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20 January 2010

California Energy Commission
Attn: Eric Solario, Project Manager
1516 Ninth Street, MS-15
Sacramento CA 95824-5512

Reference: Ridgecrest Solar Power Project (09-AFC-9)
Attached: Addendum addressing water use mitigation

Dear Sirs:

I attended the joint CEC/BLM workshops of 15 December 2009 and 5/6 January 2010 in Ridgecrest. I made public comments which I am supplementing with the addendum attached.

I am opposed to the current form of the project for environmental reasons, primarily regarding uncertain effectiveness in mitigating its impact on the declining groundwater supply, and secondarily the its impact to wildlife, both to listed endangered species and also to threatened and desert-adapted species. The latter include not only desert tortoise and ground squirrel(s), but also kit fox, burrowing owl and gecko. The non-endangered species seem to have received no attention whatsoever in formulating mitigation measures for the project.

The impact on groundwater can be mitigated, the magnitude of which and means for addressing it are discussed in the enclosed addendum. The issues involved encompass multiple dimensions. I believe that an appeal was made at the workshops for suggestions to address the multiple mitigation issues. I have not made suggestions for an integrated approach to addressing the multiple issues, but have made suggestions on how to address various issues separately. I believe that it is up to project proponents to figure out how to best integrate individual issue mitigation approaches into an integrated program of mitigation measures. We will be left to judge how well their proposed mitigation program serves to mitigate the various areas of impact.

The most intractable aspect of groundwater mitigation is the 30+ year span of the project. It is not a sure thing that 30 years of current and future demand can be met from the remaining local groundwater resources. A real contribution to the growing issue of water supply here could be made by committing the project to importing the full measure of its water demands, as they actually play out (rather than an optimistic projection of them), from outside sources.

The impact of wildlife cannot be mitigated in the current project location. The richness of the habitat in and around El Paso Wash makes formulating a mitigation program supremely difficult. The SM Ridgecrest project's lack of progress in biological mitigation aspects reflects the level of difficulty—it may be unsolvable. Without a full EIR/EIS process to provide for public review of plans and for monitoring compliance, is there any way that the CEC and/or BAM can provide assurance that environmental issues will be addressed and resolved?

It should be noted that the project is already behind schedule to make the December 2010 deadline for projects qualifying for shovel-ready federal funds. Rather than make up schedule shortfall by further compressing the fast-track approval process and thus increasing risk of project or mitigation failure, it may make more sense to cut losses and terminate it.

Sincerely,

E R Middlemiss

Addendum to letter of 20 January 2010. From*: Edward R. Middlemiss*
To: *California Energy Commission* Ref: *Ridgecrest Solar Power Project (09-AFC-9)*

The Solar Millenium (SM) Ridgecrest solar-thermal power project reviews of 15 December 2009 and 5/6 January 2010 emphasized the need for feedback on, and suggestions for, ways to make progress in areas of deficiency in SM's proposed mitigation measures.

Emphasis was placed on the concessions made by SM in formulating its revised plans for the Ridgecrest solar-thermal power project. The principal concession focused on replacing the original wet cooling thermal cycle with a dry cooling thermal cycle. The main benefit regarding water use is based on a claim that water consumption is reduced by 90% as a result of this substitution. The *NY Times* article of 29 September 2009 on the water issues associated with solar thermal power plants sited in the desert southwest stated that the original SM Ridgecrest project would have consumed 815 million gallons (annually). At 7.5 gallons per cubic foot, and 43,560 cubic feet per acre-foot, that number translates to 2500 acre-feet per year. The revised estimate of annual consumption for the SM Ridgecrest of 500 acre-feet annually thus is reduced by 80%, not 90%. Discrepancies of this magnitude by promoters of the project damage the credibility of the proposed project's documentation (or the NY Times, if its article is in error).

Water use mitigation.

The SM approach to water use mitigation seems to be throwing some money at it and walking away from responsibility for results. It has not (yet) suggested contracting-out of the mitigation verification task to a cooperating agency based near the project site.

Mitigation goals / implementation methods. The SM Ridgecrest project water use mitigation goals and implementation methods (MGIM) include offsetting merely 100% of the estimated 500 acre-feet annual consumption of the operational phase of the project, and perhaps even then may be limited to a cash contribution to a mitigation program created and administered by another agency. The goal of that approach seems to be transferring liability for performance to that agency. There are several problems with this goal/method combination.

MGIM problem #1. The 500 acre-feet number is just an estimate. The Indian Wells Valley Water District (IWVWD) has essentially issued the SM project a license to consume up to 550 acre-feet annually. That any shortfall in consumption in any one year may be banked to offset excess consumption in future years is not ruled out.

MGIM problem #2. The construction phase estimate of 1500 acre-feet is not accounted for in mitigation. In parallel, the IWVWD has essentially issued the SM project a license to consume up to 1650 acre-feet during consumption (as a hard limit imposed by the IWVWD—derived from its limited capacity to supply demands in excess to projected growth). This amounts to three years of operational consumption. Yet there also seems to be widespread disbelief that the construction phase can be completed within such a limit. In addition, the SM project could conceivably escape this limitation by trucking water originating from a vendor other than the IWVWD, but still sourced from the valley aquifer. Other construction projects have done so, such as the CALTRANS expansion of the state highway 178 corridor several years ago.

MGIM problem #3. A water consumption mitigation program based solely on projected savings suffers from many shortcomings. Such a mitigation program approach seems to be what SM management seems to have in mind—to wit, note that SM has proposed to post a money amount for mitigation to be carried out by an unnamed agent, which will be responsible for results, absolving SM from any further responsibility. The first of these is that projected savings frequently prove to be optimistic. Operation phase consumption begins promptly, but mitigation measures may take protracted efforts to achieve the projected level of annual savings. The second is that should mitigation measures, once completed, initially achieve projected levels of savings, sustaining that level of savings over the life of the project may prove unattainable.

MGIM problem #4. The mitigation program does not seem to include a verification component. Should a verification component be incorporated, the method employed to calculate savings may allow external factors to artificially enhance mitigation program benefits without any effort on the part of the mitigation program participants. The significance of this point, though subtle, is that part of the benefits claimed in a projected result, or accounted for in a verification phase (should there be one) may be entirely illusory. External factors producing such a result would include (but not be limited to) hikes in the IWVWD water rates (in the case of home and commercial sites), hikes in electricity rates (in the case of institutional and agricultural sites), and future restrictions on water use imposed by official bodies (executive and judicial).

Suggested solutions for MGIM problems. A range of methods may be adopted that ensure that water consumption mitigation measures may be sufficient to the task of offsetting consumption with real savings.

Static one-time program approaches. This kind of mitigation program may be characterized as one which is designed and implemented only once, given that performance verification is applied after completion of the measures, but not sustained thereafter. With this kind of approach, low mitigation program management costs are paired with high costs associated with conservative mitigation goals. To provide assurance that goals are met over the life of the project operational life of 30 years, the goal for the level of savings should be set at a multiple of the total consumption (both construction and operation phases). Due to uncertainties, including but not limited to those described above, the multiple ought to be set at the 300% to 500% level (relative to the 550 acre-foot license, not the 500 acre-foot estimate). The project may not be renewed under current terms, as the water supply situation locally is expected to be much less favorable at that time. If this limitation is not acceptable to any party, then the mitigation multiple must be increased in compensation.

Adaptive approaches. This kind of mitigation program may be described as on-going (or permanent) and responsive to uncertainties associated with estimates and projections, and unforeseen events. Responsibility for achieving mitigation goals does not end with completion of the initial verification efforts, but continues for the life of the project. It is not merely an adjunct to the construction phase, but becomes a burden to the operational phase also. As the uncertainties are adapted upon emergence, the mitigation goal may be set at only 100% of 550 acre-feet. Verification of savings should be ongoing and based on mitigation program project participants relative to comparable uses by comparable non-participants (it is, after all, an adaptive program). Excess savings in any one year may be banked to offset shortfalls in subsequent years. Persistent shortfalls must be compensated for by expansion of the mitigation program participation level. Mitigation program participants who leave the program for any reason must be replaced by suitable new recruits. Construction phase consumption should be included in the mitigation goals. All forms of consumption should be accounted for, given that the source originates in the valley aquifer. If water imports are used, they need not be mitigated. However, the source of water imports must also be made available to local users (no exclusive use for the SM project may be permitted within the context of the mitigation program). At the end of the project period (30 years operation), any renewal constitutes a new project for the purposes of environmental review and mitigation measures.

Cash for grass (commercial and home sites). In the case of the small-site "cash for grass" mitigation approach, the drill seems to be paying a bribe to a large group of individuals for removal of turf and replacement with a form of landscaping that is less water-use intensive. The burden of landscape replacement belongs to the individual, who is to be motivated to make the

change both by the one-time subsidy represented by the "cash for grass" payment and anticipated reduction in monthly water bills associated with reduced consumption.

Problems of homesite "cash for grass." Responsibility for verification of the anticipated water use reduction is shifted from SM to others, both to individuals for accomplishing the landscaping re-work and to an unnamed agent (perhaps non-existent) for verifying landscape replacement and monitoring subsequent water use reduction. Do these things manage themselves? The IWVWD seems to be eager for the project to proceed, citing results from other water conservation project(s), the results of which seem highly optimistic (the water-use savings cited exceed the total annual irrigation needs of an equal area of alfalfa crop in this desert climate—note that the savings come from the difference between prior and subsequent irrigation use, not the prior use itself). Perhaps the explanation for that discrepancy is that in the cited case of turf conversion, the prior irrigation practice was extremely inefficient (say, grossly excess application resulting in substantial run-off to off-site places, such as to street gutters), and the replacement program was very efficient (all applied water confined to on-site use).

Given the assumptions voiced recently (that landscaping constitutes 50% of consumption, that per-connection consumption is running slightly over 0.5 acre-foot per year, and that only the front yard of home sites should be involved in home site landscaping conversion projects in the IWVWD is involved in recent presentations on such water conservation schemes) about 1/8 acre-foot savings can be expected per home site. A goal of 550 acre-feet savings implies finding at least 4400 participants if this approach is the only one. Administering such a mass of small projects could be burdensome.

The long term of the mitigation program (30+ years) is a problem in that average duration of site ownership is but a fraction of that.

Suggested solution #1. Aggregate the mass of uncoordinated individual homeowner landscape conversion projects into one or more landscape-conversion projects under which many sites are consolidated within a single management/implementation structure. Presumably landscaping contractors would constitute a means for the consolidation process. The mitigation project would presumably provide the means for managing the consolidated projects. Configuring landscaping contractor compensation to include delayed payment component(s) based on verified reductions in consumption would incentivise application of longer-term aspects of water conservation to the consolidated mitigation projects.

Offering a guarantee regarding water bill reduction results may facilitate participation rates at reasonable subsidy (one-time payment) levels. Because of the uncertainties involved, it will be necessary to commit to aggregate mitigation project water consumption goals at a higher rate than 100% of the 650 annual acre-feet project operational phase consumption limit rate. Penalties should be assessed against consolidators and/or managers for failure of the verified consumption reductions to achieve mitigation goals.

Suggested solution #2. Install a second water meter for landscaping use only at home/commercial sites participating in the "cash for grass" program. Integrating home site backyard landscaping into the program could increase potential for consumption reduction, compared to the front-only aspect of landscaping water-use reduction projects as discussed at IWVWD up to now.

Suggested solution #3. Establish a long-term auditing program for verification of water consumption reductions associated with the "cash for grass" program. Provide for shrinkage in the results initially achieved in reducing water consumption. The anticipated causes for shrinkage include not only backsliding (loss of participant interest in the project over time), but also maturation of plant materials (trees, shrubs and groundcover), deterioration in irrigation system

hardware with extended use (and unmet demands for operator intervention to keep up irrigation efficiency as conditions change), and participants dropping out of the program. Participant dropout may include abandonment, re-purposing, or demolition of the property for other uses. None of these should be accounted a success or completion of part of the project for the mitigation program, but instead prompt recruitment of replacement participants (if active management of the program is ongoing).

Provision for compensation of shrinkage in mitigation program effectiveness over time could include either the slow expansion of the number of participants in the program, or over-sizing the program at the outset, or both.

Suggested solution #4. Incorporate the terms of the mitigation program into the deed of the site, thus making it an obligation of subsequent property owners. Make opting out of the program contingent on a by-back fee, perhaps including interest and penalties. On the other hand, credit for consumption reduction already achieved should be recognized in the process of setting those fees.

Cash for grass or crops (institutional and agricultural sites). In the case of commercial or institutional sites, "cash for grass" programs have problems over and above those noted above for home and commercial sites. The first of these is the prevalence of on-site ("private") wells for supply of irrigation water. The decision makers for these sites may be absentees (not residents of the valley). In some cases, their patterns of use may include exploitation, exhaustion and abandonment of sites. Recruitment of these sites into a mitigation program presents not only the advantage of replacing a multitude of small sites with but a few large sites, but also the risk that each may require extensive negotiation in order to formulate an agreement that meets the needs of both sides (landscape substitution or fallowing of one site followed by expansion into a new site that expands the total demand on local water sources does not seem to support the goal of net reduction in demand).

Problems of institutional "cash for grass." The IWVWD and other agencies have been running water conservation programs for two decades or more. One of the prominent features of these has been irrigation audits on large-area installations, some of which are the same noted as candidates for an institutional site "cash for a grass" program in the SM Ridgecrest project in recent discussions. Because of their size, these have been considered low-hanging fruit for water conservation, hence the history of targeting them here. The fact that they are still here, still considered as candidates for yet another water conservation program, suggests that something about the institutions involved hinders or limits water conservation goals. If the inferred obstacles aren't identified and addressed effectively in the proposed SM project "cash for grass" mitigation program, the expected savings may be elusive or evaporate over time.

The large-area turfed installation is visually pleasing for those accustomed to American Midwest environments. In the desert southwest environment, it is inappropriate and wasteful. Getting institutions and the public to understand (and become invested into) this point of view is a major challenge.

Suggested solution #1. Conclude memoranda of understanding with the institutions incorporating water conservation goals, ancillary goals, methods, continuing verification monitoring, and assigning responsibilities (some of which may remain with the SM Ridgecrest project throughout its operational phase).

Suggested solution #2. If the turf replacement is synthetic turf (as in ballfields), renewal of materials periodically (say for sunlight deterioration), funding of the replacement may be divided between the institution and the SM project. The reasoning behind this suggestion is that many of the institutional turf installations are irrigated from on-site wells, hence the low cost of turf

irrigation implies that opportunities for funding the ongoing turf replacement costs from cost savings from reductions in irrigation costs may be insufficient (synthetic turf may be the high-cost option in this context).

Suggested solution #3. If the turf replacement is desert southwest style landscaping, done in an attractive, eye-pleasing and user-friendly (if it is a public-access asset, as in a public park) manner, the institutional "cash for grass" program offers a valuable opportunity for providing prominent and useful examples for valley residents of appropriate landscaping that they may emulate at home or commercial sites.

Suggested solution #4. If a memorandum of understanding is concluded with the institution, consider capping the institution's total irrigation consumption in this valley at the level achieved at the completion of the SM Ridgecrest project's turf-replacement installation phase. Any new facilities built by the participating institution ought not contribute to increased irrigation consumption, but be offsets by changes to the institutions other facilities in the valley.

Problems of agricultural "cash for grass." In the case of agricultural sites, "cash for grass/crops" have problems over and above those noted above for home, commercial and institutional sites. First among these are the consequences of the exploitation/abandonment-cycle characteristic of desert agricultural enterprises.

Large-area holdings in this valley have been assembled by land speculators for development, awaiting only the participation of partners with the capital to fund the project (and presumably the need for tax shelters). Some of these have been endowed with commercial-scale water wells in anticipation of development (and presumably avoidance of coming limitations on drilling wells).

Costs associated with groundwater decline and quality deterioration affect the profitability of crop production (external factors may exacerbate the negative effects of the exploitation regime). When the profitability of an operation reaches a threshold for action, the result may be alteration of operations to recover profitability, transfer of ownership interests for development purposes, or simple abandonment. Sale of the Brown Road area Connie Neal alfalfa operation to the IWVWD a couple of decades ago is an example of one outcome. The abandonment of the Arciero alfalfa operation in Cantil (now the site of the Beacon solar thermal project?) is another. The shrinkage of the diameter of the circular pivot machine irrigated alfalfa fields in the North Brown Road area is an example of the alteration outcome.

Additional examples of abandonment exist in this valley. The southeast corner of the Jacks Ranch Road and Inyokern Road is the site of a former alfalfa field that has not been in production for several decades. This site became a property holding of the Searles Valley chemical operations (for water rights purposes?). The former Shangri-La Ranch property east of the Wal-Mart shopping center was converted from agricultural use to a trailer park (now abandoned).

The abandonment of commercial-scale water wells operated for domestic consumption is another example of exploitation and abandonment in this valley. Most of these were operated (at the time of abandonment) by the IWVWD.

The existence of a mitigation program targeting agricultural operations may simply alter the shape of the exploitation/abandonment process. While the abandonment portion of the process may, on the face of it, seem to be a contribution to the mitigation process, it must be remembered that it is only one part of a cycle, where abandonment of one site is simply followed by establishing a replacement site. If the replacement is in the same aquifer, the goal of mitigation is not fulfilled. Any cash payment to the operator of crop fields may simply serve as the capital injection needed to promote the next cycle of exploitation.

Suggested solution #1. Agricultural field abandonment is frequently followed, if economically feasible, by re-development to a use that can better sustain the increased costs that resulted in crop use abandonment. Connie Neal attempted to subdivide his fallow alfalfa fields into residential 2-1/2 acre lots. He sold the land to the IWVWD when the demands of development exhausted his patience. The IWVWD did not buy the property in order to keep it fallow, but as a future source for its own production needs.

Construct an economic model that has the power to project the remaining economic life of the agricultural operation. Complete transparency in the agricultural operation must be a condition for entering into negotiations for recruitment into the mitigation program (apparently the mineral content of irritation water applied to the alfalfa fields is a type of information that has been closely held by agricultural operators). As deterioration of water quality is a critical factor in creating the economic model, the negotiations cannot begin until the water quality information is made available.

Validate the model against the history of the cycle of agricultural exploitation and abandonment. Take credit (for mitigation purposes) for reduced consumption only for the remaining years of (anticipated) agricultural production.

Make the validation phase of the mitigation program last the duration of the SM Ridgecrest project operational phase. Revise the economic model to refine the estimate of (projected) remaining production life of the agricultural operations fallowed for the mitigation program.

Suggested solution #2. As the business model of agricultural operators seems to be dependent upon creating tax shelters to attract capital, it may be impossible to prevent establishment of replacement crop fields by agreement. There may be investor/operators from other areas standing by to replace any that may have made agreements not to operate here—in fact, supposing that other parties may be operating mitigation programs in other areas that parallel those that may be established here, those constrained in other areas may simply swap places with any that may become constrained by any agreements made here in the context of the SM Ridgecrest project. To try to prevent unknown operators from establishing newly planted agricultural operations after mitigation measures pay for fallowing existing agricultural fields may not be productive. It may be more useful to find a means that does not rely on prior constraint by agreement with individuals.

Suggested solution #3. Given that it may not be possible to constrain agricultural exploitation of valley resources by all potential operators by making agreements with some, it may become necessary to resort to judicial means to generally constrain development here. The implication is that only groundwater adjudication may be sufficient to realize any water mitigation goals adopted for the SM Ridgecrest project. In order to utilize this approach, without the need to wait for establishing the groundwater management regime that such an approach entails, it may be sufficient to prepare the ground for adjudication in anticipation of its need. The idea would be to pre-package the process, in analogy to the pre-packaged Chapter 11 bankruptcies of airlines such as United Airlines and USAir.

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