

# NAVAL BASE VENTURA COUNTY, PORT HUENEME SITE PORT HUENEME, CA



## MTBE CONTROL AND CONTAINMENT FACT SHEET

April 2001

### INTRODUCTION

From late 1984 to early 1985, approximately 10,800 gallons of gasoline leaked from two storage tanks and piping under the Naval Exchange (NEX) gas station at the Naval Base Ventura County Port Hueneme Site (NBVC). Since 1985, the Navy has taken actions to prevent any damage to the environment from the leaks. These actions included replacing the leaking tanks and piping, removing the soil around the tanks, and pumping and disposing of the gasoline that leaked and remained in the ground. In addition, sampling and testing was conducted to determine how much of the gasoline has mixed with groundwater under NBVC and exactly where the water and gasoline mixture is located.

As a result of the testing, a gasoline additive known as methyl tertiary-butyl ether, or MTBE, was detected in the groundwater in December 1992. No specific cleanup actions or plans concerning the MTBE were made at that time because the U.S. Environmental Protection Agency (U.S. EPA) and other scientific institutions did not recognize it as a risk to human health or the environment. Since that time, many questions have been raised about the adverse effects of MTBE, particularly in drinking water supplies. Research is currently underway to help us understand the effects of MTBE on human health and the environment and to develop new cleanup solutions for this chemical. In the meantime, we are diligently working at NBVC on efforts to control and contain any future contamination of the environment from the MTBE.

### WHAT IS MTBE?

MTBE is a colorless liquid that is a byproduct of crude oil refining. It was originally added to gasoline as an octane booster to replace lead. Since the early 1990s, U.S. EPA mandate has required that oxygenate chemicals be added to gasoline to increase oxygen contents in gasoline to make it burn cleaner and, thereby, reduce harmful carbon monoxide emissions. MTBE is the most common fuel oxygenate, and is used in more than 80% of oxygenated fuels. MTBE dissolves easily in water. Because of this, it travels faster and farther in water than other gasoline components. It has a strong turpentine-like taste and odor, so even small amounts of MTBE can make a water supply distasteful.

### CAN THE MTBE UNDER NBVC AFFECT ME?

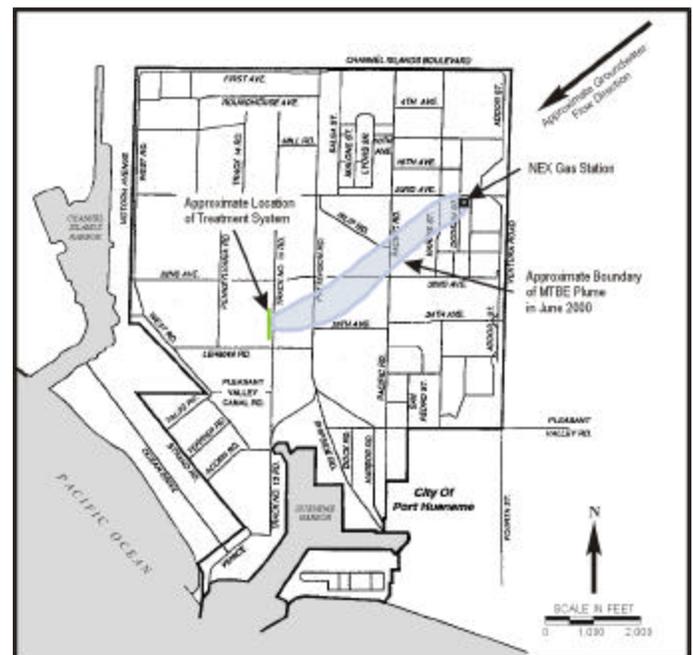
At NBVC, there are currently no known pathways by which the public would be exposed to the chemical so the risk of being affected by MTBE is very low. Specifically, the contamination begins about 6 feet below ground surface (bgs) and is confined to a shallow aquifer, which is not used for drinking water because of its seawater-like quality and low yield.

The effects of MTBE on human health depend on how much of the chemical is present and if humans are physically exposed to the chemical. MTBE can enter your body when you breath air or drink water that contains it or from absorption through your skin. The most frequent exposure to MTBE for the general population is from breathing gasoline vapors while refueling your car or truck.

### WHERE IS MTBE LOCATED AT NBVC?

In 1997, during the process to permanently close the NEX gas station site, the Los Angeles Regional Water Quality Control Board (LA RWQCB) asked for further evaluation of the MTBE contaminated groundwater, commonly referred to as the MTBE plume. Since then, three investigations have been undertaken to determine the extent of the MTBE plume.

Results indicate that the MTBE plume is located in areas underlying primarily the commercial and industrial activities of the base. The MTBE plume at NBVC begins at the NEX gas station (see map below) and extends about 4,800 ft to the control and containment system, with a maximum width of about 500 ft.



MAP OF THE PLUME AT NBVC PORT HUENEME SITE

The MTBE plume is confined to a semi-perched aquifer located at a depth from 6 to 25 ft bgs. A clay layer, which ranges from approximately 20 to 50 ft in thickness in the vicinity of the site, isolates the contaminated water from underlying aquifers. The MTBE plume is totally confined within the limits of the NBVC boundaries.

There are no wells on base or near the plume currently being used to pump drinking water. Active wells used for drinking water in nearby communities are several miles away to the south and east. They pump water from the lower aquifer system, which ranges from about 800 to 1,000 feet deep.

Since 1996, the Navy has closely monitored the MTBE plume at NBVC. The plume has moved (or "migrated") in a south-westerly direction at speeds up to 1 ft/day in some areas.

## **WHAT IS THE NAVY DOING NOW?**

The Navy's primary goal is to ensure that the MTBE plume is effectively controlled and contained.

Recently, the Navy evaluated eleven different MTBE plume control and containment alternatives (both conventional and innovative). A conventional pump and treat method was selected as an interim measure because it has proven effectiveness and can be quickly implemented to halt the migration of the MTBE plume. It works by pumping the underground water to the surface and then using activated carbon to pre-treat the water, if necessary, before it is transferred off-site for treatment at the City of Oxnard Waste Water Treatment Plant (WWTP).

The map shows the approximate location where the treatment system will be installed at NBVC. During the spring of 2001, 15 extraction wells will be drilled, and fitted with pumps to lift groundwater to the surface. The number, location, and pumping rate of the wells is designed to ensure the plume does not spread any further. The Navy will periodically monitor the water as it is pumped to the surface and discharged to the City of Oxnard WWTP. Pretreatment of the pumped water using activated carbon will be provided, as needed, to ensure that the discharge complies with all permit requirements and does not adversely affect the operations of the City of Oxnard WWTP.

The Navy will continue to explore more innovative methods. As more information becomes available, changes to this

interim alternative may be proposed to improve performance and/or reduce cost.

## **INNOVATIVE MTBE CLEANUP TECHNOLOGIES**

Since our selection in 1994 as one of four National Environmental Technology Test Sites, NBVC has supported demonstrations of over 15 innovative MTBE cleanup technologies. The technologies are designed to find, monitor and cleanup MTBE. Past and future demonstrations will benefit both the public and private sector, as well as have significant cleanup benefit for the plume at NBVC.

The characteristics of the MTBE plume at NBVC - that it is fully confined to the base, does not affect a drinking water resource, currently presents no known risk to ecological receptors, and has no known pathway to the public - make it ideal for demonstrating MTBE cleanup solutions.

Examples of some very successful pilot projects include:

- Researching field test equipment and procedures that immediately measure concentrations of contaminants, saving time and money;
- Injecting air and oxygen to stimulate growth of bacteria which break down MTBE;
- Monitoring trees in the plume to see if they are breaking down MTBE (phytoremediation);
- Testing new types of monitoring wells that are less expensive and more effective.

In April 2000, NBVC also was selected to participate in the U.S. EPA's MTBE Technology Demonstration Project. Three MTBE technologies will be evaluated at four locations (one technology will be demonstrated at two different locations) at NBVC for cost and performance during the next two years.

Results of MTBE cleanup technology demonstrations at NBVC will be made widely available to government and private industry for use as a resource in planning MTBE cleanup projects.

The Navy is proud of its role in solving some of the complex scientific questions that will create new technological solutions for MTBE sites throughout the country.

If you have questions, please contact:

PUBLIC AFFAIRS OFFICER  
(805)989-9234

For more information, visit the following Web sites:

<http://water.wr.usgs.gov/mtbe/>  
<http://www.epa.gov/swrust1/mtbe/index.htm>  
<http://enviro.nfesc.navy.mil/erb/support/netts/main.htm>