TO: Regional Water Quality Control Board  
FROM: Marylia Kelley, Executive Director  
ORG: Tri-Valley CAREs, 2582 Old First Street, Livermore, CA 94551  
DATE: August 29, 2009  
SUBJ: Written Comments to the Regional Water Quality Control Board (RWQCB) for Consideration in the “Development of a Strategy to Protect the Beneficial Uses of Groundwater in the Central Valley”

Tri-Valley CAREs is a Livermore-based non-profit founded in 1983. The organization works to educate and involve the public in decisions regarding cleanup of contaminated soil and groundwater in and around the Lawrence Livermore National Laboratory Main Site in Livermore and its Site 300 High Explosives Testing Range, located near Tracy, California in the Central Valley.

Our work on the Site 300 cleanup is most directly relevant for consideration in the “development of a strategy to protect the beneficial uses of groundwater in the Central Valley.” Tri-Valley CAREs is the recipient of an Environmental Protection Agency “Technical Assistance Grant” to monitor the Superfund cleanup at Site 300.

In preparing this comment, I have reviewed Tri-Valley CAREs’ written comments on various Site 300-related documents, and have gleaned the directly relevant ones for submittal to the Central Valley Regional Water Control Board in its efforts to come up with a uniform policy.

Following these initial comments (Part One), you will find 13 “Community Acceptance Criteria” (Part Two) developed by Tri-Valley CAREs in conjunction with Tracy, CA and other area residents.

TRI-VALLEY CAREs’ PUBLIC COMMENT -- PART ONE:

These Part One comments from Tri-Valley CAREs (TVC) fall into two categories: 1) the interpretation of the non-degradation policy (State Water Resource Control Board Resolution 68-16, and SWRCB Resolution 92-49); and, 2) strict enforcement of groundwater cleanup standards. I have placed the various comments addressing these issues, below.

1. **Non-degradation Policy**
   
   • TVC continues to believe that SWRCB Resolution 68-16 (i.e., the non-degradation policy) applies to the site and thus there is an absolute need to control contaminant migration.
TVC 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. Resolution 92-49, paragraph III.G, may be the more stringent of ARARs for setting in-situ cleanup standards. Paragraph III. F states that cleanup and abatement activities (emphasis added) shall conform to the provisions of Resolution 68-16. As such, the migration of a contaminated plume is in opposition to this Resolution and compliance with ARARs.

Leaving a large amount of contaminant mass in the groundwater or vadose zone is unacceptable, and violates the letter and spirit of State Water Resources Control Board Resolutions 92-49 and 68-16, both of which indicate that potential drinking water sources should not be contaminated.

Allowing the vadose zone to contaminate the groundwater or the plume to be diluted through advection and migrate to pristine waters is contrary to State Water Resource Control Board Resolution (SWRCB) 68-16 (i.e., the non-degradation policy), which applies to this site.

SWRCB Resolution 68-16 applies to groundwater at this site. This resolution applies to discharges: either underground or aboveground discharges as is commonly understood by the general term discharge. EPA seems to view a "discharge" only as the latter. Furthermore, this narrow interpretation is not within the spirit of SWRCB Resolution 68-16 (i.e., non-degradation and protection of beneficial uses). While EPA notes that Resolution 92-49, paragraph III.G may be the more stringent of ARARs for setting in-situ cleanup standards, other Sections of 92-49 are also relevant, including paragraph III. F. Specifically, this paragraph cites that cleanup and abatement activities shall conform to the provisions of Resolution 68-16.

2. Enforcing the most stringent Cleanup Standards.

The interim ROD did not contain cleanup standards. DOE had committed to cleanup the groundwater to a level between background and levels that are set by EPA in the Safe Water Drinking Act (i.e., the maximum contaminant level or MCL), or the state MCL. Yet, with few exceptions, DOE has opted for groundwater cleanup standards that are MCLs. Many of the MCLs were first established in the 1980s and have not undergone a
serious review since then. For example, although EPA identified TCE as having a greater toxicity in 2001, the MCL has remained the same (i.e., 5 ppb). It is also worthwhile to note that a bill was recently introduced in the Senate that would force EPA to modify the MCL for TCE within 180 days, and notes that the ATSDR recommends setting the MCL at 1 microgram per liter (i.e., 1 ppb). DOE has stated that after it reaches MCLs, it will evaluate whether it can meet a more stringent cleanup level such as the state water quality numeric limits (WQNLs) (formally the water quality objectives). Tri-Valley CAREs (TVC) believes that at the very least the goals for this cleanup should be more stringent; either the WQNLs or background. If they cannot be met, then the ROD can be modified at a later date. We believe that this is the correct approach, rather than establishing the most lenient groundwater standard. We believe that the community articulated this point in several of its public comments.

- Increasing residential growth in the Bay Area in general and the Central Valley around Tracy in particular and the strain on water resources throughout the state demands that the highest level of cleanup of all potential drinking water supplies be given the highest priority.

- In our comments on the Proposed Plan, Tri-Valley CAREs (TVC) stated that the proposed cleanup standards were not satisfactory. Specifically, DOE had previously committed to clean up the groundwater to a level between background and levels that are set by EPA in the Safe Water Drinking Act (i.e., the maximum contaminant level or MCL), or the state MCL. Yet, with few exceptions, DOE has opted for groundwater cleanup standards that are MCLs. The DOE has stated that after it reaches MCLs, it will evaluate whether it can meet a more stringent cleanup level such as the state water quality numeric limits (WQNLs), also known as the water quality objectives.

- Regarding the cleanup standard for tritium, TVC recommends using the EPA PRG number for tap water of 144 picoCuries per liter (pCi/ L), as opposed to the State and Federal MCL of 20,000 pCi/ L. Using the MCL would equate to an incremental cancer risk level of approximately one in ten thousand ($10^{-4}$). As such, the standards are not protective of human health and the environment, nor do they meet Community Acceptance criteria. Likewise, standards for TCE are likely to become more stringent as the 2001 Health Assessment for this compound is put into effect.

TRI-VALLEY CAREs’ PUBLIC COMMENT -- PART TWO:
Signed by more than 300 area residents, these “Community Acceptance Criteria” have been submitted on two prior occasions to regulatory agencies by Tri-Valley CAREs. This iteration of the “Community Acceptance Criteria” reflects the Site 300 Superfund Proposed Plan. We submit the criteria again, herein, to the Regional Water Quality Control Board to be considered as part of the agency’s deliberations on “development of a strategy to protect the beneficial uses of groundwater in the Central Valley” in which the Lawrence Livermore National Laboratory Site 300 is located.

These “Community Acceptance Criteria” accompany Tri-Valley CAREs’ comment letter to the RWQCB, submitted August 29, 2009. A number of the criteria, and their underlying principles, are directly relevant to the board’s current deliberations.

Community Acceptance Criteria for the Site 300 Superfund Cleanup

PREAMBLE:

Livermore Lab’s Site 300 is one of the most contaminated locations in the country, with radioactive tritium, Uranium-238, volatile organics like TCE, high explosives like RDX, perchlorate, PCBs and other potentially deadly pollutants that must be adequately addressed in the cleanup plan.

Many of these contaminants are already in the groundwater and are migrating -- and are thus polluting pristine water as they travel. In one area of Site 300, there is a 2-mile long underground contaminant plume with radioactive tritium emanating from below a gravel “firing table” where bomb blasts are conducted and the unlined waste pits where the debris from the bomb tests has been dumped. Tritium is the radioactive isotope of hydrogen made in reactors for hydrogen bombs. The current plan does not commit to preventing its further migration through the environment.

The unlined waste pits also contain Uranium-238 and other contaminants. The City of Tracy recently sent a letter to the Dept. of Energy (DOE), which owns the Livermore Lab Site 300, requesting that these dump sites be excavated so that deadly materials will not continue to leach into the groundwater. Tri-Valley CAREs has long advocated that the DOE undertake “hot spot” removal of contaminants in the unlined dumps. The cleanup plan does not propose any removal of contaminants from the unlined dumps, even though the dump sites are demonstrably leaking.

[We, the undersigned are] also disturbed that the proposed plan often chooses the most lax cleanup standards for pollutants on the site (e.g., the maximum contaminant levels) rather than the most stringent ones [e.g. the EPA’s remediation goals and/ or the Regional Water Quality Control Board (RWQCB) water quality objectives].

The question of “how clean is clean” is a crucial one in any Superfund cleanup -- and this is especially true at Site 300 where there are multiple pollutants mingled together in various media and complex geological features like earthquake faults and regional aquifers.
The next pages contain "community acceptance criteria" developed by Tri-Valley CAREs in consultation with community members in Tracy, the Central Valley and the Tri-Valley. I ask that...RWQCB consider these criteria in making cleanup decisions...

1. Complete the Site 300 cleanup project in a timely manner.

   **Set a schedule for cleanup activities and adhere to it.** The goal should be to complete cleanup ten years after the Dept. of Energy’s (DOE) last scheduled Record of Decision (ROD), with up to 30 additional years for monitoring of residual contamination. As part of the plan, schedule milestones addressing total mass removal, and trends toward achievement of clean-up goals should be established and committed to by the DOE. Areas that will still be contaminated should be identified. We recognize that cleanup in 10 years after the last ROD will be difficult to achieve in some small areas. Also, because of the nature of tritium, EPA and California drinking water standards will not be attained for that contaminant in the near future.

2. Cleanup levels should support multiple uses of the property.

   **Assumptions about land-use need to be altered.** As we can see, residential development is beginning to take place up near the site boundary. Any modeling assumptions should assume large residential communities relying on the regional aquifer for drinking water, thus speeding up groundwater movement. Second, we do not believe that Site 300 will necessarily always remain a DOE site. The “need” for testing nuclear weapons and components (particularly of new and modified designs) is a political decision, not a technically necessary mandate, and, in our opinion this testing should cease. We recommend that Site 300 future land use assumptions include mixed residential, recreational, ecological preserve and industrial land uses. Yet as it now stands, DOE assumes that Site 300 will remain in DOE’s control in perpetuity. We recommend that Site 300 assume to be mixed residential, recreational, ecological preserve and industrial land uses. Without full cleanup to standards appropriate for residential use, the residual contamination will remain in place and will restrict the future use of the property. The Proposed Plan must commit to cleaning up to residential standards -- this will ensure that a whole new cleanup will not need to be undertaken at a later date to go after the significant residual contamination that industrial standards would leave behind.

3. The strictest state and federal government cleanup levels should be used.

   **We believe that the strictest cleanup levels should be met in cleaning up the site.** Federal and state Maximum Contaminant Levels (MCLs) 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 (and/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 such cases where “background” cleanup levels that are more protective of human health and the environment can be achieved, they should be achieved. Moreover, the U.S. EPA has published "preliminary remediation goals“ for many contaminants that are more stringent than the Maximum Contaminant Levels. The State of California also has cleanup goals that are more strict than the MCLs. In this regard, 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). The Proposed Plan must commit to the strictest cleanup standard promulgated by appropriate state and/or federal regulatory agencies like EPA and the Regional Water Quality Control Board, not the most lax.

4. Remedies that actively destroy contaminants are preferable.

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 ultra-violet 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) is not a valid cleanup in our eyes. 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. When soil excavation takes place, it should be properly controlled to minimize releases of contaminated soil into the air, and onto adjacent properties.

5. The tritium source and plume at Site 300 should be controlled.

Continued forward momentum of the tritium plume must be halted. The tritium plume, about two miles long and growing, cannot be cleaned up in the usual 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 minimal migration while the tritium decays; and, d) a stringent contingency plan in case these methods fail. As it currently stands, groundwater rises into the waste dumps during heavy rainfall and picks up additional tritium. Isolation of the wastes may be accomplished by use 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 facility. The Proposed Plan must commit to these actions as needed to prevent further movement of tritium.

6. **Radioactive substances should be isolated from the environment.**

Contaminants should be removed, where possible, and stored to prevent future leakage. As is the case with tritium, there are several plumes containing Uranium 238, also called depleted uranium. Technology exists to separate this contaminant from the groundwater. Tri-Valley CAREs recommends that this contaminant be stored in above ground monitored facilities after separation from groundwater. This will prevent it from polluting a new location in the future.

7. **The ecosystem should be protected in the cleanup remedy.**

**Site 300 is home to endangered species and critical habitat.** 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 bird, and 25 species of mammals also occur. Special, rare and endangered species may live there, including the burrowing owl, 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). This involves making sure that cleanup activities do not inadvertently destroy unique habitat. This could occur from too quickly pumping groundwater, with the effect of destroying natural springs, or by capping large areas and replacing the vegetation with non-native species. The Proposed Plan must be rewritten to be more protective of endangered species at Site 300.

8. **Decisions should not rely on modeling alone.**
The Site Wide Feasibility Study for the Site 300 cleanup and other documents point out just how complex the hydrogeology of the site is, and how little is known about it. 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 continually updated by field testing as that information becomes available. We believe that if it necessary to base decisions primarily on modeling, the most conservative assumptions should be used. The Proposed Plan must include adequate, long-term field testing.

9. Additional site characterization is needed.

Adequate site characterization can ensure that the cleanup technologies built will be the ones needed for the pollutants in that specific area. It is 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. This should be specified in the Proposed Plan.

10. A contingency plan should be completed and subject to public review.

We recommend that a site wide contingency plan be discussed in the Proposed Plan and fully delineated in the Record of Decision document. This is needed because the cleanup of a few sites are put off until the future, there are many uncertainties, innovative technologies will be used, and contingent actions should be part of the cleanup plan and thus incorporated into the site wide Record of Decision.

11. The public should be involved in cleanup decisions.

A mechanism for long-term community involvement must be established. As it now stands, public involvement takes place through the Technical Assistance Grant (TAG) 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 Lab to find a mechanism for regularly keeping the public informed. A public record of cleanup activities should be updated regularly, maintained and made accessible at a local public library. Public workshops should be held periodically after the last ROD to discuss problems and progress.

12. Cleanup should be given priority over further weapons development.

Perhaps most important of all, Tri-Valley CAREs insists that cleanup of Site 300 be given a priority over further bomb-creating enterprises. Tri-Valley CAREs
objects to Livermore Lab increasing its outdoor explosive bomb tests 8-fold, and is participating in an effort to prevent the above-ground blasts with depleted uranium and other contaminants. These new tests will pile additional pollution on top of what is already being cleaned up under the Superfund law. We request, instead of more pollution, that adequate, stable, long-term funding be assured so that the current Superfund cleanup job gets done right. The fiscal year 2007/2008 allocation of about one percent of Livermore Lab’s annual budgets to cleanup at Site 300 (and only another 1 percent to cleanup at the Lab’s main site) is insufficient.

13. **Future activities at Site 300 should be designed to prevent releases.**

    *Releases to soil, air, groundwater and surface water from weapons testing are not acceptable.* Any activities, if they must occur, should take all necessary precautions to avoid any releases to the environment of radionuclides and chemical pollutants.

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(sign-on lines from the original are omitted)

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