California Regional Water Quality Control Board
Central Coast Region

Terry Tamminen
Secretary for Environmental Protection

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

Arnold Schwarzenegger
Governor

December 8, 2004

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

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

Dear Messrs. McClure and McLaughlin:

SLIC: 425 TENNANT AVENUE, MORGAN HILL; SEPTEMBER 10, 2004 GROUNDWATER FLOW ASSESSMENT REPORT, OLIN/STANDARD FUSEE SITE, MORGAN HILL, SANTA CLARA COUNTY

Regional Board staff have reviewed the following technical reports submitted by the Olin Corporation (Olin) in respect to perchlorate found in wells north and northeast of the Tennant Ave site:

- September 10, 2004, *Groundwater Flow Assessment Report* (Report),
- October 22, 2004, *Groundwater Flow Assessment White Paper* (WP Report), and
- October 29, 2004, *Groundwater Flow Assessment RWQCB Request For Additional Information* (AI Report).

The September 10, 2004 Report was submitted in response to our February 19, 2004 work plan approval letter that requires a perchlorate investigation upgradient. The WP Report was submitted by Olin to address questions raised during a joint Olin/Regional Board staff/City of Morgan Hill (City)/Santa Clara Valley Water District (District) meeting held to discuss the September 10, 2004 Report. The AI Report was submitted in response to a Regional Board request for additional information related to groundwater modeling and other questions raised by the September 10, 2004 Report. In addition, we have considered the following comments related to the Groundwater Flow Assessment:

- October 15, 2004, Review of "Groundwater Flow Assessment Report, Olin/Standard Fusee" submitted by Komex on the City's behalf.
- November 12, 2004 letter, "*Comments on Correspondence from Olin Corporation to the Regional Water Quality Control Board, Central Coast Region dated October 22 and October 29, 2004...*" submitted by Komex on the City's behalf.
- November 4, 2004, letter "*Comments on the Groundwater Flow Assessment Report, Olin Standard Fusee Site, 425 Tennant Road...*" submitted by the District

Mr. Tom Mohr
Santa Clara Valley Water District

PCAG Members

U.S. Environmental Protection Agency

Elected Officials

cc via U.S. Mail:

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

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

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 County
Environmental 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

S:\SLIC\Regulated Sites\Santa Clara Co\Olin\OLIN-425 TENNANT AVENUE\COMMUNICATIONS - RICK McCLURE\Northeast Flow Report - Response To 9-10-04 Submittal.doc

- Verbal comments received from Olin at meetings held on September 22 and November 4, 2004.
- Verbal Comments received from the District during discussions held on September 22, October 28, and November 19, 2004.
- Verbal Comments received from the City during discussions held on September 22 and November 19, 2004.
- Written Comments received from the Perchlorate Community Advisory group on November 29, 2004.

Discussion

Regional Board staff approved Olin's Northeast Groundwater Flow Assessment Work Plan in a letter dated February 19, 2004. The approval letter directed Olin to investigate the occurrence of perchlorate in upgradient wells. Olin proceeded with the investigation and submitted the Phase I results in the September 10, 2004 Report. The Report included results of a groundwater model that was used to represent local and regional groundwater flow conditions. Olin believes that the modeling results, coupled with regional groundwater flow data from the District, adequately demonstrate that groundwater has not flowed to the northeast for a sustained period of time. However, the report did not contain any recommendations related to locations and installation of clustered monitoring wells as required by the February 19, 2004 work plan approval letter.

Regional Board staff is impressed with and appreciates the level of effort Olin has put into the Phase I data evaluation and submittal. We believe that the work put forth in Olin's groundwater model is useful information and appears to demonstrate that Llagas sub basin groundwater generally flows from North to South. The model appears to corroborate regional groundwater potentiometric maps dating back to the early 20th century. However, both the groundwater model's synthetic potentiometric maps and District potentiometric maps demonstrate that relatively flat and even reverse gradients have existed and the model does not account for flow in individual aquifer units. In addition the District has provided comments that cautions against using its regional data to account for local flow conditions. Lastly, information provided demonstrates that agricultural redistribution and reapplication of pumped groundwater is unlikely to have occurred, and thus is not a source of perchlorate transfer.

While regional flow patterns appear to be corroborated by the Report, local flow in discrete aquifer zones has not been adequately addressed. It is still possible that discrete aquifer zones (e.g., B1, B2, B3) could have or still are transporting perchlorate to the Northeast. The groundwater model was not developed to account for these discrete zones, having modeled the entire B aquifer zone only. Other concerns with the model include: rationale for boundary conditions assigned to the model top and bottom, recharge from inflow from adjacent mountains, inclusion of creeks and paleochannels, and representation of a groundwater divide as a constant head boundary vs. no-flow boundary. Significant questions still remain about recharge, vertical gradients and the integrity of confined and semi-confined units. Additionally, the groundwater elevation data used to account for local flow conditions is suspect with regard to its usefulness to represent individual aquifer

wells. We recommend that this meeting take place no later than January 26, 2005.

2. Olin and Standard Fusee shall submit the final work plan by **February 4, 2005**. The final work plan shall include a time frame for implementation and reporting.

Pursuant to Section 13267 of the California Water Code, Olin and Standard Fusee are required to provide the Additional 13267 Requirements by **the dates cited above**. Failure to submit adequate or complete information may subject you to a Regional Board enforcement action. The Regional Board requires Olin Corporation and Standard Fusee to submit the additional information cited above in accordance with Section 13267 of the Water Code to determine the concentrations and movement of the perchlorate plume in the vicinity of the site. We require Olin Corporation and Standard Fusee to submit the information as the current owner/operator and the former operator, respectively, of a flare manufacturing facility that caused soil and groundwater perchlorate contamination at and near the site at 425 Tennant Avenue, Morgan Hill.

Any person affected by these Section 13267 requirements 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 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.

Should you wish to discuss this letter or other related matters, please contact David Athey at (805) 542-4644 or Eric Gobler at (805) 549-3467.

Sincerely,

Roger W. Briggs
Executive Officer

cc via E-mail:

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

Jim Ashcraft
City of Morgan Hill

John Rohrer
Komex

Peter Forest
San Martin County Water

Steven L. Hoch
Hatch & Parent

Sylvia Hamilton
PCAG

zones. Most groundwater elevations used were collected from long screen length wells that span several aquifers or from wells with no boring or construction logs. Data used also may have been influenced by nearby pumping wells and pumping depressions. Few of the wells have elevations linked by survey data and errors caused by the interpolation of elevation data from topographic contours may be significant. These potential problems with groundwater elevation measurements yield, at best, composite groundwater elevations that may not account for local reversed gradients or conditions. Our concern with using regional groundwater elevation data that does not account for local conditions is reflected in our February 19, 2004 letter. The February 19, 2004 letter requires the installation of at least two-clustered multi-screened piezometers for local groundwater elevation characterization.

As you are aware, models are approximations of reality and it appears that this model does not adequately address the complex local groundwater flow conditions. However, the model has helped to identify data gaps that need to be filled to complete the model. Regional Board staff believes it is premature to rely solely on a groundwater model and regional elevation data to predict local groundwater flow directions (or to understand historic flow directions) without additional sub aquifer data (i.e., piezometric head elevations). Therefore, Olin and Standard Fusee shall move ahead forthwith with phase II of the Groundwater Flow Assessment Work Plan, specifically Task 2.2, piezometer installation. According to the Schedule contained in the November 21, 2003, Groundwater Flow Assessment Work Plan, approved and incorporated in the Regional Board's February 19, 2004 Section 13267 requirements, piezometers were supposed to be installed no later than 28 days after the Regulatory Meeting where the Phase I results were presented. The Phase I results were presented at our Regulatory Meeting held on September 22, 2004. According to the schedule presented in the Groundwater Flow Assessment Work Plan, these wells should have been installed by October 20, 2004. The Regional Board staff will not recommend enforcement action for violation of the October 20, 2004 date, if Olin and Standard Fusee install the additional piezometers no later than January 25, 2005. Failure to comply with this deadline will subject Olin and Standard Fusee to enforcement action based on the original compliance date.

Additional 13267 Requirements (These requirements do not supercede nor modify our February 19, 2004 letter.)

Perchlorate Monitoring:
Olin and Standard Fusee shall collect and analyze perchlorate samples from the clustered monitoring wells installed as part of Task 2.2. In addition, perchlorate samples shall be collected from wells in the area bounded by Railroad, Diane and Murphy Avenues. Olin and Standard Fusee shall submit a work plan by **December 30, 2004**, which identifies all known wells in the above-cited area and provides a plan for gaining access and sampling the wells. Once the work plan is submitted, Olin shall immediately proceed with sampling activities. Perchlorate samples shall be collected quarterly and reported in quarterly groundwater monitoring reports. We believe perchlorate data collected to the Northeast will be helpful in determining the lateral and vertical distribution.

In the event that private well perchlorate testing results indicate that perchlorate is present, Olin shall notify the well owner and recommend that the well owner(s) should consider providing their families with bottled water. The Regional Board will not require Olin to comply with Clean up and Abatement Order No. R3-2004-0101 Requirements to supply short or long term alternative water supply if data collected by Olin demonstrates to the Executive Officer's satisfaction that the perchlorate did not originate from the 425 Tennant Ave former flare manufacturing facility.

Forensic Analysis:
Olin and Standard Fusee assert that they are not responsible for perchlorate detected to the Northeast of the facility. However, the 425 Tennant Avenue facility is the only known perchlorate source in the immediate area, and the characterization of northeast groundwater flow direction is incomplete. Regional Board staff and Olin representatives have had discussions regarding the appropriateness and value of a forensic analysis to investigate the possible origins of "upgradient" perchlorate. There is value in performing a forensic analysis to determine if the perchlorate detected to the Northeast can be attributed to the former Olin Facility. While we understand that a forensic analysis may not provide definitive results, it will be a useful tool in either eliminating or confirming Olin as a source of upgradient perchlorate. Olin and or Standard Fusee shall submit the following reports in order to substantiate their claim of non-responsibility:

1. By **January 14, 2005**, submit a draft forensics work plan. The draft work plan shall include the following:

    a. A method for distinguishing perchlorate that originates from the Olin site from other potential sources. The source area forensic signature from the Olin site shall be developed through analysis of the ratios of rare to common isotopes that are ingredients of highway safety flares including chloride, oxygen, strontium, and nitrogen.
    b. Delineation of the test area including target groundwater and surface water bodies. The plan may be designed in iterative phases to allow validation of the method before applying it to a larger number of wells.
    c. A quality control plan to control error propagation and enable determination of the margin of error for each analyte used. The quality control plan shall establish a method for determining, in advance of full-scale field application of forensic techniques, whether the separation between distinct signatures of different sources, with their respective error margins, will be sufficient to distinguish sources of perchlorate.

    Forensic investigation of perchlorate sources is an emerging science, and Olin's application of this method will be pioneering. Recognizing the emerging nature of the methods Regional Board staff is requiring, we request that a meeting be held with voluntary attendance by experts in the application of stable isotope forensic techniques to discuss the best, simplest, and most appropriate approach to distinguishing sources of perchlorate impacting the City of Morgan Hill's