



Linda S. Adams
Acting Agency
Secretary

California Regional Water Quality Control Board

Los Angeles Region



Arnold Schwarzenegger
Governor

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.waterboards.ca.gov/losangeles>

March 2, 2010

Mr. Louis L. Ainsworth
Pentair, Inc.
5500 Wayzata Blvd., Suite 800
Golden Valley, MN 55416

GENERAL WASTE DISCHARGE REQUIREMENTS (ORDER NO. R4-2007-0019, SERIES NO. 120, CI NO. 9582) HYDROGEN PEROXIDE AND OZONE INJECTION FOR REMEDIATION OF VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER - FORMER ESSEF MANUFACTURING FACILITY MAIN PARCEL AT 8825 BEACH STREET, LOS ANGELES (SITE CLEANUP PROGRAM NO. 0866C, SITE ID NO. 2047N00)

Dear Mr. Ainsworth:

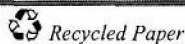
California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff have completed the review of your application for coverage under the General Waste Discharge Requirements (WDR) to inject ozone and hydrogen peroxide into site groundwater through the sixteen injection wells to remediate groundwater contamination with volatile organic compounds (VOCs).

This former manufacturing site is located at 8825 Beach Street in Los Angeles. (Figure 1) Based on previously performed multi-staged investigation, it was found that soil and groundwater have been impacted with VOCs. The discharger has remediated contaminated groundwater with an ex-situ advanced oxidation system (the HiPox System) and discharged groundwater to a sanitary sewer until 2008. In 2009, the discharger proposed to modify the current remediation system to inject hydrogen peroxide and ozone into the aquifer to expedite the remediation process and treat residual groundwater contamination at the site in an in-situ manner. Based on the third quarter 2009 groundwater monitoring data, 1,1-dichloroethane was found in nine of the ten monitoring wells at concentrations ranging from 1.83 micrograms per liter ($\mu\text{g/L}$) in Well MW-5 to 3,490 $\mu\text{g/L}$ in Well MW-1, 1,1-dichloroethene from 1.58 $\mu\text{g/L}$ in Well MW-7 to 1,620 $\mu\text{g/L}$ in Well MW-1, and 1,4-dioxane from 46.8 $\mu\text{g/L}$ in Well MW-1 to 1,010 $\mu\text{g/L}$ in Well E-1. We have received the May 28, 2009, *Revised Remedial Action Plan (RAP)*, prepared by ENVIRON on your behalf. The RAP proposed installation of sixteen injection wells to approximately 65 feet below grade surface for injection ozone and hydrogen peroxide. We approved the RAP in our September 3, 2009 letter.

We have determined that the proposed discharge meets the conditions specified in Regional Board Order No R4-2007-0019, "*Revised General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel, Volatile Organic Compound and/or Hexavalent Chromium Impacted Sites,*" adopted by this Regional Board on March 1, 2007.

Enclosed are the Waste Discharge Requirements, consisting of Regional Board Order No. R4-2007-0019 (Series No. 120), Monitoring and Reporting Program No. CI-9582 and Standard Provisions.

California Environmental Protection Agency



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

Mr. Louis Ainsworth
Pentair, Inc.

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March 2, 2010

The WDRs issued shall not be terminated until Regional Board staff determines the WDRs are no longer needed for the site.

The "Monitoring and Reporting Program" requires you to implement the monitoring program on the effective date of this enrollment under Regional Board Order No. R4-2007-0019. 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, please include a reference to "Compliance File No. CI-9582", which will assure that the reports are directed to the appropriate file and staff. Also, please 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. R4-2007-0019 only to the applicant. A copy of the Order will be furnished upon request or downloaded at: http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/general_orders/r4-2007-0019/r4-2007-0019.pdf.

If you have any questions, please contact Dr. Kwang-il Lee at (213) 576-6734 or Paul Cho at (213) 576-6721.

Sincerely,



Tracy J. Egoscue
Executive Officer

Attachments:

- Figure 1, Site and Receptor Map
- Figure 2, Site Injection Wells

Enclosures:

- 1) General Waste Discharge Requirements, Order No. R4-2007-0019 and Standard Provisions
- 2) Monitoring and Reporting Program, CI No. 9582
- 3) Fact Sheet

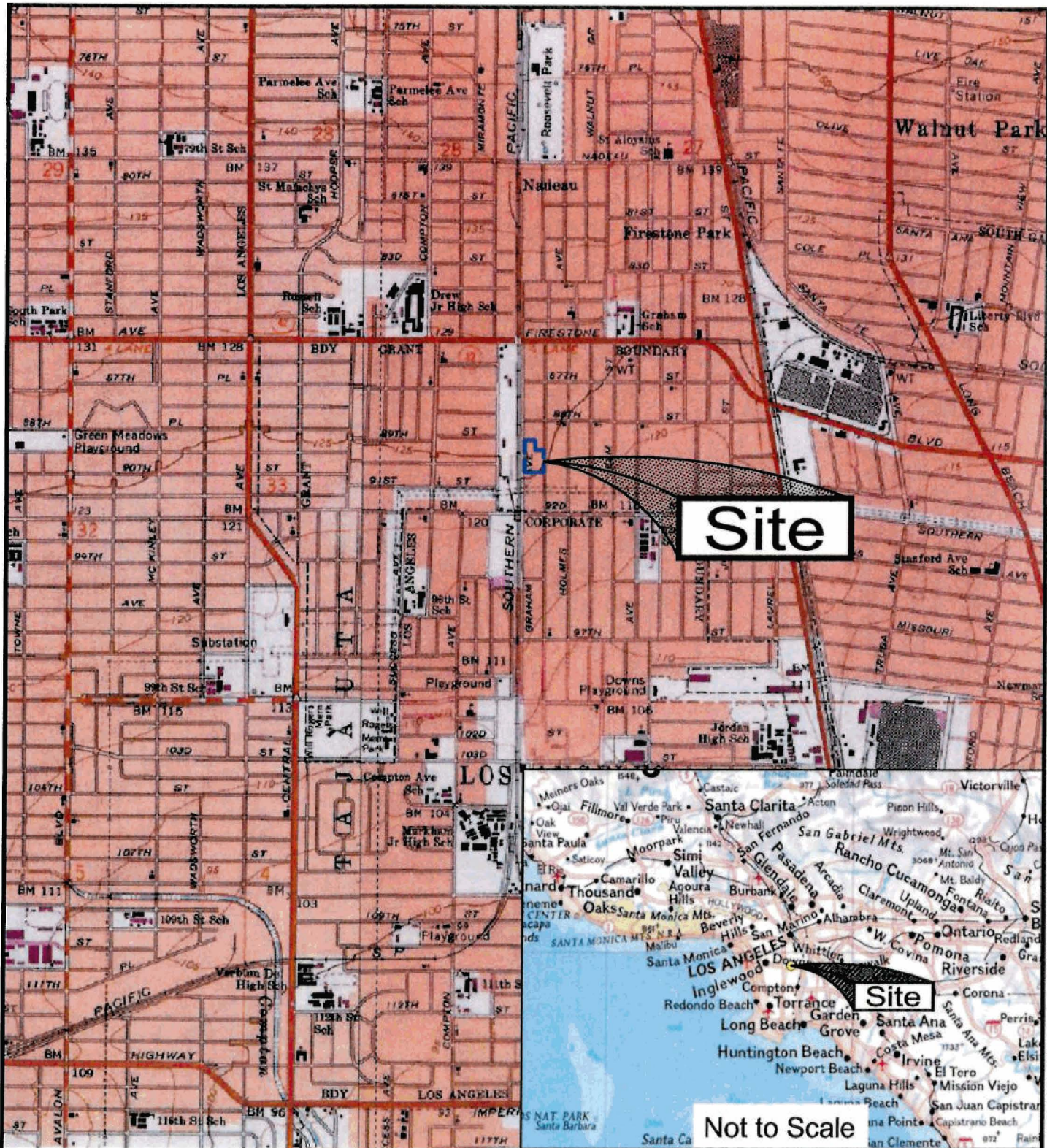
cc: Mr. Farid Achour, EMVIRON (fachour@environcorp.com)

California Environmental Protection Agency



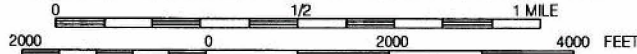
Recycled Paper

Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.



Map Created with TOPO! (tm) (c)2001 National Geographic Holdings (www.topo.com)

SOURCE:
 U.S.G.S. 7.5 minute series (topographic)
 South Gate, CA Quadrangle, version 1978, current as of 1981
 Inglewood, CA Quadrangle, version 1978, current as of 1981



CONTOUR INTERVAL 5 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929
 SCALE 1:24000

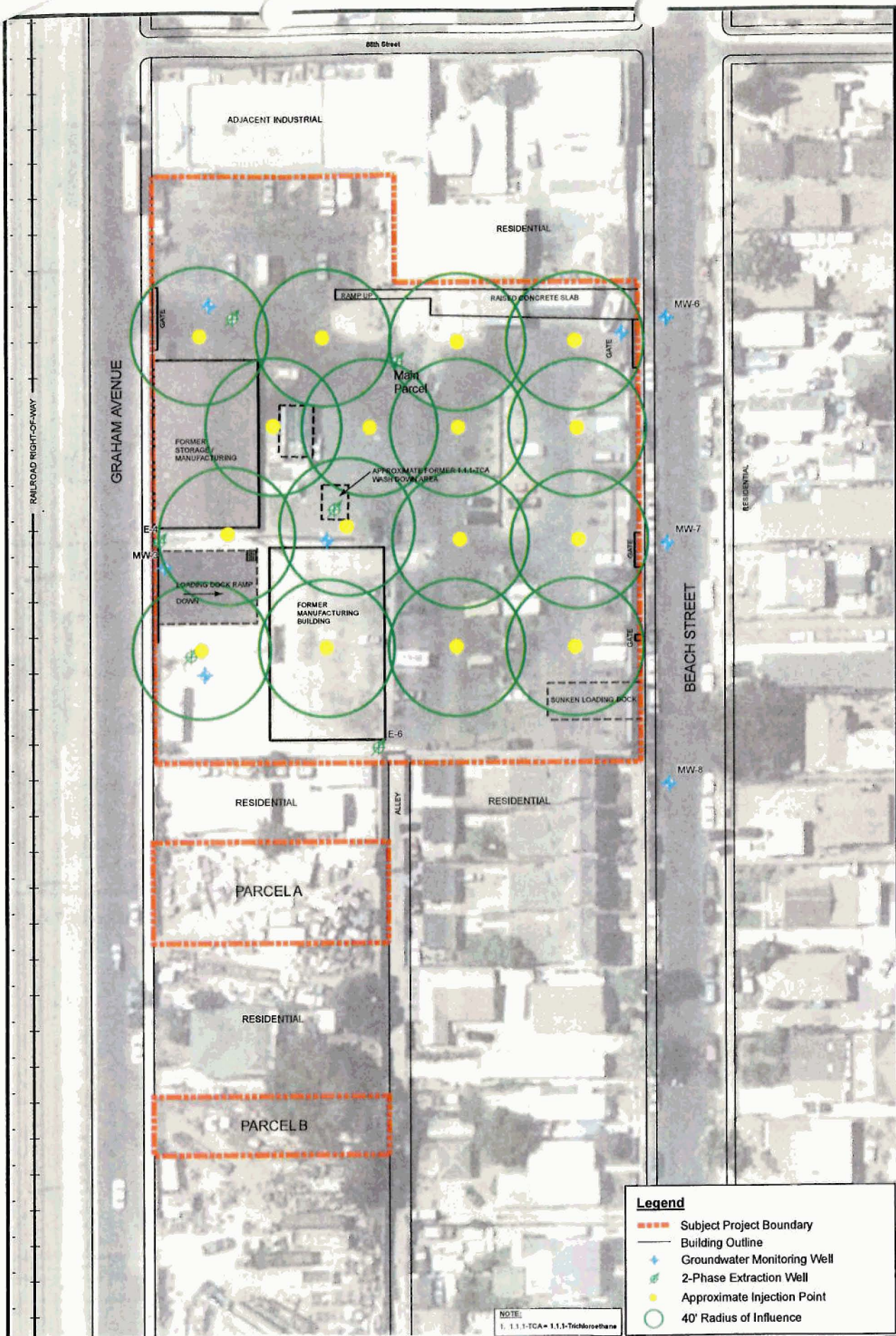


Site Vicinity Map

Former Essef / American Concrete Products Property
 8825 Beach Street, 8906-8908 and 9000 Graham Avenue, Los Angeles, California

Figure
1

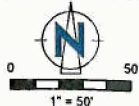
File: Z:\01_P\Projects\Pentam\04_CAD\Figures\05-11174\GW_Monitoring\03-2009\11174GF01_SVM_03-09.dwg [Figure_1]



- Legend**
- - - Subject Project Boundary
 - Building Outline
 - ◆ Groundwater Monitoring Well
 - ◆ 2-Phase Extraction Well
 - Approximate Injection Point
 - 40' Radius of Influence

NOTE:
1. 1, 1, 1-TCA = 1, 1, 1-Trichloroethane

ENVIRON



DRAWN BY
SSS
DATE:
05/12/09
APPROVED
10/28/09
CONTRACT NUMBER
04-21721A

Proposed Hydrogen Peroxide and Ozone Injection Points
Former Essel / American Concrete Products Property
8825 Beach Street 8906-8908 and 9000 Graham Ave., Los Angeles, California



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

MONITORING AND REPORTING PROGRAM NO. CI-9582

FOR

FORMER ESSEF MANUFACTURING FACILITY MAIN PARCEL
8825 BEACH STREET, LOS ANGELES

(OZONE AND HYDROGEN PEROXIDE INJECTION FOR GROUNDWATER CLEANUP)
(ORDER NO. R4-2007-0019, SERIES NO. 120)

I. REPORTING REQUIREMENTS

- A. Pentair, Inc. (hereinafter Discharger) shall implement this monitoring program on the effective date of Regional Board Order No. R4-2007-0019. The first monitoring report under this program, for January - June 2010, shall be received at the Regional Board by August 15, 2010. Subsequent monitoring reports shall be received at the Regional Board according to the following schedule:

<u>Monitoring Period</u>	<u>Report Due</u>
January – June	August 15
July – December	February 15

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.

- B. The Discharger shall include an annual summary to the second half semi-annual monitoring report which is due by February 15 each year. The summary shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall explain 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 (WDRs).

- C. Laboratory analyses—all chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services Environmental Laboratory Accreditation Program (ELAP). A copy of the laboratory certification shall be provided each time a new and/or renewal certification is obtained from ELAP.
- D. The method limits (MLs) employed for effluent analyses shall be lower than the permit limits established for a given parameter, unless the Discharger can demonstrate that a particular ML is not attainable and obtains approval for a higher ML from the Regional Board Executive Officer (Executive Officer). The Discharger shall submit a list of the analytical methods employed for each test and the associated laboratory quality assurance/quality control (QA/QC) procedures upon request by the Regional Board.
- E. Groundwater samples must be analyzed within allowable holding time limits as specified in 40 CFR Part 136. All QA/QC samples must be run on the same dates when samples were actually analyzed. The Discharger shall make available for inspection and/or submit the QA/QC documentation upon request by Regional Board staff.
- F. Each monitoring report must affirm in writing that “All analyses were conducted at a laboratory certified for such analyses by the California Department of Health Services, and in accordance with current United States Environmental Protection Agency (USEPA) guideline procedures or as specified in this Monitoring Program.” Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the report.
- G. 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 WDRs. This section shall be located at the front of the report and shall clearly list all non-compliance with WDRs, as well as all excursions of effluent limitations.
- H. The Discharger shall maintain all sampling and analytical results: date, exact place, and time of sampling; dates analyses were performed; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- I. If the Discharger performs analyses on any groundwater samples more frequently than required by this Order using approved analytical methods, the results of those analyses shall be included in the report.

- J. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with the requirements and, where applicable, shall include results of receiving water observations.
- K. The Discharger should not implement any changes to the Monitoring and Reporting Program prior to receiving Executive Officer's written approval.

II. OZONE AND HYDROGEN PEROXIDE INJECTION MONITORING REQUIREMENTS

The Semi-Annually reports shall contain the following information regarding injection activities:

1. Location map showing injection points used for the ozone and hydrogen peroxide solution.
2. Written and tabular summary defining the quantity of ozone and hydrogen peroxide injected per month to the groundwater and a summary describing the days on which the injection system has been operating.
3. Monthly visual inspection at each injection well shall be conducted to evaluate the well casing integrity for a period of three months after each injection. The semi-annual report shall include a summary of the visual inspection.

III. GROUNDWATER MONITORING PROGRAM

The Discharger shall conduct groundwater monitoring at the site. Groundwater samples shall be collected from seven down-gradient monitoring wells (MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, and E-6), one source area monitoring well (MW-1), and one up-gradient monitoring well (MW-4) on a semi-annual basis to monitor the effectiveness of the in-situ groundwater remediation. Groundwater shall be monitored for the duration of the remediation in accordance with the following discharge monitoring program:

CONSTITUENT	UNITS	TYPE OF SAMPLE	MINIMUM FREQUENCY OF ANALYSIS
All chemical compounds listed in the US EPA Test Method 8260B	µg/L	Grab	• Semi-Annually ¹
Ethanol Formaldehyde Acetone	µg/L	Grab	• Semi-Annually ¹
Total dissolved solids, Arsenic, Boron, Chloride, Bromide, Sulfate, Lead, Nickel, Cadmium, Manganese	mg/L	Grab	• Semi-Annually ¹

Oxidation-reduction potential	milivolts		• Semi-Annually ¹
Dissolved Oxygen	µg/L	Grab	• Semi-Annually ¹
Dissolved ferrous iron	µg/L	Grab	• Semi-Annually ¹
Total Chromium and chromium six ²	µg/L	Grab	• Semi-Annually ¹
pH	pH units	Grab	• Semi-Annually ¹
Temperature	⁰ F/ ⁰ C	Grab	• Semi-Annually ¹
Groundwater Elevation	Feet, mean sea level and below ground surface	In situ	• Semi-Annually ¹

¹ One week before injection and Semi-Annually thereafter.

² The Discharger is required to monitor for total chromium and chromium six in the baseline, second and fourth Semi-Annually sampling. If detected at any of these sampling events, the total chromium and chromium six must be monitored Semi-Annually thereafter.

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

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

IV. MONITORING FREQUENCIES

Monitoring frequencies may be adjusted to a less frequent basis or parameters dropped by the Executive Officer if the Discharger makes a request and the Executive Officer determines that the request is adequately supported by statistical trends of monitoring data submitted.

V. CERTIFICATION STATEMENT

Each report shall contain the following 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)"

VI. PUBLIC DOCUMENTS

These records and reports are public documents and shall be made available for inspection during normal business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region.

Ordered by:



Tracy J. Egoscue
Executive Officer

Date: March 2, 2010

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
320 West 4th Street, Suite 200, Los Angeles, California 90013

FACT SHEET
WASTE DISCHARGE REQUIREMENTS
FOR
FORMER ESSEF MANUFACTURING FACILITY MAIN PARCEL

OZONE AND HYDROGEN PEROXIDE INJECTION

ORDER NO. R4-2007-0019 (SERIES NO. 120)
CI-9582, FILE NO. 10-019

FACILITY ADDRESS

8825 Beach Street
Los Angeles, CA 90002

FACILITY MAILING ADDRESS

Mr. Louis Ainsworth
Pentair, Inc.
5500 Wayzata Blvd., Suite 800
Golden Valley, MN 55416

PROJECT DESCRIPTION

This former manufacturing site is located at 8825 Beach Street in Los Angeles. Based on previously performed multi-staged investigation, it was found that soil and groundwater have been impacted with volatile organic compounds (VOCs), primarily 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), and 1,4-dioxane. A pilot test study for soil vapor extraction was completed in 2001. In our letter dated August 5, 2002, Regional Board staff approved the proposed remedial action plan. Installation of the soil vapor remediation system commenced in February 2004. Due to discovery of 1,4-dioxane in the extracted groundwater samples, the extracted groundwater was treated with an ex-situ advanced oxidation system (the HiPox system: Ozone + Hydrogen Peroxide) and then discharged to a sanitary sewer from 2005 to 2008.

In 2009, the discharger proposed to modify the current remediation system to inject hydrogen peroxide and ozone into the aquifer to expedite the remediation process and treat residual groundwater contamination at the site in an in-situ manner. We have received the May 28, 2009, *Revised Remedial Action Plan* (RAP), prepared by ENVIRON. We approved the RAP in our September 3, 2009 letter.

The Discharger proposes to inject ozone and hydrogen peroxide solution to lower the concentration of VOCs in groundwater at the site. A total of sixteen injection wells to approximately 65 feet below ground surface (bgs) will be installed for injecting ozone and hydrogen peroxide. The soil vapor extraction pilot test performed in 2001 indicated a radius of influence (ROI) of at least 60 feet. The ROI of 40 feet was considered for designing the proposed injection network.

VOLUME AND DESCRIPTION OF INJECTION

Mobile ozone sparge units with an ozone production capacity of 5 lbs/day (approximately 6 percent ozone gas concentration by weight) will be used based on literature review and vendor discussions. Ozone will be injected into the subsurface at pressures up to 20 to 25 pounds per square inch and at flow rates of 2 to 8 cubic feet per minute. A 17 percent hydrogen peroxide aqueous solution will be delivered to the subsurface by a feed pump. Hydrogen peroxide injection will begin with at rate of 1.5 gallons/day for all 16 injection

points, and then focused around the wash down area which is the presumed historical contamination source area. A field Programmable Logic Controller with an interface panel viewer will be used to control the manifolds to enable and disable oxidation points, switch between ozone and hydrogen peroxide injection, set lag time between sparge cycles, and set of sparge duration.

Each injection point will include a deep ozone sparge point and a shallow hydrogen peroxide injection point. The sparge points will be constructed using 1.5-inch-diameter well casing. Ozone will be injected through an 18-inch-long porous poly-vinylidene fluoride casing at approximately 63 feet, and hydrogen peroxide will be injected through a 1-foot-long, 1.5-inch-diameter Schedule 80 and 0.01-inch slotted polyvinyl chloride screen at approximately 43 feet. The ozone sparge depth of 63 feet was selected to inject into the groundwater near the base of the VOCs-impacted, saturated soils. The hydrogen peroxide injection sparge depth was selected to inject at the top of the saturated zone and smear zone.

Since ozone is an unstable compound with a short half-life when it is produced, it will decay rapidly in water. The groundwater temperatures recorded at the site confer a half-life of ozone of 20 to 30 minutes in groundwater. Hydrogen peroxide decomposes exothermically into water and oxygen gas spontaneously that are innocuous chemical substances.