

June 2, 2006

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**Subject: Comments on the Draft Site-Wide Remediation Evaluation Summary
for LLNL Site 300**

Dear Claire:

Enclosed are Tri-Valley CAREs comments that address LLNL's Draft Site-Wide Remediation Evaluation Summary for LLNL Site 300. We have organized our comments into three categories: First, General Comments and then Specific Comments on the draft summary report. In the third section, we have attached **Community Acceptance Criteria** to be considered when making final cleanup decisions as the criteria are relevant to the scenarios presented in the draft report and, in particular, to the choices that flow out of them.

Yours very truly,
Peter M. Strauss
Marylia Kelley

cc:

Kathy Setian, US EPA
Jacinto Soto, DTSC
Susan Timm, CVRWQCB
Leslie Ferry, LLNL

SECTION ONE: General Comments

We appreciate this opportunity to provide comments on this draft summary report. We realize that much hard work has gone into the report, and, more importantly, into the remediation so far. This report and the choices that stem from it will set the stage for the next critical phase of the cleanup; that is, to transform the “interim” cleanup remedies into a permanent remedy. Our general and specific comments detail the importance of making this decision carefully, correctly and on the basis of the best possible analysis.

1. The Site 300 Superfund interim Record of Decision (ROD) does not contain cleanup standards. However, DOE has committed to cleanup the groundwater to a level at or between background and levels that are set by EPA in the Safe Water Drinking Act. The summary provides some detail on time and cost to achieve one of three options: background, water quality objectives (WQO), and Maximum Contaminant Levels (MCL). For the most part, we recommend DOE aim high: that is to set the standards to background, where feasible, and at the very least, to water quality objectives. A discussion of the report’s evaluation of the cleanup standards is addressed in the specific comments. In general, we are extremely disappointed with all of the conclusions and recommend that the report be re-written substantially before it is finalized.

For soil, the current assumption is to clean soil to a level that does not pose a risk to on-site workers. Because there have been serious discussions by DOE of shutting down current programmatic operations at Site 300 (e.g., all high explosive and testing activities) beginning in 2011 (see comment 2 below), and because there has been such high residential growth in the surrounding and abutting City of Tracy, we request that soil be cleaned to residential standards. While we recognize that residential standards may not be feasible in a few small places, on the whole, we recommend that residential standards be used. In the future, this would allow DOE to more easily dispose of the property and limit its liability. Unfortunately, this report does not evaluate the cost or time differences between the currently assumed industrial standards and residential standards. It is a major recommendation by Tri-Valley CAREs to include this analysis in the final version of the document.

In all cases, we recommend that the cleanup standard for carcinogens no less stringent than one in one million incremental lifetime cancer risk (10⁻⁶).

2. One of the major points that Tri-Valley CAREs continues to recommend is that a possible mission change or change in ownership of the site should be considered in remedy selection and cleanup goals. The DOE’s Fiscal Year 2007 Budget Request cites that an evaluation of the test capability of Site 300 is underway to determine the feasibility of shutting down operations beginning in 2011. This presents a substantial change from assumptions used in the interim ROD: that is, DOE maintained that it would control the site indefinitely. The “reasonably

expected land-use” for Site 300 is no longer as certain as DOE has portrayed it to be in earlier documents. Also, as noted above, because the Bay Area and Central Valley are growing so rapidly, and residential growth is beginning to occur near Site 300, it would be unfortunate if the cleanup levels decided in 2007 (the current timetable for the final ROD) were to dictate how this 11 square mile site will be used in the future. It is our position that the remedies and cleanup levels that are eventually chosen should not limit or inhibit tomorrow's land-use decisions.

3. Discussions about changing the remedy for Building 850 are underway. A surface "sand pile" and soil contain radioactive tritium, chemical explosives, Uranium 238, PCBs and dioxins. In the Building 850 area, we would like more hydraulic control of the source areas so the groundwater plumes do not continue to migrate, thereby contaminating additional water resources. We want to see any new proposals thoroughly vetted through the regulatory agencies and the community.
4. The plan should contain milestones by which the success of the subsequent cleanup can be evaluated. The remedies and the accompanying plan should contain measurable goals. It is important that the plan contain a measurable schedule and performance standards which can be verified. The model that accompanies each Operable Unit, or OU (for purposes of evaluating the time it takes to achieve the three different standards) is a good place to begin. After remedy selection is complete, we request that the model for each OU be “optimized” and modified to incorporate any changes made to the remedy.
5. Risk assessment and modeling are imperfect sciences. We advocate using the Precautionary Principle (which states in part, that when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically).
6. We prefer cleanup remedies that actively destroy contaminants to ones that merely capture the pollutants by transferring them to another medium, e.g., from water to granular activated carbon. Where practical, advanced biodegradation permeable barriers or other methods that destroy the contaminants are preferable.
7. Cleanup should be given priority over further weapons development. The budget for remediation of pollution at Site 300 should be adequate, stable and assured over the many decades it will take to actually complete this momentous task. The DOE must not renege on its obligation to the community to clean up its mess. Currently, the money for cleanup of Site 300 hovers at 1% of Livermore Lab's annual budget.
9. Tri-Valley CAREs re-iterates from previous comments that if Monitored Natural Attenuation (MNA) is selected, most of the contaminant mass must be reduced through degradation. We propose that an objective for any remedy that uses MNA

have at least 75 percent of the reduction take place through biological, chemical or radiological degradation. Further dispersal of a contaminant is more properly defined as continuing “pollution” than as a cleanup “remedy.”

10. Tri-Valley CAREs strongly reiterates that State Water Resource Control Board Resolution (SWRCB) 68-16 (i.e., the non-degradation policy) applies to groundwater at this site, not merely to discharges of treated water. This resolution applies to discharges: either underground or above ground discharges as is commonly understood by the general term discharge.

SECTION TWO: Specific Comments

1. Referring to Appendices C and D, we think that it is fallacious to use non-discounted costs to compare the various scenarios. Discounting reflects the time value of money. Benefits and costs are worth more if they are experienced sooner. The higher the discount rate, the lower is the present value of future cash outlays. Virtually every economic analysis that is done in the private sector converts costs to present value to compare costs. Government agencies also use present value costs to compare alternatives, including the Army Corps of Engineers (flood control projects) and the Department of Energy (see Yucca Mountain, for example). If costs are compared using non-discounted values, as this report does, it is like comparing apples to oranges and then to pears. If we understand DOE’s logic for not using present value analysis, as it was explained at the public workshop, it is that it will have to go to Congress for appropriations each year, and therefore, it must request the actual costs. That however, is not a logical argument for using non-discounted costs to compare scenarios. The only logical reason we see not to use non-discounted costs would be if the DOE were to request the entire sum, including out-year costs, in the present budget. As we all know, the DOE Fiscal Year 2007 does not do this. Thus, the approach taken in the draft summary report skews the evaluation of the remedies as presented in Appendix D.

To reiterate, it is a common principle in economics that today’s dollar is not worth as much as a dollar next year. There is no doubt that over time, the U.S. economy will grow, with proportional revenue increases to the government. To make decisions based on nominal estimates going out several hundred years serves no purpose, except to inflate the costs of alternatives that take longer to complete. We believe that the comparative analysis of scenarios in Appendix D does a disservice to the good work that went into the modeling (Appendix B), and needs to be translated to present value if it is going to be useful. Furthermore, the Office of Management and Budget offers “net present value” as the standard criterion. We recommend Appendix D be substantially rewritten to reflect present and “net present” value before the report is finalized.

For reference, specifically, OMB Circular A-94 states that, “The standard criterion for deciding whether a government program can be justified on

economic principles is *net present value* – the discounted monetized value of expected net benefits (i.e., benefits minus costs). Net present value is computed by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits.”

2. Referring to Appendix B, years of experience have led to the realization that the significant uncertainty about environmental cleanup requires adopting a flexible, iterative approach. Frequently missed target dates and failure to meet remedial action objectives have forced the development of mechanisms that allow for the continuous improvement and optimization of remediation technologies and techniques. As we understand from our discussions at the May 15, 2006 Public Workshop, the modeling assumptions for groundwater remedies were not optimized in drafting this report. In other words, only a hypothetical “fence” of wells was used for each scenario: even though we all know that an optimized wellfield would most likely achieve the results faster and with less cost. Yet, Appendix C contains a section (C.2.2.2) on Remedial Action Optimization where it assigns a cost to each facility for optimization. So, how come the benefits of the optimization (e.g. reduced time for remediation) are not integrated into the analysis? We recommend that the analysis be redone to include this. In the final consideration about which scenario to choose (Appendix D), it is important to put some positive value (i.e., benefit) on optimization – and not treat it just as a cost.

It is surprising that LLNL presents this analysis: for it has the experience where it aggressively managed well-fields and achieved results quicker than expected. LLNL coined then phrase “plume collapse”, yet the evaluation of the results in Appendix D seems to rest entirely on assumptions that went into a rather stagnant model. When this analysis is followed through in Appendix D, the modeling inputs dictate the answer to the question of which scenario is most desirable: even in cases where it takes the same amount of time to clean up to MCLs or WQO, the additional well monitoring trumps other considerations.

3. Appendices B, C, and D need to be changed to incorporate the above comments. Given the discussions in **Specific Comments 1 and 2**, the evaluation of which option to choose is entirely biased. In each case, it recommends that the remedy and standards should be based on MCL or partial capture to MCL. We find that this a predictable outcome, and not done in the good faith that DOE made with its original commitment: to set standards between background and MCLs. We again stress, for example, that we believe that the WQO for TCE (2.3 ppb) be chosen as the least stringent standard.

We also point out that the in 2001, EPA presented a new health risk assessment of TCE and found considerable evidence that disease occurrence was considerably higher than previously thought. Region 9 of EPA took these results and established a provisional PRG for TCE in the air. It was up to 40 times higher (more stringent) than prior estimates. Because of controversy surrounding the 2001 study, the National Academy of Sciences is evaluating it. Nevertheless, we

think that eventually, the TCE MCL will be adjusted downwards, probably to less than the WQO of 2.3 ppb. We therefore encourage you to take this opportunity to set your goals high and be in front of the curve.

4. Regarding tritium: Referring to Section D-4, we find that the analysis between achieving an MCL of 20,000 pCi/L (MCL) versus 100 pCi/L (called background – although frankly background is nowhere near this number – 100pCi/L is a convenient detection limit not a true background), which will take 35 years of additional monitoring, is well worth the expense of \$5 million (non-discounted). We recommend 100 pCi/L as the “floor” for cleanup, the remedy should not accept anything less stringent.

SECTION THREE: Community Acceptance Criteria

1. Complete the cleanup in a timely manner. Set a schedule for cleanup activities and adhere to it. The goal should be to complete cleanup of most pollutants within 10 years after the Dept. of Energy's (DOE) last scheduled Record of Decision, with up to 30 additional years for monitoring of residual contamination. As part of the plan, schedule milestones outlining total mass removal, and trends toward achievement of cleanup goals should be established and committed to by the DOE.

2. Cleanup levels should support multiple uses of Site 300, not just weapons work. First, residential development is beginning to take place near the site boundary. Any modeling assumptions should include the likelihood that large residential communities will rely on the regional aquifer for drinking water, thus speeding up groundwater movement. Second, according to DOE's 2007 budget request, the Department is considering the feasibility of closing out programmatic operations at Site 300 after 2011. In fact, there is zero "need" for testing nuclear weapons components at Site 300, and DOE ought to terminate those activities -- and sooner than 2011. Site 300's future land use assumptions should include mixed residential, recreational, ecological preserve and industrial land uses. Lax cleanup standards will result in residual contamination being left in soil and groundwater that will, in turn, restrict future land uses. Therefore, the most stringent standard should prevail.

3. Cleanup levels should be set to the strictest state and federal government levels. Tri-Valley CAREs believes that the strictest cleanup levels should be met in cleaning up the site. Federal and state Maximum Contaminant Levels for all groundwater (on-site and off-site) should be the "bottom line below which the cleanup will not fall." In many cases the technology exists (or can be developed) that will clean up contamination to "background" levels — that is to the level that existed in nature at the site before Livermore Lab took over in 1955 and began polluting it. In all cases where feasible, "background" levels should be achieved. Tri-Valley CAREs concurs with a strict interpretation of the California Regional Water Quality Control Board's non-degradation policy for groundwater. Migration of contaminants into pristine waters should be halted. At a minimum, the standard of 1 in 1 million excess cancer deaths should be adhered to, as well as meeting a hazard index of less than 1 (non-cancer health effects).

4. Remedies that actively destroy contaminants are best. In order of preference, Tri-Valley CAREs recommends the following types of cleanup measures: (a) remedies that destroy contaminants (i.e. by breaking them down into non hazardous constituents), such as ultraviolet light/hydrogen peroxide, permeable barriers, or biodegradation; (b) active remedies that safely treat or remove contaminants from the contaminated media; (c) monitored natural attenuation in so far as it relies on natural degradation (and not further dispersion of the pollution) within a reasonable time frame. What is called "risk and hazard management" (i.e., restrictions on land use, fencing, signs and institutional controls), while potentially useful for reducing short-term risks, is not valid as cleanup. In no case do we think that "point of use cleanup" (e.g., merely placing

filters on off-site drinking water wells) is appropriate. In all cases, hydraulic control should be established to halt migration of contaminant plumes to pristine waters.

5. The tritium source and plume should be controlled. The tritium plume, nearly two miles long and growing, cannot be cleaned up in the traditional sense of the word, since it is not feasible to separate the radioactive hydrogen (tritium) component from the water. Therefore, Tri-Valley CAREs recommends the following: (a) isolation of the tritium contaminated wastes in the unlined dumps to prevent further and continuing contamination of the groundwater; (b) hydraulic control of the plume to prevent further migration; (c) aggressive monitoring to ensure no migration while the tritium decays (at a rate of 5.5% per year); and, (d) a stringent contingency plan in case one or more of these methods fail. As it currently stands, groundwater rises into the unlined waste dumps during heavy rainfall and picks up additional contamination. Isolation of the wastes may be accomplished by means of drains, capturing groundwater upstream from the pits before it is inundated, and, where feasible, by removing the tritium-contaminated debris from the pits and storing it above ground in a monitored storage facility.

6. All radioactive substances should be isolated from the environment. In addition to radioactive tritium, there are also groundwater plumes containing uranium-238. The uranium in groundwater at Site 300 comes from bomb testing activities. The technology exists to separate uranium-238 from the groundwater. This should be done.

7. The ecosystem should be protected. Site 300 sits on 11 square miles of land about 30 miles east of San Francisco. It sits on a series of steep hills and canyons, covered by grasslands. Seven major plant communities occur at Site 300, including: coastal sage scrub, native grassland, introduced grassland, oak woodland and three types of wetland. 20 species of reptiles and amphibians, 70 species of birds, and 25 species of mammals also occur. Included may be special, rare and endangered species including the burrowing owl and the San Joaquin Kit Fox and the Large-flowered Fiddleneck. In order to protect the ecosystem, ecological risks should be no greater than those for humans (i.e., a Hazard Index of less than one for selected species, based on recent data). Moreover, every effort must be taken to ensure that the cleanup methods chosen do not inadvertently destroy unique habitat.

8. Decisions should not rely on modeling alone. The Site Wide Feasibility Study and other documents point out just how complex the hydrogeology of the site is, and how little it is understood. Given this, Tri-Valley CAREs believes that over-reliance on modeling to predict the fate and transport of contaminants is not a good idea. Computer modeling should be used as a tool only, and it should be continually updated by actual field testing.

9. Additional site characterization is needed. It is also apparent from the cleanup planning documents to date that additional characterization (e.g. of soil,

groundwater, waste dumps, etc.) is necessary, and will have to be budgeted for many years to come.

10. A contingency plan should be completed and publicly reviewed. This is needed because there are many uncertainties in the cleanup, novel remediation technologies will be used in some areas of Site 300, and contingent actions should be part of the cleanup plan and thus incorporated into the Superfund site-wide Record of Decision (ROD).

11. The public should be involved in decisions. As it now stands, public involvement takes place through the Technical Assistance Grant with Tri-Valley CAREs and at public meetings and hearings. After the ROD is signed, there are no mandatory public hearings or workshops. Therefore, we would like a commitment from the Livermore Lab to find a mechanism for regularly keeping the public informed.

12. Cleanup should be given funding priority over weapons development. Cleanup at Site 300 should be given a priority over further bomb-creating enterprises, and adequate, stable, long-term funding should be assured in order that the job may be done right. The current allocation of approximately one percent of Livermore Lab's annual budget for cleanup at Site 300 is insufficient.

13. Future activities should adhere to the "Precautionary Principle" to prevent harm. Releases of radioactive and toxic pollutants to soil, air, groundwater and surface water from ongoing and/or future operations at Site 300 are not acceptable. Any activity on the site should follow the common sense "Precautionary Principle" to avoid potentially harmful releases. Tri-Valley CAREs is additionally alarmed at Livermore Lab's 2006 "expression of interest" to the Dept. of Homeland Security to construct an exotic biowarfare agent research center at Site 300 that could experiment with Ebola virus and other diseases for which there is no known cure.

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