BLUE ECONOMY INCUBATOR

HIGHLIGHTS

Q1 FY20

PORT of SAN DIEGO
Waterfront of Opportunity

October 17, 2019

BACKGROUND

In 2015, the Port of San Diego (Port) established the **Aquaculture & Blue Technology Program**, recognizing the growth opportunities of the Blue Economy sector and its strategic position within one of the world's leading Blue Tech clusters. The program is conducting planning and pre-development work to support and inform aquaculture and blue tech opportunities in and around San Diego Bay. This work includes using marine spatial planning tools to conduct a constraints and opportunities analysis for aquaculture with a focus on shellfish and seaweed; a land-based infrastructure feasibility analysis to identify locations to support aquaculture businesses on land; as well as baseline research related to aquaculture.

In 2016, under this program, the Port established a **Blue Economy Incubator** to assist in the creation, early development, and initial scaling of new Blue Economy business ventures. The incubator is acting as a launching pad for sustainable aquaculture and Port-related blue tech ventures by removing barriers to early-stage entrepreneurs and providing key assets and support services focused on pilot project facilitation including subject matter expertise, permit-ready infrastructure, entitlement assistance, marine spatial planning tools, market access, and strategic funding. The vision for the Blue Economy Incubator is for the Port to act as a catalyst for aquaculture and blue tech, and to build a portfolio of new businesses and partnerships that deliver multiple social, environmental, and economic benefits to the Region. As the state-legislated trustee of tidelands and submerged waters of San Diego Bay, developing sustainable domestic aquaculture and supporting Port-related blue tech assists in fulfilling the Port's public trust responsibility to promote fisheries and commerce, as well as aligning with its mission to enhance and protect the environment.

The Blue Economy Incubator is inviting early stage and market-ready aquaculture and blue tech ventures that align with the incubator objectives to submit business and pilot project proposals. Incubator proposals are reviewed following a four-step cross-departmental due diligence process culminating in a staff recommendation to the Board of Port Commissioners (Board). Since the launch of the incubator, the Port has received over 150 inquiries and 45 proposals were officially submitted for review. To date, the Board has approved eight **Blue Economy Agreements** with early stage companies to launch pilot projects including shellfish nursery operations; copper remediation technology; a drive-in Boatwash; a smart marina application; a marine debris removal vessel; seaweed aquaculture; bio-enhancing shoreline armoring alternative; and a new approach to soil remediation in marine environments (see Figure 1).

The Blue Economy Incubator program directly aligns with or is otherwise complementary to several planning and environmental initiatives already underway at the Port. Through facilitation of pilot projects, the program has created synergies with and continues to inform other environmental programs from copper remediation, to marine debris removal management, to shellfish and seaweed aquaculture as a tool for bioremediation and restoration.

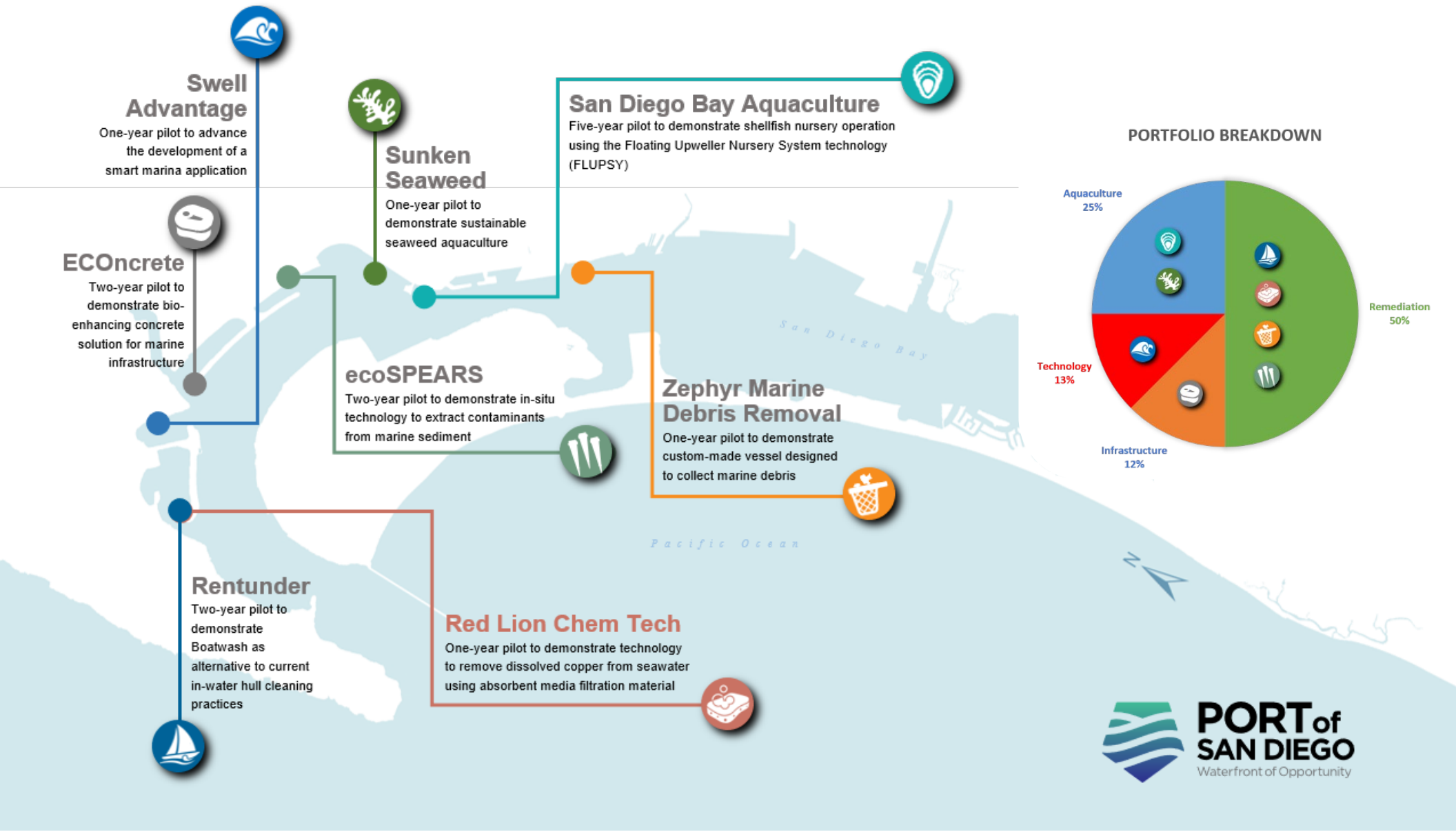

Figure 1. *Blue Economy Incubator Portfolio of companies and pilot projects*

REPORTING FRAMEWORK

The Blue Economy Incubator selection process balances each proposal's potential social and environmental benefit, alignment with the Port's core mission and Public Trust obligation, as well as the potential financial return on investment. The incubator proposals are selected by an incubator committee for approval by the Board for funding through a Blue Economy Agreement. Each Blue Economy Agreement sets out the terms of the partnership (e.g. Port contribution and royalty terms) and includes a Statement of Work (SOW) for the approved pilot project. As part of the SOW, **Key Performance Indicators (KPIs)** are tracked through quarterly reports submitted by the incubator companies. The KPIs are the impact metrics used by the Port to track the progress and performance of each of the Portfolio companies.

The goal of this reporting framework and associated KPIs is to track the performance of the incubator Portfolio based on measurable environmental, social and financial impacts delivered through the approved pilot projects and companies business operations. Measuring impact is an important way for the Port to assess the incubator progress in carrying out its mission to deliver multiple benefits to the region. Figure 2 provides a summary of the Portfolio performance, from pilot project to commercial success.

The Blue Economy Incubator highlights report provides the **Impact Scorecards** developed for each one of the incubator pilots/companies. These scorecards will be updated on a quarterly basis and submitted to the Board along with the Quarterly Financial Report.

PROGRAM HIGHLIGHTS

The Blue Economy Incubator has achieved some key objectives set forth in the program Operating Plan:

- Established first Port-led Blue Economy Incubator and launched eight innovative pilot projects
- Launched first commercial shellfish and seaweed aquaculture projects in San Diego Bay and measuring the associated environmental benefits.
- Launched first drive-in Boatwash along US West coast to test Boatwash effectiveness to reduce copper inputs into the Bay from hull cleaning operations.
- Removed over 33,000 pounds of marine debris from the Bay through the marine debris removal pilot project.
- Recognized by state and federal agencies, as well as industry and academia for providing pathways for the sustainable development of aquaculture in the region.

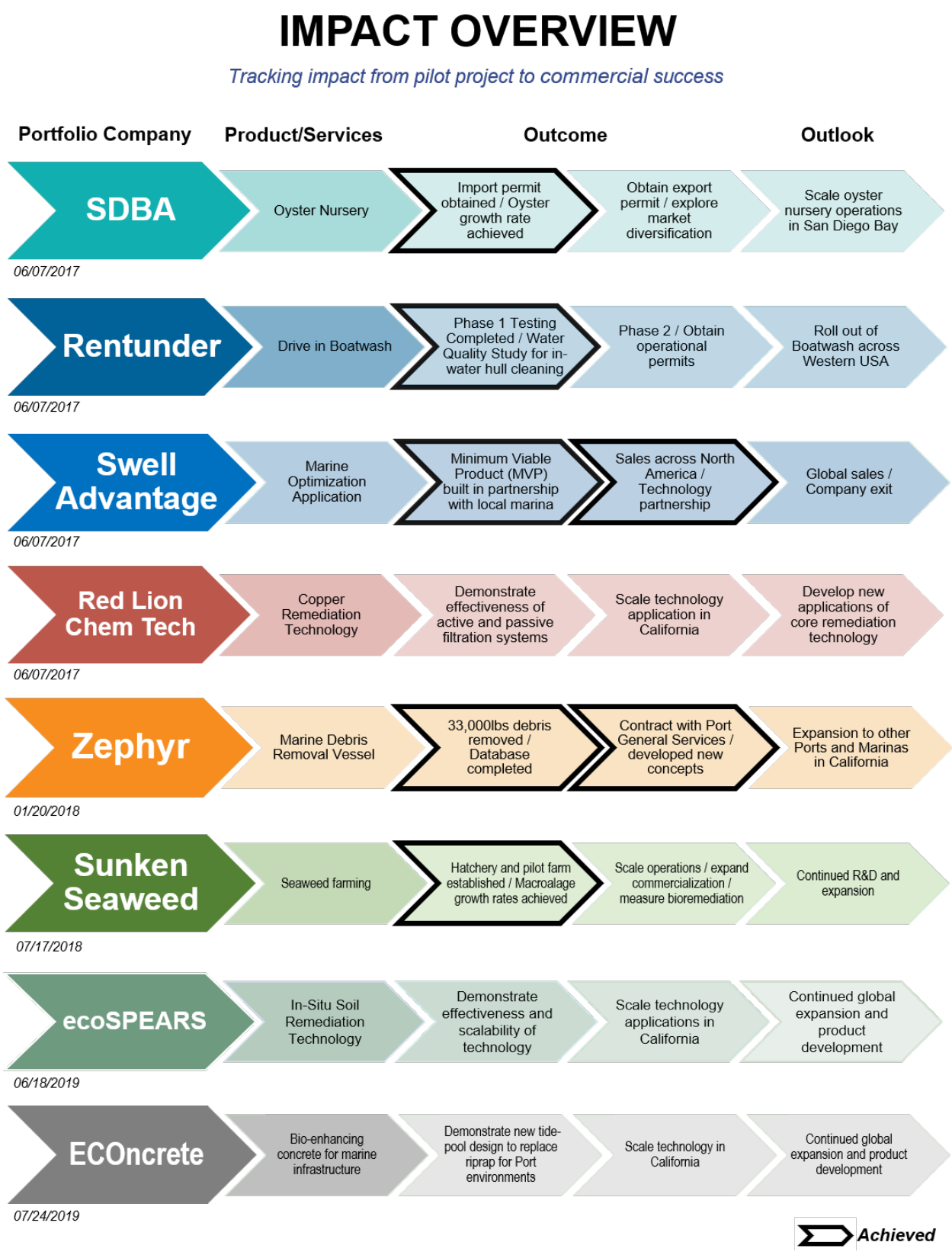

Figure 2. *Summary of Portfolio Performance and Impact*

San Diego Bay Aquaculture

San Diego Bay Aquaculture is specializing in growing marine shellfish to support sustainable aquaculture businesses in San Diego Bay and beyond

PILOT PROJECT

In 2017, San Diego Bay Aquaculture (SDBA) partnered with the Port of San Diego to demonstrate an accelerated, year-round shellfish aquaculture nursery operation in San Diego Bay, using the Floating Upweller System (FLUPSY) technology. SDBA's principals have twelve years of experience in shellfish and seaweed farming, FLUPSY operations and aquafarm ownership.

A FLUPSY is a floating barge that serves as a shellfish nursery, growing oysters from seed (size of red pepper flakes) to juvenile stage (size of quarters). During the five-year pilot project SDBA will be importing and growing oysters and other shellfish to the juvenile stage, establishing health and growth baselines, and measuring the associated environmental benefits. The juvenile shellfish will be exported to grow-out locations outside of San Diego Bay. The goal of the pilot is to demonstrate that shellfish nursery operations in San Diego Bay are feasible.

HIGHLIGHTS

- *First commercial shellfish aquaculture operation in San Diego Bay*
- *During scaled operations, the FLUPSY's annual capacity is expected to be up to 20 million oyster seed per year*
- *Port supporting long-term planning effort to establish health baseline and measuring the associated environmental benefits.*

CURRENT STATUS

In support of the pilot, the Port provided funding, and permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to establish the FLUPSY. SDBA is rearing experimental batches of shellfish to verify growth performance, explore market diversification and further establish the health baseline record with a goal to obtain necessary export permits and regulatory approvals.

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IMPACT Scorecard: SDBA / Q1 FY20

PILOT TIMELINE: Board Approval: 6/20/2017 Start Date: 9/10/2018 End Date: 9/10/2023

PILOT OVERVIEW

Tracking impact from pilot project to commercial success

	Product/Services	Outcome	Outlook
SDBA	Oyster Nursery	Import permit obtained / Oyster growth rate achieved	Obtain export permit / explore market diversification → Scale oyster nursery operations in San Diego Bay

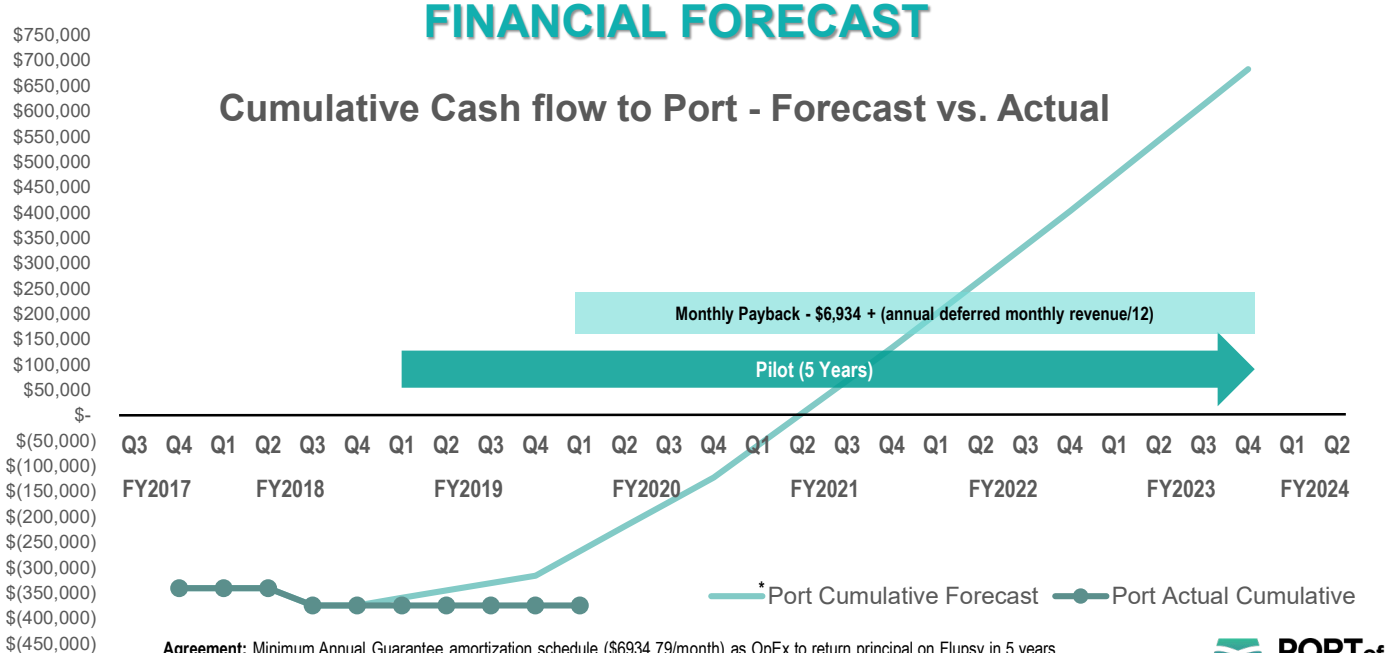
ENVIRONMENTAL & SOCIAL IMPACT

Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Shellfish growth rate (length/day/individual)			Rate of customer acquisition	FLUPSY energy efficiency	Effectiveness of operations
	Diploid Pacific Oyster	Manila Clam	Triploid Pacific Oyster			
Q2 FY20–Q2 FY23	*Pilot continues to track growth performance of experimental batches of shellfish to further develop the health baseline required to secure export markets through FY 2020. Market diversification opportunities underway that include abalone grow out as well as shellfish production for restoration projects. Operations anticipated to scale mid FY 21.*					
Q2 FY19	0.64 mm/day	0.13 mm/day	0.3 mm/day	N/A	N/A	**Growth rate 3X faster than anticipated**

Per pilot project statement of work

FINANCIAL FORECAST



Agreement: Minimum Annual Guarantee amortization schedule ($6934.79/month) as OpEx to return principal on Flupsy in 5 years. Non-OpEx reserve schedule for shortfall. 10% of gross sales kicker contribution triggered with annual profit

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

Swell Advantage

Swell Advantage is offering a cloud-based, mobile-enabled enterprise management software for marinas, waterfronts, and yacht clubs

PILOT PROJECT

In 2017, Swell Advantage partnered with the Port of San Diego to advance the development of its smart marina application. Swell Advantage is a technology start-up, developing operation support tools to assist marina professionals to automate and optimize their operations and enhance customer experiences.

Swell's smart marina application provides decision making support to assist marina managers in slip allocation resulting in increased revenue. The application also manages boater communication with the goal of building stronger, and safer marina communities. The application assists managers to understand how individual boaters use their facility, how efficiently operations are running, and if the marina is maximizing slip revenues. The one-year pilot project was completed in collaboration with a local marina in San Diego Bay.

HIGHLIGHTS

In 2019, Swell Advantage teamed up with payments and Point of Sale (POS) Company Square to better service marinas and waterfronts across the US and Canada and meet boaters' customer service expectations in a digital world.

CURRENT STATUS

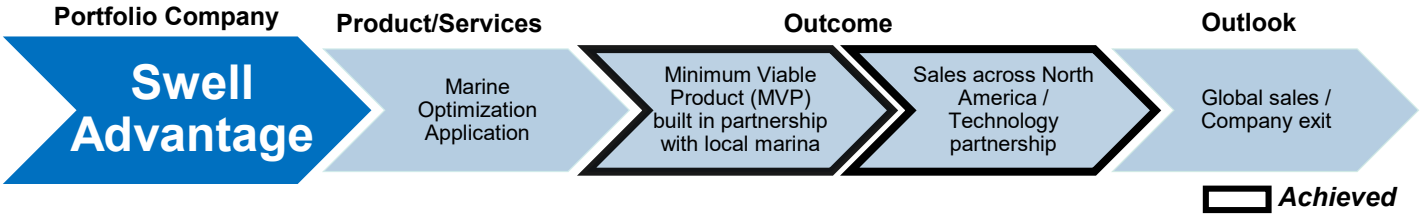
Since the completion of the pilot project Swell Advantage continues to develop its products by working with some of the top marina managers and marina experts in the world, while being driven by extensive customer feedback and observations.

IMPACT Scorecard: Swell Advantage / Q1 FY20

PILOT TIMELINE: Board Approval: 06/20/2017 Start Date: 07/1/2017 End Date: 09/1/2018

IMPACT OVERVIEW

Tracking impact from pilot project to commercial success



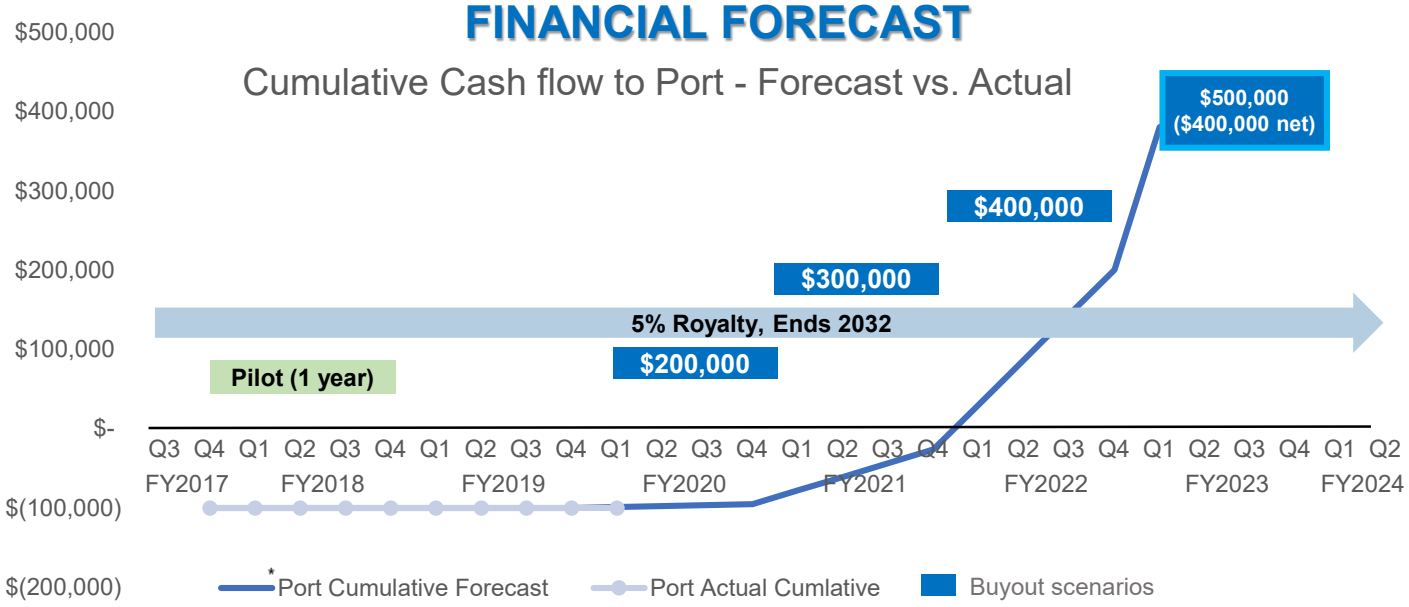
ENVIRONMENTAL & SOCIAL IMPACT

Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Benchmark maximum potential revenue	Identify highest value boater who fits the marina opening	Streamline customer communications through community management platform (CRM)	Deliver clean modern user interface (UI/UX)
Q1-Q4 FY18	Revenue per foot and revenue per boater developed	Achieved with additional identified internal changes to maximize revenues	Successful CRM platform developed with system including email, text and phone	Built in Google infrastructure and latest in UI/UX best practices implemented
Post Pilot Project	Pilot Project completed. Major milestone completed; **Square integration** - On May 30th, 2019 Swell teamed up with payment and point of sale company Square to enhance their customer experience and compliment their current product. 1% to the plant – Swell's first donation was to the Great Ocean Cleanup. **Expansion** – Since the completion of the pilot project Swell Advantage has obtained contracts with some of the major waterfronts and marinas in North America and is now looking to expand into Australia.			

Per pilot project statement of work

FINANCIAL FORECAST



Agreement: 5% Royalty of any gross revenue on sales worldwide for a period of 15 years, payments beginning January 30, 2020. Swell has a cumulative buy-out schedule.

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

Rentunder

Rentunder invented the Drive-in Boatwash technology to offer a quicker and environmentally friendly alternative to in-water hull cleaning

PILOT PROJECT

In 2017, Rentunder partnered with the Port of San Diego to demonstrate whether the Boatwash technology is a feasible alternative to current in-water hull cleaning practices in San Diego Bay. Rentunder is the manufacturer, seller and distributor of the Drive-in Boatwash technology. Rentunder is led by a team of hydraulic experts and engineers from Sweden.

The Drive-in Boatwash consists of driving a boat (sailboat or motor-boat up to 53 feet) into an enclosed basin, then mechanically brushing the boat hull. The entire cleaning process is conducted within the enclosed basin of the Boatwash, which is designed to retain residual debris and particulate matter to assist in reducing copper released into Bay and harbors. During the two-year pilot project a water quality study was developed to assess water quality during cleaning events and to determine potential operation adjustments.

HIGHLIGHTS

This pilot project represents the first installation of the drive-in Boatwash technology along US West coast. The pilot is allowing for testing of the Boatwash effectiveness to reduce copper inputs into the Bay from hull cleaning operations.

CURRENT STATUS

In support of the pilot, the Port provided funding, and permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to establish the Boatwash. To date, the pilot involved the installation of the Boatwash, as well as the establishment of a water quality monitoring study in collaboration with key stakeholders, and the coordination of three controlled cleaning events.

PORT of SAN DIEGO

IMPACT Scorecard: Rentunder / Q1 FY20

PILOT TIMELINE: Board Approval: 06/20/2017 Start Date: 7/17/2018 End Date: 7/17/2020

IMPACT OVERVIEW

Tracking impact from pilot project to commercial success

Portfolio Company	Product/Services	Outcome	Outlook
Rentunder	Drive in Boatwash	Phase 1 Testing Completed / Water Quality Study for in-water hull cleaning	Phase 2 / Obtain operational permits → Roll out of Boatwash across Western USA

Achieved

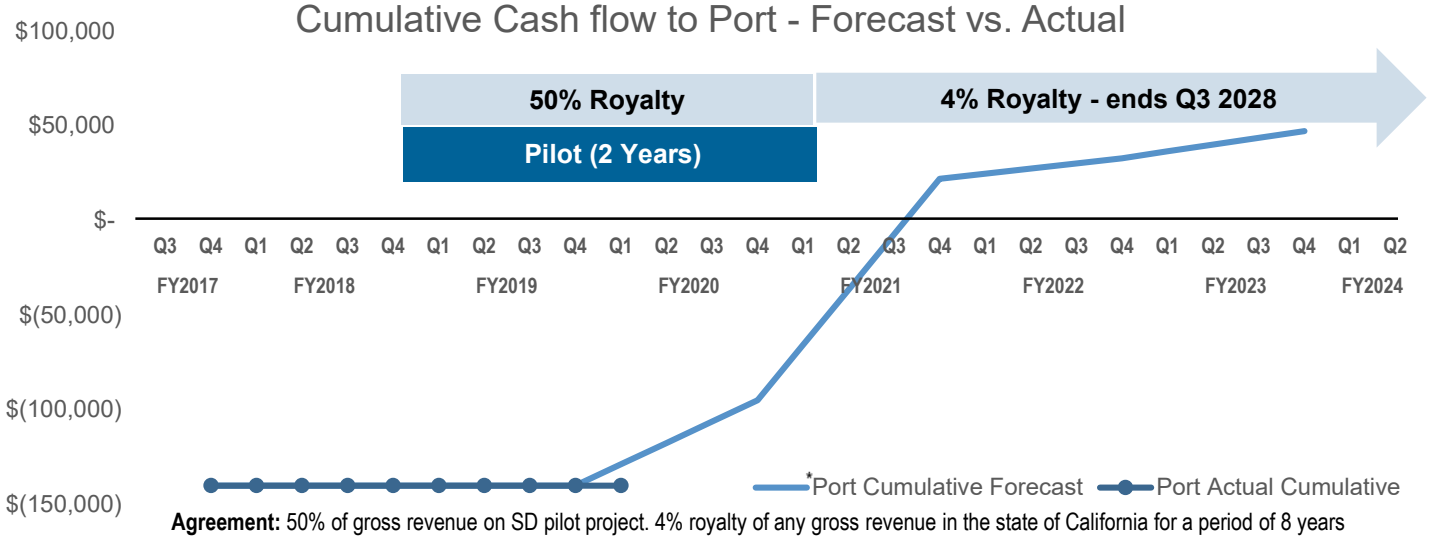
ENVIRONMENTAL & SOCIAL IMPACT

Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Rate of customer acquisition & total #	# boaters that stop painting their boats using copper	# of boats washed monthly	Amount of dissolved copper collected from basin	Water quality in and around basin	Effectiveness of cleaning operations
Q1-Q4 FY20	***PHASE 2** / Results from Phase 1 will be used to inform any needed programmatic modifications prior to implementing Phase 2. Such modifications may include operational adjustments, new technology(ies) and/or water quality sampling adjustments.*					
Q1-Q4 FY19	***PHASE 1** completed and report finalized / 3 sample cleaning events were conducted to compare the concentrations of dissolved and total copper in the water prior to, during, and after hull cleaning events (comparing Boatwash mechanical brushes to conventional diver-based in-water hull cleaning). The sampling also quantified the amount of particulate copper being captured within the enclosed Boatwash.*					

Per pilot project statement of work

FINANCIAL FORECAST



Agreement: 50% of gross revenue on SD pilot project. 4% royalty of any gross revenue in the state of California for a period of 8 years

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

Red Lion

Red Lion is developing environmental solutions to alleviate the impacts of oil spills, flooding or water contaminated by chemical pollutants

PILOT PROJECT

In 2017, Red Lion Chem Tech (Red Lion) partnered with the Port of San Diego to demonstrate their adsorbent media filtration technology designed to remove dissolved copper in seawater. Red Lion is a remediation company specializing in developing environmental solutions to alleviate the impacts of oil spills, flooding or water contaminated by chemical pollutants. The company principals have over 30 years of experience assisting in the development and growth of technology start-ups.

The goal of the one-year pilot project is to demonstrate the efficiency of the media filtration technology under both a passive (Ballast Flow Through) and active (Pump and Treat Flow Through) filtration systems. The pilot project is expected to determine the cost-effectiveness and potential Baywide scalability of the technology in harbor environments.

HIGHLIGHTS

In 2015 Red Lion conducted laboratory demonstrations of their technology using San Diego Bay water with test results showing up to 85% efficiency in removing copper.

CURRENT STATUS

In support of the pilot, the Port provided funding, and permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to test Red Lion's technology. The pilot is scheduled to take place during Phase 2 of the Boatwash pilot project.

PORT of SAN DIEGO

IMPACT Scorecard: Red Lion / Q1 FY20

PILOT TIMELINE: Board Approval: 06/20/2017 Start Date: *TBD* End Date: *TBD*

IMPACT OVERVIEW

Tracking impact from pilot project to commercial success

Portfolio Company	Product/Services	Outcome		Outlook
Red Lion Chem Tech	Copper Remediation Technology	Demonstrate effectiveness of active and passive filtration systems	Scale technology application in California	Develop new applications of core remediation technology

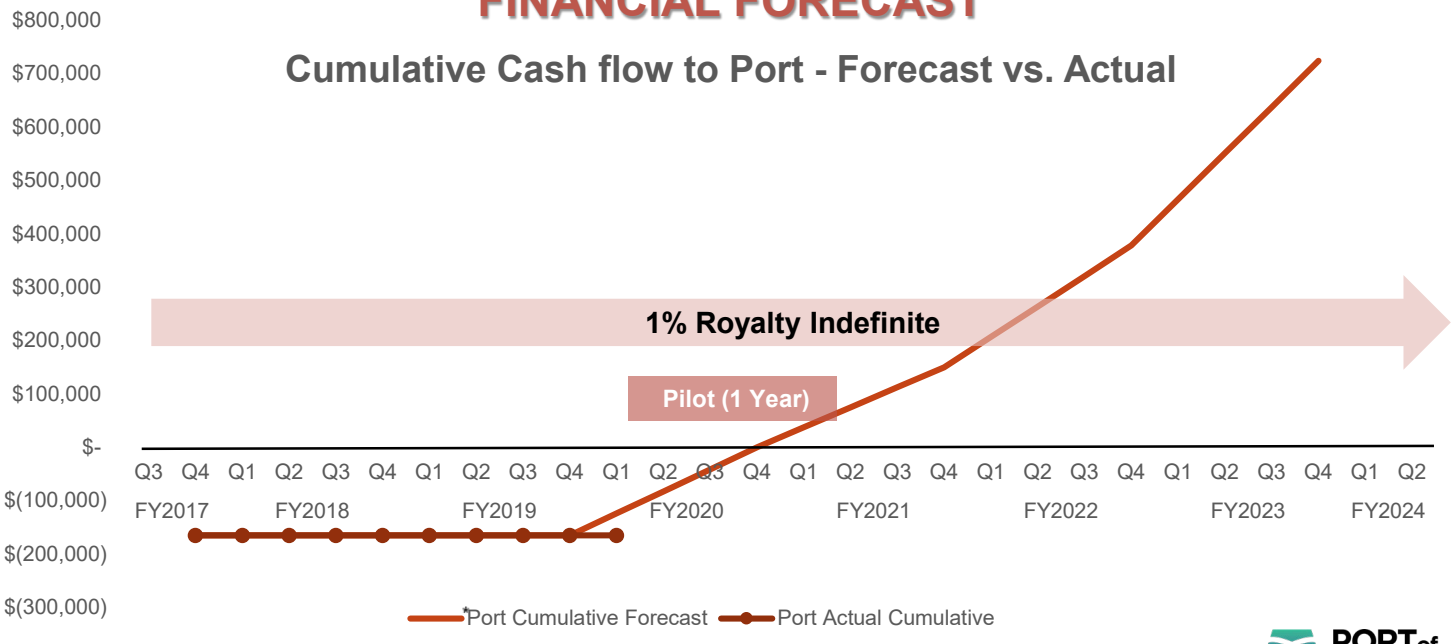
ENVIRONMENTAL & SOCIAL IMPACT

Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Amount of total and dissolved copper removed	Effect on bay water quality and load removal	Amount of resin used, and cost associated with production and analysis
TBD	*This pilot project is scheduled to take place during Phase 2 of the Boatwash pilot project, where advanced filtration systems and emerging copper remediation technologies will be tested for their potential to collect dissolved copper released during hull cleaning. Red Lion copper remediation technology will be tested by filtering water in an active Pump and Treat Flow-Through (P&T) system and a Passive Flow-Through (PASS) system.*		

As per pilot project statement of work

FINANCIAL FORECAST



Agreement: 1% royalty of worldwide gross revenues from Copper Mitigation Water Technology (core tech) in perpetuity.

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

Zephyr Debris Removal

Zephyr is offering an innovative vessel design and service model for marine debris removal in bay and harbor environments to reduce marine debris pollution

PILOT PROJECT

In 2018, Zephyr partnered with the Port of San Diego to demonstrate an innovative new design for a marine debris skimming vessel, and for the development of a database of key variables influencing marine debris accumulation in San Diego Bay. Zephyr is a start-up company whose founder has over 20 years of experience in the maritime industry as a small business owner and commercial fishing captain.

During the one-year pilot, over 33,000 pounds of trash were collected from San Diego Bay, as well as data on location, volume and content of debris. The data collected is assisting and informing management decisions to address marine debris sources and hotspots around San Diego Bay. Moving forward, Zephyr is actively working on a new innovative approach to prevent and reduce debris accumulation in Bay environments to improve and expand his marine debris removal services.

HIGHLIGHTS

Winner!

2018 AAPA Environmental Improvement Awards

Category: Mitigation
Marine Debris Removal Project

In 2018 the Port won an award from the American Association of Port Authorities (AAPA) for its support of Zephyr innovative debris removal system through pilot project facilitation.

CURRENT STATUS

Since March 2019 Zephyr is working under a one-year contract with the Port's General Services Department to continue marine debris removal services. As the vessel continues to demonstrate its efficient skimming operation and technology the goal is to commercialize the solution across California and beyond to help remove debris from other Ports and Harbors.

PORT of SAN DIEGO

IMPACT Scorecard: Zephyr / Q1 FY20

PILOT TIMELINE: Board Approval: 1/9/2018 Start Date: 2/5/2018 End Date: 2/5/2019

PILOT OVERVIEW

Tracking impact from pilot project to commercial success

Portfolio Company	Product/Services	Outcome		Outlook
Zephyr	Marine Debris Removal Vessel	33,000lbs debris removed / Database completed	Contract with Port General Services / implementation of new technology	Expansion to other Ports and Marinas in California

Achieved

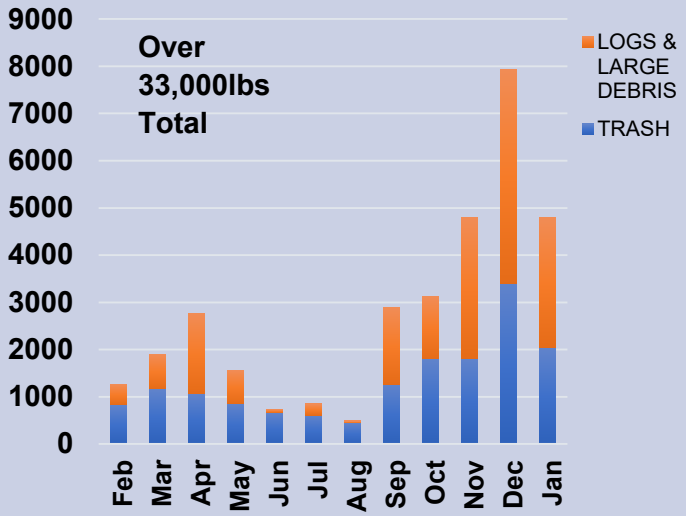
ENVIRONMENTAL & SOCIAL IMPACT

Pilot Key Performance Indicators

OVERALL KPI	Track amount of debris collected	Track effectiveness of skimming operations
Q1 FY19	4,809 LBS	Seasonality pattern developed
Q2 FY19	15,872 LBS	Designed Technology improvements
Q1 FY19	4,216 LBS	Hot spot, trash accumulation locations identified
Q4 FY18	5,065 LBS	Pattern and predictability developed based on variables and data collected
Q3 FY18	3,172 LBS	Baseline variables established and recorded

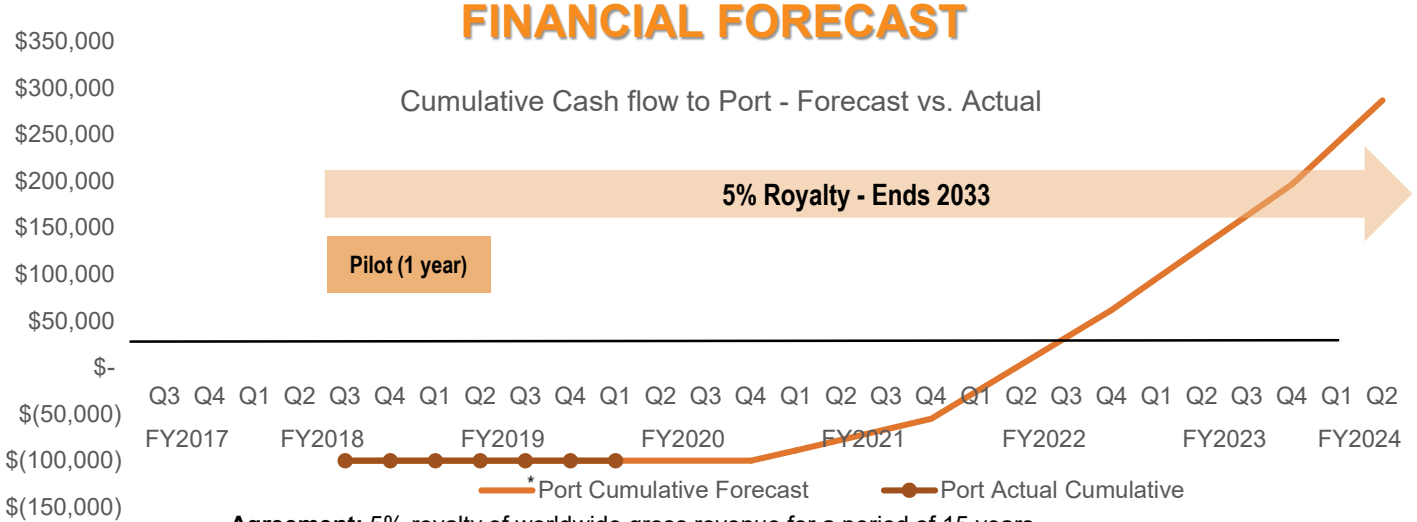
Per pilot project statement of work

2018 Total Trash (lbs/month)



Monthly Marine Debris removed during pilot

FINANCIAL FORECAST



Agreement: 5% royalty of worldwide gross revenue for a period of 15 years

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

Sunken Seaweed

Sunken Seaweed is farming multiple seaweed species and developing a diversity of products, from culinary seaweed to fertilizer

PILOT PROJECT

In 2018, Sunken Seaweed partnered with the Port of San Diego to demonstrate the feasibility of seaweed aquaculture in San Diego Bay. Sunken Seaweed is an aquaculture start-up company led by two marine ecologists committed to pioneering sustainable, seaweed aquaculture in and around San Diego Bay.

Sunken Seaweed established their seaweed hatchery at San Diego State University Marine Lab and installed their submerged pilot farm using assets managed by the Port in San Diego Bay. Since the start of the one-year pilot project, the company has been cultivating, outplanting, growing, monitoring, and harvesting several species of seaweed native to Southern California. Beyond commercialization, results from the pilot project are helping assess seaweed aquaculture's multiple co-benefits, from carbon sequestration and bioremediation to improving water quality and ecosystem productivity.

HIGHLIGHTS

Sunken Seaweed farm design in San Diego Bay demonstrates a novel approach to utilize docks and piers as structures for seaweed farming and other aquaculture in bay and urban settings.

CURRENT STATUS

In support of the pilot, the Port provided funding, and permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to establish the pilot farm. Sunken Seaweed has leveraged the assets and results from the pilot to obtain additional grant funding, to continue operations and measuring the ecosystem benefits and services that seaweed aquaculture provides.

PORT of SAN DIEGO

IMPACT Scorecard: Sunken Seaweed / Q1 FY20

PILOT TIMELINE: Board Approval: 07/17/2018 Start Date: 11/1/2018 End Date:11/1/2019

IMPACT OVERVIEW

Tracking impact from pilot project to commercial success

Portfolio Company	Product/Services	Outcome	Outlook
Sunken Seaweed	Seaweed farming	Hatchery and pilot farm established / Macroalage growth rates achieved	Scale operations / expand commercialization / measure bioremediation
			Continued R&D and expansion

Achieved

ENVIRONMENTAL & SOCIAL IMPACT

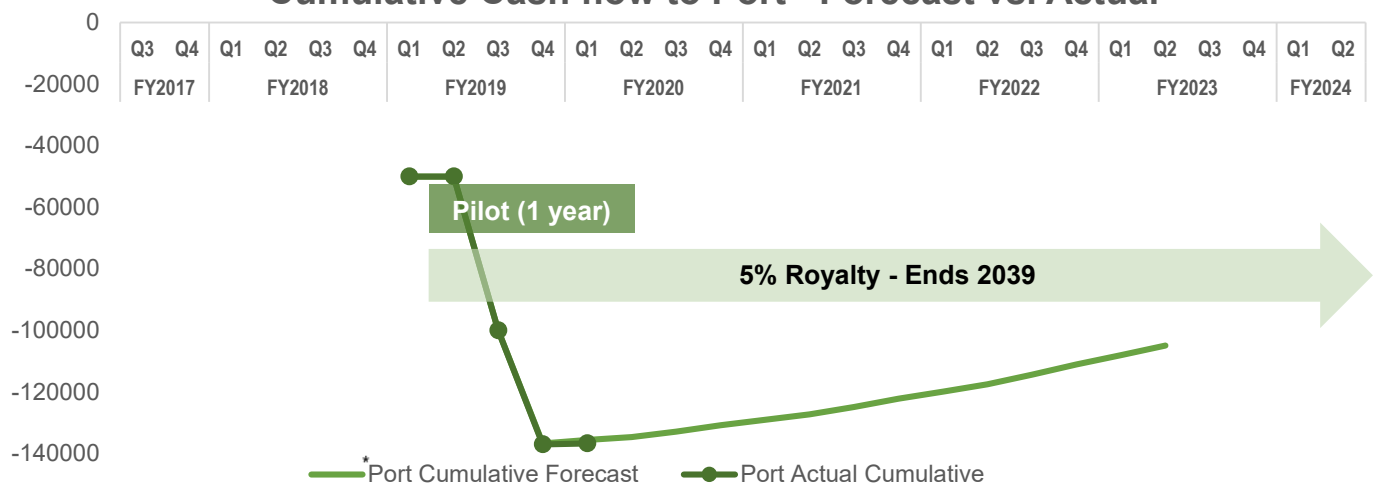
Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Average Macroalgae growth rate (grams per week)	Innovation and Proof of Concept	Customer acquisition
Q1 FY20	N/A	N/A	N/A
Q4 FY19	**Seaweed Species:** Gracilaria: Result Pending Ulva: Result Pending Macrocystis: Result Pending Codium fragile: Result Pending	Outplanted farm with new permitted species; conducted tissue sampling to determine whether seaweed absorbs heavy metals; deployed cages on farm to protect species from wave energy and predation	N/A
Q3 FY19	**Seaweed Species:** Gracilaria: 1100 g/wk Ulva: Result Pending Macrocystis: Result Pending	Deployed multiple macroalgae seaweed species at different depths; determined that Ulva and Gracilaria species grew well in shallower water, while Macrocystis grew well at multiple depths	N/A
Q2 FY19	N/A	Design and construction of dynamic farm structure that oscillates with the tides; novel design demonstrating way to utilize existing docks/piers for aquaculture in urban settings	N/A

As per pilot project statement of work

FINANCIAL FORECAST

Cumulative Cash flow to Port - Forecast vs. Actual



Agreement: 5% royalty of worldwide gross revenue for a period of 20 years

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

ecoSPEARS

ecoSPEARS is developing cost-effective cleanup solutions to extract and destroy toxic contaminants from sediment, soil and groundwater

PILOT PROJECT

In 2019, ecoSPEARS partnered with the Port of San Diego to demonstrate its innovative in-situ technology to extract contaminants from impacted marine sediment. ecoSPEARS is a start-up company comprised of a fast-growing team of innovators, engineers, and scientists developing cleanup solutions for contaminated sediment.

SPEARS stands for Sorbent Polymer Extraction and Remediation System. Shaped like spikes, SPEARS filled with a proprietary solution are deployed into contaminated sediment or around challenging or sensitive wetland areas where dredging may not be feasible. Once settled into the sediment, the SPEARS act like sponges, passively absorbing chlorinated toxic contaminants such as polychlorinated biphenyls (PCBs) and dioxins. Once the remedial site goals are met, the SPEARS are safely removed and retrieved, and then the SPEARS enter a green chemical process to destroy the PCB's absorbed.

Since 2017, ecoSPEARS is the exclusive licensee of the NASA-patented SPEARS technology, invented and validated by NASA environmental scientists and engineers at NASA-Kennedy Space Center (KSC).

CURRENT STATUS

In support of the pilot, the Port is providing funding, and permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to test the SPEARS technology. The permits for the pilot were obtained and both the baseline sampling and SPEARS deployment will take place before the end of 2019.

PORT of SAN DIEGO

IMPACT Scorecard: ecoSPEARS / Q1 FY20

PILOT TIMELINE: Board Approval: 6/8/2019 Start Date: 10/15/2019 End Date: 9/10/2020

IMPACT OVERVIEW

Tracking impact from pilot project to commercial success

Portfolio Company	Product/Services	Outcome	Outlook
ecoSPEARS	In-Situ Soil Remediation Technology	Demonstrate effectiveness and scalability of technology	Scale technology applications in California	Continued global expansion and product development

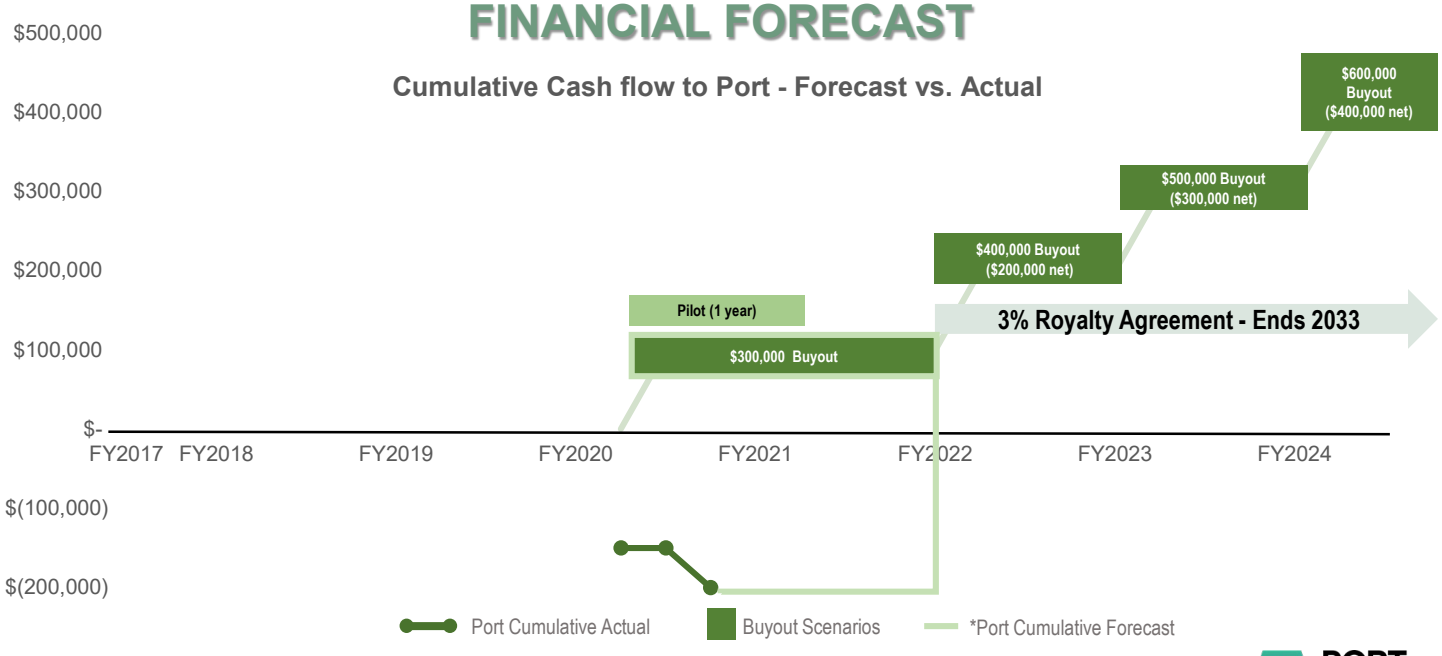
ENVIRONMENTAL & SOCIAL IMPACT

Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Effectiveness in reducing PCB concentrations in sediments	No solvent/water exchange across spike	Destruction of extracted PCBs	Assess effectiveness in treating PCB-impacted sediment using solvent-rinse extraction process
Q4 FY20	*During its two-year pilot project, ecoSPEARS will deploy SPEARS at three different locations in San Diego Bay. The primary goal will be to determine how much PCB mass the SPEARS technology will remove over a predetermined period.*			
Q3 FY20				
Q2 FY20				

Per pilot project statement of work

FINANCIAL FORECAST



Agreement: 3% royalty agreement on worldwide gross revenue for a period of 15 years. ecoSPEARS has a cumulative buyout schedule

**Revenue forecast based on sales projections submitted to Port*

PORT of SAN DIEGO

ECOncrete

ECOncrete is offering concrete technology to enhance the biological and ecological value of coastal infrastructure while preserving functional and structural properties

PILOT PROJECT

In 2019, ECOncrete partnered with the Port of San Diego to demonstrate a new design of its tide pool armor unit product. ECOncrete is an early-stage company comprised of a multidisciplinary team of renowned marine ecologists, biologists, geologists, concrete experts, engineers, and designers.

During the two-year pilot project, ECOncrete is proposing to demonstrate their new and innovative tide pool design, the Coastal Star interlocking tidal pool. This new tide pool product has a star-like appearance and is designed to interlock with other Coastal Star tide pools. The tidepools serve as a replacement for traditional riprap and provide ecological armoring and shoreline stabilization, while also creating well-defined local ecosystems that mimic natural tide pools. During the two-year pilot project, ECOncrete will install 72 Coastal Star tide pools across three sites along the San Diego Bay shoreline.

HIGHLIGHTS

ECOncrete tide pool technology was incorporated within the Brooklyn Bridge Park renovation plan in New York. Six months after deployment the pools' oxygen level is twice as high as the surrounding area due to seaweed photosynthesis, making the tide technology an ideal habitat for flora and fauna.

CURRENT STATUS

In support of the pilot, the Port is providing funding, and permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to test the ECOncrete technology. The design of the tide pools is completed, and the installation is planned for early 2020.

PORT of SAN DIEGO

IMPACT Scorecard: ECOncrete / Q1 FY20

PILOT TIMELINE: Board Approval: 07/24/2019 Start Date: *2020* End Date: *2022*

IMPACT OVERVIEW

Tracking impact from pilot project to commercial success

Portfolio Company	Product/Services	Outcome	Outlook
ECOncrete	Bio-enhancing concrete for marine infrastructure	Demonstrate new tide-pool design to replace riprap for Port environments	Scale technology in California	Continued global expansion and product development

ENVIRONMENTAL & SOCIAL IMPACT

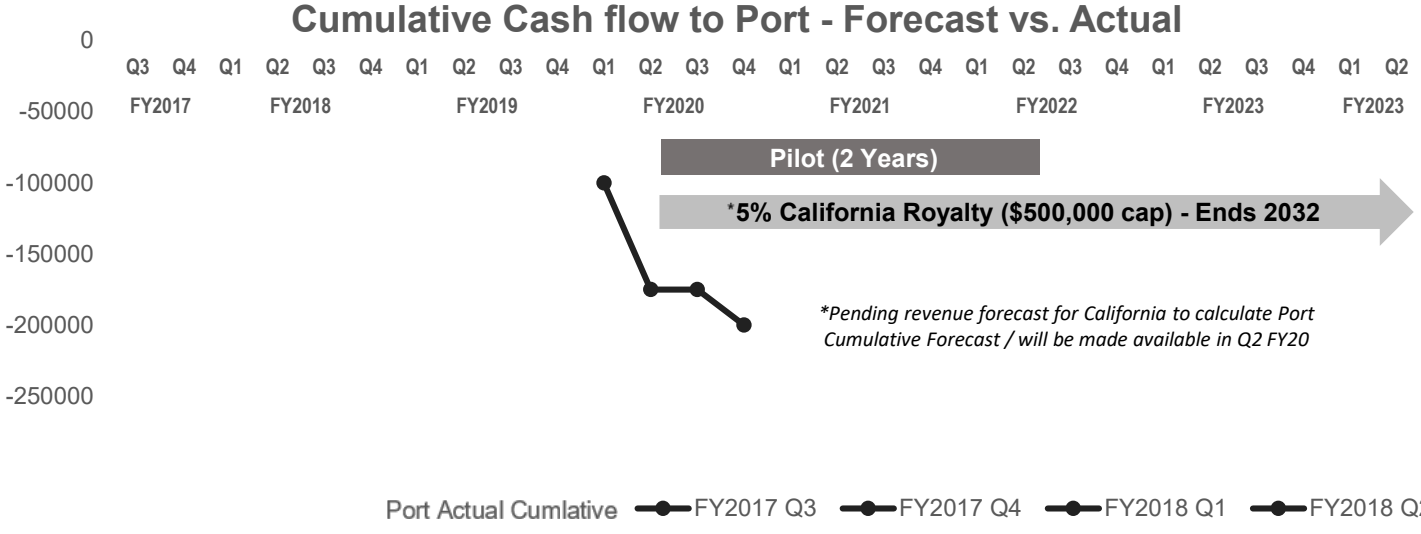
Pilot Key Performance Indicators

OVERALL KPI (Port Fiscal Year)	Biodiversity	Species Abundance	Species Richness	Community Structure	Percent Live Cover	Accumulation of Biogenic Build-Up (calcium carbonate)
FY20-22	*Every six months after installation, ECOncrete will evaluate the viability of the tide pool units as an ecological armoring replacement to traditional riprap. Biological monitoring will be comprised of in-situ surveys. Ecological success criteria will be evaluated according to biological parameters when compared to the existing shoreline.* *Structural success criteria will be evaluated according to the Level 1 & 2 visual inspection of the tide pools at the conclusion of the 2-year pilot project for determining the overall condition (cracking, chipping, etc.), as well as structural stability - per the standards established by the American Society of Civil Engineers "ASCE Manual 101, Underwater Investigations".*					

Per pilot project statement of work

FINANCIAL FORECAST

Cumulative Cash flow to Port - Forecast vs. Actual



Agreement: 5% royalty for 12 years in California for two products (coastal star interlocking tidal pool + pile encapsulation products) and $500k cap

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