TETRA TECH EC, INC.

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January 26, 2010

California Energy Commission
Docket No. 09-AFC-8
1516 9th St.
Sacramento, CA 95814

Genesis Solar Energy Project - Docket Number 09-AFC-8

Docket Clerk:

Included with this letter is one hard copy and one electronic copy of the ***Addenda to DR Requests 64, 65 and 120 of Set 1A for the Genesis Solar Energy Project.***

Sincerely,

Tricia Bernhardt
Project Manager/Tetra Tech EC

cc: Mike Monasmith /CEC Project Manager

SYSTEM CERTIFICATION ISO 14001 SGS

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ADDENDA TO GENESIS SOLAR ENERGY PROJECT

DATA REQUEST RESPONSES TO SET 1A, DECEMBER 15, 2009:

DATA REQUESTS 64, 65, AND 120

Item 64:

Dry Lakes - Groundwater Dependent Communities. Please provide a map and description of the vegetation (including dominant species, physiographic setting, habitat function and values, special-status species associates) that occurs around the margin of Ford Dry Lake. The mapping should be on an aerial photo at a form and scale similar to that submitted in the Data Adequacy Supplement (e.g., Figure 5.3-7B). The mapping should extend out from the lake margin to a distance encompassing any plant communities that include facultative wetland plants as dominants, co-dominants, or important associates. Please include acreage of each plant community type within this mapped area. Please provide an assessment of the potential impact of water table drawdown on Ford and Palen Dry Lake groundwater dependent plant communities, including the desert chenopod scrub community mapped at Ford Dry Lake.

Addendum to Submitted Response:

Ford Dry Lake

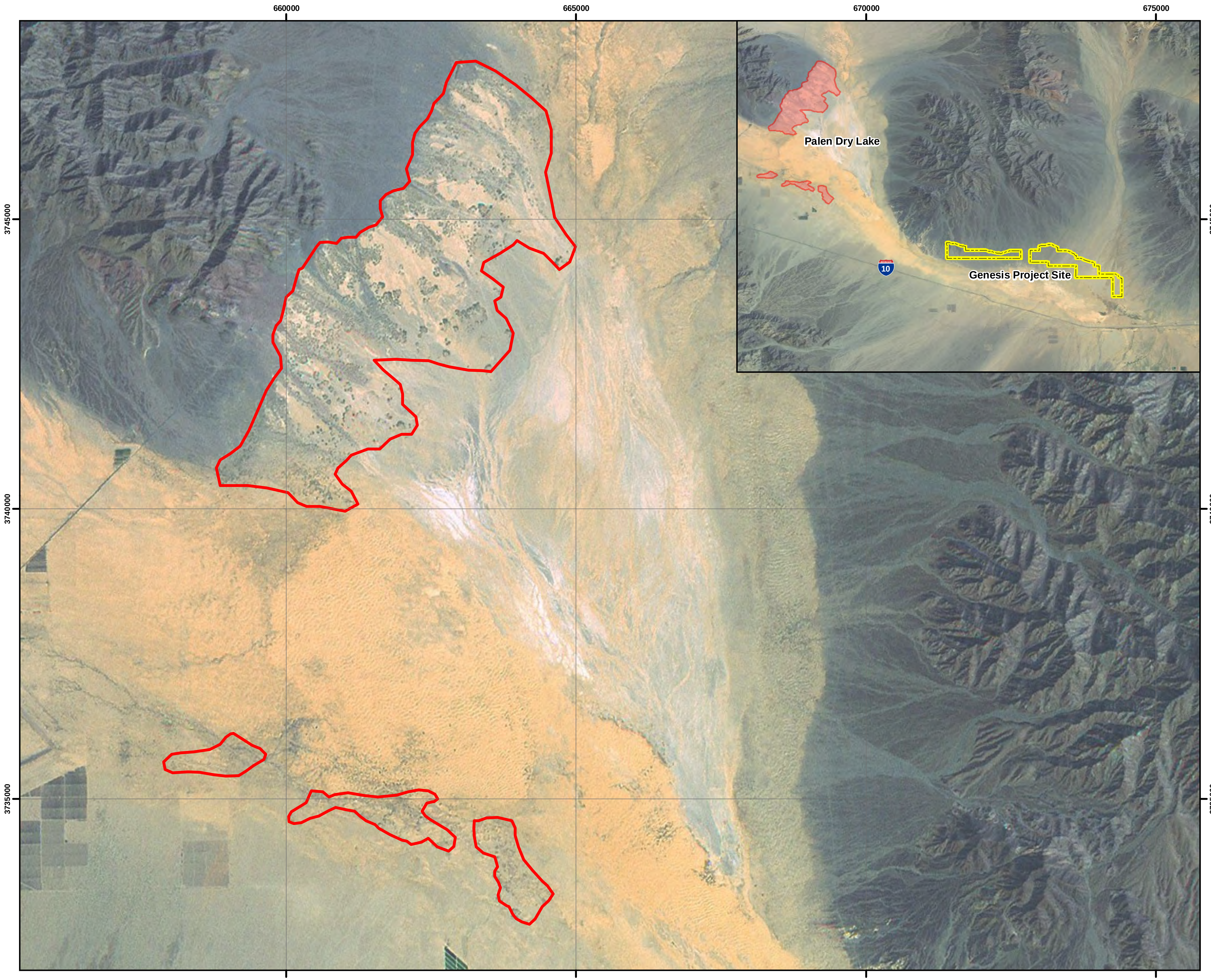
A mixed chenopod community of bush seepweed (*Suaeda moquinii*), allscale (*Atriplex polycarpa*) and four-winged saltbush (*A. canescens*), suggested in the previously submitted response based on zone-of-influence transects conducted around the Project Area in Spring 2009, was verified along the northeastern border of Ford Dry Lake on 15 January 2010. This is the only area around the lake that appears dark on aerials, so it was inspected to document the vegetation, even though the groundwater table is too low to support groundwater-dependent vegetation (see original response to DR 64, attached). A few, small (2-3 m) blue palo verde (*Cercidium floridum*) are also at this location, which is where the main wash between the Palen and McCoy Mountains meets Ford Dry Lake. Based on the original response to DR 64 and these additional data, the plant species growing in and around Ford Dry Lake are considered to be dependent on precipitation, surface water flow, and infrequent flooding of the dry lake bed. There are no desert plants in the Project vicinity that are known to rely on groundwater dependent, deep root systems. Therefore, further surveys are not warranted.

Palen Dry Lake

Bordering Palen Dry Lake are two species that are commonly associated with groundwater: honey mesquite (*Prosopis glandulosa*) and tamarisk (*Tamarix* sp.). Two honey mesquite communities are found along northwestern Palen Lake and west of the dune field at the southwestern end of Palen Lake (Figure BIO-DR 64A 1). The total area is 2247 ha. There are two, individual clones at the southern tip of Palen Lake and a single, clone of probable mesquite (based on a comparison on aerial photographs to

GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA



Legend

- Honey Mesquite Community (5,820 ac.)
- Genesis Project Site

N

0 0.5 1 1.5 2
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI,TTEC, Alice Karl & Assoc.

FIGURE BIO-DR 64A 1
HONEY MESQUITE COMMUNITIES ALONG NORTHWESTERN AND SOUTHWESTERN PALEN DRY LAKE

TETRA TECH EC, INC

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known mesquite around Palen Lake) north of the lake. Tamarisk is present as occasional, mostly individual, trees in scattered sinks throughout the Palen Lake basin.

The community along northwestern Palen Lake was examined on 11 December 2009. The honey mesquite community there is characterized by coppice mounds approximately 3-8 m across, vegetated primarily by honey mesquite (presumably clones) that ring the mounds (Figure BIO-DR 64A 2). The mounds are loose-sandy and the combination of sand accumulation and erosion around the less-protected exterior of the mounds has resulted in "elevating" the mounds approximately 0.5-3 m above the surrounding grade. Between the mounds, the surface soil is soft, slightly silty sand, with a 90% covering of fine gravel; salt precipitates, possibly resulting from capillary action and evaporation, are patchy throughout. Allscale and bush seepweed are common shrubs between the mounds. Southwest of Palen Lake, a large dune field lies between the lake and the honey mesquite community. The mesquite is more thinly developed than that on the northwestern portion of the lake and the coppice mounds are lower (Figure BIO-DR 64A 3).

Figure BIO-DR 64A 2. Small honey mesquite coppice mound on right and in distance, On the northwestern border of Palen Lake. Notice the "raising" of the mound on the right due to sand deposition. Allscale and seepweed grow between the mounds.

Figure BIO-DR 64A 3. Honey mesquite west of the dune field southwest of Palen Lake.

Plants that obtain at least some of their water from shallow groundwater are called phreatophytes (Cooper et al. 2006). Some phreatophytes are obligate phreatophytes, where there is a strong association with groundwater, whereas others are facultative phreatophytes, i.e., more opportunistically associated with groundwater (Ward 2009). Honey mesquite is considered a facultative phreatophyte. It has a dual rooting system, growing both a long tap root and long lateral roots, the latter extending up to several meters from the plant (Ansley et al. 1990). This dual rooting system enables honey mesquite to accommodate different conditions relative to available water. In one study, the capacity of honey mesquite to have high summer productivity was largely dependent on it's tap root system's ability to acquire water from a depth of 4-6 m; lateral roots to 1 m depth appeared to function more during cooler, wetter seasons and also for nutrient accumulation (Nilsen et al. 1981). However, honey mesquite can also grow where subsurface water is limited; in that situation, it is more dependent on shallow lateral roots for water acquisition (Ansley et al. 1990). Roots may also have the capacity to redistribute soil water, both pulling it into the near-surface layer from the lower root zone and vice versa (Hultine et al. 2004). Finally, soil types may exert a strong influence on root development, with shallow roots achieving greater development and importance in soils with greater infiltration, in order to acquire water, but with deep roots achieving greater development for water acquisition where surface soils are heavy (Cuomo et al. 1992).

The question for the Genesis Project is whether a drop in the water table due to the Project will affect phreatophytes at Palen Lake, specifically the honey mesquite communities along the western edge. The maximum predicted water table drawdown associated with the Project is approximately 0.003 m (0.01 ft) at Palen Lake after 33 years of pumping (Worley Parsons 2010). According to the most recent cumulative groundwater effects analysis, there will be no effect on Palen Lake from the Project.

Even though no Project effects are anticipated at Palen Lake, the applicant offers a conservative analysis for the mesquite communities at northwestern and southwestern Palen Lake. This analysis is based on an increased depth to the water table of 0.003 m over the life of the Project and the extent of anticipated cumulative drawdown associated with all future pumping in the basin over the life of the project. (Wetland vegetation will not be analyzed further than the analysis submitted for DR 64 [Genesis Solar, LLC 2009], as there is no wetland vegetation at Palen Lake and investigations by Worley Parsons [2010] provide data that indicate that the playa does not discharge groundwater to the playa surface to form a wet playa.) Hand auger borings in December 2009 found groundwater at northwestern Palen Lake at 2.4 m below the surface (Worley Parsons 2010). A groundwater reduction of 0.003 m is expected to be well within the expected normal seasonal or diurnal water table fluctuations, and would not have a measurable effect on the height of the phreatic rise of water above the water table (Worley Parsons 2010), and would be accommodated by the mesquite plants, based on the response of mesquite at other locations. At Ash Meadows, Nevada, for instance, where honey mesquite was not shown to be affected by groundwater reductions that were within the normal annual variation (Trammell et al. 2008). Furthermore, phreatophytes are capable of adapting to gradual groundwater decreases by expanding their root systems, as well as altering other physical and physiological responses to accommodate the changes (Cooper et al. 2006, Butler et al. 2007).

Using aerial photography to view changes in the mesquite community at northwestern Palen Lake over time, Worley Parsons (2010: Figure 28) demonstrated that the community did not change from 1977 to 2002. Groundwater pumping for agriculture in Chuckwalla Valley during the late 1970s and early 1980s lowered the water table ~39 m near Desert Center, west of Palen Lake, between 1980 and 1985; during this same period a well north of Palen Lake (Well 49) showed a groundwater decline of ~1.5 m (Worley Parsons 2010: Page 21 and Figure 18). The mesquite community at northwestern Palen Lake did not change during this period of maximum recorded historical water level drawdown in the basin, and cumulative drawdown associated with the future pumping in the basin is expected to be less than this amount. In summary, no Project effects are anticipated at Palen Lake, and the cumulative drawdown associated with future pumping in the basin is less than the historical maximum drawdown and would not affect the identified honey mesquite community.

Item 65:

Information Required:

Springs and Seeps – Groundwater Dependent Communities. Please provide a vegetation map, description, and acreage table for any shallow groundwater-dependent vegetation potentially associated with McCoy Spring as well as any other seeps and springs within the potential area of influence of groundwater pumping. In determining which seeps and springs to include in this mapping effort please consult the Northern and Eastern Colorado Desert Coordinated Management Plan (Map 3-1, Existing Water Sources), USGS topographic maps, the information data portal of the Mojave Desert Ecosystem Project (MDEP), Joshua Tree National Park biologists, and other local experts that may have knowledge regarding the location of active seeps, springs, and wetlands within the area potentially influenced by groundwater pumping. Please provide an assessment of the potential impact of water table drawdown on vegetation and wildlife dependent on seeps and springs.

Addendum to Submitted Response:

McCoy Spring and surrounding canyons were visited on 16 and 20 January 2010. The spring is in a dry, rocky, fairly narrow wash, 3-5 m wide; rocks have been built around the catchment to contain and/or protect the water (Figures BIO-DR 64A 1 and 2). There is no groundwater-dependent vegetation at the catchment or elsewhere in the wash. Vegetation in the wash is identical to that in the other area washes, dominated by desert lavender (*Hyptis emoryi*), sweetbush (*Bebbia juncea*), rhatany *(Krameria*, probably *grayi* although the surveyor did not identify the species) and scattered small ironwood (*Olneya tesota*) (Figure BIO-DR 65A 3). This catchment may be a permanent or semi-permanent water source. It contained amphibian larvae, so the eggs either hatched in a permanent water source or when the spring surfaced in early December in response to the last storm before the site visit, augmented by captured rainwater. The spring is not, however, connected to the adjacent basin aquifer system but is part of a separate groundwater flow system originating in the surrounding mountains (see original response for DR 65).

Figure BIO-DR 65A 1. McCoy Spring, with rock structure built up around the spring (January 2010).

Figure BIO-DR 65A 2. McCoy Spring, atop rock structure. Opening at the right is the partially covered opening shown in Figure BIO-DR 64A 4.

Figure BIO-DR 65A 3. McCoy Spring wash, January 2010, showing typical wash vegetation for the area. No groundwater-dependent vegetation is present.

During the January 2010 visit, a search of the surrounding area and canyons revealed no evidence of seeps, springs, or other areas where water surfaced. However, photographs on the Internet from November 2004, showed what appeared to be a patch of Bermuda grass (*Cynodon* sp.) in the same drainage, near the spring (Figures BIO-DR 65A 4 and 5). Winter 2004-5 was an exceedingly wet winter, apparently resulting in groundwater near McCoy Spring seeping out of the ground in more than one location, and creating a sufficiently moist area to temporarily support a small, but robust, population of Bermuda grass, an invasive, exotic species. The absence of groundwater- or surface water-dependent vegetation indicates that this area is only intermittently moist. The Bermuda grass patch was not in evidence during January 2010.

Figure BIO-DR 65A 4. Part of the McCoy Spring system surfacing during an unusually wet winter in November 2004. Note the lack of woody vegetation and the patch of apparent Bermuda grass. Note also the apparent presence of caliche cemented gravel in the foreground, which could be structurally controlling the emergence of groundwater. (Photo Source: Available on the Internet at http://www.dzrtgrls.com/mccoy_spring_petroglyphs/McCoySpringPetroglyphs/index.html)

Figure BIO-DR 65A 5. Apparent stand of Bermuda grass in the McCoy Spring drainage in November 2004. (Photo Source: Available on the Internet at http://www.dzrtgrls.com/mccoy_spring_petroglyphs/McCoySpringPetroglyphs/index.html)

Item 120:

Creosote Rings. Please discuss whether surveys were conducted or remote imagery analysis (of high resolution aerials) or review for possible creosote bush rings in the project survey area, and if so, the results of the surveys including a map depicting the locations of creosote rings. If no such analysis was made, please explain why.

Addendum to Submitted Response:

High resolution aerial photographs, the same aerials that CEC Staff used for their draft delineation of state waters, were examined for creosote rings on the Project Area. None was observed.

LITERATURE CITED

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APPLICATION FOR CERTIFICATION FOR THE
GENESIS SOLAR ENERGY PROJECT

Docket No. 09-AFC-8

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(Revised 1/04/10)

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DECLARATION OF SERVICE

I, Tricia Bernhardt, declare that on January 26, 2010, I served and filed an ***Addenda to Data Requests 64, 65 and 120 of DR Set 1A for the Genesis Solar Energy Project*** dated January 26, 2010. 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://ww.energy.ca.gov/sitingcases/genesis_solar].**

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:

__x__ sent electronically to all email addresses on the Proof of Service list;

__x__ by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

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

Original Signed By:

Tricia Bernhardt