WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION
Form #3

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OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

NOTICE OF AGENCY APPROVAL OF A PROPOSED RULE

AND

FILING WITH THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

AGENCY: DCL&ER, Division of Environmental Protection TITLE NUMBER: 47

CITE AUTHORITY § 20-5A-6A

AMENDMENT TO AN EXISTING RULE: YES _____ NO X

IF YES, SERIES NUMBER OF RULE BEING AMENDED: _____

TITLE OF RULE BEING AMENDED: _____

IF NO, SERIES NUMBER OF RULE BEING PROPOSED: 9

TITLE OF RULE BEING PROPOSED: Underground Injection Control Fee Schedule

THE ABOVE PROPOSED LEGISLATIVE RULE HAVING GONE TO A PUBLIC HEARING OR A PUBLIC COMMENT PERIOD IS HEREBY APPROVED BY THE PROMULGATING AGENCY FOR FILING WITH THE SECRETARY OF STATE AND THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE FOR THEIR REVIEW.

David C. Callaghan, Director
Division of Environmental Protection

7.50

DATE: August 10, 1993

TO: Legislative Rule-Making Review Committee

FROM: Department of Commerce, Labor and Environmental Resources; Division of Environmental Protection

LEGISLATIVE RULE TITLE: Underground Injection Control Fee Schedule

1. Authorizing statute (s) citation: § 20-5A-6A

2.a. Date filed in State Register with Notice of Hearing: 6/30/93

2.b. What other notice, including advertizing, did you give of the hearing? Notice placed in 8 newspapers across the state, Copies provided to state agencies, Water Quality Advisory Committee and other interested parties.

2.c. Date of hearing (s): no hearing, comment period closed 8/2/93

2.d. Attach list of persons who appeared at hearing, comments received, amendments, reasons for amendments;
Attached X No comments received ____

2.e. Date agency approved proposed Legislative Rule filed in State Register following public hearing: 8/12/93

2.f. Name and telephone of agency contact: Laidlev Eli McCoy, 558-2107

3. If the statute under which the rule was promulgated and submitted requires certain findings and determinations to be made as a condition precedent to their promulgation:

3.a. Date on which a notice of the time and place of hearing for the taking of evidence and a general description of the issues to be decided was filed in the State Register:
N. A.

3.b. Date of hearing: ____

3.c. Date the required findings and determinations together with reasons therefor were filed in the State Register: ____

3.d. Findings and determinations, and reasons (attached).

DEPARTMENT OF COMMERCE LABOR AND ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

RESPONSIVENESS SUMMARY
August 1993

Proposed Rule: "Underground Injection Control Fee Schedule"

The West Virginia Division of Environmental Protection (DEP) has received thoughtful criticism during the public comment period on proposed "Underground Injection Control Fee Schedule" Title 47, Series 9. This rule sets forth a schedule of fees to be charged for activities regulated by the Underground Injection Control Program.

To comply with federal and state public participation requirements the DEP issued on July 2, 1993 a notice announcing the beginning of a thirty day public comment period. The notice was published in eight newspapers, representative of various geographic areas across the state. Copies of the public notice were also sent to state agencies affected by the rule, the U.S. Environmental Protection Agency, the members of the Water Quality Advisory Committee, and other interested parties.

A public hearing on the rule was not held as the DEP anticipated minimal comment. The DEP received 14 written statements by August 2, 1993, the date on which the official record was closed. Thirteen of the statements were a single response written as a form letter. The following is this agency's response to the recommendations and concerns raised.

Comment/Response

The commentors objected to deep underground injection and demanded a ban on all underground injection activities in the State.

Although the comments received do not directly respond to the rule being proposed the DEP feels that it is necessary to respond to the commentors' remarks.

The Underground Injection Control Program (UIC) is a federally mandated program established by the 1974 Safe Drinking Water Act.

Section 1421 of the Safe Drinking Water Act required the Environmental Protection Agency (EPA) to promulgate regulations establishing minimum requirements for effective underground injection control programs.

In 1983 the State of West Virginia applied for and received primary enforcement responsibility for the UIC program. Under the concept of primacy the states control their own programs as long as state rules are no less stringent than those administered directly by the EPA. Without a federal or state regulated program for underground injection practices, wastes of all varieties could be disposed of, relatively at will, without regard for human health and the environment.

The UIC program is designed to prevent the migration of fluids out of the underground zone where they are injected. In accordance with UIC rules, the state requires all owners and operators of injection wells to obtain permits before they can legally operate the well. When approved, each permit specifies what the owner or operator must do to ensure that groundwater is not contaminated.

These fees are intended to support and maintain the UIC program in order to provide a regulatory framework for the safe disposal of waste underground without harm to the resource.

Since there was no comment specifically related to the proposed rule, DEP does not propose any changes to the rule other than to clarify the definition of the term well in subsection 2.17 so that it is consistent with the purpose of this rule.

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
OFFICE OF THE SECRETARY
State Capitol, Room M-146
Charleston, West Virginia 25305-0310
Telephone: (304) 558-0400
Fax No.: (304) 558-4983

GASTON CAPERTON
Governor

JOHN M. RANSON
Cabinet Secretary

June 30, 1993

David C. Callaghan, Director
Division of Environmental Protection
10 McJunkin Road
Nitro, West Virginia 25143-2506

Re: Proposed Rule - Title 47, Series 8 - Underground Injection Control Fee Schedule

Dear Director Callaghan:

Pursuant to West Virginia Code Section 5F-2-2(a)(12), I hereby consent to the proposal of the rule specified above.

You may attach a copy of this letter to your filing with the Secretary of State as evidence of my consent.

Sincerely yours,

John M. Ranson

John M. Ranson
Cabinet Secretary

JMR:ro

cc: Dave Watkins

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DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1201 Greenbrier Street
Charleston, WV 25311-1088

Gaston Caperton
Governor
John M. Ranson
Cabinet Secretary

David C. Callaghan
Director
Ann A. Spaner
Deputy Director

Memorandum

To: John M. Ranson, Secretary
Department of Commerce, Labor
and Environmental Resources

From: David C. Callaghan, Director
Division of Environmental Protection

Date: June 28, 1993

Subject: Division Approval of Proposed Rules and Request for Department Consent to File.

==========

The following new rules; Underground Injection Control Fee Schedule, 47 C.S.R.~~18~~ 19 and Class V Injection Well Type Descriptions, 47 C.S.R.~~18A~~ 19 have my approval to be proposed pursuant to the West Virginia Administrative Procedures Act. Your approval is requested.

David C. Callaghan, Director
Division of Environmental Protection

2 August 1993

Dave Watkins
Office of Water Resources
Charleston, WV

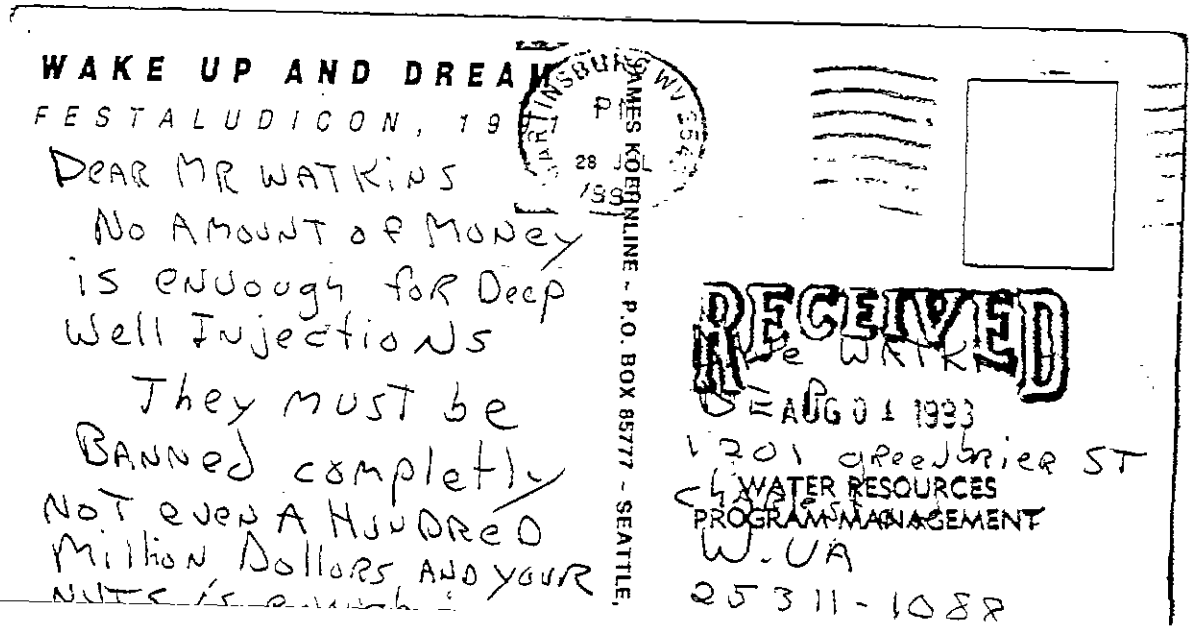
Dear Mr. Watkins;

Please abandon the plan to dispose of radioactive, chemical, and toxic wastes in deep underground wells in West Virginia. My husband and I are concerned for the well at our retirement home in Morgan County and every other well in West Virginia. The revenues cannot justify the risk.

Sincerely,

Mrs. Sally Speicher

Mrs. Sally Speicher
15 Charles Street
Walkersville, MD 21793



J. W. Rone
Jill Klein Rone
Rt 3 Box 191
Berkeley Springs, WV 25411

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

Dear Mr. Watkins,

This is in response to the proposed rule - Title 47, Series 9, Code of state regulations. This proposal will require all fees collected for permits for deep underground injection wells to be used to enforce the "control program" designed to protect underground drinking water sources.

There is no such thing as cleaning up even one polluted well that is contaminated with radioactive waste. All the other toxic chemicals that are being injected into the earth via deep underground injection wells will eventually find their way into the water table. No fee can justify the ignorance of destroying the irreplaceable water of the earth with poisons for our future generations.

Rather than propose such empty rulings, the West Virginia Division of Environmental Protection, if they are really there to protect us , should ban underground injection wells in our state.

Sincerely,

J. W. Rone

Jill Klein Rone

Timber Ridge District

Hey Guys,

Wake up! Water is the most precious Natural Resource we have, protect it.

J. W.

Irene L. Law
Rte. 3, Box 269A
Hedgesville, WV 25427

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Sincerely,

Irene L Law

White Oak Spring
1599 Pack Horse Road
Rt. 3, Box 191
Berkeley Springs, W. VA.
25411

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Sincerely,

Anne D. Herron
Protector, White Oak Spring

C. M. Law
RT 3 Bx 209A.
Hedgesville, W.VA
25427

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Rather than propose such empty rulings, the West Virginia Division of Environmental Protection, if they are really there to protect us , should ban underground injection wells in our state.

Sincerely,

Charles M. Law

P.S
I would like A Response

FROM

Charles Michael Law
RT 3 Box 269A
Hedgesville, W.VA
25427

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Rather than propose such empty rulings, the West Virginia Division of Environmental Protection, if they are really there to protect us , should ban underground injection wells in our state.

Sincerely,

Charles Michael Law

P.S. Why was there no public Hearings on an issue as important as this 2/3 rds of All Toxic Waste is injected in the ground. I want this madness stopped as well as North Mountain Toxic waste site closed.

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Sincerely,

Robert H. Simmons Sr.
Barbara H. Simmons

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Rather than propose such empty rulings, the West Virginia Division of Environmental Protection, if they are really there to protect us , should ban underground injection wells in our state.

Sincerely,

7-93

Editor, Morgan Messenger
104 North Mercer Street
Berkeley Springs, West Virginia
25411

Thankfully This was in the PAPER we are pissed off Shut Down North Mountain Toxic Waste Site Now

Dear Editor,

Tucked away on the back page of the July 14 edition of the Morgan Messenger is an article that could have been easily missed or passed over, even by the most astute environmentalist; the implications of which should bear a response from anyone who is concerned about the sources of our springs and wells.

The West Virginia Division of Environmental Protection, Office of Water Resources is asking for commentary in writing about their proposal, Title 47, Series 9, Code of State Regulations, that would establish permit application and annual permit fees for facilities that inject fluids underground through wells. These "fluids" are radioactive wastes, chemical, and other toxic waste fluids that are injected into deep underground wells. The fee money is to be used by the state Water Quality Management Fund's "control program designed to protect underground drinking water sources".

No fees could ever be enough to clean up even one water source contaminated with radioactive waste. Radioactivity cannot be removed. Every other sort of toxic waste injected into the ground eventually finds its way into the water table. No fee can justify the ignorance of destroying the irreplaceable water of the earth with poisons that will sicken and kill for generations to come.

If the WVDEP is really there to protect us and the environment, they will permanently ban deep underground injection wells in the state. And close North Mountain Toxic Waste Site

If you are concerned about Berkeley Springs pure waters and about your own water source, comments must be sent BEFORE AUGUST 2nd at 4:30 p.m. to:

West Virginia Division of Environmental Protection
Dave Watkins, Office of Water Resources
1201 Greenbrier Street

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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Rather than propose such empty rulings, the West Virginia Division of Environmental Protection, if they are really there to protect us , should ban underground injection wells in our state.

Sincerely,

William B Baxter

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

Dear Mr. Watkins,

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Sincerely,

J.S. McNeil

Mr. Dave Watkins
Office of Water Resources
1201 Greenbrier Street,
Charleston, West Virginia 25311-1088

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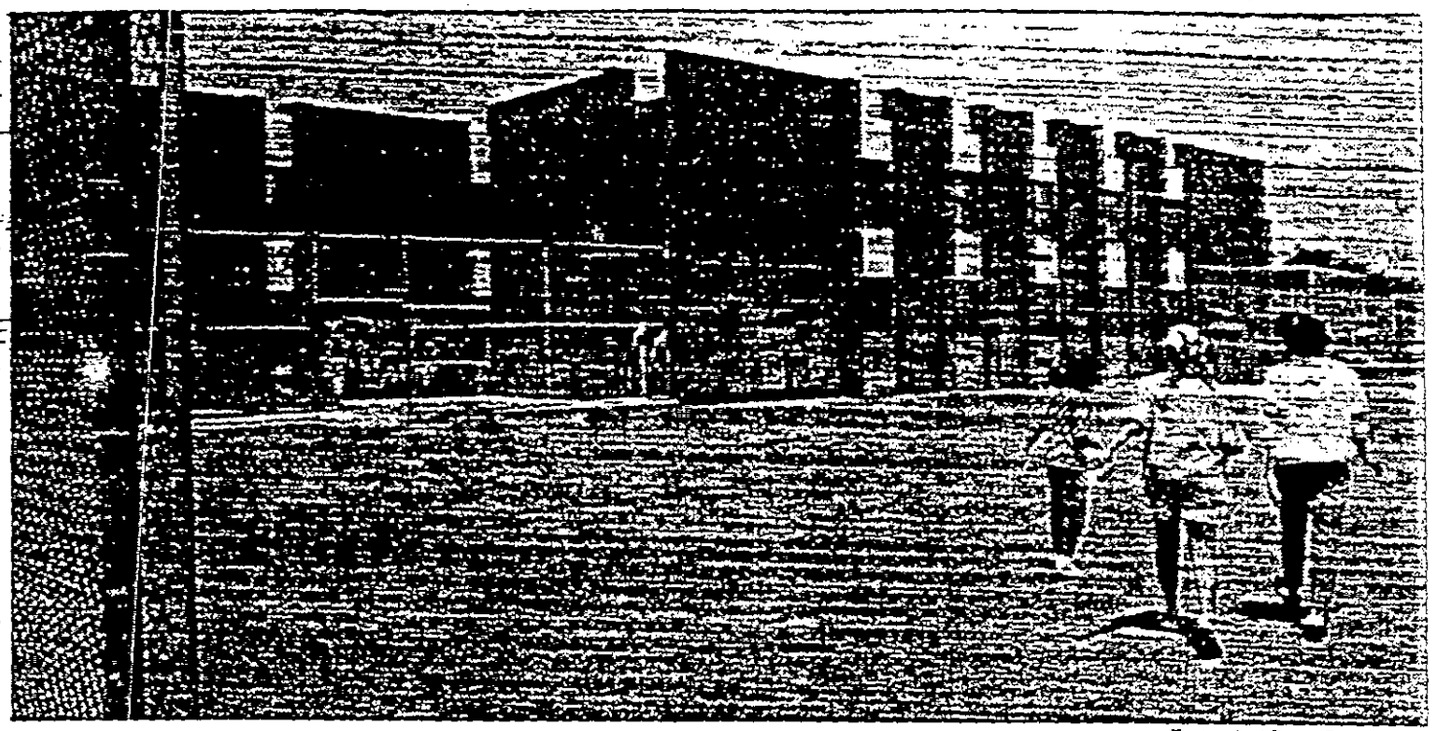
Rather than propose such empty rulings, the West Virginia Division of Environmental Protection, if they are really there to protect us , should ban underground injection wells in our state.

Sincerely, Charles B. Lowe

P.S. YOUR PROPASAL SUCKS
YOUR Guilty of CRIMES
AGAINST HUMANITY.
YOUR POISONING IS AN ATROCITY

See enclosed ARTicle to Document some of the suffering you CAUSE.



The New York Times/Eddie Hausner

Children on the playground of the Whitney Young School in Jersey City. The school has been closed because of the discovery of elevated levels of toxic chromium in the basement.

Chromium and Worry Rise in Jersey City

By ROBERT HANLEY

Special to The New York Times

JERSEY CITY — For decades, thousands of tons of slag from three local chromium refineries were routinely used as fill in building sites and dumped in vacant lots. Now, years later, the highly toxic wastes have seeped through some building walls and leached up to ground level.

State officials say the chromium poses the most serious toxic-waste problem yet discovered in New Jersey.

After four years of study, state and city environmental and health officials have found 104 sites — including homes, trucking depots, factories, parks, vacant land and an elementary school — that are contaminated with a type of chromium that ranks among the most potent carcinogens known.

"It's one of the most extensive types of contamination we've seen, even nationally," said Thomas A. Burke, deputy commissioner of the New Jersey Department of Health. "We haven't dealt with anything of this expanse before. We haven't seen waste like this scattered throughout an urban population."

Homes, parks, factories and a school are contaminated.

Some Jersey City officials, particularly the chief health officer, Lou M. Manzo, believe the state has been slow to react to the problem, particularly at the school. On May 16, Mr. Manzo ordered the school, Whitney Young, closed and its 1,100 students transferred to another school after state air sampling found elevated chromium readings in its basement.

"The state could not give me any conclusive proof that the contamination wasn't in upper floors," Mr. Manzo said.

Potentially, tens of thousands of Hudson County residents face health risks from the chemical, hexavalent chromium, state health officials say.

The chemical, which migrates through ground water and forms clusters of greenish-yellow crystals wherever it surfaces, causes breathing difficulties, skin irritation and ulceration, nasal perforation and, in cases of long-term exposure, lung cancer, primarily among chromium production workers. It is a byproduct of the extraction from ore of chrome used in paints, stainless steel, chrome plating and leather tanning and wood preservatives.

From the turn of the century until the mid-1960s, two factories here and one in neighboring Kearny produced some two million tons of residue, according to the State Department of Environmental Protec-

Continued on Page B4

ing of the renal arteries and glomerular changes resembling those seen in chronic benign hypertension. Their kidneys also showed evidence of pyelonephritis. Most human subjects dying from hypertensive complications show increased cadmium or increased Cd:Zn ratios (Schroeder, 1965b). There is some evidence that acute industrial exposure can affect the pulmonary and cardiovascular systems without necessarily influencing the kidney resulting in cardiac infarction and cor pulmonale (Zavon and Meadows, 1970). Administration to rats induced hypertension in the female. Like many other adverse effects of cadmium, this effect can be reversed by the administration of zinc (Schroeder, 1967).

Damage to the olfactory nerve, often with total loss of smell (anosmia), is often a consequence of cadmium exposure. Incidents have been reported in which 91 percent of workers exposed for more than 30 years were affected (Potts, 1965).

The testicular damage produced in several species is also indirectly caused by cadmium-induced vascular changes and can be prevented by zinc, selenium, cobalt, estrogens, and cysteine (Flick *et al.*, 1971). Cadmium produces adverse effects on the reproductive capacity of the female, at least in rats, by causing placental destruction.

Additional symptoms and signs of chronic cadmium poisoning consisting of fatigue, anosmia, watery nasal discharge, loss of weight, low hemoglobin values, bone fracture, and rickets (reversible by vitamin D and calcium) have been attributed to industrial exposure (Stokinger, 1963; Browning, 1969).

CESIUM

Occurrence and Use. Cesium occurs in nature as pollucite, a hydrous cesium-aluminum silicate (Table 18-5). Its main industrial uses are as a catalyst in the polymerization of resin-forming materials and in photoelectric cells. It is useful in this respect because the range of sensitivity is approximately that of the human eye. Radioactive cesium is a constituent of nuclear fallout.

Absorption, Excretion, Toxicity. Cesium is absorbed after oral administration and is bound within the cells of the soft tissues such as kidney and muscle. It is found in the red blood cells and may in some circumstances be able to replace potassium. The urine is the main route of excretion. Increased potassium levels facilitate cesium excretion. The radioactive material is found in milk.

No cases of industrial injury related to the chemical toxicity of cesium have been reported. It is likely that replacement of potassium by cesium would produce ill effects in man, probably neuromuscular in nature, as has been demonstrated in experimental animals (Browning, 1969).

CHROMIUM

Occurrence and Use. Chromite ($FeCr_2O_4$) is the most important chrome ore (Table 18-5). Chromium plating is one of the major uses of this metal. Steel fabrication, paint and pigment manufacturing, and leather tanning constitute other major uses of chromium. The medicinal uses of chromium are limited to external application of chromium trioxide as a caustic and intravenous sodium radiochromate to evaluate the life-span of red cells.

Absorption, Excretion, Toxicity. Chromium exists in several valence states. Only the trivalent and hexavalent are biologically significant. While conversion from trivalent to hexavalent and other states is important chemically, the inner conversion from chromic to chromate does not apparently occur biologically. The conversion of hexavalent to trivalent does take place in the body.

Trivalent chromium is an essential element in animals. It plays a role in glucose and lipid metabolism. Chromium deficiency mimics diabetes mellitus and produces aortic plaques in rats. Chromium supplementation improves or normalizes glucose tolerance in diabetics, older people, and malnourished children. It has been suggested that chromium deficiency may be a basic factor in atherosclerosis (Mertz, 1969; Schroeder *et al.*, 1970a). A deficiency of trivalent chromium apparently increases the toxicity of lead (Schroeder *et al.*, 1965).

The major environmental exposure to chromium occurs as a consequence of its presence in food. Brown sugar and animal fats, especially butter, are chromium-rich foods. Chromium is found in urban air (Table 18-5). The concentration in natural water supplies is below 10 ppb; however, in municipal drinking water concentrations of 35 ppb have been reported (Table 18-6). The daily intake has been estimated at 60 μg (30 to 100 μg), 10 μg of which is due to water concentrations (Table 18-5). However, the absorption is limited to approximately 1 percent (Schroeder *et al.*, 1962b). The occurrence of chromium in food or water has not been shown to produce any significant adverse effects in either man or experimental animals (U.S. Public Health Service, 1962; Kanisawa and Schroeder, 1969; Schroeder and Mitchener, 1971b).

The total chromium body burden of man has been estimated at less than 6 mg (Table 18-5). Chromium is transported across the placenta

United States Environmental Protection Agency
Office of Public Affairs (A 107) Washington DC 20460
June 1988

EPA

Air Toxics Facts

Decision on Whether to Regulate Chromium as a Toxic Air Pollutant

The U.S. Environmental Protection Agency has completed its evaluation of chromium as a potentially toxic air pollutant and is announcing its intention to list it as a hazardous air pollutant under the Clean Air Act.

EPA found there is sufficient health evidence for some chromium compounds to consider them human carcinogens (cancer-causing).

Chromium compounds are prevalent in the environment in two oxidation states: hexavalent, which is usually man-made and generally considered more toxic, and trivalent, which is a natural constituent of the earth's crust. Since chromium is found in the earth's crust, it is emitted from processes that utilize ores (e.g. stainless steel) and during combustion of fossil fuels. It is also emitted from processes that manufacture or use chromium chemical (e.g. pigments, chromic acid), from refractory production (e.g. high temperature furnace linings) and during waste incineration. Most source categories emit a mixture of the two forms and, as a result, all historical data refer to total chromium rather than one or the other. EPA has initiated an extensive study to better understand the amount of hexavalent chromium and the total chromium being emitted from the identified sources.

EPA's Office of Health and Environmental Assessment found, and the agency's Science Advisory Board agreed, that there is sufficient evidence from the combined human and animal data to consider at least some hexavalent compounds to be carcinogenic in people.

Chromium, or at least the hexavalent form, has been shown to result in an increased risk of lung cancer in many studies when workers were exposed to mixtures of both forms. It is not entirely clear whether the carcinogenic response was caused by the hexavalent or trivalent forms or the mixture of both.

(more)

New York, Van Nostrand Reinhold Co. (1981). (Chromic Acetate).
(12) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 1,* No. 7, 47-49, New York, Van Nostrand Reinhold Co. (1981). (Chromic Oxide).
(13) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 2,* No. 2, 21-22, New York, Van Nostrand Reinhold Co. (1982). (Chromic Acid).
(14) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 3,* No. 3, 59-62, New York, Van Nostrand Reinhold Co. (1983). (Chromic Acid).
(15) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 3,* No. 3, 62-65, New York, Van Nostrand Reinhold Co. (1983). (Chromic Sulfate).
(16) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 3,* No. 3, 65-68, New York, Van Nostrand Reinhold Co. (1983). (Chromium).
(17) See Reference (A-62). Also see Reference (A-64).
(18) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 3,* No. 6, 64-67, New York, Van Nostrand Reinhold Co. (Nov./Dec. 1983) (Sodium Dichromate).
(19) Parmeggiani, L., Ed., *Encyclopedia of Occupational Health & Safety,* Third Edition, Vol. 1, pp 468-73, Geneva, International Labour Office (1983).
(20) United Nations Environment Programme, *IRPTC Legal File 1983,* Vol. I, pp VII/189-94, Geneva, Switzerland, International Register of Potentially Toxic Chemicals (1984).

CHRYSENE

- Carcinogen (Industrial Substance Suspect of Carcinogenic Potential for Man) (A-6).

See "Polynuclear Aromatics."

CINNAMYL ANTHRANILATE

- Carcinogen (Animal Suspected, IARC) (2)

Description: $C_6H_5CH{=}CHCH_2OCOC_6H_4NH_2$ is a brownish powder which melts above 60°C.

Code Numbers: CAS 87-29-6 RTECS CB2725000

DOT Designation: —

Synonyms: Cinnamyl-2-aminobenzoate.

Potential Exposure: This is a flavor and fragrance chemical widely used in foods, beverages, soaps, detergents, perfumes.

Permissible Exposure Limits in Air: No standards set.

Permissible Concentration in Water: No criteria set.

Harmful Effects and Symptoms: Open to debate. The Council of Europe lists it as safe at levels of 25 mg/kg, but there is evidence that it causes lung cancer. More data are needed. Animal carcinogenicity is suspected (A-63).

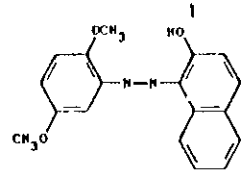
References

(1) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 1,* No. 5, 47, New York, Van Nostrand Reinhold Co. (1981).
(2) International Agency for Research on Cancer, *IARC Monographs on the Carcinogenic Risks of Chemicals to Humans, 16,* 27, Lyon, France (1978).

CITROS RED 2

- Carcinogen (Animal Positive, IARC)
- Hazardous Waste Constituent (EPA)

Description: $(CH_3O)_2C_6H_3{-}N{=}N{-}C_{10}H_6OH$ with the structural formula



is a solid melting at 156°C.

Code Numbers: CAS 6538-53-8 RTECS QL 3675000

DOT Designation: —

Synonyms: C.I. Solvent Red 80; C.I. 12156; 1-(2,5-dimethoxyphenylaz 2-naphthol.

Potential Exposure: To those encountering this material as a colorant foods or cosmetics.

Permissible Exposure Limits in Air: No standards set.

Permissible Concentration in Water: No criteria set.

Routes of Entry: Ingestion in foods.

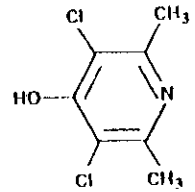
Harmful Effects and Symptoms: Has produced lung carcinomas, lymphor and bladder carcinomas in animals.

References

(1) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 1,* No. 3, 46 New York, Van Nostrand Reinhold Co. (1981).
(2) International Agency for Research on Cancer, *IARC Monographs on the Carcinogenic Risks of Chemicals to Humans, 8,* 101, Lyon, France (1975).

CLOPIDOL

Description: 3,5-Dichloro-2,6-dimethyl-4 pyridinol with the structural formula:



Clopidol is a crystalline solid melting above 320°C.

Code Numbers: CAS 2971-90-6

DOT Designation: —

tentially exposed to chromium(VI) in various forms (2). Another NIOSH estimate in 1977 reported exposures to inorganic chromium compounds as follows (3):

	Exposures
Chromic oxide	212,730
Chromic chloride	7,710
Chromic fluoride	15,330
Chromium potassium sulfate	91,380
Chromium sulfate	7,920
Chromic phosphate	20,070
Chromic nitrate	9,960
Chromic sulfate, basic	7,920
Chromous chloride	7,630

Incompatibilities:

Chromic acid and chromates: Combustible, organic, or other readily oxidizable materials such as paper, wood, sulfur, aluminum, and plastics, etc.
Chromium metal and insoluble salts: Strong oxidizers.
Soluble chromic and chromous salts: Water.

Permissible Exposure Limits in Air: The IDLH levels are as follows:

Chromic acid and chromates:	30 mg/m³
Chromium metal and insoluble salts:	500 mg/m³
Soluble chromic and chromous salts:	250 mg/m³

Current TWA standards are:

	Federal Standard	ACGIH (1983/84)
	(mg/m³)	
Chromium metal	1.0	0.5
Chromium(II) compounds	–	0.5
Chromium(III) compounds	0.5	0.5
Chromium(VI) compounds		
Water soluble	0.5	0.05
Water insoluble	1.0	0.05 (Carcinogens)
Chromyl chloride	–	0.15

The NIOSH Criteria for a Recommended Standard (1) set work-place limits for chromic acid of 0.05 mg/m³ as chromium trioxide as a TWA with a ceiling concentration of 0.1 mg/m³ as chromium trioxide determined by a sampling time of 15 minutes, as of 1973. More recently, in 1976, however (2), certain forms of chromium(VI) have been found to cause increased respiratory cancer mortality among workers.

A table of differentiation between noncarcinogenic and carcinogenic chromium(VI) compounds has been presented by NIOSH (2) as follows:

Noncarcinogens	
Evident	Inferred
Sodium bichromate	Lithium bichromate
Sodium chromate	Lithium chromate
Chromium(VI) oxide	Potassium bichromate
	Potassium chromate
	Rubidium bichromate
	Rubidium chromate
	Cesium bichromate
	Cesium chromate
	Ammonium bichromate
	Ammonium chromate

Carcinogens	
Evident	Inferred
Calcium chromate	Alkaline earth chromates and bichromates
Sintered calcium chromate	Chromyl chloride
Alkaline lime roasting process residue	tert-Butyl chromate
Zinc potassium chromate	Other chromium(VI) materials not listed
Lead chromate	in this table

NIOSH has not conducted an in-depth study of the toxicity of chromium metal or compounds containing chromium in an oxidation state other than chromium(VI). NIOSH recommends that the permissible exposure limit for carcinogenic chromium(VI) compounds be reduced to 0.001 mg/m³ and that these compounds be regulated as occupational carcinogens. NIOSH also recommends that the permissible exposure limit for noncarcinogenic chromium(VI) be reduced to 0.025 mg/m³ averaged over a workshift of up to 10 hours per day; 40 hours per week, with a ceiling level of 0.05 mg/m³ averaged over a 15-minute period. It is recommended further that chromium(VI) in the workplace be considered carcinogenic, unless it has been demonstrated that only the noncarcinogenic chromium(VI) compounds mentioned above are present. The NIOSH Criteria Documents for Chromic Acid (1) and Chromium(VI)(2) should be consulted for more detailed information.

Determination in Air: For chromic acid and chromates: collection on a filter, followed by workup with H_2SO_4 and diphenylcarbazide, followed by colorimetric analysis; see NIOSH Methods, Set O. For chromium metal and both insoluble and soluble salts: collection on a filter followed by acid workup and analysis by atomic absorption; see NIOSH Methods, Set O. See also reference (A-10).

Permissible Concentration in Water: For the protection of freshwater aquatic life: Trivalent chromium: not to exceed e (1.08 ln (hardness) + 3.48) μg/ℓ. Hexavalent chromium: 0.29 μg/ℓ as a 24-hour average, never to exceed 21.0 μg/ℓ. For the protection of saltwater aquatic life: Trivalent chromium: 10,300 μg/ℓ on an acute toxicity basis. Hexavalent chromium: 18 μg/ℓ as a 24-hour average, never to exceed 1,260 μg/ℓ. To protect human health: Trivalent chromium 170 μg/ℓ, hexavalent chromium 50 μg/ℓ. The 50 μg/ℓ limit is also established (A-65) as a drinking water standard in South Africa and in Germany.

Determination in Water: Total chromium may be determined by digestion followed by atomic absorption or by colorimetry (diphenylcarbazide) or by inductively coupled plasma (ICP) optical emission spectrometry. Chromium(VI) may be determined by extraction and atomic absorption or colorimetry (using diphenylhydrazide). Dissolved total Cr or Cr(VI) may be determined by 0.45 μ filtration followed by the above-cited methods.

Routes of Entry: Inhalation, ingestion, and eye and skin contact.

Harmful Effects and Symptoms: *Local* – In some workers, chromium compounds act as allergens which cause dermatitis to exposed skin. They may also produce pulmonary sensitization. Chromic acid has a direct corrosive effect on the skin and the mucous membranes of the upper respiratory tract, and although rare, the possibility of skin and pulmonary sensitization should be considered.

Systemic – Chromium compounds in the +3 state are of a low order of toxicity. In the +6 state, chromium compounds are irritants and corrosive, and can enter the body by ingestion, inhalation, and through the skin. Typical industrial hazards are: inhalation of the dust and fumes released during the

7/26/93

[redacted] Lustig [redacted]
Rt. 3, Box 192L
Berkeley Springs, WV 25411

Dear Mr. Watkins,

This is to let you know that I oppose any waste disposal by injection wells in WV.

Should this industry become operable, it should undergo the strictest regulation paid for as provided by Title 47 series 9. Bert Lusty