California Unions for Reliable Energy (CURE), in pre-filed testimony (authored by Mathew F. Hagemann on behalf of CURE), has raised issues regarding contamination from munitions and pyrotechnics at the proposed Blythe Solar Power Project (BSPP) site and risks posed to worker safety and public health. Staff disagrees with CURE’s assertions and need for further site characterization.

U.S. Army Corps of Engineers Investigation of Formerly Used Defense Sites (FUDS)

The Department of Defense (DoD) is responsible for environmental restoration of properties that were formerly owned by, leased to or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense. These properties are known as Formerly Used Defense Sites (FUDS) and are managed by the U.S. Army Corps of Engineers.

Mr. Hagemann asserts that the Staff Assessment (SA) does not describe the history and existing conditions on and around the Project site and fails to identify the fact that portions of the BSPP site are subject to FUDS cleanup activities. This assertion is incorrect. The RSA identifies the former Blythe Army Airfield (BAAF) to the south of the BSPP site and discusses the Phase I Environmental Site Assessment (ESA) of the BSPP (AECOM 2009). AECOM retained the services of Environmental Data Resources, Inc. (EDR) of Milford, Connecticut to provide specified state and Federal regulatory list information for potential sites of environmental concern located at or in the vicinity of the subject property. EDR’s database includes over 23 million records compiled from over 1,200 federal (including FUDS), state, local, tribal and proprietary databases and the company generates over 750,000 environmental risk reports each year. The EDR database did not indicate any sites of concern to be located on the BSPP property or within a one-mile radius of the BSPP.

Furthermore, as discussed in Attachment 2 of Mr. Hagemann’s testimony, a Defense Environmental Restoration Program (DERP) investigation and removal at the BAAF occurred in 1987. A supplemental risk assessment evaluation for the presence of unexploded ordnance conducted by SAIC in 1999 indicated that “based on site observations, there were no unexploded hazards on the surface, only spent bullets.” SAIC concluded that the overall Hazard Probability Value of 14 fell within the “Remote” category. The next and final category was “Improbable.” Further action was recommended but the Risk Assessment Code was downgraded from a score of 3 to 4 (on a scale of 1 to 5).
Documentation regarding the past and possible future evaluation of the BAAF provides no evidence that a FUDS investigation, if in fact considered warranted, would extend beyond the boundary identified by SAIC in its 1999 evaluation of the BAAF. This boundary does not include any portion of the Blythe Solar Power Plant. In his testimony, Mr. Hageman depicts two locations for the boundary of the BAAF FUDS (see his Figure 1- page 4 in his testimony), but fails to justify the larger boundary. The smaller of the two boundaries corresponds to the one provided by him in Attachment 2 and dated 1999. The northwest corner of the FUDS boundary is adjacent to the southeast boundary of the BSPP but does not extend onto the proposed BSPP site. The larger boundary he depicts in Figure 1 that extends within the BSPP right of way is not identified in any report provided in his testimony or attachments. (We note that this larger boundary does not include locations where the BSPP solar fields would be placed.) Aerial photographs (1996, 2002) provided in the Phase I ESA (Appendix I of the AFC) show crop circles encompassing firing ranges associated with the BAAF. Agricultural lands are tilled to a depth of at least three feet, thus exposing any subsurface ordnance that may have been present as a result of past military training activities. Therefore, these already disturbed lands do not support the premise that the BAAF site boundaries should be expanded.

Given the lack of evidence supporting inclusion of the BSPP within the FUDS, National Contingency Plan standards (related to the identification and mitigation of environmental and health impacts) under California Department of Toxic Substances and Control (DTSC) and Army Corps oversight would not apply to the BSPP.

Location of Jeep Range, Poorman Range and Firing and Bombing Area

Staff also disputes the location of the Jeep Range and Poorman Range as depicted in Figure 1 of Mr. Hagemann’s testimony. Figure 1 shows the two ranges encompassing large areas of the BSPP. The testimony on page 8 states that the Poorman Range extends 4 miles within the BSPP. The testimony on page 9 states that ‘the range fan associated with the Jeep Range at the Blythe AAF is shown below in Figure 1 to extend 3 miles into the Project right of way.’

Attachment 3 of Mr. Hageman’s testimony clearly identifies the Jeep Range and Poorman Range in relation to the Blythe Army Air Field (BAAF). This 1943 map shows all buildings and features of the BAAF. The map shows the two ranges located parallel to each other on the northwest boundary of the BAAF. The location of the Jeep Range is supported by aerial photographs provided in Appendix I of the AFC. The 1951 photograph clearly shows the broad outline of the Jeep Range (presumably the jeep tracks) and its relationship to the boundary of the BAAF and to an adjacent geological feature. The Jeep Range is proximate to a low hill (as is the Poorman Range) and wash that are visible on both the 1951 aerial photograph and Figure 1. Based on the legend provided in the 1951 photograph, the Jeep Range is about 1,200 feet by 600 feet. Given the accuracy of the Jeep Range location, staff believes the Poorman Range location is also accurate and that both ranges are located directly east of the southern boundary of the BSPP right of way.
Mr. Hagemann appears to have extended the Ranges based on a footnote stating that “safety fans are areas where the bullets would have been directed at distances of up to five miles depending on the caliber and type of projectiles.” No citation is provided for the statement regarding the five mile safety fan. He also appears to be using the hand drawings included in his Attachment 4; note that he has changed the range locations from those shown in Attachment 4. These hand drawings do not reflect the location or orientation of the Ranges identified in the 1943 map in Attachment 2. Nor is there any supporting documentation for the hand drawings in Attachment 4. Furthermore, he refers to Attachment 4 as a map of “Firing and Bombing Area” associated with the BAAF. These hand drawings do not correspond to the firing and bombing range identified at the top of Figure 1. No map in his testimony provides documentation for the firing and bombing range shown in Figure 1. Because no documentation exists to support the alleged location of a “Firing and Bombing Area”, staff has no evidence that a bombing range existed in the northern area of the solar project as shown in Figure 1. Furthermore, a bombing range so close to an Army Air Field is contrary to safety precautions, as well as standard operating procedures, because literally tons of bombs were stored at the BAAF and bombing ranges were usually many miles away from an AAF.

Staff concludes that there is no compelling evidence to show that any of these ranges occurred within the BSPP site.

Threat to Worker Safety and Public Health

Mr. Hagemann states on Page 11 that the range fans” that extend beneath the Project right of way may be areas where spent .30 and.50 caliber bullets may be found during project construction.” The testimony states that contamination could arise from spent bullets and pyrotechnic munitions:

“Lead has been found in association with .50 caliber rounds at a former jeep range at Nellis AFB in California.”….Compounds of concern used in pyrotechnic munitions include perchlorates used as oxidizers. Perchlorates are known to inhibit thyroid function and are a risk to human health, primarily through ingestion of drinking water, although inhalation of soil dust is a known route of exposure. Areas where pyrotechnic devices were detonated may present a health risk to construction worker (sic) at the project site.”

(Testimony of Mr. Hagemann, p. 8.) Mr. Hagemann states that the RSA did not recognize the potential for contamination associated with the range fans and that no sampling has been conducted.

Staff disagrees with Mr. Hagemann’s testimony and believes that contamination associated with munitions (bullets and pyrotechnics) is unlikely, that any munitions artifacts still remaining on the site are unlikely to pose a significant risk to worker safety and public health, and that sampling would provide no benefit to the protection of worker
safety and public health. In addition, staff’s proposed Condition of Certification **Worker Safety-8**, contained in the RSA, would provide mitigation even if the soil happened to contain significant levels of anthropogenic metals.

As discussed above, the Jeep and Poorman ranges are adjacent to (but not located within) the Project right of way and are at a considerable distance from the closest solar field where construction would occur. These ranges terminate at a rise (approximately 20 feet) that would reduce, if not eliminate, the chances of munitions going beyond the target. Furthermore, metals, and lead in particular, are found in significant concentrations in soils at firing ranges but only in the area of the shooter (due to the use of lead styphnate and lead azide as the primary constituent of most primers in the bullets (Interstate Technology & Regulatory Council Small Arms Firing Range Team, 2005)) and behind the targets and before the berm where most of the bullets fall. As noted above, the land encompassing the two ranges has been disturbed by agricultural activities.

Mr. Hagemann cites a Nellis AFB report (Attachment 5) as evidence of the need for sampling. However, the BAAF operations took place during a limited time frame (between 1942 and 1944) in contrast to Nellis AFB, where occurred over a much longer timeframe (decades). We also note that the Nellis AFB Report refers only to the presence of lead in bullets (as a function of their composition) and not the presence of lead in soils.

Even if munitions were present, the extremely dry conditions of the desert do not support rapid decomposition of metals. As reported by Scott in 2001, lead has been the material of choice for bullets because of its “low cost, easy availability, versatility and excellent performance”. The copper jacket renders the bullet more environmentally sensitive in wet soils due to the galvanic corrosion potential between lead and copper but in the dry soils of the Mojave Desert it is more resistant to degradation. Furthermore, although lead forms an oxide or a hydroxide that is amphoteric (that is, functions as both an acid and a base), it is mobile in more acidic soils and less mobile in alkaline soils. The Mojave Desert is composed primarily of alkaline soils.

To further support the lack of conditions requiring sampling, extensive surveys already conducted on the BSPP have not identified significant numbers of munitions. AECOM, on behalf of the Applicant, conducted a Class III cultural resources survey of the BSPP site. As stated in the BSPP RSA, “a Class III survey is a continuous, intensive survey of an entire target area (100%), aimed at locating and recording all archaeological properties that have surface indications, by walking close-interval parallel transects until the area has been thoroughly examined.” Ground visibility during the survey was considered “extremely good” due to the sparse desert vegetation. Staff reviewed the table identifying resource types – of more than 400 sites, less than 10 (<2.5%) referenced munitions (bullets or munitions casings).

Biological surveys were also conducted and would require similar attention to the ground surface. To staff’s knowledge, AECOM biologists encountered only one munition
of concern – the land mine referenced in Attachment 6 of Mr. Hagemann’s testimony. (Note that AECOM personnel conducting the Phase I Environmental Site Assessment indicated that unexploded ordnance (UXO) was encountered on site.) See below for discussion of UXO.

Mr. Hagemann raises the potential risk from perchlorate contamination from the use of pyrotechnics. Perchlorate would not pose a health risk through inhalation because it is extremely water soluble and unlikely to remain on the surface or near surface after decades of heavy yet intermittent downpours. Its environmental half-life in soil is very short, approximately 52 hours (Robles, Heriberto 1999) and is degraded by the presence of organic matter, reducing agents, and suitable microbial flora. The Robles study used soil from a Southern California agricultural field that contained only 0.7 % organic carbon content. Studies of ammonium perchlorate production workers (with extensive exposure to perchlorate dust) did not identify a significant effect on the thyroid, which is symptomatic of perchlorate exposure. ([http://www.epa.gov/IRIS/subst/1007.htm](http://www.epa.gov/IRIS/subst/1007.htm))

Finally, we point out that even if soil contamination were to exist in locations within the BSPP, Condition of Certification WORKER SAFETY-8, which would require that the dust control measures found in proposed Conditions AQ-SC3 and AQ-SC4 be supplemented with additional requirements including implementing methods equivalent to the requirements of Rule 402 of the Kern County Air Pollution Control District (as amended Nov. 3, 2004), would significantly limit the exposure of soil particles to workers and the public.

Unexploded Ordnance (UXO) Protection

Mr. Hagemann states (page 15) that staff’s “Condition of Certification WASTE-1 provides only for a plan to train construction workers and other site workers in the recognition of potential UXO”. This is incorrect. As shown below, this condition requires the project owner to prepare a work plan to recover, remove and investigate (including geophysical surveys) UXO. In response to a staff data request, the Applicant has specified how it intends to conduct UXO surveys ([AECOM2010a](#)). For ease of reference, staff has attached this data response below, and believes that the applicant’s proposed approach will ensure that any potential impact resulting from the presence of UXO on the project site will be reduced to a level less than significant. To further ensure that such an approach is followed, staff recommends adding a reference to the data response to the last bullet of proposed Condition of Certification Waste-1:

**WASTE-1** The project owner shall prepare a UXO Identification, Training and Reporting Plan to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance. The project owner shall submit the plan to the CPM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:
• A description of the training program outline and materials, and the qualifications of the trainers; and

• Identification of available trained experts that will respond to notification of discovery of any ordnance (unexploded or not); and

• A work plan to recover and remove discovered ordnance and complete additional field screening, which includes geophysical surveys as described in DR-WM-252 to investigate adjacent areas for surface, near surface or buried ordnance in all proposed land disturbance areas.

The project owner shall provide documentation of the plan and provide survey results to the CPM and AO.

Verification: The project owner shall submit the UXO Identification, Training and Reporting Plan to the CPM and AO for approval no less than 30 days prior to the initiation of construction activities at the site. The results of geophysical surveys shall be submitted to the CPM and AO within 30 days of completion of the surveys.

Staff believes that proposed condition Waste-1 will address the concerns raised by Mr. Hageman and CURE and along with Worker Safety-8, will reduce any risk to workers due to any residual hazardous wastes or UXO in site soils to below a level of significance. Staff also concludes that these measures taken to protect on-site workers from a significant risk, will likewise protect the off-site public as well.

References


DR-WM-254 is as follows:

**Information Required:**

Please describe the timing and methodology for completing the geophysical surveys.

**Response:**

Some combination of on-call or on-site Construction Support and/or munitions response geophysical surveys will be provided for all intrusive activities at the planned sites approximately two to four weeks ahead of field work. For those construction areas where no munitions and explosives of concern (MEC) are present, the construction footprint will be cleared to depth of detection of the instrumentation of the most appropriate instrumentation deployed (as determined by the project design team). If the geophysical anomalies are not caused by MEC, i.e., anomalies are sourced by non-hazardous munitions debris or non-ordnance objects, then further development activities will be accompanied by a resumption of Construction Support, as provided above.

For those construction areas where MEC has previously been discovered, or where two or more MEC are present, UXO Construction Support will be provided in accordance with guidance provided by:

- AECOM, 2009, Program Safety Plan, Military Munitions Response Program (Draft Outline and Definitions attached).

AUXO teams may consist of a minimum of two qualified UXO personnel (UXO Technician II or above) required. The UXO team may include additional UXO-qualified personnel, depending on site- and task-specific conditions and requirements, and the number of UXO teams will vary depending on the total level of effort.

If subsurface removal is required in support of construction activities, UXO team(s) will consist of no more than seven UXO personnel including the team leader. A Senior UXO Supervisor will be on site during operations and will not supervise more than 10 UXO teams. A UXO Safety Officer (UXOSO) is required on site during operations. A UXO Quality Control Specialist (UXOQCS) may or may not be required to be on site full time, and may be in a dual role as the UXOSO/UXOQCS if there are less than 15 field personnel on site.
The UXO team members have the following responsibilities for MEC support during construction on a site with known or suspected MEC:

- Provide the MEC identification, location, and safety functions for the prime contractor during construction activities.
- Conduct MEC safety briefings and UXO recognition training for all site personnel and visitors.

The UXOSO, or the senior UXO-qualified person on site if a UXOSO is not assigned, will act as the UXOSO and has final on-site authority for MEC procedures and safety issues.
DECLARATION OF
Alvin J. Greenberg, Ph.D.

I, Alvin J. Greenberg, Ph.D., declare as follows:

1. I am presently a consultant to the California Energy Commission’s Facilities Siting Office of the Systems Assessments and Facilities Siting Division.

2. A copy of my professional qualifications and experience is included in the Revised Staff Assessment and incorporated by reference herein.

3. I helped prepare staff rebuttal testimony on Waste Management and Worker Safety for the Blythe Solar Power Project Revised Staff Assessment based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.

5. I also reviewed the entire Waste Management section of the Blythe Solar Power Project Revised Staff Assessment and agree with the analysis and conclusions found therein.

6. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.


At: Sacramento, California
DECLARATION OF  
Suzanne L. Phinney, D.Env.

I, Suzanne L. Phinney, declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission’s Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Senior Associate.

2. A copy of my professional qualifications and experience is included in the Revised Staff Assessment and incorporated by reference herein.

3. I helped prepare staff rebuttal testimony on Waste Management for the Blythe Solar Power Project Revised Staff Assessment based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.


At: Sacramento, California
APPLICATION FOR CERTIFICATION
FOR THE BLYTHE SOLAR
POWER PLANT PROJECT

Docket No. 09-AFC-6
PROOF OF SERVICE
(Revised 5/3/10)

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DECLARATION OF SERVICE

I, Hilarie Anderson, declare that on June 24, 2010, I served and filed a copy of the attached Staff Waste Management/Worker Safety Rebuttal Testimony. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/solar_millennium_blythe]

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission’s Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

✓ sent electronically to all email addresses on the Proof of Service list;
✓ by personal delivery;
✓ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked “email preferred.”

AND

FOR FILING WITH THE ENERGY COMMISSION:

✓ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);

OR

depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Original Signature in Dockets
Hilarie Anderson