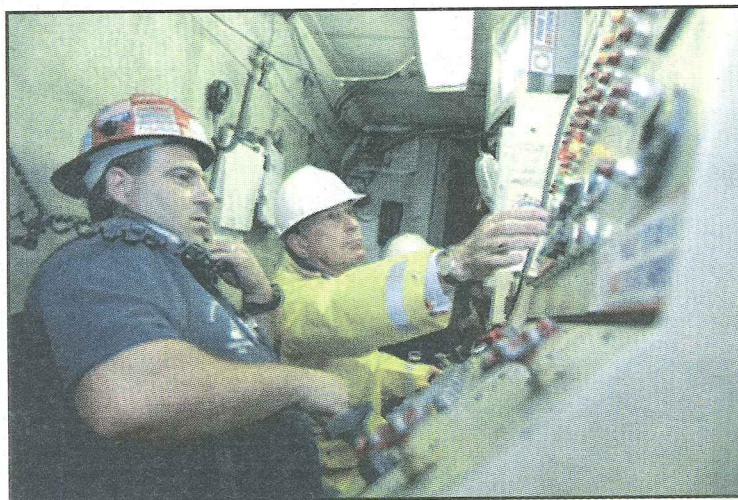


# Excavation Work on Stage Two of Water Tunnel No. 3 Finished

NEW YORK – At an event staged on Aug. 9, less than three years after announcing the start of excavation, Mayor Michael R. Bloomberg and Department of Environmental Protection Commissioner Emily Lloyd traveled 550 feet below the street surface of midtown Manhattan to mark the completion of excavation for Stage Two, the Manhattan leg, of City Water Tunnel No. 3.

Helping guide the 700-foot long tunnel boring machine (TBM) on its final journey, Mayor Bloomberg and Commissioner Lloyd made the final cut and completed the last phase of excavation. When fully operational in 2012, City Tunnel No. 3 will nearly double the 1.2 billion gallons per day capacity of the city's water supply system. Started in October 2003, the Manhattan leg of Stage Two is a \$1 billion, 8.5 mile water tunnel stretching from West 30<sup>th</sup> Street and radiating out in three directions: north to Central Park, south and east to the Lower East Side, and cross-town to the Upper East Side.

"New York City has some of the best water in the nation and while clean drinking water is often taken for granted, the city continues to develop ways to ensure the delivery of quality drinking water for generations to come," said Mayor Bloomberg. "The Third



New York City Mayor Michael Bloomberg turns off the tunnel-boring machine to mark the completion of excavation for the Manhattan leg of City Water Tunnel No. 3. When fully operational in 2012, it will nearly double the 1.2 billion gallons per day capacity of the city's water supply system. PHOTO/EDWARD REED

Water Tunnel is the single largest infrastructure project in the city's history and is exactly the kind of sound investment that we need to ensure our long-term growth and prosperity. The building of Water Tunnels One and Two were essential in New York City's evolution into a world business and cultural center and this third Tunnel will help keep our city thriving through the 21<sup>st</sup> Century."

"More than 150 years ago city officials and planners had the vision to establish a remarkable water delivery system," said Commissioner Lloyd. "Over time, that system has endured, adapted, and

expanded to meet the changing needs of New York City. New York's municipal water supply is

Please turn to page 10

## Inside

Albany Update .....5 & 18

Economic Outlook.....9

Safety Watch ..... 15

Financial Management 16

Low Bids ..... 18

# Excavation Work Finished

Continued from page 1

among the best in the world and projects like the Third Water Tunnel will make certain that it remains so by helping to ensure the reliability and quality of our water delivery system into the future."

Currently, almost all the City's water needs are serviced by City Water Tunnels No. 1 and No. 2 built in 1917 and 1936 respectively.

## AT A GLANCE

### City Water Tunnel No. 3

- The amount of rock displaced during the excavation of 8.5 miles of tunnel is approximately the size of a football field piled 250 feet high (300' x 250').
- 80,000 cubic yards of concrete will be used to line the Manhattan Tunnel.
- Tunnel depths range from 400 feet to as deep as 800 feet below Roosevelt Island.

Neither of the existing tunnels has ever been taken out of service since being activated. The additional capacity provided by City Water Tunnel No. 3 is critical, not because water usage is expected to rise, but so that Tunnels 1 and 2 can be taken out of service for inspection, maintenance and repairs, city officials noted. The Manhattan Leg of City Water Tunnel No. 3 is scheduled to begin delivering water in 2012. Stage One of Water Tunnel No. 3 began delivering drinking water to some residents of the Bronx, Manhattan and Queens in 1998 and the 10.5-mile Brooklyn-Queens leg of Stage Two is scheduled to begin transmission of water in 2009 which will supply water to

areas in all five boroughs. Construction of the shaft network, which brings water from the tunnel at depths of 600 feet to 800 feet up to the distribution system's water mains in Manhattan, will continue for the next three years.

Construction of Stage Two was greatly accelerated using a mechanical rock excavator called a tunnel-boring machine (TBM). The TBM, also known as "the mole," was lowered in sections and assembled on the tunnel floor. It chips off portions of bedrock through the continuous rotation of a series of steel cutting teeth. The TBM replaces conventional drilling and blasting methods and allows for faster and safer excavation. The TBM can clear from 55 feet to 100 feet of rock a day, more than twice as much as the previous drill and blast method that cleared between 25 feet to 40 feet a day. The Manhattan excavation set records for the Third Water Tunnel project, sometimes achieving removal of more than 100 feet of rock a day. Stage One of the Third Water Tunnel was chiseled out using the old drill and blast method, which was formerly used in all tunneling projects throughout the city.

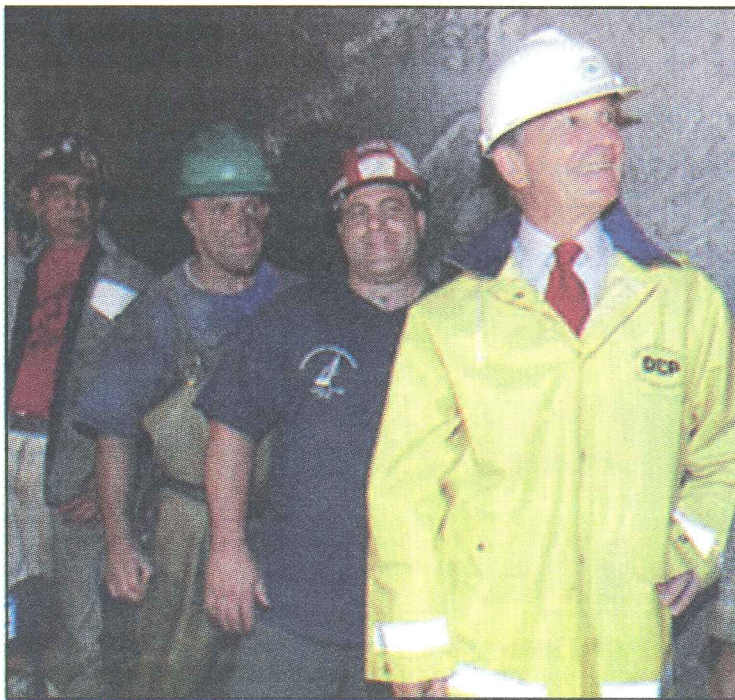
FROM: CONSTRUCTION NEWS, AUGUST 2006

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As the TBM crushes rock with its circular rotating head, which contains twenty-seven 350-pound cutters, the rock or "muck," is removed from the face of the tunnel through the TBM's trailing gear by a conveyor into muck cars that are linked together to form a train. A locomotive pulls the cars on rails through the existing tunnel to the head of the shaft at its opening, and the rock is then sifted, crushed and raised to the surface by a vertical conveyor belt. When excavation is completed, the TBM is dismantled and returned section by section to the surface. The final step before the tunnel is tested for use is to apply a 14-inch layer of concrete, smoothing the entire tunnel wall and preparing it to serve as a conduit for water.

Work on the Third Water Tunnel began in 1970, and is expected to be completed in its entirety by 2020 at an estimated total cost of \$5.5 to \$6 billion, financed through water bonds and the collection of water and sewer fees. Over the past 35 years, nearly 5,000 sandhogs have worked on the Third Water Tunnel project, performing difficult and dangerous work. The city has commissioned a permanent memorial to the 23 workers who have died while constructing this project. It will be installed within a year in Woodlawn near Van Cortlandt Park in the Bronx. The construction contractor for the Manhattan leg of Stage Two is Schiavone/Shea/Frontier-Kemper Joint Venture.



**Mayor Bloomberg, pictured with a number of sandhogs that worked on the project, announced on Aug. 9 the completion of excavation for the Manhattan leg of City Water Tunnel No. 3.**

PHOTO/EDWARD REED