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Cypress Office  
Department of Toxic Substances Control  
5796 Corporate Avenue  
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August 6, 2003

**Subject: Abandonment of Former Production Wells  
at Beaumont Site 1  
Beaumont, California**

As per recent conversations between Lockheed Martin Corporation (LMC) and DTSC personnel, LMC has prepared this letter request for the abandonment of three former production wells at Beaumont Site 1 (Site). LMC is hereby requesting authorization to properly abandon (i.e., destroy) three deep inactive wells designated W-1-1, W-1-2, and W-1-5. The well construction information is provided in Table 1.

**Table 1**  
**Well Construction Details**

Well No.	Well Material Type (diameter [inches])	Total Depth (feet bgs)	Screened Interval (feet bgs)
W-1-1	Steel-(14")	388	210-388
W-1-2	Steel-(8")	247	93-247
W-1-5	Steel-(6")	127	60-127

Note: bgs – below ground surface.

The three wells are located adjacent to a former motor washout facility (well W-1-1), the Betatron building (well W-1-2), and ranch rangeland (well W-1-5) – see Figure 2. Based on historical hydrogeologic data and well construction of adjacent wells, all three wells are screened within the Mount Eden Formation. Additionally groundwater elevations at W-1-1, W-1-2, and W-1-5 are approximated at 52 feet, 62 feet, and 120 feet below ground surface (bgs), respectively. The wells are a potential concern for cross-contamination where the well integrities are in question and where well W-1-5 is screened partially from a shallow (fractured Mount Eden Formation) to deeper (competent Mount Eden Formation) groundwater zone. In general each well is constructed of steel

casing with rivets, welds, and/or ribbing on the interior. Based on the limited well construction information available, individual wells appear to traverse one or more of the major geologic units beneath the Site including the Quaternary Alluvium and the Mount Eden Formation. Two of the wells (W-1-1 and W-1-2) are screened within the Mount Eden formation. The third well (W-1-5) is screened within the alluvium lining the valley floor and potentially extends into the Mount Eden Formation, which is present at 50 feet below ground surface (bgs) at well EW-15.

A 1989 Radian video log investigation of well integrity showed some sections of all three wells to contain partial obstructions and reductions in the general diameter. Additionally, the video well log showed partial degradation of the upper portion of the well casings above groundwater. It is assumed that all of the wells are clear enough to advance a well perforation tool down to at least 100 feet bgs. Two wells (W-1-1 and W-1-2) have been installed partially into the consolidated Mt Eden sandstone unit. These wells will be perforated a minimum of 4 perforations/foot from 50 to 100 feet bgs per Riverside County Health Department standards. Nearby recent boring data indicates well W-1-5 had been installed mainly within unconsolidated alluvium.

Appropriate sealing material ("neat" cement mixture of 5% bentonite:95% cement) will be used within the water bearing zone and a Portland cement slurry will be placed inside the casing when sealing off the unsaturated zone. Prior to seal placement, the surrounding area at each wellhead will be bermed for containment of liquid waste overflow generated during the grouting process. As the well annulus is backfilled with grout, volumetric displacement occurs when more dense cement grout is placed beneath the vertical column of groundwater. The grout will be installed from total depth through the use of tremie pipe lowered within each well's casing. As the grout level rises through emplacement, the tip of the tremie pipe is raised and maintained several feet within the upper portion of the cement grout. Slurry volume calculations are presented in Table 2 as generalized amounts only. Extra volume (30%) was added to the total to account for the extra formational seal emplacement. Once backfill has been completed up to approximately five feet bgs, the fluid grout will be allowed to set overnight (settle) and will be topped off the next day.

**Table 2**  
**Slurry Volume Requirements**

Well ID	Total Depth (feet bgs)	Screened Interval	Diameter (ft)	Grout Volume (yd <sup>3</sup> )
W-1-1	388	210-388	1.17	20
W-1-3	247	93-247	0.67	4.2
W-1-5	127	60-127	0.50	1.2
Total Volume:				25.4

Note: Grout volume includes placement of "neat cement" within the water saturated zone and Portland cement within the unsaturated zone.

The area around each well will be excavated by backhoe to expose the upper five feet of well casing. The well casings, from grade to five feet bgs, will then be cut off and capped at five feet with cement, then backfilled to grade with soil. When the wells are left unfilled overnight then a temporary cover will be left over the well of sufficient strength to withstand public egress.

Following destruction (abandonment) each location will be marked and a global position system (GPS) survey will be performed to obtain the northing and easting coordinates of the well(s). The GPS survey will use North American Datum (NAD) 83, Zone 5, coordinates. During the abandonment process, careful notes will be recorded on the location, methodology used, total well depth, depth to water, grout composition, and volume.

Previous groundwater investigations indicated elevated chlorinated hydrocarbon concentrations in groundwater at or nearby these wells. It is estimated that low levels of these chemicals will be present in the waste generated during the grouting activities. However, a sample of the liquid waste will be collected and analyzed for the suite of chemicals detected in nearby monitoring wells. This sample will be used to characterize the liquid waste. The liquid waste is presently assumed to be non-RCRA waste.

Well abandonment activities will conform to the approved Cal EPA guidance manual for "Monitoring Well Design and Construction for Hydrogeologic Characterization" July 1995, "The

California Well Standards Bulletin 74-90" June 1991, and "Water Well Standards: State of California Bulletin 74-81" December 1981.

Riverside County well destruction permits will be filed with the Riverside County Environmental Health Department prior to any field activities. The county requires a two-stage permitting process for abandonment. The first stage involves submitting a well destruction application which requests that the review process and permit be approved. The next stage requires that the well owner and well driller sign and date the permit upon acceptance by the county that all regulatory requirements, including access, traffic control, fire permits, etc. have been met.

### ***Biological Alternative/Constraints Approach***

Based on the habitation of sensitive species, such as the Stephen's Kangaroo Rat (SKR), at the Site, LMC is currently awaiting approval of our best management practices (BMPs) at the site. If the abandonment activities proposed in this letter will impact the sensitive species at the site, LMC proposes the following abandonment approach. To prevent the disturbance of the SKR and other biological constraints at each well location, LMC proposes to use non-intrusive abandonment methods (i.e., soil removal/excavation). In this case, the well monument will be left in place and the well will be perforated and sealed with grout to ground surface. If heavy equipment is not allowed to traverse to the well locations, LMC proposes grout the entire length of the well to ground surface without perforating the well casing.

All investigative-derived waste (IDW) generated by the drilling activities will be containerized in Department of Transportation (DOT) approved drums, labeled, and stored temporarily on-site pending disposal. All decontamination rinse water will also be containerized in a similar manner. Upon agency notice to proceed, LMC's environmental subcontractor will notify Underground Service Alert for utility clearances (if any are necessary due to the well's remote locations). Well destruction activities will follow the permitting and utility clearance phase. LMC estimates the field activities will be completed in one week, and can commence activities upon approval of the workplan by DTSC.

Should you have any questions regarding this proposal or need clarification, please feel free to contact me at 818-847-0197, or Ms. Linda Gertler at 818-847-0899.

Sincerely,

Gene Matsushita  
Technical Project Manager

Attachments: *Figure 1-Site Location Map*  
*Figure 2-Well Location Map*

C: Ms. Rania Zabaneh, Project Manager

Bc: Ms. Linda Gertler, LMC  
Mr. Neil Shukla, Tetra Tech  
Files

## **ATTACHMENTS**

### **Figures**