



# **The Vellela Epsilon Project: Pioneering Offshore Aquaculture in the Southeastern Gulf of Mexico**

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# Velella Epsilon Project

- ❖ Objectives
- ❖ Description Overview
- ❖ Production Summary
- ❖ Environmental Permitting Process
- ❖ Siting Analysis & Coordination
- ❖ Deployment & Staging Area
- ❖ Stakeholder Outreach & Engagement
- ❖ Proposed Schedule
- ❖ Project Outcomes
- ❖ VE Project Team Commitments
- ❖ Acknowledgements



# Velella Epsilon Project

*Laying the Groundwork for Wider Acceptance*

## Objective:

- A. Validate the feasibility of a temporary, small-scale, demonstration net pen to stock, culture, and harvest a Federally managed species (Almaco jack; *Seriola rivoliana*);







# Velella Epsilon Project

*Laying the Groundwork for Wider Acceptance*

## Objective:

- B. Serve as an educational platform for the promotion of rational aquaculture policies, by providing a working net pen example to politicians, constituents, journalists, and other influencers of policy or public perceptions, as well as the local community;



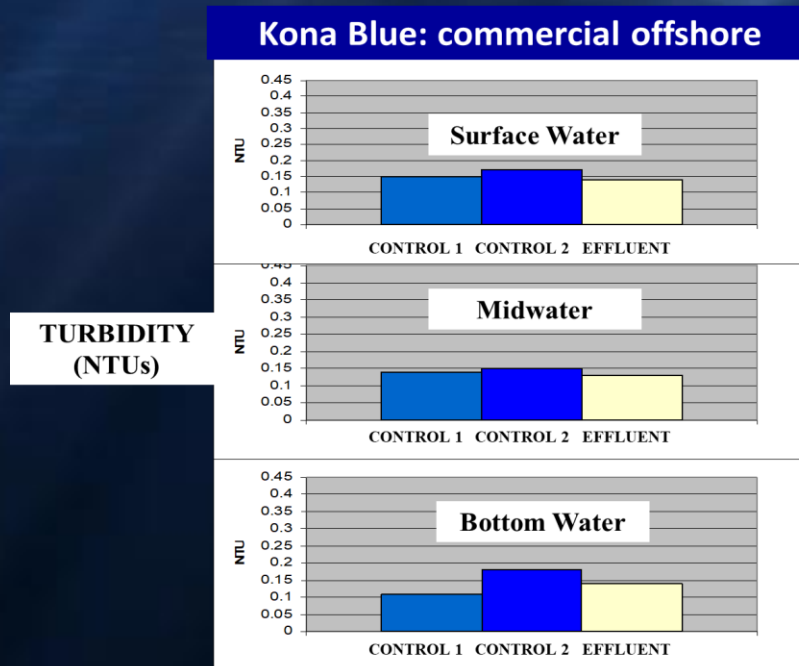


# Velella Epsilon Project

*Laying the Groundwork for Wider Acceptance*

## Objective:

- C. Serve as a demonstration platform for data collection of water quality, potential benthic impacts, and marine mammal and fish stock interactions resulting from offshore aquaculture in the GOM;







# Velella Epsilon Project

*Laying the Groundwork for Wider Acceptance*

## Objective:

- D. Provide local recreational, charter, and commercial fishing communities with evidence of the benefits of aquaculture, through the Fish Aggregation Device (FAD) effects of the project, and by documentation of fish aggregation and fishing boat activity around the VE Project; and



Velella Beta Test



Velella Gamma Test



# Velella Epsilon Project

## Objective:

- E. Increase public awareness of, and receptivity towards, offshore aquaculture and the need to grow more seafood in U.S. waters, by providing public tours of the offshore operation, including (possibly) snorkeling inside the net pen, and fee fishing.



Velella Beta Test





# Velella Epsilon Project

## Description Overview:

- Using a single net pen (PolarCirkel-style)
  - offshore-strength submersible system,
  - 17 m diameter x 7 m depth (deep),
  - effective volume  $\sim 1,600 \text{ m}^3$
- Located  $\sim 40$  nautical miles southwest of Sarasota, Florida;
- In  $\sim 40$  m (130 to 135 ft) water depth;
- On a multi-anchor (3) swivel (MAS)-point mooring system;
- Using concrete block anchor mooring; and serviced by a
- Tender vessel/feed barge tethered to side of net pen system

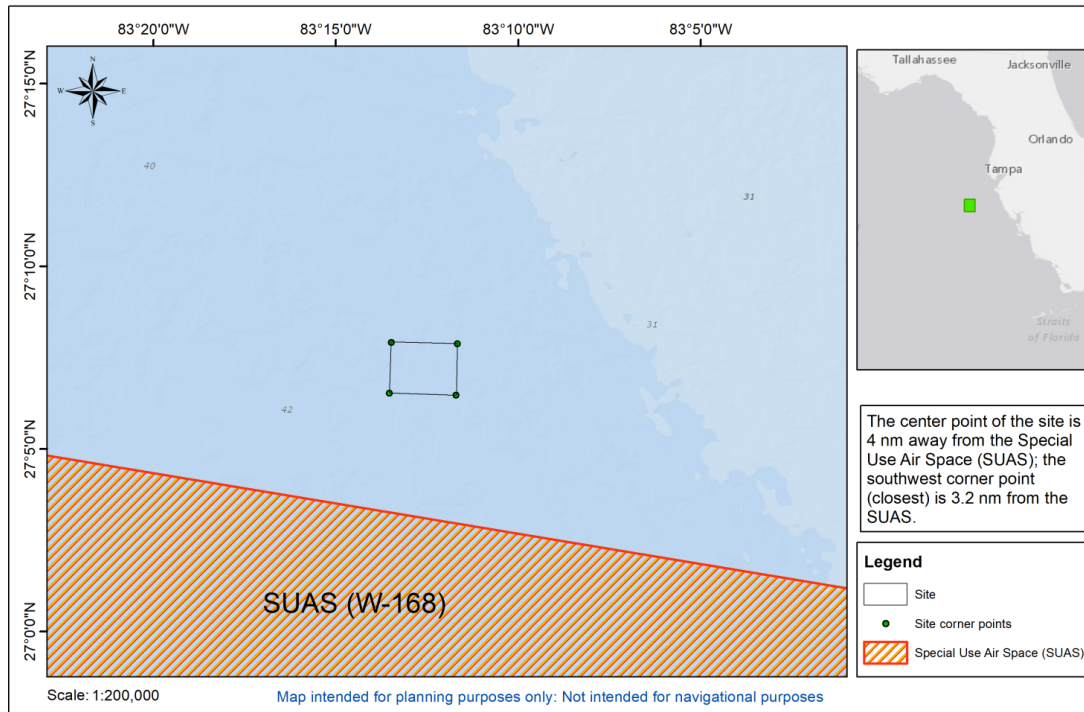




# Velella Epsilon Project

## Description Overview:

Proposed Site Location



However...this is the Conclusion of a very Comprehensive Process



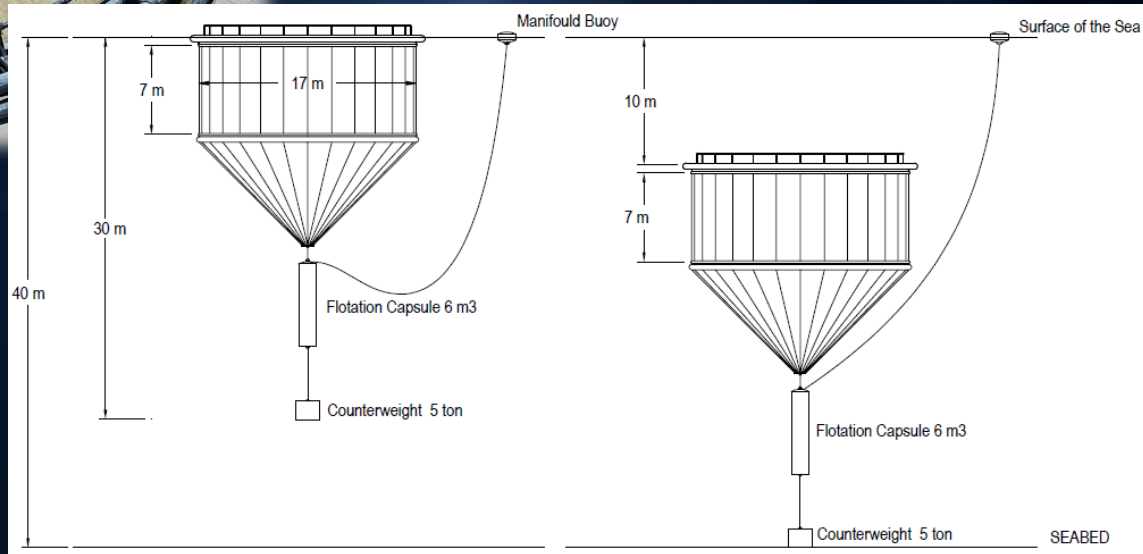
# Velella Epsilon Project

## Description Overview:

- ❑ Brass (copper-zinc alloy) Net Mesh



- ❑ Net Pen Engineering Design



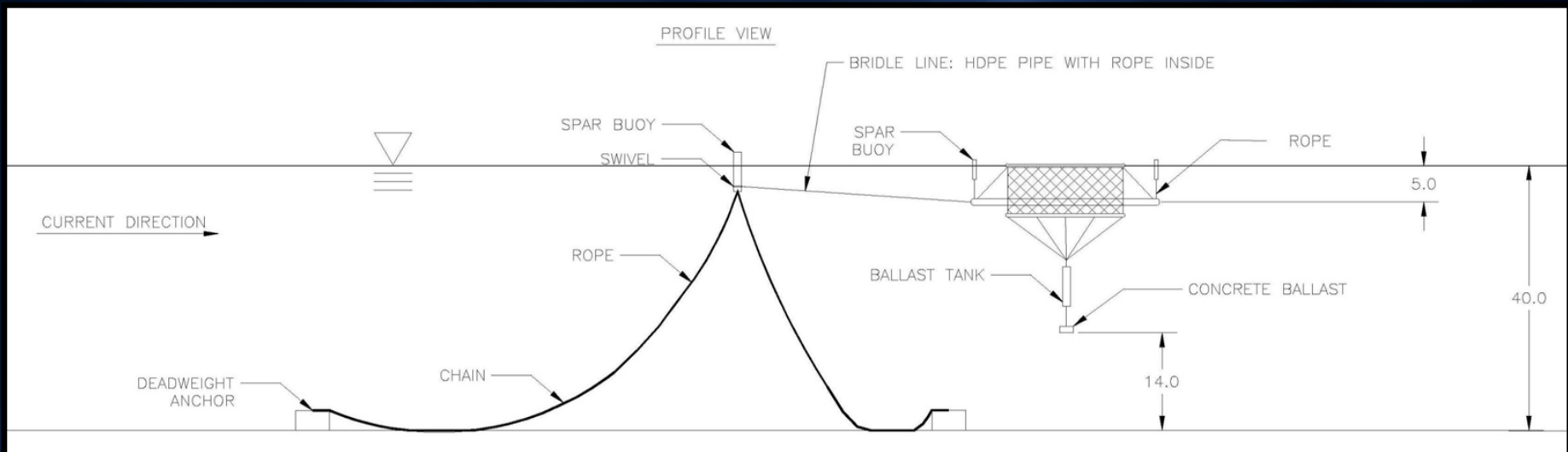


# Velella Epsilon Project

## Description Overview:

- Structural Integrity Highlights:
  - Withstand 200-Year Storm Submerged 40 Feet Below Surface
  - Three (3) Concrete Mooring Blocks
    - ✓ MAS ensures Net Pen Array can Pivot in Watch-circle
    - ✓ Swivel Ring Shackle & MAS Mooring Line (4.6" diameter)

## Engineering Mooring Design







# Velella Epsilon Project

## Production Summary:

- Rearing one (1) Single Cohort
  - Almaco jack (*Seriola rivoliana*; i.e., kampachi)
- Growout period of ~ 12 months from Net Pen Deployment
- 20,000 fish/cohort stocked x 85% survival rate = 17,000 fish
- 4.4 lbs/fish at harvest x 17,000 fish = 74,800 lbs Total Harvest





# Velella Epsilon Project

## Environmental Permitting:

- Funding Awarded and VE Project Initiation (10/10/17)
- NOAA Fisheries - Gulf Aquaculture Permit (GAP), or an Exempted Fishing Permit (EFP) –
  - At that time, the Lead Agency for Aquaculture in Federal Waters and for the VE Project
  - Pre-Application Kickoff Teleconference (11/01/17)
    - Review Project Scope; Identify Cooperating Agencies; Review Schedule; Identify other Federal and state Permits, Certifications, or Requirements; and Identify Briefing Requirements for the Gulf of Mexico Fisheries Management Council (GMFMC)
  - EFP Application submittals (01/12/18 and 04/01/18)
  - GMFMC Presentation #1 (New Orleans) – Received a list of data needs (02/01/18)
  - GMFMC Presentation #2 (Ocean Springs) – Received a Unanimous Vote/ Recommendation by the Council for NOAA Fisheries to approve the EFP (04/20/18)
  - Multiple Aquaculture EFP Interagency Coordination Meetings (teleconferences and onsite meetings)
  - However, as of the 09/25/18 U. S. District Court, Eastern District of Louisiana ruling, the EFP (and GAP) are no longer required
  - As such, USEPA is now Lead Agency; however, the Strong Collaboration with NOAA Fisheries and USACE Remains





# Velella Epsilon Project

## Environmental Permitting:

- **USEPA National Pollutant Discharge Elimination System (NPDES) Permit**
  - **USEPA Form 1 and USEPA Form 2B**
    - **Multiple submittals (05/18/18, 10/27/18, and 11/09/18)**
    - **Application considered complete (11/09/18)**
  - **Baseline Environmental Survey (BES) and Report**
    - **Compliant with the “*BES Guidance and Procedures for Marine Aquaculture Activities in U.S. Federal Waters of the Gulf of Mexico*”, October 24th, 2016**
      - **Single beam bathymetry, side scan sonar,**
      - **Sub-bottom profiler (seismic reflection), and**
      - **Magnetometer data**
      - **Hydrographic Data**
    - **Multiple interagency review and coordination meetings**
      - **Archaeological Review with FL SHPO and Dr. Gordon Watts (10/05/18)**
    - **Multiple BES Report iterations and submittals**
    - **Final BES Report (10/26/18)**
  - **BMP Plan, Environmental Monitoring Plan, Emergency Response Plan, Quality Assurance Plan (all currently in progress and to be completed by month end)**





# Velella Epsilon Project

## Environmental Permitting:

- USEPA – (NMFS/USACE/USFWS) Endangered Species Act (ESA) Section 7 Consultation (Informal) and Concurrence
- USEPA – (NMFS/USACE) Marine Mammal Protection Act (MMPA) Compliance
- USEPA – (NMFS/USACE) National Environmental Protection Act (NEPA) Environmental Assessment (EA) with a signed Finding of No Significant Impact (FONSI)
- USEPA – (NMFS/USACE) Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Stevens Act, MSA); Essential Fish Habitat (EFH) Assessment
- USACE – (USACE/NMFS/USFWS/FWC) Section 10 Permit (05/18/18, 10/27/18, and 11/09/18)
- Kampachi Farms, LLC – (Florida State Clearinghouse) - Coastal Zone Management Act (CZMA) Coastal Consistency Determination (CCD) Concurrence and/or Waiver
  - FL SHPO - National Historic Preservation Act (NHPA) Section 106 Concurrence
  - CZMA CCD Concurrence (02/25/19)
- FDACS – Aquaculture Certificate



# Velella Epsilon Project

## Environmental Permitting:

### • Other Environmental Collaborations –

- Protected Species Monitoring Plan with NOAA Fisheries (04/16/18)
  - University Graduate Student Participation
- Close Coordination with Florida State Partners: FWC, FDACS, & FDEP
- Discussions with NOAA Fisheries & USDA to Identify an
  - Animal & Plant Health Inspection Service, and an
  - Aquatic Animal Health Expert
- NOAA NCCOS/EPA Coordination for Water Quality Effluent Estimates
- USCG Coordination with Aids to Navigation, Notice to Mariners
- Former EFP Application Transformed into the Supplemental Data Document
  - Provided to Support the FL State Clearinghouse Concurrence with the Coastal Consistency Determination for CZMA Compliance







# Velella Epsilon Project

## Siting Analysis and Coordination:

Importance of Each of these can not be Underestimated

- NOAA's National Centers for Coastal Ocean Science (NCCOS):
  - Comprehensive Alternative Siting Analysis
    - Considered Farming Parameters
      - Distance to ports of entry (POE)
      - Depth and Substrate Requirements
      - Min and Max Seawater Temperature
      - Min and Max Current Velocity
      - Max Wave Energy
      - Project Footprint
    - Utilized the Gulf AquaMapper
      - Offshore Aquaculture Screening Tool
    - Originally Identified 18 Potential Sites
    - Narrowed Possible from 6 Sites to 3 Sites
    - Finalized 2 Potential Sites for BES
      - No Overlap with Anthropogenic Structures or Activities
      - Considered Proximity to and Sensitivity with EFH
      - Deconflicted Interests with Military Areas
  - Environmental Modeling (NPDES Support)







# Velella Epsilon Project

## Siting Analysis and Coordination:

### Initiated Baseline Environmental Survey (BES)

- Site A = Preferred Site
- Site B = Alternative Sites

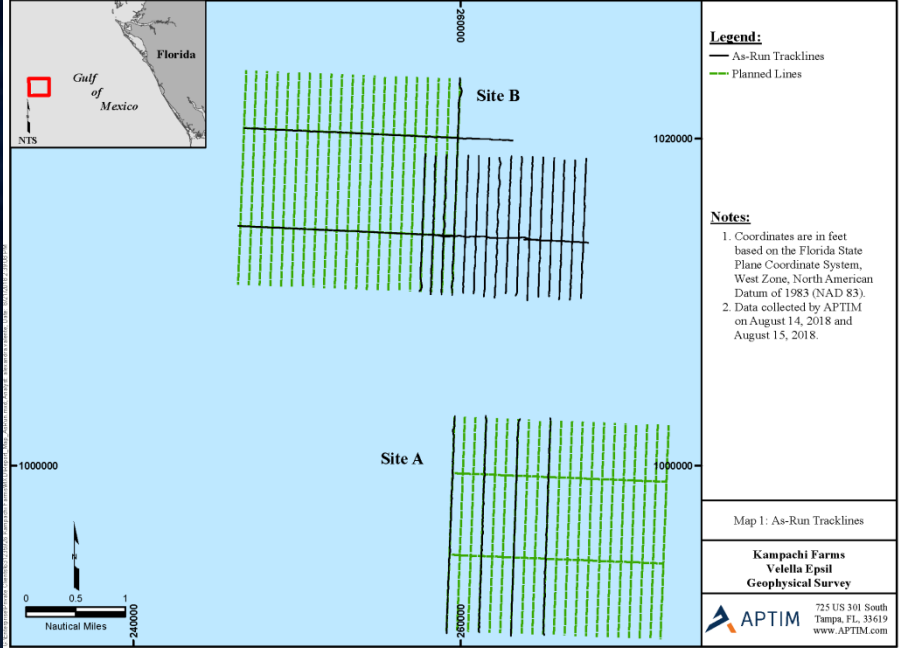




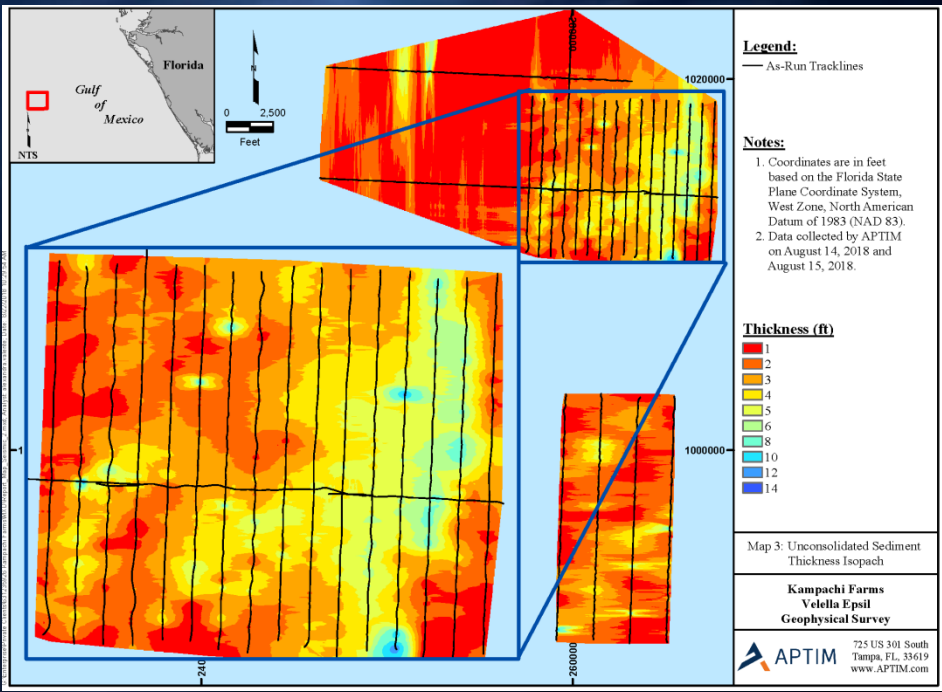
# Velella Epsilon Project

## Siting Analysis and Coordination:

☐ From Site A to Site B



☐ From Site B to Modified Site B



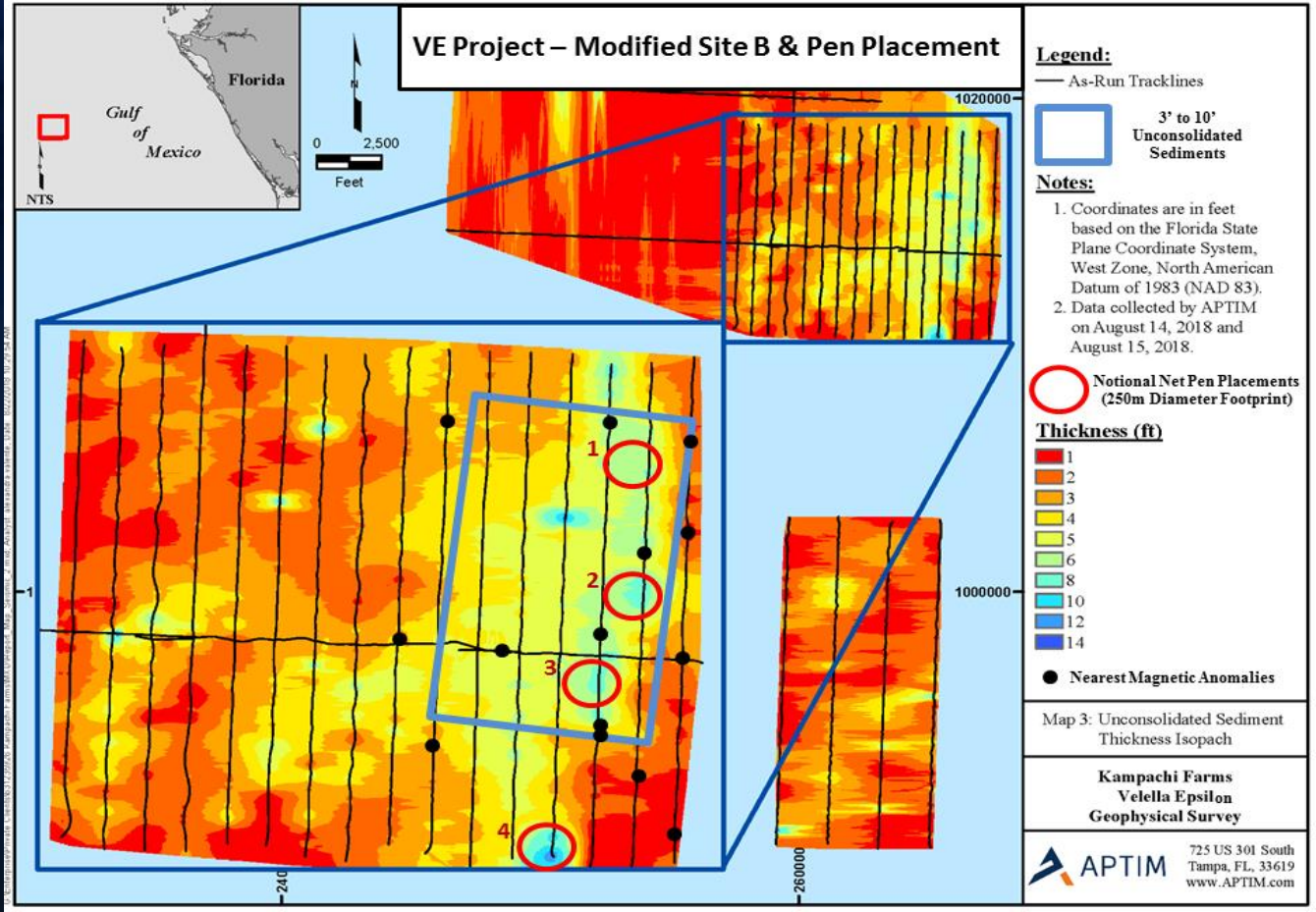




# Velella Epsilon Project

## Siting Analysis and Coordination:

☐ Modified Site B - Post Data Analysis





# Velella Epsilon Project

## Siting Analysis and Coordination:

Modified Site B Coordinates

Position	° Decimal ' Latitude	° Decimal ' Longitude	Decimal ° Latitude	Decimal ° Longitude	Perimeter (km)	Area (km <sup>2</sup> )
<b>Modified Site B from BES Report</b>						
Upper Left	27° 7.86863' N	83° 13.45827' W	27.131143° N	83.224303° W	11.1571	7.7237
Upper Right	27° 7.83079' N	83° 11.63237' W	27.130512° N	83.193872° W		
Lower Right	27° 6.43381' N	83° 11.69349' W	27.107230° N	83.194890° W		
Lower Left	27° 6.50261' N	83° 13.52658' W	27.108377° N	83.225442° W		
Center	27° 7.11266' N	83° 12.58604' W	27.118543° N	83.209767° W		
<b>Targeted Subset Area of Modified Site B from BES Report (3' to 10' Unconsolidated Sediments)</b>						
Upper Left	27° 7.70607' N	83° 12.27012' W	27.128445° N	83.204502° W	5.2273	1.6435
Upper Right	27° 7.61022' N	83° 11.65678' W	27.126837° N	83.194278° W		
Lower Right	27° 6.77773' N	83° 11.75379' W	27.112962° N	83.195897° W		
Lower Left	27° 6.87631' N	83° 12.42032' W	27.114605° N	83.207005° W		
Center	27° 7.34185' N	83° 12.02291' W	27.122365° N	83.200382° W		
<b>Notional Net Pen Placements within Modified Site B from BES Report</b>						
1	27° 7.54724' N	83° 11.85393' W	27.125787° N	83.197565° W	0.7854	0.0491
2	27° 7.17481' N	83° 11.82576' W	27.119580° N	83.197095° W		
3	27° 6.93930' N	83° 11.94780' W	27.115655° N	83.199130° W		
4	27° 6.52579' N	83° 12.09175' W	27.108763° N	83.201530° W		





# Velella Epsilon Project

## Siting Analysis and Coordination:

Importance of Each of these Can Not Be Underestimated

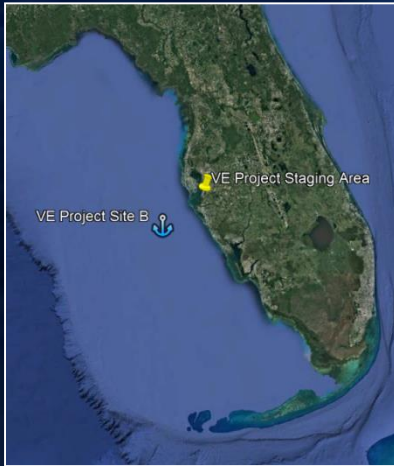
- **VE Project Completed Baseline Environmental Survey (BES)**
  - Greater Depths of Unconsolidated Sediments on Site B
  - Site Relocated Southwesterly to new Modified Site B
  - BES Report Finalized with Archaeological Review Completed
- **NOAA's National Centers for Coastal Ocean Science (NCCOS):**
  - Comprehensive Alternative Siting Analysis
  - Verified Modified Site B is Deconflicted with Military Areas
- **Southern Shrimp Alliance (SSA):**
  - Continued 16 Months of Coordination & Collaboration
  - Site Selection Partnership – Modified Site B is an Agreeable Site
- **All Environmental Permit Applications, Documentation, and Consultation Activities**
  - Relied Upon a Successful Identification and Collaboration of Project Siting
  - This is Why it is *"More than just Permitting"*



# Veella Epsilon Project

## Deployment and Staging Area:

- ❑ Manatee County Port Authority (Port Manatee)







# Veella Epsilon Project

## Stakeholder Outreach & Engagement:

### Commercial and Recreational Fisheries

- Charter Fisherman's Association (CFA)
- GOM Reef Fish Shareholder's Alliance (Shareholder's Alliance)
- Southern Shrimp Alliance (SSA)
- Fishing Communities Coalition
- Seafood Harvesters of America
- Gulf Fishermen's Association
- Southern Catch - South Atlantic Fishermen's Association
- Southeastern Fisheries Association
- Southern Offshore Fishing Association
- Pensacola Charter Boat Association
- Destin Charter Boat Association
- Organized Fishermen of Florida
- Florida Sport Fishing Association



# Velella Epsilon Project

## Stakeholder Outreach & Engagement:

### Private / Not-for-Profit Organizations

- The Marine Fish Conservation Network
- Mote Marine Laboratory / Mote Aquaculture Park
- Coastal Conservation Association of Florida
- International Game Fish Association
- International Game Fish Tournament Observers
- Directed Sustainable Fisheries
- Sierra Club
- Ocean Conservancy
- The Nature Conservancy
- The PEW Charitable Trust





# Velella Epsilon Project

## Project Schedule:

Milestone Activity	Start Date	Finish Date	Months
<b>Obtain All Environmental Permits and Approvals</b>			
VE Demonstration Project Permits	Jan-18	Aug-19	20
Initiate Pusuit of Commercial Permits	Sep-19	Aug-20	12
<b>Deploy Demonstration Netpen/ Tender Vessel Array</b>			
Lease Harbor Space	Sep-19	Sep-19	1
Obtain Mooring and Deployment Equipment	Sep-19	Oct-19	2
Net Pen Delivery	Oct-19	Oct-19	1
Construct & Deploy Net Pen Array	Oct-19	Nov-19	2
<b>Rear a Single Cohort of Almaco Jack</b>			
Larval Runs & Fingerling Production	Nov-19	Jan-20	3
Ship Fingerlings & Stock Net Pen	Jan-20	Jan-20	1
Feeding, Cleaning, & Monitoring	Jan-20	Dec-20	12
Water Quality & Benthic Monitoring	Nov-19	Jan-21	15
Environmental & Data Reports	Nov-19	Jan-21	15
Engagement in Stakeholder & Public Outreach	Jan-18	Jan-21	36
Source Buyer(s)/Dealer(s)	Apr-20	Sep-20	6
Harvest Fish	Nov-20	Dec-20	2
<b>Project Closeout</b>			
Project and Environmental Summary Report	Dec-20	Jan-21	2
Manual for Aquaculture Permitting Pathway (MAPP)	Jan-21	Jan-21	1



# Velella Epsilon Project

## Project Outcomes:

- (a) Serving as a Platform for the Promotion of Rational Aquaculture Policies and demystification of the industry, by providing a working net pen example to politicians, constituents, journalists, and other influencers of policy or public perceptions, as well as the local community;
- (b) Increasing Public Awareness of, and Receptivity Towards, Offshore Aquaculture and the need to culture more seafood in U.S. waters, by providing public tours of the offshore operation, including (possibly) snorkeling inside the net pen, and fee fishing;
- (c) Acting as a Demonstration Platform for Data Collection of Water Quality, potential benthic impacts, and marine mammal and fish stock interactions resulting from offshore aquaculture in the GOM; and
- (d) Providing local recreational, charter, and commercial fishing communities with Evidence of the Benefits of Aquaculture, through the Fish Aggregation Device (FAD) effects of the project, and by documentation of fish aggregation and fishing boat activity around the VE Project.





# Veella Epsilon Project

## VE Project Team Commitments:

- Commitment to Comply with All State and Federal Requirements
- Continue Close Coordination with State & Federal Agencies, & Stakeholders
- Set an Example for Other Aquaculture Practices to Follow in the Future

*Manual for Aquaculture Permitting Pathway, or MAPP*



# Velella Epsilon Project

## VE Project Team Commitments:

As with Kampachi's parent operations in La Paz, Mexico, commercial operations in the U.S. will:

Vigorously pursue –

**Aquaculture Stewardship Council (ASC)**

certification for environmentally and socially responsible seafood production!







# Velella Epsilon Project

## Acknowledgements:

*("It Takes a Village")*

- NOAA Sea Grant 2017 Aquaculture Initiative
  - Integrated Projects to Increase Aquaculture Production
- University of Florida Sea Grant
- Mote Aquaculture Research Park (Mote)
- University of Miami - Rosenstiel School of Marine and Atmospheric Sciences (RSMAS)
- Gulf of Mexico Fisheries Management Council (GMFMC)
- Gulf States Marine Fisheries Commission (GSMFC)
  - 2018 Marine Aquaculture Pilot Projects Grant Opportunity
- NOAA Fisheries HQ and Southeast Region (SERO)
- NOAA's National Centers for Coastal Ocean Science (NCCOS)
- U.S. Environmental Protection Agency (USEPA) Region 4
- U.S. Army Corps of Engineers (USACE), Jacksonville District
- U.S. Coast Guard (USCG), Sector St. Petersburg
- Florida Fish and Wildlife Conservation Commission (FWC)
- Florida Department of Agriculture and Consumer Services (FDACS)
- Florida Department of Environmental Protection (FDEP) & FDEP Florida Coastal Office
- APTIM Environmental Services (APTIM)
- Tidewater Atlantic Research (TAR)
- Manatee County Port Authority (Port Manatee)
- Southern Shrimp Alliance (SSA)
- Gulf of Mexico Reef Fish Shareholders' Alliance (Shareholder's Alliance)

***A True Public-Private Collaboration***



# Velella Epsilon Project

## Thank you!

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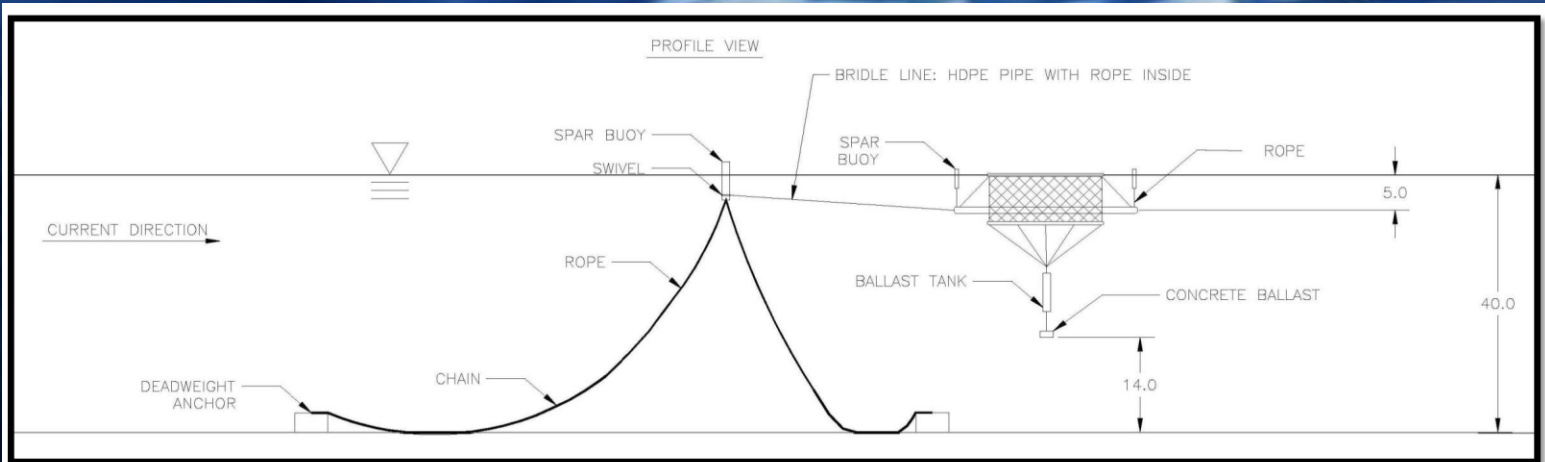


# Velella Epsilon Project





# Velella Epsilon Project



## 1) Deadweight Anchors (concrete):

- Three (3) anchors equally spaced @:
  - 120m from mooring centerline
  - 120 degrees from each other
- Each @ 4.5m x 4.5m x 4.5m (91 m<sup>3</sup>)
- Concrete friction factor = 0.5 on wet sand
- Each has an effective weight of 217 MT

## 2) Mooring Chain (Grade 2 steel):

- 80m length on each anchor
- 50mm (2") thick links
- No load = 70m length of each on seafloor
- Design load = some entirely off seafloor/ others completely on seafloor

## 3) Mooring Lines (rope):

- 40m length on each chain
- AMSTEEL®-BLUE
- 36mm (1 1/2") thick lines

## 4) Spar Buoy w/ Swivel (steel):

## 5) Bridle Lines (rope inside HDPE pipe):

- Three (3) ~30m bridle lines (rope) from swivel to spreader bar
- AMSTEEL®-BLUE
- 33.3mm (1 5/16") lines inside HDPE pipe

## 6) Spreader Bar (HDPE):

- Header Bar (load bearing) connected to Bridle Lines
  - 30m in length
  - 0.36m OD DR 11 HDPE pipe
- Side and Rear Bars (smaller load bearing)
  - 30m in length
  - 0.36m OD DR 17 HDPE pipe
- Four (4) corner spar buoys

## 7) Net Pen Connection Lines (rope):

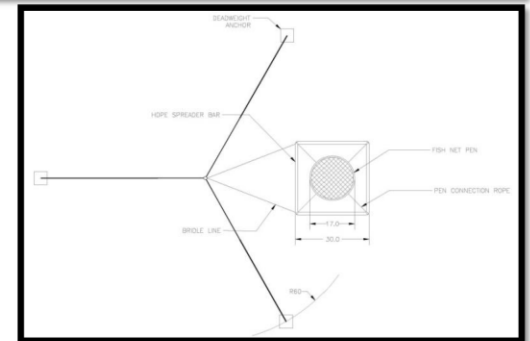
- Four (4) ~13m connection lines (rope)
- Connected from Spreader Bar to Net Pen Float Rings
- AMSTEEL®-BLUE
- 33.3mm (1 5/16") lines

## 8) Net Pen Frame Structure (HDPE):

- Top Frame Structure
  - 18m in diameter
  - One (1) HDPE side-by-side Float Rings
    - On the sea surface
    - ~0.36m OD DR 11 HDPE pipe
  - One (1) HDPE net ring (railing)
    - Connected ~1.0m above Float Rings
    - Connected to Net Pen Mesh
    - ~0.15m OD DR 17 HDPE pipe
- Bottom Frame Structure
  - 18m in diameter
  - One (1) HDPE sinker ring
    - 7.0m below Float Rings
    - Connected to Net Ring
    - ~0.36m OD DR 11 HDPE pipe
  - One (1) HDPE net ring
    - 7.0m below float rings
    - Connected to copper alloy mesh
    - ~0.15m OD DR 17 HDPE pipe

## 9) Net Pen Mesh (copper alloy):

- 17m diameter x 7m depth
- Top connected to top net ring (railing)
- Bottom connected to bottom net ring
  - 4mm wire diameter
  - 40mm x 40mm mesh square
- Effective volume of 1,600m<sup>3</sup>



## 10) Shackle Point Connection (steel):

- One (1) ~0.13m<sup>2</sup> shackle plate
- Four (4) connection lines
  - 12 mm in diameter x 10m in length
  - Connected from shackle plate to HDPE sinker ring
- ~1m Grade 2 steel chain (32mm) connected to Floatation Capsule

## 11) Floatation Capsule (steel):

- ~1.5m in diameter x ~3.45m in length
- Effective floatation volume = 6m<sup>3</sup>
- ~3m Grade 2 steel chain (32mm) connected to Counter Weight

## 12) Counter Weight (concrete):

- ~1.1m in diameter x ~2.2m in length
- Effective weight of 5 MT