

LATHAM & WATKINS LLP

650 Town Center Drive, 20th Floor
Costa Mesa, California 92626-1925
Tel: +1.714.540.1235 Fax: +1.714.755.8290
www.lw.com

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June 24, 2009

File No. 039610-0003

VIA FEDEX

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-9
1516 Ninth Street, MS-4
Sacramento, California 95814-5512

DOCKET	
08-AFC-9	
DATE	June 24 2009
RECD.	June 24 2009

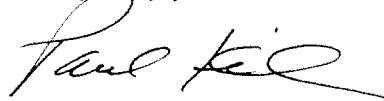
Re: City of Palmdale Hybrid Power Plant Project: Docket No. 08-AFC-9

Dear Sir/Madam:

Pursuant to California Code of Regulations, title 20, sections 1209, 1209.5, and 1210, enclosed herewith for filing please find Applicant's Response to CEC Staff Request for Clarification on CEC Data Request 137.

Please note that the enclosed submittal was filed today via electronic mail to your attention and to all parties on the attached electronic proof of service list.

Very truly yours,



Paul E. Kihm
Senior Paralegal

Enclosure

cc: 08-AFC-9 Proof of Service List (w/encl., via e-mail and U.S. Mail)
Michael J. Carroll, Esq. (w/encl.)



ARCHAEOLOGY AND HISTORIC PRESERVATION

MEMORANDUM

TO: Sara Head, AECOM Environment **DATE:** June 24, 2009

FROM: Jim Allan, WSA and Dave DeVries, Mesa Technical

SUBJECT: Response to CEC Staff request for clarification on the Palmdale Hybrid Power Project (08-AFC-9) Data Request 137

On May 20, 2009, the CEC Staff made an informal request for additional information regarding the original response to Data Request 137 regarding the Palmdale Hybrid Power Project (PHPP) proposed by the City of Palmdale (“Applicant”). CEC Cultural Resources Staff provided specific information during a June 9, 2009 conference call with the Applicant’s consultants about the scope of this supplemental response. This memorandum represents Applicant’s supplemental response to Data Request 137 in addition to previous information submitted on May 1, 2009.

I. Summary of Data Request

Staff’s informal information request regarding Applicant’s original response to Data Request 137 was divided into two parts:

1. With respect to the mid and upper fan areas of Big Rock Creek, Little Rock Creek, Anaverde Creek, and Amargosa Creek, Staff requests a map of these fans across the project site and descriptions of their surface characteristics and near-surface stratigraphy. The descriptions of the surface characteristics of the portions of the alluvial fans on the project site would include descriptions of secondary landform features across the fan surfaces such as relative number and character of intermittent stream channels, the typical character of stream channel overbank deposits, the character of any eolian features such as coppice dunes or sand sheets, and the general lithology of the surface of the subject fan portions.
2. With respect to the ranking of the archaeological sensitivity of project area soils, Staff requests that Mr. DeVries consider the potentiality that a substantial body of the evidence

of critical prehistoric resources in the project area of analysis may lie buried in the subject alluvial fans, offering no surface expression, and answer these questions:

- a. Please discuss the possible presence of buried fresh-water channels.
- b. Please discuss the possible presence of buried former wetlands, such as those that may have periodically formed along intersecting fan margins.

Staff provided substantial guidance about the scope of these informal data requests during a conference call with Applicant on June 9, 2009. Specifically, Staff stated that it wanted clarification on the following questions:

- Given that the soils maps only show evidence of surface features, how can buried features that are not evidenced on the soils maps be accounted for? On the June 9, 2009 call, Staff acknowledged that it is not feasible to expect a conclusive answer on this issue.
- Is there evidence of destructive geomorphic features at the Project Site that would reduce the likelihood of preservation occurring? Staff acknowledged that if such destructive features are present, it would support the conclusion that construction-related excavations associated with the PHPP would not result in a significant impact to cultural resources.

II. Brief Answer

The geomorphological evaluation presented in the original response to Data Request 137, and supplemented by this memorandum confirms that the PHPP site is removed from what would have been more favorable food and habitation areas, and has a low to low-moderate potential for buried archaeological sites.

- **Question 1** – Following discussions with Staff on June 9, 2009, it was determined that the previously provided maps contained sufficient data, and an additional map was not required.
- **Question 2a** – Regarding the possibility of buried former freshwater channels and buried former wetlands, WSA/Mesa Technical presented two maps of the study area - a soils map with current web-based NRCS map units and an archaeological sensitivity map derived by applying our ratings to the soil map units. The surface disturbance associated with construction of the proposed Project and its linears may go deeper than the soils map study depth, but there is no accurate way to predict, on a fan, from near-surface data alone, where buried channels are located. The fan would not exist as a fan without an evenly distributed, geographically variable flow of water through channels and outwash slopes over a great length of time. As a result, there is a moderate probability for the presence of buried fresh-water channels that would be adversely impacted by the proposed Project.
- **Question 2b** – Predicting the occurrence of buried wetlands along the edges of intersecting fan margins is a complex process, which CEC Staff acknowledged

during the June 9, 2009 conference call, and cannot be expected to be conclusively determined for the proposed Project's review. The upper and mid fan deposits comprising the southern part of the study area are accumulations of coarse-textured granitic alluvium, that is, fine sand and coarser material. Soil drainage, as reported by NRCS, would be described as well drained to excessively drained. The probability of wetlands developing upon such soils is quite low; the soil water instead generally tends to percolate freely downward to recharge the aquifer. As a result, based on the information available, there is a low likelihood of occurrence of buried wetlands at the proposed Project site.

Please note that the information provided in this memorandum is *supplemental to* the original report submitted on May 1, 2009. As such, some of the detail applicable to Staff's original Data Request 137 is provided in the Geoarchaeological Study Report submitted to the CEC on May 1, 2009, and that Study should be consulted for additional information.

III. Supplemental Analysis

To address the information informally requested by Staff, this supplemental analysis section is organized as follows:

- Key background information to understanding the issues and potential impacts involved.
- Specific responses to each of Staff's informal requests (i.e., Questions 1, 2a and 2b, as listed above).

A. Background

Evaluating the potential for buried archaeological sites is a rather new endeavor in the history of predictive modeling in California, and because of the inherent subjectivity of the process, must be subject to numerous caveats. We offer sensitivity ratings as a rough guide only, not as any sort of quantitative definition of the likelihood of finding a buried archaeological site at any particular spot. Regarding the scale we developed for archaeological sensitivity, there is no standardized methodology for evaluating this, and there are no formal definitions for grades of archaeological sensitivity such as low, moderate, or high.

Multiplying independent rating factors to achieve an overall probability product has 17th century roots in gaming, but also has 20th century agricultural applications in soil science, notably in California in the use of the "Storie Index" to rate the agricultural potential of soils. This now historical, but still useful rating system for intensive agricultural suitability of soils was devised by Professor Earl Storie of UC Berkeley, before the adoption of today's more commonly used NRCS land capability units (Storie Index soil ratings appear on p.93 ff. of the 1970 Antelope Valley Area Soil Survey).

Our approach is probabilistic, in that we have considered not only a geomorphological factor but also a cultural factor in rating the soil map units of the study area. We have not assigned numerical ratings to the sub-factors of each, believing that such quantitative exercises merely give a false impression of more accuracy than exists in the rating process.

Geomorphological factors tending to yield a high rating for the burial and preservation of archaeological sites could be some of the following:

- G1. Soils representing a series of low-energy sedimentary events, such as the deposition of windblown sand or waterborne sand atop other similar surfaces, as in A-C-2C-3C horization. The Rosamond and Cajon soils have such properties.
- G2. Soils on terrace deposits adjacent to present or former stream channels. These soils occur parallel to former fresh water channels, most often on upper and mid-alluvial fan surfaces, where the flowing water was energetic enough to downcut the channel, thus creating a terrace. Terraces usually have better developed B horizons than nearby channel or bar deposits, because they represent older stable surfaces. Several different scenarios are possible:
 - a. On an active and aggrading alluvial fan, however, terraces may be short lived, as they are buried by fresh alluvium. Shallowly buried terraces would be expected to appear as buried A horizons within soil profiles, with a horization such as A-C-**Ab**-BtB-2C, or similar.
 - b. The terrace soil could have had no time to develop an A horizon, and be present only as a contrasting C horizon deposit, with a different particle size distribution or a difference in bedding of coarse fragments.
- G3. Soils young enough not to have a strongly developed textural (clayey) B horizon, or a strong calcic horizon, but rather with entisolic (A-C) or inceptisolic (A-Bw-C) or (A-Bk-C) properties. The profiles of the Greenfield, Ramona, and Adelanto soils show a degree of B horizon development that indicates they are probably too old to conceal buried archaeological sites.

Cultural factors tending to yield a high rating for the presence of archaeological sites could be some of the following:

- C1. Soils near fresh water in summer, and near sources of food.
- C2. Soils near ecotones, edges, with a variety of game and plant resources.
- C3. Soils near raw materials for constructing shelters, baskets, points, scrapers, etc.
- C4. Soils with a history of use for traditional cultural activities such as trading rendezvous, religious practices, clan gatherings, hunting camps, etc.
- C5. Soils having easy to work characteristics, such as the sandy texture of dunes, especially occurring amidst the damp, salty, hard to dig clays of the basins. Such soils offer easy digging for storage pits or for burials, as at CCo647. Map unit DuD, Dune Land, represents dune sand side slopes.

B. CEC Question #1

The cultural factor utilized in determining the levels of archaeological sensitivity of soils and landforms is proximity to resources required to support human life, such as permanent water sources, food sources, such as fish and game, and the availability of raw materials for shelter, clothing, and technology. Soils in the upland valleys, soils near upper fan canyon mouths, and soils near fresh-water channels that are close to the shore of the former Rosamond Lake, particularly the sand dunes that surrounded the lake when it was a marshy environment, received a high sensitivity rating because they are in proximity to a variety of such life-sustaining resources. The archaeological sensitivity of soils at mid-fan elevations were rated lower because they lacked year-round surface flows and offered relatively little in the way of food or other resources when compared to soils of the uplands, canyon mouths, or basin rims.

Proximity to a water source alone would not necessarily raise the sensitivity rating of a landform to a high level, if other resources, in particular plant and game food, were also not close by. The great majority of known archaeological sites in the Palmdale area have generally demonstrated the validity of this assessment, with most sites clustered along the foothill canyons and in the dune areas around the dry lakes. Despite the amount of archaeological research conducted in the mid-fan elevations that characterize the project area, very little archaeological information has been recovered there.

Following discussions with CEC Staff on June 9, 2009, it was determined that the previously provided maps contained sufficient data, and an additional map was not required.

C. CEC Question #2a

Regarding the possibility of buried former freshwater channels and buried former wetlands, WSA/Mesa Technical presented two maps of the study area - a soils map with current web-based NRCS map units and an archaeological sensitivity map derived by applying our ratings to the soil map units. We used the shapes of the map units and their NRCS labels to identify likely freshwater channels. Dry channels appear on the map as elongated or linear-shaped map units with a slope class of "C" or greater. The slope class is indicated by the final capital letter of the map unit label, e.g. the "F" of map unit VsF, Vista coarse sandy loam, 30%-50% slopes.

The proposed PHPP plant site presents an interesting case. Running from southwest to northeast in sections 1 and 2 is a "Y" shaped, elongated soil map unit labeled "CaC." This is a young soil of the Cajon series, with 2%-9% slope, which could indicate either a depression or a topographic high such as a dune. Since dunes are separately treated as map units "DuD," and are typically much smaller than the CaC map unit, we assume that CaC represents an arroyo running through the plant site. Adjacent to the dry channel on the south is map unit AcA, the Adelanto coarse sandy loam, an older, well developed soil that could represent a terrace landform. Although there is a high archaeological potential for sites on terraces, the potential for buried sites is low, because of the length of time needed to develop the Bt horizon of the Adelanto soil. There is no way to positively link this AcA map unit with a terrace, however, using only soil survey data, except possibly shape and size on a map. Judging by the widespread occurrence of map unit AcA in the plant vicinity, it is more likely that the AcA adjacent to the former freshwater channel represents an older part of the fan surface that was not covered by more recent Cajon alluvial

deposition during flood episodes (CaA), a part of which was subsequently cut by a channel (CaC).

There are undoubtedly similar paired soil types that are buried under younger deposits, and are lacking on the present ground surface. However, if these had been within five or six feet of the surface, they would have appeared as a separate map unit on the soils map as some taxonomic variant with an A-C over Ab horization. The surface disturbance associated with construction of the plant and its laterals may go deeper than the soils map study depth, but there is no accurate way to predict, on a fan, from near-surface data alone, where buried channels are located. The fan would not exist as a fan without an evenly distributed, geographically variable flow of water through channels and outwash slopes over a great length of time. As a result of the foregoing discussion, there is a moderate probability for a presence of buried fresh-water channels that would be adversely impacted by the proposed Project, and such channel soils would also have a moderate archaeological sensitivity for the same reason that the Cajon surface soils have a moderate archaeological potential.

D. CEC Question #2b

Predicting the occurrence of buried wetlands along the edges of intersecting fan margins is a complex process, which the CEC Staff acknowledged during the June 9, 2009 conference call, that could not be feasibly expected to be conclusively determined for the proposed Project's review. The upper and mid fan deposits comprising the southern part of the study area are accumulations of coarse-textured granitic alluvium, that is, fine sand and coarser material. Many deposits contain a significant percentage of gravel. Proceeding upslope toward the canyon mouths, the fan sediments and soils developed upon them become comparatively coarse-textured, with greater percentage of pore space, less chemically reactive surface area, and less water-holding capacity. Soil drainage, as reported by NRCS, would be described as well drained to excessively drained. The probability of wetlands developing upon such soils is quite low; the soil water instead percolates freely downward to recharge the aquifer, unless trapped upon a perched water table, the possible result of an unusual discharge of more clayey alluvium, or a deposit of fine windblown dust that plugged and sealed the soil pores on the floor of a depression. Buried wetlands are much more probable on the fan toes, now overlying the once receding prehistoric shorelines of Rosamond and Rogers lakes, as, for example, beneath the Rosamond soils of the northern half of T7N R11W, just east of Lancaster. Buried wetlands, as prehistoric sag ponds, would also be more probable beneath Sorrento soils within the San Andreas rift zone. As a result, given the availability of information available, the likelihood of occurrence of buried wetlands at the proposed Project site or laterals is considered low.

IV. Summary

Based on our review of a sample of published archaeological evidence for the PHPP site area and discussions with local archaeologists who have a great deal of experience in the prehistoric archaeology of the Antelope Valley, the likelihood of buried archaeological sites in the area of the plant site appears to be low. The geomorphological evaluation presented in the original response to Data Request 137 (Geoarchaeology Study) submitted on May 1, 2009, and summarized above with added clarifications, confirm that the plant site is removed from what would have been more favorable food and habitation areas, and has a low to low-moderate potential for buried archaeological sites.

**STATE OF CALIFORNIA
ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION**

In the Matter of:)	Docket No. 08-AFC-9
)	
Application for Certification,)	PROOF OF SERVICE
for the CITY OF PALMDALE HYBRID)	
POWER PLANT PROJECT)	(Revised April 30, 2009)
)	
_____)	

APPLICANT

Thomas M. Barnett
Executive Vice President
Inland Energy, Inc.
3501 Jamboree Road
South Tower, Suite 606
Newport Beach, CA 92660
tbarnett@inlandenergy.com

Antonio D. Penna Jr.
Vice President
Inland Energy
4390 Civic Drive
Victorville, CA 92392
tonypenna@inlandenergy.com

Laurie Lile
Assistant City Manager
City of Palmdale
38300 North Sierra Highway, Suite A
Palmdale, CA 93550
llile@cityofpalmdale.org

APPLICANT'S CONSULTANTS

Sara Head
Vice President
ENSR Corporation
1220 Avenida Acaso
Camarillo, CA 93012
SHead@ensr.aecom.com

PALMDALE HYBRID POWER PROJECT
CEC Docket No. 08-AFC-09

INTERESTED AGENCIES

Michael R. Plaziak

Manager
Lahontan Regional Water Quality Control Board
14440 Civic Drive, Suite 200
Victorville, CA 92392-2306
mplaziak@waterboards.ca.gov

Rick Buckingham

State Water Project
Power & Risk Office
3310 El Camino Avenue, LL-90
Sacramento, CA 95821
E-mail preferred
rbucking@water.ca.gov

Manuel Alvarez

Robert J. Tucker

SoCal Edison
1201 K Street
Sacramento, CA 95814
Manuel.Alvarez@sce.com
Robert.Tucker@sce.com

California ISO
P.O. Box 639014
Folsom, CA 95763-9014
e-recipient@caiso.com

ENERGY COMMISSION

Jeffrey D. Byron

Commissioner and Presiding Member
CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814-5512
jbyron@energy.state.ca.us

Arthur H. Rosenfeld

Commissioner and Associate Member
CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814-5512
pflint@energy.state.ca.us

PALMDALE HYBRID POWER PROJECT
CEC Docket No. 08-AFC-09

Paul Kramer
Hearing Officer
CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814-5512
pkramer@energy.state.ca.us

Felicia Miller
Project Manager
CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814-5512
fmiller@energy.state.ca.us

Caryn Holmes
Staff Counsel
CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814-5512
CHolmes@energy.state.ca.us

Elena Miller
Public Adviser
CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814-5512
Publicadviser@energy.state.ca.us

PALMDALE HYBRID POWER PROJECT

CEC Docket No. 08-AFC-09

DECLARATION OF SERVICE

I, Paul Kihm, declare that on June 24, 2009, I served and filed copies of the attached:

**APPLICANT'S RESPONSE TO CEC STAFF REQUEST FOR CLARIFICATION ON
DATA REQUEST 137**

to all parties identified on the Proof of Service List above in the following manner:

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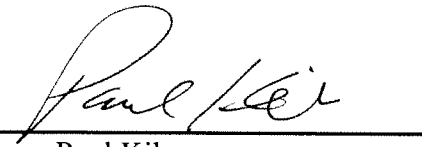
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I further declare that transmission via electronic mail and U.S. Mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 24, 2009, at Costa Mesa, California.



Paul Kihm