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PCBs, MINING, AND WATER POLLUTION

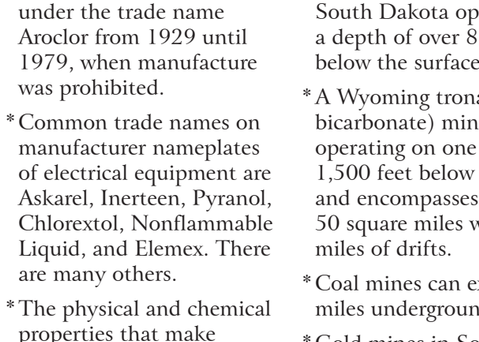
ELECTRICAL EQUIPMENT CONTAINING PCBs IS USED UNDERGROUND
ABANDONED EQUIPMENT CAN LEAK PCBs INTO GROUNDWATER
ABANDONMENT MUST BE PREVENTED

PCB PROPERTIES AND USES

* PCB is an acronym for polychlorinated biphenyl.
* PCBs are a group of 209 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, Inerteen, 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.
* Improper or open burning of PCBs can produce dioxins.
* PCBs are among the most stable organic compounds known; they resist breakdown from high temperatures and aging

REPRESENTATIVE MINE

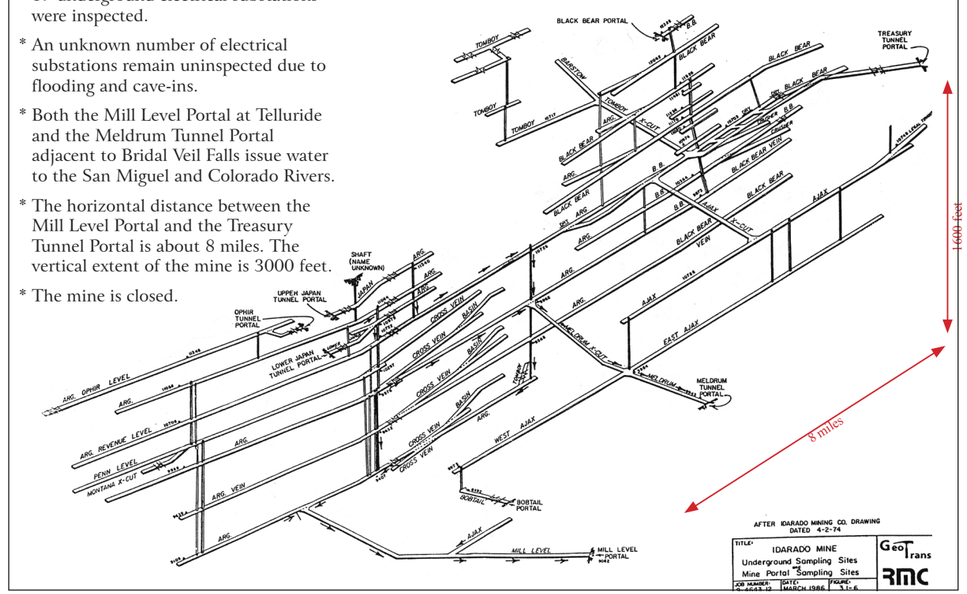
* The Idarado Mine is at Telluride, Colorado.
* Mines can be extensive in both vertical and horizontal dimensions.
* The Homestake mine at Lead, South Dakota operated at a depth of over 8,000 feet below the surface.
* A Wyoming trona (sodium bicarbonate) mine is operating on one level at 1,500 feet below the surface and encompasses an area of 50 square miles with 4500 miles of drifts.
* Coal mines can extend for miles underground.
* Gold mines in South Africa are operating at more than 12,000 feet below the surface.
* 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.
* Mines of any size can have PCB containing electrical equipment



76 gallon PCB (Pyranol) transformers (cylindrical objects with cooling fins and PCB marks) on the 20 level in the Eagle Mine at Gilman, Colorado during EPA removal due to flooding and abandonment.

THE IDARADO MINE

* The Idarado Mine was inspected by EPA in 1986.
* The mine contained 23 transformers with an average of 86 gallons of PCBs.
* 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 and Colorado Rivers.
* The horizontal distance between the Mill Level Portal and the Treasury Tunnel Portal is about 8 miles. The vertical extent of the mine is 3000 feet.
* The mine is closed.



CONSEQUENCES OF ABANDONMENT

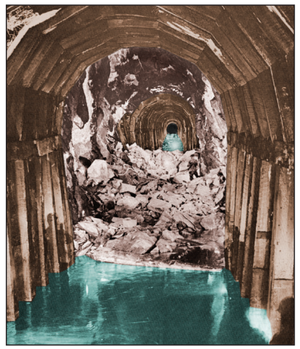
* PCB containing electrical equipment may be abandoned whenever removal is not cost effective.
* Cave-ins and flooding can prevent retrieval of abandoned electrical equipment.
* When abandoned electrical equipment is crushed or corroded by acid mine waters PCBs will be released into groundwater.
* PCBs released from abandoned electrical equipment can cause water contamination in mining districts which can introduce PCBs into the human food chain.
* PCBs in groundwater can eventually reach surface waters.
* PCBs released from abandoned mining electrical equipment add to the worldwide burden of PCBs with unforeseeable consequences.

SOLUTIONS

* Educate the mining industry and mining communities about the hazards of abandoning PCB containing electrical equipment.
* Remove PCB containing equipment from mines where abandonment is likely.
* Conduct 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 mine inspections.

HEALTH AND ENVIRONMENTAL EFFECTS

* PCBs are widespread in the environment and are even found in remote alpine and polar regions.
* PCBs are soluble in water and are absorbed into fats.
* PCBs are among the most stable organic chemicals known. They are not readily degradable. PCBs persist in the environment and in the fat of living organisms.
* Humans, fish, birds, amphibians, and even polar bears are suffering developmental defects and decreased fertility from PCBs.
* Consumption of PCB contaminated fish is the major source of human exposure.
* PCBs are among a number of endocrine disrupters which interfere with an organism's chemical messenger system and can function as female hormone mimics. They are suspected of causing decreases in human sperm counts, increases in defects in reproductive organs, as well as an increased incidence in breast, prostate, and testicular cancers. PCBs have been shown to cause defects in learning and memory in children and adults.
* The ocean is the largest and final sink of PCBs.
* PCBs bioconcentrate in phytoplankton. Phytoplankton is the basis of the ocean food chain, the primary food source for all sea organisms.
* Phytoplankton plays a key role in regulating atmospheric carbon and produce about 50% of the world's oxygen. PCBs affect the productivity of Phytoplankton and may contribute to climate change.

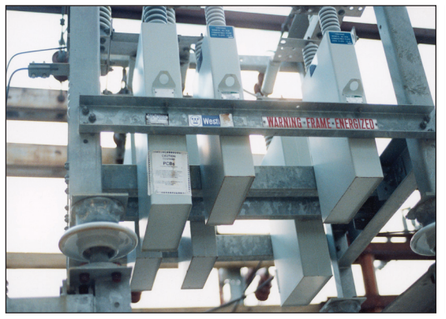


Cave-in at the Alpine Tunnel, Alpine Pass, Colorado

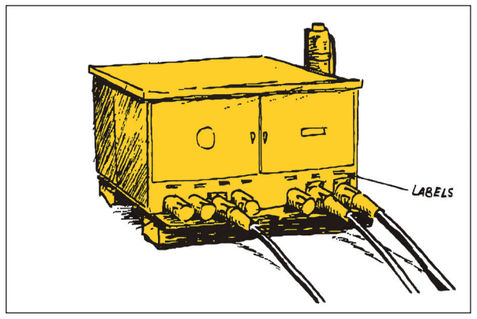
PCB Capacitors in a mine power center

DISPOSAL

* PCBs should be disposed only by government approved methods.
* Storage until approved disposal methods become available may be the only option under some circumstances.
* For disposal information, contact www.epa.gov/pcb or Dan Bench at 303-312-6027 or bench.dan@epa.gov.



PCB marked capacitor



Mine power center that commonly contains capacitors