BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In the Matter of: Arizona Public Service Company Ocotillo Power Plant	Appeal No. PSD 16-01 Maricopa County Air Quality Department PSD Permit No. PSD16-01

RESPONSE OF PERMITTEE ARIZONA PUBLIC SERVICE COMPANY TO PETITION FOR REVIEW OF PREVENTION OF SIGNIFICANT DETERIORATION PERMIT FOR THE OCOTILLO POWER PLANT

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INTRODUCTION

Arizona Public Service Co. ("APS"), the permittee in this proceeding, respectfully requests that the Environmental Appeals Board ("Board") deny Sierra Club's petition for review ("Petition") of the Maricopa County Air Quality Department's ("MCAQD") prevention of significant deterioration ("PSD") permit authorizing APS to construct five new natural gas-fired combustion turbines at its Ocotillo Power Plant (the "Permit"). Sierra Club seeks to force MCAQD to conduct a more detailed analysis of whether battery storage of electricity should somehow be incorporated into the proposed source in order to reduce its greenhouse gas ("GHG") emissions.

At the outset, the Petition must be denied because Sierra Club failed to meet the threshold requirement of presenting its objections to MCAQD during the Permit's notice and comment period. 40 C.F.R. § 124.19(a)(4)(ii). Sierra Club submitted comments on an *initial* draft of the Permit arguing that various forms of energy storage (including battery storage) should be considered in the "best available control technology" ("BACT") analysis for GHGs. But when MCAQD did precisely that—by developing and publishing for public comment a *revised* draft permit and technical support document ("TSD") explaining that battery storage options would redefine the source and are technically infeasible—Sierra Club failed to comment or register its objections that are now presented in this Petition. By withholding its objections for appeal, Sierra Club denied MCAQD the opportunity to address those objections in the final Permit and forfeited its right to raise those issues before the Board.

In any event, Sierra Club's arguments are without merit. Sierra Club claims that MCAQD committed clear error when it concluded that integrating battery storage would redefine the proposed source and does not require further examination in the GHG BACT analysis. To

the contrary, MCAQD took a hard look at the proposed source's purpose and design, and correctly determined that battery storage is a wholly different method of providing electricity than the proposed gas-fired combustion turbines and would frustrate the purpose and design of the project. The proposed turbines are designed to provide quick-ramping, reliable backup generating capacity in support of intermittent renewable energy resources by generating up to 375 MW in less than two minutes. Sierra Club's proposed battery storage approach would eliminate that quick-ramping capability because it would force the proposed turbines to start from complete shutdown each time they are called upon—a process that takes 10 to 30 minutes—and because batteries themselves, which have limited storage capacity and depend on other generation sources to charge them, cannot fill the gap with the required magnitude or duration of generation. Further, MCAQD also found that battery storage is technically infeasible for the proposed facility.

Likewise, Sierra Club is incorrect that MCAQD failed to respond to its comments regarding battery storage. MCAQD did address Sierra Club's concerns at length, both by developing and publishing a revised draft permit and TSD and by directly responding to those comments upon publication of the final Permit. To the extent MCAQD's response is not as detailed as Sierra Club would prefer, that is only because Sierra Club failed to present the issues raised in this Petition with sufficient clarity—let alone any technical detail—in its comments. The level of detail required of MCAQD's responses is commensurate with the level of detail provided in public comments. And in any event, even if the Board somehow finds that MCAQD's explanation was less than ideal, remand of the Permit would be an unnecessary waste of resources because the record is already replete with evidence supporting MCAQD's permit decision. Sierra Club's Petition should be denied.

STATEMENT OF THE CASE

I. Purpose of the Ocotillo Project

APS is the owner and operator of the Ocotillo Power Plant, located in Tempe, Arizona. APS is seeking a permit to construct the Ocotillo Power Plant Modernization Project ("Ocotillo Project" or "Project"), in which APS plans to replace two steam electric generating units at the site with five new natural gas-fired simple-cycle combustion turbines of approximately 100 MW each. Title V Operating Permit Revision and Prevention of Significant Deterioration Air Pollution Control Permit Application: Ocotillo Power Plant Modernization Project (Sept. 30, 2015) at 2, Pet. Ex. 5 ("Revised App."). The new turbines will serve to "replace the 200 MW of peak generation that will be retired at Ocotillo with cleaner units, and to provide an additional 300 MW of peak generation to handle future growth." *Id.* at 12. The Project is designed to serve as a peak load facility capable of providing 25 to 500 MW capacity that will quickly respond to rapid changes in electricity demand, particularly in response to fluctuation in generation from solar energy sources. *Id.* Because renewable energy is an intermittent source of electricity, the ability to call upon peak load facilities to quickly back up these renewable resources "is essential to maintain reliable electric service," particularly as APS and others continue to add renewable energy to the grid. *Id.* The growing role of intermittent renewable resources in the power grid "requires quick start and power escalation capability to meet changing power demands and mitigate grid instability." *Id.*; *see also* Title V Operating Permit Revision and Prevention of Significant Deterioration Air Pollution Control Permit Application: Ocotillo Power Plant Modernization Project (Jan. 23, 2015) at 2, Pet. Ex. 7 ("Initial App."). Moreover, that quick ramping capability must be available to respond to load fluctuations at "multiple times of peak demand throughout the day." *Id.* at 2.

The APS grid currently contains 1,206 MW of renewable generation capacity, of which 300-400 MW is distributed rooftop solar capacity in the Phoenix metropolitan area and Maricopa County. Technical Support Document, APS Ocotillo Power Plant, Permit Number V95-007, Permit Revision 2.1.0.0 (Dec. 15, 2015) at 6, Pet. Ex. 6 ("Revised Draft Permit TSD"). Those numbers are increasing steadily, as APS seeks to achieve a renewable portfolio equal to 15% of APS's total generating capacity by 2025 pursuant to State mandates, and as individual customers add rooftop units every day. *See id.* Accordingly, the quick-ramping energy capacity this project provides "is not only very important for normal grid stability, but also absolutely necessary to integrate with and fully realize the benefits of distributed energy, such as, solar power and other renewable resources." MCAQD Response to Public Comments received on the APS Ocotillo Power Plant Significant Permit Revision 2.1.0.0 (Mar. 22, 2016) at 11, Pet. Ex. 2 ("Responsiveness Summary" or "RS"). APS has already observed rapid load changes within its system of 25 to 300 MW in very short time periods due to intermittent renewable energy sources. Revised App. at 12, Pet. Ex. 5. Further, estimates of the required electric generating capacity ramp rate needed to back up solar generation in the future range from 165 to 310 MW *per minute*. *Id.*

In light of this observed and projected future need for quick-ramping capability, the Ocotillo Project is designed to provide 375 MW of peak load capacity within less than two minutes, reflecting an electric power ramp rate of 50 MW per minute per turbine. *Id.* In order to provide this peak load capacity in the time required, the General Electric Model LMS100 turbines used for the Project must be already operating at 25 percent load when called upon for backup generation. *Id.* When all five turbines start from 25 percent load, the proposed facility will be able to ramp up from 125 MW to its full load of 500 MW—providing 375 MW of

incremental ramping capacity—within less than two minutes. *Id.* By contrast, starting from a "black start" (i.e. complete shutdown), each turbine would need at least 10 minutes to ramp up to full load, and possibly up to 30 minutes in order to allow emission control systems for other pollutants to become fully operational.[1] *Id.* App'x B at 68. Accordingly, the ability to maintain the turbines in a state of readiness by idling at 25 percent load is also a necessary component of the Project's basic design. *See id.* at 12.

II. Procedural History

Because the Project would constitute a major modification of the existing facility for a number of regulated pollutants, the Clean Air Act ("CAA" or "Act") requires APS to undergo preconstruction review for the Project under the Act's PSD provisions. CAA § 165(a). Among other measures, the PSD provisions require APS to obtain a permit before commencing construction that contains emission limits for various pollutants—including GHGs—representing BACT for those pollutants. *Id.* § 165(a)(4).

APS submitted a PSD permit application for the Project to MCAQD on April 14, 2014, which it supplemented with additional information on January 23, 2015. *See* Initial App., Pet. Ex. 7. MCAQD is the delegated PSD permitting authority for the U.S. Environmental Protection Agency ("EPA") within Maricopa County, Arizona. Region 9 EPA Delegation Agreement (Feb. 8, 2016), Pet. Ex.3.

After reviewing APS's Initial Application, MCAQD published a draft PSD permit and draft TSD for public comment on March 4, 2015. Draft Permit for Ocotillo Power Plant (Mar. 4,

[1] Specifically, in some cases 30 minutes is needed to allow the units' oxidation catalyst and selective catalytic reduction pollution control systems to become fully operational. Revised App. App'x B at 68, Pet. Ex. 5. These systems are used to control emissions of carbon monoxide ("CO"), volatile organic compounds ("VOC"), and nitrogen oxides ("NOx"), and they are essential for the Project to meet its BACT emission limits for those pollutants. Revised Draft Permit TSD at 41, 45, Pet. Ex. 6 (identifying BACT for those pollutants).

2015), Pet. Ex. 8 ("Initial Draft Permit"); Technical Support Document, APS Ocotillo Power Plant, Permit Number V95-007, Permit Renewal and Revision 2.0.0.0 – 1.1.0.0 (Mar. 4, 2015), APS Ex. A ("Initial Draft Permit TSD"). Sierra Club, the petitioner in this appeal, submitted extensive comments on the Initial Draft Permit objecting to its provisions on a wide variety of bases. *See* Letter from Travis Ritchie, Sierra Club, to Henry Krautter, MCAQD (Apr. 9, 2015), Pet. Ex. 4 ("Sierra Club Comments"). Among many issues, Sierra Club argued that MCAQD's BACT analysis for GHGs was deficient because it did not consider the use of various energy storage technologies (including batteries) as a method for reducing the Project's GHG emissions. *Id.* at 3-15. Sierra Club stated that MCAQD should consider whether some form of energy storage could be used to replace some or all of the Project's proposed combustion turbines. *Id.* However, Sierra Club did not offer any detail as to how energy storage (including batteries) might be incorporated into the Project's design while still achieving its fundamental purpose, such as what size batteries might be needed, how long they could provide generation for, or at what load level turbine generation could take over for the batteries.

Partly in response to Sierra Club's comments on the Initial Draft Permit, MCAQD initiated a second phase of the PSD permit proceedings to address some of the concerns Sierra Club and others raised. Specifically, on April 29, 2015, MCAQD sent a letter to APS requesting that it provide additional information in response to the topics raised by Sierra Club and submit a revised permit application addressing these issues if necessary. MCAQD's Request to APS for Supplemental Information on Renewal of Permit V95007 (Apr. 29, 2015), APS Ex. B ("Request Letter"). APS responded to MCAQD's request on June 26, 2015, providing voluminous information addressing the issues raised by Sierra Club (including battery storage, among other subjects), *see* APS's Response to MCAQD's Request for Supplemental Information on Renewal

of Permit V95007 (June 26, 2015), APS Ex. C ("Response Letter"), and submitted a revised PSD permit application on September 30, 2015, *see* Revised App. App'x B at 37-67, Pet. Ex. 5.

On December 15, 2015, MCAQD published a revised draft PSD permit and TSD explaining its rationale. *See* Revised Draft Permit TSD, Pet. Ex. 6. As requested by Sierra Club, the Revised Draft Permit TSD addressed more fully whether energy storage (including battery storage) should be included in the GHG BACT analysis for the Project. *Id.* at 32-41. MCAQD ruled out energy storage technologies for two reasons: incorporating energy storage "would redefine the source," and it is "not technically feasible for this proposed peaking plant." *Id.* at 39. On that basis, MCAQD did not include energy storage as a potentially available control technology for the Project in its GHG BACT analysis. MCAQD also concluded that even if energy storage were included in the BACT analysis, it would be rejected at Step 2 as "not technically feasible for this proposed peaking power plant." *Id.*; *see also* RS at 9, Pet. Ex. 2 (battery storage "may be eliminated . . . under Step 2 because it is not technically feasible").

MCAQD provided a 30-day public comment period for the Revised Draft Permit and held a public hearing on January 16, 2016. RS at 1, Pet. Ex. 2. No party—including Sierra Club—submitted comments on the Revised Draft Permit or appeared at the hearing. *Id.* at 4.

On March 22, 2016, MCAQD issued a final PSD permit to APS for the Ocotillo Project. *See* PSD, NSR, and Title V Air Quality Construction and Operating Permit, Title V Permit Number V95-007, Revision Number 2.1.0.0, PSD Permit Number PSD16-01 (Mar. 22, 2016), Pet. Ex. 1 ("Permit"). Given the lack of comments, the final Permit did not contain any material changes from the Revised Draft Permit. Sierra Club appealed the Permit by filing this Petition with the Board on April 21, 2016.

ARGUMENT

I. This Petition Must Be Denied Because Sierra Club Failed to Preserve the Issues Raised in Its Petition.

The Petition suffers from a fatal defect and should be summarily denied by the Board. By not submitting comments on the *Revised* Draft Permit, Sierra Club failed to preserve the issues it now raises in this Petition. Sierra Club submitted comments only on the *Initial* Draft Permit, arguing (among many other arguments) that MCAQD should have given more consideration to battery storage options in its GHG BACT analysis for the Project. Sierra Club Comments at 3-15, Pet. Ex. 4. In response to Sierra Club's comments, MCAQD initiated additional permit proceedings by requesting a Revised Application from APS and issuing a Revised Draft Permit and supporting materials addressing, *inter alia*, the possible integration of battery storage into the Project. *See* Request Letter, APS Ex. B; Response Letter, APS Ex. C; Revised Draft Permit TSD, Pet. Ex. 6. But Sierra Club chose not to comment on MCAQD's purportedly deficient consideration of battery storage or its alleged misinterpretation of Sierra Club's comments when those issues were presented in the Revised Draft Permit—or, indeed, on any aspect of the Revised Draft Permit. Pet. 5. As the Board's precedent explains, by remaining silent, Sierra Club forfeited its ability to appeal those issues. This is a threshold requirement that reflects important policies and values embedded in the administrative process. Because Sierra Club failed to meet this threshold requirement, its Petition must be denied.

A person who believes that the provisions of a draft permit are inappropriate "must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period." 40 C.F.R. § 124.13. Likewise, any person challenging a PSD permit "must demonstrate, by providing specific citation to the administrative record . . . that each issue being raised in the petition was raised during the public

comment period" or was "not reasonably ascertainable." *Id.* § 124.19(a)(4)(ii); EAB, Revised Order Governing Petitions for Review of Clean Air Act New Source Review Permits (Mar. 27, 2013) at ¶7 ("NSR Standing Order"). The Board construes these threshold requirements strictly and "will make use of summary disposition to resolve cases that do not meet" them. NSR Standing Order at ¶7; *see, e.g.*, *In re Christian Cty. Generation, LLC*, 13 E.A.D. 449, 457 (EAB 2008) ("[T]he Board has routinely denied review where the issue was reasonably ascertainable but was not raised during the comment period on the draft permit[.]") (internal citation and quotations marks omitted).

As the Board has repeatedly observed, the requirement to first present objections to the permit issuer "is not an arbitrary hurdle . . . rather, it serves an important function related to the efficiency and integrity of the overall administrative scheme." *In re Prairie State Generating Co.*, 13 E.A.D. 1, 59 (EAB 2006), *aff'd sub nom. Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007) (quoting *In re BP Cherry Point*, 12 E.A.D. 209, 219 (EAB 2005)). This provision "has an important role in establishing the proper staging of the permit decision process," ensuring that the permit issuer "has the first opportunity to address any objections to the permit." *Christian Cty.*, 13 E.A.D. at 459 (internal citations and quotations marks omitted). This, in turn, allows the permit issuer to address objections "before the permit becomes final, thereby promoting the [EPA's] longstanding policy that most permit decisions should be resolved at the [permit issuer's] level." *In re New Eng. Plating Co.*, 9 E.A.D. 726, 732 (EAB 2001); *accord In re City of Palmdale (Palmdale Hybrid Power Project)*, 15 E.A.D. 700, 721 (EAB 2012). Indeed, the entire purpose of the public comment period is "so that issues may be raised and 'the permit issuer can make *timely and appropriate adjustments* to the permit determination.'" *Christian Cty.*, 13 E.A.D. at 459 (quoting *In re Union Cty. Res. Recovery Facility*, 3 E.A.D. 455, 456

(Adm'r 1990)) (emphasis added). Allowing petitioners to raise issues for the first time before the Board would "undermine the efficiency, predictability, and finality of the permitting process." *Prairie State*, 13 E.A.D. at 59.

The same policy considerations apply when the permitting authority publishes and solicits comment on a revised draft permit in light of earlier comments on a previous draft permit. It is incumbent upon the original commenter to point out alleged flaws in the revised draft's analysis—including continuing objections presented in comments on earlier drafts. The Board explained the policy reasons for this requirement in *In re City of Phoenix, Arizona*, 9 E.A.D. 515 (EAB 2000). There, the petitioner sought to raise objections before the Board that had been presented to the permit issuer "at an earlier stage of the proceeding," but were not submitted in comments on the draft permit. *Id.* at 527. The Board denied the petition due to the petitioner's failure to properly raise its objections during the comment period on the draft permit, even though it was undisputed that the petitioner had presented the same objections to the permit issuer in correspondence on preliminary drafts of the permit. *Id.* at 526-27. The Board held that 40 C.F.R. § 124.19(a)(4)(ii) required the petitioner to resubmit its earlier objections in comments on the draft permit because the petitioner's contrary view would

> require the permit issuer to divine, by means unknown, whether or not the comments were still being preserved for consideration or whether they had been resolved or abandoned by the commenter. The folly of such an enterprise is manifest. The practical effect of Petitioner's approach would more likely be to catch the permit issuer off guard than to alert the permit issuer to issues legitimately pertaining to the most recent draft permit. As a consequence, we find no merit to Petitioner's position.

Id. at 527-28; *accord In re Kawaihae Cogeneration Project*, 7 E.A.D. 107, 120 (EAB 1997) (finding where party had only presented objections to permit issuer *before* comment period on draft permit, but "no comments were received on this issue *during* the [draft permit's] public

comment period, [the permit issuer] could well have assumed that any objections had been resolved or abandoned") (emphasis added).[2]

Sierra Club failed to meet the threshold requirement of preserving the issues in this appeal. Sierra Club's Petition alleges that MCAQD erred in its analysis of the potential incorporation of battery storage into the Ocotillo project, both as a matter of substance (in its conclusion that battery storage would redefine the source) and procedure (in its response to Sierra Club's comments on the Initial Draft Permit). Pet. 11. Sierra Club claims that these issues "were raised with [MCAQD] during the public comment period or are directly related to [MCAQD's] response to other comments (and therefore not reasonably ascertainable during the comment period)," and are thus ripe for appeal. Pet. 10. But this claim is misleading and relies on an incomplete view of the permitting record. While Sierra Club did submit comments on the *Initial* Draft Permit, it failed to comment on the *Revised* Draft Permit, which actually presented MCAQD's analysis of battery storage that is the subject of this Petition.

In Sierra Club's telling, the only facts relevant to this inquiry are that: (1) MCAQD issued an Initial Draft Permit in March 2015 that did not address battery storage; (2) Sierra Club submitted comments on the Initial Draft Permit in April 2015 calling for an analysis of battery

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[2] *See also In re Carlota Copper Co.*, 11 E.A.D. 692, 726-33 (EAB 2004) (concerns presented in comments during draft permit's second public comment period do not support appeal of permit provision that was only at issue during first public comment period); *In re Avon Custom Mixing Svcs., Inc.*, 10 E.A.D. 700, 707 n.14 (EAB 2002) ("[T]o put the permit issuer on formal notice of any continuing objections to the terms of a draft permit, the person making the comments must register the objections with the permit issuer *during the public comment period* in order to preserve the right to contest any decision by the permit issuer not to incorporate the person's comments."); *New England Plating Co.*, 9 E.A.D. at 734 n.18 ("[T]he public comment period is a contained process, and . . . the permitting authority is not obligated to consider and address the full panoply of issues that may have been raised at one point in a multi-year permitting process and that may or may not still be in dispute at the time of the public comment period. Rather, it is incumbent upon the commenter to raise during the comment period all issues that are still in dispute at that time.").

storage; and (3) MCAQD issued a final Permit in March 2016 that allegedly did not properly address battery storage. But this view ignores the extensive further notice-and-comment proceedings that took place on this issue between Sierra Club's submission of its April 2015 comments and MCAQD's March 2016 issuance of the final Permit. Sierra Club glosses over these significant events in a few sentences:

> On September 30, 2015, *APS submitted an updated application* with revisions and updates to the Applicant's GHG BACT analysis. In December 2015, *the County issued a revised draft permit* and draft TSD for public comment through January 16, 2016. *No party commented on the revised draft permit*. On March 23 [*sic*], 2016, the County issued the final permit *without any substantive changes* to the December 2015 revised draft permit.

Pet. 5 (emphases added) (internal citations and abbreviations omitted). Notably, Sierra Club neglects to mention that it was this Revised Draft Permit and the materials supporting it—and *not* the Initial Draft Permit—that first set forth the analysis and conclusions challenged in this Petition. *See* Revised Draft Permit TSD at 32-34, 39, Pet. Ex. 6; Revised App. at 48-49, Pet. Ex. 5. Sierra Club also neglects to mention that the entire purpose of this second phase of the permitting process was to respond to Sierra Club's specific comments on the Initial Draft Permit (along with those of one other commenter), including its comments related to battery storage. Request Letter at 1, APS Ex. B.

Sierra Club could have—and was required to—present the issues raised in its Petition before MCAQD in the first instance. These issues were "reasonably ascertainable": indeed, Sierra Club concedes that the final Permit was issued "without any substantive changes" from the Revised Draft Permit. Pet. 5. If Sierra Club took issue with MCAQD's rationale for rejecting battery storage before Step 1 of its BACT analysis, it had a duty to raise that objection in comments so that MCAQD could address any purported deficiency before issuing the final Permit. Likewise, if Sierra Club believed MCAQD's updated analysis in the Revised Draft

Permit in response to its comments on battery storage was inadequate, it had an obligation to submit comments on the Revised Draft Permit to ensure that MCAQD had the opportunity to respond fully to its concerns. This is particularly true in this case, where MCAQD diligently used the notice-and-comment process to "make timely and appropriate adjustments to the permit determination" in response to Sierra Club's comments on the Initial Draft Permit. *See Christian Cty.*, 13 E.A.D. at 459. But instead of engaging with MCAQD to seek to adjust the Revised Draft Permit and TSD, Sierra Club remained silent and saved its objections for appeal to this Board.[3]

Thus, as in *Phoenix* and the other cases cited above, because Sierra Club did not file any comments on the Revised Draft Permit—a document whose entire purpose was to address Sierra Club's concerns regarding the Initial Draft Permit—MCAQD was left to assume that Sierra Club's earlier objections had been resolved. Sierra Club's approach seems designed to "catch the permit issuer off guard [rather] than to alert the permit issuer to issues legitimately pertaining to the most recent draft permit." *Phoenix*, 9 E.A.D. at 528. Sierra Club's failure to comment on those issues denied MCAQD its opportunity to address them in the first instance and therefore bars Sierra Club from presenting them to this Board.

II. MCAQD Correctly Found That Integrating Battery Storage Would Redefine the Proposed Source.

Even if the Board considers Sierra Club's objection to the Initial Draft Permit concerning battery storage, it has no merit in any event. A BACT analysis is not a vehicle for the permitting authority to redefine the proposed source by altering its fundamental purpose or design. Sierra

[3] At a minimum, Sierra Club should have reasserted those comments it believed were not adequately addressed by MCAQD's adjustment to the draft permit and the revised TSD. More forthrightly, Sierra Club should have submitted new comments that provided the detailed information that Sierra Club now belatedly provides in its Petition. *See* Pet. 13-14 & nn.9, 10 (providing detail on *how* battery storage should be considered to avoid turbine idling).

Club argues that "pairing" battery storage with the Project's natural gas-fired combustion turbines, which it says is different from replacing all or part of the turbines, would not redefine the proposed source because it would merely allow the turbines to be shut down more frequently instead of idling at low load between periods of peak demand. However, MCAQD took a "hard look" at APS's purpose for the Project and correctly found that battery storage "is not compatible with the purpose and design of a true peaking facility such as the Project to provide rapid, reliable power." RS at 8, Pet. Ex. 2. The Project's purpose is to provide up to 375 MW of peak generation in less than two minutes in order to provide backup for intermittent renewable generation. Sierra Club's unprecedented "paired" battery storage approach would frustrate that purpose. It would alter the Project's fundamental method for generating electricity, making the Project dependent on third-party generation to charge its batteries, and preventing the Project from responding to load swings at the magnitude and speed required.

A. The CAA Does Not Require MCAQD to Consider Measures that Would Redefine the Source.

EPA and the Board have long recognized that the CAA does not require a permit issuer to consider measures in its BACT analysis that would redefine the proposed source. *See, e.g.*, *Prairie State*, 13 E.A.D. at 23 ("the permit issuer must be mindful that BACT, in most cases, should not be applied to regulate the applicant's objective or purpose for the proposed facility"); *Palmdale*, 15 E.A.D. at 729 (permit issuer is "not required to consider inherently lower polluting technology alternatives that would require 'redefining the design' of the source as proposed by the permit applicant"); EPA, *New Source Review Workshop Manual* (Oct. 1990) (Draft) at B.13 ("NSR Manual") ("Historically, EPA has not considered the BACT requirement as a means to redefine the design of the source when considering available control alternatives."). This longstanding Agency interpretation reflects "a central concern with preservation of the facility's

basic purpose." *Prairie State*, 13 E.A.D. at 21. EPA's interpretation has also been affirmed by the courts. *See Sierra Club v. EPA*, 499 F.3d 653, 655 (7th Cir. 2007) (upholding Board's decision in *Prairie State*) ("Refining the statutory definition of 'control technology' . . . to exclude redesign is the kind of judgment by an administrative agency to which a reviewing court should defer."). Recently, EPA has reaffirmed that the prohibition against redefining the source through the PSD permitting process extends to the BACT analysis for greenhouse gas emissions. EPA, *PSD and Title V Permitting Guidance for Greenhouse Gases* (Mar. 2011) at 26 ("EPA has recognized that a Step 1 list of options need not necessarily include lower polluting processes that would fundamentally redefine the nature of the source proposed by the permit applicant. BACT should generally not be applied to regulate the applicant's purpose or objective for the proposed facility.").

In order to assess what measures would redefine the source, the permit issuer is guided by "how the *applicant*, in proposing the facility, defines the goals, objectives, purpose, or basic design for the proposed facility." *Prairie State*, 13 E.A.D. at 23 (emphasis added); *see also id.* at 20 (recognizing "Congress intended the *permit applicant* to have the prerogative to define certain aspects of the proposed facility that may not be redesigned through the application of BACT") (emphasis added); *In re La Paloma Energy Center, LLC*, PSD Appeal No. 13-10, slip op. at 26, E.A.D. at __ (EAB Mar. 14, 2014) ("To determine whether a potential control option would redefine the source, the Board has required permitting authorities to examine first how the *applicant* defined the proposed facility's end, object, aim, or purpose, in other words, the facility's basic design as described in the application and supporting materials.") (emphasis added) (internal quotation marks and citations omitted). It is then the permit issuer's responsibility to take a "hard look" at the project's purpose as defined by the applicant and

identify the line between changes that would redefine the source and changes that may properly be considered in the BACT analysis. *See Prairie State*, 13 E.A.D. at 26. The permit issuer has broad discretion in making this determination, and accordingly, the Board "reviews such determinations under an abuse of discretion standard." *Palmdale*, 15 E.A.D. at 732; *see also Sierra Club*, 499 F.3d at 655 ("As it is not obvious where to draw that line . . . , it makes sense to let [the permit issuer] draw it, within reason.").

B. The Ocotillo Project's Fundamental Purpose and Design Include the Specific Quick-Ramping Capacity Described in APS's Applications and the Revised Draft Permit.

APS described the Project's basic business purpose and design in its permit applications. *See supra* pp. 3-5 (citing Initial App. and Revised App.). MCAQD took a "hard look" at APS's applications and concurred in APS's description of the Project's fundamental purpose and design, including its need for specific fast-ramping capabilities in order to meet current and future peak demand requirements. Revised Draft Permit TSD at 5-7, Pet. Ex. 6. Sierra Club's attempt in this Petition to second-guess that purpose is misguided and factually incorrect.

MCAQD recognized that the ability to provide 375 MW of ramping capacity in less than 2 minutes, at a ramp rate of 50 MW per minute per turbine, is "critical for the project to meet its purpose." *Id.* at 7. MCAQD found these capabilities are "necessary to meet changing power demands and mitigate grid instability caused by the intermittency of renewable energy generation," including during "multiple times of peak demand throughout the day." *Id.* at 5. MCAQD acknowledged that APS has already observed rapid load changes from renewable energy sources of up to 300 MW in very short time periods. *Id.* at 6. It also recognized that the Project's turbines cannot provide the required ramping capacity unless they are able to idle at 25 percent load for substantial periods. *Id.* at 5 ("The new units need the ability to start quickly, change load quickly, and idle at low load."), 7 (Project can only provide needed ramp rate

"[w]hen all 5 proposed GTs are operating at 25% load"); *see also* RS at 17, Pet. Ex. 2 (recognizing "operation at 25% of load is indeed part of the normal operation of these units, and is in fact an important design concept for the LMS100 CTG and for the planned Project"). According to MCAQD, the minimum 10 minute startup time that these units would require from a black start "is not adequate to meet the grid stability requirements." RS at 12, Pet. Ex. 2.

In its Petition, Sierra Club attempts to literally redefine the source by omitting APS's specific need for 25 to 375 MW of quick ramping capacity from the Project's basic purpose. Pet. 15-16, 23-24. According to Sierra Club, the Project's purpose is simply to provide 25 to 500 MW of total capacity with some unspecified amount and rate of quick-ramping capability. *Id.* 17. Sierra Club argues that the Project's stated purpose of providing up to 375 MW of ramping capacity in two minutes was included in the Revised Permit Application "only as a descriptive capability of APS's preferred configuration, not as a business purpose or need." *Id.* 23. The permitting record shows this is plainly incorrect. APS has already observed fluctuation within its power grid of up to 300 MW in very short time periods due to intermittent solar energy, and that fluctuation is only expected to increase as renewable energy resources are further integrated into the grid. Revised App. at 12, Pet. Ex. 5. APS is not seeking to construct a peak load facility merely to meet some abstract demand: the fundamental business need for the Ocotillo Project is to address known peak load requirements within specific time frames and amounts that have already been observed due to increased reliance on intermittent renewable sources. The proposed design of the Project is "critical" to meet that purpose, as MCAQD expressly recognized. *Id.*; Revised Draft Permit TSD at 7, Pet. Ex. 6.

Likewise, Sierra Club argues that "[n]either APS nor the County explicitly explained what business need or end goal is fulfilled by idling all five Ocotillo combustion turbines at such

low load [25 percent]. (Idling at low load is an operational description, not a project need description.)." Pet. 15-16. Not so. Sierra Club's novel distinction between an "operational description" and a "project need description" is unavailing. *Cf. Prairie State*, 13 E.A.D. at 21 (refusing to distinguish between project's "schematic design" and "purpose" because design "can be presumed to be directed at accomplishing the permit applicant's purpose"). APS explained, and MCAQD agreed, that the Project's turbines are only capable of providing the rapid ramping capacity within the necessary time frame when they are already idling at 25 percent load. Revised App. at 12, Pet. Ex. 5; Revised Draft Permit TSD at 7, Pet. Ex. 6; RS at 17, Pet. Ex. 2. Elsewhere in its Petition, Sierra Club begrudgingly concedes this basic fact, and acknowledges that without idling the turbines at 25 percent load, it would take 10 minutes for them to reach full load—five times longer than the Project requires. Pet. 16. Sierra Club scoffs at the idea that this prolonged ramping period would meaningfully impact the Project's business purpose, glibly observing that the ability to idle at low load "would serve *only* to allow the Ocotillo plant to provide ramping capability 8 minutes sooner than it could from a black start." *Id.* (emphasis added). But as MCAQD recognized, that difference is "critical," and even a 10 minute startup time is "not adequate to meet the grid stability requirements." RS at 12, Pet. Ex. 2.

Further, as APS noted, the actual startup time needed from a black start may be as long as 30 minutes to allow for emission control systems to become fully operational. Revised App. App'x B at 68, Pet. Ex. 5. Sierra Club provides no evidence to refute MCAQD's conclusion that a startup time of 10 minutes or more is inadequate. Rather, Sierra Club's argument is premised on its unsubstantiated assertion that the Project's basic purpose does not include the stated need to respond to load swings of 25 to 375 MW in less than two minutes. Because that assertion is incorrect, as discussed above, Sierra Club's argument must fail. *See Palmdale*, 15 E.A.D. at 724

(denying petition where petitioner "has provided no basis for second-guessing the [permit issuer's] judgment").

Finally, Sierra Club claims that even if the Project's stated ramping capability is part of its basic purpose, the Board should disregard that purpose as "a post-hoc adjustment to narrow the purported project need in order to avoid consideration of a feasible control technology." Pet. 24. As an initial matter, the phrase "post-hoc adjustment" incorrectly suggests that the description of the Project's ramping capacity was unfairly added after the fact with no opportunity for public input. In reality, the details of APS's need for the Project's specific ramping capability were presented during the public comment process, in both APS's Revised Permit Application and MCAQD's Revised Draft Permit. Revised App. at 12, Pet. Ex. 5; Revised Draft Permit TSD at 6, Pet. Ex. 6. Sierra Club had an opportunity to comment on the Project's purpose and design but chose not to.

In any event, the Project's stated ramping capability and its related need to idle at 25 percent load were not "adjustments": they are entirely consistent with the Project's purpose as it was defined in the Initial Permit Application. APS's Initial Permit Application specified that the Project's purpose was to provide "firm electric capacity which can be quickly and reliably dispatched when renewable power, or other distributed energy sources are unavailable," including "multiple times of peak demand throughout the day." Initial App. at 2, Pet. Ex. 7. It also specified that "[t]o achieve these requirements," it was necessary to provide for "steady state loads as low as 25%" in the permit. *Id.*; Initial Draft Permit TSD at 4, APS Ex. A. The Revised Permit Application simply provided additional detail about the speed and magnitude of the Project's needed ramping capability. MCAQD took a "hard look" at this additional information and included it in its assessment of the Project's purpose. The permitting authority has "broad

discretion" in assessing a proposed source's fundamental purpose and design. *Palmdale*, 15 E.A.D. at 732. MCAQD did not abuse that discretion here.

C. Integrating Battery Storage Would Frustrate APS's Basic Purpose and Design for the Ocotillo Project.

After taking a "hard look" at APS's stated purpose and design for the Ocotillo Project, MCAQD correctly found that incorporating battery storage into the Project—whether to replace or supplement generation from the proposed combustion turbines—is inconsistent with that purpose and would redefine the source. Indeed, requiring MCAQD to consider battery storage in the Project's BACT analysis would "stretch the term 'control technology' beyond the breaking point." *Sierra Club*, 499 F.3d at 655. Sierra Club's proposed configuration would transform the Ocotillo Project into a fundamentally different kind of source that would be incapable of satisfying its intended purpose. As discussed below, integrating battery storage into the Project (1) would fundamentally alter its method of producing electricity; (2) would make the Project dependent on third-party generation, transforming it into a power purchase and distribution facility; and (3) would prevent the Project from achieving its purpose of providing reliable backup generation to support intermittent renewable resources.

1. Battery Storage is a Fundamentally Different Generation Method.

Integrating battery storage is neither an "add-on control" nor a lower-emitting "production process" that can be applied to the Project. Rather, it is an alternative source design that relies on a fundamentally different method for supplying electricity.[4] While Sierra Club

[4] The permit issuer is not required to independently consider "alternatives" to the proposed source as part of its BACT analysis. *See Prairie State*, 13 E.A.D. at 30. Instead, the CAA provides for "alternatives" to be considered in a more limited way as part of the public comment process. CAA § 165(a)(2) (PSD permit may not issue unless "a public hearing has been held with opportunity for interested persons . . . to appear and submit written or oral presentations on the air quality impact of such source, *alternatives thereto*, control technology requirements, and other appropriate considerations") (emphasis added). For that reason, "the

attempts to distinguish "battery storage paired with combustion turbines" from "complete *replacement* of the combustion turbines with energy storage," Pet. 31 (emphasis in original), its proposed alternative configuration would in fact replace *generation* from the Project's proposed natural gas-fired combustion turbines with generation from batteries. As described in the Petition,[5] battery generation would replace turbine generation during each turbine's ramp-up period, until some unspecified point in time when the turbine is allowed to take over and "operate closer to 100% load." Pet. 13. This would effectively constitute a change in the Project's choice of fuel, since it would change the source of electricity generated by the Ocotillo Project from natural gas combusted in a turbine to electrical energy stored in a battery.

The Board has routinely found that changes to a power plant's fuel design would redefine the source. *See, e.g.*, *Palmdale*, 15 E.A.D. at 734 ("Agency guidance and prior Board decisions . . . have rejected using a BACT analysis to require fundamental changes in the fuel design of electric power generating stations"); *Prairie State*, 13 E.A.D. at 25 ("It has also been long-standing EPA policy that certain fuel choices are integral to the electric power generating station's basic design"); *La Paloma*, slip op. at 24 ("EPA generally considers proposed changes to an applicant's proposed primary fuel to be a redefinition of the source."). This is true even where only a portion of the fuel used would be changed. *See In re Pennsauken Cty.*, 2 E.A.D. 667, 673 (Adm'r 1988) (requiring proposed municipal waste combustor to convert to a 20/80 mixture of refuse-derived fuel and coal would redefine the source).

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extent of the permitting authority's consideration and analysis of alternatives need be no broader than the analysis supplied in public comments." *Prairie State*, 13 E.A.D. at 30 (internal quotation marks and citation omitted). MCAQD met that burden here. *See infra* Section III.

[5] As discussed in Section III, *infra*, none of the operational details for Sierra Club's alternative configuration of battery storage paired with combustion turbines were presented in its comments on the Initial Draft Permit.

Sierra Club fails to identify any permitting authority that has ever found integration of battery storage to be appropriate for consideration as part of a BACT analysis for a proposed fossil fuel-fired power plant. By contrast, EPA has repeatedly *rejected* calls by Sierra Club to consider the use of battery storage as a control technology for power plants. *See* EPA, Response to Comments, South Texas Electric Cooperative, Inc. – Red Gate Power Plant Prevention of Significant Deterioration Permit for Greenhouse Gas Emissions, PSD-TX-1322-GHG (Feb. 2015) at 4-10, APS Ex. D ("Red Gate RS") (rejecting calls to replace either all or some of generation from proposed peak load RICE facility with generation from battery storage); EPA, Responses to Public Comments, Draft Greenhouse Gas PSD Air Permit for the Shady Hills Generating Station (Jan. 13, 2014) at 11, APS Ex. E ("Shady Hills RS") ("EPA disagrees with the commenter that zero-emission energy storage should be considered as part of the BACT analysis for the Shady Hills project because it does not fulfill the purpose of the source and would therefore constitute a redefinition of the source."); RS at 6, Pet. Ex. 2 (discussing both EPA decisions).

Indeed, Sierra Club has not identified *any* facility that utilizes battery storage in the way that it claims MCAQD should have required for the Ocotillo Project.[6] Although Sierra Club repeatedly cites to the Angamos coal-fired power plant in Chile, *see* Pet. 26-27, that facility's design is irrelevant to the Ocotillo Project. Sierra Club mischaracterizes Angamos as a "hybrid coal-battery power plant" that uses its battery capacity to "improve efficiency." Pet. 26. While the Angamos facility does have 20 MW of battery storage capacity, it does not rely on those batteries to "improve efficiency" or to provide electricity during startup or to replace low load operation. To the contrary, Angamos simply maintains its battery capacity in order to fulfill its

[6] For this reason, Sierra Club's claim that "Energy Storage Paired with Combustion Turbines is an Available and Demonstrated Technology" lacks any record support. Pet. 25.

mandatory "spinning reserve" requirement. Sierra Club Comments at Ex. 3 p. 5, Pet. Ex. 4 p. 89. Spinning reserve is unused generation capacity that the source is required to keep available for use in the event of "an unexpected transmission loss, the failure of a power generator, or another accident that might otherwise necessitate reducing power to customers." *Id.* By having the batteries available to meet its spinning reserve requirement, the Angamos facility is able to supply greater baseload generation by utilizing more of its coal-fired plant's generating capacity that would otherwise have been kept in reserve for emergencies, effectively increasing the source's maximum capacity and emissions instead of decreasing them.

Contrary to Sierra Club's assertion, this is not "the same concept that would apply to [the Ocotillo Project's] LMS 100 units." Pet. 26. In fact, it is the opposite. Sierra Club's proposed alternative configuration would require APS to produce peaking electricity from its batteries *first*, only supplying electricity from its gas-fired turbines once they are sufficiently close to 100 percent load. By contrast, the Angamos facility generates electricity almost exclusively from its coal-fired power plant, operating as a baseload facility with few startup and shutdown periods, while only calling upon its stored battery capacity in the event of system emergencies. Sierra Club Comments at Ex. 3 p. 5, Pet. Ex. 4 p. 89.[7]

[7] Sierra Club also argues that a report by the Boston Consulting Group supports it proposed battery storage configuration. Pet. 27. But the language Sierra Club cites from that report refers only to other forms of energy storage and not to batteries. *See* Sierra Club Comments at Ex. 12 p. 11, Pet. Ex. 4 p. 220 ("Given the large amounts of power and energy required to buffer conventional generation assets, the use of storage facilities in this application is mainly relevant to large-scale [compressed-air energy storage] and pumped-hydro storage."). Likewise, the Board may not consider Sierra Club's new arguments regarding the Mission Rock Energy Center because that facility was not presented to MCAQD in comments. Pet. 27-28.

2. Integrated Battery Storage Would Require Dependence on Third-Party Generators.

Further, Sierra Club's proposed alternative configuration would frustrate the Project's purpose of providing reliable backup generation by making the Project itself dependent on generation from *other* sources. *See* RS at 6, Pet. Ex. 2; Revised Draft Permit TSD at 33, Pet. Ex. 6. A battery itself cannot generate electricity: it merely stores energy generated from other sources. Therefore, requiring the Project to supply electricity through battery capacity during the turbines' ramp-up period would effectively require APS to purchase electricity from third-party generators to charge the batteries in the first place. *See* Revised Draft Permit TSD at 33, Pet. Ex. 6.

This frustrates the Project's objective of supporting grid reliability and stability. If APS is unable to charge the batteries due to transmission constraints, high demand for load from third-party generators, or other issues, it will be unable to start up and operate its turbines when called upon due to its inability to meet the BACT limit. In a recent GHG BACT determination, EPA agreed that requiring a power plant's owner to "purchase power from third parties for onsite storage" would "amount to a fundamental change in the purpose of the project, effectively changing [the source's] operation from power generation to power purchase and distribution." Red Gate RS at 6, APS Ex. D; *see also* RS at 6, Pet. Ex. 2 (citing Red Gate RS); Revised Draft Permit TSD at 33, Pet. Ex. 6 (same).

3. Sierra Club's Proposed Battery Storage Approach Would Result in the Inability to Provide Quick-Ramping, Reliable Backup Generation.

Integrating battery storage into the Project's design in the manner Sierra Club describes would eliminate the operational flexibility necessary to "meet changing power demands and mitigate grid instability caused by the intermittency of renewable energy generation," prohibiting the Project from achieving its fundamental purpose. Indeed, with Sierra Club's proposed design,

the Project would be helpless to respond to fluctuations in demand that have already been observed within the APS system. RS at 12, Pet. Ex. 2 (startup time from black start is "not adequate to meet the grid stability requirements"). Without the ability to idle at low loads, the Project's ramping capacity would be too little, too late.

Sierra Club claims in its petition that a 25 MW battery would eliminate the need to idle the turbines because, if there is a spike in demand of 25 MW, then the battery can provide that power (at least for some time) instead of the turbines doing so, and that this somehow fulfills the purpose of the Project. This conclusion is plainly wrong because it is based on Sierra Club's unsupported redefinition of the Project's purpose and not on the actual purpose as specified by APS in its Initial and Revised Permit Applications and evaluated by MCAQD. The purpose of the Project is to provide the capability of responding, *within two minutes*, to a 375 MW spike in power demand due to sudden fluctuations of distributed solar generation. Revised App. at 12, Pet. Ex. 5; Revised Draft Permit TSD at 6, Pet. Ex. 6. Having 25 MW (or 50 MW, or even 125 MW) of battery storage available does not address that purpose.[8] Sierra Club did not satisfy its obligation to submit comments explaining how that purpose could be met using battery storage. And when Sierra Club finally decided to provide further explanation in its Petition—improper as that approach is—that explanation utterly failed to address the Project's actual purpose.

[8] Even for a load swing as small as 25 MW, the battery would only be able to meet that demand for a limited time before discharging all of its stored electricity. *See infra* p. 26; Red Gate RS at 7, APS Ex. D. Therefore, even under Sierra Club's proposed battery storage approach, the Project's GHG BACT limit would need to allow the turbines to operate at 25 percent load when that is what the grid requires. As a result, it is likely that adopting Sierra Club's battery storage approach would not even alter the GHG BACT limit contained in the final Permit. *See Palmdale*, 15 E.A.D. at 735 (denying review where petitioner failed to show alternative configuration "would make any significant difference to the final BACT emissions limit for GHGs at this facility").

Indeed, the only way that the Project can provide the required ramping capacity is for all five of its turbines to be idling at 25 MW when called upon. RS at 11-12, Pet. Ex. 2; Revised Draft Permit TSD at 7, Pet. Ex. 6. If the turbines were instead shut down and were "paired" with 25 MW of battery storage, as Sierra Club suggests, the only amount of power the Project could provide in less than 10 minutes (which is the minimum startup time for these turbines) is 25 MW from the battery. A battery may be able to provide that 25 MW very fast. But two minutes later, the Project would still be unable to provide more than that 25 MW because the turbines are still ramping up and will not reach full load until at least 8 minutes later.[9]

Likewise, the Project's ability to respond to fluctuating demand would be constrained by the limits on how much electricity each battery can supply between recharges. Regardless of its capacity, a battery can only discharge a limited amount of electricity before it must eventually be replenished with energy from another generating source. For example, the 20 MW battery at the Angamos facility is only capable of providing electricity for "up to 15 minutes." Sierra Club Comments at Ex. 3 p. 5, Pet. Ex. 4 p. 89. At that duration, it may be difficult for battery storage to cover the ramp-up period for the Project's combustion turbines over even a single peak load period. *See* Revised App. App'x B at 68, Pet. Ex. 5 (turbine startup requires 10-30 minutes). Further, as MCAQD recognized, the Ocotillo Project may be needed to respond to several short peak demand periods in a row. RS at 8, Pet. Ex. 2; Initial App. at 2, Pet. Ex. 7 (noting in description of Project purpose that "because customers use energy in different ways and at

[9] In both its Petition and its comments on the Initial Draft Permit, Sierra Club failed to describe with specificity the size of the battery storage unit it believes would be appropriate to integrate into the Project. In the Petition, Sierra Club refers to battery storage units ranging from 25 MW up to 125 MW. *See* Pet. 13 & nn.9, 10. Even the upper end of this range (which is larger than any battery storage facility Sierra Club identified in its comments on the Initial Draft Permit), 125 MW of capacity would not be sufficient to meet observed load swings in the APS system. Revised App. at 12, Pet. Ex. 5. Therefore, Sierra Club has not met its burden to show that MCAQD abused its discretion by rejecting battery storage.

different times, this can create multiple times of peak demand throughout the day"). If the Project expends its battery capacity to allow the turbines to respond to one peak demand period, it may not be able to replenish its capacity before the Project is called upon again, leaving the Project unable to restart the turbines.

In sum, Sierra Club's proposed alternative configuration using battery storage would fundamentally redefine the proposed source. It would convert the Ocotillo Project from a plant that generates electricity through natural gas combustion to a plant that generates electricity through battery storage first, and natural gas second; from a plant that is capable of generating electricity independently of other sources to a plant that relies on third-party generation; and from a plant that can flexibly and quickly respond to fluctuating demand at any time to a plant that must slowly ramp up to full load and can provide backup power only if its batteries are sufficiently charged. Because these changes would frustrate the most basic aspects of the Project's purpose and design, MCAQD correctly did not include battery storage in its BACT analysis.

III. MCAQD Responded Appropriately to Sierra Club's Comments Regarding Battery Storage.

Sierra Club claims that MCAQD "fail[ed] to respond to Sierra Club's comments recommending consideration of energy storage paired with gas combustion turbines as a control technology." Pet. 11. The record, however, demonstrates that MCAQD addressed Sierra Club's comments on battery storage at great length and provided a rational basis for concluding that incorporating batteries into the Ocotillo Project would redefine the source. MCAQD's responses were more than adequate, particularly given that Sierra Club's comments on the issue presented in this Petition—to the extent they were actually raised in the way Sierra Club now describes them—were cursory, vague, and lacking in detail. And in any event, even if MCAQD's

response to these comments was somehow less than optimal, remanding the Permit for further consideration of battery storage would be a needless exercise because the record already demonstrates sufficiently that battery storage is not BACT for this Project.

A. MCAQD Adequately Responded to Sierra Club's Comments on Using Battery Storage to Reduce Low Load Idling.

Unlike the Petition filed before this Board, which describes Sierra Club's speculative configuration of "paired" turbines and battery storage in great detail for the first time, Sierra Club's comments on the Initial Draft Permit focused heavily on *replacing* some or all of the Project's turbines with battery storage. The comments offered only a vague conceptual description of how batteries might be used to eliminate the need for idling the Project's turbines at 25 percent load, without providing any detail as to how that might be achieved. *See* Sierra Club Comments at 6, Pet. Ex. 4. Notwithstanding those vague and unclear comments, MCAQD more than met its obligation to respond to the Sierra Club's arguments. By selectively focusing on a few quotes, Sierra Club mischaracterizes MCAQD's Response to Comments as addressing only whether "the complete *replacement* of the combustion turbines with energy storage was either infeasible or constituted a redefinition of the source." Pet. 31. To the contrary, MCAQD's Response to Comments also directly addressed the reasons why pairing battery storage with the Project's gas turbines as an integrated system in order to eliminate low load operations would redefine the source.

For example, MCAQD responded that integrating battery storage into the Project would "fundamentally redefine the source" because it would require use of "an alternative means of power production." RS at 8, Pet. Ex. 2. MCAQD recognized that like replacing turbines with batteries, even pairing batteries with turbines to reduce low-load operation as Sierra Club proposed would involve replacing one form of generation with a fundamentally different form of

power production, if only during the low load periods or during turbine startup. Likewise, MCAQD responded that use of energy storage—whether to replace low load operations or simply to replace the turbines altogether—"first requires separate generation and the transfer of the energy to storage to be effective," which is a fundamentally different design from a turbine-only source that "does not depend upon any other generation source to put energy on the grid." *Id.* at 6.

Similarly, MCAQD explained why battery storage cannot be "paired" with turbines to simply replace low load operation of the turbines. MCAQD noted that battery storage can provide limited generation only until it must be replenished, which would frustrate the Project's ability to serve its fundamental purpose of providing reliable backup generation in response to load fluctuations resulting from intermittent solar energy. *Id.* at 6, 8. MCAQD stated that "APS, in order to assure reliability, must build a system that can meet not only a short peak demand, but also several short peak demands in a row, an extended peak demand, or even several extended peak demands." *Id.* at 8. But "[i]f the utility is reliant upon stored energy for *some or all* of its peaking power"—which the Project would be if it were forced to utilize stored battery power to replace low load operation of the turbines—"at some point the stored energy may run out before it can be recharged, making the solution unreliable for meeting the full demand." *Id.* (emphasis added). This is particularly true if the Ocotillo Project is needed to respond to multiple peak demands in a row, since the facility could expend its battery capacity during the first peak demand period and not have enough left to cover a second peak demand period. Therefore, MCAQD responded, "energy storage is not compatible with the purpose and design of a true peaking facility such as the Project to provide rapid, reliable power." *Id.*

Importantly, the Response to Comments also explains why "pairing" battery storage with the turbines to replace low load operations would not eliminate the need to idle the turbines at 25 percent, as Sierra Club claims in this Petition. As MCAQD explained, APS requires the ability to "provide 25 MW to 500 MW of electrical energy as needed on an *immediate basis*, and potentially *for an extended period of time*." *Id.* at 9 (emphases added) (footnote omitted). In order to quickly respond to load fluctuations, a ramp rate of 50 MW per minute per turbine (providing 375 MW of capacity in less than 2 minutes) "is critical for the project to meet its purpose." *Id.* at 12. That ramp rate is only possible where "all 5 proposed [turbines] are operating at 25% load" when they are called up: if the turbines were forced to begin ramping up from a cold start, it would take "10 minutes or more" to reach the required load, which MCAQD concluded "is not adequate to meet the grid stability requirements." *Id.* The paired battery-turbine configuration Sierra Club describes in its Petition would eliminate low-load idling without offering any other way to reduce this inadequate 10-minute startup time. Also, as MCAQD recognized, battery storage would not be capable of standing in for turbine generation during this startup period: the "largest grid-connected battery storage systems" are only 32 MW and 36 MW, which would be simply inadequate to satisfy the "375 MW of capacity . . . in less than 2 minutes" the Project requires. *Id.* at 8, 12. And MCAQD noted those facilities can only store 8.0 and 9.0 MWh of energy, respectively, meaning they can only supply electricity for 15 minutes at their rated capacities before they must be recharged. *See id.* at 8.

The fact that many of these statements are equally responsive to both the issue of wholesale replacement with battery storage and pairing the Project's turbines with battery storage does not mean that MCAQD failed to consider the entire issue. It simply means that both

of Sierra Club's proposed alternatives suffer from the same defects that would frustrate the Project's basic purpose and design.

Even if these responses were not as detailed as Sierra Club argues they should be, MCAQD has satisfied its obligations to respond to the comments under the CAA. *See Prairie State*, 13 E.A.D. at 30 ("the permitting regulations do not require the permit issuer's response to public comments to be of the same length or level of detail as the comment"). Sierra Club could easily "deduce the likely basis" for MCAQD's decision to eliminate battery storage from the BACT analysis, and the Board is "able to discern that [MCAQD] applied its considered judgment" and considered Sierra Club's comments in developing the GHG BACT limit for the Project. *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 191 (EAB 2000); *see also Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 497 (2004) ("Even when an agency explains its decision with less than ideal clarity, a reviewing court will not upset the decision on that account if the agency's path may reasonably be discerned.") (internal quotation marks omitted). The record demonstrates that MCAQD considered all of the relevant issues and its final decision on the Permit was rational.

B. A More Detailed Response Was Not Required Because Sierra Club Failed to Clearly Present Its Comments Regarding Pairing the Project With Battery Storage.

Sierra Club claims that it "repeatedly and clearly" raised the issue of "pairing or integrating energy storage *with* the gas turbines in order to mitigate excess GHG emissions that occur during operation at low loads" in its comments on the Initial Draft Permit.[10] Pet. 12, 29 (emphasis in original). A fair reading of Sierra Club's comments belies this claim. In fact, the

[10] As noted in Section I, *supra*, Sierra Club did not comment at all on the Revised Draft Permit, which clearly outlined MCAQD's interpretation of Sierra Club's comments on the Initial Draft Permit. Sierra Club's failure to comment on the Revised Draft Permit precludes it from raising this issue on appeal. 40 C.F.R. § 124.19(a)(4)(ii).

comments were vague, unclear, and lacking in detail on the issue. Sierra Club never presented any viable approach to integrating battery storage into the Project that would eliminate the need to idle the turbines at low load in order to facilitate quick-ramping capability. In the few places where Sierra Club mentioned using energy storage to eliminate low load operations in its comments on the Initial Draft Permit, Sierra Club mischaracterized the purpose of low load operation as a desire to meet a demand of 25 MW rather than to allow the turbines to rapidly respond to load swings. As a result, those comments are devoid of any technical detail as to how "pairing" battery storage with the turbines might serve the Project's required ramp rate and eliminate the need for low load idling. MCAQD was not required to develop a more fulsome and detailed analysis of Sierra Club's alternative Project configuration, which was only fleshed out for the first time in its Petition before the Board.

As an initial matter, prior decisions of the Board have held that the level of detail required in a permit issuer's response to comments is commensurate with the detail in which a particular comment was presented. The Board has previously found that "in the PSD context the extent of the permitting authority's consideration and analysis of alternatives need be no broader than the analysis supplied in public comments." *Prairie State*, 13 E.A.D. at 30 (internal quotation marks omitted); *see also La Paloma*, slip op. at 33 ("[T]he scope of a permitting authority's duty to respond to comments suggesting the addition of solar technology is limited to the extent to which the comment is raised."). Moreover, MCAQD was not required to "conduct an independent analysis of available alternatives" to respond to the comments, as Sierra Club seems to assert. *Prairie State*, 13 E.A.D. at 30 (citation omitted); *see also Palmdale*, 15 E.A.D. at 734 ("Under established Board case law, it is questionable whether the [permit issuer] had any obligation to conduct a substantive analysis in response to these questions.") (citing *In re*

Westborough, 10 E.A.D. 297, 298 (EAB 2002)). Indeed, the permit issuer's response to a comment does not need "'to be of the same length or level of detail as the comment.'" *Prairie State*, 13 E.A.D. at 30 (quoting *In re NE Hub Partners*, 7 E.A.D. 561, 583 (EAB 1998). It is sufficient that MCAQD's responses "demonstrate that all significant comments were considered." *Id.*

The comments clearly were considered in this case, as demonstrated by MCAQD's request that APS provide a response to Sierra Club's comments and an updated permit application, and by its subsequent issuance of the Revised Draft Permit and TSD analyzing battery storage and proposing a lower GHG BACT limit, all to address Sierra Club's comments on the Initial Draft Permit.[11]

The focus and level of detail in MCAQD's Response to Comments was commensurate with that of Sierra Club's comments on the Initial Draft Permit. Sierra Club's comments on energy storage focused almost entirely on reducing the Project's GHG emissions by *replacing* some or all of the proposed gas turbines with batteries or some other form of energy storage. *See* Sierra Club Comments at 4, Pet. Ex. 4 (project need "could be achieved using energy storage to replace some or all of the proposed LMS100 turbines"), 6 (purpose "could be served either by replacing all of the LMS100 units with energy storage, or by pairing energy storage units with fewer LMS100 units"), 8 (energy storage alone "can meet most, if not all, of the peaking

[11] Moreover, what MCAQD did in the final Permit is exactly what Sierra Club commented MCAQD should do—revise the GHG BACT limit to reflect a reduced duration of operation at low loads, to the extent possible within the Project's purpose and design. *See* Sierra Club Comments at 6, Pet. Ex. 4. MCAQD simply did not rely on battery storage to do so.

capacity needs"), 14 ("Replacing any or all of the proposed five LMS100 gas turbines with storage will reduce GHG and other criteria pollutant emissions from the entire plant.").[12]

Even where Sierra Club commented on "pairing" battery storage with gas turbines to reduce low load operations, its language suggests that the alternative configuration being discussed would still involve the replacement of at least some of the Project's turbines. For example, Sierra Club stated that the Project's need could be served "by *pairing* energy storage units *with fewer LMS100 units*." Sierra Club Comments at 6, Pet. Ex. 4 (emphasis added). Later in the comments, when describing how use of battery storage could purportedly reduce low load operations, Sierra Club stated that "energy storage *coupled with fewer LMS100 turbines* could eliminate or reduce the need for low load operation and ramping requirements, thereby improving the efficiency of the LMS100 units by avoiding low load operation." *Id.* at 37 (emphasis added).

Sierra Club suggested in a brief section of its comments that integrating energy storage may be used to eliminate low load operation of the turbines, but that discussion is incorrect on its face and appears to misunderstand the actual *purpose* of idling the turbines at 25 percent load. In a high-level conceptual description, Sierra Club stated:

> Interfacing energy storage with gas turbines would eliminate the need to operate the LMS100 turbines at low loads. This configuration would improve overall Project heat rate and efficiency, thus reducing GHG and other criteria pollutant emissions. Energy storage technology is capable of starting nearly instantaneously and changing loads quickly without the need to idle. These capabilities would eliminate the need for the LMS100 units to idle or operate at 25% load when they are not called upon for more efficient capacities.

[12] On that issue, MCAQD found that replacing some or all of the turbines with battery storage would redefine the source. RS at 8-9, Pet. Ex. 2. Sierra Club has not challenged that finding.

Id. at 6 (internal footnote omitted). This statement is plainly wrong because Sierra Club's suggestion could not possibly eliminate the need for low load idling: as MCAQD recognized in its Response to Comments, the purpose of idling the turbines is to allow them to reach full load in less than 2 minutes, rather than the minimum 10 minutes they would require if starting from inoperative status. RS at 12, Pet. Ex. 2. Sierra Club did not claim in its comments (and does not claim now) that incorporating some battery storage would reduce the time the turbines require to reach full load from a cold start, or that it could provide the 375 MW of ramping capacity the Project requires until the turbines reach full load. Therefore, "pairing" battery storage with the turbines would not eliminate the need for idling at low load.

That error suggests that Sierra Club simply misunderstood the purpose of idling the turbines at 25 percent load, and that the true meaning of Sierra Club's vague comment was that integrating battery storage could reduce the need to operate the turbines at low load *to meet low levels of demand.* That reading of Sierra Club's comment is bolstered by the other solutions Sierra Club offered to eliminate low load operations, such as using smaller 25 MW turbines at full load to meet demand rather than operating the proposed 100 MW turbines at 25 percent load. *See* Sierra Club Comments at 15, Pet. Ex. 4. But as MCAQD has explained in response, neither of these approaches actually eliminates the need for low load idling because it does not serve the Project's basic purpose of providing 375 MW of ramping capacity in less than 2 minutes. RS at 12, Pet. Ex. 2.

To the extent Sierra Club's comments can even be read to suggest that battery storage can meet the Project's need for quick-ramping capability, as the Petition now suggests, MCAQD's response was commensurate with the level of detail in those comments. Sierra Club's high-level discussion does not provide sufficient detail to allow for a permitting agency to conduct a

meaningful analysis and develop a comprehensive response (assuming such a response is even required, which it is not). The CAA does not require the permit issuer to "analyze a myriad of potential [alternative] configurations for the proposed plant" contained within a commenter's vague musings. *Palmdale*, 15 E.A.D. at 735. As the Board has explained,

> [e]ngaging in such an exercise would impose a heavy burden on the [permit issuer] that goes well beyond the permitting authority's obligations to consider and respond to public comments and to satisfy statutory and regulatory obligations in setting a BACT emissions limit . . . . The permit process cannot work efficiently or as designed by Congress if the permit issuer is obliged to anticipate and analyze multiple permutations or variations of conceivable options that an overbroad and vague question can invoke.

Id. Requiring otherwise would turn the PSD permitting process into the "Sisyphean labor" that the Seventh Circuit warned against. *Sierra Club*, 499 F.3d at 655.

That is exactly the situation presented here. Sierra Club's generalized comments regarding how energy storage (including battery storage) integration might work to eliminate the need to operate the Project's turbines at low loads, in combination with the numerous references to replacing those turbines in whole or in part, would leave MCAQD with the impossible task of considering every conceivable permutation if it were required to respond to the comments as Sierra Club claims.[13] Regarding battery storage alone, MCAQD would have had to consider use of no batteries, complete replacement of all five turbines with batteries, and every permutation in between, including various sizes of batteries.

In particular, this analysis would have been exceedingly difficult because Sierra Club's comments lacked any technical detail regarding how a "paired" turbine and battery storage

[13] In addition to battery storage, Sierra Club identified four other types of energy storage: compressed air energy storage, liquid air energy storage, pumped hydro, and flywheels. Sierra Club Comments at 5, Pet. Ex. 4. Rather than focusing on these individual technologies, Sierra Club discussed "energy storage" in general to support various claims about how storage might be incorporated into the Project. *See id.* at 5-15. Thus, it was not clear from the comments that any one type would be capable of augmenting or replacing the Project's turbines.

system could be configured and operated to eliminate low load idling while also providing the quick-ramping capacity the Project required, making it impossible for MCAQD to respond in any more detailed way. Sierra Club's comments failed to provide key information as to how its proposed alternative to the proposed Project would work, such as: (i) what size batteries are available for use; (ii) how long those batteries could provide electricity before discharging all of their stored energy; (iii) how quickly they can be recharged; (iv) what size batteries would be appropriate to meet the proposed Project's basic purpose while still reducing emissions; (v) at what point during a turbine's ramp-up period the responsibility for meeting load should be handed over from the battery to the turbine; and (vi) other essential questions. While Sierra Club's counsel has now suggested partial answers to some of these questions in its Petition for the first time, MCAQD never had the opportunity to analyze those details in the administrative setting. Sierra Club's comments contained, at most, one paragraph vaguely asserting that a paired system would eliminate low load turbine operations, without any detail of how that might work. In contrast, the Petition contains a two-page description of a speculative design and operational configuration that, notably, does not cite *any* record support. *See* Pet. at 13-14 & nn.9, 10.

Because Sierra Club's comments on "pairing" battery storage with the Project's turbines were, at best, vague and overbroad, MCAQD had no obligation to provide a more detailed response.

C. In Any Event, Remand Would Be Unnecessary Because the Record Supports MCAQD's Action.

Even if MCAQD's response to Sierra Club's comments on battery storage were somehow found to be less than fulsome, remand of the Permit would be inappropriate because the administrative record already contains more than sufficient evidence to support MCAQD's

conclusion. As the Board has recognized, remanding a PSD permit is "not necessary" where the record already demonstrates that further proceedings "would not lead to a different result." *La Paloma*, slip op. at 30. Even where a permitting agency's justification for its actions is "less than optimal," *Prairie State*, 13 E.A.D. at 45, the Board has consistently held that in order to justify a permit remand, "there must be a compelling reason to believe that the omissions by the permitting authority led to an erroneous permit determination—in other words, that omissions materially affected the quality of the permit determination." *La Paloma*, slip op. at 30 (quoting *In re Mecklenburg Cogeneration L.P.*, 3 E.A.D. 492, 494 n.3 (Adm'r 1990)); *see also In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 191 (EAB 2000) ("[W]e have not been presented with a compelling reason to believe that [the permit issuer's] failure to explain its total PM limit calculus led to a clearly erroneous permit decision."). Here, the administrative record contains ample case-specific evidence as to why incorporating battery storage into the Project would redefine the source.

In *La Paloma*, the Board assessed whether EPA Region 6 had properly found that incorporating solar energy generation into a gas-fired combustion turbine project would redefine the source. *La Paloma*, slip op. at 23. The Board concluded that Region 6 had failed to take the necessary "hard look" at whether incorporating solar generation would redefine the source based on a "case-specific" justification. *Id.* at 29. Yet the Board held that "[n]evertheless, despite the deficiencies in the Region's explanation, under the facts and circumstances of this case, a remand is not necessary and would not lead to a different result." *Id.* at 30. The Board examined materials that were already in the administrative record and concluded "there is sufficient evidence to support the Region's conclusion that the supplemental solar option would constitute redesign of the source under the specific circumstances of this case given the business purpose,

space limitations, and the specific design requirements of the facility." *Id.* In particular, the Board noted that the proposed project's site did not have sufficient space for solar generating equipment, that nothing in the record suggested that the project owner could expand the size of its site, and that moving the proposed facility to a different location would be inconsistent with its basic business purpose. *Id.* at 30-32. For those reasons, remanding the permit for further proceedings was unnecessary.

Here, remanding the Permit to MCAQD would likewise be an unnecessary exercise that would only waste MCAQD's resources while further delaying the Ocotillo Project. MCAQD *did* take a "hard look" at whether incorporating battery storage into the Project would redefine the sources. And, even more so than in *La Paloma*, the administrative record is replete with case-specific evidence demonstrating that incorporating battery storage into the Project would redefine the source and should not be included in the BACT analysis.

As discussed above, *see supra* Section II.B-C, "pairing" the Project's turbines with battery storage would frustrate the Project's "business purpose," *see La Paloma*, slip op. at 30. The Ocotillo Project's basic purpose is to provide peak load capacity with "quick ramping capability to backup renewable power and other distributed energy sources," including the specific ability to "provide approximately 375 MW of ramping capacity . . . in less than 2 minutes." Revised App. at 12, Pet. Ex. 5. The Project addresses APS's business need to generate electricity in response to observed rapid load changes within the APS system of 25 to 300 MW due to fluctuations in solar energy generation, as well as expected future growth in intermittent renewables. *Id.* Sierra Club's proposed battery storage approach would frustrate APS's business purpose for the Project by converting it from an energy generation facility to an energy storage and distribution facility that relies on generation from third parties.

Sierra Club's proposed approach would require APS to alter "the specific design requirements of the facility," *La Paloma*, slip op. at 30, which are themselves crucial to achieving the Project's business purpose. The record establishes that the Project's turbines can only achieve the required ramp rate of 375 MW in two minutes if they begin ramping from 25 percent load, and that if the turbines are forced to start up from inoperative status, they can take at least five times as long to reach full load. Revised App. at 12 & App'x B p. 68, Pet. Ex. 5; Revised Draft Permit TSD at 7, Pet. Ex. 6. But Sierra Club's approach would transform the Ocotillo Project from a facility that can meet this need to a facility that can only supply electricity up to its maximum battery capacity (which Sierra Club suggests could be anything from 25 to 125 MW) until the turbines come online 10 to 30 minutes later. Nothing in the record suggests that the Project could be designed to provide the necessary ramping capacity from batteries alone until the turbines are able to come online: in fact, the largest battery installation cited in Sierra Club's comments is 100 MW. Sierra Club Comments at 5, Pet. Ex. 4.

In any event, evidence in the record indicates that the "paired" battery storage approach Sierra Club describes would not even reduce the Ocotillo Project's GHG emissions, suggesting that battery storage is not a "control technology" for GHG emissions that would need to be considered at BACT Step 1. For example, the record states that the Project's purpose is to address observed rapid load fluctuations within the APS system of 25-300 MW. Revised App. at 12, Pet. Ex. 5. Therefore, while the need for capacity from the Ocotillo facility may be as high as 300 MW at some times, it may also be as low as 25 MW—which the facility could only meet by operating one of its 100 MW turbines at 25 percent load. Sierra Club has not presented evidence that a battery storage unit could satisfy a peak demand need for 25 MW over a prolonged period. Therefore, even with a paired battery-turbine configuration, the Ocotillo

Project would still need a GHG BACT emission limit that can accommodate operations at 25 percent load, meaning that the BACT limit may not change from its current level. *Id.*

Further, prohibiting the turbines from idling at 25 percent load would require the turbines to start up and shut down more frequently, thereby increasing the time during which the turbines are operating even *less* efficiently than they would at 25 percent. *See id.* App'x B at 63 Fig. B7-1, Pet. Ex. 5 (showing turbine GHG emission rate increases rapidly at loads below 25%). MCAQD's Revised Draft Permit TSD demonstrates that increasing the number of startup and shutdown events at the Ocotillo Project from the current estimate of two per day per turbine to four per day per turbine would increase annual CO_2 emissions by approximately 8 percent owing to more frequent operations at inefficient loads. *See* Revised Draft Permit TSD at 15 Tbl. 10 (estimating 730 startup/shutdown events per year per turbine), 16 Tbl. 11 (listing potential GHG emissions for estimated startup/shutdown events), Pet. Ex. 6. More frequent startup and shutdown operation would also increase CO emissions by 50 percent and VOC and NOx emissions by roughly 40 percent. *See id.* at 16 Tbl. 11 (listing potential emissions of those pollutants during estimated startup/shutdown events).

Finally, in addition to rejecting battery storage integration at Step 1 because it would redefine the proposed source, MCAQD also determined that the use of battery storage is not technically feasible at the scale and duration necessary for this Project and would therefore be eliminated at Step 2 of the BACT analysis. *Id.* at 69; RS at 9, Pet. Ex. 2. Sierra Club does not dispute, or even mention, this determination. Accordingly, including battery storage at Step 1 of the BACT analysis would be a futile exercise.

Therefore, even if MCAQD's response to Sierra Club's comments were found to be not as detailed as it could have been, the Board should not remand the Permit to allow for further

consideration of battery storage. As the Board found in *La Paloma*, case-specific evidence in the record demonstrates that remand would be unnecessary because further proceedings would not lead to a different result.

CONCLUSION

For the foregoing reasons, the Board should deny Sierra Club's petition for review of the Ocotillo Project's PSD permit.

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STATEMENT OF COMPLIANCE

I hereby certify that the foregoing RESPONSE OF PERMITTEE ARIZONA PUBLIC SERVICE COMPANY TO PETITION FOR REVIEW OF PREVENTION OF SIGNIFICANT DETERIORATION PERMIT FOR THE OCOTILLO POWER PLANT complies with the requirements of 40 C.F.R. § 124.19(d). The word count is 13,980 using the word count function in Microsoft Word.

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing RESPONSE OF PERMITTEE ARIZONA PUBLIC SERVICE COMPANY TO PETITION FOR REVIEW OF PREVENTION OF SIGNIFICANT DETERIORATION PERMIT FOR THE OCOTILLO POWER PLANT were served through the Environmental Appeal Board's electronic filing system and by electronic mail to the following, this 12th day of May, 2016:

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