
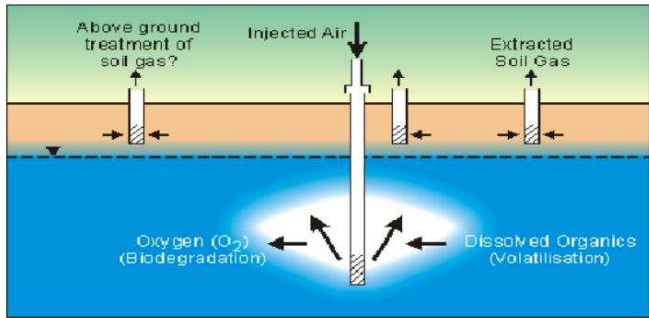
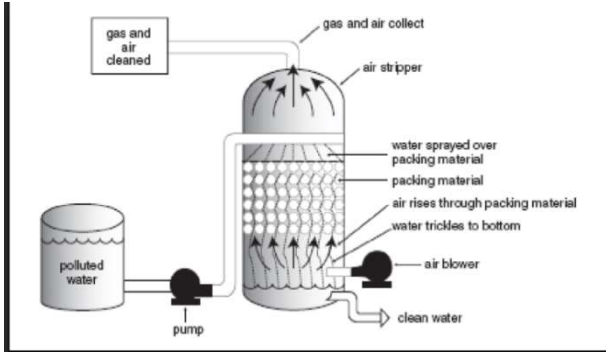



# Definitions Sheet

<p><b>1,4- dioxane</b></p> <ul style="list-style-type: none"> <li>Organic compound, colorless liquid with a faint sweet odor</li> <li>Used in inks, adhesives and well as consumer products</li> </ul>	
<p><b>Air Sparge:</b></p> <ul style="list-style-type: none"> <li>Groundwater remediation technique that pumps air into groundwater through wells to circulate and aerate the water</li> <li>Speeds up the removal of VOCs by increasing oxygen levels for biodegradation.</li> </ul>	 <p>A schematic diagram illustrating method of air sparging.</p>
<p><b>Air Stripper</b></p> <ul style="list-style-type: none"> <li>Process of moving air through impacted water to remove volatile chemicals from the water. This process is a remedy for VOC contamination in groundwater</li> </ul>	
<p><b>ARAR</b></p> <ul style="list-style-type: none"> <li>CERCLA cleanups must attain all Applicable or Relevant and Appropriate Requirements (ARARs) of <ul style="list-style-type: none"> <li>Other Federal environmental laws,</li> <li>More stringent State laws, and</li> <li>State facility-sitting laws</li> </ul> </li> </ul>	

# Definitions Sheet

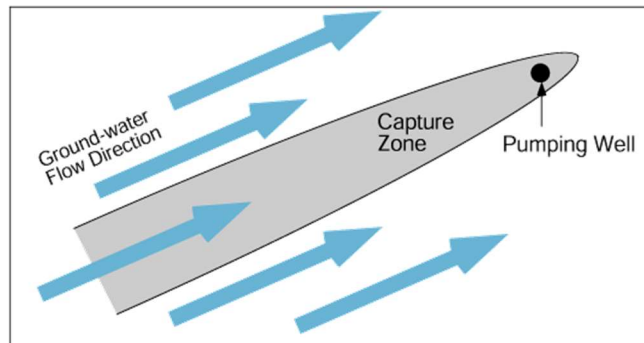
## Biosparge System

- Uses microorganisms to naturally break down (or biodegrade) organic chemicals in impacted water



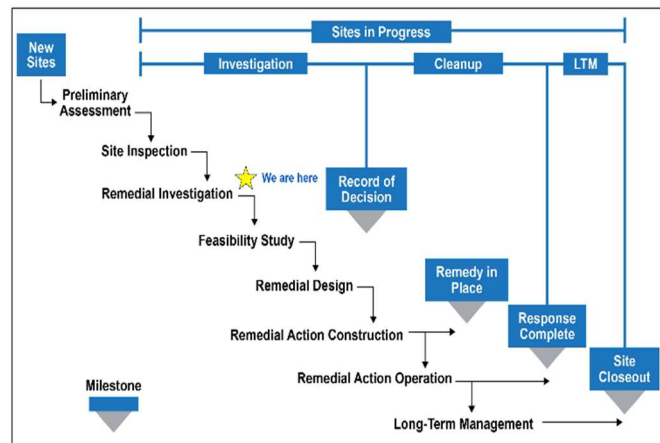
## Capture Zone

- The underground area around a well that may contribute water to the well when it is pumped
- Capture zones take into consideration well pumping rates and underground geology (sand, clay, etc)



## CERCLA

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), enacted in 1980 by Congress
- Responds directly to releases or threatened releases of hazardous substances that may endanger public health or the environment
- Also known as Superfund, is a federal law that gives the government the authority to respond to hazardous substance releases and clean up contaminated sites



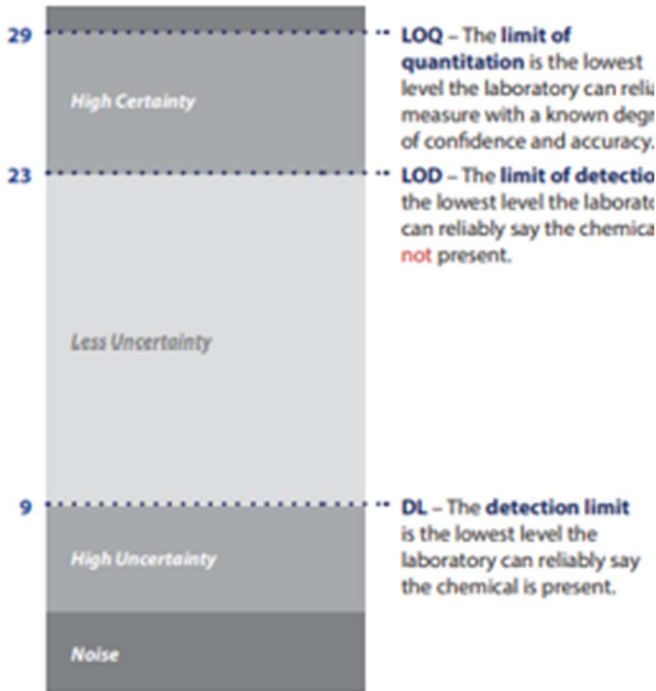


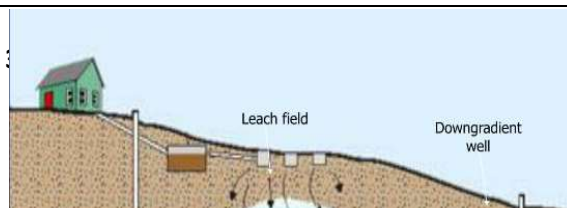
## Degradation

- Process of breaking down a substance over a period of time
- Can be natural or assisted with external forces such as a chemical or antibiotics

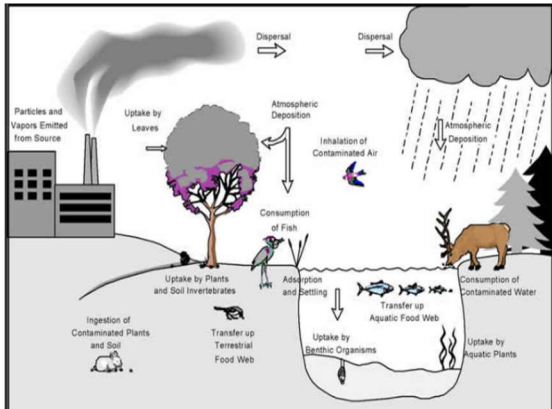

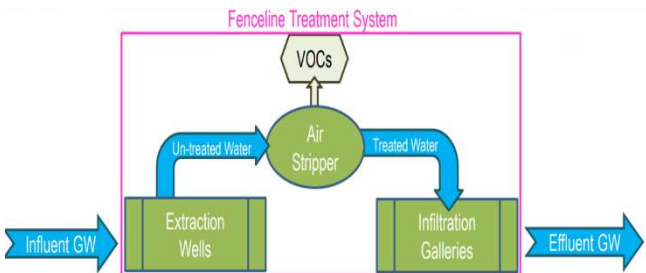


# Definitions Sheet

<p><b>Department of Environmental Conservation (DEC)</b></p> <ul style="list-style-type: none"> <li>Department of New York State government that guides and regulates the conservation, improvement, and protection of New York's natural resources</li> </ul>	
<p><b>Department of Health (DOH)</b></p> <ul style="list-style-type: none"> <li>State department responsible for public health</li> </ul>	
<p><b>Detection Limit (DL)</b></p> <ul style="list-style-type: none"> <li>Lowest concentration of an analyte in a sample that the lab can say is present</li> </ul> <p><b>Limit of Detection (LoD)</b></p> <ul style="list-style-type: none"> <li>Smallest concentration of an analyte in a test sample that the lab can easily distinguish from zero</li> </ul> <p><b>Limit of Quantitation (LoQ)</b></p> <ul style="list-style-type: none"> <li>Smallest concentration of an analyte in a test sample that the lab can determine with acceptable accuracy</li> <li>Usually higher than LoD and requires more precise measurements and greater degree of accuracy</li> </ul>	 <p><b>29</b> -- <b>LOQ</b> – The limit of quantitation is the lowest level the laboratory can reliably measure with a known degree of confidence and accuracy.</p> <p><b>23</b> -- <b>LOD</b> – The limit of detection is the lowest level the laboratory can reliably say the chemical is present.</p> <p><b>9</b> -- <b>DL</b> – The detection limit is the lowest level the laboratory can reliably say the chemical is present.</p>
<p><b>Downgradient</b></p>	







# Definitions Sheet

<ul style="list-style-type: none"><li>Wells located downgradient detects impacts from the contaminants.<ul style="list-style-type: none"><li>Groundwater flows at different rates and directions, when something is downgradient, it is located within the groundwater's traveling direction.</li><li>Similar to downwind in air</li></ul></li></ul>																																				
<p><b>Fate and Transport</b></p> <ul style="list-style-type: none"><li>Refers to how the nature of contaminants might change or break down and where they go as they move through the environment</li></ul>																																				
<p><b>Feasibility Study</b></p> <ul style="list-style-type: none"><li>A comparative process that uses information gathered and analyzed during the RI phase to find the most effective option that eliminates or reduces contamination</li></ul>																																				
<p><b>Fence Line Treatment System</b></p> <ul style="list-style-type: none"><li>Designed to catch and treat VOC impacted groundwater from Site 6A before it enters the Peconic River</li></ul>																																				
<p><b>Hazard Index</b></p>	<p><b>Hazard Index MCL Calculation Examples</b></p> <table><thead><tr><th></th><th>HFPO-DA</th><th>PFBS</th><th>PFNA</th><th>PFHxS</th><th>Hazard</th><th></th></tr></thead><tbody><tr><td>Example 1</td><td><math>\frac{(10 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(200 \text{ pptl})}{(2000 \text{ pptl})}</math></td><td><math>\frac{(14 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(14 \text{ pptl})}{(10 \text{ pptl})}</math></td><td>0.9</td><td>No exceedance of final Hazard Index MCL</td></tr><tr><td>Example 2</td><td><math>\frac{(15 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(200 \text{ pptl})}{(2000 \text{ pptl})}</math></td><td><math>\frac{(16 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(15 \text{ pptl})}{(10 \text{ pptl})}</math></td><td>3</td><td>Exceedance of final Hazard Index MCL (and exceedance of PFHxS MCL)</td></tr><tr><td>Example 3</td><td><math>\frac{(14 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(10 \text{ pptl})}{(2000 \text{ pptl})}</math></td><td><math>\frac{(10 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(10 \text{ pptl})}{(10 \text{ pptl})}</math></td><td>1</td><td>No exceedance of final Hazard Index MCL</td></tr><tr><td>Example 4</td><td><math>\frac{(10 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(100 \text{ pptl})}{(2000 \text{ pptl})}</math></td><td><math>\frac{(14 \text{ pptl})}{(10 \text{ pptl})}</math></td><td><math>\frac{(13 \text{ pptl})}{(10 \text{ pptl})}</math></td><td>2</td><td>Exceedance of final Hazard Index MCL (no individual MCL)</td></tr></tbody></table>		HFPO-DA	PFBS	PFNA	PFHxS	Hazard		Example 1	$\frac{(10 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(200 \text{ pptl})}{(2000 \text{ pptl})}$	$\frac{(14 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(14 \text{ pptl})}{(10 \text{ pptl})}$	0.9	No exceedance of final Hazard Index MCL	Example 2	$\frac{(15 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(200 \text{ pptl})}{(2000 \text{ pptl})}$	$\frac{(16 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(15 \text{ pptl})}{(10 \text{ pptl})}$	3	Exceedance of final Hazard Index MCL (and exceedance of PFHxS MCL)	Example 3	$\frac{(14 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(10 \text{ pptl})}{(2000 \text{ pptl})}$	$\frac{(10 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(10 \text{ pptl})}{(10 \text{ pptl})}$	1	No exceedance of final Hazard Index MCL	Example 4	$\frac{(10 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(100 \text{ pptl})}{(2000 \text{ pptl})}$	$\frac{(14 \text{ pptl})}{(10 \text{ pptl})}$	$\frac{(13 \text{ pptl})}{(10 \text{ pptl})}$	2	Exceedance of final Hazard Index MCL (no individual MCL)
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# Definitions Sheet

<ul style="list-style-type: none"> <li>The Hazard Index (HI) maximum contaminant level (MCL) is calculated using the data for certain PFAS.</li> </ul>	
<p><b>JP-4</b></p> <ul style="list-style-type: none"> <li>Jet fuel</li> <li>Developed in 1952, known as "AVTAG"</li> <li>Used by the U.S military from 1951-1995</li> </ul>	
<p><b>JP-5</b></p> <ul style="list-style-type: none"> <li>Jet fuel.</li> <li>Developed in 1952, known as "AVCAT"</li> <li>Developed for aircraft stationed aboard aircraft carriers</li> </ul>	
<p><b>Leachability</b></p> <ul style="list-style-type: none"> <li>Natural process of transfer a chemical from a solid material into water that contact it</li> <li>An example is a chemical in soil leaching to groundwater</li> </ul>	
<p><b>Maximum Contaminant Level</b></p> <ul style="list-style-type: none"> <li>Legal threshold limit on amount of a substance that is allowed in public water systems</li> <li>Applicable to water providers/purveyors (RWD, SCWA, etc)</li> <li>Standards set by the EPA or states for different chemicals</li> </ul>	

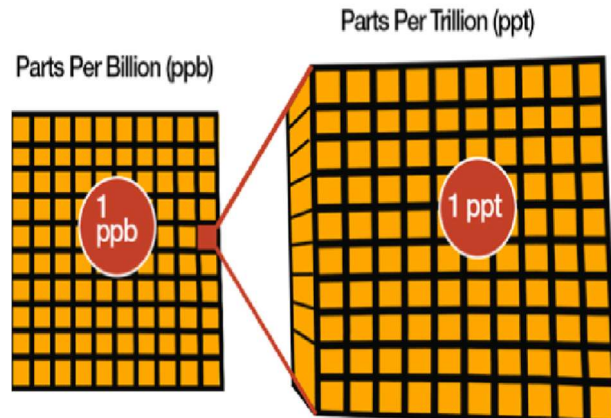
# Definitions Sheet

## Parts Per Trillion (ppt)

- A part of set of units to describe small values of dimensionless quantities
- Equivalent to nanogram per kilogram
- Number of units of a given substance that exists as a portion of a greater substance comprised of one trillion parts

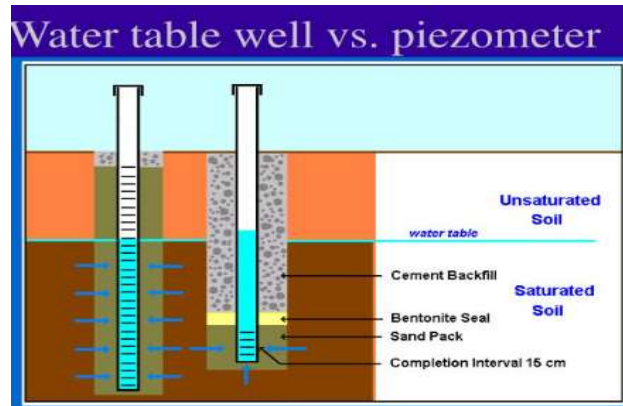
## Parts Per Billion (ppb)

- Number of units of a given substance that exist as a portion of a greater substance comprised of one billion parts



## Piezometer Well

- A well that is designed and installed for the purpose of monitoring water levels within a specific depth interval based on water pressure



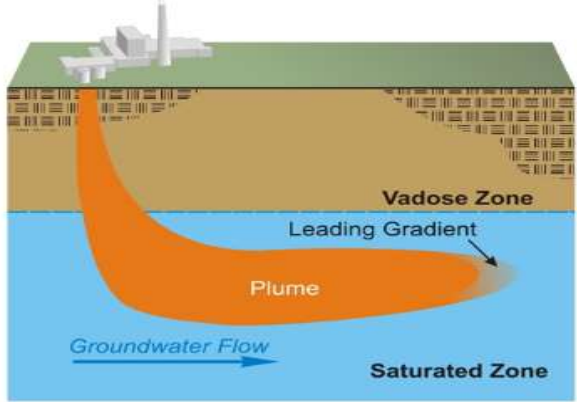
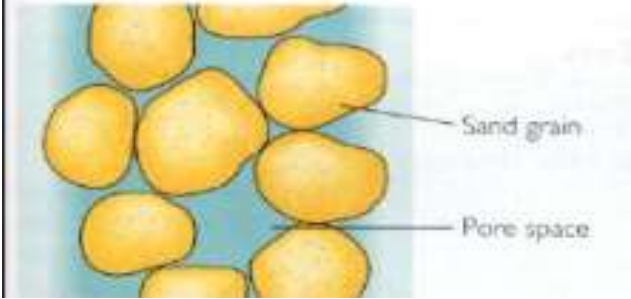

## PFAS

- Synthetic manufactured chemicals found in many household items
- Found in the environment in air, soil, rain, animals, plants, as well as in people
- Widely used since 1950s in many products



## Plume

# Definitions Sheet

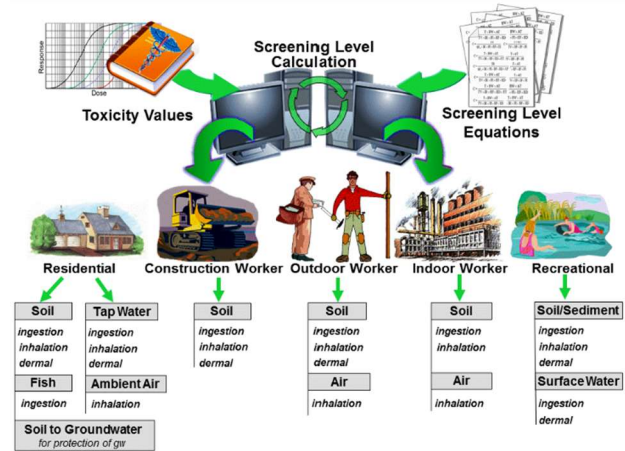
<ul style="list-style-type: none"> <li>Body of water within a groundwater aquifer that has been impacted with chemicals</li> </ul>	 <p>The diagram illustrates a cross-section of the ground. At the top, a building is shown on the surface. Below the surface is the <b>Vadose Zone</b> (un-saturated). Below that is the <b>Saturated Zone</b> (groundwater). An orange <b>Plume</b> of contaminated water is shown originating from a source and moving to the right. A blue arrow labeled <b>Groundwater Flow</b> indicates the direction of movement. The leading edge of the plume is labeled <b>Leading Gradient</b>.</p>
<p><b>Porewater</b></p> <ul style="list-style-type: none"> <li>Water that is contained in pores of soil or in between small rocks</li> <li>Very small quantities</li> </ul>	 <p>The diagram shows several yellow, rounded <b>Sand grain</b>s. The spaces between these grains are labeled <b>Pore space</b>, representing where water (porewater) is contained.</p>
<p><b>Preliminary Assessment (PA)</b></p> <ul style="list-style-type: none"> <li>First step in a CERCLA investigation</li> <li>Conducted to identify and evaluate additional areas of potential releases on each installation</li> </ul>	 <p>A photograph showing a silver laptop open on a wooden desk, with a stack of several books placed next to it, symbolizing research or investigation.</p>
<p><b>Record Of Decision (ROD)</b></p> <ul style="list-style-type: none"> <li>A document that provides recommendation on remedial action and clarification on roles and responsibilities in decision documents</li> <li>Explains how to address changes made to proposed and selected remedies</li> </ul>	<p><b>Record Of Decision</b></p>



# Definitions Sheet

## Regional Screening Level

- Screening tool used in investigations to determine where further evaluation is needed
- Derived from combining exposure information from EPA toxicity database
- Not cleanup standards



## Remedial Investigation (RI)

- Comes after the SI in the CERCLA process if releases are confirmed.
- A detailed on-site investigation to fully characterize:
  - The Nature and extent of the release- how wide, how deep, and where contamination may be.
  - The fate and transport- how a contaminant may move within the environment.
  - The potential risks to human and environmental health.



## Site Inspection (SI)

- Comes after the PA in the CERCLA process.
- An on-site sampling event to determine if there was a release.
- This initial phase starts the characterization of a release and identifies potential threats to human health and the environment associated with the release.





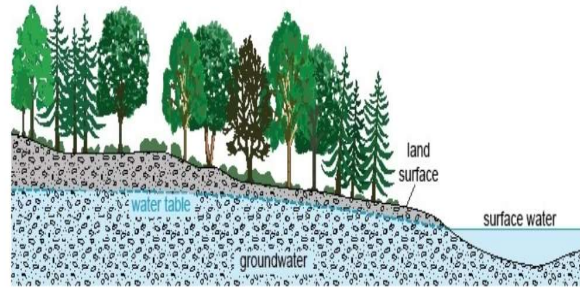
# Definitions Sheet

## Surface Water

- Water that collects on the surface of the ground.

## Ground Water

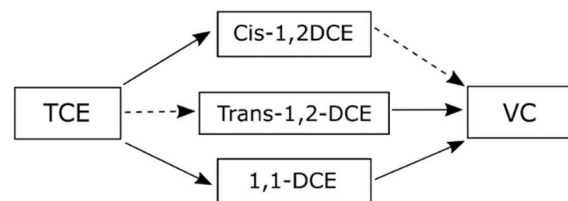
- Water that is held underneath surface in soil pores and rock.



## TCE

- Chemical used as an industrial degreasing solvent
- Colorless, non-flammable with chloroform like mild smell.
- TCE, when exposed to the environment breaks down into predictable daughter products
- These daughter products are VOCs as shown on the figure

### Trichloroethene Breakdown

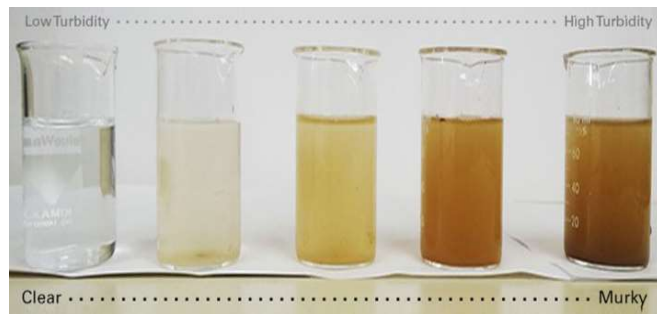


—————> Major Pathway  
 - - - - -> Minor Pathway

TCE = Trichloroethene  
 Cis-1,2-DCE = Cis-1,2Dichloroethene  
 Trans-1,2-DCE = Trans-1,2-Dichloroethene  
 1,1-DCE = 1,1-Dichloroethene  
 VC = Vinyl Chloride

## Turbidity

The quality of being cloudy, opaque with suspended matter in water.

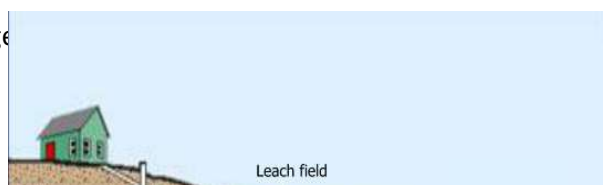


## United States Geological Survey (USGS)

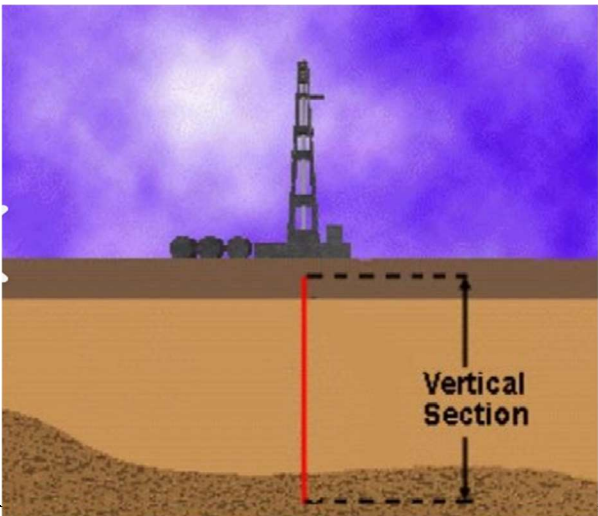

- A government agency that provides scientific information about natural resources, hazards, and physical features of the earth (topography).



## Upgradient



# Definitions Sheet

<ul style="list-style-type: none"> <li>Upgradient wells reflect natural groundwater conditions not affected by the contaminants. <ul style="list-style-type: none"> <li>Groundwater flows at different rates and directions, when something is upgradient, it is located before the plume.</li> <li>Similar to upwind in air</li> </ul> </li> </ul>	
<p><b>Vertical Profile Borings (VPBs)</b></p> <ul style="list-style-type: none"> <li>Drilling method used to collect various samples such as soil and water</li> <li>Causes minimal disturbances to the ground surface and provides detailed information regarding the local geology</li> <li>Can be used to better understand underground plume fate and transport</li> </ul>	 <p>The diagram illustrates a Vertical Profile Boring (VPB) operation. On the surface, a drilling rig is shown. A vertical red line indicates the borehole extending into the ground. A dashed rectangular box around the borehole is labeled "Vertical Section". The ground is depicted in layers of brown and tan, representing different geological strata.</p>
<p><b>VOCs</b></p> <ul style="list-style-type: none"> <li>Volatile organic compounds</li> <li>Transitions into gases or vapors very easily</li> <li>Also common in household items.</li> </ul>	 <p>The image shows several household cleaning products, including spray bottles and liquid containers in various colors (blue, yellow, green, white). These products are examples of Volatile Organic Compounds (VOCs).</p>
<p><b>Well Development</b></p>	

## Definitions Sheet

- Process which removes well drilling fluids, mud, cutting, from a newly installed well.
- Completed by pumping or surging compressed air to get the material from the well out.

