STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

**STAFF REPORT FOR REGULAR MEETING OF MAY 11-12, 2006**
Prepared on April 10, 2006

**ITEM NUMBER:** 9

**SUBJECT:** **Perchlorate Cases**

**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 completed its review of the Design Report and on February 28, 2006, granted approval to initiate operating the on-site recharge system. The recharge system is designed to accommodate an injection rate range of 50 to 250 gpm, with the expectation that extraction rates will generally occur within a range of 50 to 175 gpm. Groundwater is extracted from two shallow (A-zone) wells and an uppermost intermediate (B1-zone) well, located on the southern portion of the site. Extracted groundwater is combined and filtered, and perchlorate is removed using an ion-exchange process. Treated groundwater is injected to the shallow (A-zone) aquifer using three injection wells located along the northern portion of the site. Two additional injection wells may be added in the future if necessary.*

*During on-site bioremediation system operation (expected through the end of 2007), the recharge rate to the injection wells will be reduced by approximately 40 gpm (on average), as some portion of the treated groundwater will continue to be diverted to the infiltration unit. Following completion of the bioremediation program, the injection wells will receive the entire effluent discharge. In addition, while the goal is to inject all effluent into the shallow aquifer, Olin will retain the capability of discharging effluent to the Butterfield Ditch when deemed necessary during emergencies.*

**On-site Ex Situ and In Situ Soil Treatment:**

In situ soil treatment commenced on August 16, 2005. 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. As required by the Monitoring and Reporting Program, Olin has collected lysimeter and moisture sensor data.

***Update:*** *In-situ bioremediation (ISB) system results are presented in 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." Performance Monitoring results indicate the ISB system is operating as designed and is performing as anticipated.*

*Anticipated work during the first quarter of 2006 includes continued water and electron donor additions, routine maintenance, and ongoing performance monitoring and evaluation. Water Board staff will continue to evaluate the performance and effectiveness of the ISB system and will update the Water Board concerning any significant developments.*

**Groundwater Monitoring and Reporting:**
***Update:*** *To assist the City of Morgan Hill gain a better understanding of water level fluctuations northeast of the Olin facility, Water Board staff coordinated a sampling schedule and sharing of water level data between the City of Morgan Hill's consultant (WorleyParsons-Komex) and Olin's consultant (MACTEC). The coordination efforts led to the sharing of water level measurements from several City water supply wells and Olin's water level measurements collected as part of its March 1, 2006 sampling event.*

*Olin completed the installation of ten dedicated groundwater-monitoring wells south of the Site. Each well was constructed with multi-level technology for a total of eighty-seven screened intervals. Samples and groundwater elevations were collected late in the Fourth Quarter 2005 period and results are reported in the Llagas Subbasin Characterization Report, received on March 30, 2006. All of these wells will be incorporated into the monitoring network and results will be reported in subsequent quarterly reports. Further, during December 2005, Olin performed additional groundwater assessment activities within the study area south of the Site. A total of ninety-seven groundwater samples were collected using the Hydropunch method during the CPT investigation at twenty-nine locations. The results of the CPT investigation are summarized in Olin's Llagas Subbasin Characterization Report.*

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

**Northeast Perchlorate Area:**

***Update:*** *Water Board staff is evaluating all available information pertaining to the detections of perchlorate northeast of the Olin facility. This task includes 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 the new information provided in Olin's March 30, 2006 Llagas Subbasin Characterization Report. Water Board staff anticipates sending a letter discussing the perchlorate detected northeast of the Olin Site at the end of April. Staff will briefly 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. Staff anticipates some interested persons (Olin, City of Morgan Hill, interested agencies and general public) may want to express their opinions to the Water Board at the May 12, 2006, public meeting.*

**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).

***Update:*** *In accordance with the State Board Order, after four prospective quarters of monitoring (after May 19, 2006), the Executive Officer may authorize Olin to cease proving replacement water to users of domestic wells showing perchlorate concentrations equal to or less than 6 ppb. Based on observed decreasing perchlorate trends throughout the Llagas Subbasin, we anticipate Olin will request to cease providing replacement water for a majority of the domestic water supply wells currently affected. To date, no such request has been received.*

**Cleanup or Abatement Order R3-2005-0014**

***Update:*** *Water Board staff reviewed and approved full implementation of Olin's February 3, 2006 "Llagas Subbasin Characterization Work Plan" (Work Plan), on March 21, 2006. On March 3, 2006, Olin submitted "Plume Migration Control Assessment Report for the Llagas Subbasin" (Migration Control Report). Water Board staff has completed its review of this report and is preparing a response letter. Additionally, Olin submitted the "Llagas Subbasin Characterization" (Characterization Report), dated March 30, 2006. Water Board staff will review this report and provide comments to Olin.*

**Perchlorate Community Advisory and Perchlorate Working Groups**

***Update:*** *The next PCAG meeting will be held at the San Martin Lions Club on* ***Friday, May 5, 2006, at 2 pm.*** *Water Board staff will attend and be available to address questions from the public concerning the ongoing 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 groundwater 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.

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.

Water Board staff and Whittaker's consultant completed a "Public Notice of Remedial Design/Remedial Action Work Plan." *The Water Board received comments from the San Benito County Water District, members of the Riverside Irrigation Complany and site neighbors. Water Board staff has responded to one of the comments and will respond and address 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. *Staff received Whittaker's response to our questions and will review and respond prior to the May Regional Board meeting.*

*Water Board staff is reviewing Whittaker's January 19, 2006 "Terra Linda Water Association Supply Well (TLWA well) Assessment Report." The Report included an evaluation of the TLWA well construction details, evaluation of the aquifer yeild, confirmation of water-bearing units, vertical delination of constituents of concern, development of groundwater hydro-geochemical signatures. Water Board staff will provide comments to Whittaker prior to the May Regional Board meeting.*

*On March 27th, Whittaker submitted a "Data Gap Investigation/Well Installation Work Plan" as an informational item to address 1) hydrogeologic data gaps in and around the southern Site boundary and 2) the installation of extraction wells as part of the "Remedial Design/ Remedial Action Work Plan." Water Board staff is currently reviewing the document and will provide comments to Whittaker prior to the May Regional Board meeting.*

*Water Board staff is reviewing Whittaker's March 28, 2006 "Potential Source Area Investigation Work Plan." The Work Plan was prepared in accordance with the Water Board's request to conduct additional soil investigations at North Building 5 and Building 23. The work plan identified data gaps and proposed additional work to further delinate TCE impacts beneith the two buildings.*

**<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.

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.

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. Staff received the Phase VI Environmental Investigation Work Plan on March 1, 2006. Water Board staff and BAE System consultants held a conference call on March 22nd to discuss initial comments. Water Board staff requested additional information and will conduct a site inspection prior to the May Regional Board meeting to review the proposed work onsite. Water Board staff will finalize Phase VI work plan comments following the site inspection. BAE Systems will conduct Phase VI work after the rainy season.*

*On February 28, 2006, Water Board staff received the "Human and Ecological Risk Assessment." The risk assessment proposed soil cleanup values based on the risk to potential receptors (human ecological, and groundwater). Water Board staff is working with Office of Environmental Health Hazard Assessment (OEHHA) to review this document.*

*On February 28, 2006, BAE Systems submitted an "Additional Environmental Investigation Report." The additional investigation included 1) analysis of grass samples throughout the site, 2) a geophysical survey at Arena 1, and 3) advancement of 12 shallow soil borings at Arena 1. Of the 19 grass samples collected, five contained less than 1.0 mg/kg perchlorate, one contained 3.7 mg/kg, one contained 16 mg/kg, and no perchlorate was detected in the rest.*

*Water Board staff has requested BAE Systems expedite submitting its annual report required pursuant to its 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. BAE Systems collected stormwater samples in January 2006. Perchlorate was detected in stormwater down gradient of Arena 1 and explosives were detected down gradient of Building 6. Pursuant to the Industrial Stormwater Permit, BAE will implement BMPs to the maximum extent practicable and update*

*the site's Stormwater Pollution Prevention Plan. Water Board staff will review the BMPs and updated Stormwater Pollution Prevention Plan.*

**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 their site wells for chemicals of concern. Perchlorate was detected for 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" proposed 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.

*On March 24, 2006, Water Board staff received the figures and tables showing current land use and the site-sampling plan. Staff received the full work plan and appendices on March 31, 2006. Water Board staff will review and provide comments to the work plan in late May 2006.*

Water Board staff is 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.

## ATTACHMENT

1. Olin's Progress Report # 44, dated April 10, 2006

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