California Regional Water Quality Control Board
San Diego Region

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April 4, 2006

In reply, refer to:
WPN:10-6001.02:haasj

Robert Stone, President
Quantum Ozone, Inc.
342 9th Street
Del Mar, CA 92014

Certified Mail No.
7005 1820 0005 4392 3733
(return receipt requested)

Brad Fowler, Director of Public Works
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629

Certified Mail No.
7005 1820 0005 4392 3740
(return receipt requested)

INVESTIGATIVE ORDER NO. R9-2006-0039
QUANTUM OZONE, INC. AND CITY OF DANA POINT, OZONE TREATMENT DEMONSTRATION PROJECT AT NORTH CREEK, DOHENY BEACH, CITY OF DANA POINT, ORANGE COUNTY

Dear Mr. Stone and Mr. Fowler:

Enclosed is Investigative Order No. R9-2006-0039 (Order) of the California Regional Water Quality Control Board, San Diego Region (Regional Board) concerning proposed discharges of disinfected urban runoff into North Creek of Doheny Beach, tributary to the Pacific Ocean, within the City of Dana Point. The Order is issued pursuant to California Water Code (CWC) sections 13225, 13267, and 13383 and directs you to submit monitoring reports associated with the discharges from the proposed ozone-based urban runoff treatment device at North Creek, Doheny Beach. The Order does not relieve the City from responsibility to effectively prohibit illicit discharges into the storm sewer conveyance system.

Please note the requirements contained within the Order. Specifically, all technical reports submitted to the Regional Board shall be accompanied by the certification, under penalty of law, that the information is true, accurate, and complete.

Failure to meet the requirements may subject you to further enforcement action by the Regional Board, including administrative civil liability pursuant to CWC sections 13268 and 13385. Any

request for extensions of submittal dates must be submitted in writing and are denied absent written approval of the Executive Officer of the Regional Board.

The heading portion of this letter includes a Regional Board code number noted after "In reply refer to:" In order to assist us in the processing of your correspondence please include this code number in the heading or subject line portion of all correspondence and reports to the Regional Board pertaining to this matter.

Please contact Jeremy Haas at (858) 467-2735 or jhaas@waterboards.ca.gov if you have any questions regarding this matter.

Respectfully,

JOHN H. ROBERTUS
Executive Officer
San Diego Regional Water Quality Control Board

JHR:js:jch

CIWQS Party ID No. 12179 (City of Dana Point)
P:\Dana point north creek ozone request\CAO R9-2006-0039 north creek.doc

cc:
Richard Boon, Stormwater Program Supervisor; County of Orange; 1750 S. Douglass Rd; Anaheim, CA 92806
Richard Rozzelle; State Park Superintendent; California Dept. of Parks and Recreation; Orange Coast District; 3030 Avenida Del Presidente; San Clemente, CA 92672

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

INVESTIGATIVE ORDER NO. R9-2006-0039

FOR

QUANTUM OZONE, INC.
342 9TH STREET
DEL MAR, CA 92014

AND

CITY OF DANA POINT
33282 GOLDEN LANTERN
DANA POINT, CA 92629

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

1. California Water Code Sections 13267(b) and 13383 contain criteria that allows the Regional Board to conduct investigations and to establish technical, monitoring, inspection, entry, reporting, and record keeping requirements from any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste in accordance with the conditions in the section.

2. California Water Code Section 13225(c) directs the Regional Board to require local agencies to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water.

3. The City of Dana Point (City) owns and operates the municipal separate storm sewer system (MS4) used to convey and discharge urban runoff to North Creek, Doheny Beach. The City is responsible for the quality of the discharges from the MS4 in accordance with the National Pollutant Discharge Elimination System (NPDES) Permit requirements (Regional Board Order No. R9-2002-0001, NPDES Permit No. CAS0108740).

4. Designated beneficial uses of inland surface waters in North Creek and adjacent marine waters in the Pacific Ocean at Doheny Beach in the Water Quality Control Plan for the San Diego Basin (Basin Plan) include, Agricultural Supply (AGR), Industrial Service Supply (IND), Contact Water Recreation (REC 1), Non-contact Water Recreation (REC 2), Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), Marine Habitat (MAR), and Rare, Threatened, or Endangered Species (RARE).

5. Annual monitoring reports submitted by the County of Orange and other permittees in accordance with municipal NPDES requirements (Order No. R9-2002-0001) demonstrate that receiving waters in North Creek routinely exceed water quality objectives for fecal indicator bacteria and often exceed California Toxic Rule (CTR) criteria for the following heavy metals: cadmium, copper, nickel, and zinc. Freshwater aquatic life criteria for metals are expressed as a function of total hardness in the water body.

6. Quantum Ozone, Inc. proposes to conduct a pilot demonstration project by temporarily installing an in-situ, ozone generating system into an existing urban runoff solids removal unit owned and operated by the City of Dana Point (City). The solids removal unit is located in a subterranean vault within the City's municipal separate storm sewer system (MS4) and currently discharges treated stormwater flows into North Creek within the City adjacent to Doheny State Beach. The goal of the demonstration project is to assess the system's ability to reduce and/or eliminate pathogens and indicator fecal bacteria in the urban runoff prior to its discharge to North Creek. Ozone is a common disinfection agent for water and wastewater and has been increasingly proposed for use in urban runoff situations. It is generally believed that bacteria and pathogens are destroyed from ozone-induced cell lysis[1]. A secondary objective is to reduce concentrations of dissolved metals through promotion of adsorption.

7. The proposed time frame of the demonstration is from March 2006 to September 30, 2006.

8. Ozone, a strong oxidizing disinfection agent, is toxic to marine and freshwater organisms, including phytoplankton, zooplankton, bacteria, and less so for benthic organisms. Ozone decays rapidly in water, limiting residual effects. Toxic byproducts, however, can be produced during ozone disinfection and are dependent upon the influent water quality. Brominated byproducts are a primary concern in source waters containing bromide[2]. The presence of bromine can cause both immediate and delayed toxicity to marine organisms even after relatively short periods of ozonation[3]. Existing data for North Creek does not include assessments for bromide. Effluent monitoring for bromate and bromine is necessary to assess potential toxicity of brominated byproducts discharged from the ozone system.

9. The water quality data from monitoring the effluent of the in-situ, ultraviolet and ion ozone generating system is necessary to confirm whether the proposed system reduces indicator fecal bacteria in the urban runoff prior to its discharge to North Creek without

[1] Environmental Protection Agency. 1999. *Wastewater Technology Fact Sheet: Ozone Disinfection.* EPA 832-F-99-063
[2] National Drinking Water Clearinghouse. December 1999 Fact Sheet. *Tech Brief Twelve: Ozone.*
[3] William Cooper et al. 2002. Final Report. *Ozone, seawater, and aquatic nonindigenous species: Testing a full-scale ozone ballast water treatment system on an American oil tanker.*

increasing toxicity from metals, ozone, and disinfection byproducts to marine and freshwater organisms.

10. Quantum Ozone, Inc. has submitted a monitoring program, which if implemented properly, will adequately assess the quality of the effluent to ensure that ozone residuals and brominated disinfection byproducts are not present in toxic quantities. Proposed water quality monitoring locations include the influent to the solids removal device, the MS4 discharge point to North Creek, and a location within North Creek. As proposed, ozone and oxygen levels would be monitored daily, and bromine, bromate, bacteria and metals would be monitoring weekly. Quantum Ozone, Inc. has also proposed a daily air monitoring program to ensure that ozone gas is not released from the demonstration project.

11. A Quality Assurance (QA) program is necessary to ensure that water quality data collected are of adequate quality given the monitoring objectives. Quality Assurance consists of two separate but interrelated activities: a) Quality Control (QC), which refers to the technical activities employed to ensure that the data collected are adequate given the monitoring objectives to be tested; and 2) Quality Assessment (QA) implemented to quantify the effectiveness of the quality control procedures. The State Water Resource Control Board's Surface Water Ambient Monitoring Program (SWAMP) is a framework to coordinate consistent and scientifically defensible methods and strategies for improving water quality monitoring, assessment and reporting.

12. In accordance with California Water Code section 13267 (b) these findings provide the City of Dana Point and Quantum Ozone, Inc. with a written explanation with regard to the need for the reports and identify the evidence that supports the requirement to submit the reports.

13. This action is being taken for the protection of the environment and, as such, is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 2100 Et seq.) in accordance with Section 15108, Chapter 3, Title 14, California Administrative Code.

IT IS HEREBY ORDERED that, pursuant to Sections 13225, 13267, and Section 13383 of Division 7 of the California Water Code Quantum Ozone, Inc. and the City of Dana Point shall conduct a technical investigation and shall prepare and submit periodic monitoring and technical reports to the Regional Board. The technical reports shall contain, but not be limited to, the following information:

1. **Water Quality Data and Assessment.** Water quality monitoring reports shall be submitted to the Regional Board monthly to assess the effects of the ozone treatment system. Each report shall contain raw and summary data, an assessment of compliance with applicable water quality standards, and an assessment of the effects of the ozone treatment system. Each

report shall include data in tabular and graphical form, and electronic data shall be submitted to the Regional Board upon request. A certified contract laboratory or municipal staff certified to conduct the specific analyses shall perform all sampling, laboratory, quality assurance, and analytical procedures, except for daily ozone and oxygen, which may be performed by trained staff of Quantum Ozone, Inc.

a. Monitoring locations shall include the influent to the solids removal device, the storm drain discharge point to North Creek (or effluent from the ozone treatment system), and North Creek within 75 feet of the MS4 discharge point.

b. Water quality data shall be obtained by grab samples and reported for the following constituents and at the following frequencies:

Parameter (All data shall be collected by grab samples)	**Reporting Unit**	**Monitoring Frequency**
Ozone	mg/L	Weekly Ozone and dissolved oxygen need only be monitored at the North Creek receiving water location.
Dissolved Oxygen	mg/L	
Bromine	mg/L	Weekly Bromine and bromate only need to be monitored at the North Creek receiving water location.
Bromate	mg/L	
Bromide	mg/L	Weekly Concentrations of bromide shall be collected for the first two influent sampling events. If no bromide is detected in either of those samples, then monitoring for bromide can cease. If bromate or bromine is detected in three consecutive effluent samples, then bromide shall be immediately added to the routine influent and effluent monitoring programs.
Fecal Coliform	MPNor CFU /100ml	Weekly
E. Coli Or Enterococcus	MPNor CFU /100ml	
Total Hardness	mg/L	
Nickel	µg/L	
Zinc	µg/L	
Copper	µg/L	
Cadmium	µg/L	

Note: mg/L = milligrams per liter µg/L = micrograms per liter
MPN and CFU refer to most probable number and colony forming units, respectively, and refer to different methods for quantifying concentrations of bacteria.

2. **Report Schedule.** The first report is due May 10, 2006 for all data obtained through April 30, 2006. For subsequent reports, the report period will be the calendar month, with the report of data due to the Regional Board no later than the 10th day of the following month.

3. **Final Report.** A final report shall be submitted by November 30, 2006 if the system is operated for more than 60 days. The final report shall contain an assessment of all data collected under the monitoring program. The assessment shall include discussions on the production of disinfection byproducts, ozone calibration, characteristics of metals before and after ozonation, and effects on fecal indicator bacteria. The assessment shall also consist of a statistical analysis of the data. The report shall include data in tabular and graphical form, and electronic data shall be submitted to the Regional Board upon request.

4. **Data Quality Assurance.** All information submitted in the monthly and final reports shall conform to a Quality Assurance Project Plan compatible with the Surface Water Ambient Monitoring Program (SWAMP).[4]

5. **Certification Statement**. Each monitoring and technical report submitted to the Regional Board shall include the following certification statement signed by either the principal executive officer, ranking elected official, or duly authorized representative of that person:

   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person(s) directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NOTIFICATIONS

1. Requirements established pursuant to Water Code Sections 13267(b) or 13383 are enforceable when signed by the Executive Officer of the Regional Board.

2. Pursuant to California Water Code section 13268, any person failing or refusing to furnish technical or monitoring program reports as required by Section 13267, or falsifying any information provided therein, is guilty of a misdemeanor, and may be liable civilly in an amount which shall not exceed one thousand dollars ($1,000) for each day in which the violation occurs

[4] The State Water Resource Control Board (SWRCB) has prepared an electronic template for Quality Assurance Project Plans (QAPP) to assist in QAPP development, to provide a common format that will allow for review to be expedited, and to provide information on SWAMP consistency. Additional information and the template are available on-line at http://www.waterboards.ca.gov/swamp/qapp.html.

3. Pursuant to Section 13385 of the Water Code, a violation of a requirements established pursuant to Water Code Section 13383 may subject you to civil liability of up to $10,000 per day for each day in which the violation occurs.

JOHN H. ROBERTUS
Executive Officer

Date