STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
ORDER NO. R4-2004-0156

WASTE DISCHARGE REQUIREMENTS
FOR
UNITED STATES NAVY, NAVAL BASE VENTURA COUNTY
(NORTHWEST CORNER OF PACIFIC ROAD AND 32ND AVENUE)
PORT HUENEME, CALIFORNIA

(FILE NO. 94-073)

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) finds:

1. The United States Navy (U.S. Navy) (hereafter Discharger), in cooperation with the United States Environmental Protection Agency (U.S. EPA), is planning to evaluate an innovative technology for the remediation of shallow groundwater, at Naval Base Ventura County, Port Hueneme, at the northwest corner of the intersection of Pacific Road and 32nd Avenue in Port Hueneme, California (Latitude 34° 9' 49", Longitude 119° 12' 27"). A map with the base location is provided as Figure 1.

2. The U.S. government owns the Naval Base; the U.S. EPA will install, operate and monitoring the performance of the remediation technology, with the assistance of Navy personnel.

3. Naval activities began at the Port Hueneme facility in 1940. The facility is an active Navy base with a deep-water port. Prior to 1940, the area was agricultural.

4. A plume of groundwater contaminated with dissolved fuel hydrocarbons, including benzene, toluene, ethylbenzene, xylenes, (BTEX) and methyl tertiary butyl ether (MTBE), is present downgradient of the Naval Exchange (NEX) gas station. The gas station, built in 1950, is located at the southeast corner of 23rd Avenue and Dodson Street (Figure 2). Detectable MTBE is present approximately 5,600 feet downgradient (southwest) of the former tank area at the NEX (Figure 2). Detectable BTEX is present approximately 1,000 feet downgradient of the former tank area. The plume at the demonstration site will only contain MTBE. Recent groundwater samples from the vicinity of the test contained up to 3,000 micrograms per liter (µg/L) MTBE.

5. A layer of fuel hydrocarbons was observed floating on groundwater during an initial investigation conducted by the Navy Public Works Department in 1985. Pressure tests indicated that the fuel hydrocarbons had leaked from the gasoline underground storage tanks and dispensing system. Gasoline station inventory records indicated that approximately 10,800 gallons of gasoline were lost from inventory between September 1984 and March 1985. The leaking tanks at the gas station were removed; as were significant quantities of gasoline contaminated soil.

6. The NEX gas station is currently operating with three, 15,000 gallon, underground tanks containing unleaded, midgrade, and premium gasoline. The tanks are permitted by the Ventura County Environmental Health Division.

7. The MTBE plume at the Port Hueneme facility is part of the Department of Defense National Environmental Technology Test Site, and is used by several government, business and education groups to evaluate technologies for the treatment of MTBE in soil and groundwater. The site for this test was formerly used by Envirogen in one of several tests evaluated by the U.S. EPA, in 2001. In 2001, the U.S. EPA selected the Navy's Port Hueneme MTBE plume as the U.S. EPA Innovative Technology Demonstration/Evaluation Site for the Cleanup of MTBE in groundwater, for the West Coast. The U.S. EPA set up a similar site on the East Coast at Dover Air Force Base, in Delaware.

8. The Discharger has submitted a document titled the *Proposal and Work Plan Evaluation of Enhancement of Natural Attenuation of BTEX, MTBE and Ethanol Using Infiltration Galleries* (Work Plan), dated February 26, 2004. The Work Plan consists of test procedures and methods for evaluating the effectiveness of the remediation technology. The expected test duration is 18 months. The Regional Board approved the Work Plan in a letter dated April 19, 2004 (see attachment 1).

9. The site will be located approximately 2000 feet down gradient from the gas station, and slightly more than one mile from the Pacific Ocean (Figures 1 and 2).

10. Several investigations were conducted to determine the extent of the MTBE plume. They have included the use of pushed microwells, and direct-push sampling methods. The MTBE plume is well defined.

11. The test will take place immediately above, and in, the perched aquifer. The perched aquifer is located between approximately 7 feet and 20 feet below grade. The infiltration gallery will extend from the ground surface to approximately 3 feet below ground surface (bgs).

12. Soil in the test area is silty from near the surface to a depth of approximately 7 to 9 feet. Medium-grained sand is present below the silty zone to approximately 18 to 20 feet below grade. A clay-rich zone occurs at approximately 20 feet below grade, immediately below the sand. The clay-rich zone acts as an aquitard, preventing significant downward movement of the contaminant. This clay-rich zone is believed to separate the perched groundwater unit from underlying aquifers. The perched unit is not used as a source of agricultural or domestic water. The "upper" and "lower" aquifer systems, below the perched unit, are used for water supplies. The upper aquifer system consists of the Oxnard and Mugu Aquifer zones at a depth of 150 to 450 feet bgs. The Oxnard Aquifer and Mugu Aquifer are the principal sources of water for the agricultural irrigation in this area, however, other beneficial uses exist for ground water in this area, such as municipal and domestic supply, and shall be protected accordingly. The lower aquifer system consists of the Hueneme, Fox Canyon, and Grimes Canyon Aquifers at a depth of over 450 feet bgs. There is no potential for the test to adversely effect water supply wells.

13. The location, small scale, and controlled nature of the pilot test prevent the possibility of any adverse impact to groundwater quality. In addition, the U.S. Navy has two in-situ "bio-barriers" and a pump and treat system downgradient of test area. The "bio-barriers" and pump and treat system will intercept all liquids moving from the test area. The first "bio-barrier" is approximately 500 feet down gradient of the site and the second is approximately 3,000 feet down gradient. The pump and treat system is approximately 3,200 feet down gradient.

14. The static groundwater gradient is to the southwest at 0.001 to 0.003 foot/foot. The approximate hydraulic conductivity of the aquifer, adjacent to where the pilot test is planned, ranges from 1,267 to 3000 gallons/day/foot. Assuming an effective porosity of 35 %, the calculated Darcy groundwater velocity ranges from 0.63 to 3.8 feet/day. Tracer studies conducted near the pilot test area indicate that the actual groundwater velocity ranges from 0.77 to 1.5 feet/day. Data from other areas of the base indicate velocities may be 1/3 to 1/10 of these values.

15. Groundwater near the site contains approximately 2000 mg/L Total Dissolved Solids (TDS).

16. The test will use two adjacent plots about 40 feet apart. Each plot is approximately 30 feet by 40 feet (Figures 2 and 3).

17. Each plot will have an infiltration gallery measuring approximately 3 feet (wide) by 28 feet (long) by 3 feet (deep). The gallery will be outfitted with various water release and oxygen monitoring/release devices, and backfilled with non-native, coarse sand.

18. Groundwater introduced into the infiltration gallery will be pumped from the shallow aquifer via existing small diameter wells installed just upgradient of the site for use in a previous remediation technology test.

19. Initially, only groundwater, obtained from shallow wells immediately up gradient of the infiltration galleries, and tracers will be released into the infiltration gallery. Once it is clear that the discharge control and monitoring systems are working properly, the released groundwater will have precisely metered quantities of BTEX and ethanol added. It may be necessary to add MTBE if the concentrations present in the pumped water from the existing MTBE plume are too low. The total masses of chemicals that may be released over the 18 months of the test are 6.6 kilograms (kg) of ethanol, 0.13 kg each of benzene and xylene, 0.4 kg of toluene, and 0.26 kg of MTBE. The total area of each gallery where the chemicals will be released is 84 square feet. The chemicals will be released at the following concentrations: 500 mg/L ethanol; 5 mg/L benzene and xylene; 15 mg/L toluene; and 10 mg/L MTBE. In addition, 0.008 kg of pentaflorobenzoic acid and 0.8 kg bromide will be released. The pentaflorobenzoic acid will be released at 3 mg/L and the bromide at 300 mg/L.

20. The infiltration gallery will be kept aerobic by controlling the rate at which groundwater is released into the top of the gallery. The U.S. EPA expects that the organic contaminants will be degraded during downward infiltration.

21. At each plot four groundwater monitoring points will be used to monitor the test. One monitoring point is immediately upgradient, another within, and two downgradient of the infiltration gallery. The downgradient wells are approximately 2 meters apart and 3 meters downgradient of the infiltration gallery.

22. The U.S. Navy will provide periodic monitoring reports to the Regional Board. The data in the reports will be provided to the Navy by the US EPA.

23. The Ventura County, Public Works Agency, Waste Resources and Engineering Department, Water Resources Division (WRD) is the local permitting agency for all monitoring wells and test hole borings at the subject site. This Regional Board has assumed lead agency role for this project under the California Environmental Quality Act and has conducted an Initial Study in accordance with Title 14, California Code of Regulations, Section 15063, entitled Guidelines for Implementation of the California Environmental Quality Act. Based on the Initial Study, the Regional Board prepared a Mitigated Negative Declaration that the project will not have a significant adverse effect on the environment.

24. The Regional Board adopted a revised Water Quality Control Plan for the Los Angeles Region on June 13, 1994. This Water Quality Control Plan designates beneficial uses and establishes water quality objectives for all ground water within the Region. Existing or potential beneficial uses for groundwater in the Ventura Central Groundwater Basin - Oxnard Plain Hydrologic Subarea, where the site is located, are municipal and domestic supply, agricultural supply, and industrial service and process supply. The requirements contained in this Order, when met, will be in conformance with the objectives of the Water Quality Control Plan.

The Regional Board has notified the Discharger and interested agencies and persons of its intent to issue Waste Discharge Requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations.

The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge and to the tentative requirements.

IT IS HEREBY ORDERED that the Discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations and guidelines adopted thereunder, shall comply with the following:

A. Waste discharge requirements:

1. The discharge (infiltration) or its handling shall not cause pollution or nuisance as defined in the California Water Code and all chemicals, water, or other materials injected shall be fully contained laterally and vertically, or recovered.

2. Injection shall be limited to pumped groundwater, BTEX, ethanol, MTBE, and the widely used tracers pentaflorobenzoic acid and bromide, as discussed in the work plan for the project titled, *Proposal and Work Plan Evaluation of Enhancement of Natural Attenuation of BTEX, MTBE and ethanol using infiltration galleries*, dated February 26, 2004, and approved by the Regional Board staff on April 19, 2004. Any modification to the injection planned in these documents will require prior written approval of the Executive Officer.

3. Any excavated hazardous waste shall be transported to a legal point of disposal. For the purpose of this requirement, a legal point of disposal is defined as one for which waste discharge requirements have been established by a California Regional Water Quality Control Board and which is in full compliance therewith.

4. Injection shall be limited to the perched groundwater aquifer only at the two test plots near Pacific Road and 32nd Avenue.

5. The pH of the injected liquid shall at all times be within the range of 6.0 to 9.0.

6. The maximum total masses of chemicals that may be released over the 18 months of the test are 6.6 kilograms (kg) of ethanol, 0.13 kg each of benzene and xylene, 0.4 kg of toluene, and 0.26 kg of MTBE. The chemicals will be released at concentrations not to exceed: 500 mg/L ethanol; 5 mg/L benzene and xylene; 15 mg/L toluene; and 10 mg/L MTBE. In addition, 0.008 kg of pentaflorobenzoic acid and 0.8 kg bromide may be released. The pentaflorobenzoic acid may be released at 3 mg/L and the bromide at 300 mg/L.

B. Discharge Prohibitions:

1. The Discharger shall provide hydraulic control, which provides full and complete containment of any released materials, including tracers, or by-products of chemical processes, for the duration of the project.

2. The discharge of chemicals, including tracers, or any by-products into any surface water drainage course or to surface waters is prohibited.

3. The Discharger's activities shall not cause detectable levels of released chemicals, including tracers, or any by-products, to migrate outside the evaluation area as shown in figures 2 and 3.

4. The Discharger's activities shall not cause the groundwater outside the evaluation area to contain taste, color or odor producing substances in concentrations that cause nuisance or adversely affect the beneficial uses.

C. Provisions:

1. This Order includes "Standard Provisions Applicable to Waste Discharge Requirements" (Attachment 2). If there is any conflict between provisions stated herein and the "Standard Provisions Applicable to Waste Discharge Requirements", the provisions stated herein will prevail.

2. This Order includes the attached Monitoring and Reporting Program No. CI-8812 which is incorporated herein by reference. If there is any conflict between provisions stated herein and the "Standard Provisions Applicable to Waste Discharge Requirements", the provisions stated herein will prevail.

3. In the event that wastes are transported and disposed of to a disposal site, the Discharger shall report types of wastes and quantity of each type; name and address of each hauler of wastes (or method of transport if other than by hauling); and location of the final point(s) of disposal for each type of waste.

4. Discharge of wastes to any point other than as specifically described in this Order is prohibited and constitutes a violation thereof.

5. The Discharger shall submit an evaluation summary report detailing the results of the evaluation project. The report should include an evaluation of the effectiveness of the process, the impact of released chemicals or any by-products on the receiving groundwater quality, the hydraulic properties on the aquifer, and any other effects the devices may have. This report must be received by the Regional Board within 6 months of project completion.

6. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as specified in Monitoring and Reporting Program No. CI-8812. Violations may result in enforcement action, including Regional Board or court order requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

7. The release of chemicals shall not cause a condition of pollution or nuisance as defined by the California Water Code, Section 13050.

8. The Discharger shall cleanup and abate the effects of this evaluation including extraction of any by-products which adversely affect beneficial uses and shall provide an alternate water supply source for any municipal, domestic or other water use wells that become contaminated in exceedance of water quality objectives as a result of releasing chemical.

9. All work must be performed by or under the direction of a registered civil engineer, registered geologist, or certified engineering geologist. A statement is required in all technical submittals that the registered professional in direct responsible charge actually supervised or personally conducted all the work associated with the project.

10. All technical submittals must be wet stamped by a California licensed civil engineer, registered geologist, or certified engineering geologist.

11. These requirements do not exempt the Discharger from compliance with any other laws, regulations, or ordinances, which may be applicable. They do not legalize the waste treatment facility, and they leave unaffected any further restraints on the facility that may be contained in other statues of and/or required by other agencies.

12. This Order does not alleviate the responsibility of the Discharger to obtain other necessary local, state, and federal permits to construct facilities necessary for compliance with this Order; nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.

13. A copy of these requirements shall be maintained at the Discharger' s on-site office and be available at all times to operating personnel.

14. In the event of any change in name, ownership, or control of this property, the Discharger shall notify this Regional Board in writing and shall notify the succeeding owner or operator of the existence of this order by letter, a copy of which shall be forwarded to the Regional Board.

15. The Discharger must notify this Regional Board by telephone within 24 hours, followed by written notification within one week, in the event they are unable to comply with any of the conditions of this Order due to:

    a. Breakdown of waste treatment equipment,

    b. Accidents caused by human error or negligence,

    c. Other causes such as acts of nature,

    d. Permits required from other agencies, or

    e. Site development.

16. In accordance with Section 13260 of the California Water Code, the Discharger shall file a report with this Regional Board of any material change or proposed change in the character, location or volume of the discharge.

17. In accordance with Section 13267 of the California Water Code, the Discharger shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer. The specifications are subject to periodic revisions as may be warranted.

18. The Regional Board and other authorized representative shall be allowed:

    a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;

    b. Access to copy any records that are kept under the conditions of this order;

    c. To inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this order; and

    d. To photograph, sample, and monitor for the purpose of assuring compliance with this Order, or as otherwise authorized by the California Water Code.

19. In accordance with Section 13263 of the Water Code, these waste discharge requirements are subject to periodic review and revision by this Regional Board.

20. These requirements do not exempt the Discharger from compliance with any other laws, regulations, or ordinances, which may be applicable. They do not legalize these waste treatment and disposal facilities and they leave unaffected any further restraints on those facilities that may be contained in other statutes or required by other agencies.

21. These requirements shall not be construed to limit, waive, or otherwise impair any additional or more stringent requirements imposed upon the discharger pursuant to the provisions of any agreement entered into by the discharger.

D. Expiration Date

This Order expires on October 7, 2007.

The Discharger must file a Report of Waste Discharge in accordance with Title 27, California Code of Regulations, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.

I, Jonathan Bishop, Interim Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region on, October 7, 2004.

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JONATHAN BISHOP
Executive Officer