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Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

August 12, 2003

Mr. Curt Christensen
Square D Company
1717 Centerpark Road
Lincoln, Nebraska 68512

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
CLAIM NO. 7001 1140 0000 1126 7821

Dear Mr. Christensen:

GENERAL WASTE DISCHARGE REQUIREMENTS FOR GROUNDWATER REMEDIATION AT PETROLEUM HYDROCARBON FUEL AND/OR VOLATILE ORGANIC COMPOUND IMPACTED SITES – FORMER SQUARE D FACILITY, 4335 EAST VALLEY BOULEVARD, LOS ANGELES, CALIFORNIA (SLIC FILE NO. 852 SITE ID NO. 2045M00)

We have completed our review of your application for Waste Discharge Requirements to use In-situ Reactive Zone system (IRZ) to remediate the volatile organic compounds (VOCs)-contaminated groundwater at the site.

Square D Company formerly owned and operated an electric component manufacturing facility located at 4335 East Valley Boulevard in Los Angeles from 1946 to 1987 (Figure 1). The site lies at the boundary of two groundwater basins, San Gabriel Valley Basin and the Central Los Angeles Coastal Plain Basin. The discharge point lies 118° 11'29" longitude and 34°3'49" latitude.

In 1993, groundwater and soil contamination of trichloroethene (TCE) related to the former activities of Square D Company was identified at the site. TCE was detected at 2,000,000 micrograms per kilogram (µg/kg) in the soil and 310 micrograms per liter (µg/l) in the groundwater. Further investigations conducted at the site show that TCE contamination in the soil is found in the saturated soils 20 to 30 feet below ground surface (bgs). Groundwater was encountered at 24.62 feet bgs and TCE was detected at concentrations as high as 2,800 µg/l.

On April 23, 2003, the Los Angeles Regional Water Quality Control Board approved a Remedial Action Plan to use In-situ Reactive Zone (IRZ) to remediate the contaminated groundwater. IRZ technology is based on the concept of enhancing natural processes in a groundwater system to drive the condition that is more conducive to degradation. IRZ technology uses a groundwater system with sucrose and carbohydrate source to enhance the biologically mediated reaction. A bacterial community that is capable of fermenting sugars develops in the altered bacterial environment. The anaerobic bacteria use hydrogen, an end product of the sugar fermentation, in reductive dechlorination. Reductive dechlorination transforms the VOCs into less chlorinated intermediates and finally to CO_2 and water.

The remediation plan includes nine IRZ injection wells and five groundwater monitoring wells. Well locations are shown in Figure 2. The IRZ system will initially use a 10% molasses solution and inject 110 gallons of solution into each IRZ injection well per injection event. The volume and concentration of molasses solution and the frequency of injection will be adjusted based on the field monitoring results.

Regional Board staff has reviewed the information provided and has determined that, following the installation of at least one groundwater monitoring well to be designated as W-7 in the former wood working source area (AOC-1), the proposed discharge meets the conditions specified in Order No. R4-2002-0030, "*General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel and/or Volatile Organic Compound Impacted Sites*," adopted by this Regional Board on January 24, 2002. The well(s) must be constructed and installed using the same materials and methods discussed in your Regional Board approved workplan for installation of groundwater monitoring wells dated February 27, 2002. It is a requirement of the monitoring program to have groundwater monitoring wells within the IRZ injection area that are not utilized as application wells. In the former woodworking area (AOC-1), W-5 can only be used as an application well and in the former sanding and painting area (AOC-2), W-2 can only be used as a monitoring well.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2002-0030 (Series No. 031) and Monitoring and Reporting Program No. CI-8608.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this enrollment (August 12, 2003) under Regional Board Order No. R4-2002-0030. All monitoring reports shall be sent to the Regional Board, ATTN: Information Technology Unit.

When submitting monitoring or technical reports to the Regional Board per these requirements, include a reference to No. CI-8608, which will assure that the reports are directed to the appropriate file and staff. Do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

We are sending a copy of Order No. R4-2002-0030 only to the applicant. A copy of the Order will be furnished to anyone who requests it.

If you have any additional questions, please contact Ms. Dionisia Rodriguez at (213) 620-6122.

Sincerely,

for David A. Bacharowski, AEO
Dennis A. Dickerson
Executive Officer

Enclosures:
1. Board Order No. R4-2002-0030
2. Monitoring and Reporting Program No. CI-8608
3. Standard Provisions Applicable to Waste Discharge Requirements (addressee only)

cc: See Mailing List

MAILING LIST

Mr. Robert Sams, Office of Chief Counsel, State Water Resources Control Board
Mr. Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Mr. Alan Hsu, Los Angeles Regional Water Quality Control Board
Mr. Jeffrey Friedman, Arcadis G&M, Inc.
Ms. Carol Williams, San Gabriel Basin Watermaster
Mr. Jose Reynoso, Los Angeles County Department of Health Services, Water Well Permits
Ms. Vera Melnyk-Vecchio, State Department of Health Services, Drinking Water Field Operations

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-8608
FOR
SQUARE D COMPANY
(FORMER SQUARE D FACILITY)

ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2002-0030 (Series No. 031)
SLIC FILE NO. 852

I. MONITORING AND REPORTING REQUIREMENTS

A. Square D Company (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment (August 12, 2003) under Regional Board Order No. R4-2002-0030. The first monitoring report under this program for the monitoring period July-September 2003 shall be received at the Regional Board by October 15, 2003. Subsequent monitoring reports shall be received at the Regional Board according to the following schedule as specified in the Cleanup and Abatement Order No. 2001-102:

Monitoring Period	Report Due
January – March	May 1
April – June	August 1
July – September	November 1
October – December	February 1

B. Monitoring reports shall include technical information on total quantities of injected chemicals/fluids, composition of injected chemicals/fluids, and injection points/locations. If there is no discharge or injection during any reporting period, the report shall so state. Monitoring reports must be addressed to the Regional Board, Attention: Information Technology Unit.

C. By March 1 of each year, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements.

D. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and the corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall be located at the front of the report and shall clearly list all non-compliance with discharge requirements, as well as all excursions of effluent limitations.

E. The Discharger shall comply with requirements contained in Section G. of Order No. R4-2002-0030 "*Monitoring and Reporting Requirements*" in addition to the aforementioned requirements.

II. GROUNDWATER MONITORING

The Discharger shall monitor the groundwater conditions to determine the efficacy of the carbohydrate injection and to confirm that the *In-situ* Reactive Zone (IRZ) is hydraulically contained. To monitor hydraulic containment of the injected solution, a magnesium bromide tracer will be added at a constant concentration to all solutions placed in the aquifer. Hydraulic control will also be monitored using the analysis of dissolved organic carbon (DOC) and chlorinated volatile organic compounds (VOCs) in downgradient and cross-gradient wells. DOC is the primary means to measure the presence or absence of carbohydrate solution in groundwater. Absence of significant organic carbon in the upgradient, downgradient and cross gradient wells will confirm that the injected reagent remains confined to the remediation area.

The Discharger shall monitor the quality of the groundwater to determine the degree of remediation in the three areas of concern. In the former woodworking area (AOC-1) monitoring will be performed at monitoring wells MW-9 (upgradient), W-7 (source well) and MW-7 (downgradient). In the former sanding and painting area (AOC-2), monitoring will be performed at monitoring wells W-3 (upgradient), W-2 (source well), and MW-11 and MW-12 (downgradient). VER 4 and 5, monitoring wells that are part of an existing monitoring well system at the site, will be tested in the former machine shop area (AOC-3). Monitoring will also be performed on W-1 (source well) and MW-8 (downgradient) in AOC-3.

CONSTITUENT	UNITS*	TYPE OF SAMPLE	MINIMUM FREQUENCY OF ANALYSIS
Chlorinated Volatile Organic Compounds (EPA Method 8260B)	µg/l	grab	Quarterly
Dissolved Organic Carbon (EPA Method 415.1)	mg/l	grab	Quarterly
Total dissolved solids and Total suspended solids	mg/l	grab	Quarterly
pH	pH units	grab	Quarterly
Oxidation-reduction potential	millivolts	grab	Quarterly
Groundwater Elevation	Feet, bgs	In situ	Quarterly
Dissolved Oxygen	mg/l	grab	Quarterly
Chemical Oxygen Demand	µg/l	grab	Quarterly

Major Anions (bromide, chloride, sulfate, nitrate, nitrite, phosphate, carbonate and sulfide)	µg/l	grab	Quarterly
Major Cations (calcium, magnesium, potassium and sodium)	µg/l	grab	Quarterly
Methane, Ethene, Ethane, Carbon Dioxide	µg/l	grab	Quarterly

*µg/l – micrograms per liter
mg/l – milligrams per liter
bgs – below ground surface

The Discharger shall monitor the injection wells, IRZ-1 to IRZ 11, according to the monitoring schedule in the attached Table 5.

In the event of additional groundwater monitoring, the Discharger must submit the results of the monitoring according to the reporting schedule specified in section I.A.

All groundwater monitoring reports must include, at minimum, the following:

a. Well identification, date and time of sampling;
b. Sampler identification, and laboratory identification;
c. Quarterly observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

III. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Regional Board Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

IV. REMEDIATION PROGRESS REPORT

As specified in the amended Cleanup and Abatement Order (CAO) No. 2001-102 dated October 22, 2002, the Discharger shall submit quarterly remediation progress reports according to the following schedule:

January – March	May 1
April – June	August 1
July – September	November 1
October – December	February 1

V. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____day of _____

at _____

_____(Signature)

_____(Title)"

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger, will be treated as confidential.

Ordered by: for David A. Boyd, AEO Date: August 12, 2003
Dennis A. Dickerson
Executive Officer

Table 5. Carbohydrate Injection and Monitoring Schedule
Former Square D Facility, 4335 Valley Boulevard, Los Angeles, California

			Weeks																																															
Parameters	EPA Analytical Method	Baseline	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
[illegible]																																																		
IRZ-2 through IRZ-11 (except IRZ-5)			M	M	M	M		M		W		W		W				W				W				W				W				W				W				W				W				W
[illegible]																																																		
MW-7		FLP												FL												FLP												FL												FLP
MW-9		FLP												FL												FLP												FL												FLP
MW-11		FLP												FL												FLP												FL												FLP
MW-12		FLP												FL												FLP												FL												FLP
IRZ-1		FLP	F	F	F	F		F		F		F		FLP				F				F				FLP				F				F				FLP				F				F				FLP
IRZ 2		FLP	F	FL	F	FL		F		FL		FL		FLP				FL				FL				FLP				FL				FL				FLP				FL				FL				FLP
IRZ-3		FLP	F	F	F	F		F		F		F		F				F				F				FLP				F				F				F				F				F				FLP
IRZ 4		FLP	F	F	F	F		F		F		F		F				F				F				F				F				F				F				F				F				F
IRZ-5		FLP	F	F	F	F		F		F		F		FLP				F				F				FLP				F				F				FLP				F				F				FLP
IRZ 6		FLP	F	FL	F	FL		F		FL		FL		FLP				FL				FL				FLP				FL				FL				FLP				FL				FL				FLP
IRZ 7		FLP	F	FL	F	FL		F		FL		FL		FL				FL				FL				FL				FL				FL				FL				FL				FL				FL
IRZ 8		FLP	F	F	F	F		F		F		F		F				F				F				F				F				F				F				F				F				F
IRZ 9		FLP	F	F	F	F		F		F		F		F				F				F				F				F				F				F				F				F				F
IRZ-10		FLP	F	F	F	F		F		F		F		FL				F				F				FL				F				F				FL				F				F				FL
IRZ 11		FLP	F	F	F	F		F		F		F		FL				F				F				FL				F				F				FL				F				F				FL
VER-1		FLP	F	F	F	F		F		F		F		FL				F				F				FL				F				F				FL				F				F				FL
VER-2		FLP	F	F	F	F		F		F		F		FL				F				F				FL				F				F				FL				F				F				FL
W-1		FLP	F	F	F	F		F		F		F		FL				F				F				FL				F				F				FL				F				F				FL
VER-4		FLP	F	FL	F	FL		F		FL		FL		FL				FL				FL				FL				FL				FL				FL				FL				FL				FL
VER 5		FLP	F	FL	F	FL		F		FL		FL		FL				FL				FL				FL				FL				FL				FL				FL				FL				FL
MW-8		FLP	F	FL	F	FL		F		FL		FL		FL				FL				FL				FL				FL				FL				FL				FL				FL				FL
[illegible]																																																		
Dissolved oxygen	–[1]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
Oxidation reduction potential (ORP)	–[1]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
pH	–[1]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
Temperature	–[1]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
Specific conductance	–[1]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
Iron, ferrous	–[2]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
Hydrogen sulfide	–[2]	x	x	x	x	x				x				x				x				x				x				x				x				x				x				x				x
[illegible]																																																		
Dissolved organic carbon (DOC)	415.1	x		x		x				x		x		x				x				x				x				x				x				x				x				x				x
Volatile Organic Compounds	8260	x												x												x												x												x
Sulfate	300.0	x												x												x												x												x
Nitrate	300.0	x												x												x												x												x
Bromide	300.0	x												x												x												x												x
[illegible]																																																		
Carbon dioxide	Microseeps[3]	x												x												x												x												x
Nitrogen	Microseeps[3]	x												x												x												x												x
Methane	Microseeps[3]	x												x												x												x												x
Ethane	Microseeps[3]	x												x												x												x												x
Ethene	Microseeps[3]	x												x												x												x												x

(1) Field measurements using YSI 6000 Water Quality Transmitter Unit.
(2) Field test kit (Hach)
(3) Method developed by Microseeps, Inc.
(4) IRZ groundwater data collection will be coordinated with quarterly groundwater monitoring events such that data duplication does not occur.
(5) This table was previously presented in the ARCADIS Geraghty & Miller, Remedial Action Implementation Work Plan, dated June 14, 2000 and has subsequently been revised.

M = Molasses addition
W = Cheese whey addition
EPA = Environmental Protection Agency
F = Field Monitoring
L = Laboratory Analysis
P = Permanent Gases