Generating Environmental Currency: Turning Eco-Projects Into New Lines of Business

AAPA Capital Projects Seminar

Norfolk, VA
May 9, 2018

Seminar agenda

- Introduction & subject overview
- Introduction of panel
- Generating environmental currency – Port of Long Beach perspective & experience
- Generating environmental currency – Port of Cleveland perspective & experience
- Panel interview, questions, answers and participation
- Takeaways

Introduction & subject overview

- The ‘business’ of port authorities has to become more profit orientated and financially self-reliant and funding
- All costs need to be addressed from a ‘profit centre’ standpoint
- Environmental stewardship is no exception

Quote from Aaron Ellis, 2 May 2018

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THE UNIFIED VOICE OF THE SEAPORT INDUSTRY

AAPA www.aapa-ports.org

Matthew Arms

Assistant Director Environmental Planning

Port of Long Beach

Matthew Arms, Assistant Director of Environmental Planning for the Port of Long Beach, California, joining the Port in 2003.

Mr. Arms earned his Bachelor of Science degree in Environmental Science from Washington State University in 1998 and worked in environmental consulting before beginning his career at the Port.

Environmental Planning is the division most directly responsible for the Port's industry-leading environmental programs eg, the 2005 Green Port Policy and the 2006 San Pedro Bay Ports Clean Air Action Plan (CAAP) and its 2017 Update.

The division leads programs to improve air, water and soil quality, preserve wildlife habitat and integrate sustainability into Port practices.

Due to the effectiveness of these programs, total diesel emissions at the Port have dramatically dropped by 85% since 2005, and native wildlife is making a comeback.

Nicholas LaPointe

Director
Planning & Capital Development

Cleveland-Cuyahoga County Port Authority

Nick is a Professional Engineer, overseeing the port's capital infrastructure planning and maintenance, asset management and project delivery.

Nick also manages the port's Sediment Processing and Management Facility - critical to the maritime community in Cleveland, as it is responsible for annually processing and beneficially harvesting more than 250,000+ CY of dredged sediment from the Cuyahoga River and Cleveland Harbor.

Professionally, Nick has always been in the maritime and ports industries. Prior to joining the port, he spent nine years working on complex marine infrastructure projects along the East Coast with Weeks Marine Inc - one of the nation's largest marine contractors.

Before that, he obtained a bachelor's degree in Civil Engineering from the University of Toledo and an MBA from Case Western Reserve University while working as a captain on Lake Erie.

Franc J Pigna
CRE FRICS CMC

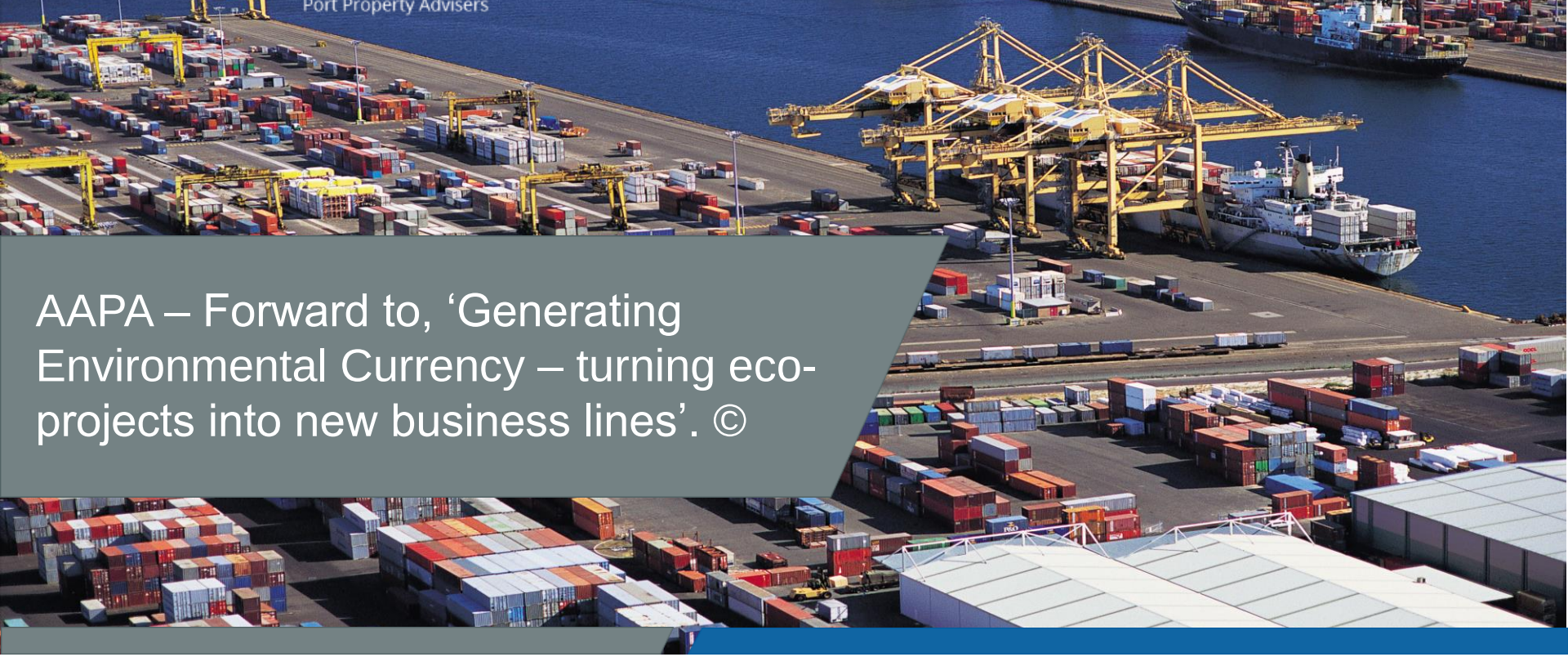
Managing Director

Aegir
Port Property Advisers

Established in 2003, Aegir is the pioneer property consultancy exclusively focused on meeting the unique real estate challenges faced by ports and associated maritime and logistics industries by increasing competitive advantages, maximising property revenues and enhancing overall port values through the more strategic use of a port's largest asset – property.

Pigna has been meeting complex property related challenges worldwide on behalf of clients in the port, shipping, related logistics, financial, infrastructure, corporate and institutional investment sectors for decades. He is a member of The Counselors of Real Estate and is a Fellow and Chartered Management Consultant of the Royal Institution of Chartered Surveyors.

Pigna is a frequent speaker internationally at industry events and universities and has authored several papers, articles and chapters in books on port property, infrastructure finance and port authority and city-port issues.



AAPA – Forward to, ‘Generating Environmental Currency – turning eco-projects into new business lines’. ©

Franc J Pigna CRE FRICS CMC, Managing Director

9 May 2018

www.aegisports.com

www.drewry.co.uk

Port Property Advisors | Maritime Research | Maritime Advisors | Supply Chain Advisors | Maritime Equity Research

Let’s get started…

TIME TO *THINK* WELL *OUTSIDE THE* ZONE…

…*BOX* NOT REQUIRED!

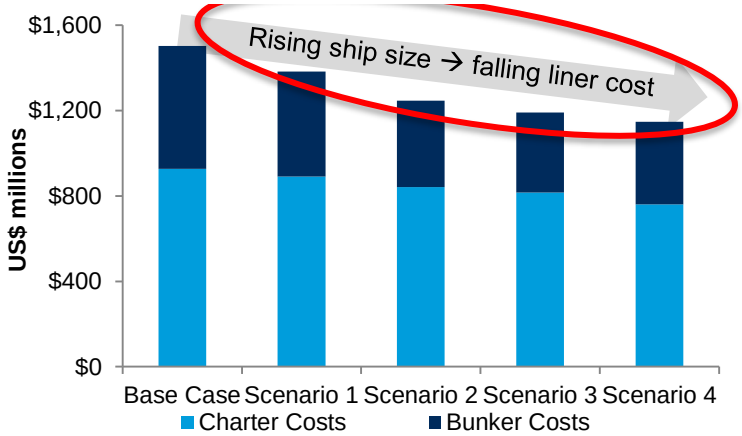
Business challenges ports face – addressing their environmental stewardship duties

- Globalisation will continue; global commerce gateways ie, ports, will continue to expand with increased cargo velocity and throughput
- Historically, ports were major centres of pollution – air, water, light and noise; this is no longer sustainable or allowable by port communities
- Ports are a nexus for trade, industrial activity and energy- how this is managed needs and is being re-thought
- Chasing ‘economies of scale’ by shipping lines and shippers is presenting numerous challenges to ports, including in the environmental front
- Major advances have been made on the environmental front; still a way to get near carbon neutral
- Financial sustainability of environmental initiatives needs to be addressed

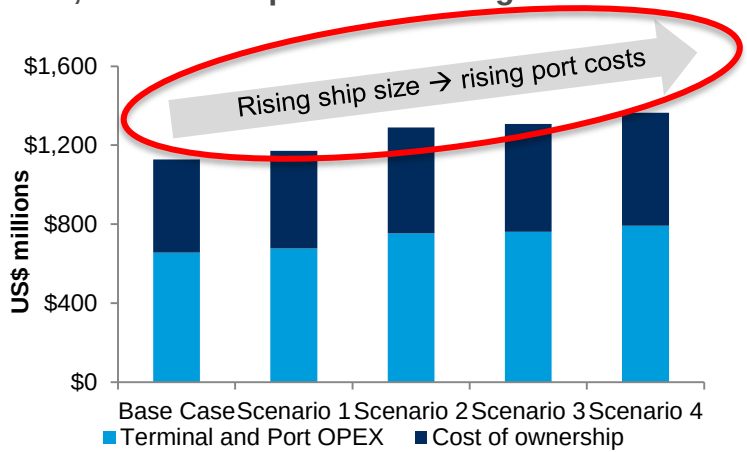
Container shipping - Findings from Drewry study

Diminishing economies of scale from megaships?

Simulation shows liner costs fall as ships get bigger



However, also shows port costs rising with vessel size



- As vessel sizes increase: Shipping lines' network costs fall…but the costs incurred by ports and terminals rise…o overall system costs increase
- **Drewry believes optimum vessel size reached for foreseeable future (and may already been exceeded)**
- **Aegir believes ports not charging enough to cover true costs and profit on asset values and operating costs**

Larger ships, major peak periods changing demand for ports/terminals…

…requiring more infrastructure, longer periods of underutilisation, lower revenues AND fewer, but larger terminals – MAJOR port challenge!

Before

3,000 boxes

MONDAY

3,000 boxes

THURSDAY

Shipping lines obtaining cost savings with bigger ships…

After

6,000 boxes

MONDAY

Are shipping lines prepared to pay for these enhanced requirements?

…but generating higher investment needs through supply chain infrastructure

Implications of liner industry development

Terminal costs now the largest spend item for carriers

% split of costs (AP Moller Maersk) 2012 and 2015

Costs	2012	2015
Vessel	26%	28%
Bunker	25%	13%
Terminal	24%	32%
Other	25%	27%

Pressure to reduce terminal handling costs (impact on port fees?)

Question of joint contracting by alliances (impact on port concession, rents?

Areas of opportunities…

- Holistic approach to pricing port services, property assets, fixed and variable revenues to cover true costs of operating a port – private sector would/cannot subsidise clients, why should ports?

- Ports are natural geographic concentrations and central hubs for logistics, value added services, commerce, finance, raw materials and increasingly – energy.

- Few ports have actively pursued energy management strategies – the need for this is now.*

- Why? This results form their need to co-ordinate their planning, acting as a transport nexus, managing and fomenting economic activity and growth AND, addressing the increasingly importance of environmental stewardship.*

- For future ports, active energy management offers efficiency gains, development of alternative revenue sources, heightened competitive advantages and higher returns on and of capital invested for their shareholders.*

* Acciaro, Michele & Ghiara, Hilda & Cusano, Maria. (2014). Energy management in seaports: A new role for port authorities. Energy Policy. 71. 4–12. 0.1016/j.enpol.2014.04.013.

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MAY 9, 2018
AAPA CAPITAL PROJECTS SEMINAR

GENERATING ENVIRONMENTAL CURRENCY

MATT ARMS
ASSISTANT DIRECTOR,
ENVIRONMENTAL PLANNING

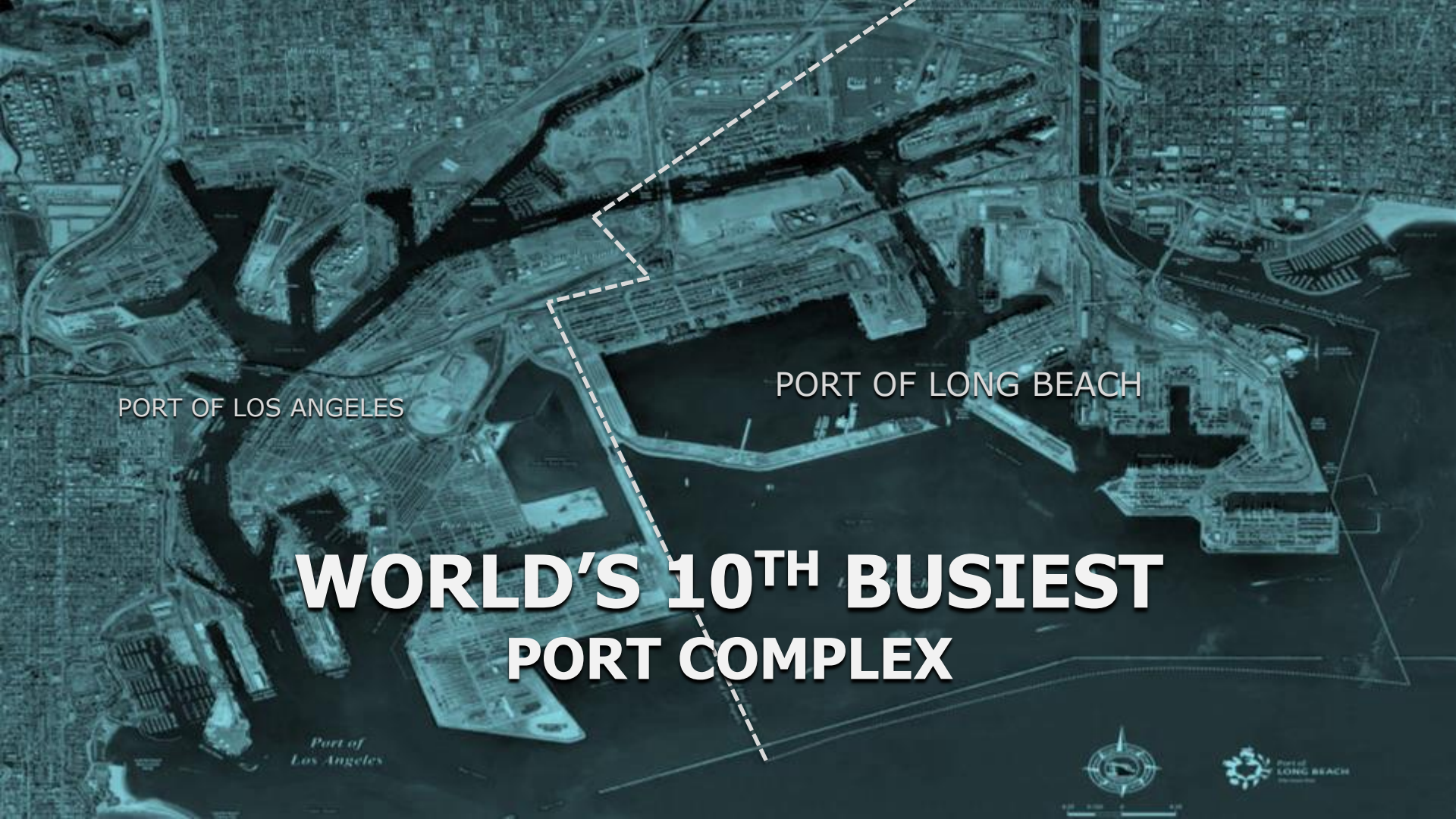
Port of LONG BEACH
The Green Port

PORT OF LONG BEACH

LEADING GATEWAY FOR U.S.-ASIA TRADE

$180 BILLION IN CARGO

SUPPORTING 30,000 LONG BEACH JOBS


PORT OF LOS ANGELES
PORT OF LONG BEACH
WORLD'S 10TH BUSIEST
PORT COMPLEX
Port of
Los Angeles
Port of
LONG BEACH


PIER A Opens
1997
PIER C Opens
1991
PIER T Opens
2002
TERMINAL PROJECTS
SINCE 1990
PIER G Redevelopment Begins
2002
PIER J Expansion
1993


GREEN PORT POLICY

TERMINAL PROJECTS

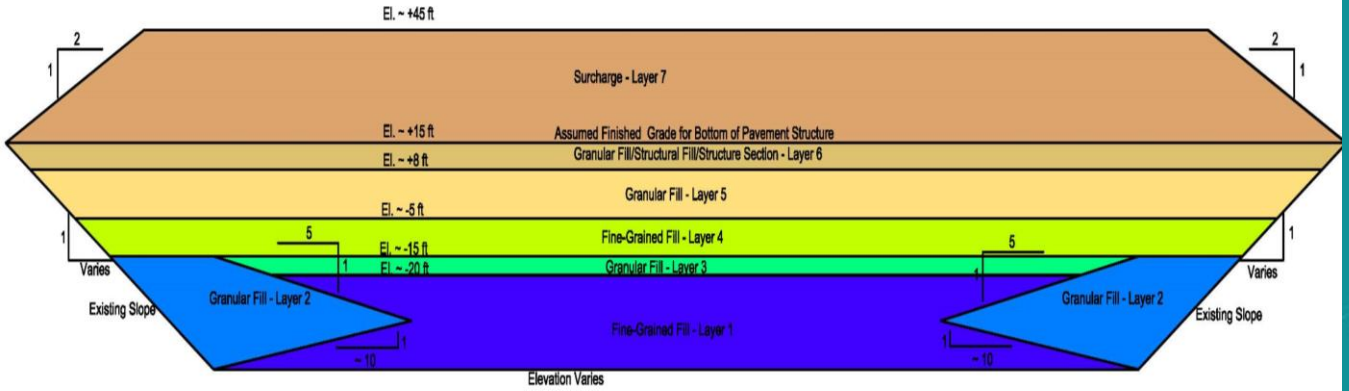
SINCE 1990


MIDDLE HARBOR

SEDIMENT - BENEFICIAL REUSE

THIRD PARTY FILL

THIRD PARTY FILL PLAN



Optimizing the Fill Plan

- Silts, clays and compressible soils lower in fill
- Separate larger layers of silts/clays with sand for drainage
- Provide a non-compressible area above existing rock slopes
- Surcharge and wick drains for settlement management

VOLUME

- LAYER 1: 325,000 CU.YD (<-20)
- LAYER 2: 100,000 CU. YD (<-20 GRANULAR BERM)
- LAYER 3: GRANULAR FILL 164,000 CU. YD (-20 TO -15)
- LAYER 4: 300,000 CU.YD (-15 TO -5)
- LAYER 5: 531,000 CU.YD (-5 TO 8)
- LAYER 6: 300,000 CU.YD (+8 TO +15)
- LAYER 7: 700,000 CU.YD SURCHARGE (+15 TO +45)

THIRD PARTY FILL PLAN

Approximate Elevation (ft)	Fill Layer	Tentative Projects for Each Layer	Estimated Source Volume (cy)	Estimated Total Volume (cy)
(+15 to +45)	7	Borrow Site	500,000	700,000
		Storage Site	200,000	
(+8 to +15)	6	Storage Site	300,000	300,000
(-5 to +8)	5	LA County, Marina del Rey, Areas 1-6	116,000	531,000
		LA County, Marina del Rey, Areas 7-9	108,000	
		Port of Los Angeles, China Shipping Surcharge	307,000	
(-15 to -5)	4	Eagle Rock Aggregate, Port of Long Beach D44	6,000	300,000
		Miscellaneous Port of Long Beach Projects	100,000	
		City of Long Beach, Colorado Lagoon	70,000	
		City of Long Beach, Alamitos Bay	41,000	
		LA County, Marina del Rey, Areas 7-9	83,000	
(-20 to -15) Granular Layer	3	LA County, Marina del Rey, Areas 1-6	164,000	164,000
(<-20) Berm	2	LA County, Marina del Rey, Areas 7-9	100,000	100,000
(<-20')	1	City of Newport Beach, Rhine Channel	150,000	325,000
		USACE LARE and City of Long Beach Rainbow Harbor	175,000	


Middle Harbor Sites (Blue)
1. Inner Harbor Turning Basin & Back Channel
2. Pier T/West Basin/Pier Echo
3. Middle Harbor Sediment Trap
4. Phase 3 East Basin Fill
Maintenance Dredging (Green)
5. Pier J South Access Channel
6. Pier F, Berths 206-207
7. Pier A, Berths 88-96
8. Pier B, Berths 84-87
9. Pier B, Berths 82-83
Seaside Fwy
PORT OF LONG BEACH
Aquarium of the P
The Queen Mary
Pico Ave
W Shoreline Dr
W Ocean Blvd
Navy Way
Alameda
710
47
103
1A

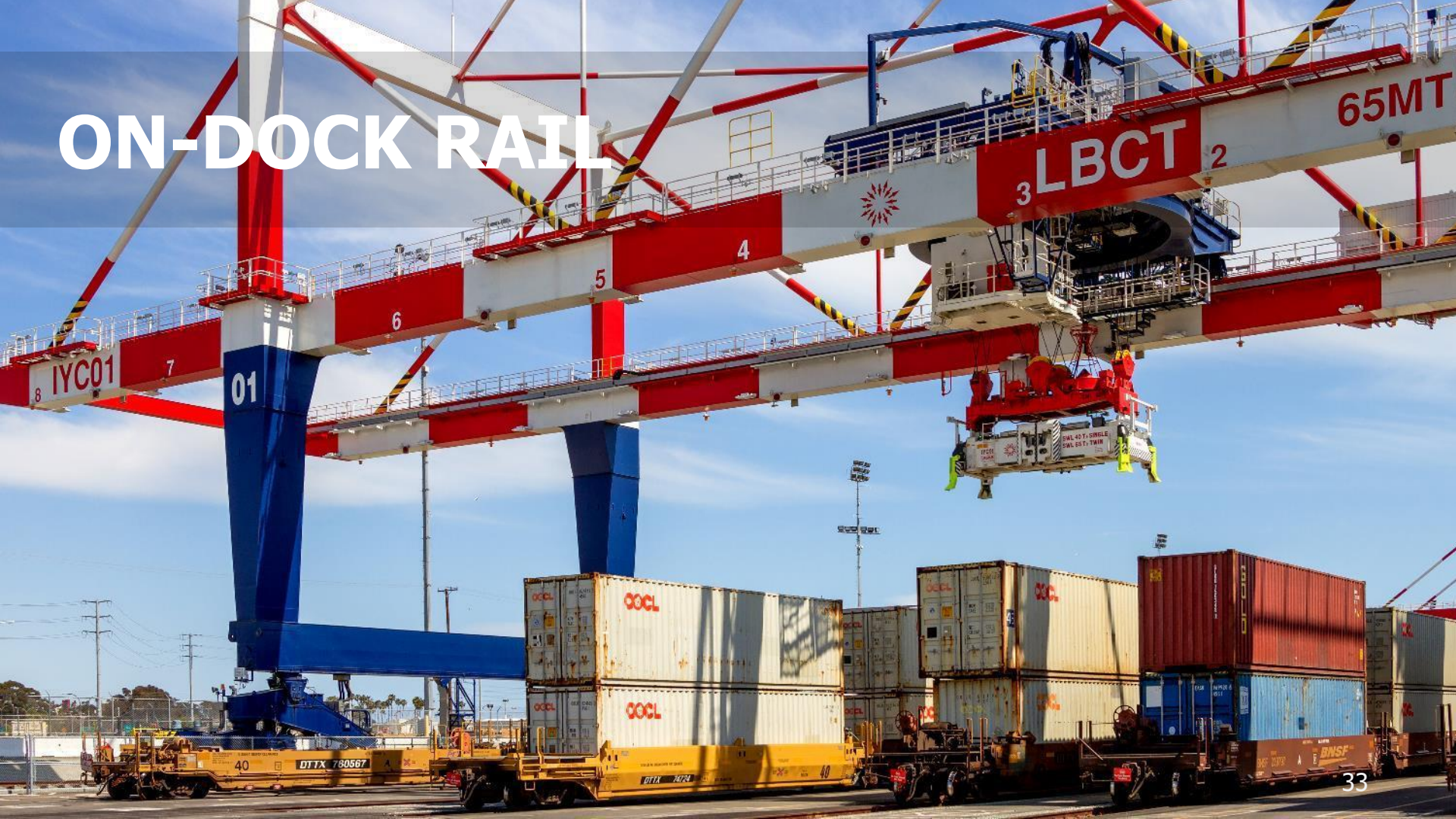
MITIGATION CREDITS

- Used to mitigate loss of marine habitat in the Port from fills
- Bolsa Chica Restoration
- Colorado Lagoon Restoration
- Los Cerritos Wetlands Restoration

SOLAR INSTALLATION

ZERO EMISSIONS EQUIPMENT

ON-DOCK RAIL



TURNING ECO PROJECTS INTO NEW BUSINESS


BUILDING
THE GREEN PORT OF THE FUTURE!

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PORT CLEVELAND

Global Reach. Local Benefits.

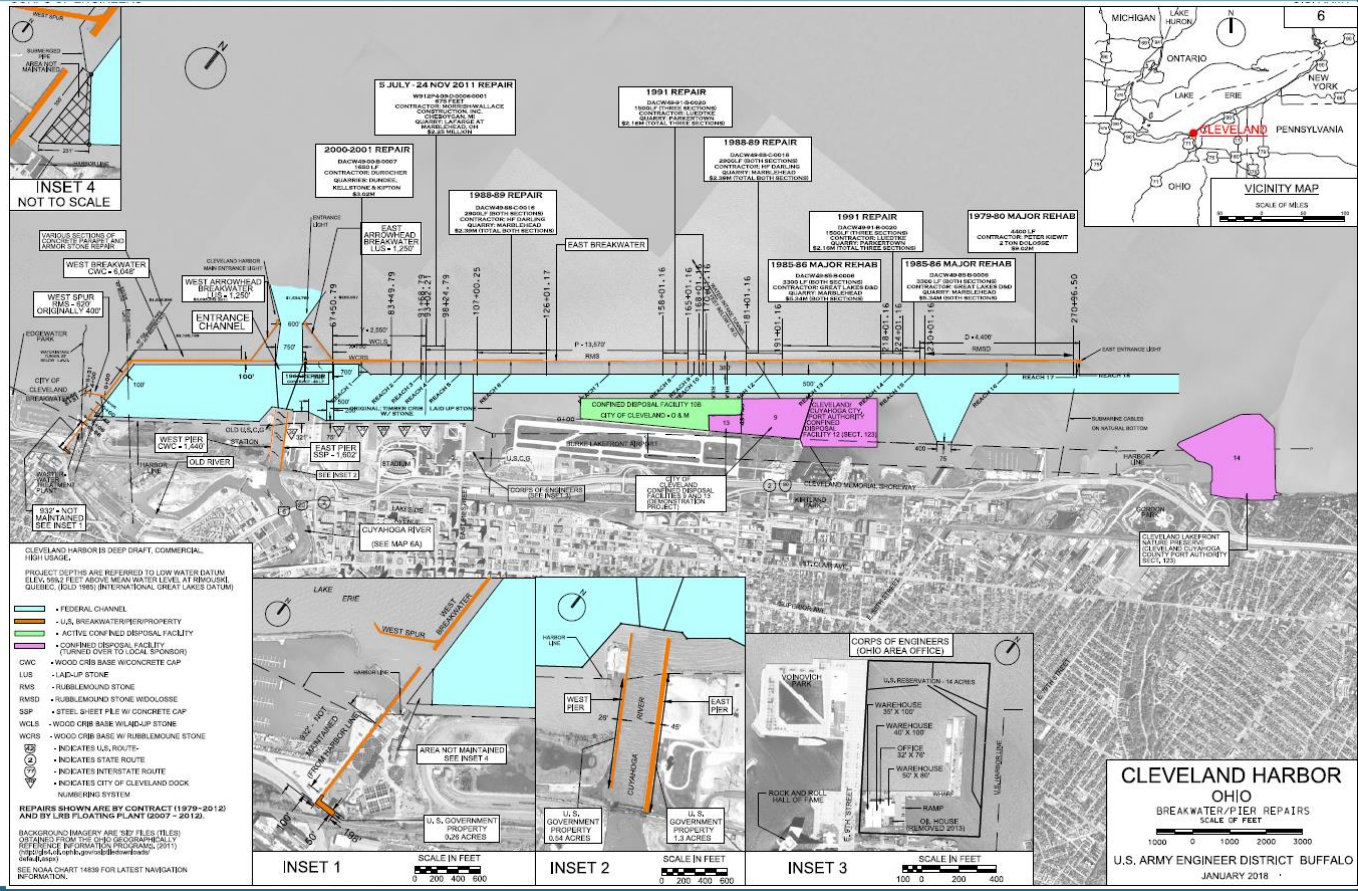
AAPA 2018 CAPITAL PROJECTS SEMINAR

Cleveland Harbor Beneficial Reuse & Bedload Interceptor

MAY 9, 2018

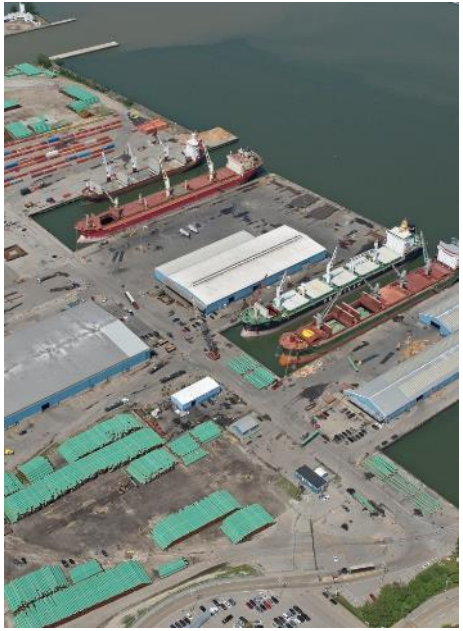
CLEVELAND HARBOR

- 20,000+ Jobs
- $3.5B Economic Activity
- 13 Million Tons Annually
- 1st Major U.S. Port of Call St. Lawrence Seaway System
- 6+ Miles Protected Breakwater
- 5.9 Mile Federally Maintained Navigation Channel



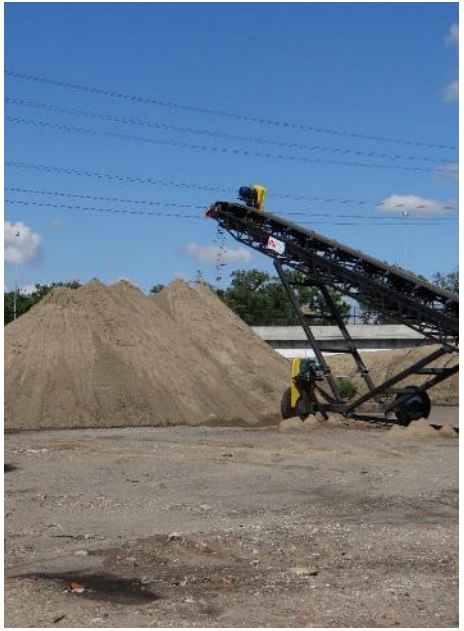
PORT CLEVELAND

PORT OF CLEVELAND: MARITIME BUSINESS



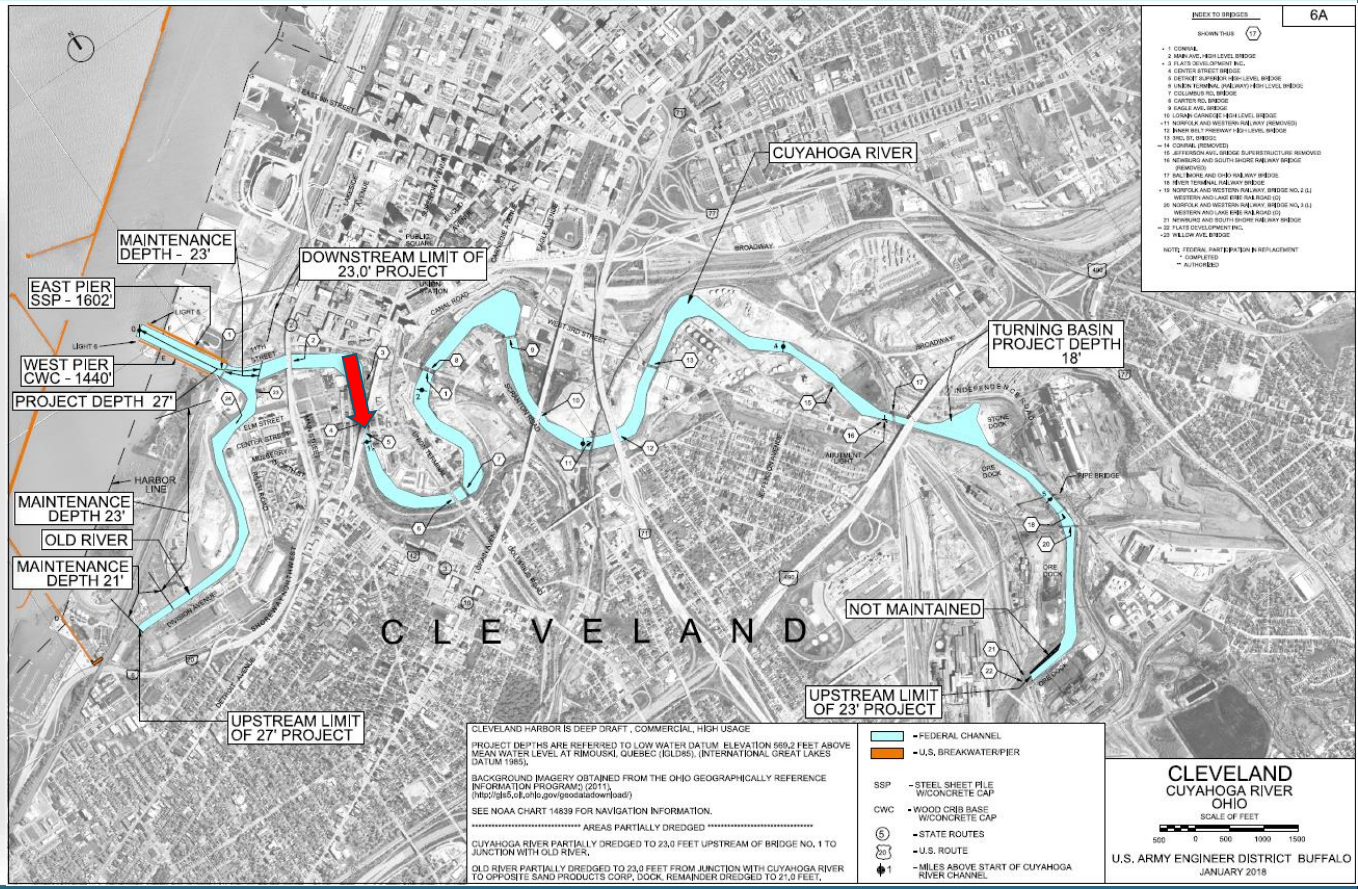
GENERAL CARGO

BULK CARGO



DREDGE SEDIMENT MANAGEMENT

CUYAHOGA RIVER

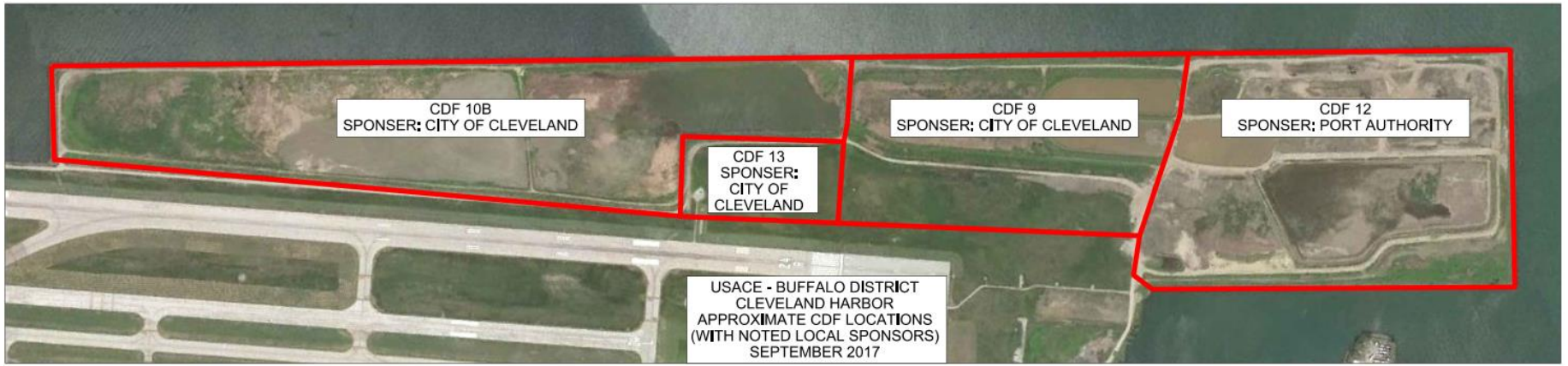


PORT CLEVELAND

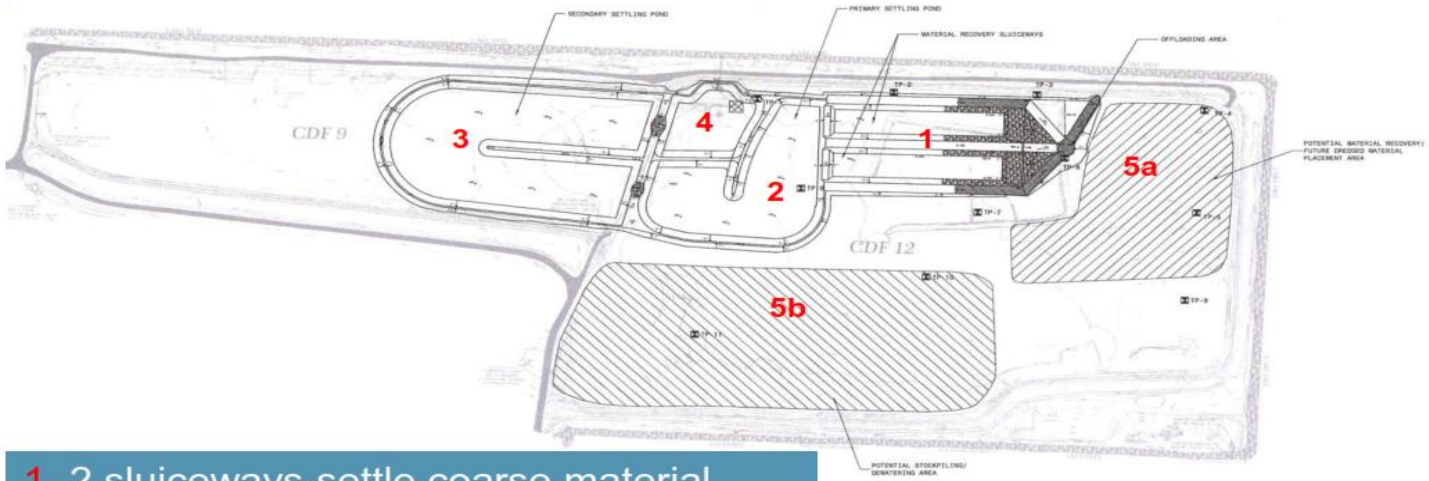
ANNUAL DREDGING & CDF CAPCITY CONSTRAINTS

- 250,000+ CY MATERIAL DREDGED FROM RIVER & HARBOR ANNUALLY
- FEDERAL CHANNEL GEOMETRY DE-ENERGIZES RIVER
- HISTORICALLY MATERIAL DEPOSITED UPLAND IN SERIES OF CONFINED DISPOSAL FACILITIES (CDFs)
- LONG TERM CDF CAPACITY EXHAUSTED IN CLEVELAND HARBOR
- COSTS OF CONSTRUCTING NEW A NEW CDF HAVE BEEN ESTIMATED @ $175M+

CLEVELAND HARBOR CONFINED DISPOSAL FACILITIES



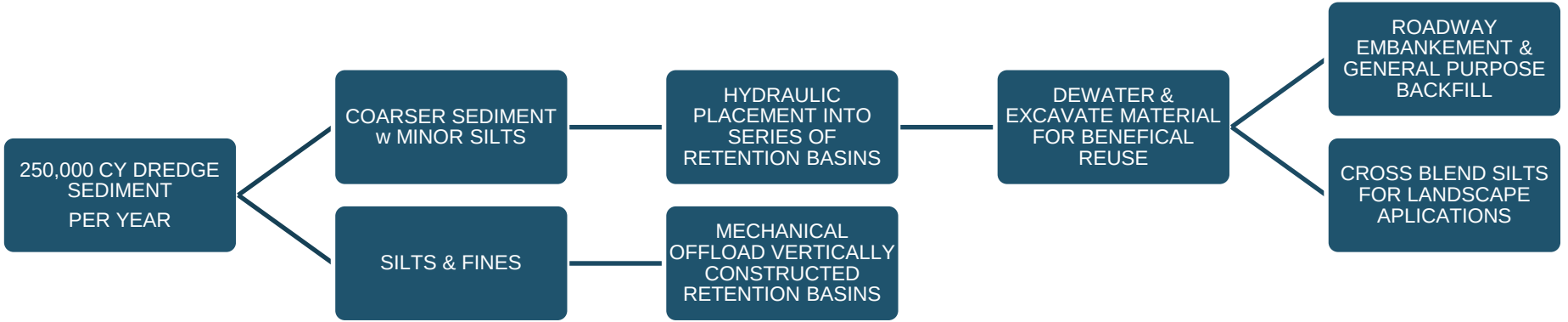
PORT OF CLEVELAND'S SEDIMENT PROCESSING FACILITY & BENEFICAL REUSE MODEL



1. 2 sluiceways settle coarse material
2. Silts settle in secondary basin
3. Water clarifies in 3rd basin
4. Recycling basin for water for scows
5. Areas for (a)stockpiles and (b) compost

PORT CLEVELAND

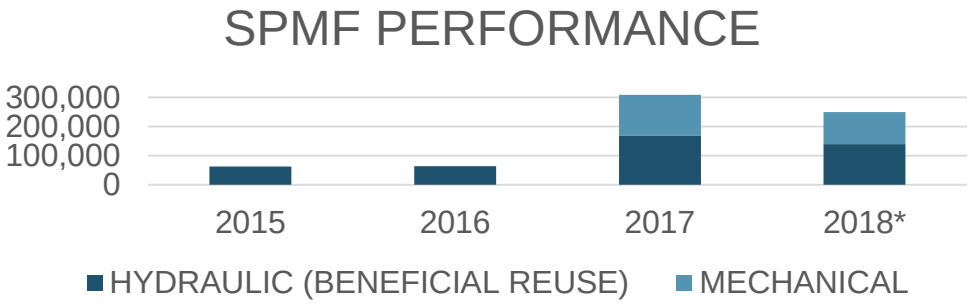
PORT OF CLEVELAND'S SEDIMENT PROCESSING FACILITY & BENEFICAL REUSE MODEL



PORT OF CLEVELAND'S SEDIMENT PROCESSING FACILITY: MARITIME STAKEHOLDER BENEFITS

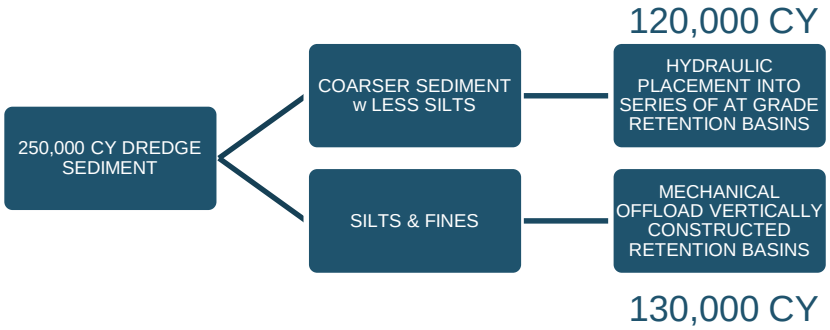
- 20+ YEAR DISPOSAL SOLUTION
- PRIVATE MARITIME STAKEHOLDER DREDGE DISPOSAL
- PORT AUTHORITY DREDGE SEDIMENT DISPOSAL
- CERTAINTY CHANNEL TO BE FULLY DREDGED ON AN ANNUAL BASIS
- COSTS SAVINGS 25%+ PER CY TO FEDERAL GOVERNMENT
- LIMITS COSTS TO LOCAL GOVERNMENT SPONSOR
- ENVIRONMENTALLY RESPONSIBLE
- MAXIMIZES HISTORIC INVESTMENT IN EXISTING CDFs

SEDIMENT PROCESSING & MANGEMENT FACILITY

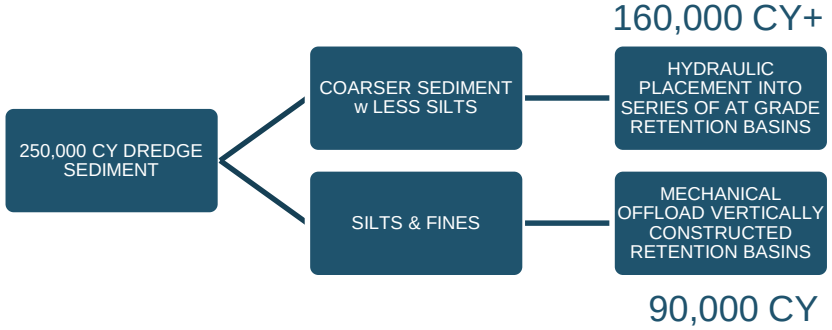


PORT OF CLEVELAND'S SEDIMENT PROCESSING FACILITY 2018 EXPANSION

EXISTING



PROPOSED



REDUCE AVAILABLE AIR SPACE CONSUMPTION BY 30%, TURNS A 20 YEAR FACILITY INTO A 26 YEAR FACILITY!

SEDIMENT PROCESSING & MANGEMENT: BED LOAD INTERCEPTOR

CONCEPT: INTERCEPT SEDIMENT IN PASSIVE MANNER PRIOR TO IT REACHING FEDERAL NAVIGATION CHANNEL

- LESS COSTLY
- SEDIMENT LESS RISK OF BEING CONTAMINATED
- HARNESS FORCE OF MOTHER NATURE
- HIGH QUALITY SEDIMENT

PORT OF CLEVELAND SEDIMENT PROCESSING & MANAGEMENT: PARTNERS & FUTURE GOALS

PARTNERS:

- OHIO DIVISION OF NATURAL RESOURCES OFFICE OF COASTAL MANAGEMENT
- OHIO ENVIRONMENTAL PROTECTION AGENCY
- UNITED STATES ARMY CORP. OF ENGINEERS, BUFFALO DISTRICT
- KURTZ BROS. INC. (SPMF SITE OPERATOR)
- HULL & ASSOCIATES (ENGINEER OF RECORD)
- STREAMSIDE SYSTEMS (BEDLOAD INTERCEPTOR)

FUTURE GOALS:

- EXPAND BED LOAD INTERCEPTOR CONCEPT & IMPROVE EFFICENCY
- EXPAND BENEFICAL REUSE MARKET & CONSUMPTION OF MATERIAL
- REDUCE NEED FOR LONG TERM STORAGE OF DREDGE SEDIMENT
- PROVIDE CLEVELAND MARITIME COMMUNITY LONG TERM DREDGE SEDIMENT SOLUTION IN A COST EFFECTIVE & ENVRIONMENTALLY RESPONSIBLE MANNER

THANK YOU!

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Questions & Answers

- Port of Long Beach
  - Are costs for eco-projects recaptured in maritime revenues, rent?
  - Are projected infrastructure projects required to pass certain positive environmental impact thresholds, along with operational and financial ones?
- Port of Cleveland
  - Are there any economic uses for the dredge material?
  - Does the port have any infrastructure re-capture charges in its maritime revenues and tariffs?

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Conclusion and takeaways

- Environmental stewardship is not just a duty and cost of operation, it is a major shield against economic obsolescence.
- Port's need to assess all true costs of operations, including environmental stewardship
- For decades, shippers have greatly benefitted from tax revenue funded subsidies
- The days of subsidising port clients though is nearing an end; consumers must decided if they will continue to pay subsidies through their taxes or at the point of purchase (ie, the real costs of logistics)

'A pessimist sees the difficulty in every opportunity; ***an optimist sees the opportunity in every difficulty.'***

Sir Winston Leonard Spencer-Churchill