California Regional Water Quality Control Board
Central Coast Region

Alan C. Lloyd, PhD.
Secretary for Environmental Protection

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Arnold Schwarzenegger
Governor

September 23, 2005

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

Dear Mr. McClure:

SLIC: COMMENTS, LLAGAS SUBBASIN CHARACTERIZATION WORK PLAN, OLIN SITE, 425 TENNANT AVENUE MORGAN HILL, SANTA CLARA COUNTY

Regional Water Board (Water Board) staff reviewed the August 12, 2005 *Llagas Subbasin Characterization Work Plan* (Work Plan). This letter identifies our specific comments, questions, suggestions, and requests. The Work Plan needs to be revised to provide more detail and address comments included below. First, we provide a little background regarding Work Plan submittal timing.

The Work Plan was submitted in response to Cleanup or Abatement Order R3-2005-0014 (CAO), which required submittal on June 3, 2005. On June 3, 2005, Olin Corporation (Olin) requested a due date extension. Olin requested the Work Plan due date be changed to 15 days after *Llagas Subbasin Monitoring Plan* (Monitoring Plan) approval. Water Board staff denied Olin's request in a letter dated June 13, 2005. However, Water Board staff decided not to recommend enforcement as long as reasonable progress was made to address Monitoring Plan comments and the Work Plan was submitted 15 days after Monitoring Plan approval.

Water Board staff provided Monitoring Plan comments to Olin on June 16, 2005, and directed Olin to submit a separate monitoring well installation work plan. The CAO required Olin to submit the characterization and monitoring well installation work plan in one document. However, Water Board staff directed Olin to submit the monitoring well installation work plan separate from the characterization portion of the work plan to expedite Llagas Subbasin characterization. Water Board staff is currently reviewing the additional Llagas Subbasin monitoring information submitted by Olin, and is waiting for additional information related to the City of Gilroy sentinel well network.

Water Board staff held meetings with Olin, City of Gilroy and Santa Clara Valley Water District (Water District) to facilitate Work Plan submittal and to address stakeholder concerns. These stakeholders met on July 27, 2005, to discuss the final Work Plan outline and to facilitate document submittal. Olin subsequently notified Water Board Staff that the Work Plan would be

submitted on August 12, 2005. According to our records the Work Plan was submitted 68 days after the CAO requirement. As stated in our recent correspondence to Olin, reports must be submitted by their due dates or we may consider enforcement action..

The remainder of today's letter addresses Water Board staff's review of the Work Plan. The Work Plan describes Olin's proposed characterization methods that will be used to define the lateral and vertical extent of perchlorate in Llagas Subbasin groundwater. Italso evaluates the suitability of using existing supply wells to monitor groundwater quality. Olin uses elements of the United States Environmental Protection Agency's (USEPA) Decision Quality Objective (DQO) process to identify characterization data needs. The Work Plan includes a general outline of characterization tasks.

Water Board staff appreciates the work Olin has done to develop the Work Plan. The stakeholders and Olin have worked cooperatively to complete the Work Plan and move the needed investigation forward. Water Board staff received Work Plan comments from the City of Morgan Hill, City of Gilroy, the Santa Clara Valley Water District (Water District), and from DuaneMorris on behalf of numerous San Martin homeowners. The DuaneMorris comments are attached. Other Stakeholder comment letters are not attached here, since they were provided to Olin previously. However, we include elements of the stakeholder comments in this letter, where applicable. Stakeholder comments not included are incorporated by reference. Olin shall review and incorporate referenced comments as appropriate. Olin shall also denote which comments have been incorporated in the final Work Plan.

The Work Plan lacks a clear description of the hydrogeologic groundwater basin conceptual model and of existing data gaps. The Work Plan also lacks a schedule for providing specific information to us. Water Board staff does not believe the Work Plan, in its current form, ensures desired implementation. The Work Plan appears to be a better-developed outline of Olin's proposed activities. Therefore, Olin's Work Plan is not accepted. Olin must revise the Work Plan to clarify the conceptual model and identify specific information that will be collected and reported. Olin shall review the following comments and resubmit the Work Plan:

General Comments

1. Overall planning strategy - Olin must revise the Work Plan to include an overall planning strategy (e.g., where Olin is, where does Olin want to go, what does Olin need to know to get there). Work Plan Section 3 does apply the USEPA Data Quality Objectives (DQO) Process appropriately. The DQO process is a systematic approach to aid in data collection activities. Step 1 (Problem Statement) in the USEPA DQO Guidance states, "the planning team describes the conditions or circumstances that are causing the problem and the reasons for undertaking the study." In this case, the problem could be stated as, "perchlorate released from the site has contaminated groundwater, impacted beneficial uses (drinking water), and threatens other uses." The problem statement is the basis for all other steps in the DQO process. Instead of a problem statement, Work Plan Section 3 begins the DQO process with three "issue statements":

    a. "Whether sufficient data exist to delineate the lateral and vertical extent of perchlorate and assess the potential for future migration."

b. "Whether the data obtained from supply wells are sufficient to delineate the lateral and vertical extent of perchlorate in groundwater at levels to support future reports."
c. "Does the data suggest that additional source of perchlorate are present to explain current distribution of perchlorate?"

The scope of these statements is too narrowly and vaguely framed and does not provide an appropriate basis for investigation work needed.

The Work Plan fails to show how subsequent DQO steps will be carried out. For example, the decisions listed under "Identify the Decisions" appear to be descriptions of data gaps (e.g., Is perchlorate found in groundwater within the Llagas Subbasin at background concentrations?). An example of an appropriate Work Plan decision is, "It is necessary to install a barrier system at the leading edge of the plume to protect downgradient receptors based on available data."

The project needs a strategic plan to move forward quickly, but it has to be applied in an appropriate and effective manner. Another planning process that may be useful is the Triad Approach (Interstate Technology Regulatory Cooperation 2003). The Triad Approach is consistent with the DQO process, but it incorporates planning for remedial design (e.g., what does Olin need to know to fix the problem) and puts more emphasis on expediting field investigation efforts. The method used to characterize groundwater is Olin's choice, but the method needs to be applied correctly. Olin should review the DQO process and resubmit the Work Plan in conformance with the DQO protocol. Please explain and justify any deviations.

2. Conceptual Site Model (CSM) - The strategic planning process must be applied in the context of the CSM. The CSM must identify known data and any assumptions made should be clearly differentiated. Section 2.3 presents a "conceptual model for the Llagas Subbasin," but it is incomplete. As presented, the conceptual site model primarily presents the regional hydrogeologic setting and describes perchlorate transport as a diffuse plume. The CSM is presented as fact and does not clearly differentiate between known data and assumptions.

While plume diffusion may occur several miles downgradient, this may not be the case within a mile of the site. The CSM does not describe the manner of perchlorate release or character of the source zone. The depth and distribution of perchlorate in soils and groundwater underlying the site will influence down gradient perchlorate movement in aquifer zones closer to the site. The CSM must be revised to include current or potential receptors (although the City of Gilroy wells are discussed in subsequent sections, it is not clear if there are other potential receptors) or other pathways such as discharge to surface waters.The CSM should include figures that describe the different investigative and geographic areas and should clearly identify specific critical data gaps. The CSM is lacking in several areas and must be revised to include a comprehensive evaluation of, or comprehensive information on, the following:

a. The basis for dividing the three hydrologic units and eight subunits and what criteria are used to differentiate between units and subunits.
b. The potential or actual hydraulic communication between units.
c. The potentiometric surfaces, gradients, and groundwater velocities for each unit and subunit.

d. The potential influence that the groundwater divide and natural and artificial recharge areas have on aquifer zone groundwater flow conditions.
e. The comparability of perchlorate and nitrate distributions, since the character and distribution of their source zones are very different and could lead to different vertical and lateral distribution in groundwater.
f. Actual and potential perchlorate source(s).
g. Groundwater contours near and north of the site (in Figure 4).
h. The character of offsite migration in the shallow and deeper zones.
i. The vertical distribution of perchlorate within the Llagas Subbasin.
j. Perchlorate plume redistribution and migration caused by well pumping.

The Work Plan discusses six characterization tasks, but it is unclear how those tasks are needed to fill conceptual model data gaps. Olin shall review its conceptual site model and clearly identify what is known, what is assumed, and what are the existing data gaps. Your review is likely to include specific plume areas such as the south of site area, church avenue pond area, middle plume area, Gilroy plume area and end of plume area. The Work Plan indicates that Olin knows very little about the offsite plume.

3. Characterization – The primary objectives in characterizing Olin's plume is to determine the risk posed by actual or potential contamination, and to collect data necessary for remediation system design. The information needed to satisfy the aforementioned characterization objectives is an understanding of the contaminants present, the three-dimensional extent and concentration of contaminants, and the geologic and hydrologic factors that control perchlorate migration. The Work Plan proposes collecting and evaluating several types of data, but it is not clear when and how the data will be collected and used (i.e., what decision will the data support). The clarity problem relates to the strategic planning process discussed in General Comment 1, above. The values of some data sets are questionable and in some cases the proposed methods may not provide definitive data. For example, the stated rationale for collecting time stratigraphic data is that the units may control perchlorate migration. However, Olin may or may not be able to establish meaningful time stratigraphic units with the proposed methods and the stratigraphic units identified may or may not be controlling perchlorate movement. Similarly, analysis of chemical and isotopic signatures may or may not contribute to our understanding of perchlorate migration. At a minimum, the characterization effort should include detailed vertical profiles of perchlorate and lithologies along the axis (longitudinal), multiple cross-sections extending to the margins, and the leading edge of the plume. Because of the large size of the plume, we suggest that the consultant evaluate screening tools (e.g., Field Screening Method for Perchlorate in Water and Soil, U.S. Army Corp of Engineers 2004) for characterization to better locate monitoring wells and screen intervals. Olin will be in a better position to predict perchlorate movement if there is a clear picture of the lateral and vertical distribution of perchlorate.

The Work Plan outline submitted to Water Board staff indicated that Olin's characterization approach would be based on potential remediation efforts (i.e. remediation based characterization). The Work Plan does not mention the remediation based characterization approach nor does it identify data gaps that need to be filled based on potential remediation schemes.

Olin shall resubmit the work plan and include specific details related to data collection. The amount and types of data need to be specified. In instances where data collection is

dependent on sequential work, Olin shall identify those instances and provide a time schedule for submitting the final details for Water Board staff review and acceptance. The current Work Plan does not adequately detail data collection and is excessively narrative.

Rather than comment on each of the Six Characterization Tasks, Water Board staff is providing the following example. Water Board staff will provide more specific comments once the Work Plan is resubmitted with specific tasks and time lines. In *Section 4.5 Gilroy Area/Sentry Wells, page 33,* Olin's objective for the Gilroy area is to identify groundwater flow patterns, perchlorate distribution, and pumping patterns to determine if additional sentry wells are needed. This section is vague and appears to list the reasons why no further work should be done near the City of Gilroy. The Work Plan needs to include the wells that Olin will use to collect lithologic, production, and construction data. The Work Plan should describe how the radii of influence of municipal wells will be evaluated. It should indicate which wells will be sampled for perchlorate and general minerals. Without detailed information, Water Board staff is unable to determine if the proposed work is adequate.

Olin shall include specific details of data collection and analysis tasks that are stated in Hydrologic Characterization Tasks 4.1 through 4.6. Olin shall provide a time line for submitting additional data, in instances where collection is dependent on the performance or outcome of yet to be completed work. Olin shall also provide the technical justification and data for decisions that are made.

4. Perchlorate Occurrence - Several text sections state that there are detections of perchlorate in areas that are "not reasonably expected to have been impacted by perchlorate from the site." It is not clear what these statements mean or refer to. Olin shall revise these sections with more descriptive language that describes the location.

5. Notification Level - Olin refers to the Notification Level, a non-enforceable Department of Health Services standard, in several report sections in relation to characterization. While some Work Plan sections attempt to clarify that the lateral and vertical extent of perchlorate will be characterized to the current Practical Quantification Limit of 4 parts per billion, the written report is confusing and misleading. Olin must characterize the lateral and vertical perchlorate plume extents to the lowest reproducible Practical Quantification Limit, in this case 4 ppb. The Work Plan must be rewritten to clarify that perchlorate occurrence in groundwater will be characterized to 4 ppb.

6. Fate and Transport - The fate and transport of perchlorate throughout the plume area is not discussed. It is possible that perchlorate may be present in the vadose zone because of agriculture irrigation. This is especially true in areas just south of Olin's site where perchlorate concentration range from 4 to 100 ppb. Olin shall evaluate the possible existence of shallow vadose zone perchlorate in Llagas Subbasin vadose zone and soils. The Water District will be advancing 134 shallow borings and will be installing 33 new shallow wells as part of a water supply study. The Water District's work may be useful for Olin's analysis and should be considered. Olin shall evaluate shallow perchlorate redistribution in its Work Plan.

7. Aquifer Properties - The Water District has identified six wells that may allow Olin to collect aquifer hydraulic property data. Table 3 and Figure 1, located in the Water District's

comments, outline the location and data for these wells. Olin shall review this information and incorporate testing of these wells in its Work Plan. If Olin believes the pump test data would not be useful, then Olin shall provide a technical justification for not using such data. Also, Olin shall include slug test data from the northeast piezometers to support slug testing south of the Olin site.

Specific Comments

8. *Section 2.2.3 Offsite Perchlorate Distribution, Page 9* – Olin speculates, "the extent of perchlorate within the Llagas Subbasin reflects a relatively uniform vertical distribution within the off-site equivalent of the intermediate aquifer zone." This claim may be true farther from the site (five or more miles); however, the distribution of perchlorate closer to the site (one or two miles) is likely to be located in specific aquifer zones. Olin shall consider vertical distribution differences based on proximity to the site and develop the Work Plan to address such differences.

9. *Section 2.3 Llagas Subbasin Conceptual Model, Page 12* - This section states that perchlorate detections in areas that are "not reasonably expected to have been impacted by perchlorate from the site suggests that a background perchlorate concentration exists or that other sources of perchlorate..." The Work Plan shall address the possibility that the apparent inconsistencies in perchlorate detections may also reflect data gaps in the existing conceptual site model.

10. *Section 3.0 Llagas Subbasin characterization Process, page 13* – The Work Plan states, "the decision analysis process to determine the need to collect and evaluate additional data will be performed in general accordance with the procedures outlined in the *Guidance For Data Quality Objective Process* (USEPA, 2000)". Water Board staff is unclear what is meant by "general accordance". Olin shall either follow the DQO process guidance or clearly note where it is deviating from the process. Technical justification shall be provided where deviation occurs. Olin's justification will provide Water Board staff and stakeholders with a clear understanding of how Olin is making decisions and will lead to fewer future disagreements related to data collection and interpretation.

11. *Section 3.0 Llagas Subbasin characterization Process, page 13* – Olin states, "the field investigation will focus on those areas of the Subbasin where perchlorate is found a concentrations at or above the NL for perchlorate, currently set at 6 μg/L." The report further states that the investigation will extend out to areas at 4 ppb, the current USEPA method 314.0 practical quantification limit, and trace (<4 ppb) results will be included in laboratory results. The above-mentioned wording is confusing. Olin shall make it clear that the perchlorate plume will be characterized to the most current Practical Quantification Limit as required in comment five. As included in the Water Board's second quarter 2005 monitoring report comments, Olin shall report trace detections in its data review tables with trace result notation.

12. *Section 3.0 Llagas Subbasin Characterization Process, Subparagraph 7, page 17* – Olin states, "...Hydrostatic and groundwater quality data collected from multilevel monitoring wells will be compared to those data from existing supply wells to refine the current conceptual model, as necessary." For Olin to rely on supply well data, the cleanup CAO

requires Olin to demonstrate that private supply wells are equivalent to depth specific dedicated monitoring wells. A direct comparison of perchlorate results may or may not prove equivalency. Olin must do additional work to prove well equivalency. Olin shall use hydropunches or another acceptable method to collect depth discrete data in aquifer units where the supply wells are installed. The depth discrete data collection shall be performed within 100 feet of the private supply well proposed for monitoring plan inclusion. The depth discrete data will provide Olin with two sets of useful data: a snap shot of the plume delineation and additional data to determine if the private supply wells are useful for plume monitoring. In addition, Olin shall demonstrate long term access to wells in the form of written agreements with well owners.

Olin's revised Work Plan, addressing each revision or comment mentioned above, shall be submitted by October 24, 2005. Olin shall notify Water Board staff in writing if the Work Plan will not be submitted by this date. Failure to resubmit adequate information may subject Olin to enforcement action. 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

Enclosure: Letter dated September 15, 2005 (received September 21, 2005) from DuaneMorris

cc via E-mail:

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

Olin Interested Party List

cc via U.S. Mail:

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Office
WATER QUALITY CONTROL

September 15, 2005

VIA EMAIL AND U.S. MAIL

Mr. David Athey
California Regional Water Quality Control Board
Suite 101
895 Aerovista Place
San Luis Obispo, CA 93401

Re: <u>Llagas Subbasin Characterization Workplan: Olin/Standard Fusee Site, 425 Tennant Avenue, Morgan Hill, CA</u>

Dear Mr. Athey:

We represent more than one hundred San Martin homeowners whose wells are contaminated with perchlorate. On behalf of our clients, we submit the following comments on Olin's Llagas Subbasin Characterization Work Plan ("Work Plan"). We submit these comments to the California Regional Water Quality Control Board, Central Coast Region (RWQCB), as part of our ongoing effort to address the contamination caused in the San Martin area by Olin Corporation (Olin). These comments were prepared by our consultant Eric Nichols of LFR Levine Fricke, following his review of the Work Plan.

Summary: As ordered by the RWQCB in its Cleanup and Abatement Order R3-2005-0014 (CAO), this Work Plan, in conjunction with the Llagas Subbasin Monitoring Well Installation Work Plan, is intended to address the requirements of CAO ordering paragraphs A, B, and C, and are intended to provide information necessary to address paragraphs D (Llagas Subbasin Characterization Report), E (Plume Migration Control Assessment Report), and I (Subbasin Cleanup Level Report).

As stated by Olin, the two main objectives of this Work Plan are to:

1. Characterize the Llagas Subbasin with respect to the lateral and vertical extent of perchlorate in groundwater to support decision documents specified by the CAO.

2. Evaluate the suitability of using existing supply wells to monitor groundwater quality by comparison to data collected from multilevel monitoring wells.

Other stated goals are to outline the processes and methods of characterization, and to provide information for future CAO-required reports and decisions. Olin proposes six tasks to accomplish these goals and objectives.

General Comments

1. **Perchlorate should be delineated to detection limits.** Olin proposes to delineate the perchlorate plume to concentrations between 4 and 6 micrograms per liter (the Practical Quantitation Limit and the Department of Health Services Notification Level, respectively). A background level of perchlorate in the Subbasin has not been established; nor has a regulatory cleanup level (other than RWQCB's policy of restoring water quality to background) been established or approved for this site. Until both of these levels have been established and approved, Olin should characterize the occurrence of perchlorate in the basin to the method detection limit.

2. **Inadequate number of new monitoring wells.** In order to accomplish the CAO-mandated goal of characterizing "the lateral and vertical extent of perchlorate in all identifiable aquifer zones" and providing "accurate aquifer zone specific perchlorate concentration data", Olin proposes to install only nine multi-level monitoring wells along the entire 9-to-10 mile long perchlorate plume that extends from the Site past the City of Gilroy. Eight of these wells are to be spaced about 1 to 1.5 miles apart. As many aspects of the Work Plan must rely on information from these wells, this is an inadequate number. As Olin intends to "provide sufficient data such that an evaluation of the mass flux of perchlorate" can be estimated, transects of multilevel monitoring wells should be installed.

3. **Continued reliance on supply wells.** One of the two primary goals of the Work Plan is to evaluate whether data from particular supply wells are equivalent to data from properly sited and constructed monitoring wells. As written, many aspects of the document appear to pre-judge the outcome of this comparison in favor of continued reliance on supply well data. For example, the Work Plan states that "comparison of groundwater quality data between samples from the multi-level monitoring wells and existing supply wells will illustrate the degree of homogenous mixing of perchlorate within the intermediate aquifer and the suitability of using supply wells to monitor groundwater conditions." With no depth-discrete monitoring well data yet collected off-site, how can the supposed uniformity of perchlorate in any aquifer zone already be known? Until sufficient depth-discrete monitoring data have been collected and evaluated, and any equivalency with supply well data demonstrated, the distribution of perchlorate in each aquifer zone in the Llagas Subbasin remains highly uncertain.

   The CAO lists the following criteria to make this evaluation:

- Analysis of lithologic logs and well construction data
- Sampling and analysis for geochemical parameters
- Flow metering, packers to isolate zones, video logging, and chemical techniques for field-testing
- Comparison of supply well attributes and characteristics to properly sited and constructed monitoring wells
- Long-term well access.

Many of these criteria are not even discussed in the Work Plan, nor are equivalent alternative criteria proposed. The Work Plan does not identify this important evaluation as a separate task, even though it is one of two stated primary objectives of the Work Plan.

4. **Rationale for selection of Tasks 2 and 4 are unclear.** Task 2 (South of Site Assessment) and Task 4 (Shallow Aquifer Evaluation) are called out as separate tasks from Task 1, the Hydrogeologic Characterization of Llagas Subbasin. In reality, these tasks are a subset of the RWQCB-ordered hydrogeologic characterization of the Llagas Subbasin. The CAO does not specifically identify Task 2 or 4, and Olin's rationale for distinguishing these tasks as separate and distinct from Task 1 is unclear. The rationale for separating these two tasks from the overall task of hydrogeologic characterization of Llagas Subbasin should be stated more clearly.

Specific Comments

1. **Section 4.1.2 – In Situ Aquifer Testing.** Olin proposes conducting a series of slug tests during well installation. Slug tests influence a very small portion of the aquifer around the tested borehole interval, and may not be representative of the bulk hydraulic properties of the aquifer. A series of aquifer pumping tests would yield data that is more representative of the bulk hydraulic properties of each tested aquifer interval.

2. **Section 4.1.3 – Soil Core Petrophysical Testing.** The Work Plan does not give a clear indication of the number of samples will be collected from the fine-grained (aquitard) units, stating that "...select soil core samples will be collected...at discrete depth intervals identified in the field that correlate with the reported overbank or lacustrine deposits..." The Work Plan states that samples will be collected from coarse-grained materials in the shallow, intermediate, and deep aquifer zones. The

Work Plan at the very least should define which aquitards will be sampled; it would make sense to sample the aquitard(s) between the shallow and intermediate zone, and the aquitard between the intermediate and deep zone, if such aquitards are encountered. Core samples should be collected at several locations and in areas where variable aquitard thicknesses and degrees of fine-grained material are present.

3. **Section 4.1.4 - Deposition Time Stratigraphic Correlation.** The Work Plan indicates various sequence stratigraphy methods will be performed to correlate lithologic units. The Work Plan gives no indication of the overall level of effort for this task, such as the approximate number, type, and location of each petrological and palynological analysis.

4. **Section 4.1.6 – Review of Concurrent Studies.** It is unclear why the Work Plan states the LLNL nitrate study is consistent with Olin's tentative conceptual model of perchlorate in the Llagas Subbasin. The relevancy of LLNL's observation that nitrate has not migrated to depths greater than 150 meters lacks is unclear. This is almost 500 feet in depth, and there is little depth-discrete data regarding the vertical extent of perchlorate with which to draw a similar observation. It appears that the findings of the LLNL report are being used to imply that perchlorate has not migrated to particular depths. Such an interpretation needs to be demonstrated with depth-discrete, chemical-specific data.

5. **Section 4.2 – South of Site Assessment.** Only two new multi-level wells are proposed to confirm regional flow directions. At least three locations are needed to calculate flow direction; to increase reliability, many wells should be used. In addition, flow directions need to be confirmed in each aquifer zone. The section also states that groundwater analytical data will be collected "from a sufficient number of locations" to characterize the extent of perchlorate and to further delineate areas where perchlorate may have migrated from shallow to intermediate zone; the "sufficient" number of locations includes only two monitoring wells (MW-16 and MW-17) and an unspecified number of grab samples. The results from MW-16 and MW-17 will be used to guide the location(s) of the grab samples. Since grab samples are a one-time snapshot and cannot be repeated, the results cannot be confirmed, nor can temporal trends be identified at these locations.

   A transect of multi-level wells near the proposed locations of MW-16 and MW-17 would better serve many of the stated goals of the Work Plan.

   This section should acknowledge that there have been times during the historical operation of the Olin site when the A-zone has not been saturated, and that under these conditions, the B-zone would have been the uppermost saturated aquifer.

6. **Section 4.3 – Background Perchlorate Evaluation.** No mention is made of performing analyses of the isotopic composition of perchlorate in groundwater, which could assist in identifying other significant sources of perchlorate in the basin, if any exist.

   The Work Plan indicates that data from wells northeast of the site will be used to evaluate the distribution of background perchlorate with the Subbasin. To our knowledge, the results of the Groundwater Flow Assessment and Northeast Sampling have not yet been compiled and accepted by the regulatory agencies. Olin's assumption that areas to the Northeast of the site are (and have historically always been) upgradient of the site remains just an assumption.

7. **Section 4.4 – Shallow Aquifer Evaluation.** This task is predicated on Olin's assumption that perchlorate from its site is primarily present in the intermediate aquifer. There are few depth-discrete monitoring locations to support or refute this hypothesis. This task needs to consider the full range of historical variations in water levels and flow directions before making any conclusions regarding the alleged perchlorate source(s) and potential vertical redistribution of perchlorate within the Subbasin.

8. **Section 4.5 – Gilroy Area/Sentry Wells**. This task intends to interpret groundwater elevation data to evaluate the radii of influence of the Gilroy supply wells. Accomplishing this task will require that the observation wells monitor the same depth intervals as the pumped intervals of the supply wells. Moreover, the radii of influence provides an indication of areal extent of drawdown, not the extent of hydraulic capture. This should be distinguished in the Work Plan, and other means of evaluating the wellhead protection should be established.

   It is unclear whether a new sentry well would be installed if needed – the Work Plan states that "Should existing wells not be sufficient to meet the above-stated objective, a new sentry well **could** be installed and the Llagas Subbasin Monitoring Plan modified" (emphasis added).

   This text mentions a geologic cross section south of Leavesley Road. The orientation of the section is shown on Figures 13 and 14, but the Section itself is not included in the Work Plan. In addition, both figures use the same symbol for three different types of wells, which makes it impossible to distinguish a sentry well from an existing Supply well or a new monitoring well.

9. **Section 4.6 - Southern extent of perchlorate.** As scoped, this task appears to rely primarily (and perhaps solely) on supply well data. Please refer to General Comment No. 3 above.

   Figure 13 appears to show many more perchlorate detections than are shown in Figure 5. These apparent inconsistencies should be resolved or explained.

   Figures 13 and 14 appear to indicate six additional future monitoring wells (MW-45 through MW-50), located in the southern portion of the apparent perchlorate plume. These wells are not discussed in the text, and should be explained.

10. **Section 5.0 – Schedule and Reporting.** This section provides no intermediate milestones or project schedule. There is no mention of the CAO-required deadline of March 30, 2006 for submittal of a summary report of the work proposed in this Work Plan.

If you have any questions, or if you would like to discuss the foregoing with our consultant Mr. Nichols, please contact me or Rick Franco of this office.

Sincerely

Colin Pearce (cc)

Colin L. Pearce
For DUANE MORRIS, LLP

CLP/cwc
Enclosure

cc: Thomas Mohr, Santa Clara Valley Water District (via email: tmohr@valleywater.org)
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