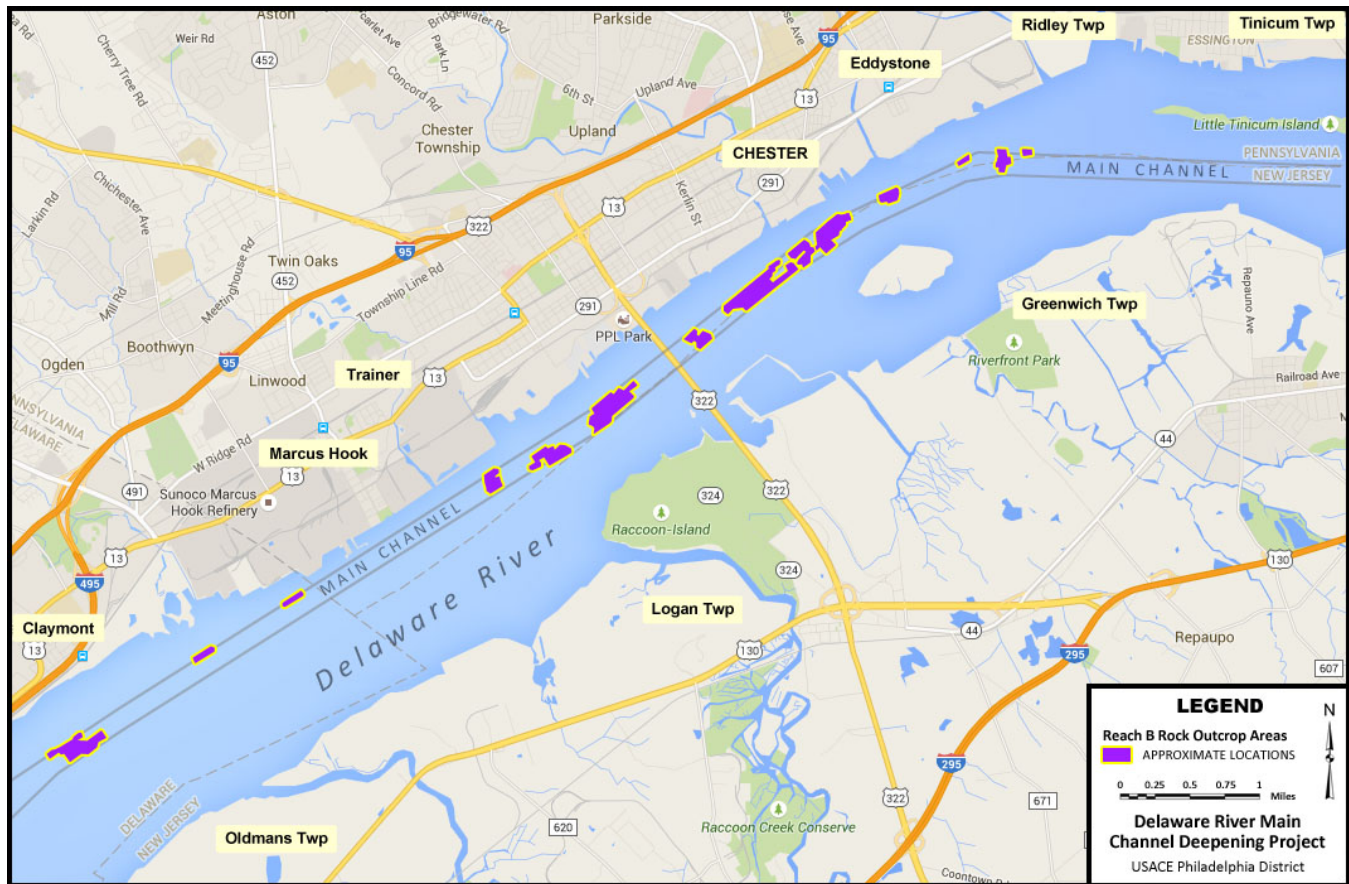


ROCK REMOVAL CONTRACT

updated 9 Oct 2015

Delaware River Main Channel Deepening Project



What: Fracturing and removal of rock outcrops above -47 feet MLLW as part of deepening the Delaware River Main Channel from 40 to 45 feet MLLW (2 feet additional depth required to ensure safe ship transit and allow for long-term channel maintenance)

Where: Multiple locations within a 10-mile stretch from west of Philadelphia International Airport to just below the PA/DE line

Why: The presence of these rock formations make this the only section of the project that cannot be deepened solely by hydraulic or mechanical means

When:	22 Jul 2015	Advertised contract
	10 Sep 2015	Opened bids
	30 Sep 2015	Awarded contract to Great Lakes Dredge & Dock Co. for \$76.8 million
	1 Dec 2015 - 15 Mar 2016	Conduct rock blasting and dredging within two 3-1/2 month periods one year apart (seasonal restrictions are to protect endangered sturgeon populations in the river)
	1 Dec 2016 - 15 Mar 2017	

- How:**
1. Fracturing of rock by controlled underwater blasting so it can be removed mechanically
 2. Removal of blasted rock by mechanical dredging
 3. Placement at Corps-owned dredged material disposal areas (Fort Mifflin/Pedricktown) or contractor-furnished area



Rock Removal Procedures

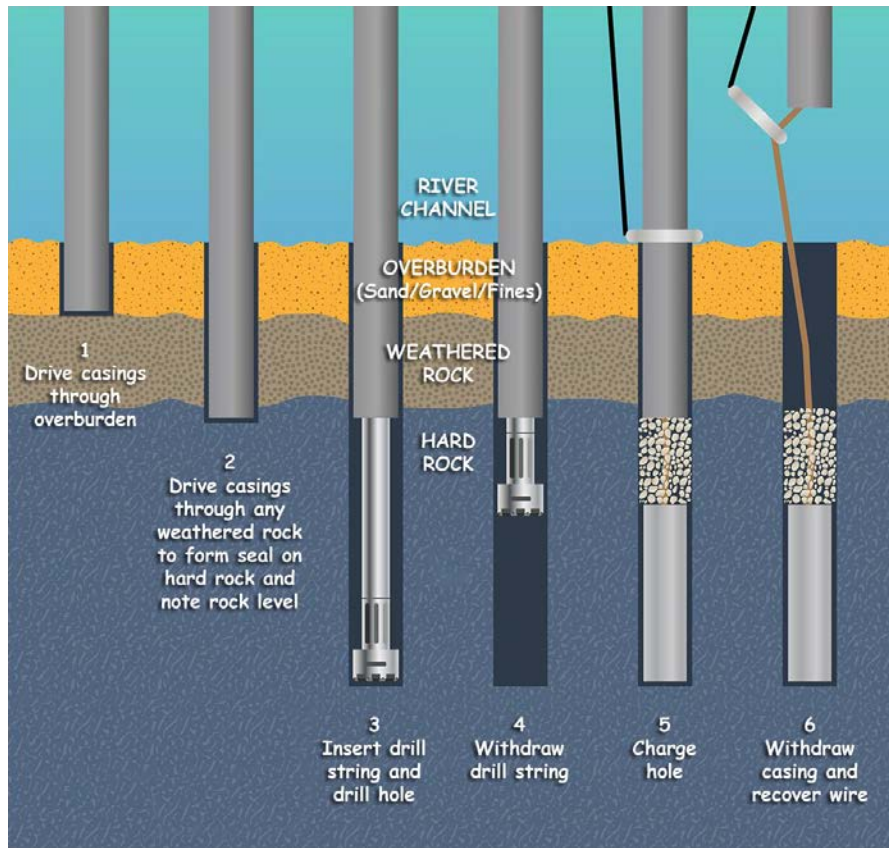
- 1) Develop blasting program
- 2) Identify areas requiring blasting
- 3) Install blast holes with drill barge
- 4) Drill holes down below required clearance depth (-47 feet MLLW) to ensure removal of all rock
- 5) Place explosives within blast hole



Typical drill barge (foreground)



Since blasting is conducted underwater, visual effects on the surface are minimal – the video stills above show rock blasting in a similar 43-foot channel



- 6) Conduct blasting operations
- 7) After blasting, rock is removed using mechanical dredging (typically bucket dredging) and placed at Fort Mifflin



Bucket dredging operations

What About Sturgeon Impact?

- Corps consulted with National Marine Fisheries Service on potential impact to endangered Atlantic and shortnose sturgeon and to other fish and aquatic life
- In coordination with NMFS, the Corps has developed a sturgeon protection plan—including adherence to established seasonal windows and monitoring during construction—that will be implemented during the conduct of rock blasting