



P.O. BOX 248, 1186 LOWER RIVER ROAD, NW,  
CHARLESTON, TN. 37310-0248

VIA: OVERNIGHT EXPRESS

September 21, 2005

Mr. David Athey, P.E.  
Water Resources Control Engineer  
Central Coast Regional Water Quality Control Board  
895 Aerovista Place, Suite 101  
San Luis Obispo, CA 93401

**Subject: Revised Alternative Water Supply Implementation Work Plan  
Olin/Standard Fusee Site  
425 Tennant Avenue  
Morgan Hill, California**

Dear Mr. Athey:

As indicated in the Alternative Water Supply Implementation Work Plan (Oct 29, 2004), enclosed is Olin Corporation's revised Alternative Water Supply Implementation Work Plan. The Work Plan was revised to incorporate the State Water Resources Control Board Order WQ 2005-0007.

Sincerely,  
OLIN CORPORATION

A handwritten signature in blue ink, appearing to read 'Richard W. McClure', with a long, sweeping underline.

Richard W. McClure, P.G., REM  
Environmental Remediation Group

/ ATTACHMENTS

cc: Mr. Eric Gobler, RWQCB – Central Coast Region  
Ms. Sylvia Hamilton, CAG  
Mr. Thomas Mohr, SCWVD  
Mr. Curt Richards, Olin  
Mr. Donald Smallbeck, MACTEC  
Ms. Beverly Vessa, Olin/Standard Fusee Repository

**Revised Alternative Water Supply  
Implementation Work Plan  
Olin/Standard Fusee Site  
425 Tennant Avenue  
Morgan Hill, California**

Prepared for



MACTEC Project No. 6300050002 03

*Margaret E. Tanner by eak with permission*

Margaret E. Tanner  
Senior Engineer

*D-R-S-ALK*

Donald R. Smallbeck  
Senior Principal Environmental Scientist

September 21, 2005



MACTEC Engineering and Consulting, Inc.  
5341 Old Redwood Highway, Suite 300  
Petaluma, CA 94954 - (707) 793-3800

Revised Alternative Water Supply Implementation Work Plan  
Olin/Standard Fusee Site  
425 Tennant Avenue  
Morgan Hill, California

MACTEC Project No. 6300050002 03

This document was prepared by MACTEC Engineering and Consulting, Inc. (MACTEC) at the direction of the Olin Corporation (Olin) for the sole use of Olin, the only intended beneficiaries of this work. No other party should rely on the information contained herein without the prior written consent of the Olin and MACTEC. This report and the interpretations, conclusions, and recommendations contained within are based in part on information presented in other documents that are cited in the text and listed in the references. Therefore, this report is subject to the limitations and qualifications presented in the referenced documents.

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## 1.0 INTRODUCTION

This Revised Alternative Water Supply Implementation Work Plan (Revised Work Plan) is prepared in response to the California Regional Water Quality Control Board's (RWQCB) request for a revised work plan that reflects modifications to Cleanup or Abatement Order R4-2004-0101 by the State Water Resources Control Board (State Water Board) in Order No. WQ 2005-0007 dated May 19, 2005 (amended CAO). The amended CAO establishes the perchlorate level at which Olin is required to supply alternative water to affected well owners. The perchlorate level is based on the Public Health Goal (PHG), which was established by the Office of Environmental Health Hazard Assessment (OEHHA) at 6 parts per billion (ppb) on March 12, 2004.

Currently, Olin supplies bottled drinking water in conformance with the amended CAO. At the request of the RWQCB, Olin previously conducted an evaluation of potential alternatives for potable water to use as a planning tool. The results of the evaluation were presented in the Alternative Water Supply Evaluation (AWSE) Report submitted to the RWQCB on April 16, 2004 (*MACTEC, 2004*). As required by the amended CAO, this Revised Work Plan focuses on wells with most recent perchlorate detections above 6.1 ppb to 9.9 ppb. Amended CAO ordering paragraph 5 addressed wells with perchlorate concentrations at 10.0 ppb and above. Figure 1 shows the location of the Site and wells currently identified with perchlorate detections greater than 6 ppb.

Practicable alternatives were identified and evaluated in the AWSE Report. Alternatives included the application of treatment systems for the removal of perchlorate from drinking water as well as alternatives that do not involve water treatment. Based on the evaluation, the most practicable treatment alternative for wells with perchlorate detections at the RWQCB-specified concentration range of 6.1 ppb to 9.9 ppb is wellhead treatment.

The objective of this Revised Work Plan is to describe the steps necessary to implement wellhead treatment for users served by wells with perchlorate detections at concentrations between the amended CAO-specified levels of 6.1 and 9.9 ppb. The Revised Work Plan includes a description of the tasks and estimated implementation timetable.

## 2.0 BACKGROUND

The following includes a summary of information from the AWSE as well as supplemental data to support this Revised Work Plan.

### **Well Information**

The well information used in the AWSE and this Revised Work Plan is based on the results of various sampling programs conducted within the Santa Clara Valley area and on information obtained from the Santa Clara Valley Water District (SCVWD). The records compiled by the SCVWD are based on historical construction logs, metering, field observations, and transmittals from well owners and include well locations, well usage, well construction details, and average annual production rates. The record information for each well needs to be verified and general well production data and specific water demand information collected for implementation of the water supply alternative.

### **Well Use**

The majority (about 75%) of wells included within this work plan are domestic wells predominantly used for single-family homes. There are approximately 15 wells that are used for multi-family dwellings, groups of homes, residential subdivisions, and small communities that constitute shared, small or non-community well systems. The Santa Clara County Department of Environmental Health (SCCDEH) and the California Department of Health Services (DHS) are responsible for different types of water systems based on the number of connections. The remainder of the wells are industrial and agricultural water supply wells. The industrial and agricultural wells are typically much larger non-domestic water producers, and may have a potable secondary use comparable to typical domestic production rates. For agricultural and industrial supply wells, alternative water supply is being considered for the portion of flow from these wells that is used as potable water supply.

### **Identification of Wells Based on Perchlorate Concentrations**

The AWSE was initially conducted on wells with one or more detected perchlorate concentrations greater than the Department of Health Services (DHS) drinking water notification level (NL) of 6 ppb. This Revised Work Plan addresses wells with most recent perchlorate detections within the amended CAO-specified range of 6.1 ppb to 9.9 ppb. The tasks within this work plan will be focused first on those wells with most recent perchlorate concentrations above 6.1 ppb. The approximate numbers and types of affected wells have been updated and are summarized below.

**Number of Wells with Perchlorate Detections by Usage and Perchlorate Range**

<b>Perchlorate Concentration (ppb)<sup>1</sup></b>	<b>Total Wells</b>	<b>Domestic Wells</b>	<b>Agricultural Wells</b>	<b>Municipal/ Industrial Wells</b>	<b>Well Use Not Designated</b>
6.1 – 9.9	51	36	8	6	1

<sup>1</sup> Wells are identified within a specific range based on their most recent perchlorate detection concentration as of Second Quarter 2005. The number of wells identified within each concentration range is subject to change based on the results of ongoing and future monitoring.

Figure 1 shows the distribution of wells in the 6.1 to 9.9 ppb perchlorate concentration range.

**Water Supply Alternative**

Water supply alternatives were developed and evaluated in the AWSE. Based on the AWSE evaluation, the most appropriate alternative for wells with perchlorate detections at the amended CAO-specified concentration range of 6.1 ppb to 9.9 ppb is wellhead treatment. This alternative is appropriate for domestic wells or the potable use component of agricultural/industrial wells.

The AWSE focused on the use of ion exchange systems that have been successfully used for treatment of perchlorate and have been accepted as a treatment alternative for potable water supply by permitting agencies. These treatment systems are typically placed at the wellhead or placed in line for the potable distribution component the agricultural or industrial wells. Scaleable ion exchange treatment systems are based on the following water well maximum discharge capacity subclasses:

- 0-7 gallons per minute (gpm),
- 0-15 gpm,
- 0-30 gpm,
- >60 gpm.

The number and size of vessels containing perchlorate removal resin for each system is based on the quantity of water used and the instantaneous discharge rate from the wellhead. Water production information obtained from wells that require a water supply alternative is critical to the Revised Work Plan because ion exchange treatment systems are scaled based on accurate measurements of both the

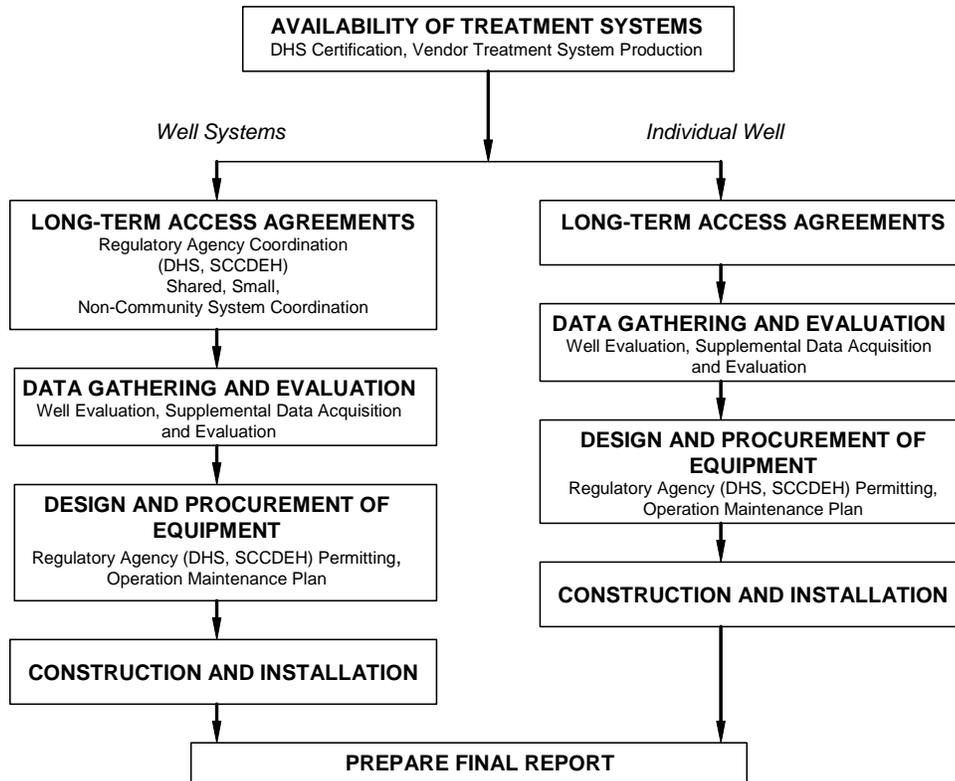
individual well's peak flow and the typical daily production. The available monthly and annual production data obtained from the SCVWD is insufficient for wellhead treatment design, as it does not include information related to the individual well construction, specifically the well's peak flow volumes. Additionally, for many of the private domestic wells, the average annual production information is self reported estimates and are not based on metered water use nor does this information provide the critical peak flow information. As a result, unless current pump production curves and metered information are available, pump curve tests and measurements will be required at each well to properly select one of the treatment system subclasses and to scale the system.

### 3.0 APPROACH

This Revised Work Plan encompasses a multi-faceted approach for well evaluation and construction work tasks to implement wellhead treatment for wells with the RWQCB-specified perchlorate concentrations ranging from 6.1 to 9.9 ppb located south of the Olin/Standard Fusee Site. The decision-making processes and methodology components presented in this Revised Work Plan are in general accordance with guidance from the U.S. EPA (*EPA, 1988*) for providing alternate water supplies. As described above, in conformance with the amended CAO wellhead treatment has been identified in this Revised Work Plan to remove perchlorate from potable water wells with perchlorate concentrations in the RWQCB-specified 6.1 to 9.9 ppb range

The work will proceed on a well-by-well basis in five steps: 1) availability of treatment systems; 2) long-term access agreements; 3) data gathering and evaluation; 4) equipment design and procurement; and 5) construction/installation. The flow chart below summarizes the approach.

**FLOW CHART  
ALTERNATIVE WATER SUPPLY IMPLEMENTATION WORK PLAN**



The approach is divided into the following steps, each of which is described below.

**Step 1: Availability of Treatment Systems**

DHS is currently evaluating an approval process for domestic ion exchange treatment systems for potable use at the scales previously described in Section 2 of this work plan. Olin has secured contract agreements with treatment system vendors and installed ion exchange treatment systems on wells with most recent perchlorate detections at or above 10 ppb, pursuant to the amended CAO paragraph #5.

Following installation of the treatment system on wells with perchlorate detections at or above 10 ppb, Olin will move forward with steps to implement wellhead treatment on water wells with perchlorate concentrations in the 6.1 to 9.9 ppb range. In staging the tasks within this work plan, construction, and

implementation of treatment systems will be first focused on the individual wells that are identified with perchlorate concentrations at or above the following thresholds: 8 ppb, 7 ppb and 6 ppb, respectively.

### **Step 2: Long-Term Access Agreements**

Agreements for property and well system access will be secured from each well owner. These agreements will depend on a number of issues related to ownership, access and quality assurance/quality control for system installation and operation. Actual execution of the agreement by the property owner(s) is beyond Olin's ability to control and any delays or refusals could impact implementation of individual ion exchange units.

It is anticipated that additional coordination will be necessary to obtain agreements for those wells that are used or owned by multiple families, residential subdivisions, small communities, and water districts. The SCCDEH or DHS contacts responsible for the water systems will be notified and updated, where required. As a result of the additional coordination, well systems serving multiple facilities will proceed along a separate path for planning and scheduling purposes.

### **Step 3: Data Gathering and Evaluation**

Well data will be assembled on a well-by-well basis to facilitate evaluation of the reliability and quality of the existing data, identify and address data gaps, and assess if the objective of the project as outlined in the approach can be met for each well. This will be accomplished through an access agreement (Step 2) with each well owner that will enable well-by-well evaluations. If the results of the initial evaluation tasks suggest that additional implementation tasks are necessary, Olin will conduct appropriate implementation tasks for completion.

#### **Well Evaluation**

Data from each well requiring a water supply alternative will be collected and summarized in an appropriate format (graphical, tabular, or matrix formats). These data will be reviewed and evaluated to assess the reliability and quality of the data, identify data gaps, and to assess if the project objective can be met. Each well will be canvassed to identify and/or confirm the following information:

- Well ownership and location,
- Well construction, distribution infrastructure including schematic pipe layout, pipe conditions, water storage availability,
- Daily, and/or peak demand requirements, well production, and water usage,

- Water quality,
- Legal or institutional constraints which might affect implementation of wellhead treatment,
- A description of proposed location for wellhead treatment,
- A description of all property easements, and
- Impediments and/or difficulties that might be encountered during implementation of either alternative.

Inaccessible wells and data gaps will be identified. Following identification of data gaps, the relative importance of the needed data will be evaluated to assess the necessity of additional data collection to support the decision making process. As data gaps are identified, additional investigation and evaluation may be required as discussed below in the supplemental data acquisition task.

#### **Supplemental Data Acquisition**

Based on the identified data gaps, supplemental data acquisition, including pump curve testing, may be required to evaluate well conditions and to identify, size, and/or design alternative treatment systems on a *well-by-well* basis.

Pump curve tests will be performed on wells that do not have available current pump production curves. The pump curve tests will typically consist of wellhead pumping at three pressure step-intervals and flow rate measurements. The water from each pump test will be collected and discharged back into the bladder tanks of each individual well. If accurate production data is not available for water use from the well, meters will be installed and readings performed to identify typical usage.

#### **Supplemental Data Evaluation**

Supplemental data collected (such as pump curves) will be evaluated to identify treatment system requirements (sizes and specifications) and personnel/subcontractor requirements. Ownership, water sharing, and property management issues as well as the condition of the existing well system will be evaluated to characterize operations, monitoring and maintenance (OMM) and agency reporting requirements.

#### **Step 4: Design and Procurement of Equipment**

Wellhead treatment systems will be specified to meet the specific maximum discharge, water-supply, and perchlorate removal requirements for potable water on each individual well. Based on the well evaluation, well system piping specifications will be developed to connect the treatment system to the

wellhead and potable water distribution system. A contractor agreement will be secured with a vendor to provide and construct wellhead treatment systems based on individual well characteristics. The schedule for equipment procurement will depend on the size of each wellhead system, the layout of each treatment and distribution system, as well as the physical impediments that could interfere with system construction and installation. Equipment, hardware, and materials for each wellhead treatment system will be procured via contractor agreements.

Necessary pre-installation and connection permits and/or easements will be obtained as needed for the individual wells. If necessary, the existing permits for the shared, small, or non-community well systems will be revised and submitted to the appropriate agency (SCCDEH or DHS). As necessary, Olin will participate in meetings and coordinate with the water system managers, owners and users, and regulatory agencies to coordinate and obtain approvals for the treatment system design and the OMM program.

### **Step 5: Construction / Installation**

Construction and installation of each wellhead treatment system, using ion exchange treatment technology and connection of individual wells or areas-of-wells, will be performed by Olin-approved contractors.

A concrete pad will be constructed to support the treatment system. The typical proposed system will consist of multiple ion exchange vessels operated in a lead/lag arrangement. The system will include parallel trains, each train piped in a lead-lag configuration, with one vessel in the lead position and one vessel in the lag position. The lead-lag arrangement provides a “double barrier” approach to effectively remove perchlorate. The piping for the water treatment system will have flow indicators and flow totalizers for monitoring the quantity of water treated.

Water from the well will be pumped through two vessels that contain the ion-exchange resin which will remove the perchlorate. Each vessel housing the ion exchange resin will be certified for potable use and rated for the system pressure. Treated groundwater will be transferred to the bladder pump or directly to the potable water distribution system. The piping system needed to install the system will be plumbed according to individual well/system specifications.

The number and size of ion exchange vessels for each well is based on well production (peak and average) as previously discussed. Once an ion exchange vessel reaches a pre-determined perchlorate breakthrough level, that vessel will be removed from service. The lag vessel will then be moved to the lead position and a fresh vessel will be put in the lag position. The used vessel will be returned to the vendor’s facility for proper management.

Following installation system shakedown for an individual system, post installation monitoring will be performed to assess demand performance and efficiency in perchlorate removal.

## 4.0 REPORTING

A summary of work completed and status updates will be presented within the monthly progress reports submitted to the RWQCB. Once the wellhead treatment systems have been installed on all wells for which treatment is specified, an Alternative Water Supply Implementation Report will be prepared. This report will summarize the results of the well evaluation, any potential supplemental data collection, and evaluation, and implementation of wellhead treatment.

## 5.0 SCHEDULE

A schedule has been developed to implement the steps outlined above on a well-by well basis. Following completion of the ion exchange treatment system implementation on wells with detections of perchlorate at 10 ppb or greater, implementation steps will proceed in a phased manner on the individual wells that are identified with perchlorate concentrations at 8.0-9.9 ppb, 7.0-7.9 ppb, and above 6.1 ppb. The steps from securing well agreements through installation/construction will proceed concurrently on well-by-well basis. Implementation timing limitations are based on securing access agreements, availability of required data, and equipment availability. It is anticipated that additional coordination will be necessary to secure access agreements and obtain regulatory approval to install treatment systems on water system wells. Therefore, a separate implementation schedule has been provided for these wells. The above work plan tasks will be performed on a well-by-well basis according to the following tentative implementation schedule.

<b>Project Activity</b>	<b>Typical Duration / Dependency</b>	
	<b>Individual Well</b>	<b>Well System</b>
Long-term Access Agreement <sup>1</sup>	90 days/well	120 days/well
Well Evaluation (following access agreement)	1-2 wells/day	1-2 wells/day
Supplemental Data Acquisition	5 – 10 days/well	5 – 10 days/well
Supplemental Data Evaluation	3 – 5 days/well	3 – 5 days/well
Design and Procurement of Equipment	90 days/well	120 days/well
Construction / Installation	30 days/well	30 days/well
Final Report	60 days following completion of all wellhead treatment systems	

<sup>1</sup> Following completion of ion exchange treatment system implementation on wells with detections of perchlorate at 10 ppb or greater. Execution of the Access Agreements by the property owner is beyond Olin's ability to control and could impact the duration of this step in the process.

## 6.0 REFERENCES

- California Department of Health Services (DHS), 1999. *Drinking Water Source Assessment and Protection (DWSAP) Program. Division of Drinking Water and Environmental Management, California Department of Health Services.* January.
- California Regional Water Quality Control Board (RWQCB), 2004. Letter dated July 6, 2004 to Olin Corporation and Standard Fusee Corporation, containing Cleanup and Abatement Order NO. R3-2004-0101.
- Environmental Protection Agency (EPA), 1988. *Guidance Document for Providing Alternate Water Supplies.* EPA/540/G-87/006 OSWER Directive 9355.3-03. February.
- MACTEC Engineering and Consulting, Inc. (MACTEC), 2004. *Alternative Water Supply Evaluation. Olin/Standard Fusee Site, 425 Tennant Avenue, Morgan Hill, California.* Prepared for Olin Corporation, Charleston, Tennessee. April 16.
- Santa Clara Valley Water District (SCVWD), 2001. *Santa Clara Valley Water District Groundwater Management Plan.* July.

## FIGURES

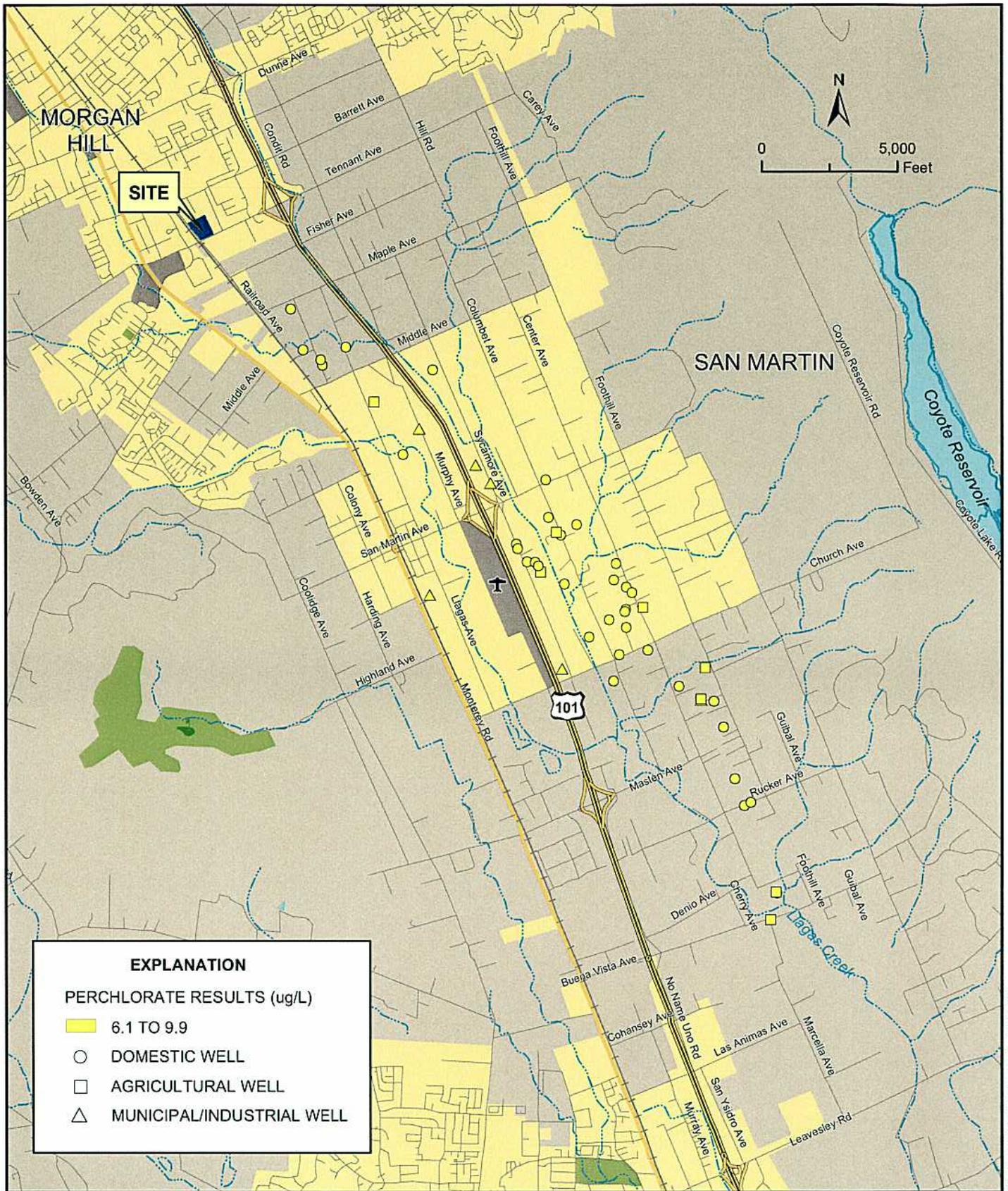


Figure 1-UPDATE-a.mxd - 9/21/05



**Wells with Perchlorate Concentrations  
between 6.1 and 9.9 ug/L**

Revised Alternative Water Supply Implementation Work Plan  
Olin/Standard Fusee Site  
Morgan Hill, California

FIGURE

**1**

DRAWN  
TJH

JOB NUMBER  
6300050002 03

APPROVED  
*DS MET*

DATE  
9/2005

REVISED DATE

APPENDIX A

RWQCB LETTER, REQUEST FOR COMPLIANCE UPDATE, JUNE 16, 2005



# California Regional Water Quality Control Board

## Central Coast Region



Alan C. Lloyd, PhD.  
Secretary for  
Environmental  
Protection

Internet Address: <http://www.waterboards.ca.gov/centralcoast>  
895 Aerovista Place, Suite 101, San Luis Obispo, California 93401  
Phone (805) 549-3147 • FAX (805) 543-0397

Arnold Schwarzenegger  
Governor

June 16, 2005

Received

JUN 20 2005

Mr. Richard W. McClure  
Olin Corporation  
Environmental Remediation Group  
PO Box 248  
Charleston, TN 37310-0248

Mr. Jay McLaughlin  
President and CEO  
Standard Fusee Corporation  
PO Box 1047  
Easton, MD 21601

Env. Remediation

FILE COPY

Dear Mr. McClure and Mr. McLaughlin:

**SLIC: REQUEST FOR COMPLIANCE STATUS UPDATE, CLEANUP OR ABATEMENT ORDER R3-2004-0101, 425 TENNANT AVENUE FACILITY, MORGAN HILL, SANTA CLARA COUNTY**

As you are aware, the State Water Resources Control Board (State Water Board) adopted Order WQ 2005-0007 (Order) on May 19, 2005. The Order amends the Central Coast Regional Water Quality Control Board's (Regional Water Board) Cleanup or Abatement Order No. R3-2004-0101 (CAO R3-2004-0101). The Order establishes the perchlorate trigger level at which Olin Corporation is required to supply alternative water to affected well owners. The perchlorate trigger level is based on the Public Health Goal (PHG), which is currently set at 6 parts per billion. The PHG was established by the Office of Environmental Health Hazard Assessment (OEHHA) on March 12, 2004. According to OEHHA, the PHG is the perchlorate concentration that would pose no significant health risk to individuals, including sensitive populations (i.e. pregnant women and young children), consuming the water on a daily basis over a lifetime<sup>1</sup>. The Order also allows Olin Corporation to submit a request to the Executive Officer or Regional Water Board to cease bottled water supply if perchlorate concentrations are below 6 parts per billion for four consecutive quarters.

On June 6, 2005, My staff and I met with Curt Richards of Olin Corporation to discuss items related to the Order and received a verbal update on Olin's current efforts to install ion exchange units on private wells. During the meeting with Mr. Richards, we agreed to consider Olin's proposals to stop bottled water service to wells with four consecutive quarters (within the last year) of results less than 4 parts per billion. As discussed, Olin shall demonstrate that these wells have a minimum of four consecutive quarters of data with at least one quarterly sample after May 19, 2005. We also agreed to consider wells above 4 and below 6 parts per billion and that have at least four consecutive quarters of recent data and at least one "prospective" (i.e.,

<sup>1</sup> Memorandum to California Environmental Protection Agency Secretary Terry Tamminen from OEHHA Director Dr. Joan Denton. The memo can be downloaded from: <http://www.oehha.ca.gov/water/phg/pdf/Phgmemo31204.pdf>

after May 19, 2005) result. However, the Mann Kendal statistical trend analysis must be applied to those wells to determine concentration trends before we will consider the request.

Wells that do not meet this requirement shall be sampled until there are at least four consecutive quarterly results. Any request to stop alternative water supply with less than four quarters of "prospective" data must be considered by the Regional Water Board at a public hearing, as required by the Order.

As we understand from Mr. Richards, Olin is not proposing any additional legal action related to CAO R3-2004-0101 or the Order. We believe this is a positive step forward in the successful and fair implementation of alternative water supplies, since further legal action does not serve the needs of affected well owners.

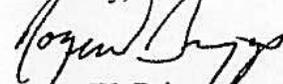
Regional Water Board staff requests that Olin provide a status update related to Olin's compliance with CAO R3-2004-0101 and the Order. This includes Olin's efforts to install ion exchange systems on wells with perchlorate concentrations above 10 parts per billion, and an update of the October 29, 2004 *Alternative Water Supply Work Plan*. The October 29, 2004 *Alternative Water Supply Work Plan* shall be updated to reflect the modifications made to R3-2005-0101 by the Order. The written update shall also include the location (on a map) of the remaining >10 parts per billion private wells, the wells' identification numbers, estimated time frame for ion exchange system installation, and any other outstanding issues related to those wells. The status update shall be submitted by **July 15, 2005**. The revised October 29, 2004 *Alternative Water Supply Work Plan* is due forthwith, but July 15, 2005 is an acceptable date for submittal.

The directive for a status update is pursuant to Water Code Section 13267. Failure to submit adequate or complete information may subject you to Regional Water Board enforcement action. The Regional Water Board requires you to submit your response in accordance with Section 13267 of the Water Code to determine compliance with CAO R3-2004-0101 and the Order. We require Olin to submit the information as the owner of the property, and as one of the previous operators of a flare manufacturing facility that caused soil and groundwater perchlorate contamination at and in the vicinity of the Olin site at 425 Tennant Avenue, Morgan Hill.

Any person affected by this Water Code 13267 order of the Regional Water Board may petition the State Water Board to review the action in accordance with section 13320 of the California Water Code and Title 23, California Code of Regulations, Section 2050. The State Water Board must receive the petition within 30 days of the date of this order. Copies of the law and regulations applicable to filing petitions will be provided upon request.

We look forward to working with you so that implementation of long-term alternative water supplies for affected residents can proceed forthwith. If you have any questions, please contact David Athey at (805) 542-4644 or Eric Gobler at (805) 549-3467.

Sincerely,



Roger W. Briggs  
Executive Officer

California Environmental Protection Agency



Recycled Paper

cc via E-mail:

Olin Interested Party List

Ms. Lori Okun  
Office of the Chief Counsel  
State Water Resources Control Board

cc via U.S. Mail:

Mr. Jay Baksa  
City of Gilroy  
7351 Rosanna Street  
Gilroy, CA 95020-6197

Ms. Helene Leichter  
City of Morgan Hill  
17555 Peak Avenue  
Morgan Hill, CA 95037

Mr. Keith M. Casto  
Sedgwick, Detert, Moran & Arnold  
One Embarcadero, 16th Floor  
San Francisco, CA 94111-3628

Mr. Eric Lacy  
CA Dept. of Health Services  
2151 Berkeley Way  
Berkeley, CA 94704-1011

Mr. Eugene Leung  
CA Dept. of Health Services  
2151 Berkeley Way  
Berkeley, CA 94704-1011

Mr. Joe Root, General Manager  
Corde Valle  
One Corde Valle Club Drive  
San Martin, CA 95046

Mr. Richard Peekema  
4817 Wellington Park Dr.  
San Jose, CA 95136

Ms. Suzanne Muzzio  
Santa Clara Co. Env. Health Services  
1555 Berger Drive, Suite 300  
San Jose, CA 95112-2716

Mr. Rob Stern  
7510 Kenbrook Place  
Suwanee, GA 30024

S:\SLIC\Regulated Sites\Santa Clara Co\Olin\OLIN-425 TENNANT AVENUE\COMMUNICATIONS - RICK McCLURE\2005 Letters\Compliance Update Request CAO Final DOC

APPENDIX B

STATE WATER RESOURCES CONTROL BOARD ORDER WQ 2005-0007

STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

**ORDER WQ 2005 - 0007**

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In the Matter of the Petitions of

**OLIN CORPORATION AND STANDARD FUSEE, INCORPORATED**

For Review of Cleanup And Abatement Order No. R3-2004-0101

Issued by the  
California Regional Water Quality Control Board,  
Central Coast Region

**SWRCB/OCC FILES A-1654 and A-1654(a)**

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BY THE BOARD:

On July 6, 2004, the Executive Officer of the Central Coast Regional Water Quality Control Board (Central Coast Water Board) issued Cleanup and Abatement Order No. R3-2004-0101 (Cleanup Order)<sup>1</sup>, which required Olin Corporation (Olin) and Standard Fusee, Incorporated (Standard Fusee), to provide replacement water service to owners of private domestic wells affected by discharges of potassium perchlorate (perchlorate) from the facility at 425 Tennant Avenue, Morgan Hill, in Santa Clara County (hereinafter referred to as "Facility"). Olin and Standard Fusee (Petitioners) filed petitions asking the State Water Resources Control Board (State Water Board) to review the requirement to provide replacement water service for wells with perchlorate detections below the current California public health goal and notification

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<sup>1</sup> The Cleanup Order was incorrectly numbered R4-2004-0101.

level for drinking water.<sup>2</sup> In this Order the State Water Board addresses the significant issues raised in the petition and revises the Cleanup Order.<sup>3</sup> The remaining issues are dismissed.<sup>4</sup>

## I BACKGROUND

Olin manufactured signal flares at the Facility from approximately 1956 to 1988. From 1988 to 1995, Standard Fusee leased the Facility and also manufactured signal flares.<sup>5</sup> Perchlorate, used in the manufacture of signal flares, was detected in water samples at the site in August 2000. In 2001, Olin undertook further investigation of the contamination with the Central Coast Water Board's oversight. Perchlorate has been detected in numerous groundwater wells located downgradient of the Facility (up to a distance of approximately ten miles) with

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<sup>2</sup> Olin also requested a stay of the Cleanup Order. The State Water Board's Executive Director denied the stay request by letter dated September 22, 2004.

<sup>3</sup> This order is based upon the record before the Central Coast Water Board and upon the following documents, of which the State Water Board takes administrative notice: *Public Health Goal for Perchlorate in Drinking Water*, prepared by Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, March 2004; National Academy of Sciences, *Health Implications of Perchlorate Ingestion*, 2005; Memorandum from Joan E. Denton, Director, Office of Environmental Health Hazard Assessment, to Alan C. Lloyd, Agency Secretary, California Environmental Protection Agency, 4/1/05, Responses to Recent Comments on the Perchlorate PHG. Petitioners as well as the Central Coast Water Board sought to supplement the record with additional information documenting ongoing state and national efforts to establish a reliable drinking water standard for perchlorate. With the exception of the OEHHA document named above, these requests are denied. In addition, Petitioners requested leave to reply to contentions set forth in the Central Coast Water Board response to the petition. That request is also denied. Olin submitted documents as attachments to its comment letters dated March 29, 2005, and May 16, 2005, but did not comply with California Code of Regulations, Title 23, section 2050.6(a) for admission of new evidence. Of those documents, the following are excluded: U.S. Environmental Protection Agency, Analytical Methods Developed by the Office of Ground Water and Drinking Water; and Air Force Center for Environmental Excellence, Monitoring and Remediation Optimization System (MAROS) Software User's Guide, Version 2.1, November 2004. All other attachments submitted by Olin are either already in the record or are hereby made a part of the record.

<sup>4</sup> See *People v. Barry* (1987) 184 Cal.App.3d 158; Cal. Code Regs. (CCR) tit. 23, § 2052(a)(1). Dismissed issues have either been addressed in previous State Water Board orders or are not sufficiently substantial to warrant review.

<sup>5</sup> Standard Fusee's brief petition joins in Olin's petition and request for relief, as well as Olin's reasons for contending that the Central Coast Water Board action was improper. On March 30, 2005, Standard Fusee submitted comments on a draft of this Order that had been circulated for public comment. That submission included a request to present additional evidence on claims not previously raised in Standard Fusee's or Olin's petitions. The State Water Board's regulations governing petitions of regional water quality control board actions provide that petitioners must raise substantive issues or objections before the regional water board or, in the alternative, provide an explanation of why these issues could not have been raised before the regional water board. Cal. Code Regs., Tit. 23, § 2050(a)(9). Moreover, any request to present additional evidence not provided to the regional board shall be made at the time the petition was filed, or as soon as possible thereafter. Cal. Code Regs., Tit. 23, § 2050.6(a)(1). If evidence was not presented to the regional water board, the proponent must provide a detailed explanation of the reasons why the evidence could not have been submitted. Cal. Code Regs., Tit. 23, § 2050.6(a)(2). Because Standard Fusee failed to raise the new claim in its petition or in earlier submissions and has not satisfactorily explained why this claim or evidence could not have been submitted previously, comments presenting new claims not properly before the State Water Board are excluded from the administrative record. The request to present supplemental evidence is denied.

concentrations ranging from non-detect to 100 micrograms per liter ( $\mu\text{g/L}$ ). Since 2002, Olin has been providing alternative water to owners of domestic water wells in which perchlorate concentrations exceed  $4 \mu\text{g/L}$ .

Water Code section 13304 was amended in 2004 to clarify the authority of regional water quality control boards to require alternative water supplies pursuant to a cleanup.<sup>6</sup> The statute provides that a regional water board may require provision of “uninterrupted replacement water service, which may include wellhead treatment, to each affected public water supplier or private well owner.”<sup>7</sup> Replacement water provided “shall meet all federal, state, and local drinking water standards and shall have comparable quality to that pumped by the public water system or private well owner prior to the discharge of waste.”<sup>8</sup> The statute does not define what constitutes an “affected” well.

There is currently no enforceable state or federal standard for perchlorate in drinking water for use in determining when a well is affected such that the user should be entitled to replacement water service. In March 2004, the California Office of Environmental Health Hazard Assessment (OEHHA) issued a final Public Health Goal (PHG) of  $6 \mu\text{g/L}$  for perchlorate.<sup>9</sup> OEHHA’s PHG must be based upon a risk assessment to identify a level at which no known or anticipated adverse effects on health will occur, with an adequate margin of safety.<sup>10</sup> PHG’s are used by the California Department of Health Services (DHS) in establishing drinking water standards or Maximum Contaminant Levels (MCLs).<sup>11</sup>

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<sup>6</sup> Cal. Water Code, § 13304(a), (f). SB 1004, approved 9/29/03, effective 01/01/04.

<sup>7</sup> Cal. Water Code, § 13304(a).

<sup>8</sup> *Id.* Water Code § 13304(f). The cited provision refers to the quality of replacement water provided, and not to the groundwater affected by a discharge. The intent of this Order is to clarify the condition of an affected well in order to determine when replacement water is appropriately required. This Order is not intended to address requirements as to the quality of water served as replacement water when such service is otherwise found warranted.

<sup>9</sup> California Health & Safety Code, section 116293 requires OEHHA to perform a risk assessment and adopt a public health goal for perchlorate based exclusively on public health consideration. Criteria for this determination are set forth at Health & Safety Code, section 116365.

<sup>10</sup> Cal. Health & Saf. Code, § 116365(c)(1).

<sup>11</sup> Cal Health & Safety Code, § 116365(a). The primary drinking water standard “shall be set at a level that is as close as feasible to the corresponding public health goal placing primary emphasis on the protection of public health . . . .” *Id.*

DHS has not yet completed an MCL for perchlorate. However, DHS has established a notification level<sup>12</sup> for certain contaminants, which requires timely notification of local governing bodies by drinking water systems whenever the relevant level is exceeded in a drinking water source.<sup>13</sup> Before March of 2004, the notification level for perchlorate was 4 µg/L, having been revised downward from 18 µg/L in 2002. The notification level was later revised to 6 µg/L based on the final PHG. While the state continues to develop regulatory standards for this contaminant, the issue remains in flux on a national level.<sup>14</sup>

Olin commenced replacement water service in late 2002, when the notification level for perchlorate was 4 µg/L. In April 2004, following publication of OEHHA's final PHG of 6 µg/L, Olin sought approval from the Central Coast Water Board to raise the level of contamination requiring replacement water service to 6 µg/L to match the PHG. The Board declined Olin's request and later issued the Cleanup Order to implement its determination that Olin must continue providing replacement water for wells testing at or above 4 µg/L.<sup>15</sup> Olin filed its petition with the State Water Board, objecting to the 4 µg/L "trigger" level.

## II. CONTENTIONS AND FINDINGS

Contention: Olin contends that the Central Coast Water Board abused its discretion by requiring continued water replacement service for wells with perchlorate detections based upon a 4 µg/L trigger level rather than the final PHG of 6 µg/L adopted by OEHHA.

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<sup>12</sup> The DHS notification level was previously referred to as an action level. See, Cal. Health & Saf. Code, § 116455, effective 1/1/05.

<sup>13</sup> Cal. Health & Saf. Code, §§ 116450, 116455. Notification levels are "nonregulatory, health-based advisory levels . . . for contaminants in drinking water for which maximum contaminant levels have not been established. Notification levels are established as precautionary measures . . ." Health & Saf. Code, § 116455(c)(3).

<sup>14</sup> The United States Environmental Protection Agency (U.S. EPA) issued a Draft Toxicological Health Assessment for perchlorate in 2002. The draft document indicated a preliminary goal of 1 µg/L for perchlorate in drinking water. U.S. EPA, together with several other federal agencies, referred the draft health assessment document to the National Academy of Sciences (NAS) for further review. OEHHA has reviewed the resulting NAS report issued in January 2005 and concluded that "there does not appear to be any new scientific evidence for OEHHA to revise the perchlorate risk assessment, nor alter the estimated health-protective drinking water concentration of 6 ppb (6µg/L) that is stated in the final PHG document." Memorandum from Joan E. Denton to Alan C. Lloyd, 4/1/2005.

<sup>15</sup> The Cleanup Order requires Olin and Standard Fusee to provide replacement water service for wells in which perchlorate has been detected at or above 4 µg/L at any time within the past four consecutive quarters. Cleanup Order, at Paragraph 1. The Cleanup Order also requires replacement water service for wells where perchlorate is detected below 4 µg/L, but Dischargers may cease supply with Central Coast Water Board Executive Officer concurrence if results remain below 4 µg/L for four consecutive quarters. *Id.*, at Paragraph 2.

Finding: We do not find abuse of discretion in the Central Coast Water Board's determinations. However, we do find that OEHHA is the agency charged with public health risk assessments of the nature presented here. The Water Boards should defer to OEHHA and DHS in determining the appropriate level of contamination requiring replacement drinking water service requirements.

The Central Coast Water Board's primary reason for refusing to revise the trigger level for replacement drinking water is its stated belief that a conservative approach is needed, given the prevailing uncertainty about safe level of perchlorate consumption. The Central Coast Water Board points to lack of scientific consensus as well as its desire to protect the most sensitive affected populations.<sup>16</sup> The Central Coast Water Board also claims that variations in down-gradient water quality monitoring results justify using a more conservative trigger level, to ensure that a safe level is met in all cases. Finally, the Central Coast Water Board argues that State Board Resolution 92-49, generally authorizing regional boards to require cleanup to background levels, supports requiring a more stringent water replacement level than is set forth in the PHG.<sup>17</sup>

OEHHA is the state agency responsible for performing health risk assessments for drinking water under the Safe Drinking Water Act of 1996.<sup>18</sup> The statute requires that the risk assessment be performed "using the most current principles, practices, and methods used by public health professionals who are experienced practitioners in the field of epidemiology, risk assessment, and toxicology."<sup>19</sup> Although the PHG is not a legally enforceable standard,<sup>20</sup> OEHHA's expertise and conclusions are clearly key to later development of safe drinking water standards by DHS.

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<sup>16</sup> At unsafe levels, perchlorate interferes with thyroid function. The most sensitive populations include pregnant women and their developing fetuses, lactating women, infants, and individuals with thyroid problems. *Public Health Goal for Perchlorate in Drinking Water*, OEHHA, March 2004, at 1.

<sup>17</sup> State Water Board Resolution 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code, section 13304, adopted June 18, 1992, and amended April 21, 1994 and October 2, 1996.

<sup>18</sup> Health & Saf. Code, § 116365.

<sup>19</sup> Health & Saf. Code, § 116365(c).

<sup>20</sup> "[OEHHA] and [DHS] are prohibited from imposing any mandate that requires a public water system to comply with a public health goal." Health & Saf. Code, § 116365(c)

Regional water boards have discretion to require replacement water to “affected” public water suppliers and private well owners that “meet[s] all applicable federal, state, and local drinking water standards and . . . [is of] comparable quality to that pumped by the public water system or private well owner prior to the discharge of waste.”<sup>21</sup> Wells “affected” by a discharge of waste include those wells in which water does not meet the federal, state and local drinking water standards.<sup>22</sup> Where no federal, state, or local standard yet exists, it is appropriate to use goals developed by agencies with expertise for public health determinations in deciding whether replacement drinking water is necessary. Any other approach would require regional water boards to make individual, possibly inconsistent public health and toxicological determinations or, in the alternative, to require replacement drinking water whenever there is any detection of a contaminant.<sup>23</sup> This approach ignores the expertise of OEHHA and, in the case of contaminants for which MCLs have been developed, DHS. By contrast, cleanup levels for groundwater are a separate issue and are more appropriately within the expertise and professional purview of the water boards.

While the Central Coast Water Board points to fluctuations in perchlorate detection as further justification for requiring water replacement at a lower level of contamination, reliability of data is a separate issue. Olin must meet the replacement water requirements at whatever level is determined appropriate, regardless of fluctuations. In order to ensure that any discontinuation of replacement drinking water service resulting from this Order is based upon accurate and current information, we will require that four prospective, consecutive quarters of monitoring data be provided to illustrate that a well consistently tests below the PHG. Therefore, well owners currently receiving replacement water service will not have such service discontinued as a result of the findings in this Order until four new consecutive quarters of

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<sup>21</sup> Wat. Code, § 13304(f).

<sup>22</sup> As noted in footnote 8, this Order applies only to the quality of groundwater for which replacement drinking water service is required, not to the quality of replacement drinking water provided to well owners.

<sup>23</sup> The logical result of the Central Coast Water Board’s argument that the State Water Board Res. 92-49 requirement for cleanup to background contaminant levels justifies its water replacement levels would routinely require water replacement for groundwater constituent levels that may be many times lower than that determined safe by state and federal agencies. Simply put, while cleaning up to background may be required, that does not mean that replacement water is always necessary until the cleanup is complete, regardless of the amount of contamination.

monitoring are available to show that a well tests below the PHG. The Central Coast Water Board has discretion to act to shorten this time period.<sup>24</sup>

Nothing in this Order should be read to require amendment of any pre-existing agreements by dischargers to provide replacement water at levels below PHGs. Nor does this Order prevent a public water supplier from deciding to stop service of water that is below these levels. The sole issue addressed is the determination by Regional Water Boards that wells have been “affected” and that replacement water must be ordered. Where new water replacement orders are considered, or where existing agreements or orders provide for reconsideration of replacement water levels, regional water boards should defer to OEHHA and DHS in determining safe drinking water levels. This Order applies only to requirements for water replacement and not to groundwater or soil cleanup levels required under State Water Board Resolution 92-49.<sup>25</sup> Further, this Order applies only to replacement drinking water and not to replacement water for other potentially affected beneficial uses.

Nothing in this Order shall be read to prevent a regional water board from issuing a water replacement order directing future actions preparatory to providing timely replacement water in the event that the appropriate standard is met or exceeded in the future. Regional water boards may also require that dischargers submit water replacement plans prior to documentation of contaminant levels exceeding the relevant standard. Where water quality data exhibit trends indicating the likelihood of future exceedances, it is prudent and appropriate for regional water boards to take such action before actual well exceedances occur.

### **III. CONCLUSION**

The Regional Water Board inappropriately failed to accord the deference due to OEHHA in determinations involving safe drinking water contaminant levels. The Regional Water Board has not shown why the OEHHA PHG is insufficiently protective in this case.

### **IV. ORDER**

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<sup>24</sup> Olin and the Central Coast Water Board have jointly submitted monitoring requirements for wells subject to replacement water service. Our revision of the Cleanup Order will refer to and incorporate those requirements.

<sup>25</sup> “Affected” wells may include those subject to other measures for implementing cleanup. This Order only addresses how a regional water board must determine the trigger levels for requiring safe replacement drinking water pending completion of a cleanup in compliance with Resolution 92-49. The trigger levels at issue in this Order are based on the need to protect public health. This Order does not prevent a regional water board from requiring any action that is related directly to remediation of ground water or is necessary to prevent migration of waste through ground water.

IT IS HEREBY ORDERED THAT CLEANUP AND ABATEMENT Order No. R3-2004-0101 is amended as follows:

1. Delete Finding 10 and replace with the following: “The Office of Environmental Health Hazard Assessment [OEHHA] established its public health goal of 6 ppb based upon upon the level of perchlorate in drinking water that would pose no significant health risk to individuals consuming the water on a daily basis over a lifetime. OEHHA is required to base its public health goal exclusively on public health considerations, without regard to cost impacts. Because OEHHA is the state agency responsible for such health risk assessments, it is appropriate to use the public health goal as the applicable level for determining wells requiring replacement drinking water supply.”

2. Delete Finding 11.

3. Revise Directive 1 to read as follows: “Effective immediately, Discharger shall supply interim uninterrupted replacement water service (i.e., bottled water or equivalent), in accordance with California Water Code Section 13304, to owners of private domestic wells in which perchlorate has been detected at concentrations greater than 6 ppb in the last twelve months regardless of past results. Discharger may stop supplying interim uninterrupted water service upon the Regional Board Executive Officer’s concurrence that long term uninterrupted water service has been provided to individual well owners or there have been four consecutive quarters of equal to or less than 6 ppb results.”

4. Delete Directive 2 and replace with the following: “Olin shall implement monitoring requirements for wells subject to replacement water. These requirements address conditions under which monitoring may be discontinued. The requirements are incorporated and included as Attachment A.”

5. Add a new Directive 2a to read as follows: “Notwithstanding other requirements, for well owners currently receiving replacement water service, no discontinuation of that service shall occur, unless approved by the Central Coast Water Board, until four prospective quarters of monitoring show perchlorate concentrations equal to or less than 6 ppb.”

6. Revise Directive 4 to read as follows: “Following Executive Officer concurrence with the detailed Alternative Water Supply Implementation Work Plan Discharger

shall implement the plan for wells with concentrations from 6 ppb to 9.9 ppb, according to a schedule approved by the Executive Officer.”

### **CERTIFICATION**

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 19, 2005.

AYE:           Arthur G. Baggett, Jr.  
                  Peter S. Silva  
                  Richard Katz  
                  Gerald D. Secundy  
                  Tam M. Doduc

NO:            None.

ABSENT:      None.

ABSTAIN:     None.

  
Debbie Irvin  
Clerk to the Board

Attachment A

Range	Monitoring Approach
5.0 to < 6.0 ppb	Olin will sample bimonthly. After four data points, Olin shall evaluate the data using the Mann-Kendall variability analysis. <sup>1</sup> If there is no trend (NT) or if the concentration trend is increasing (I) or probably increasing (PI), Olin shall continue to sample on a bimonthly basis. If the trend is stable (S), decreasing (D) or probably decreasing (PD), then Olin will sample at least twice per year for one year (monitoring should occur during wet and dry seasons or during periods of maximum concentration changes as determined by the Mann-Kendall trend analysis). If trend is still stable (S), decreasing (D) or probably decreasing (PD), Olin will sample once in the next year. If that concentration is < 6.0 and trend remains stable (S), decreasing (D) or probably decreasing (PD), Olin may stop sampling with Executive Officer concurrence.
4.0 to <5.0	Olin will sample at least twice per year (monitoring should occur during wet and dry seasons or during presumed periods of maximum concentration changes). After four data points, Olin shall evaluate the data using the Mann-Kendall variability analysis. If there is no trend (NT) or if the concentration trend is increasing (I) or probably increasing (PI), Olin shall continue to sample on a semiannual basis, or bimonthly if the concentration exceeds 5.0. If the trend is stable (S), decreasing (D) or probably decreasing (PD), then Olin will sample once in the next year. If that concentration is < 5.0 and the trend is stable (S), decreasing (D) or probably decreasing (PD), Olin may stop sampling with Executive Officer concurrence.
< 4.0 wells (other than wells that were previously in the sampling programs in the above two ranges) within 500 feet of wells that have had a 6 ppb result.	Olin shall sample semiannually for one year. If the perchlorate concentrations remain less than 4 ppb, then Olin shall sample once in the next year. If that concentration is less than 4 ppb, Olin may stop monitoring with Executive Officer concurrence.

<sup>1</sup> Olin shall submit the proposed statistical analysis for review and approval by Regional Board Staff.

APPENDIX C

RWQCB AMENDED CAO R4-2004-0101



Terry Tamminen  
Secretary for  
Environmental  
Protection

# California Regional Water Quality Control Board Central Coast Region



Arnold Schwarzenegger  
Governor

Internet Address: <http://www.swrcb.ca.gov/rwqcb3>  
895 Aerovista Place, Suite 101, San Luis Obispo, California 93401  
Phone (805) 549-3147 • FAX (805) 543-0397

July 6, 2004

Mr. Richard W. McClure  
Olin Corporation  
Environmental Remediation Group  
PO Box 248  
Charleston, TN 37310-0248

Certified Mail No. 7000 0520 0019 0359 6988

Return Receipt Requested

Mr. Jay McLaughlin  
President and CEO  
Standard Fusee Corporation  
PO Box 1047  
Easton, MD 21601

Dear Messer's McClure and McLaughlin:

**SLIC: 425 TENNANT AVENUE, MORGAN HILL; CLEANUP OR ABATEMENT ORDER  
NO. R3-2004-0101, 425 TENNANT AVENUE FACILITY, SANTA CLARA COUNTY**

Enclosed is Cleanup and or Abatement Order (Order) No. R3-2004-0101. This Order directs you to supply uninterrupted replacement water to well owners with perchlorate-contaminated wells. Olin Corporation and Standard Fusee Corporation (hereafter "Discharger") have been named in this Order because it is or was the sites' owner and or operator.

This Order establishes criteria for supplying interim and long-term uninterrupted water service to private well owners with perchlorate-contaminated wells. The Order requires Discharger to provide interim uninterrupted water to well owners whose wells meet two important criteria. The first criteria is for wells that test at or higher than 4ppb. Well owners with wells that test at or higher than 4 ppb shall be supplied interim uninterrupted water service (currently bottle water). The Order also establishes a mechanism for stopping bottled water supply to these wells and includes follow up monitoring. The second criterion is for wells that test less than 4 ppb. For those wells, Discharger may cease supply of uninterrupted water service if, after four quarters of testing, the results remain less than 4 ppb. However, the Order will still require additional testing to monitor perchlorate groundwater concentrations.

The Order also requires Discharger to begin implementation of long term uninterrupted water supply service for wells with concentrations at or above 10 ppb. As part of this requirement, Discharger will be submitting a time schedule for long-term uninterrupted water supply implementation. In addition, Discharger is required to submit a detailed plans for long term uninterrupted water supply

*California Environmental Protection Agency*



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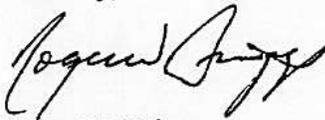
July 6, 2004

options for wells with concentrations ranging from 4 to 9.9 ppb. Once this plan is Approved by the Executive Officer, Discharger will be required implement the plan.

As noted in the Order, any person affected by the Order may petition the State Water Resources Control Board for review within 30 days. (California Water Code §13320.) You may also request a Regional Board hearing by contacting Staff Counsel **Lori T. Okun by facsimile to (916) 341-5199** within 30 days of receipt of this letter. The hearing will be conducted by the Regional Board at a public meeting or by the Executive Officer, as determined by the Executive Officer. A hearing by the Executive Officer may consist of a review of the written record after interested parties have had the opportunity to submit any additional written materials. Any hearing will be open to Olin Corporation, Standard Fusee Corporation and other interested persons. A request for a Regional Board hearing does not toll or otherwise extend the 30-day period for filing a petition with the State Board pursuant to Water Code Section 13320.

If you have questions, please call **David Athey at (805) 542-4644** or Eric Gobler at (805) 549-3467.

Sincerely,



Roger W. Briggs  
Executive Officer

S:\SLIC\Regulated Sites\Santa Clara Co\Olin\OLIN-425 TENNANT AVENUE\CAO\CAO trans.doc

Attachment: Order No. R3-2004-0101

cc via E-mail:

Ms. Lori Okun  
Office of the Chief Counsel  
State Water Resources Control Board

Mr. Jim Ashcraft  
City of Morgan Hill

Mr. Rich Chandler  
Komex

Mr. Peter Forest  
San Martin County Water

Ms. Sylvia Hamilton  
PCAG

Mr. Tom Mohr  
Santa Clara Valley Water District

PCAG Members

Elected Officials

U.S. Environmental Protection  
Agency

Mr. Steven L. Hoch  
Hatch & Parent

***California Environmental Protection Agency***



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cc via U.S. Mail:

Mr. Jay Baska  
City of Gilroy  
7351 Rosanna Street  
Gilroy, CA 95020-6197

Mr. Eric Lacy  
CA Dept. of Health Services  
2151 Berkeley Way  
Berkeley, CA 94704-1011

Ms. Helene Leichter  
City of Morgan Hill  
17555 Peak Avenue  
Morgan Hill, CA 95037

Mr. Eugene Leung  
CA Dept. of Health Services  
2151 Berkeley Way  
Berkeley, CA 94704-1011

Mr. Richard Peekema  
4817 Wellington Park Dr.  
San Jose, CA 95136

Ms. Suzanne Muzzio  
Santa Clara Co. Env. Health Services  
1555 Berger Drive, Suite 300  
San Jose, CA 95112-2716

Mr. Keith M. Casto  
Sedgwick, Detert, Moran & Arnold  
One Embarcadero, 16th Floor  
San Francisco, CA 94111-3628

Mr. Joe Root, General Manager  
Corde Valle  
One Corde Valle Club Drive  
San Martin, CA 95046

Mr. Rob Stern  
7510 Kenbrook Place  
Suwanee, GA 30024



**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION  
895 Aerovista Place, Suite 101  
San Luis Obispo, California 93401-7906**

**CLEANUP OR ABATEMENT ORDER NO. R4-2004-0101**

**Issued to**

**Olin Corporation and Standard Fusee, Incorporated  
425 Tennant Avenue, Morgan Hill  
Santa Clara County**

The California Regional Water Quality Control Board, Central Coast Region (hereafter Regional Board) finds:

1. Olin Corporation and Standard Fusee, Incorporated, (hereafter "Discharger") discharged or permitted the discharge of potassium perchlorate (hereafter "perchlorate") to waters of the state underlying a manufacturing facility located at 425 Tennant Avenue, Morgan Hill (hereafter "Property").

2. Section 13304(a) of the California Water Code provides that:

"Any person ... who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including but not limited to, overseeing cleanup and abatement efforts. A cleanup and abatement order issued by the state board or a regional board may require the provision of, or payment for, uninterrupted replacement water service, which may include wellhead treatment, to each affected public water supplier or private well owner. Upon failure of any person to comply with the cleanup or abatement order, the Attorney General, at the request of the board, shall petition the superior court for that county for the issuance of an injunction requiring the person to comply with the order. In the suit, the court shall have jurisdiction to grant a prohibitory or mandatory injunction, either preliminary or permanent, as the facts may warrant."

3. Section 13050(l) of the California Water Code defined "pollution" as an alteration of the water quality to a degree that unreasonably affects either beneficial uses or facilities that serve these beneficial uses. Section 13050(m) defines "nuisance" as "anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so

as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons ... (3) Occurs during, or as a result of, the treatment or disposal of wastes.”

4. Pursuant to Chapter 2 of the Water Quality Control Plan, Central Coast Region, (Basin Plan), present and potential beneficial uses of groundwater underlying the Property, and down gradient, include domestic and municipal water supply, agricultural water supply, and industrial water supply.
5. Perchlorate is a hazardous substance. The perchlorate detected at the site is waste as defined in California Water Code Section 13050(d). There is no Basin Plan water quality objective for perchlorate in groundwater. The current cleanup standard for perchlorate, as required by State Water Resources Control Board Resolution No. 92-49 is background or the lowest feasible levels, as described in Finding 10, below.
6. The discharge of perchlorate described in this Order creates, or threatens to create, a condition of pollution or nuisance because, among other reasons, it has interfered with the use of private domestic wells, which contain perchlorate, and has interfered with the use of affected water supplies for municipal and domestic beneficial uses.
7. The former Olin Corporation site is a 13-acre parcel located in southern Morgan Hill. Olin Corporation manufactured signal flares at the Property for about 32 years from 1956 to 1988. Standard Fusee Corporation leased the site and manufactured signal flares for seven years from 1988 to 1995. Potassium perchlorate was used by the Discharger to manufacture flares from 1956 to 1995. Perchlorate contamination at the site may have occurred primarily from an unlined evaporation pond and sumps that received wastes from the cleaning of the ignition material mixing bowls, on-site incineration of cardboard flare coatings with potassium perchlorate residues, and accidental spills.
8. The Discharger caused or allowed perchlorate-containing wastes to be discharged to the soil and groundwater underlying the Property. Due to the naturally permeable and transmissive nature of underlying and down gradient hydrogeology, perchlorate-containing wastes have impacted soils and groundwater beyond the Property. The following reports detail the presence of perchlorate in soil and/or groundwater at, and beyond, the Property:
  - Environmental Engineering Consultant’s *Perchlorate Investigation* dated December 7, 2000
  - Environmental Engineering Consultant’s *Perchlorate Investigation* dated March 21, 2001
  - Law Engineering and Environmental Service’s *Soil and Groundwater Investigation Report for the Olin/Standard Fusee Property* dated May 16, 2002
  - MACTEC Engineering Consultant’s *Phase 3 Soil and Groundwater Investigation Report* dated December 2, 2002

- MACTEC Engineering Consultant's *Phase 3 Soil and Groundwater Investigation and Remedial Action Conceptual Design Report* dated June 30, 2003
- GeoSyntec Consultant's *Soil Remediation Feasibility Study* dated November 21, 2003
- MACTEC Engineering and Consulting's *Third Quarter 2003 Groundwater Monitoring Report* dated October 30, 2003
- MACTEC Engineering and Consulting's *Fourth Quarter 2003 Groundwater Monitoring Report* dated January 30, 2004
- MACTEC Engineering and Consulting's *First Quarter 2004 Groundwater Monitoring Report* dated April 30, 2004

The maximum perchlorate concentration detected in groundwater beneath the Property (at well MW-01) was 770 parts per billion (ppb) during the October 27, 2003, groundwater-sampling event. Measurable perchlorate concentrations in the nine plus mile offsite groundwater plume range from 2 ppb to a maximum of 100 ppb. Perchlorate presence, as noted above and in Finding 10, constitutes a condition of pollution and or nuisance, as defined in California Water Code Section 13050.

9. Since October 22, 2002, Olin Corporation (hereafter "Olin") has been supplying interim uninterrupted replacement water, in the form of bottled water, to affected private well owners with perchlorate detections at 4 ppb or higher. On April 7, 2004, Olin requested that Regional Board staff reconsider the 4 ppb interim uninterrupted replacement water supply level since the Department of Health Services (DHS) Action Level was changed to 6 ppb, based on the Office of Emergency Health Hazard Assessment's public health goal. In a response dated April 29, 2004, the Regional Board Executive Officer determined it necessary to maintain the 4 ppb level for interim uninterrupted replacement water supply. Consequently, the Discharger was directed to keep providing bottled water, on an interim basis, to people whose wells contained perchlorate above 4 ppb.
10. The 4 ppb interim uninterrupted replacement water supply level is 2 ppb lower than the DHS Action Level. However, this requirement is appropriate pursuant to Section 13304. First, alternative water would not be required if the perchlorate had not been discharged. While some wells are below 6 ppb, perchlorate, at any level, is not considered a background constituent of local groundwater. The natural background perchlorate concentration in the Llagas groundwater sub-basin and vicinity is zero. Since the perchlorate discharge has caused a condition of pollution or nuisance and has impacted groundwater beneficial uses, Olin is required to abate potential and actual effects. State Water Resources Control Board Resolution No. 92-49 applies to all cleanup and abatement activities, including providing alternate water supplies. The Resolution requires dischargers to "clean up *and* abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the

total values involved, beneficial and detrimental, economic and social, tangible and intangible." (Id., Section III.G.) Cleanup levels less stringent than background must comply with Section 20400, Title 27, California Code of Regulations (formerly Section 2550.4, Title 23, California Code of Regulations). The Discharger has not demonstrated that cleanup levels above background are appropriate or that background levels cannot be restored. Since the groundwater supplying the polluted wells must be cleaned up to background, absent such demonstration, replacement water should meet the same standard.

Second, perchlorate Public Health Goals, also called Reference Dose by some government agencies (hereafter referred to collectively as "public health goal"), have been established by both the California Office of Environmental Health Hazard Assessment (OEHHA) and the state of Massachusetts Department of Environmental Protection. The United States Environmental Protection Agency (USEPA) has also established a perchlorate public health goal. The public health goal is used by the respective states and federal government in establishing drinking water standards. There is general agreement among these entities that the most sensitive receptor populations are pregnant women, infants, developing children, and hypothyroid individuals. While the USEPA's and Massachusetts' public health goal is 1 ppb, California's is 6 ppb. The difference between California's and the USEPA and Massachusetts' public health goals is based on the uncertainty factor used. The USEPA and Massachusetts public health goal is calculated using a larger uncertainty factor, which they believe assures protection of the most sensitive populations. The OEHHA level also strives to be protective of sensitive populations, but differs in magnitude. The states of Massachusetts and California are both awaiting the National Academy of Science's (NAS) final recommendations on an acceptable public health goal. Both states have pledged to re-review their public health goals, if the NAS study differs from each state's respective goal. Since the states' and USEPA's toxicological risk assessments differ in regard to an appropriate uncertainty factor, a public health goal, and because the NAS study is still underway, it is appropriate to continue requiring interim uninterrupted replacement water supply at the conservative levels described below in ordering paragraphs 1 and 2.

Lastly, groundwater elevations and quality show variance during the wet and dry seasons. Monitoring data demonstrates that perchlorate concentrations in wells that are 6 ppb and over could and have occasionally and temporarily dropped below 4 ppb. Many well owners that now receive bottled water only have one or two sample results for their well, which may not reflect seasonal variations in perchlorate concentrations. Such variance must be considered when determining conditions for interim uninterrupted water supply.

11. Olin has also supplied interim uninterrupted replacement water (bottled water) to some well owners with perchlorate detections less than 4 ppb. However, if perchlorate detections remain less than 4 ppb or non-detect for four quarters, the Regional Board Executive Officer agreed that Olin may end alternative water supply

to the specific well owner. Olin recently sent a blanket letter to over 400 interim uninterrupted replacement water recipients notifying them that bottled water delivery would cease on or about June 4, 2004. It is not known if those well owners had a minimum of four sample results prior to cessation of bottled water delivery.

12. Olin submitted an Alternative Water Supply Evaluation report on April 16, 2004, that outlines alternative water supply options for perchlorate-impacted well owners. Regional Board staff directed Olin to evaluate uninterrupted replacement water supply options for wells with perchlorate concentrations ranging from 4, 6, 8, 10, 16 and 40 ppb. Olin's report did not evaluate alternatives for wells with concentrations below 6 ppb, the current Department of Health Services Action Level.
13. This enforcement action is being taken for the protection of the environment and as such is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.) in accordance with Sections 15307 and 15308, Chapter 3, Title 14, California Code of Regulations. The issuance of this Order is also an enforcement action taken by a regulatory agency and is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.), pursuant to Section 15321(a)(2), Title 14, CCR.
14. Pursuant to Section 13304 of the California Water Code, the Regional Board is entitled to, and may seek, reimbursement for all reasonable costs actually incurred by the Regional Board to investigate unauthorized discharges of wastes or to oversee cleanup of such waste, abatement of the effect thereof, or other remedial action pursuant to this Order.
15. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board (State Board) to review the action in accordance with Section 13320 of the California Water Code and Title 23, California Code of Regulations, Section 2050. The State Board, Office of Chief Counsel, must receive the petition within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.
16. Section 13267(b) of the California Water Code provides that:

“In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the

reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

As described in this Order, existing data and information about the site indicates that waste has been discharged or is discharging from the facilities described above, which facilities are owned or operated, or formerly owned or operated by the Discharger named in this Order.

This Order requires monitoring, work plans and reports pursuant to Water Code Section 13267. This finding is made in compliance with Section 13267. The work plans and monitoring required by this Order are necessary to design a water replacement plan and implementation schedule and to determine compliance with this Order.

IT IS HEREBY ORDERED, pursuant to Sections 13267 and 13304 of the California Water Code that the Discharger abate the discharge of waste at and near the Property as follows:

1. Effective immediately, Discharger shall supply interim uninterrupted replacement water service (i.e., bottled water or equivalent), in accordance with California Water Code Section 13304, to owners of private domestic wells in which perchlorate has been detected at concentrations at or above 4 ppb at any time within the past four consecutive quarters. Discharger may stop supplying interim uninterrupted water service upon the Regional Board Executive Officer's concurrence that long term uninterrupted water service has been provided to individual well owners or there have been four consecutive quarters of non-detect (using a maximum Method Detection Limit of 2 ppb) or less than 4 ppb results. However, if interim uninterrupted water service is stopped because one of the above mentioned conditions is satisfied, the Discharger shall continue to monitor the private wells in question for perchlorate semi-annually for one year. If perchlorate groundwater concentrations remain at trace or non-detect levels during that time, the Discharger shall monitor the private wells annually for two years. If perchlorate groundwater concentrations remain non-detect or trace during that two-year period, the Discharger may stop sampling with the Executive Officer's concurrence.
2. Effective immediately, Discharger shall supply interim uninterrupted replacement water service (i.e., bottled water or equivalent), in accordance with California Water Code Section 13304, to owners of private domestic wells in which perchlorate has been detected at concentrations below 4 ppb. Discharger may stop supplying interim uninterrupted water service upon the Regional Board Executive Officer's concurrence that long term uninterrupted water service has been provided to individual well owners or there have been four consecutive quarters of non-detect (using a maximum Method Detection Limit of 2 ppb) or less than 4 ppb results. However, if interim uninterrupted water service is stopped because one of the above mentioned conditions

is satisfied, the Discharger shall continue to monitor the private wells in question for perchlorate semi-annually for one year. If perchlorate groundwater concentrations remain at trace or non-detect levels during that time, the Discharger shall monitor the private wells annually for two years. If perchlorate groundwater concentrations remain non-detect or trace during that two-year period, the Discharger may stop sampling with the Executive Officer's concurrence. If perchlorate is detected at or above 4 ppb at any time, the Discharger shall provide uninterrupted water service in accordance with Paragraph 1.

3. **By October 29, 2004**, Discharger shall submit a detailed Alternative Water Supply Implementation Work Plan for uninterrupted replacement water, for wells with perchlorate concentrations from, and including, 4 ppb to 9.9 ppb. The work plan shall include: a detailed evaluation of water production rates, infrastructure needs, water usage rates, and estimated timetables for implementation.
4. Following Executive Officer concurrence with the detailed Alternative Water Supply Implementation Work Plan for wells with concentrations from 4 ppb to 9.9 ppb, Discharger shall implement the plan according to a schedule approved by the Executive Officer.
5. Discharger shall provide long term uninterrupted water service to affected well owners with perchlorate concentrations at 10 ppb (or above) as outlined in MACTEC's April 16, 2004 *Alternative Water Supply Evaluation report* (Report). The Report discusses uninterrupted water replacement options for each of these 15 individual wells. If the Discharger identifies ion exchange treatment as the most effective alternative, Discharger shall submit a schedule for implementation within **30 days following** certification by DHS. However, if ion exchange is not certified by March 31, 2005 or if DHS denies certification, Discharger shall select an alternate long term replacement water option by **May 2, 2005** or within 30 days after DHS denies certification (whichever is earlier). Discharger shall implement the alternative option in accordance with a schedule approved by the Executive Officer. Discharger may elect to implement ion exchange technology before DHS acts on the certification, in lieu of selecting an alternative option, as long as Discharger also provides bottled water until DHS issues the certification.
6. Interim and long-term replacement water shall comply with California Water Code Section 13304(f).

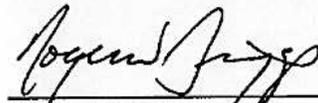
The Discharger shall be liable, pursuant to California Water Code Section 13304, to the Regional Board for all reasonable costs incurred by the Regional Board to investigate unauthorized discharges of waste, or to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, pursuant to this Order. The Discharger shall reimburse the Regional Board for all reasonable costs associated with Property investigation, oversight and cleanup. Failure to pay any invoice for the Regional Board's investigation or oversight costs within the time stated in the invoice (or within thirty days

after the date of invoice, if the invoice does not set forth a due date) shall be considered a violation of this Order. If the Property is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program.

All technical and monitoring plans and reports required in conjunction with this Order are required pursuant to Section 13267 of the California Water Code and shall include a statement by the Discharger, or an authorized representative of the Discharger, certifying (under penalty of perjury in conformance with the laws of the State of California) that the work plan and/or report is true, complete, and accurate. Hydrogeological reports and plans shall be prepared or directly supervised by, and signed and stamped by a registered geologist and/or an appropriately licensed engineer.

This Order in no way limits the authority of this Regional Board to institute additional enforcement actions or to require additional investigation and cleanup at the facility consistent with California Water Code. This Order may be revised by the Executive Officer as additional information becomes available.

FAILURE TO COMPLY WITH THE PROVISIONS OF THIS ORDER MAY SUBJECT YOU TO FURTHER ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO, ASSESSMENT OF CIVIL LIABILITY UNDER SECTIONS 13268 AND 13350 OF THE CALIFORNIA WATER CODE AND REFERRAL TO THE DISTRICT ATTORNEY OR ATTORNEY GENERAL FOR INJUNCTIVE RELIEF AND CIVIL OR CRIMINAL LIABILITY.



Roger W. Briggs  
Executive Officer

7-6-04

Date

DISTRIBUTION

Revised Alternative Water Supply Implementation Work Plan  
Olin/Standard Fusee Site  
425 Tennant Avenue  
Morgan Hill, California

September 21, 2005

Copy No. \_\_\_\_

Copies 1 - 2: Mr. David Athey and Mr. Eric Gobler  
Regional Water Quality Control Board  
Central Coast Region  
895 Aerovista Place, Suite 101  
San Luis Obispo, California 93401

Copies 3 - 4: Mr. Richard McClure and Mr. Curt Richards  
Olin Corporation  
1186 Lower River Road, NW  
Charleston, Tennessee 37310-0248

Copy 5: Mr. Thomas Mohr  
Santa Clara Valley Water District  
5750 Almaden Expressway  
San Jose, California 95118-3686

Copy 6: Ms. Sylvia Hamilton  
CAG Chairperson  
230 Cox Avenue  
San Martin, California 95046

Copy 7: Ms. Beverly Vessa  
Olin/Standard Fusee Repository  
Morgan Hill Library  
17575 Peak Avenue  
Morgan Hill, California 95037-4128

Copies 8 - 11: MACTEC Job Files

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