NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
INTERIM DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:EHA/HEER
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November 22, 2011

Mr. Lenny Siegel
Executive Director
Center for Public Environmental Oversight
278-A Hope Street
Mountain View, CA 940441

Facility: Kekaha Emergency Diesel Generator

Subject: Response to Center for Public Environmental Oversight Comments dated October 21, 2011on the July 2011 Remedial Action Work Plan for the Emergency Generator Installation Site, Kekaha, Kaua'i.

Dear Mr. Siegel:

The Hawaii Department of Health (HDOH), Hazard Evaluation and Emergency Response (HEER) Office reviewed your comments on the Remedial Action Work Plan for the Kekaha Emergency Diesel Generator dated October 21, 2011. The HDOH would like to thank you for taking time to read our guidance for the investigation and assessment of pesticide-contaminated sites. Some clarification is required, however, for issues regarding the nature and importance of "hot spots" and the "toxicity" of the contaminants in the soil with respect to the risk posed to nearby residents. Notes on these issues are provided below.

Some clarification also has to be made regarding the statement "***The fundamental problem with the Remedial Action Work Plan is that it proposes no remedial action, just the placement of gravel on contaminated soil and the installation of a cattle fence and boulders barriers***".

Under the Hawaii Environmental Response Law (HRS 128D), capping and access restriction are acceptable remedial actions. HDOH would like to make it clear that the final remedy for the site has not been selected yet. Two remedial alternatives, both considered protective of the human health and the environment were presented to the community for public comments. Alternative 1 proposes to excavate the perimeter and manage soil in place. This alternative will include excavating soil from the perimeter of the project site to a depth of 1-ft below ground surface. After the soil has been removed, confirmation sampling will be conducted and the areas will be backfilled with clean fill and returned to the original grade. The soil excavated from FHMA-05 and FHMA-06 will be used to prepare the area where concrete pad will be installed. The project site will be fence to restrict access. Alternative 2 is to manage the soil in- place at perimeter and

on-site. This includes installation of 3-4 inches of gravel along the perimeter and inside of the project site. Boulders and fences will be installed to restrict access. Although, ADC prefers alternative 2 as the remedy for the site the HDOH hasn't selected the remedy. The HDOH instead presented in the public meeting these two remedial alternatives for public comments. Additional alternatives might be developed for the site.

The comments presented focus on two primary issues. **First, based on his communication with residents in the Kekaha community, they do not want theADC site to be used for emergency generators.** This is a planning issue, not an environmental issue that would be overseen by our office. This issue should be taken up with the county planning office in coordination with the property owner and the residents of Kekaha.

The second point in the letter is more pertinent to our office. Again based on his communication with local residents, **the residents want contaminated soil at the ADC site removed or capped to prevent potential exposure.** This is a legitimate proposal and our rules require that we take into account community input before approval of a proposed remedial option. This message was also presented during the public meeting held in October 19 in Kekaha.

Clarification of technical comments and misunderstandings are provided below (following your numbering). Copies of the comments are also attached.

1. **They assume industrial use, which means that a weaker exposure is applied. Recognizing that the reasonably anticipates future land use could entail residential use, gardens or schools would only lead to a more protective exposure standards….**Remediating the site to levels adequate for unrestricted, future land use would be ideal but is not necessary under the current, planned site use, or in all likelihood financially practical given the resources of the property owner unless the soil could be disposed of in the nearby municipal landfill. Disposal of the dioxin-contaminated soil in municipal landfills is discussed in our 2010 guidance on dioxins (HDOH 2010b). TCLP tests will be required for arsenic-contaminated soil (see HDOH 2010a).

2. **Combining multiple samples ("increments") from within each of the three targeted Decision Units missed or "averaged away" hot spots.** A detailed discussion of sampling theory is beyond the scope of this memorandum. As discussed in our offices Technical Guidance Manual and more recently USEPA Superfund guidance for the investigation of dioxin-contaminated sites (references below), the "Decision Unit (DU)" and "Multi-Increment Sample (MIS)" investigation approach in fact is specifically intended to find "hot spots" and incorporate them into the decisions made for the targeted area. From a risk perspective, the DU itself is the "spot" of interest and the goal is to identify "Hot DUs." HDOH (and USEPA) soil action levels are intended for comparison to the *average* concentration of a contaminant for the entire, targeted area that a person is assumed to spend time in over a number of years ("exposure area"). MIS sampling indeed averages down "hot spots" within the DU, but more to the point, it "averages up" cold spots within the DU to generate a more realistic, average concentration of the contaminant for the DU as a whole. The objective of a site investigation is to estimate the

mean contaminant concentration for the DU area as a whole (e.g., the "exposure point concentration" for a designated "exposure area" in a standard risk assessment).

Traditional, discrete soil sampling approaches, in fact, tend to miss small hot spots within a DU and *underestimate* representative contaminant concentrations. This is one reason that the USEPA Superfund group that studies dioxin-contaminated sites is now recommending the use of DU-MIS approaches instead of traditional, discrete soil sample approaches (USEPA 2011).

It is worth noting that their guidance refers to the work being carried out in Hawai'i as an example to follow. Several states and other groups are currently preparing guidance on the use of DU-MIS investigation approaches. Staff from USEPA headquarters are taking part in preparation of the guidance, along with staff from HDOH.

3. **HDOH weakened its exposure standards for arsenic.** This is incorrect and due to a misreading of our 2010 guidance on soil action levels for arsenic (HDOH 2010a). HDOH guidance calls for initial comparison of soil data to an assumed, natural background concentration of arsenic in soil of 20 mg/kg. This helps to quickly identify sites that could be impacted by pesticide-related arsenic.

   If the reported concentration of total arsenic in soil exceeds 20 mg/kg, HDOH guidance then recommends that a "bioaccessibility" test be carried out on the soil to see how likely it would be for the arsenic to be stripped from the soil if the soil was accidentally ingested. The concentration of bioaccessible arsenic in the soil is then compared to another set of soil action levels. For residential use of a property this action level is 23 mg/kg, i.e., concentrations of bioaccessible arsenic below this level do not pose a significant health concern. For commercial industrial use the action level is 95 mg/kg.

   Consideration of the bioaccessibility of arsenic is soil is critical for Hawai'i due the high iron content of the volcanic soils (the reason the soil is so red). Arsenic will quickly become tightly bound to iron in the soil and not bioavailable if the soil is incidentally ingested. This explains the high level of arsenic in some former sugarcane fields. Arsenic was used as weed killer in the fields in the 1910s through 1930as but had to be continuously re-applied in areas of especially high rainfall because the high iron in the soil quickly bound up and "detoxified" the arsenic, making it ineffective. (Significantly elevated levels of arsenic have not been identified in sugarcane fields around the Kekaha area, reflecting the comparatively low rainfall and reduced problems with weeds.)

   This is the approach used for the former pesticide mixing area. Exceeding the HDOH action level for bioaccessible arsenic likewise does not necessarily imply that arsenic in the soil poses a significant health risk, only that more evaluation is warranted if the soil is not going to be remediated. The action levels are conservative and assume long-term continuous, frequent (e.g., 250 to 350 days a year) contact with contaminated soil over many years. Importantly, and in accordance with HDOH and USEPA risk assessment guidance, the action levels apply to specifically targeted areas of open soil that represent the long-term, "exposure area" of the targeted receptor (e.g., a child or worker). An

example of an exposure area might be the yard around a house or an uncovered area of soil at a commercial property, as was the case for this project. The soil action levels do not apply to short-term ("acute") exposure to small spots of contaminated soil within an exposure area. Equivalent action levels for short-term exposure would be orders of magnitude higher for most chemicals.

4. **HDOH soil action levels for dioxins.** First, it is important to note that HDOH soil action levels and USEPA screening levels are not hard-fast, promulgated "cleanup standards" similar to drinking water standards. Referring to the action levels and screening levels as "standards" is not accurate or appropriate. The draft USE PA updates to their soil screening levels for dioxins will not be promulgated as strict, non-flexible cleanup standards. They are exactly what they are call – screening levels, a place to start. Exceeding a screening level does not mean that exposure to the soil poses a significant health risk, only that additional evaluation is warranted.

The USEPA screening levels mentioned in this comment are just that - screening levels. They are intended for use at sites where no information has been gathered in the past and represent the level of contamination that under any site scenario would *not* pose a significant health risk. These action levels represent a *starting* point, not an end point. As discussed in our offices dioxin guidance, the proposed USEPA screening levels represent the *bottom* of a range of dioxin levels in soil that will not pose a significant health risk.

Unlike drinking water standards, which are promulgated and are not flexible, soil action levels and screening levels are very dependent on site-specific circumstances. These are discussed in our offices action level guidance and include, among other factors: soil type, the types and proportions of congeners present (in the case of dioxins and furans), bioavailability of the contaminant in soil, the extent of barren versus grassed or otherwise covered areas (relates to actual exposure), frequency and nature of site use, number and type of contaminants present, uncertainty in toxicity studies, etc.

HDOH has been studying the nature of dioxin-contaminated soil in Hawai'i for a number of years. As described in the supporting documentation, our guidance represents the next step in the development more specific and appropriately protective soil action levels for dioxins. We referred to multiple sources of information on dioxin toxicity, including the draft USEPA guidance. As discussed in the supporting document, we ultimately chose to incorporate toxicity factors published by the World Health Organization. Among other factors, this was due to a lower uncertainty in the toxicity factors proposed and also to the consideration of bioavailability and other factors in their guidance. (Note that USEPA guidance also recommends that bioavailability of dioxins in soil be considered in more detailed risk assessments and screening levels.)

The commenter suggests that HDOH soil action levels for dioxins are "less protective" than screening levels published by USEPA and other states. This is not correct. As discussed above, the HDOH action levels instead reflect a more thorough review of the nature of dioxin contaminated soils in Hawai'i. Comparison of dioxin screening levels between agencies is an "apples and oranges" issue. The draft USE PA screening levels in particular assume 100% bioavailability of dioxins in soil. This may be a conservative

starting point but, as described in the HDOH guidance, it is not at all realistic. A default, assumed bioavailability of dioxins in soil of 50% is in fact routinely used in risk assessments by both the USEPA and state agencies (see HODH guidance). This would effectively double the draft USE PA screening levels mentioned.

It is also worth noting that USEPA has used a default, residential soil screening level of 1,000 ng/kg (1ppb) TEQ dioxins in soil since the late 1980s (formally published in a 1998 RCRA memorandum). HDOH reviewed the basis of the RCRA screening levels when we began to identify dioxin-contaminated soil in Hawai'i in 2005 and found the basis of the screening levels to be lacking and not adequately conservative. In 2006 we publish dioxin soil action levels more over 60% lower than those in use by USEPA at the time (e.g.,450 ng/kg for residential sites). We further lowered our soil action levels by more than 10% in 2008 after reviewing additional toxicity studies published by the state of Minnesota (e.g.,390 ng/kg for residential sites). We also specified that the more current and conservative TEFs published by the World Health Organization in 2006 be used, which USEPA has also subsequently adopted. The combined use of the WHO TEFs and use of a reduced soil action level effectively resulted in our guidance being more conservative than the existing UEPA guidance by an order of magnitude.

Although we still consider our earlier soil action levels to be protective, in 2010, after a more lengthy review of WHO and other agency studies, and in an effort to better identify sites that could be significantly impacted with dioxins but were characterized using outdated, discrete sampling approaches, we further reduced our residential soil action level for TEQ dioxins by a factor of almost one-half, to 240 ng/kg. We likewise reduced our commercial/industrial soil action level to 1,500 ng/kg (vs a screening level of 5,000 to 20,000 ng/kg used by USEPA for most of the past two decades). During this same period, we further tightened our guidance for the investigation of dioxin-contaminated sites by requiring that DU-MIS approaches be used, rather than out-dated, discrete sampling approaches that had a high potential to underestimate the representative concentration of dioxins present in soil as well as the lateral and vertical extent of contamination.

Quite contrary to Mr. Siegel's note, our office most likely has the most stringent supportable) guidance for the assessment of dioxin-contaminated sites in the US, especially with our emphasis on DU-MIS investigations.

It is also worthwhile to note that soil action levels published by HDOH are *more stringent* that USEPA "Regional Screening Levels (RSLs, formerly "PRGs)" for 85% of the chemicals listed in our guidance (HDPH 2009). This does not necessarily mean that the USEPA RSLs are "wrong" or not "under protective," it simply reflects our offices more detailed review of the potential risks and environmental hazards posed by these chemicals in Hawai'i.

Recommendations:

5. **a) Excavation of toxic hot spots.** The alternative remedial actions noted in your letter are legitimate for consideration and indeed have been discussed within our office and

with the property owner. Based on the review of the comments, and new information on the presence of school inside the former Amfac Office, soil with levels of contaminants above residential action levels from FHMA-05, FHMA-06 and adjacent areas, including the road and drainage swale must be addressed to allow safe use of publicly accessible areas, through excavation, disposal, or consolidation inside the portion of the fenced project site designated for commercial/industrial use. FHMA-03 will be excavated and buried underneath the generator pad (if ADC decides to install the generators inside the 3-acre project site designated for commercial land use). The portion of the project site that includes Decision Unit 1 and Decision Unit 3 will be fenced to restrict access and will be covered with clean-fill material. Please refer to our selected final remedy which will be posted in our website http://hawaii.gov/health/environmental/hazard/index.html.

b) A dust suppression and air monitoring plan should be developed for this site before construction is approved. As a part of the remedial action conducted under HDOH oversight, ADC is required to follow best management practices such as: silt fencing, dust fence, dust control measures, personal air quality monitoring, and excavation staging, so that the remedial action is protective of human health and the environment.

c) **Development and implementation of a robust, transparent, long-term management plan if contaminated soil is left in place.** The Environmental Hazard Management Plan will be revised based on the final remedy and will include contingency plans in case there is a breach in the institutional and engineering control.

If you have further questions and would like to discuss issues and responses to your comments you can give me a call at 808-586-4815, Roger Brewer at 808-586-4328 or Melody Calisay at 808-586-7577.

Sincerely,

Fenix Grange
Supervisor-SDAR
Hazard Evaluation and Emergency Response
919 Ala Moana Blvd., Room 206
Honolulu, HI 96814

Cc: Eugenia Chow – EPA Region IX
Debbbie Schechter – EPA Region IX

References

HDOH, 2010a, Update to Soil Action Levels for inorganic Arsenic and Recommended Soil Management Practices (October 2010): Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaiidoh.org/

HDOH, 2010b, Update to Soil Action Levels for TEQ Dioxins and Recommended Soil Management Practices (June 2010): Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaiidoh.org/

HDOH, 2011, Technical Guidance Manual Notes: Decision Unit and Multi-Increment Sample Investigations (March 2011): Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaiidoh.org/

USEPA, 2011, User Guide - Uniform Federal Policy Quality Assurance Project Plan Template For Soils Assessment of Dioxin Sites (September 2011): U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, 112pp, http://www.epa.gov/superfund/health/contaminants/dioxin/pdfs/Dioxin%20UFP%20QAPP%20UserGuide.pdf