S-AK-1/2
NY & NJ Harbor Deepening Project
Noise and Blast Monitoring and Compliance Program

Tom Shea
Project Manager
Harbor Programs Branch
Agenda

- Introduction to the Port of NY and NJ
- Overall project purpose and schedule
- Why we are blasting
- Where we are blasting
- What we have done to limit impacts
- Inspection program
- How to contact us
The Port of New York and New Jersey is the gateway to the most concentrated and affluent consumer market in the world. It is the largest port on the East Coast, and the third-largest in the nation.

The Port Authority of New York and New Jersey manages Port Newark, the Elizabeth-Port Authority Marine Terminal, the Howland Hook Marine Terminal, the Brooklyn-Port Authority Marine Terminal, the Red Hook Container Terminal, and Port Jersey.
Significance of the Port of New York & New Jersey

- Largest Port on the East Coast (59% share)
- 3rd in US (13% share); 15th in World
- $114.5 B in cargo (over 5 million TEUs per year)
- 1,031,540 automobiles
- 269,900 full time jobs (10/2011)
- $11.2B in personal income (10/2011)
- $2.2 B in NY/NJ state and local tax revenue
- 35 percent of US population served
Over 269,900 direct and indirect jobs in port related activities. Through the Port’s four major container terminals, waterborne cargo moves to all parts of the United States and throughout the world.
Goods arrive every day on container ships (basically everything we buy on a daily basis) most of it is consumed in the immediate area. (source: Port Authority of NY and NJ)
Why water Transportation?

Economic Theory of Adam Smith, Water Transportation, and the Potential to Grow

The classical economist Adam Smith recognized the efficiency of water transportation in 1776, when he published his revolutionary book, An Inquiry into the Nature and Causes of the Wealth of Nations. Smith championed water over ground transportation when he analyzed why some nations are better off than others.

Smith stated:

“A broad wheeled wagon, attended by two men and drawn by eight horses, in about six weeks time carries and brings back between London and Edinburgh near four ton weight of goods. In about the same time, a ship navigated by six to eight men, and sailing between the ports of London and Leith, frequently carries and brings back two hundred ton weight of goods.”

“Six or eight men, therefore, by the help of water-carriage, can carry and bring back in the same time the same quantity of goods between London and Edinburgh as fifty broad-wheeled wagons, attended by a hundred men, drawn by four hundred horses.”

As a result of this comparison, Adam Smith came to the simple but important conclusion: “Countries are only wealthy when they have growth potential.” This unprecedented concept was echoed in our Constitution, which empowered the United States government to form economic incentives. These incentives stimulated commerce, building the basis for the nation’s economic development.

1 Ship can move the equivalent of
100 Small Barges
or
1500 Rail Cars
or
6000 Semi Trucks

Source: American Waterways Operators
Panamax and Post-Panamax Container Vessels

<table>
<thead>
<tr>
<th></th>
<th>Length of Post-Panamax Vessel</th>
<th>Beam</th>
<th>Draft</th>
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<tbody>
<tr>
<td>Panamax</td>
<td>366m</td>
<td>48m</td>
<td>12m</td>
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<tr>
<td>Post-Panamax</td>
<td>366m</td>
<td>49m</td>
<td>13m</td>
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<thead>
<tr>
<th>First (1956-1970)</th>
<th>Converted Cargo Vessel</th>
<th>Converted Tanker</th>
<th>Dimensions</th>
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<td>Draft: 30 m</td>
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<td>9 m &lt; 30 ft</td>
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<td>Draft: 33 m</td>
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<td>10 m 33 ft</td>
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<td>Draft: 40 m</td>
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<td></td>
<td>11-12 m 36 ft</td>
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<td>Beam: 36 m</td>
<td>Draft: 43 m</td>
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<td></td>
<td>11-13 m 36-43 ft</td>
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<tbody>
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<td>Beam: 43 m</td>
<td>Draft: 46 m</td>
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<td></td>
<td>13-14 m 43-46 ft</td>
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<th>Sixth (2006-)</th>
<th>New Panamax</th>
<th>Dimensions</th>
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</thead>
<tbody>
<tr>
<td>Length: 397 m</td>
<td>Beam: 50 m</td>
<td>Draft: 50 ft</td>
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<tr>
<td></td>
<td></td>
<td>15.5 m 50 ft</td>
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Why Do We Dredge?

Primary Benefits:
- Provide access to landside facilities
- Provide economically efficient loading of ships
- Maintain channels and anchorages for commerce

Secondary Benefits:
- Remove contaminated materials health and safety
- Provide source material for beach renourishment
Three Broad Categories of Dredging

- **New Work**
  - Dredge channels deeper than they currently are
  - Example: NY & NJ Harbor Deepening

- **Maintenance**
  - Maintain a specific channel depth due to shoaling
  - Example: USS Intrepid Berth; Jamaica Bay Channels

- **Environmental**
  - Remove contaminated material to reduce existing risks and to improve the ecological system
  - Example: Lower Passaic River
Types of Dredges

- Clamshell
- Cutter head
- Backhoe
- Drill Boats
Underwater dredging, drilling and blasting
Underwater drilling and blasting

- Drill Boats
- Explosives

**Drill Boats**

Mounted on spuds, the drillboat has three drilling frames that drill holes in the rock on the channel floor for insertion of explosives that fragment the rock for excavation.

**Setting Explosives**

A. The drill is lowered to the channel bed through a steel casing suspended from the drill tower.

B. Once the hole is drilled to 8 feet below required channel depth, drill is withdrawn. A hose, two explosive cords, and a detonator are lowered to the bottom of the hole.

C. A fluid explosive material is pumped into the hole through the hose.

D. A bag of gravel is placed at the top of the arrangement to keep components in place.

The drillboat then is towed back away from the area and after passing marine traffic is well away, the explosives are detonated.

Some channels including the Kill Van Kull have been carved from hard material such as shale, sandstone, serpentine, and diabase rock. Drilling and blasting is used to break up the hard bottom in order to make the channel wider and deeper. Drillboats bore holes in the channel bottom. Explosive material is placed and detonated. As many as 100 holes spaced 10 feet apart, may be drilled and blasted for one drillboat set-up.
Drilling and underwater blast
New York/New Jersey Harbor Project Overview

Description:

- Deepens 35 miles of navigation channels to 50 - 53 ft (mean low water) to provide deep draft access to the major container terminals within the Port of New York and New Jersey.

- Includes four separate authorized projects that were consolidated in 2002.

- Key features of the 50 ft. project include:
  - 17 large multiyear dredging contracts
  - Mitigation restoring 143 acres of tidal wetlands
  - Offsets NOx air emissions from project
  - Beneficial use of dredged material

Total Project Cost $2.5 Billion

Sponsor
Port Authority of New York & New Jersey
New Jersey Department of Transportation Office of Maritime Resources
General Map of NY & NJ Harbor Deepening Contract Areas (50 ft)
As of March 12, 2012

Contracts
- Completed
- Underway
- Work Remaining
Material Types and Locations
## Construction Schedule

### S-AK-2
- **Contract Award**: Oct 11
- **Dredging Starts**: Nov 11
- **Blasting Starts**: Nov 11
- **Blasting Ends**: Apr 13
- **Dredging Ends**: May 13

### S-AK-3
- **Contract award**: ~ Nov 12
- **Complete**: ~ Dec 13
Regulatory Limits on Blasting

- Corps follows US Bureau of Mines Guidelines
- Vibration from Blasting may not exceed these limits

For type of Structure within 1,500 of blast area:

- Historic Structures: Peak Particle Velocity May not Exceed 0.5 in/sec (Standard for S-AK)
- Residential Structures: 1.0 in/sec
- All Other Structures: 2.0 in/sec

Typical Vibrations encountered daily:

- Human threshold: 0.02 in/sec
- Phone calls: 0.3 in/sec
- Normal Door Slam: 0.5 in/sec

Average for KVK Contract S-AK-2: 0.029 to 0.049 in/sec
Richter Scale based on powers of 10

<table>
<thead>
<tr>
<th>Event</th>
<th>Richter scale (magnitude)</th>
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<tbody>
<tr>
<td>Major earthquake in Japan or NZ or Chile</td>
<td>7.0-9.0</td>
</tr>
<tr>
<td>2011 Virginia earthquake</td>
<td>5.8</td>
</tr>
<tr>
<td>1944 New York earthquake</td>
<td>5.8</td>
</tr>
<tr>
<td>2009 New Jersey earthquake</td>
<td>3.0</td>
</tr>
<tr>
<td>Rock breaking in mining</td>
<td>1.0</td>
</tr>
<tr>
<td>Bus hitting pot hole on Staten Island</td>
<td>&lt;1.0</td>
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<tr>
<td>Rock blasting in Arthur Kill</td>
<td>&lt;&lt;1.0</td>
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BUILDING STRONG®
NYC Limits on Noise

- **Limits:**
  - Day Time (7am to 10pm): Operations must not exceed 10 dB over normal background noise (average 65 dB)
  - Night (10pm to 7am): Operations cannot exceed 7 dB over normal background noise (average 55 dB).

- **Examples**
  - 140 dB = firearms, air raid siren, jet engine
  - 130 dB = jackhammer
  - 100 dB = chain saw, pneumatic drill
  - 80 dB = alarm clock, busy street
  - 60 dB = conversation, dishwasher
  - 40 dB = quiet room
  - 30 dB = whisper, quiet library
Informing resident who reside within 1500 feet of drilling and underwater blasting
Monitoring Program

In some instances, hard rock needs to be removed from the channels to reach these necessary depths, which requires the use of drilling and blasting techniques. The Corps only uses drilling and blasting as a last resort when it is determined that materials cannot be removed through dredging.

Seismographs are set up to monitor vibrations. The Army Corps and other agencies involved perform various monitoring activities during this construction to ensure that the work conforms to all applicable federal, state and local requirements and ordinances.
Monitoring Drilling and Blasting Operations

The subcontractor and the Corps take concerns about damage claims to any property during blasting operations seriously.

Visits to residents and property owners logging concerns include documentation; observing a blast with the resident or property owner at his/her home or place of business; placing strain gauges on any cracks; and/or placing a geophone at the property to monitor vibrations, both of which will remain for the length of the project.

To ensure the safety of the communities, residents, and structures in the project area and minimize the level of disturbance the project may cause, the Corps uses the best available drilling and blasting technology, and adheres to all federal, state and local requirements.

The Corps monitors all blasting activities conducted by its subcontractors to ensure that vibration levels associated with each blast are within the allowable vibration limits that have been set for each project area.

Portable seismographs are used to measure and record the ground vibrations and air overpressure. The specialist conducting this work will analyze the recordings and keep updated information available at all times for the Corps, authorized agencies and concerned citizens to review.

Blasting event reports are kept for each blast and contain information about the vibration level as it compares to the Table of Safe Blasting Levels established by the explosive industry.

Residents or property owners who have concerns during the drilling and blasting activities may call (201) 339-6470.

Regular Sound Monitoring Stations
(levels monitored at stations within 1500' of equipment)
Blast summary reports are posted on the Army Corps’ New York District website www.nan.usace.army.mil/harbor
Noise Monitoring Report

sAK-2 - Site NAK-2 21 Arlington Avenue, Staten Island, New York  
04/30/2012 - 05/06/2012

Sounds Levels exceeded the Impact Noise Criteria Levels on Wednesday night, and Sunday Evening.
Getting In Touch During the Dredging

- Complaint Hotline: 201-339-6470
- USACE Project Office: 201-433-9228
- USACE Project Manager: 917-790-8304
- USACE Public Affairs: 917-790-8007
Contact Information

- Tom Shea, Project Manager
- thomas.shea@usace.army.mil
- (917) 790-8304
- Harbor Programs Branch
  US Army Corps Of Engineers
  NY District
  26 Federal Plaza, Room 2119
  NY, NY 10278-0090