

16 August 2007

Mr. Hector Hernandez  
Central Coast Water Board  
895 Aerovista Place, Suite 101  
San Luis Obispo, CA 93401-7906

**Subject: Status Update on Priority Zone A Plume Migration Control Implementation,  
Olin/Standard Fusee Site, Morgan Hill, California**

Dear Mr. Hernandez:

This letter has been prepared by Geosyntec Consultants, Inc. (Geosyntec) on behalf of Olin Corporation (Olin) to inform the Central Coast Water Board (Water Board) of the effects that recent deep aquifer characterization data have on the implementation approach and schedule of the Priority Zone A Plume Migration Control System (System). This deliverable expands upon and formally documents the previous discussions that occurred during the 25 July 2007 meeting between Olin and the Water Board in San Luis Obispo, California.

As discussed during the 25 July 2007 meeting, deep aquifer analytical data from recently installed monitoring wells MW-59 and MW-60 were received on 3 July 2007. As shown in Figure 3.24 of the Second Quarter (April-June) 2007 Groundwater Monitoring Report<sup>1</sup> (2Q07 Report), Priority Zone A in the deep aquifer now extends approximately two miles southeast of the Site, and thus is significantly larger than was understood when the Area I Plume Migration Control Work Plan<sup>2</sup> (Area I Work Plan) and the Area I Extraction Well Installation Work Plan<sup>3</sup> (Well Installation Work Plan) were submitted in December 2006 and April 2007, respectively. In addition, geological logs for MW-55, MW-59, and MW-60 indicate the presence of gravel channel deposits within the deep aquifer zone. These wells showed relatively rapid recoveries during well development, suggesting that hydraulic conductivities in gravel channels present within the deep aquifer may be higher than originally contemplated. Based on these observations, the flow rates required to hydraulically contain Priority Zone A in the deep aquifer may be substantially greater than anticipated during preparation of the Area I Plume Migration Control Feasibility Study<sup>4</sup> (Area I FS) and the Area I Work Plan. Additional activities are currently being planned by MACTEC to further characterize Priority Zone A in the deep aquifer. In particular, characterization activities will focus on confirming the possible paleochannels

related to the Coyote Creek, as well as understanding the continuity of the gravel channel deposits found at depth.

The implementation schedule for Priority Zone A plume migration control submitted to the Water Board as part of the Area I Work Plan, and later updated for the Well Installation Work Plan and the Llagas Subbasin Cleanup Work Plan<sup>5</sup> (Cleanup Work Plan), is affected by the recent deep aquifer characterization data. It is critical to emphasize that the existing project schedule continues to represent the most efficient approach and sequencing for implementation of the Priority Zone A System. If the proposed Addendum to the Area I FS (FS Addendum) is submitted without sufficient characterization of the deep aquifer, there is a strong possibility that the System selected may not be able to achieve its objectives. As one example, if On-Site Recharge (OSR) with treatment by ion exchange (IX) were chosen as the recommended alternative without deep aquifer characterization being completed, particularly the possibilities of paleochannels, it is possible that total system extraction rates (as determined by deep aquifer hydraulic testing) may exceed the recharge capacity of the Site. Furthermore, if the water quality of the extracted aquifer (e.g., nitrate concentrations) was worse than that of the receiving groundwater due to the chemistry of the deep aquifer, IX would not be the appropriate technology for the System. Following an incorrect project pathway in an attempt to accelerate the overall project schedule is more likely to result in project delays than reductions in schedule.

The recent perchlorate data at MW-59 and MW-60 have the following implications for the Priority Zone A plume migration control strategy:

- **Extraction Well Locations:** Although the data from MW-59 and MW-60 do not affect the intermediate extraction well location, the data do significantly change the anticipated locations for the proposed deep extraction wells. Whereas a single extraction well located along Fisher Avenue was originally designated for deep aquifer extraction, it is now possible that multiple deep extraction wells may be needed to hydraulically contain Priority Zone A, once the nature and extent of Priority Zone A is appropriately delineated. It is not appropriate to select location(s) for the deep aquifer extraction well(s) until ongoing deep aquifer characterization activities are substantially complete.
- **Extraction Rates:** Given the inadequately defined distribution of perchlorate in the deep aquifer and the presence of thicker and possibly continuous gravel channel deposits, the flow rates required to hydraulically contain Priority Zone A in the deep aquifer is unknown, but may be substantially greater than initially anticipated during

preparation of the Area I Work Plan. As further discussed below, this has significant ramifications on both water treatment and treated water disposition.

- **Treated Water Disposition Option & Extraction Well Design:** OSR may no longer be feasible depending on the volume of groundwater that may need to be extracted from the deep aquifer to hydraulically contain Priority Zone A. An OSR capacity assessment is currently underway to estimate a maximum recharge capacity for the Site. If overall extraction rates increase substantially due to the deep aquifer, it is uncertain whether the OSR capacity of the Site will be sufficient to accommodate OSR as the disposition option. A definitive answer to this question will not be available until the OSR assessment is complete, the deep aquifer paleochannels are properly characterized, and the extraction wells have been located, installed and hydraulically tested. If OSR is not a viable option, off-site recharge and/or MWS would need to be re-considered.
- **Water Treatment Option:** Three potential treatment options were identified in the Area I Work Plan, including ion exchange (IX), ex-situ bioremediation (ESB), and in-situ bioremediation (ISB). There are several factors that will influence the selection of the final water treatment option. First and foremost, the final water disposition option will affect the water treatment option selected. If the treated water is to be supplied to a local water purveyor, IX would most likely be the treatment option chosen. In contrast, if recharge of treated groundwater to the subsurface (either on-Site or off-Site) is chosen as the disposition option, the three treatment options may all be viable. In addition, the overall system flow rate and nitrate concentrations will influence technology selection.

The data from MW-59 and MW-60 significantly affect several aspects of the Priority Zone A plume migration control strategy. In particular, the choice of OSR for final water disposition is no longer certain because of the likely increase in total system extraction rate. In addition, the treatment option can not be selected because of the uncertainty associated with disposition of the treated water. It will not be possible to resolve the uncertainties described until characterization of the deep aquifer is complete and the deep aquifer extraction well(s) is located, installed and tested. Only when the uncertainties are resolved will it be possible to complete and submit the FS Addendum.

An updated schedule for Priority Zone A is provided in Figure 1. In contrast to the schedule presented in the Cleanup Work Plan, which anticipated that deep aquifer characterization activities would be substantially complete by the beginning of July 2007, it is now apparent that

the characterization activities will continue until November 2007. Upon substantial completion of the deep aquifer channel characterization activities, final locations for the deep aquifer extraction wells can be selected.

The schedule in the Cleanup Work Plan showed permitting and installation of the intermediate and deep aquifer extraction wells commencing upon Water Board approval of the letter titled Recommendation for Final Extraction Well Locations and Designs for Priority Zone A<sup>6</sup> (Well Location Letter). The Well Location Letter was submitted on 30 July 2007 and its approval is anticipated by 30 August. For the reasons given previously, only an intermediate extraction well location could be provided. At present, preparations are being made to proceed with installation of the intermediate extraction well.

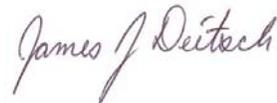
The updated schedule provided in Figure 1 shows the installation of the intermediate and deep extraction wells as separate tasks. The intermediate extraction well will be installed and tested by the end of November 2007, as originally contemplated. For the deep extraction well(s), we are likely to understand the magnitude of the paleochannels on the deep aquifer characterization at the beginning of December 2007. Subsequent to selection of deep aquifer extraction well locations, the well(s) will be installed and hydraulically tested to generate the data required to determine flow rate and final water disposition and treatment options. Considering permitting, subcontracting & mobilization activities, well installation & development, and hydraulic testing, the earliest that data will be available to support the development of the FS Addendum is March 2008. Allowing for time to evaluate the deep aquifer data, submittal of the FS Addendum will occur in April 2008. Upon Water Board concurrence with the FS Addendum, design and implementation of the Priority Zone A System will proceed.

The proposed sequencing of tasks is the most efficient allocation of resources for implementation of the Priority Zone A plume migration control. As noted previously, straying from the proposed sequencing of tasks may have the unintended consequence of delaying overall project progress.

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Olin will keep the Water Board apprised of progress as data emerge from the deep aquifer characterization program, and will continue to update the Water Board on schedule for Priority Zone A. Please feel free to contact Mr. Rick McClure at Olin (423.336.4576) if you have any questions with the information contained in this letter.

Sincerely,



James J. Deitsch, PE  
Senior Engineer



Evan E. Cox, MSc  
Principal In Charge

Attachment: Figures

Copies to: Ms. Thea Tyron, Central Coast Water Board  
Ms. Shiela Soderberg, Central Coast Water Board  
Mr. Rick McClure, Olin  
Mr. David Share, Olin  
Mr. Don Smallbeck, MACTEC

### **References**

1. MACTEC Engineering and Consulting, Inc. (MACTEC). 2007a. Second Quarter (April-June) 2007 Groundwater Monitoring Report, Olin/Standard Fusee Site, 425 Tennant Ave, Morgan Hill, California. Prepared by MACTEC Engineering & Consulting, Inc., July 30, 2007.
2. Geosyntec. 2006. Area I Plume Migration Control Work Plan, Olin/Standard Fusee Site, Morgan Hill, California. Prepared by Geosyntec Consultants Incorporated, 6 December 2006.

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3. Geosyntec. 2007. Area I Extraction Well Installation Work Plan, Olin/Standard Fusee Site, Morgan Hill, California. Prepared by Geosyntec Consultants Incorporated, 30 April 2007.
4. Geosyntec. 2006. Area I Plume Migration Control Feasibility Study, Olin/Standard Fusee Site, Morgan Hill, California. Prepared by Geosyntec Consultants Incorporated, 6 December 2006
5. MACTEC Engineering and Consulting, Inc. (MACTEC) and Geosyntec. 2007. Llagas Subbasin Cleanup Work Plan, Olin/Standard Fusee Site, Morgan Hill, California. Prepared by MACTEC Engineering & Consulting, Inc. and Geosyntec, June 15, 2007.

**Figure 1**  
**Updated Draft Schedule for Design, Implementation & Startup of Priority Zone A Migration Control System**

