



# National Primary Drinking Water Regulations

## 2,4,5 - TP (Silvex)

### CHEMICAL/ PHYSICAL PROPERTIES

CAS NUMBER: 93-72-1

**COLOR/ FORM/ODOR:**

White powder with little odor; available in granules, solutions and tablets as the amine or sodium emulsifiable salts & various esters.

M.P.: 181.6° C B.P.: N/A

VAPOR PRESSURE: N/A

OCTANOL/WATER PARTITION (Kow): N/A

DENSITY/SPEC. GRAV.: 1.21 at 20° C

SOLUBILITY: 200 mg/L of water at 25° C;  
Slightly soluble in water

**SOIL SORPTION COEFFICIENT:**

Koc reported at 2600; Very low mobility in soil

ODOR/TASTE THRESHOLDS: N/A

HENRY'S LAW COEFFICIENT: N/A

**BIOCONCENTRATION FACTOR:**

BCF=58 in fish; not expected to bioconcentrate in aquatic organisms.

**TRADE NAMES/SYNONYMS:**

2,4,5-Trichlorophenoxypropionic acid; Weed-B-Gon; Propon; Silvi-Rhap; Sta-fast; Miller Nu Set; Aqua-Vex; Color-Set; Ded-Weed; Fenoprop; Fenormone; Fruitone T; Garlon; Kuran; Kurosai G/SL; Silvex

### DRINKING WATER STANDARDS

MCLG: 0.05 mg/L

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HAL(child): 1- to 10-day: 0.2 mg/L  
Longer-term: 0.07 mg/L

### HEALTH EFFECTS SUMMARY

**Acute:** EPA has found 2,4,5-TP to potentially cause the following health effects from acute exposures at levels above the MCL: depression and other nervous system effects, weakness, stomach irritation and minor damage to liver and kidneys.

Drinking water levels which are considered "safe" for short-term exposures: For a 10-kg (22 lb.) child consuming 1 liter of water per day, a one- to ten-day exposure to 0.2 mg/L or upto a 7-year exposure to 0.07 mg/L.

**Chronic:** 2,4,5-TP has the potential to cause the following health effects from long-term exposures at levels above the MCL: minor liver and kidney damage

**Cancer:** There is inadequate evidence to state whether or not 2,4,5-TP has the potential to cause cancer from a lifetime exposure in drinking water.

### USAGE PATTERNS

In 1982, 2,4,5-TP production was 500,000 pounds, with industrial/commercial herbicide consuming 60%; range and pastureland use consuming 40%. The amount of silvex used annually in the U.S. prior to 1983 was estimated in 1985 to be 7,000 pounds. At present,

however, silvex is not used in the U.S. due to the cancellation of all registered uses effective Jan 2, 1985.

The greatest use of 2,4,5-TP was as a postemergence herbicide for control of woody plants, and broadleaf herbaceous weeds in rice and bluegrass turf, in sugarcane, in rangeland improvement programs, on lawns. Aquatic uses include control of weeds in ditches and riverbanks, on floodways, along canals, reservoirs, streams, and along southern waterways.

### RELEASE PATTERNS

Former sources of release include spraying from application of the herbicide formulations, runoff from fields, and direct release to water for control of aquatic weeds. It may also have been released as the result of hydrolysis of esters of silvex.

### ENVIRONMENTAL FATE

When released on land, silvex will strongly adsorb to soils and biodegrade, but is not expected to leach, hydrolyze, or evaporate. It may be lost due to runoff from treated fields. Silvex has been reported to be very well adsorbed to essentially completely adsorbed in soils (reported Koc value of 2600). Average half-lives for biodegradation of silvex in soils ranged from 12 days for 3 prairie soils to 17 days. Negligible degradation was observed in air-dried soils.

If released to water, silvex will biodegrade slowly and strongly adsorb to sediment, where slow biodegradation will occur. The loss due to volatilization of silvex from

aqueous and soil systems will not be significant due to its low vapor pressure of the acid. It will not appreciably hydrolyze but may be subject to photooxidation near the surface of waters.

While no data concerning the rate of biodegradation in water were found, available information suggests that silvex is degraded slowly both in water and sediments. 2,4,5-Trichlorophenol has been identified as a product of the biodegradation of silvex. From limited data available, it may be concluded that any phenoxy herbicide, whether applied as ester or as dimethylamine salt formulations, may be chemically transformed to the same phenoxyalkanoic anion in soil and water at rates dependent on pH. These anions would presumably reassociate with a variety of inorganic cations present in the soil to maintain electrical neutrality, and then undergo leaching and biological degradation.

Silvex may be released to air during spraying operations but not as a result of evaporation due to its very low vapor pressure. It will be lost from the atmosphere mainly by rainout and dry deposition. Vapor phase photooxidation by reaction with photochemically produced hydroxyl radicals may be significant (estimated half-life 6.3 hrs).

Bioconcentration of silvex will not be significant based with a reported bioconcentration factor of 58 for fish in flowing water.

Agricultural workers may have been exposed to silvex during spraying operations using herbicides containing this chemical. Exposure may have also occurred through consumption of contaminated foods, including fruits and milk. At present, however, no workers are expected to be exposed to silvex during application of herbicides because all registered uses of silvex were canceled effective Jan 2, 1985.

#### **OTHER REGULATORY INFORMATION**

##### **MONITORING:**

###### **FOR GROUND/SURFACE WATER SOURCES:**

INITIAL FREQUENCY- 4 quarterly samples every 3 years

REPEAT FREQUENCY- If no detections during initial round:

2 quarterly per year if serving >3300 persons;

1 sample per 3 years for smaller systems

TRIGGERS - Return to Initial Freq. if detect at > 0.0002 mg/L

##### **ANALYSIS:**

###### **REFERENCE SOURCE**

EPA 600/4-88-039

###### **METHOD NUMBERS**

515.1; 515.2; 555

##### **TREATMENT:**

###### **BEST AVAILABLE TECHNOLOGIES**

Granular Activated Charcoal

##### **FOR ADDITIONAL INFORMATION:**

◆ EPA can provide further regulatory and other general information:

· EPA Safe Drinking Water Hotline - 800/426-4791

◆ Other sources of toxicological and environmental fate data include:

· Toxic Substance Control Act Information Line - 202/554-1404

· Toxics Release Inventory, National Library of Medicine - 301/496-6531

· Agency for Toxic Substances and Disease Registry - 404/639-6000

· National Pesticide Hotline - 800/858-7378