



Technical Paper

Title: Properly Implemented Rock Blasting and Vibration Control Program Protects a Nearby Water Supply Plant in Southwest Florida – Case History

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**PROPERLY IMPLEMENTED ROCK BLASTING AND VIBRATION CONTROL PROGRAM
PROTECTS A NEARBY WATER SUPPLY PLANT IN SOUTHWEST FLORIDA
- CASE HISTORY**

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ABSTRACT

The presence of deep injection wells in a county's water treatment plant (WTP) created a unique deterrent to the developer's plans for rock blasting, excavation, and development of water management areas (lakes) in connection with the construction of an adjoining residential community and golf course in northeast Naples, Florida, USA.

Possibility of damaging vibrations from rock blasting operations and potential impact to the integrity of the injection wells required safety measures to be taken in developing the rock blasting program to alleviate concerns of county representatives. A properly planned program consisted of test borings and rock corings to develop geophysical characterization of site specific limestone as well as simulated test blasts conducted in the farthest water management areas in an effort to develop some baseline parameters. In addition, a 12.2 m (40 ft) deep test well was drilled and a geophone installed to evaluate the effects of vibration below the surface. Peak Particle Velocity (PPV) was measured at various stations placed at selected distances from the test blast areas. Surface and subsurface measurements were taken and used in a comprehensive monitoring plan to alleviate the county's concerns. The data so developed was presented and reviewed by the county, prior to the issuance of a permit for blasting beyond 150 m (500 ft) from the WTP.

Following completion of the investigative program and issuance of restrictive permit, production rock blasting operations were performed under the full-time monitoring of the geotechnical consultant. This included setting up of multiple monitoring stations at various locations, including selected locations within the critical WTP facility itself. Additional items included documenting the contractor's drill hole patterns, quantity of explosives detonated in a given shot sequence and millisecond delay period, monitoring station distance, and Peak Particle Velocity (PPV) at the surface level as well as at the bottom of the test well. Pre- and post-blast survey of WTP and other critical structures within the influence zone were also conducted.

This engineered, inspected, and tested program provided a cost-effective method for rock blasting, excavation, and construction of these urban area lakes. More importantly, the test and production blasting operation and vibration (velocity, acceleration, and displacement) measurements provided noteworthy evaluations for close proximity development blasting near subterranean structures.