STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF MARCH 24, 2006

Prepared on February 16, 2006

ITEM NUMBER: **11**

SUBJECT: **Perchlorate Cleanup Sites**

DISCUSSION: New information is shown in *italics*. Please refer to previous staff reports for historical information. ***Olin's latest monthly update is included as Attachment 1.***

Olin Corporation Facility, 425 Tennant Avenue, Morgan Hill, Santa Clara County
Lead Staff: Hector Hernandez 805-543-4641

Current milestones in the investigation of perchlorate contamination emanating from the former Olin facility include:

On-site Groundwater Treatment and Containment:

Olin performed a hydrogeologic investigation to aid in the design and construction of an on-site treated groundwater injection system. Water Board staff has reviewed the results of the hydrogeologic investigation and it appears to support Olin's contention that on-site recharge is viable. Olin submitted a "90% Engineering Design Report" (Design Report) for the on-site recharge system on December 19, 2005. The Design Report provides design details, including anticipated flow rates and injection well locations.

Update: Water Board staff has completed its review of the Design Report and granted approval to initiate operating the on-site treated groundwater injection system. Olin intends to initiate system operation during February 2006.

On-site Ex Situ and In Situ Soil Treatment:

In situ soil treatment commenced on August 16, 2005. Olin is currently completing treatment system optimization, which includes determination of infiltrative capacity for each treatment cell and nutrient injection optimization. Optimization of the in situ bioremediation system is proceeding according to the scope of work provided in the "Remedial Action Work Plan & 90% Design Report for Soil Remediation" submitted in April 2004. Olin has also collected lysimeter and moisture sensor data as required by the Monitoring and Reporting Program. The system was shut off on September 22, 2005, to allow establishment of a sustainable anaerobic bacterial soil population. The system was restarted in late October. In situ bioremediation system monitoring results are presented in Olin's "Third Quarter 2005 Containment and Treatment Report" (MRP 2003-168) submitted to the Water Board on October 31, 2005.

Update: According to Olin's January 31, 2006 "Fourth Quarter 2005 Performance Monitoring Report for On-Site Containment & Treatment of Perchlorate in Groundwater and in Situ Bioremediation of Perchlorate in Soil", approximately 3.6 million gallons of amended water has been applied to the in situ bioremediation system, through December 31, 2005, along with about 12,000 pounds of citric acid electron donor. During the Fourth Quarter of 2005, it appears the In Situ Bioremediation (ISB) system has operated as designed. Monitoring results indicate that the ISB system is not adversely impacting

underlying groundwater. Anticipated work during the first quarter of 2006 includes continued water and electron donor additions, routine maintenance, and ongoing performance monitoring and evaluation.

Groundwater Monitoring and Reporting:

Olin completed monthly and quarterly sampling during September 2005. The water-level measurements included 20 on-site and off-site monitoring wells, and 26 nested BarCad wells at eight on-site locations. Groundwater samples were collected from the 28 on-site wells. Groundwater samples were collected from 145 off-site wells for the Third Quarter 2005 monitoring event.

Sampling results are included in Olin's "Third Quarter 2005 Groundwater Monitoring Report" submitted on October 31, 2005.

Update: Water Board staff reviewed Olin's "Fourth Quarter 2005 Groundwater Monitoring Report" received on January 30, 2006. Groundwater elevations and groundwater samples were collected during the fourth quarter 2005 from on-site depth-discrete monitoring wells, depth-discrete monitoring wells and production wells northeast of the Site, and other off-site production wells. Groundwater samples were collected from October 19 through November 15, 2005 from three on-site production wells, 39 on-site monitoring wells, 36 off-site monitoring wells, and 827 off-site production wells. Included in the "Fourth Quarter Groundwater Monitoring Report" is a detailed evaluation of groundwater flow, stable isotopes, major anion and cation chemistry, and hydraulic property estimates for the area northeast of the Olin site.

The "First Quarter 2006 Groundwater Monitoring Report" is due April 30, 2006. Water Board staff intends to review this report and provide comments to Olin.

Northeast Perchlorate Area:

The Water Board hosted a meeting on December 20, 2005, to discuss the status of Olin's northeast perchlorate investigation. The meeting was held to facilitate an ongoing discussion of this issue and to summarize the data for the Water Board's new project managers. Attendees included Water Board staff, City of Morgan Hill staff, Komex (City of Morgan Hill consultant), Olin Corporation, MACTEC (Olin Consultant), and Water District staff. The Water District, Komex and MACTEC each made presentations supporting their positions regarding Olin's responsibility for detections of perchlorate northeast of the Site. Olin presented new information regarding stable isotopes and additional sampling data collected from northeasterly-located wells. No decisions related to Olin's responsibility have been made. Olin will be submitting the latest northeast perchlorate information as part of the "Fourth Quarter 2005 Groundwater Monitoring Report" due January 30, 2005.

Update: Water Board staff is evaluating all available information pertaining to the detections of perchlorate northeast of the Olin facility. This task will include the review of all available data provided by all interested parties (i.e., Olin, City of Morgan Hill, Santa Clara Valley Water District), evaluation of all potential perchlorate sources, and new information to be provided in Olin's Site Characterization Report, due by March 30, 2006. Water Board staff anticipates its review and evaluation of this issue will be completed prior to the May 2006 Water Board hearing. Staff intends to present and discuss its determination as to whether the Olin facility is the source of perchlorate detections at the City of Morgan Hill's Nordstrom Water Supply Well during the May 2006 Water Board hearing.

Cleanup or Abatement Order No. R3-2004-0101

Olin continues to install groundwater ion exchange (IX) treatment systems on domestic wells. Olin is working with the Department of Health Services on certification issues. Olin has not provided Water Board staff with an update regarding when IX certification is expected.

Olin continues to provide interim alternative drinking water in accordance with Water Board CAO No. R4-2004-0101 (revised by the State Water Resources Control Board in its Order No. WQO 2005-0007, adopted on May 19, 2005).

Cleanup or Abatement Order R3-2005-0014

Update: Olin resubmitted a revised version of the "Llagas Subbasin Characterization Work Plan" (Work Plan) on February 3, 2006. Additionally, Olin submitted "Cleanup Level for Perchlorate in Off-Site Groundwater" (Cleanup Level Report), on January 31, 2006. Water Board staff is currently reviewing these reports.

Perchlorate Community Advisory and Perchlorate Working Groups

Update: *The next PCAG meeting will be held at the San Martin Lions Club on* ***Thursday, March 30, 2006, at 7 pm.*** *Water Board staff will discuss current Olin cleanup issues.*

Olin reports and significant correspondence can be accessed on our website at: http://www.swrcb.ca.gov/rwqcb3/Facilities/Olin%20Perchlorate/Olinsite.htm

McCormick Selph, 3601 Union Road, Hollister, San Benito County
Lead Staff: Hector Hernandez 805-543-4641

McCormick Selph submitted the full-scale corrective action work plan on September 30, 2005. The work plan describes McCormick Selph's plans for implementing groundwater treatment using hydrogen release compounds over a much broader plume area. Water Board staff is evaluating the report and will be providing comments to McCormick Selph.

Update: Water Board staff is reviewing the file and becoming familiar with the site-specific conditions. As soon as staff's file review is completed, staff will provide the Regional Board a more comprehensive update concerning groundwater impacts at this facility.

Whittaker Ordnance Facility, 2751 San Juan Road, Hollister, San Benito County
Lead Staff: Kristina Seley 805-549-3121

Remedial Design/Remedial Action Work Plan (Work Plan) – On May 28th, Water Board staff received Whittaker's "Remedial Design/ Remedial Action Work Plan" (Work Plan) for site-wide cleanup. The Work Plan included a design description, rationale, and schedule to mitigate impacts from Site constituents of concern including perchlorate, hexavalent chromium, and volatile organic compounds (VOCs). The purpose of the proposed design is to contain off-site migrating groundwaters and reduce the risk of impacting off-site groundwater beneficial uses.

After the on-site groundwater is extracted, Whittaker proposes to treat and discharge the water into the San Benito River (approximately 2000 feet north of the Site boundary) under an NPDES permit. The treatment system proposed consists of granular activated carbon for VOC removal and a bioreactor for perchlorate remediation.

Whittaker plans to decommission the Riverside and Christopher agricultural wells to reduce the vertical migration of contaminants. Members of the Riverside Irrigation Company (RIC) have expressed their concern regarding replacement water for the Riverside Well. Staff required Whittaker to obtain written approval from landowners/residents of the RIC prior to submittal of an alternative water supply source final design.

On October 12, 2005, Water Board staff sent Whittaker a letter that outlines the next steps anticipated in the cleanup process. Staff provided detailed Work Plan comments in a letter dated October 25, 2005. In summary, staff approved the System to extract, treat, and contain groundwater migrating from the site and to reduce the risk to off-site receptors provided Whittaker addresses Water Board comments, addresses public comments, and enrolls in our general NPDES permit for highly treated groundwater. Performance monitoring of the System will dictate if additional cleanup or abatement is required. Whittaker is required to

a. Submit a community involvment draft fact sheet and distribution list
b. Complete additional investigations in the North Building 5 and Building 23 areas prior to approval of the proposed soil capping solution.
c. Submit a performance-monitoring plan.
d. Submit a final Remedial Action/Remedial Design Report.

Update: Water Board staff and Whittaker's consultant completed a "Public Notice of Remedial Design/Remedial Action Work Plan" *(Attachment 2). The public will have until March 20th to comment. Water Board staff and Whittaker will respond to all comments received prior to System startup.*

On December 22, 2005, Whittaker submitted a "Notice of Intent" to enroll in the "General Permit for Discharges of Highly Treated Groundwater to Surface Water". *Water Board staff provided a response to the "Notice of Intent" requesting additional information before approval. The System is designed to treat perchlorate- and VOC-impacted groundwater to non-detect levels, and at no time shall the discharge exceed water quality objectives for perchlorate and VOCs.*

<u>BAE Systems (former United Defense), 900 John Smith Road, Hollister, San Benito County</u>
Lead Staff: Kristina Seley 805-549-3121

On June 24, 2005, former United Defense representatives informed the Water Board that BAE Systems purchased United Defense Industries. Although BAE Systems now operates the facility, staff has not changed.

The site is located on approximately 1,200 acres. BAE Systems has conducted military armor and tracked vehicle testing since 1968. Currently, the site is developed with several buildings, former munitions magazines, and two munitions test arenas.

On March 28, 2005, Ms. Seley spoke with BAE Systems' consultant and discussed the request by the Regional Board to implement interim corrective actions at perchlorate source areas in Arena 1. On September 21, 2005, BAE Systems submitted a "Interim Remedial Action Work Plan". In late September 2006, BAE Systems excavated shallow perchlorate-impacted soils in Arena 1 at concentrations greater than 5 milligrams per kilogram (mg/kg). BAE Systems removed approximately 400 cubic yards of soil and installed a 35,000 square foot temporary chip seal cap at Arena 1 to minimize potential mobilization associated with rainfall and runoff.

On July 1, 2005, the Executive Officer issued Monitoring and Reporting Program No. 05-0113 for the BAE site.

The second quarterly report, "Fourth Quarter 2005 Groundwater Monitoring Report," was received on January 31, 2006. Water Board staff is currently reviewing the quarterly report.

On October 15, 2005, BAE Systems submitted the Phase V Environmental Investigation Report. BAE Systems conducted additional site work to determine the extent of perchlorate and explosives in groundwater and soil. The following areas were investigated:

- **Burn Pit Area**: The landowner identified this area as a location where refuse materials had been burned in the past. Perchlorate has not been detected in soil borings at the Burn Pit Area. HMX has been detected in one of four historic soil borings, and no energetics were detected in the Phase V soil borings.

- **Arena 1**: Perchlorate has impacted groundwater and storm water quality. The highest perchlorate concentrations were found at depths less than 5 feet. Perchlorate was detected in nine of ten Phase V drainage soil borings. Perchlorate was detected in eight of ten Phase V shallow groundwater samples ranging from 950 micrograms per liter (µg/L) to 76 µg/L. BAE conducted source removal as described below.

- **Building No. 6 Area**: Phase V concluded that energetics including HMX, RDX, TNT, and TNB in soil are

concentrated in two areas, the former wastewater clarifier and the Building 6 entrance road. During historical investigations, HMX (at 0.3 µg/L) at 32 feet bgs) was the only energetic detected. During the Phase V investigation, 2,4, DNT was the only energetic detected (12 µg/L at 104 feet and 19 µg/L at 105 feet bgs). Energetics were detected at low concentration in one of three Phase V borings.

- **Building No. 1 Area**: Rain runoff from metal parts and equipment storage may have resulted in soil and groundwater impacts at this area. Perchlorate was detected in two of three historic soil borings at concentration less than 0.160 milligrams per kilogram (mg/kg). During the Phase V investigation, perchlorate was detected in two of five soil borings ranging from 0.015 mg/kg and 0.12 mg/kg.

Water Board staff has reviewed the "Phase V Environmental Investigation Report" and has provided comments. BAE Systems will submit a work plan for its next environmental investigation based on Water Board staff comments. We anticipate BAE Systems will submit a Risk Assessment and Remedial Investigation/ Feasibility Study by February 28, 2006. *Water Board staff is working with Office of Environmental Health Hazard Assessment (OEHHA) to review this document.*

Water Board staff have requested BAE Systems expedite submitting its annual report required pursuant to their industrial storm water permit. At Arena 1, storm water samples have confirmed perchlorate detections. We have requested BAE Systems determine if the excavation of perchlorate impacted soil at Arena 1 conducted prior to this rainy season mitigated impacts to surface water. We expect to receive these results prior to the March Board meeting.

MK Ballistic Systems, 2707 Santa Ana Valley Road, Hollister, San Benito County
Lead Staff: Kristina Seley 805-549-3121

Background: The MK Ballistic Systems site is located west of the BAE Systems Test Facility. Currently, MK Ballistic Systems leases buildings and storage magazines on the five-acre property and manufactures "less-lethal" explosives and ordnance components and devices. Numerous other tenants have conducted similar operations at the facility and have used perchlorate and other explosive compounds in their manufacturing process. In 1991, USEPA conducted a time-critical cleanup action when one of the former tenants, Caelus Devices, Inc., went bankrupt and abandoned the facility without proper containment and storage of shock-sensitive explosive chemicals.

Concern: BAE Systems tested all site wells for chemicals of concern. Perchlorate was detected three consecutive quarters at about 30 ppb in a windmill well upgradient from all identified soil and groundwater perchlorate impacts. BAE Systems' "Phase IV Environmental Investigation Report" proposes that historical use of perchlorate at the neighboring site, MK Ballistic Systems, may be the cause of contamination. Based on the historical use of perchlorate and explosives at MK Ballistic Systems, and due to the perchlorate detections in the windmill well, we believe that current or past practices at the MK Ballistics site may have impacted groundwater.

Action: On January 9, 2006, Water Board staff met with the landowner, her attorney and environmental consultant, and the current operator at the facility to discuss our concern that past practices may have impacted the windmill well. In a January 24, 2006 letter, the Water Board directed the landowners and current operator to provide a work plan by March 24, 2006. The requested work plan must include a summary of historical practices, proposed investigation tasks, sampling and analysis plan, and time schedule (see Attachment 3).

Water Board staff is also coordinating with Department of Toxic Substance Control (DTSC), which is currently reviewing existing site conditions.

The landowner conducted perchlorate testing at the domestic supply wells located on the property, but in the inferred upgradient direction to the MK Ballistic Systems site. While a copy of the results has not been received, Water Board staff was informed by the landowner's attorney that perchlorate was not detected in any well tested. Water Board staff will confirm these results prior to the March Board meeting.

ATTACHMENTS

1. Olin's Progress Report # 42
2. Whittaker Site Public Notice of Remedial Design/Remedial Action Work Plan.
3. MK Ballistic Systems Site Environmental Investigation Work Plan request letter

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