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PCBs, MINING, AND WATER POLLUTION

ELECTRICAL EQUIPMENT CONTAINING PCBs IS USED UNDERGROUND
ABANDONED EQUIPMENT WILL LEAK PCBs INTO GROUNDWATER
ABANDONMENT MUST BE PREVENTED

PCB PROPERTIES AND USES

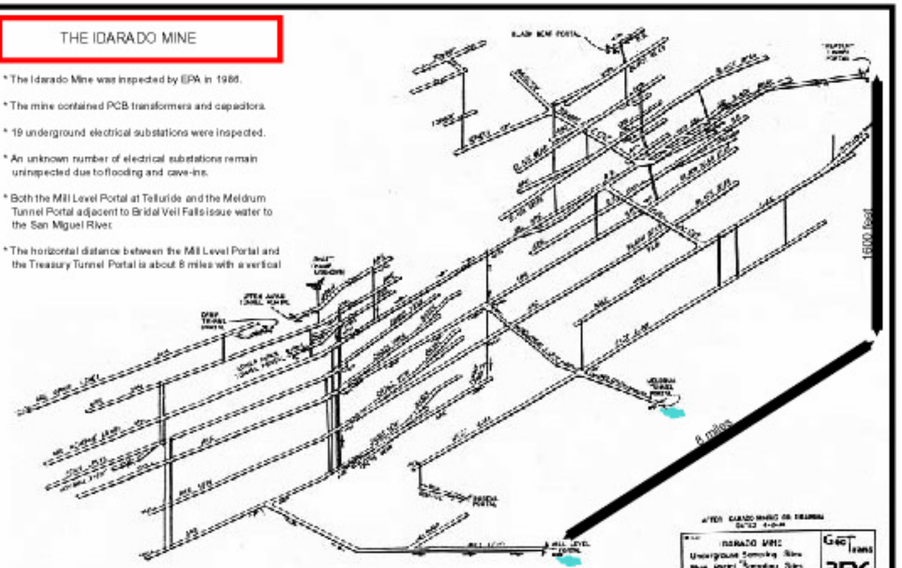
* PCB is an acronym for polychlorinated biphenyl.
* PCBs are a group of about 200 man-made structurally-related chemicals.
* PCBs were manufactured under the trade name Aroclor from 1929 until 1979, when manufacture was prohibited.
* Common trade names on manufacturer nameplates of electrical equipment are Askarel, Inertean, Pyranol, Chlorextol, Nonflammable Liquid, and Elemex. There are many others.
* The physical and chemical properties that make PCBs commercially valuable also make them environmentally detrimental.
* PCBs are fire resistant and have good electrical insulating properties.
* PCBs are among the most stable organic compounds known; they resist breakdown from high temperatures and aging.

REPRESENTATIVE UNDERGROUND MINE

* The Idarado mine is at Telluride, Colorado.
* Mines can be extensive in both vertical and horizontal dimensions.
* A South Dakota gold mine is operating on many levels at a depth of over 8,000 feet below the surface.
* A Wyoming trona (sodium bicarbonate) mine is operating on one level at 1,500 feet below the surface and encompasses an area of 50 square miles with 4500 miles of drifts (tunnels).
* Coal mines can extend for miles underground.
* Gold mines in South Africa are being worked at more than 11,000 feet below the surface with plans to go as deep as 16,000 feet in the near future.
* Large mines can require hundreds of electrical substations and/or power centers that may harbor PCB containing electrical equipment.
* Surface facilities and equipment including mills, smelters, transfer facilities, draglines, and power shovels may also use PCB equipment.
* Even small mines can have PCB containing electrical equipment.

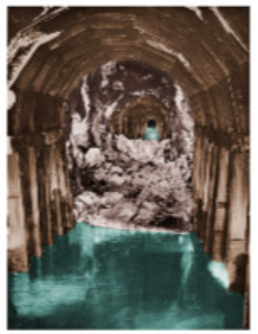
THE IDARADO MINE

* The Idarado Mine was inspected by EPA in 1986.
* The mine contained PCB transformers and capacitors.
* 19 underground electrical substations were inspected.
* An unknown number of electrical substations remain uninspected due to flooding and cave-ins.
* Both the Mill Level Portal at Telluride and the Meldrum Tunnel Portal adjacent to Bridal Veil Falls issue water to the San Miguel River.
* The horizontal distance between the Mill Level Portal and the Treasury Tunnel Portal is about 8 miles with a vertical



CONSEQUENCES OF ABANDONMENT

* PCBs containing electrical equipment can be abandoned whenever removal is not cost effective.
* Cave-ins and flooding will prevent retrieval of abandoned PCB containing electrical equipment.



* Abandoned equipment will be crushed or corroded by acid mine waters and will release PCBs into groundwater.
* PCBs in groundwater will eventually reach surface waters.
* PCBs released from underground mines may cause water contamination in mining districts which can introduce PCBs into the human food chain.
* Release of PCBs from abandoned mining electrical equipment adds to the worldwide burden of PCBs with unforeseeable consequences for the future.

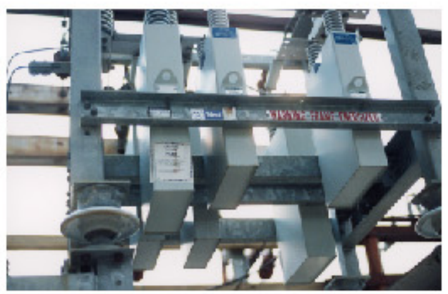
HEALTH AND ENVIRONMENTAL EFFECTS

* PCBs have spread throughout the environment so that no living thing can avoid them.
* PCBs are not biodegradable and are persistent in the environment; they are orders of magnitude more fat than water soluble and concentrate in fatty tissues.
* Fish, birds, amphibians, and even polar bears are suffering birth defects and declines in fertility linked to PCB exposure.
* PCBs are among a number of chemicals considered environmental endocrine disruptors, suspected to be the cause of decreases in human sperm counts, increases in birth defects in reproductive organs, as well as increased incidence in breast, prostate, and testicular cancers.
* The ocean is the largest and final sink of PCBs the consequences of which are unknown.
* PCBs affect phytoplankton communities which are the basis of the ocean food chain and are a major source of atmospheric oxygen.

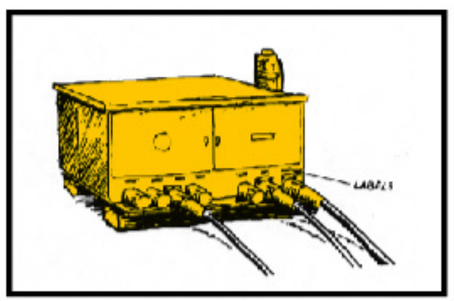
SOLUTIONS

* Begin routine underground mine inspections by a government authority having jurisdiction over PCBs.
* Training required for underground mine inspectors is minimal. Inspectors should be accompanied at all times by mine personnel.
* There is no legitimate safety concern that should prevent inspections.
* Remove PCB containing equipment from mines where abandonment is likely.
* Educate mining communities and the mining industry about the hazards of abandoning PCB containing equipment.

76 gallon PCB transformers (cylindrical objects with cooling fins) with PCB marks in an underground mine



PCB marked capacitor



Mine power center that commonly contains capacitors

PCB Capacitors in a mine power center