STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF DECEMBER 3, 2004
Prepared on October 30, 2004

ITEM NUMBER: 12

SUBJECT: Perchlorate Sites

DISCUSSION:

New information is shown in ***italics***. Please refer to the July 9, 2004 staff report for additional historical background information.

General Information: The Department of Health Services (DHS) released the draft Maximum Contaminant Level (MCL) for perchlorate, on October 27, 2004. The draft MCL is 6 ppb. The DHS must now formally adopt the MCL through a statutorily defined process. The main steps in DHS' Drinking Water Program's regulations process include: Review by DHS' Office of Regulations; DHS' Budget Office, the Department of Finance; and the Health & Human Services Agency. It is then released to the Office of Administrative Law (OAL) for publication in the California Regulatory Notice Register announcing the availability of the regulation for a 45-day public comment period. A second 15-day public comment period will be held, but only if changes are made in response to public comments received during the first comment period. The draft MCL will then be approved by the DHS Director's Office followed by a final review by OAL. Following OAL approval, the regulation is filed with the Secretary of State, and becomes effective 30 days later. Regional Board staff anticipates the MCL will be adopted within the next 12 months and will provide updates as the draft MCL makes its way through the review and adoption process.

Olin Corporation Facility, 425 Tennant Avenue, Morgan Hill, Santa Clara County [David Athey 805-542-4644]

Current milestones in the investigation of perchlorate contamination on and offsite of the former Olin facility include:

Onsite Groundwater Treatment and Containment:

On November 18, 2003, Regional Board staff approved the installation and operation of the Onsite Groundwater Containment and Perchlorate Removal System (System). The System's purpose is to provide hydraulic containment and removal of perchlorate through onsite groundwater extraction and treatment. The System began operation on February 23, 2004. By April 7, 2004, System startup was completed and has been operated continuously since that time.

On July 30, 2004, Olin Corporation (Olin) submitted the Second Quarter 2004 On-Site Groundwater Containment & Perchlorate Removal System Performance and Discharge Monitoring Report. Olin is required to submit these reports quarterly and highlights include:

- Total groundwater extraction from April 1 to June 29 was 14,276,305 gallons.
- Based on an average concentration of 46 µg/l, approximately 5.5 lbs. of perchlorate was removed from onsite groundwater.
- Samples collected at the midpoint and discharge pipe sample ports were consistently less than 4 ppb.

The Third Quarter Report was received October 30, 2004 and is being reviewed. Updated groundwater treatment data was not available for the period of July to October. Regional Board staff will provide an update in the February Staff Report.

On and Off-site Groundwater Monitoring and Reporting:

On April 30th, Olin submitted the 1st Quarter, 2004 groundwater monitoring report. This report includes information related to groundwater monitoring activities, including greater detail on groundwater flow conditions, and provides Olin's justification for their proposed groundwater monitoring system. Regional Board staff is currently reviewing the proposed groundwater monitoring system justification and will be providing comments to Olin shortly. Regional Board staff is reviewing and incorporating, where appropriate, comments from the Cities of Morgan Hill and Gilroy, the Santa Clara Valley Water District and PCAG.

Update: Regional Board staff is currently reviewing the proposed groundwater-monitoring plan and will be providing comments to Olin by November 15th. Olin has verbally requested that Regional Board staff delay issuing comments so that Olin and the Santa Clara Valley Water District could meet and discuss issues related to offsite monitoring and cleanup (meeting scheduled for November 3, 2004).

Northeast Groundwater Flow Assessment:

Regional Board staff met with Olin and their consultants on May 17th to discuss their preliminary findings. Olin verbally presented findings related to regional groundwater flow conditions and a simplified model of upgradient municipal well capture zones. However, Olin did not present any information on local groundwater conditions including groundwater elevations.

Olin submitted the Northeast Groundwater Flow Assessment Report on September 10, 2004. Regional Board staff met with Olin, the City of Morgan Hill, and Santa Clara Valley Water District on September 22, 2004 to discuss the report's findings. Regional Board staff is currently reviewing the report and will be responding to Olin in the next few weeks. Regional Board staff will provide its response to the Regional Board as part of the December Perchlorate update.

Update: Regional Board staff has finished their preliminary review and have identified several issues where more information is needed. In addition to information that was required to be submitted by Regional Board staff's February 19, 2004 Northeast Flow Assessment work plan approval letter, Olin submitted modeling information that Olin believes demonstrates that groundwater flow does not occur to the Northeast. However, Olin did not include modeling information related to input parameters and assumptions. Regional Board staff have therefore requested this information be submitted by October 29th (see letters dated October 8th and 15th, 2004, in Attachment 1). The information was received and is being reviewed. On October 22, 2004, Olin submitted a report entitled Groundwater Flow Assessment White Paper. The paper provides additional information as a follow-up to the September 22, 2004 joint technical meeting. Regional Board staff plans to issue comments to Olin in November upon completion of its review of all recent related information.

The City of Morgan Hill submitted comments, via email, on October 19, 2004. The SCVWD has verbally indicated it will be submitting comments after they have a chance to review the additional information provided for Olin. Regional Board staff will consider all comments received prior to issuing final comments to Olin.

Onsite Ex Situ and In Situ Soil Treatment:

Olin has proposed to treat onsite perchlorate impacted soils using both ex situ and in situ methods. The two main components of the treatment option include: ex situ anaerobic bioremediation of perchlorate-contaminated soils greater than 7,800 µg/kg, the United States Environmental Protection Agency (USEPA) residential Preliminary Remedial Goal, and in situ bioremediation of soils above the site-specific soil screening level of 50 µg/kg. The site specific soil remediation goal is derived from the methods described in the

USEPA's *Soil Screening Guidance*: *Users Guide* and is the calculated concentration of

perchlorate that would not result in groundwater impacts above 4 µg/kg.

Regional Board staff conditionally approved *Olin's Remedial Action Work Plan & 90% Design Report For Soil Remediation* on June 10, 2004. Olin subsequently responded to comments and Regional Board staff provided final approval on August 3, 2004. Olin has begun In Situ system construction and has completed the Ex Situ Soil treatment pile. Figures 1 and 2 in the October 22, 2004, Staff Report, show the completed Ex Situ pile without the final cover.

Olin continues to construct the In Situ system and will initiate operation at the conclusion of Ex Situ soil treatment.

Update: *According to Olin's October 12, 2004, Progress Report #26, confirmatory soil samples have been collected from the Ex Situ soil treatment pile. Olin is collecting the samples to determine if the Ex Situ soil treatment has reached the cleanup goal of 50 ug/l. Once the cleanup level has been achieved, Olin will backfill the Ex Situ soil excavation. Olin anticipates mobilizing for In Situ treatment system construction by the end of October, depending on the weather.*

Response to Regional Board Member question from the October 22, 2004 meeting:

Question – Does the soil treatment system become over saturated with heavy rain? How is this controlled? (paraphrased)

Answer – Excessive rainfall or over saturation is not a critical problem and system operation can be adjusted to account for the excess moisture. During heavy rain events, the system can be throttled back or even shut down while rain events happen. Once rainfall ceases, the system can be turned back on. In the case of heavy prolonged rainfall, the food (substrate) can be spread manually, using rainfall as the carrier, thereby eliminating treatment downtime. In addition, the groundwater extraction and treatment system has been designed to capture groundwater that flows from beneath the treatment area. This acts as a backup to soil treatment in the event heavy rainfall does disrupt soil treatment. Additionally, all rain that falls on the soil treatment area will be contained within earthen berms and will not leave the treatment area.

City of Morgan Hill Water - Tennant Well:

In a letter dated March 17, 2004, Regional Board staff requested that Olin comment on whether the Tennant well can or cannot be operated based on updated site hydrogeologic information. The City of Morgan Hill has voluntarily shut down the Tennant well because of perchlorate detections. The City has now requested that the City be allowed to restart the well, based on an anticipated water shortage in the coming months. Olin has previously objected to the operation of the Tennant well based on their belief that it could potentially pull perchlorate into deeper aquifer zones. Regional Board staff requested that Olin review the City's report and respond by April 30, 2004.

Olin Corporation responded to Regional Board staff's request with a letter dated April 30th, 2004. The response outlined their technical and non-technical position on why the Tennant well should not be operated. Staff has reviewed the response and does not agree with Olin's technical response. In a letter dated May 19th, staff requested Olin supply additional technical data to support Olin's position. Olin responded to the May 19th letter on June 21, 2004. After careful review, Regional Board staff does not believe Olin's response includes any additional information. In response, Regional Board staff sent a letter to the City of Morgan Hill informing them that Regional Board staff has no objection to Tennant well operation. In addition, a letter was sent to Olin directing them to closely monitor their groundwater containment and treatment system if the Tennant well is operated. If impacts are shown, Olin is required to show the impacts extent and propose remedies. If Olin can adequately demonstrate that remedies cannot be proposed, Regional Board staff will ask the city to shut down the well. However, any request to stop Tennant well pumping will only be sent upon careful review and concurrence with Olin data.

Update: Tennant well operation has been temporarily suspended because of bacterial contamination. The City is working with the ion exchange treatment system vendor to correct the problem. The City anticipates restarting the well in November.

Cleanup or Abatement Order No. R3-2004-101:

This July 9, 2004 Order, directs Olin and Standard Fusee to supply uninterrupted replacement water to well owners with perchlorate-contaminated wells. The Order requires Olin and Standard Fusee 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 4 ppb. Well owners with wells that test at or higher than 4 ppb shall be supplied interim uninterrupted water service (currently bottled 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, Olin and Standard Fusee may cease supply of uninterrupted water service if, after four quarters of testing, the results remain less than 4 ppb. However, the Order requires additional testing to monitor perchlorate groundwater concentrations.

On August 5, 2004, Olin petitioned the State Water Resources Control Board (State Board) to review the Order. The State Board is currently reviewing the petition and will be issuing a determination on completeness shortly. In the meantime, Olin is continuing to comply with the ordered requirements. Wellhead treatment for the West San Martin Water Company and the San Martin County Water District wells will not be affected by Olin's appeal. Olin has made individual agreements with these water purveyors and perchlorate will continue to be removed from those supply sources. Staff is working on the response to the Olin Petition.

Regional Board staff submitted their response to the Olin petition on September 20, 2004. Support for the Cleanup and Abatement Order No. R3-2004-0101 was also provided to the State Board from Stan Williams and Sylvia Hamilton on behalf of the Perchlorate Working Group and the Perchlorate Community Advisory Group. (see Attachment 1 in the October 22, 2004, Staff Report) and from Assemblyman John Laird (see Attachment 2 in the October 22, 2004, Staff Report). The State Water Resources Control Board has up to 270 days to review and act on the response. On September 22, 2004, the State Board denied Olin's stay request that sought to hold Cleanup and Abatement Order R3-2004-0101 in abeyance (see Attachment 3 in the October 22, 2004, Staff Report) until the petition is acted on by the State Board.

Update: The State Board is still considering Olin's petition and Regional Board staff's response. The state Board has 270 days from September 20, 2004, to act on the petition.

Upcoming Reports: The Cleanup or Abatement Order requires Olin to submit an Alternative Water Supply Implementation Work Plan (Work Plan) by October 29, 2004. The report was received. The Work Plan will detail Long Term alternative water supply for wells with perchlorate concentrations from, and including, 4 ppb to 9.9 ppb. The Work Plan is required to include a detailed evaluation of water production rates, infrastructure needs, water usage rates, and estimated times for implementation. Following Executive Officer Concurrence with the Work Plan, Olin will be required to implement the Work Plan on a schedule approved by the Executive Officer.

Southern Plume Area and Gilroy Wells:

During the Second Quarter, Olin tested 42 southern area wells near the City of Gilroy. Of these 42 wells, six were sampled for the first time. Twenty-six wells did not contain perchlorate above the reporting limit of 4 ppb. Sixteen wells had perchlorate concentrations ranging from 4 to 6.6 ppb. According to Olin, these results define the southern most detections of perchlorate above the Department of Health Service's 6 ppb action level.

As of the Second Quarter, the City of Gilroy supply wells have not had detections of perchlorate above 4 ppb. Regional Board staff will continue to monitor the southern plume area and work with Olin to ensure the southern plume area is properly delineated.

Perchlorate Community Advisory Group (PCAG)

Regional Board staff provided an update at the September 23, 2004 PCAG meeting. Olin and their consultant MACTEC presented a summary of the 2nd Quarter Report, the Groundwater Flow Assessment Report, and

Point of Entry for perchlorate-impacted well treatment.

Update: The October 8, 2004, PCAG meeting was canceled. The next PCAG meeting is scheduled for November 12th.

McCormick Selph, 3601 Union Road, Hollister, San Benito County

On July 12, 2004, PES submitted the Second Quarter 2004 Groundwater Monitoring Report. The report outlines the Discharger's activities related to ongoing groundwater monitoring and pilot scale hydrogen releasing tests. The site will continue to monitor both the chemically reducing conditions and perchlorate concentrations in nearby wells in order to establish concentration trends. Regional Board staff has not performed an in depth report review at this time. However, a cursory review indicates that reducing conditions favorable to perchlorate removal have been established in the coarser grain aquifer material. This is confirmed by a decline in coarser grain aquifer perchlorate concentrations from 1,200 µg/l to less than the laboratory reporting limit of 4 µg/l. Establishment of reducing conditions in finer grain deposits has still not been observed. McCormick Selph's consultant believes the slower fine grain deposits' groundwater movement is delaying establishment of reducing conditions. Regional Board staff will continue to monitor the status of the Pilot Scale Injection as quarterly reports are submitted.

Update: Regional Board staff recently reviewed the 3rd Quarter, 2004 groundwater monitoring report, submitted October 14, 2004. Onsite groundwater perchlorate concentrations mirror 2nd quarter results. The coarser grain alluvial aquifer results continue to show a decrease in perchlorate concentrations. This decrease is related to the higher hydraulic conductivities of the coarser grain deposits. Deeper fine grain deposits continue to show no effect from the pilot scale HRC injections. Regional Board staff has issued a comment letter and will continue to monitor the pilot scale HRC injections as the Quarterly reports are submitted. McCormick Selph is required to submit the reports through July 15, 2005 and will submit a final cleanup plan on September 15, 2005.

Whittaker Ordnance Facility, 2751 San Juan Road, Hollister, San Benito County

On August 13 2004, Regional Board staff visited the Whittaker Ordnance facility to discuss site activities and observe site cleanup areas. Remediation efforts continue in the Waste Storage Pad Area, Ex Situ Soil Bioremediation test pad, and Former Building 22A. Whittaker is still collecting data in these areas and will be submitting the following reports shortly (some reports have been received):

- ***First Semi-Annual 2004 Groundwater Monitoring Report*** – This report covers monitoring activities from January 1, 2004 to June 30, 2004. This Report was received on August 30, 2004 and is currently being reviewed by Regional Board staff.
- ***Groundwater Monitoring Well Installation Report*** – This report outlines Whittaker's recent well installation activities related to additional onsite and offsite groundwater characterization.
- ***Deep Aquifer Analysis Report*** – This report will discuss the best options for offsite groundwater containment. Currently, three offsite wells have been impacted. This Report was received on September 17, 2004, and is currently being reviewed by Regional Board staff.
- ***Final Waste Storage Pad Demonstration Report*** – This report will outline in situ soil testing results and provide final soil remediation recommendations.
- ***Former Building 22A Ethanol Infiltration Pilot-Test Status Report Addendum*** – This report will present additional testing information collected by Whittaker. This Report was received on September 13, 2004, and is currently being reviewed by Regional Board staff.
- ***Ex Situ Bioremediation Pilot-Test Status Report*** – This report will present the current test status and recommendations for additional work. This report was received on September 15, 2004, and is currently being reviewed by Regional Board staff.
- ***Sampling and Analysis Plan*** - This report will be submitted in response to Regional Board staff's request for a comprehensive review of on and off site groundwater monitoring. Regional Board staff

anticipates updating Whittaker's Monitoring and Reporting Program once the report is reviewed and approved.

- **Monitoring Well Installation Report and Revised Hydrostratigraphic Interpretation Report –** This Report was received on September 20, 2004. The report details well installation activities performed to better define groundwater conditions downgradient. Regional Board staff is currently reviewing this report.

Update: Site wide remediation activities are described in Whittaker's First Semi-Annual 2004 Groundwater Monitoring Report and are summarized below. A map showing these locations, except Off-site Supply Well Treatment locations, is included as Attachment 2. Details will be presented at the December 3, 2004 Board Meeting.

Off-site Supply Well Treatment

- *Riverside Well Air Stripper: The Riverside Well Air Stripper (Air Stripper) began operation in November 1995. The Air Stripper consists of a 4-foot diameter, 43 foot tall (30-foot packed column) with a typical flow rate of 480 gallons per minute. The well is operation about six months of the year, mainly during the dry season. During the first Quarter 2004, 57,600 gallons of groundwater were treated and approximately 0.021 pounds of VOC were removed. During the second quarter approximately 130,000 gallons were treated with approximately 0.0026 pounds of VOC removal. Trichloroethene (TCE) concentrations ranged from 150 to 660 µg/l during the first half of 2004.*
- *Carbon Adsorption Treatment Systems: These systems were installed in 1993 on three domestic wells contaminated with TCE and other VOC at or near drinking water standards. No VOC were detected during the First or Second Quarter 2004 effluent monitoring events.*

North Building 5 Former Septic Tank Area

- *Groundwater Extraction and Treatment System (GETS): The treatment system has been in operation since January 15, 2002. The GETS system consists of carbon adsorption and ion exchange treatment. The GETS system treats groundwater extracted from MW-3, MW-7 and extraction wells EW-1, 2, 3 and 4. Treated groundwater is re-injected at well MW-44. During the first quarter 2004, approximately 111,500 gallons of groundwater were extracted. According to the Discharger, approximately 0.29 pounds of perchlorate and 4.84 pounds of VOCs were removed. Further, second quarter removal rates were slightly less, with about 0.24 pounds of perchlorate and 3.6 pounds of VOCs removed.*
- *Soil Vapor Extraction System (SVE): The SVE system was installed in January 2002. The system consists of a trailer mounted 100 cubic feet per minute vacuum pump that extracts soil vapors from extraction wells VZ-1, 2, and 3. During the first half of 2004, the airflow through the system averaged 39.5 standard cubic feet per minute. The total VOC mass removed during the past 6 months was approximately 33.7 pounds, with a average monthly removal rate of 5.6 pounds.*
- *Ozone Sparging System (OSS): This OSS started operation in January 2002. The OSS is designed to chemically oxidize VOCs in groundwater and secondarily to increase dissolved oxygen concentrations at the treatment areas periphery to promote in situ aerobic degredation of TCE by products, including cis-1,2-DCE and vinyl chloride. The system was not in operation during the 1st semi-annual reporting period because of operation problems with the Ozone generator. The system has been repaired and, according to the Discharger, will be back in operation during the 3rd quarter of 2004. Because the system was not operational, concentrations of VOCs were shown to be stable or increasing. Regional Board staff is not concerned with these trends since it appears that when operational, the OSS system is effective at removing VOCs.*

South Building 5 Former Drywell Area Hydrogen Releasing Compound Post-Pilot Test Monitoring

In November of 2000, the Discharger initiated an interim remedial measure consisting of Hydrogen Releasing Compound (HRC) slurry injected in a 20 well point grid. Monitoring results since November 2000 indicate that concentrations of perchlorate, TCE and hexavalent chromium show reduced concentrations. However, the persistence of cis-1,2-DCE in the study area and the absence of measured Oxidative Reductive Potential

less than –200 to 250 mV indicates that continued reduction of the remaining constituent of concern (COC) mass will not likely occur. Regional Board staff will be addressing this issue with the Discharger in the coming months.

Northwest Site Boundary Area In Situ Reactive Zone (IRZ)

The Northwest Site Boundary Area IRZ injection well network is installed along the northwest property line to intercept portions of the commingled plume emanating from the North Building 5 Former Septic Tank Area, South Building 5 Former Dry Well Area, Former Waste Storage Pad Area, and the Lower Pond Area. Substrate Injection events were conducted February 2 to 13, April 22 to 27 and July 7 to 9, 2004. Approximately 565 gallons of substrate, 1 part corn syrup to 15 parts water, were injected during each event. Seven injection events have now occurred since inception of corrective action in June 2003.

Monitoring results indicate that reducing conditions have been established as demonstrated by COC reductions in monitoring wells MW-11, MW-2 and WBZ2-1 of: perchlorate 71%, 41% and 33% declines respectively; hexavalent chromium 100% and 53% (MW-11 and 2); and TCE in MW-11 of 69%.

Recent groundwater monitoring well installation activities have led to a better understanding of shallow hydrogeology in the IRZ area. The Discharger now believes the monitoring wells cited above may be located side gradient of the IRZ area. Regional Board staff will be evaluating the Discharger's data and will be addressing this issue in comments on the 1st Semi-Annual Groundwater Monitoring Report.

Lower Pond Area IRZ

Three injection events were conducted during the 1st semi-annual reporting period. On February 6th and April 21st approximately 390 gallons of 20:1 water to corn syrup solution were injected. Another 1000 gallons of substrate (15:1 solution) was injected from July 6 through 9, 2004. Seven injections have now been conducted since corrective action began in June 2003. The Discharger has acknowledged that performance monitoring well MW-63 is side to upgradient of the IRZ treatment area and is not likely within the area influenced by the IRZ corrective action. Regional Board staff will be addressing Lower Pond Area IRZ corrective action monitoring as part of comments on the 1st Semi-Annual Groundwater Monitoring Report Comments.

Building 23 IRZ

Three injection events were conducted during the reporting period including: February 2, 2004, 800 gallons of 10:1 water to corn syrup solution; April 21st through 22nd, 1,300 gallons of 10:1 solution; and July 6th, 1,300 gallons of 10:1 solution. During these events the substrate solution was applied to injection points IP-4, 5, 6, 53, 54, and 55 at varying amounts and pressures.

Monitoring results indicate that Dissolved Oxygen and Oxidative Reduction Potential are declining and indicate that COC-reducing conditions are present within portions of the Building 23 IRZ area. Perchlorate concentration have exhibited declining trends and are below reporting limits, <4 ug/l, in well MW-56 and has shown a 95% decline in MW-28. Hexavalent Chromium Concentrations have exhibited declining trends and were below detection limits, 0.5 ug/l, in well MW-56 and 60, and have shown a 93 % reduction in MW-28. Freon 113 concentrations have been reduced by 96 % in MW-56. Currently, perchlorate and TCE have not shown declining trends in MW-60. The Discharger plans on increasing substrate additions to increase available TOC around MW-60. Should this fail to reduce COC concentrations, the Discharger will evaluate additional injection points southwest of MW-60 to optimize IRZ conditions.

Upper Burn Area IRZ

Perchlorate is the only COC in groundwater. The upper burn area includes 27 substrate injection wells installed in a 15,000 square foot area. Three injection events were conducted during the first six months of 2004. Injection events were conducted on February 9, 2004, 459 gallons; April 21st through 22nd, 1,185 gallons; and June 30th through July 1st, 650 gallons. Ten injection events have now been conducted since expansion of the IRZ in September 2002.

IRZ performance monitoring parameters indicate that perchlorate-reducing conditions have been established. Perchlorate

concentrations have decreased in monitoring well MW-49 from approximately 200,000 µg/l, September 25, 2002, to less than 8 µg/l, March 15, 2004. However, an increase was seen in MW-49 during the May 21st monitoring event to 83 µg/l. Perchlorate concentrations also showed declining trends in MW-27, 99.8% reduction, and MW-50, 96% reductions.

Southwest Burn Area IRZ

The Southwest Burn Area's primary COC is perchlorate, although TCE has been detected in several local monitoring wells. There are approximately 19 injection wells installed within an approximate 72,000 square foot area. Three injection events were conducted including: February 2nd through 5th, 1,000 gallons; April 19th through 27th, 2,250 gallons; and June 30th to July 7th, 2,000 gallons. In addition, the Discharger has attempted to hydrofracture low flow injection points by increasing applied pressure to 100 pounds per square inch and increasing flow rate to increase the potential radius of influence. As a result, injection refusal was not encountered although low flow rate persists in injection well IP-36.

Varying results are evident in surrounding monitoring wells. Monitoring wells MW-1, 90% reduction, and MW-17, 69% reduction, have shown decreasing trends while concentrations in MW-57 remain stable. The Discharger hypothesizes that the mixed results may be caused by the shallow groundwater gradient and low seepage velocity, (2 to 3 foot per year), poor advective[1] distribution of substrate solution beyond the initial injection radius of influence, and the current injection well network distribution/spacing. Regional Board staff will be working closely with the Discharger to ensure these issues are addressed and remediation continues.

Former Burn Area Soil Remediation Program

The Discharger has proposed soil flushing with groundwater extraction and treatment for Former Burn Area soil remediation. The proposed soil treatment system consists of a 170 foot by 170 foot pond with four cells, four extraction wells per cell screened at perched zones 35 to 50 feet below grade, and three peripheral monitoring wells. Currently, treated groundwater disposal methods are being evaluated. The Discharger's pilot scale tests indicate the system would operate for two years effectively leaching perchlorate from impacted soil to 40 feet below grade. Additionally, the Discharger anticipates the perched groundwater zones will also be remediated. Regional Board staff will be working with the Discharger to evaluate and select an appropriate treated groundwater disposal method.

United Defense, 900 John Smith Road, Hollister, San Benito County

Site Investigation Update:

As reported at the July 9, 2004 Regional Board meeting, United Defense is proceeding with additional site investigations. Regional Board staff approved the additional investigation work items in a July 30, 2004 letter. The recommendations set forth within the Report include:

- Continued research and analysis of local hydrogeology and geology to determine the fate and transport of site contaminants.
- Ranch well groundwater sampling.
- Surface water sampling in the Santa Ana Creek up and down stream of the pond and up and down stream of Arena 2.
- Further evaluation of the lateral and vertical extent of perchlorate and nitrate including the implementation of additional monitoring wells, cone penetration test borings, and soil borings at Arena 1 and Building 6.
- Attainment of United Defenses' non-drinking water well's construction log.

United Defense is required to submit this information by September 30, 2004. Regional Board staff anticipates providing an update in the December 3, 2004 Regional Board Status Report.

Update: Regional Board staff are currently reviewing the Phase III Environmental Investigation Report (Report) submitted September 30th. The Report provides supplemental information to the Initial Site Assessment and Phase II Reports. The Phase III investigation was conducted to more fully assess the extent of perchlorate, nitrate and nitrite, energetics (explosive compounds, i.e. TNT), and aluminum contamination in site

[1] Advection is the process by which moving groundwater carries with it dissolved solutes. (Fetter, C.W., Applied Hydrogeology, 3rd Edition, 1994)

soil, groundwater, and surface water. A site map showing the location of the investigation areas is included in Attachment 3. The following areas were investigated:

- *Arena 1: Previous sampling during the Phase II investigation found perchlorate at a maximum of 2,900 milligrams per kilogram (mg/kg) in soil and 2,600 micrograms per liter (µg/l) in groundwater. Soil results from the Phase III investigation ranged from ND to 3.4 mg/kg. As stated in the Report, Phase II and Phase III perchlorate soil samples are generally highest within two feet below ground surface. Perchlorate detections in groundwater for the Phase III analysis ranged from ND to 8.5 µg/l. These results are from groundwater samples taken from recently installed groundwater wells. Previous groundwater perchlorate results were collected from temporary soil borings.*

- *Arena 2: One soil boring at 0.5 ft had a perchlorate detection of 3.7 mg/kg.*

- *Three Nearby Groundwater Wells: Perchlorate was detected in the Rancher's well at 15 µg/L and the Windmill well at 34 µg/l. Nitrate + nitrite (as N) was detected in the Windmill well and WW-1 at 45 µg/l and 4.2 µg/l respectively.*

- *Ranch Pond Dredge Area: Perchlorate was detected at 1.1 mg/kg in one of the two soil boring samples taken. Nitrate + nitrite (as N) was detected at 8.2 mg/kg and 27 mg/kg in the two borings. Aluminum was also detected at 13,000 mg/kg and 17,000 mg/kg, but results were below the background sample results of approximately 25,000 mg/kg.*

- *Building No 6 Area: Additional energetic sampling was conducted near Building No. 6 to further assess the extent of HMX, RDX, and TNB (energetics) contamination. The Report states that generally concentrations increase with depth. HMX, RDX, and TNB were found at 2,400 µg/kg, 1,200 µg/kg, and 240 µg/k, respectively, 20 feet below ground surface.*

- *Building No 1 Area: All groundwater and surface water results tested non detect for energetics and perchlorate.*

- *Santa Ana Creek: All surface water samples of perchlorate, nitrates and nitrites, and energetics were non-detect. Dissolved aluminum was detected in four samples ranging from 0.14 mg/l to 0.25 mg/l. Sediment samples exhibited similar results; perchlorate, nitrates/nitrites and energetics samples were all non-detect. However, aluminum concentrations ranged from 6,300 mg/kg to 13,000 mg/kg.*

  Staff anticipates issuing a comment letter to United Defense by the end of October.

ATTACHMENTS

1. Letters to Rick McClure, Dated October 8, 2004 and October 18, 2004.
2. Former Whittaker Ordinance Facility Site Map.
3. United Defense LP Site Map.

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ATTACHMENT 1

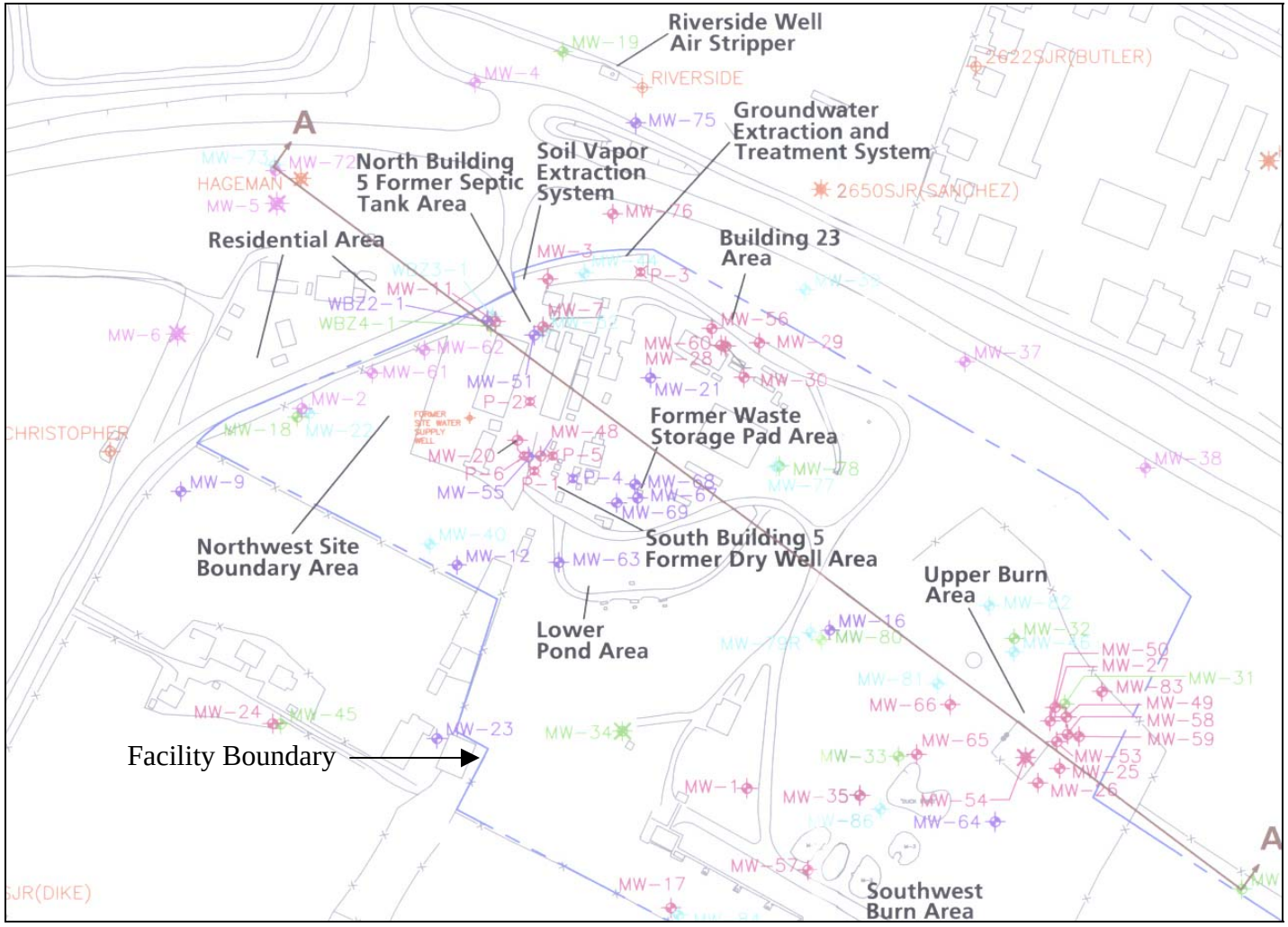
Letters to Rick McClure
Dated October 8, 2004 and October 18, 2004

ATTACHMENT 2

Former Whittaker Ordinance Facility Site Map

ATTACHMENT 3

United Defense LP Site Map



WHITTAKER ORDINANCE FACILITY
SITE MAP