

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

IN THE MATTER OF
STANDARD CHLORINE OF
DELAWARE, INC.
NEW CASTLE COUNTY, DELAWARE

Respondent

Proceeding Under Section 106(a)
of the Comprehensive Environmental
Response, Compensation, and
Liability Act of 1980, as amended,
42 U.S.C. § 9606(a)

Docket No. III-96-73-DC

ADMINISTRATIVE ORDER

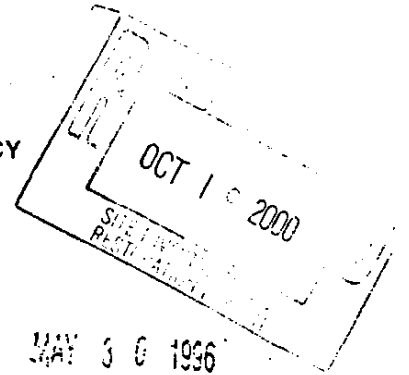
FOR REMEDIAL DESIGN AND REMEDIAL ACTION

I. JURISDICTION

A. This Administrative Order ("Order"), concerning the Standard Chlorine of Delaware Superfund Site ("Site" or "SCD Site"), in Delaware City, New Castle County, Delaware, is issued to the Respondent by the Environmental Protection Agency ("EPA") under the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9606(a). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order No. 12580 (52 Fed. Reg. 2923, January 29, 1987), and was further



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431



CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Charles M. Kummel, President
Standard Chlorine of Delaware, Inc.
1015-35 Belleville Turnpike
Kearney, NJ 07032

Re: Standard Chlorine of Delaware, Inc.
Administrative Order EPA Docket No. III-96-73-DC

Dear Mr. Kummel:

Enclosed please find an Administrative Order issued to Standard Chlorine of Delaware, Inc. Please note that you must notify the Environmental Protection Agency (EPA) within thirty-two (32) days of issuance of the Order of your intention to comply (Section XXV). You may confer with EPA within twenty (20) days of issuance and must therefore notify EPA promptly if you wish to schedule a conference (Section XXIV). Also note that failure to comply with this Order may result in EPA seeking the sanctions described in Section XXII.

If there are any questions regarding this matter, please contact Sarah Keating, Senior Assistant Regional Counsel, at (215) 566-2655.

Sincerely,

Abraham Ferdas, Associate Division
Director for Superfund Programs

Enclosure

cc: J.R. Hirl, Occidental
Harold Wagner, Air Products
L.A. Wilkes, STAR Enterprise
Anne Hiller, DNREC
Robert Toughey, SCD
Richard Ricci, Esq.
Sarah Keating, EPA

delegated to the EPA Regional Administrators on September 13, 1987, by EPA Delegation No. 14-14-5.

B. Prior notice of this Order has been given to the State of Delaware pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

II. PARTIES BOUND

A. This Order is issued to Standard Chlorine of Delaware, Inc. ("Respondent").

B. This Order shall apply to and be binding upon the Respondent and its agents, successors and assigns.

C. Respondent is jointly and severally responsible for implementing all of the requirements of this Order.

D. Neither a change in ownership of any property covered by this Order, nor a change in the ownership or corporate or partnership status of Respondent, shall in any way alter, diminish, or otherwise affect the Respondent's obligations and responsibilities under this Order.

E. In the event of any change in ownership or control of any of the property covered by this Order that is owned or controlled by Respondent, Respondent shall notify EPA, in writing, at least thirty (30) days in advance of the effective date of such change, of the name, address, and telephone number of the grantee or transferee-in-interest of such property. In addition, Respondent shall provide EPA with copies of all agreement(s) or contracts, including but not limited to indemnification agreements, executed in connection with the

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transfer or change, within five (5) days of the effective date of such agreement(s), and shall provide a copy of this Order to all grantees or transferees-in-interest prior to execution of any agreement for transfer.

F. In the event of any change in majority ownership or control of Respondent, Respondent shall notify EPA, in writing, no later than thirty (30) days after such change, of the nature and effective date of such change. Respondent shall provide a copy of this Order to the prospective owner(s) or successor(s) of the Respondent before any change of ownership or control becomes irrevocable.

G. In the event that Respondent files for bankruptcy or is placed involuntarily in bankruptcy proceedings, Respondent shall notify EPA within three (3) working days of such filing.

H. Respondent shall provide a copy of this Order to all contractors, subcontractors, laboratories, consultants, and other persons retained to conduct or monitor any portion of the Work performed pursuant to this Order prior to execution of any agreements or contracts with such persons. If the Respondent is under contract or agreement with any contractor, subcontractor, laboratory, consultant or other person retained to conduct or monitor any portion of the Work required pursuant to this Order at the time this Order is issued, Respondent shall provide a copy of this Order to all such persons within five (5) days of receipt of this Order. Respondent shall condition all contracts and agreements with such persons on compliance with the terms of this

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*good history
of spill and
response by EPA +
DNREC*

Order. Notwithstanding the terms of such contracts or agreements, Respondent remains responsible for complying with the terms of this Order and for ensuring that its contractors, subcontractors, laboratories, consultants, and other persons retained to conduct or monitor any portion of the Work required by this Order comply with the terms of this Order.

I. Within sixty (60) days after the effective date of this Order, Respondent shall record a notice of the existence of this Order on the deed for any property that comprises any portion of the Site, for the purpose of giving notice to prospective purchasers of the existence of this Order. Respondent shall also, within seventy-five (75) days after the effective date of this Order send notice of such recording to the EPA Remedial Project Manager ("RPM").

III. FINDINGS OF FACT

The following facts are a synopsis of information contained in the Administrative Record supporting issuance of this Order. That Administrative Record is incorporated by reference as if fully set forth herein.

A. Site Location, History and Uses

1. The approximately 85-acre Standard Chlorine of Delaware, Inc. ("SCD" or "Standard Chlorine") Superfund Site ("Site" or "SCD Site") is located three miles northeast of Delaware City, New Castle County, Delaware. The SCD facility was constructed in 1965 on farmland purchased from the Diamond Alkali

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Company which had purchased the land from the Tidewater Refinery Company. The Site is an operating industrial facility and is surrounded by other large industrial facilities.

2. SCD operations were started in 1966 with the production of chlorinated benzene compounds including chlorobenzene, paradichlorobenzene, orthodichlorobenzene, and lesser amounts of metadichlorobenzene and trichlorobenzene.

3. In September 1981, a release of approximately 5,000 gallons of monochlorobenzene ("MCB") occurred at the SCD Site while workers were filling a railroad tank car. Some of the released chemical ran off into surface ditches toward a tributary to the Red Lion Creek.

4. A second major release occurred at the SCD Site on January 5, 1986 (hereinafter referred to as the "second release") when approximately 400,000 gallons of paradichlorobenzene ("DCB") and approximately 169,000 gallons of trichlorobenzene ("TCB") were released at the Site due to an above-ground tank failure. The released material followed two pathways, one easterly, onto asphalt paved plant property and one northerly along the railroad tracks that run through the Site. The released material spread to the unnamed tributary of Red Lion Creek, adjacent to the SCD facility, and continued downstream to the point of confluence with Red Lion Creek.

5. SCD used booms, dikes, and a filter fence to contain and minimize further discharge of the second release.

6. SCD entered into a license agreement, dated March

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27, 1986, with Occidental Chemical Corporation ("Occidental") to utilize land owned by Occidental for remediation efforts associated with the second release. Subsequently, SCD built a sedimentation basin on a portion of Occidental's property (subsequently purchased by SCD), to store contaminated sediments collected during remediation efforts. Those sediments remain in the basin which is a part of the Site.

7. Contaminated soils and sediments were also excavated and stockpiled in waste piles on land owned at the time by Occidental and Air Products and Chemicals, Inc, ("Air Products"). This property, which comprises a portion of the SCD Site, was recently purchased by SCD.

B. Responsible Party

Respondent Standard Chlorine of Delaware, Inc. is the present owner and operator of a major portion (at least 66 acres) of the Site and was the owner and operator of a major portion of the Site, at the time that hazardous substances were released into the environment.

C. Response Actions and Investigations Performed at the Site

1. In response to the 1981 release of MCB, SCD took action to contain and recover the surface runoff. SCD excavated and disposed of contaminated soils at an off-site permitted commercial facility. In addition, SCD conducted an investigation to determine the extent of contamination to the subsurface. SCD's investigation revealed that the ground water beneath the

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Site was contaminated with other chlorinated benzene compounds in addition to MCB. The primary source for the other chlorinated benzene compounds was attributed to a leaking process drainage catch basin (CB#1), which was discovered and repaired by SCD in March of 1976.

2. SCD installed a ground water treatment and recovery system in 1982. Monitoring of the ground water recovery and treatment system is currently performed by S D and has been documented in quarterly reports submitted by SCD to the Delaware Department of Natural Resources and Environmental Control ("DNREC") since 1988.

3. EPA and DNREC conducted a Preliminary Assessment/Site Investigation ("PA/SI") to determine if the Site was eligible for inclusion on the National Priorities List ("NPL"). The Site was placed on the NPL on July 1, 1987.

4. On January 12, 1988, SCD entered into an Administrative Consent Order with DNREC to conduct a Remedial Investigation/Feasibility Study ("RI/FS") at the Site. Between 1988 and 1993, SCD's environmental consultant, Roy F. Weston, conducted a Remedial Investigation ("RI") to characterize the nature and extent of contamination at the Site, including a Risk Assessment to quantify any existing or potential human health risks and to evaluate potential environmental risks, and a Feasibility Study ("FS") to evaluate alternatives for remediation of the Site. Environmental media studied during the RI included ground water, surface and subsurface soils, surface water and

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sediments from the unnamed tributary to Red Lion Creek and Red Lion Creek itself, surface water and sediments from the sedimentation basin, and soils from the soil piles. Fish tissue samples from Red Lion Creek were also collected and analyzed. A final RI report dated September 1992, a final FS report and draft FS Addendum, dated May 1993 and September 1993, respectively, were submitted to EPA and DNREC.

D. Release of Hazardous Substances at the Site and Resultant Endangerment

1. The following are the findings of the RI and the Risk Assessment on the primary contaminants at the Site:

- a. Ground water is contaminated with chemicals that exceed Maximum Contaminant Levels ("MCLs") established under the Safe Drinking Water Act 42 U.S.C. §§ 300f -300j-26, for public drinking water supplies and/or risk-based and health-based concentrations. Currently, ground water from the Columbia aquifer in the vicinity of the Site is not used as a drinking water supply source. The contaminants contributing to the risk at the Site are referred to as contaminants of concern ("COCs") and consist of benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobenzene, nitrobenzene, pentachlorobenzene, 1,2,3,4-tetrachlorobenzene,

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1,2,4,5-tetrachlorobenzene, toluene, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, and 1,3,5-trichlorobenzene. Quarterly monitoring reports indicate that at least six ground water wells have detected "free organics." The detection of free organics most likely reflects the presence of Dense Non Aqueous Phase Liquids ("DNAPLs"). DNAPLs are hydrocarbon liquids (organic comp. 13) such as chlorinated solvents, which are heavier (denser) than water and immiscible with water (do not mix well with water). Gravity causes DNAPLs to migrate downward and infiltrate the subsurface soils and ground water until the DNAPLs reach an impermeable layer. DNAPLs act as a continuing source of contamination to ground water.

- b. Surface soils, subsurface soils, and sediments along the pathways of the 1981 release and the second release were contaminated with chlorinated benzene compounds as were the soil piles and sedimentation basin that were built following the second release in 1986.
- c. Surface waters in the sedimentation basin, the unnamed tributary, and the Red Lion Creek contain chlorinated benzene compounds. An advisory issued by DNREC and the Delaware Division of Public

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Health on May 2, 1986 recommending that the public not consume fish taken from Red Lion Creek downstream of Route 13 is currently in effect.

2. The substances identified in paragraph III.D.1(a) above are "hazardous substances" within the meaning of Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). Eleven of the fourteen substances identified in paragraph III.D.1(a) are listed at 40 C.F.R. § 302.4. 1,2,3,4-tetrachlorobenzene, 1,2,3-trichlorobenzene, and 1,3,5,-trichlorobenzene are not listed at 40 C.F.R. Section 302.4 but are nevertheless "hazardous substances" within the meaning of Section 101(14) of CERCLA.

A toxicological assessment of some of the hazardous substances found at the Site is presented below. Those which are carcinogens are classified by the EPA according to the following weight-of-evidence categories: (1) a Group A Human Carcinogen means there is sufficient evidence from epidemiological studies to support a causal association between exposure and cancer; (2) a Group B1 Probable Human Carcinogen means there is limited evidence of carcinogenicity of humans from epidemiological studies; (3) a Group B2 Probable Human Carcinogen means there is limited evidence of carcinogenicity in animals; (4) a Group C Possible Human Carcinogen means there is limited evidence of carcinogenicity in animals with inadequate or lack of evidence in humans; and (5) a Group D Carcinogen means there is no evidence of the chemical causing cancer. Some chemicals are classified as systemic toxicants which means that the chemical can potentially

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damage an organ in the body, other than by cancer.

a. **Benzene.** Benzene is a clear, volatile, colorless, highly flammable liquid with a characteristic odor. Benzene is used as a constituent in motor fuels, as a solvent for fats, inks, oils, paints, plastics and rubber, as a chemical intermediate, and in the manufacture of detergents, explosives, pharmaceuticals, and dye-stuffs. Exposure to benzene can occur through skin and eye contact, ingestion and inhalation. Local exposure to benzene may result in skin and eye irritation and dermatitis. Short-term exposure to benzene may lead to central nervous system depression. Headache, dizziness, nausea, convulsions, coma, and death may result from short-term exposure. Long-term exposure to benzene may lead to blood changes such as anemia. Occupational exposure to benzene may result in leukemia. The EPA has classified benzene as a Group A Human Carcinogen.

b. **Chlorobenzene.** Chlorobenzene is a colorless liquid with a mild aromatic odor. This compound is used in the manufacture of aniline and phenol, and as an intermediate in the manufacture of dyestuffs and pesticides. Chlorobenzene can irritate the skin, eyes and nose, and can cause drowsiness, incoherence and liver damage. The EPA has classified chlorobenzene as a Group D Carcinogen and it is considered a systemic toxicant.

c. **Dichlorobenzene.** There are three isomeric forms of dichlorobenzene. 1,3-DCB is a colorless to pale yellow liquid at room temperature. Information about production and use of

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1,3-DCB is not available; however, 1,2-DCB is used as a process solvent in the manufacture of toluene diisocyanate and as an intermediate in the synthesis of dyestuffs, herbicides and degreasers. 1,4-DCB is used as an air deodorant and insecticide. 1,4-DCB is considered a Group B2 Probable Human Carcinogen by the EPA. 1,3-DCB and 1,2-DCB are considered Group D Carcinogens by the EPA. 1,3-DCB is not classifiable as to human carcinogenicity based on a lack of human and animal data and limited genetic data. 1,2 DCB has been recognized as a systemic toxicant by the EPA. Acute inhalation of vapors in humans may cause eye and upper respiratory tract irritation and central nervous system depression. Chronic dermal and inhalation exposure in experimental animals may lead to weakness, fatigue, anemia, liver damage and kidney damage.

d. Hexachlorobenzene. Hexachlorobenzene has a molecular weight of 285, and exists as a crystalline solid with a melting point of 230 degrees Celsius and a boiling point of 326 degrees Celsius. It has very low volatility, is nearly insoluble in water, and is highly soluble in acetone, ether, benzene, and chloroform. It is used as a fungicide on wheat seeds, and as a feedstock in synthesizing the wood preservative pentachlorophenol. It is distributed worldwide, and residues in fish, birds, and domestic animals have steadily increased since 1972. Hexachlorobenzene is a Group B2 Probable Human Carcinogen, based on its tumorigenic effects in mice, rats and hamsters. It caused liver tumors in all three species, and tumors of the

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spleen and thyroid in hamsters. There is some evidence that hexachlorobenzene causes birth defects; adverse reproductive effects have been observed in rats and monkeys. Humans accidentally exposed to hexachlorobenzene displayed numerous adverse effects, including enlarged livers, rheumatoid arthritis-like symptoms, and severe skin damage.

e. **Tetrachlorobenzene.** Limited toxicity information is available for 1,2,4,5-tetrachlorobenzene. This compound probably behaves similarly to other chlorinated benzene compounds (such as trichlorobenzene), and likely causes irritation to the skin, eyes, nose and respiratory tract following exposure.

f. **Toluene.** Toluene is a clear, colorless, non-corrosive liquid with a sweet, pungent odor. This compound is used in the manufacture of many chemicals, and as a solvent for paints. Toluene is also a component of automobile and aviation fuels. Toluene can cause irritation to the eyes, respiratory tract, and skin. Exposure to this compound is also associated with headaches, dizziness, fatigue, and muscle weakness.

g. **Trichlorobenzene.** 1,2,4-Trichlorobenzene is a low-temperature melting liquid or solid with a pleasant odor. It is used as a dye carrier, herbicide intermediate, heat transfer medium, degreaser, and as an insecticide. Exposure to 1,2,4-trichlorobenzene can irritate the skin, eyes, and upper respiratory tract. In experimental animals, damage to the liver, kidney and lung has been associated with chronic exposure.

3. The SCD Site may pose an imminent and substantial

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endangerment to human health, welfare and the environment because of possible exposure to hazardous substances at concentrations that may result in adverse health affects and environmental impacts. Human exposure to contaminants from the Site can result from ingestion, inhalation, and direct dermal contact with contaminated soil and sediment, surface waters and any future use of groundwater. Receptors for which risks are unacceptable include the current worker who is exposed to contaminated soils, the future worker who may be exposed to contaminated soils and ground water, the future visitor who may be exposed to contaminated ground water, and the hunter/fisherman who may be exposed to contaminated soils, sediments, and/or surface water. Under the current worker scenario, 1,4-dichlorobenzene poses the greatest carcinogenic risk at the Site, primarily due to the high levels detected in the soil.

Exposure to ground water from the Columbia aquifer accounts for most of the future risk at the Site; the Risk Assessment assumed that the future use of the Site would include using water from the Columbia aquifer as a drinking water supply source. Currently, ground water from the Columbia aquifer in the vicinity of the Site is not used as a drinking water supply source and there is no current evidence that the contamination has entered the Potomac Formation aquifer. However, ground water contamination has migrated beyond Standard Chlorine's property line as far north as Red Lion Creek. If response actions are not taken, the ground water will continue to serve as a source of

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contamination to Red Lion Creek impacting ecological receptors including plants, fish, and other animals.

F. The Record of Decision

1. Pursuant to Section 117 of CERCLA, 42 U.S.C. Section 9617, EPA published notice of its Proposed Remedial Action Plan ("Proposed Plan") for the Site on April 4, 1994 and provided the opportunity for public comment on the proposed Remedial Action ("RA") for the Site. The public comment period on the Proposed Plan ended on June 6, 1994.
2. On March 9, 1995, EPA issued a final Record of Decision ("ROD") for the Site, on which the State of Delaware concurred. The ROD describes the Remedial Action which EPA selected for the Site.
3. The ROD is appended to this Order as "Exhibit 1" and is incorporated herein by reference. The ROD is supported by an Administrative Record, prepared in accordance with Section 113(k) of CERCLA, 42 U.S.C. § 9613(k), and which contains the documents and information upon which EPA based its selection of the Remedial Action.
4. The selected remedy consists of two components: an interim action for the ground water and a final action for the soils and sediments at the Site. The interim action for the ground water addresses containment of ground water to minimize the continued release of contaminants and includes: construction of a subsurface physical barrier such as a trench or slurry wall; source removal of DNAPLs (if identified during mandated further

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investigation); treatment of ground water and resulting air emissions; and further investigation of ground water and DNAPL contamination. The final action for soils and sediments selected by EPA in the ROD is biological treatment. If based on treatability and/or pilot studies, EPA determines that biological treatment is not feasible for the Site, the contingency remedy for soils and sediments, low temperature thermal desorption ("LTTD"), identified in the ROD shall be implemented.

5. Notice of the final ROD was published in the Wilmington News Journal, in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b), on April 14, 1995.

6. The selected remedy for the SCD Site will protect human health and the environment by controlling exposure to contaminated groundwater, soils, and sediments and by reducing the migration of contaminants in the ground water and in local surface water.

IV. CONCLUSIONS OF LAW AND DETERMINATIONS

A. The SCD Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

B. "Hazardous Substances", as that term is defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), have been disposed of, deposited, stored, placed, or have otherwise come to be located on, and remain at, the Site.

C. The hazardous substances at the Site are being released or threaten to be released, as "release" is defined in Section

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101(22) of CERCLA, 42 U.S.C. § 9601(22), from the Site into the environment, and may present an imminent and substantial endangerment to the public health or welfare or the environment.

D. Respondent is a "person" within the meaning of Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

E. Respondent Standard Chlorine of Delaware, Inc. is a person who owns and operates a portion of the Site and who owned and operated a portion of the Site at the time of disposal of hazardous substances, as the terms "owner" and "operator" are defined at Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and is therefore liable pursuant to Sections 107(a)(1) and (2) of CERCLA, 42 U.S.C. §§ 9607(a)(1) and (2).

F. EPA has determined that actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response actions selected in the ROD and by achieving the Performance Standards set forth in the ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

G. EPA has determined that in order to implement the response actions selected in the ROD, the Work required by this Order must be performed.

V. DEFINITIONS

Unless otherwise expressly provided herein, terms used in this Order that are defined in CERCLA or in regulations promulgated pursuant to CERCLA shall have the meaning assigned to them in the statute or its implementing regulations. Whenever