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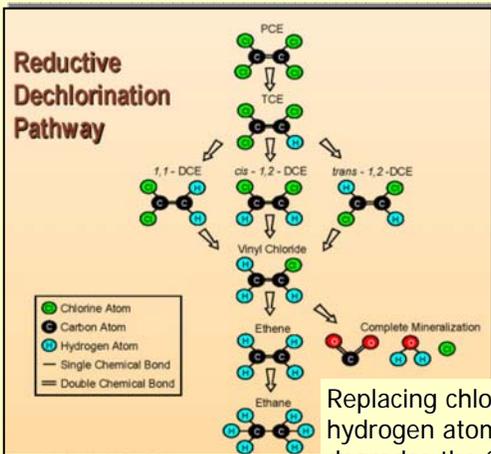
FACT SHEET REGARDING REMEDIAL INVESTIGATION AND TREATABILITY STUDY SITE 4  
NCBC GULFPORT MS  
1/1/2005  
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# Site 4 Treatability Study

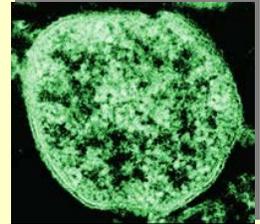
There are microscopic organisms in the ground that can break down harmful chemicals into non-harmful products. The Treatability Study looked at the possibility of using these microbes to clean up contamination at Site 4.

## Natural Attenuation

- If conditions are right, microscopic organisms (called microbes) break down contaminants into less harmful substances. This process is called **Natural Attenuation**.
- For **chlorinated volatile organic compounds (CVOCs)**, such as those found at Site 4, natural attenuation occurs through a process called **reductive dechlorination**.
- Reductive dechlorination involves replacing chlorine atoms with hydrogen atoms, as shown in the diagram below.

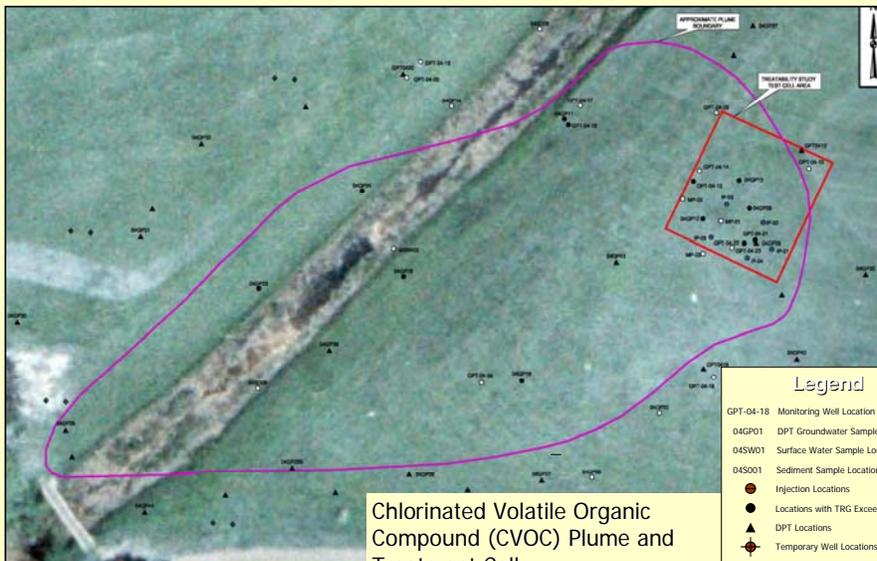


This microbe, *Dehalococcoides ethenogenes*, is capable of breaking down harmful chemicals into non-harmful products.



## The Treatability Study

- A Treatability Study was conducted to determine the best way to accelerate natural attenuation of the CVOCs present at Site 4.
- The genetic testing component of the study determined that *Dehalococcoides ethenogenes*, a microbe capable of degrading CVOCs, was present. However, **the number of microbes were not adequate** to effectively achieve natural attenuation at the site.
- Parameter testing determined that these microbes were living in **anaerobic (low oxygen)** conditions.
- The findings from these tests were used to develop and implement a **pilot scale study**.
- The pilot scale study involved injecting lactate (a source of hydrogen) into the study area to enrich the anaerobic conditions at the site.
- Once the site was determined to be adequately anaerobic, additional *Dehalococcoides ethenogenes* microbes were injected into the test area.



This equipment was used to inject the contaminant eating bacteria into the test area.

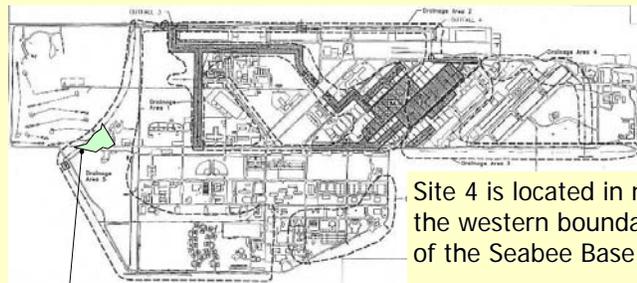
# Site 4 Remedial Investigation

## Findings at Site 4, Former Landfill

- Site 4 was operated as a landfill from 1966 to 1972.
- One groundwater sample collected in 1995 contained Dichloroethylene (DCE) and vinyl chloride (VC), compounds often found in drycleaning solvent.
- DCE and VC are part of a group of compounds called Chlorinated Volatile Organic Compounds, or CVOCs.
- Groundwater sampling in 2004 again found that the contaminants had not broken down over time, as anticipated. When this happens it is called "DCE Stall."
- No other contaminants of concern were identified.
- A cleanup is being proposed to prevent the possibility of CVOCs seeping into Canal No. 1 in the future.

## Risk Assessment Results

- The Human Health Risk Assessment identified potential risks only for residents using shallow groundwater in the vicinity of the CVOC plume.
- Based on a survey of local wells, there are currently no residents within two miles of the site using water from shallow wells.
- Exposure to surface water is not considered a risk because CVOCs found in the surface water at levels considered to be safe by the Mississippi Department of Environmental Quality (MDEQ).
- No ecological risks were identified.



Site 4 is located in near the western boundary of the Seabee Base.

Site 4 CVOC Plume



Site 4 Sample Locations