park, Bowman, Hackberry Junction & Matson Subdivision**
- 4) Install small package plant to serve Olivia and Port Alto WSC**

Area No. 1A & 1B Regional Options

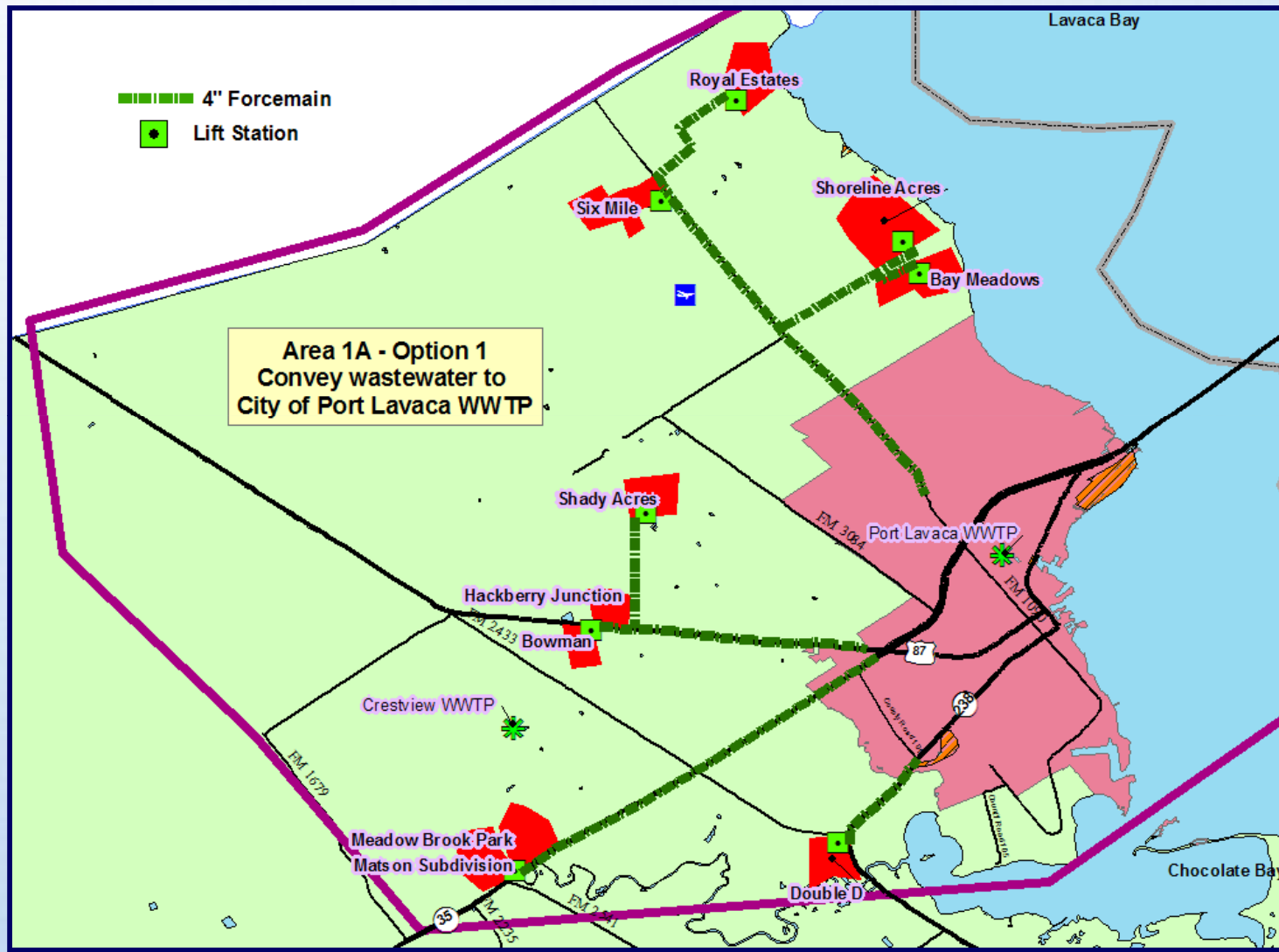
Wastewater Service (Cont.)

- 5) City of Point Comfort provide centralized wastewater service to Port Alto WSC, Olivia, and other developments in the area**
- 6) Install small package plant to serve Campbell Carancahua Beach Subdivision, El Campo Club Community & Schicke Point Community**

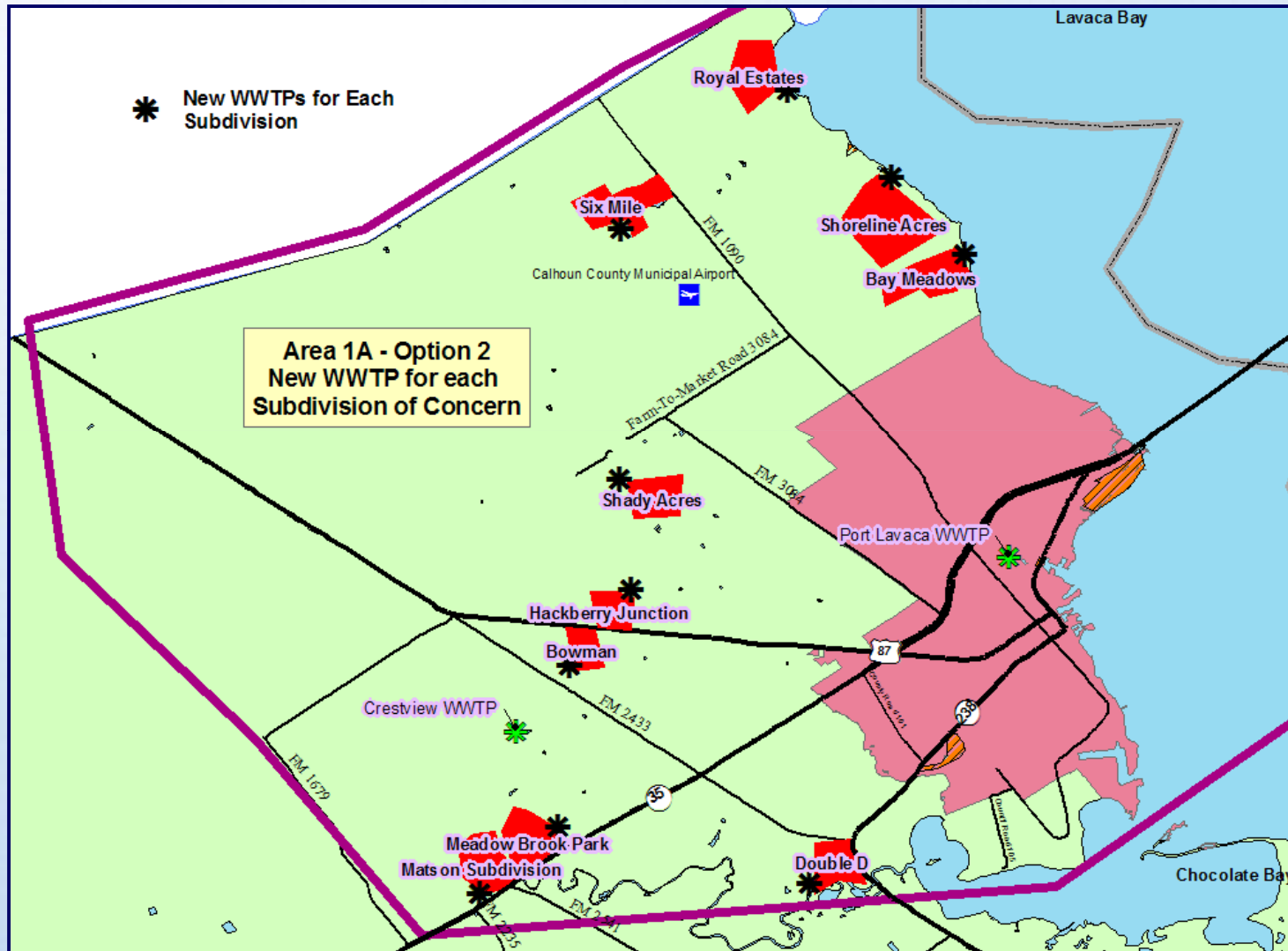
Reclaimed Water

- 1) Stand-alone alternative**
- 2) Formosa Plastics and Alcoa receive treated effluent/reuse from Cities of Point Comfort and Port Lavaca**

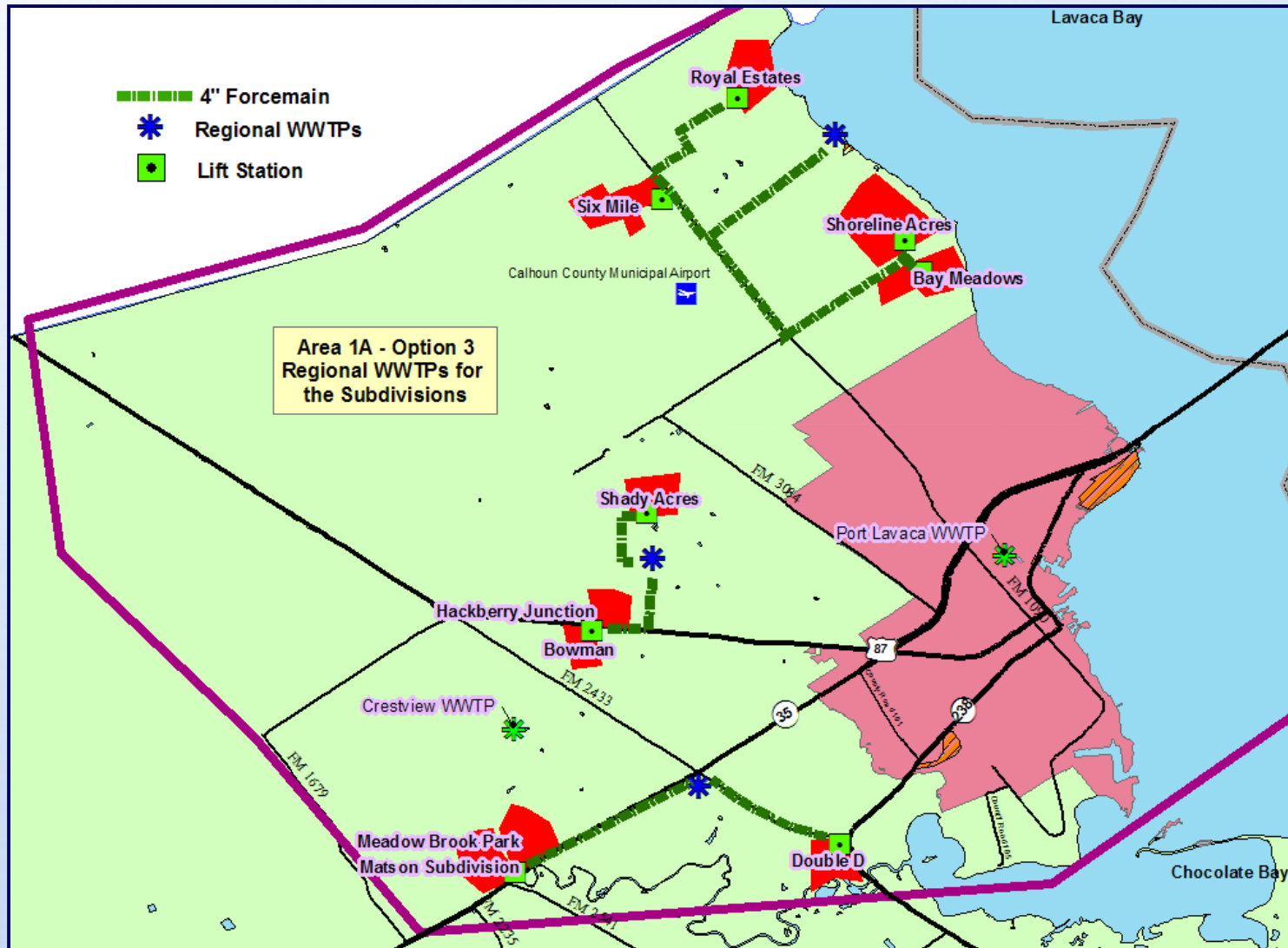
Area 1A – Option 1



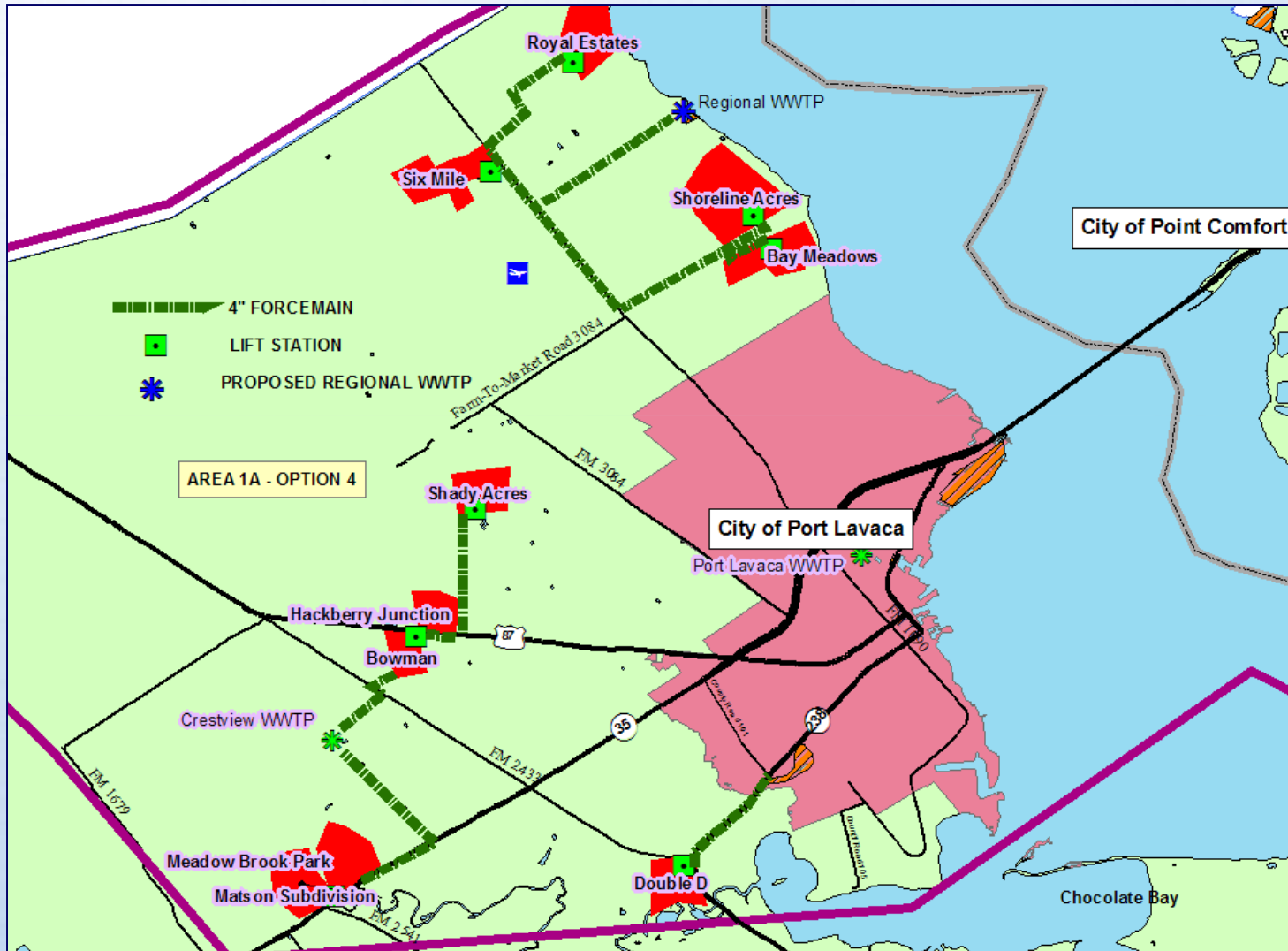
Area 1A – Option 2



Area 1A – Option 3



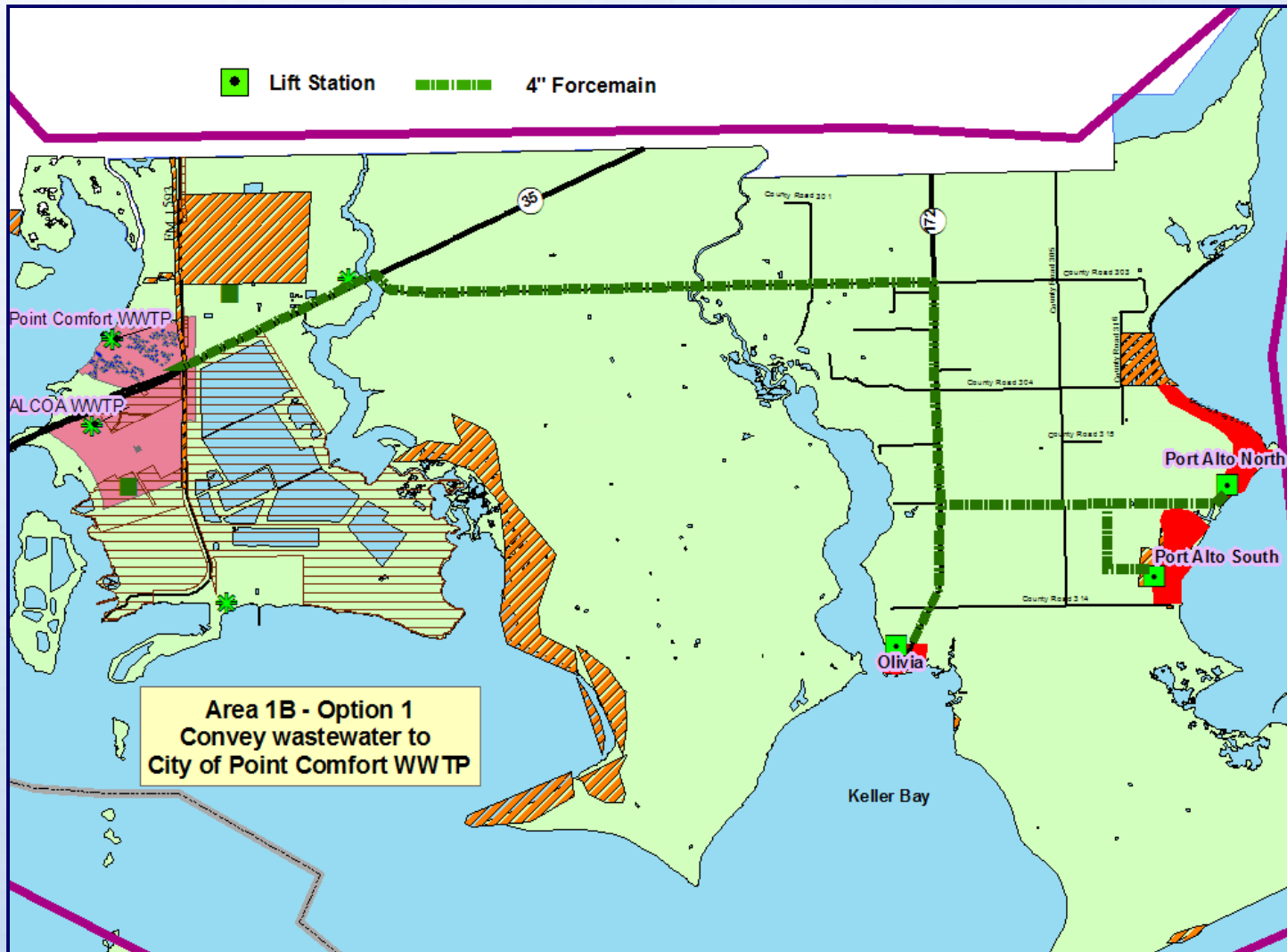
Area 1A – Option 4



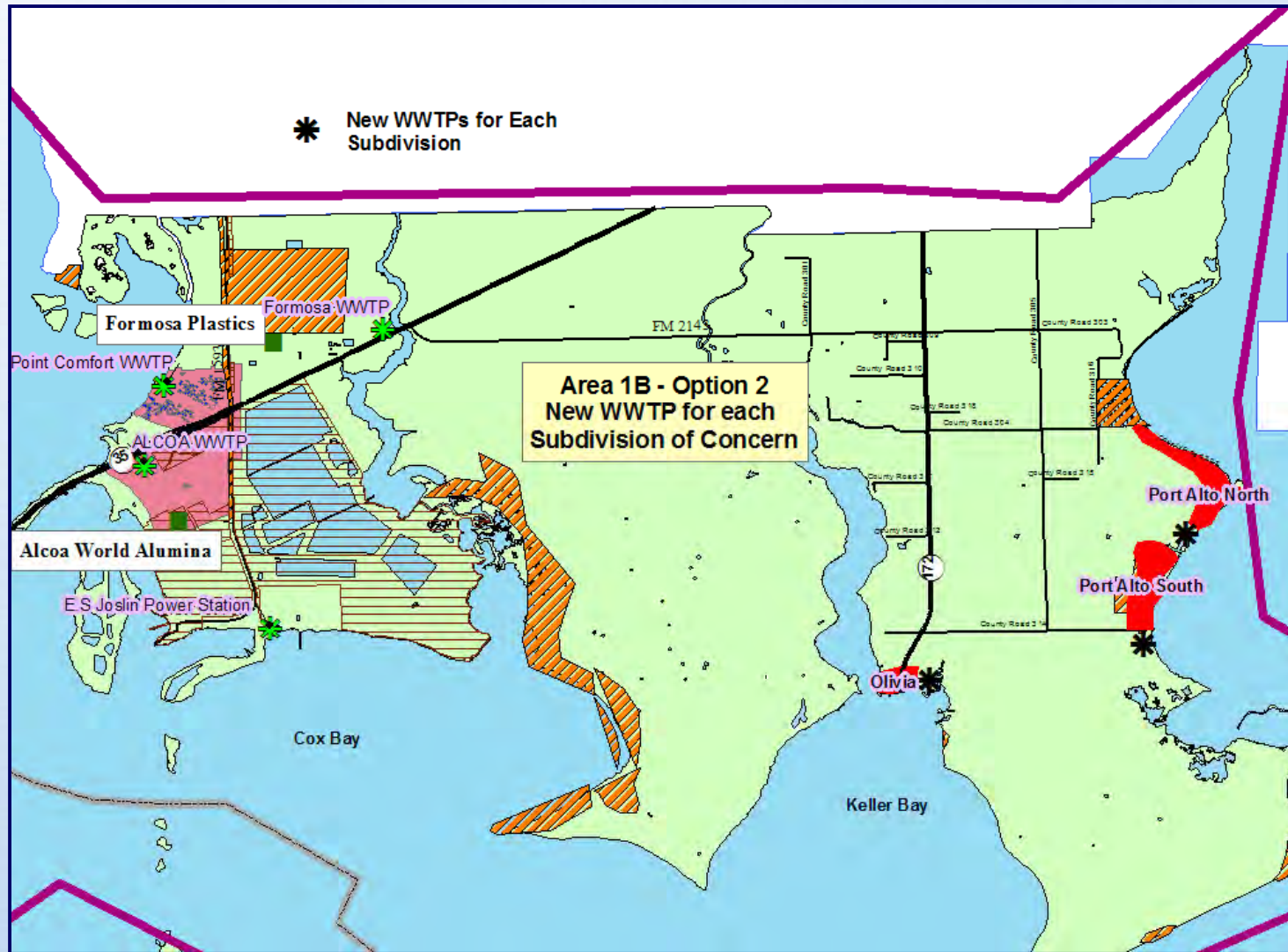
Cost Comparisons for Area 1A

Subdivision	Option 1	Option 2	Option 3	Option 4
Double D	\$123.51	\$177.08	\$157.35	\$123.51
Matson	\$141.05	\$186.11	\$157.40	\$134.05
Meadow Brook	\$137.14	\$186.11	\$154.78	\$130.79
Royal Estate	\$190.91	\$186.11	\$183.87	\$183.87
Shoreline Acres	\$129.57	\$177.08	\$148.10	\$148.10
Six Mile	\$127.66	\$177.08	\$139.72	\$139.72
Hackberry Junction	\$132.96	\$186.11	\$166.36	\$134.05
Bay Meadows	\$154.13	\$186.11	\$173.27	\$173.27
Bowman	\$140.60	\$186.11	\$173.64	\$134.05
Shady Acres	\$164.08	\$186.11	\$179.96	

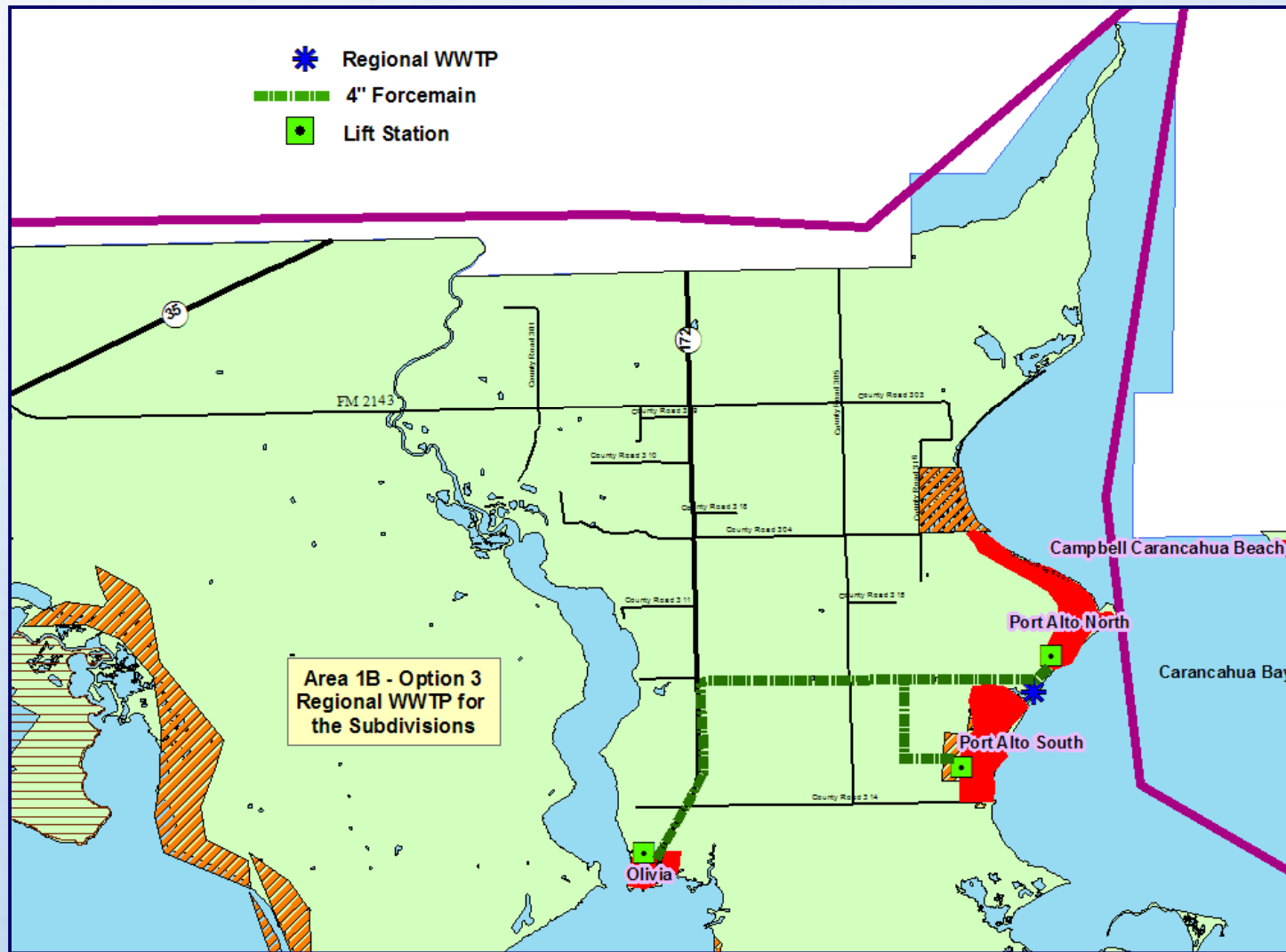
Area 1B - Option 1



Area 1B – Option 2



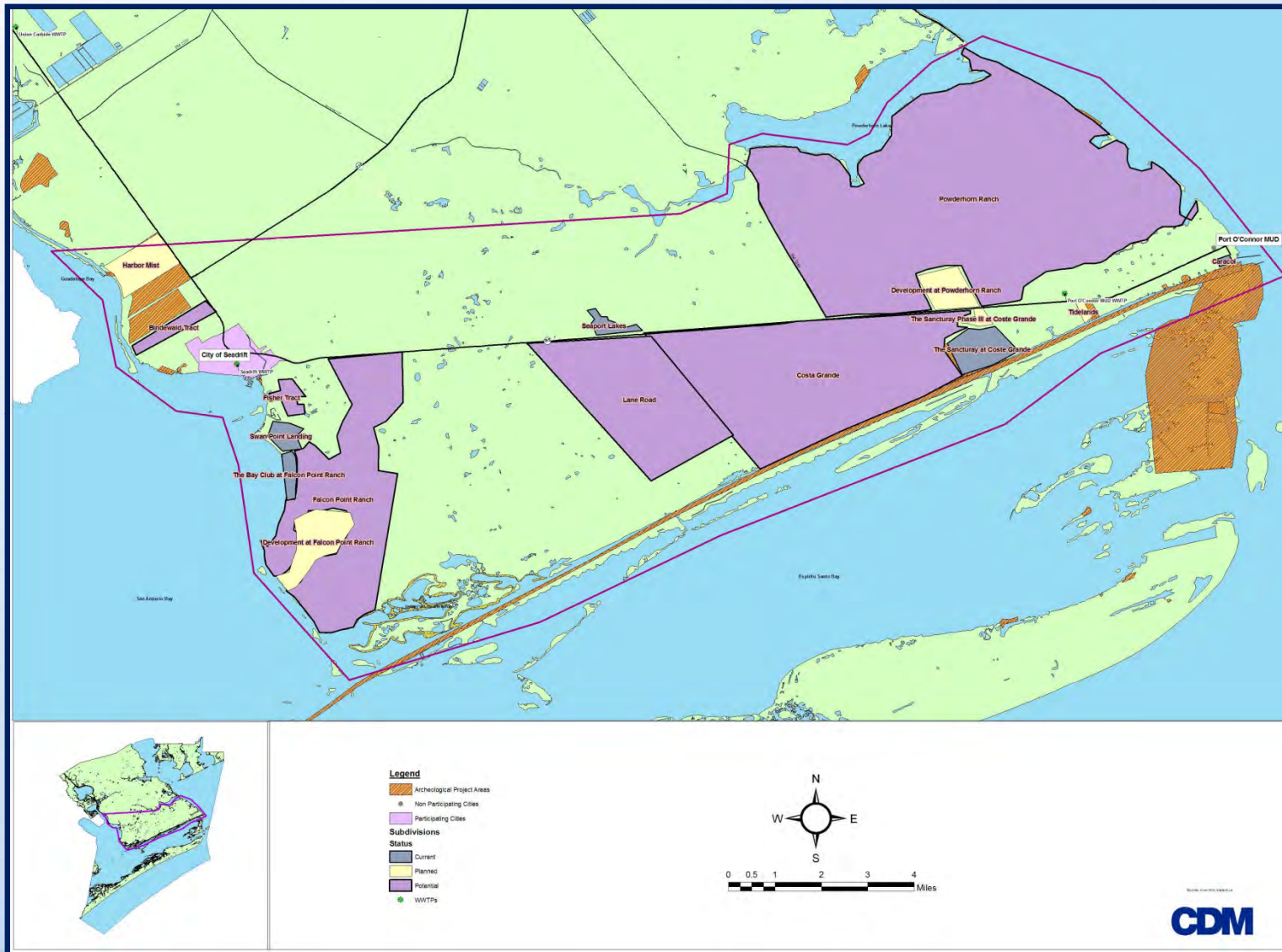
Area 1B – Option 3



Cost Comparisons for Area 1B

Subdivisions	Option 1	Option 2	Option 3
Olivia	\$136.24	\$145.22	\$142.13
Port Alto South	\$100.14	\$142.22	\$109.07
Port Alto North	\$92.88	\$177.08	\$106.97

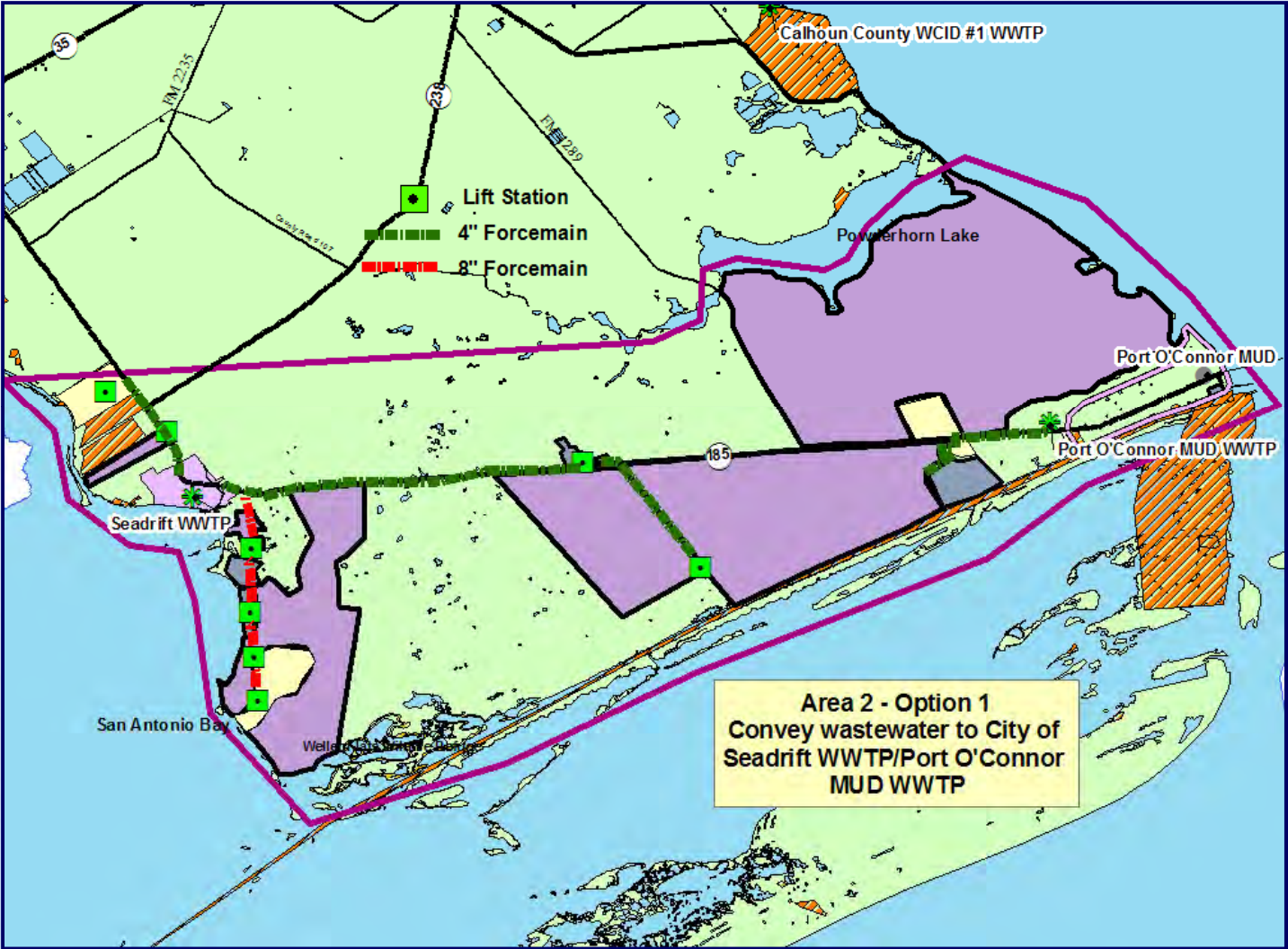
Area No. 2 Regional Options



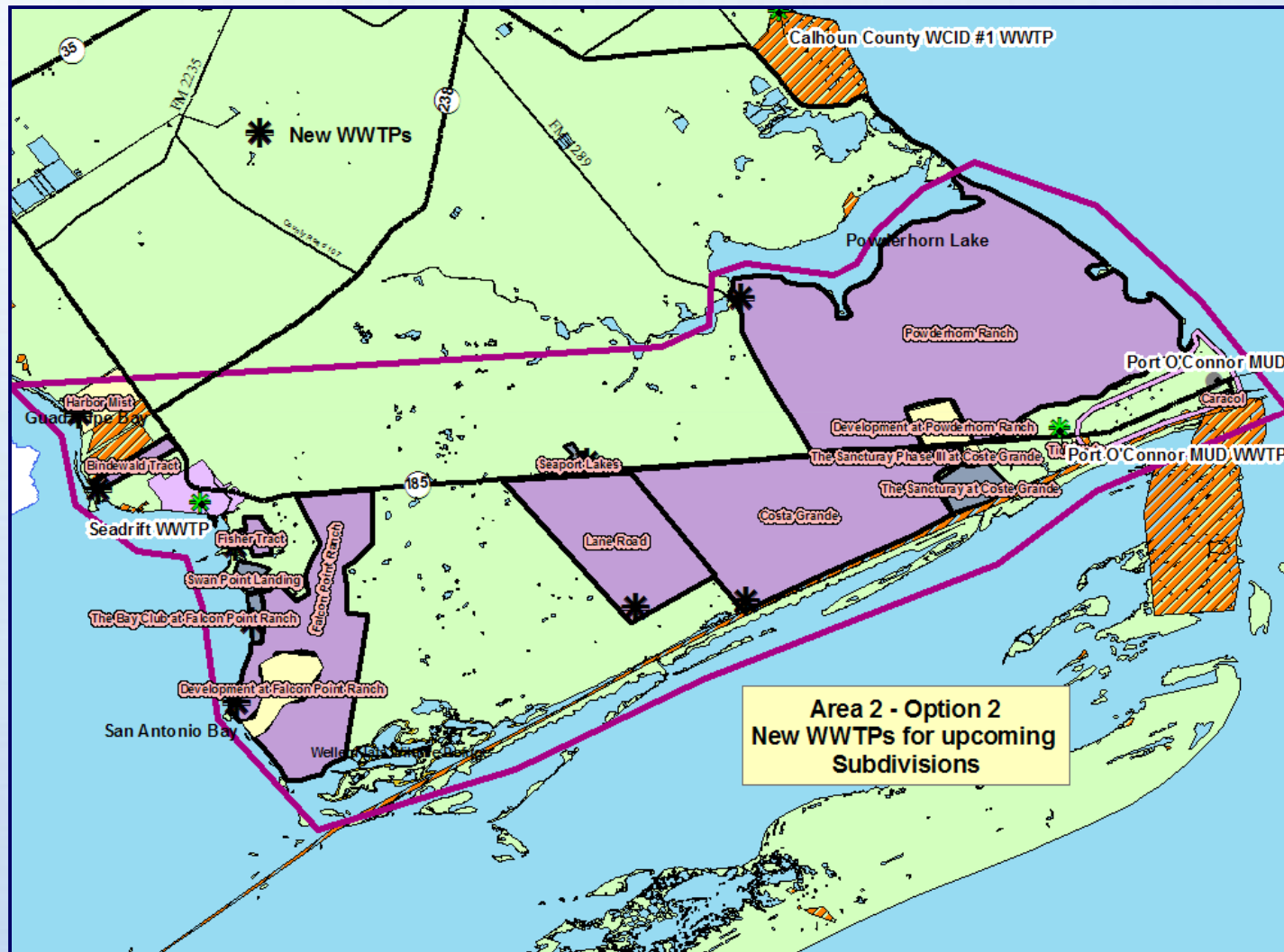
Area No. 2 Regional Options

- 1) a. City of Seadrift serve Swan Point Landing, Falcon Point and others located in close proximity**
- b. Port O'Connor MUD extend wastewater service west along Highway 185 to Lane Road Development, The Sanctuary, Powder Horn Ranch & Costa Grande**
- 2) City of Seadrift and Port O'Connor MUD provide wastewater service to their existing areas; install package plant near Lane Road Development to serve developments along Highway 185**

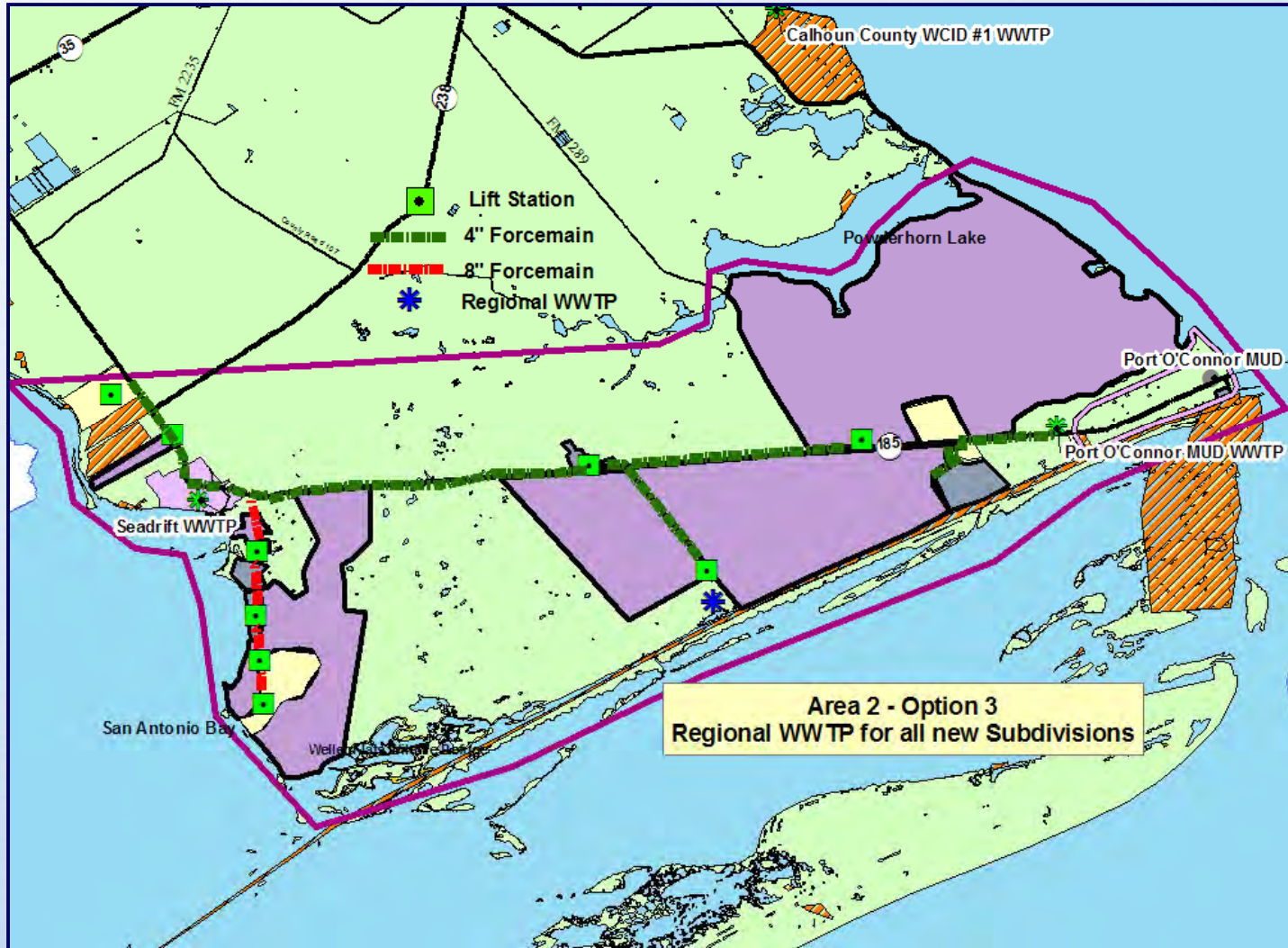
Area 2 – Option 1



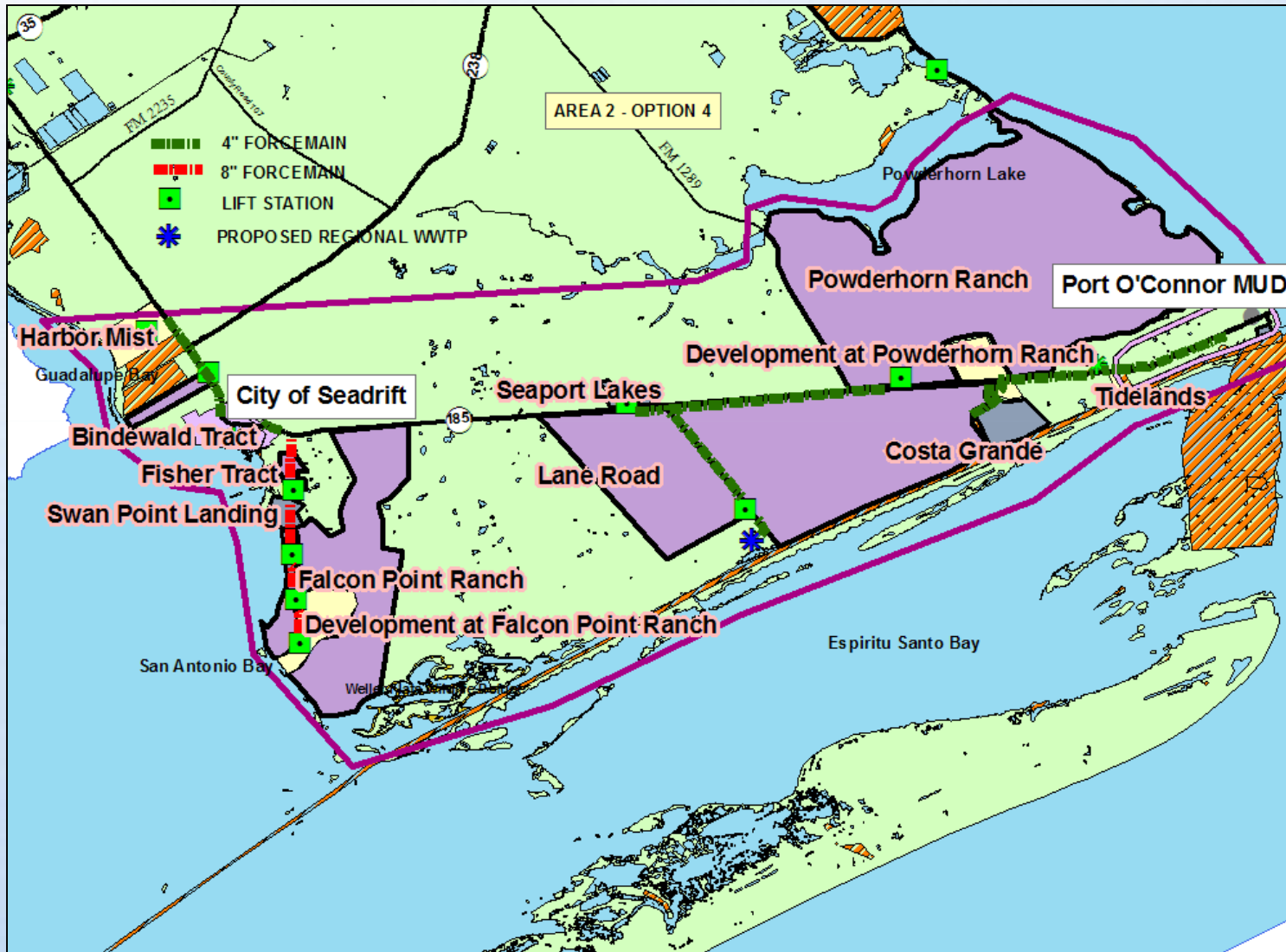
Area 2 – Option 2



Area 2 - Option 3



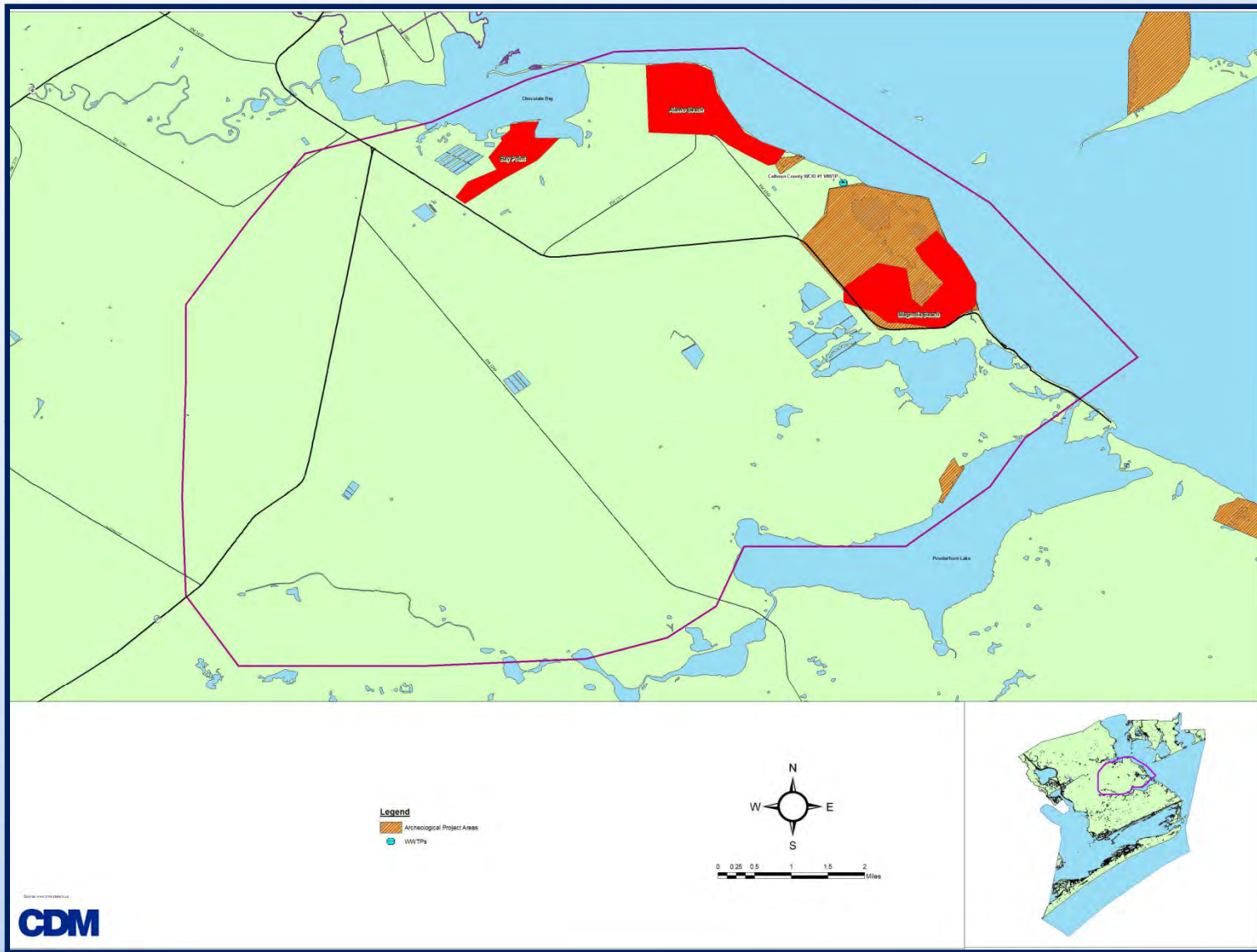
Area 2 - Option 4



Cost Comparisons for Area 2

Subdivisions	Option 1	Option 2	Option 3	Option 4
Harbor Mist	\$171.10	\$180.85	\$119.02	\$171.10
Bindewald	\$162.52	\$170.96	\$107.85	\$162.52
Fisher	\$166.48	\$170.96	\$111.81	\$166.48
Swan Point Landing	\$257.69	\$224.96	\$186.20	\$257.69
Falcon Point	\$146.08	\$104.77	\$89.47	\$146.08
Seaport Lakes	\$296.69	\$224.96	\$194.67	\$202.27
Lane Road	\$158.71	\$159.93	\$96.27	\$103.88
Costa Grande	\$142.35	\$81.17	\$81.48	\$89.09
Powderhorn	\$150.79	\$141.29	\$116.99	\$124.59

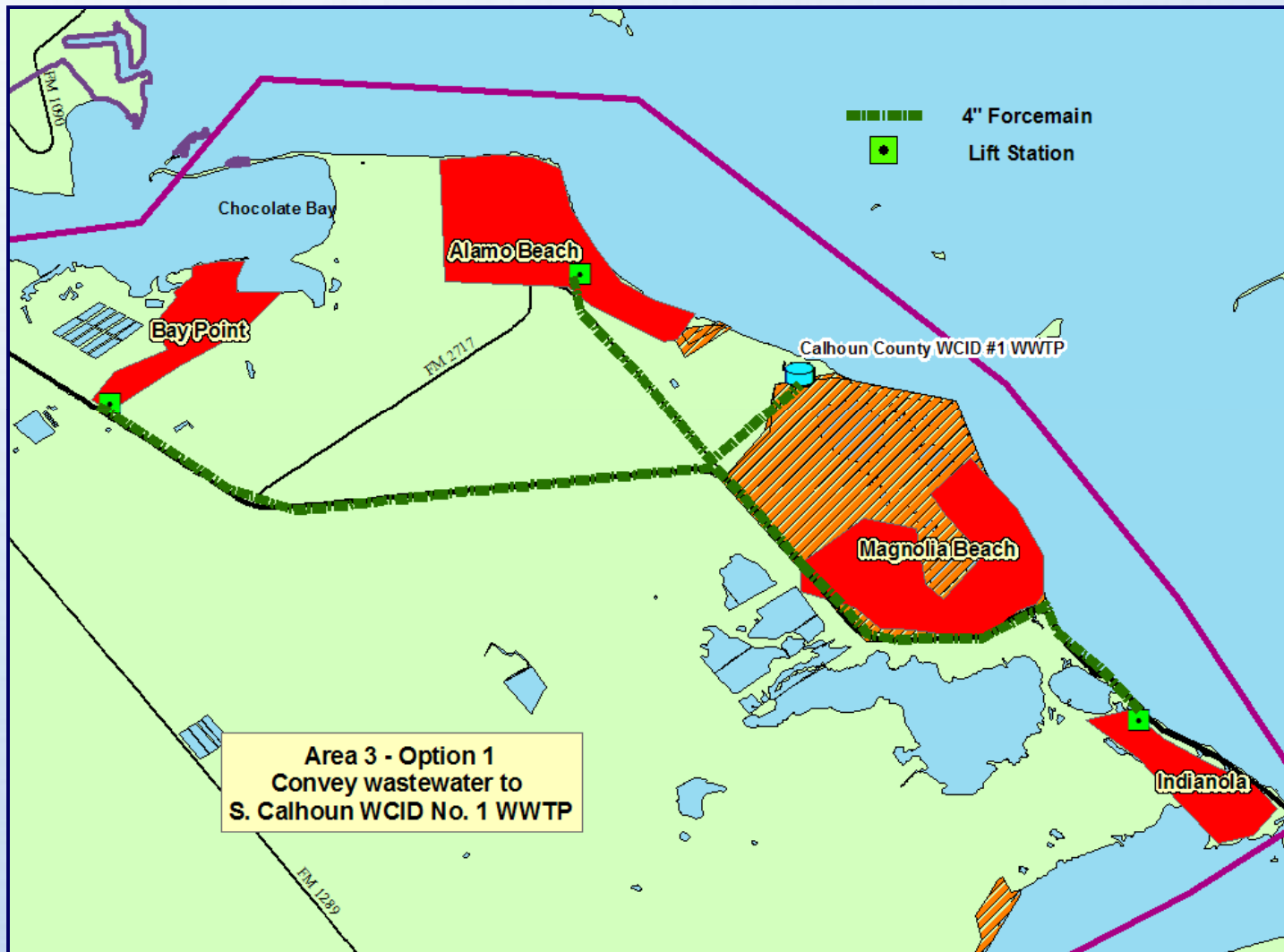
Area No. 3 Regional Options



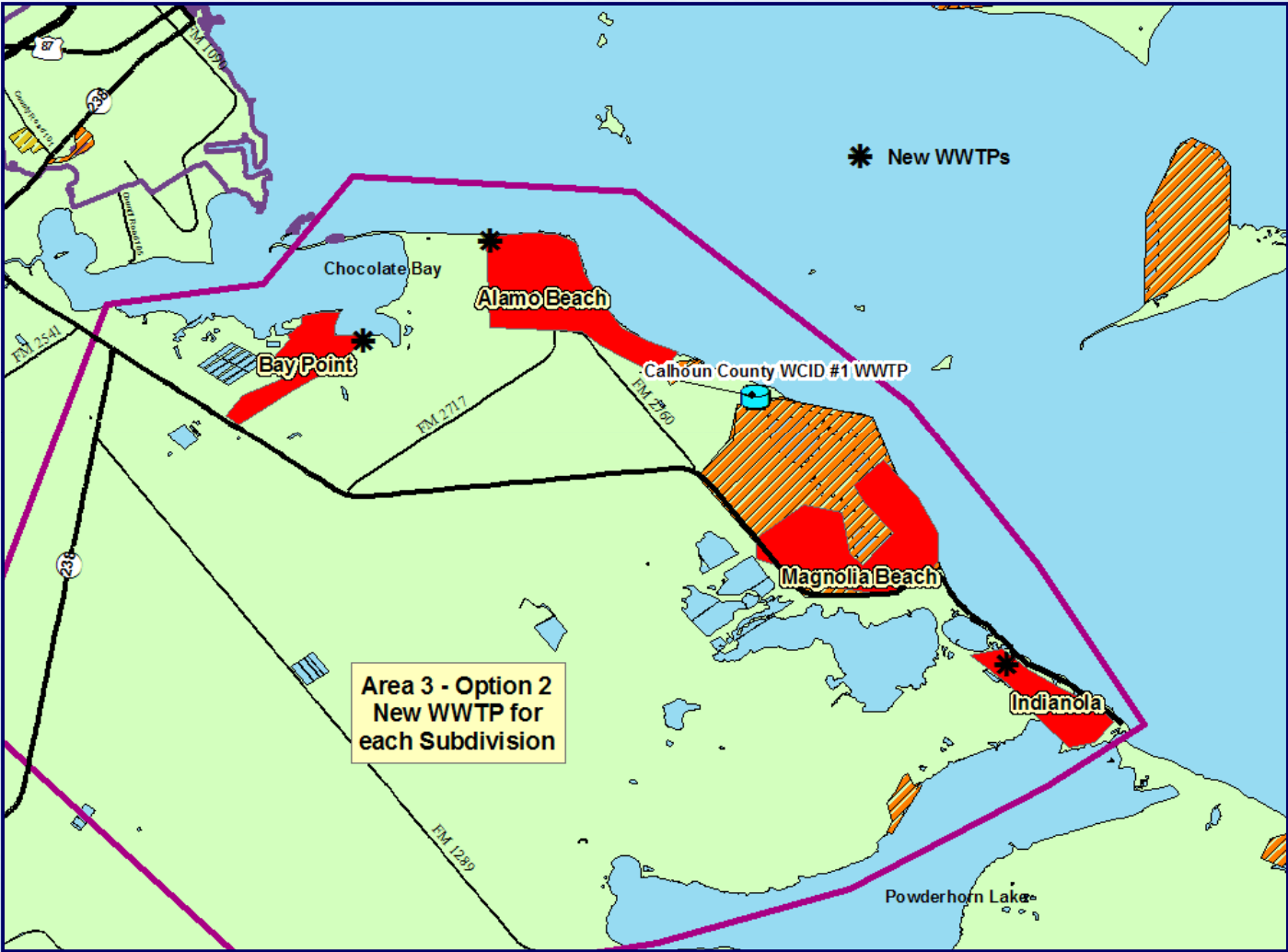
Area No. 3 Regional Options

- 1) Magnolia Beach WWTP expand its system to serve Indianola, Alamo Beach, Baypoint Subdivision and other areas on septic systems**

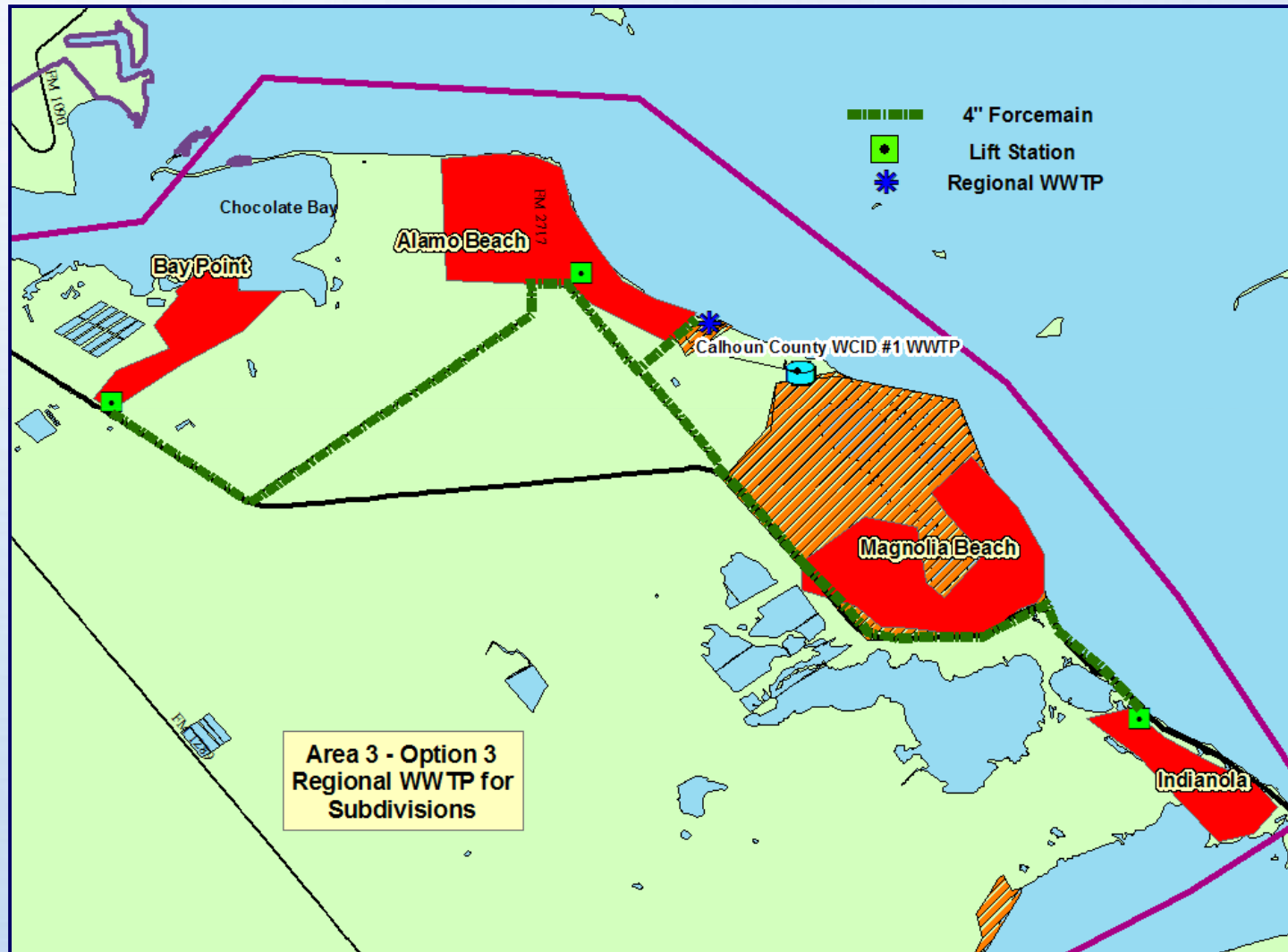
Area 3 - Option 1



Area 3 – Option 2



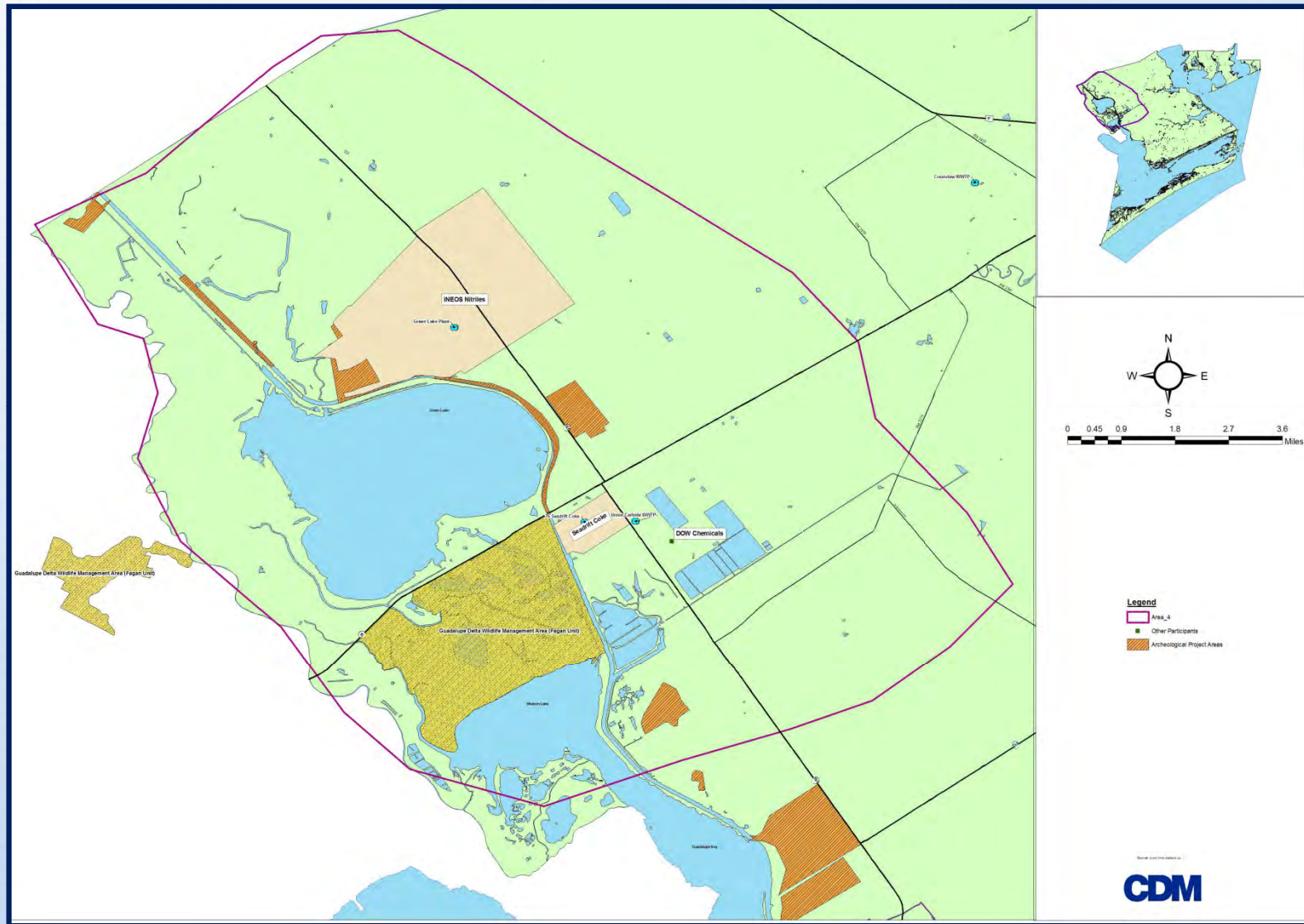
Area 3 - Option 3



Cost Comparisons for Area 3

Subdivisions	Option 1	Option 2	Option 3
Indianola	\$97.08	\$129.30	\$146.46
Alamo Beach	\$83.47	\$139.05	\$132.84
Bay Point	\$79.04	\$139.05	\$128.41

Area No. 4 Regional Options



Area No. 4 Regional Options

- 1) Construct small package plant to provide centralized wastewater service to 300 acre site adjacent to INEOS Nitriles.**
- 2) Dow Chemical and Seadrift Coke receive treated effluent/reuse from the City of Seadrift WWTP and new INEOS Nitriles package plant.**

Cost Comparisons for Area 4

Type of Activity	Option 1	Option 2
Reclaimed water from City of Port Lavaca WWTP	\$878.90*	\$632.36*

* Annual cost per acre foot

Summary of Economical Options

AREA 1A

- Double D conveys to Port Lavaca WWTP
- Matson, Meadow Brook, Bowman and Hackberry Junction
- Convey wastewater to Crestview WWTP
- Shoreline Acres, Six Mile, Bay Meadows and Shady Acres
- Convey wastewater to Port Lavaca WWTP
- Royal Estates can have its own package plant

AREA 1B

- All subdivisions convey wastewater to Point Comfort WWTP

AREA 2

- All subdivisions convey wastewater to Regional WWTP

AREA 3

- All subdivisions convey wastewater to SCC WCID No. 1 WWTP

EPA Affordability Index

As per “National Level Affordability Criteria” under the 1996 Amendments to the Safe Drinking Water Act (Final Draft Report) from U.S. EPA, the affordability criterion for wastewater systems is:

- 2% of Median Household Income (MHI)
 - 4% benchmark for affordability for both water and wastewater
-
- ◆ **Calhoun County MHI for 2009: \$43,405.00**
 - ◆ **Monthly Affordable Wastewater bill: \$72.34
(MHI*0.02/12)**

Conclusions & Recommendations

- ◆ **The monthly cost for providing service to the proposed developments ranged from \$81.17 to \$296.69.**
- ◆ **For the proposed developments, the monthly cost to the homeowners will not be a wastewater fee; however, it will be included in the home purchase cost and collected as part of the homeowner's mortgage.**
- ◆ **The monthly costs for providing service to the existing subdivisions ranged from \$123.51 to \$183.87.**

Conclusions & Recommendations

- ◆ **For the existing subdivisions with OSSFs, it will be difficult to finance constructing a new collection/regional treatment system that results in an average monthly wastewater bill of \$72 unless grant funding can be obtained.**
- ◆ **Transporting treated effluent from the Port Lavaca WWTP across Lavaca Bay to Formosa Plastics is an expensive alternative. The average flow from the Port Lavaca WWTP is 1.11 MGD and the cost per acre-foot for this reclaimed water is \$878.9/ac-ft.**
- ◆ **A number of water reduction mechanisms were identified for the industrial project participants; further evaluation would be required to assess the viability of the proposed options.**

Industrial Water & Wastewater Findings

Alcoa – Point Comfort Operations

- 1) **Interested in source water (could be reuse water) for dust suppression and process water use**
 - Dry weather only
 - Minimal discharge due to reuse practices already implemented
- 2) **25,300 gpd dry weather**
- 3) **45,500 gpd wet weather**
- 4) **Evaluating reuse opportunity with Formosa Plastics Corporation**

Dow Chemical – Seadrift Operations

- 1) Largest water reduction potential if economically justified**
- 2) Average water usage from 2007 to 2009 varied from 10 to 27 MGD**
- 3) Substantial water use for cooling, cycles through ponds**
- 4) Average discharges**
 - Treated effluent: 1 MGD
 - Cooling water: 3.5 to 4 MGD
- 5) Potential water reduction strategies:**
 - Use treated effluent to supplement cooling water
 - Consider recirculating coolers (cooling towers, wet surface air coolers)

Formosa Plastics Corporation

- 1) Needs additional water supplies**
- 2) Cooling tower blowdown available for re-use**
- 3) Average site water usage 33 MGD; 16 process units**
- 4) Cooling towers are significant water user**
- 5) Multiple waste streams reused internally**
 - Condensate
 - Biological treatment effluent
 - Sanitary
 - Boiler blowdown
 - Backwash
 - Stormwater
- 6) Additional reuse opportunities being considered**
- 7) Site discharge is 20% of water usage (7.6 MGD):
Internal reuse and evaporative losses**
- 8) Effluent TDS = 17,000 mg/L (limited reuse opportunities)**

INEOS Nitriles

- 1) Can provide land for reuse water storage or treatment facilities**
- 2) Potential to supply effluent to other facilities for reuse**
 - Treated sanitary effluent and utility wastewaters (0.5 MGD average)
 - Stormwater
- 3) Would need to conduct a water balance study to evaluate reuse opportunities**

Seadrift Coke, L.P.

- 1) Interested in opportunities to reduce costs for purchased water and implementing water reduction strategies**
- 2) Treated effluent is a potential candidate for reuse**
 - Currently uses carbon polishing to insure compliance with effluent limits
 - Effluent TDS < 1,000 mg/L
- 3) Would need to conduct a water balance study to evaluate reuse opportunities**

Funding Opportunities

Q&A Discussion

Next Steps

Project Contacts

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**Calhoun County Regional Wastewater Facility Study
Project Meeting
August 11, 2011**

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