VIA email and FedEx

March 13, 2012

Tom Barnes
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RE: Comments on the Cadiz Valley Water Conservation, Recovery, and Storage Project Draft Environmental Impact Report State Clearinghouse #2011031002

Submitted on behalf of:
Center for Biological Diversity:
National Parks Conservation Association
California Wilderness Coalition
San Bernardino Valley Audubon Society
Sierra Club Desert Committee
Mojave Desert Land Trust
Sierra Club
Morongo Basin Conservation Association
Defenders of Wildlife
Desert Tortoise Council
Sierra Club Desert Committee, San Gorgonio Chapter, and National Organization
Southern California Watershed Alliance
Desal Response Group
Desert Survivors

Dear Mr. Barnes:

On behalf of the Center for Biological Diversity ("CBD"), the National Parks Conservation Association ("NPCA"), the California Wilderness Coalition (CWC), San Bernardino Valley Audubon Society, Sierra Club Desert Committee, the Mojave Desert Land Trust, the Morongo Basin Conservation Association, Defenders of Wildlife, the Desert Tortoise Council, the San Gorgonio Chapter of the Sierra Club, Southern California Watershed Alliance, Desal Response Group and Desert Survivors, we appreciate and welcome the opportunity to comment on the Cadiz Valley Water Conservation, Recovery, and Storage Project ("Cadiz Water Project," "Proposed Project" or "Project") Draft Environmental Impact Report ("DEIR").

For the reasons set forth below, commenters request that a new DEIR be prepared for the Proposed Project under the lead agency of San Bernardino County. Also, the right-of-way ("ROW") for the Proposed Project requires Bureau of Land Management ("BLM") approval, and the Proposed Project, therefore, requires full review under the National Environmental Policy Act ("NEPA"), 42 U.S.C. section 4321 *et seq.* We urge the appropriate state agencies to coordinate with the appropriate federal agencies to prepare a joint EIR/DEIS for the Proposed Project that complies with both state and federal law.

NPCA is a non-profit organization whose mission is to protect and enhance America's national parks for present and future generations. NPCA has 450,000 members nationwide and over 45,000 California members, and works with elected officials, the media, and communities to foster stewardship of our national treasures. NPCA has three offices in the Mojave Desert: Joshua Tree, Barstow, and Las Vegas.

The Center for Biological Diversity ("CBD") is a national, nonprofit conservation organization with more than 320,000 members and online activists dedicated to protecting endangered species and wild places. Due to the proposed project's significant impacts to deserts and to the development of suburban sprawl, CBD has followed the proposed project closely in its various iterations through the years, and has utilized its staff biologist to review the relevant impacts on plants and wildlife.

The California Wilderness Coalition ("CWC") protects the natural landscapes that make California unique, providing clean air and water, a home to wildlife, and a place for recreation and spiritual renewal. With 3,000 members, CWC is the only organization dedicated to protecting and restoring California's wild places and native biodiversity on a statewide level. Since 1976, we have empowered local communities and conservationists to be the voice for wild California.

The San Bernardino Valley Audubon Society (SBVAS) is a chapter of the National Audubon Society, which has about half a million members nationwide. The chapter itself has approximately 1800 members who reside in the inland empire. Audubon members regularly visit the Mojave desert for birdwatching, photography, and the appreciation of nature.

The Sierra Club is a national nonprofit organization of approximately 1.3 million members and supporters dedicated to exploring, enjoying, and protecting the wild places of the

earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club's Desert Committee includes members that focus on conservation of deserts of the southwest, including California. The San Gorgonio chapter focuses on conservation issues throughout San Bernardino County, California.

Mojave Desert Land Trust conserves land with important biological, cultural and scenic values. Our work helps to secure the biodiversity, beauty, and integrity of healthy desert ecosystems for future generations to enjoy. We have 1,300 land trust members, and as a major landowner in the California desert, we have acquired more than 37,000 acres of important desert habitat through acquisition, restoration, land stewardship and strategic partnerships with state and federal agencies.

The Morongo Basin Conservation Association (MBCA) advocates for a healthy desert environment that nurtures our rural character, cultural wealth, and economic well-being. We have over 400 members and supporters.

Defenders of Wildlife ("Defenders") is a national environmental organization with 1.1 million members and supporters in the U.S., including 109,000 in California. Defenders is dedicated to protecting all wild animals and plants in their natural communities. To this end, Defenders employs science, public education and participation, media, legislative advocacy, litigation and proactive on-the-ground solutions in order to prevent the extinction of species, associated loss of biological diversity, and habitat alteration and destruction.

The Desert Tortoise Council is a private, non-profit organization comprised of hundreds of professionals and laypersons who share a common concern for wild desert tortoises and a commitment to advancing the public's understanding of this species. Established in 1976 to promote conservation of tortoises in the deserts of the southwestern United States and Mexico, the Council regularly provides information to individuals, organizations and regulatory agencies on matters potentially affecting the desert tortoise within its historical range.

The Southern California Watershed Alliance works on steelhead restoration, dam removal, and jobs through water conservation programs with community based-organizations throughout the Southern CA Bight, from Point Conception to southern point south of Ensenada, Baja CA, Mexico.

The Desal Response Group works on the environmental response to ocean water desalination proposals in CA and northern Baja California by promoting the alternative portfolio of water reclamation, onsite water reuse, serious water demand programs, stormwater and urban runoff capture and treatment, rainwater catchment, and greywater.

Desert Survivors is a non-profit organization with the mission of experiencing, sharing and protecting desert wilderness. Recognizing that the places they love to explore will not remain wild unless they give others the opportunity to experience them, Desert Survivors is committed to actively monitoring and preserving desert wilderness. In addition to its advocacy

work, Desert Survivors leads free backpacking trips and car camps for people of all levels of skill and fitness, as well as offering courses in beginning backpacking. Desert Survivors has 700+ members, primarily in California and Nevada

Dr. James Andre is an individual with 19 years experience in desert ecology in his position as Director of the UC Granite Mountains Desert Research Center.

I. EXECUTIVE SUMMARY

The DEIR for the Proposed Project falls woefully short of meeting the core requirements of CEQA. We also have serious concerns about the Proposed Project's potential to degrade federally protected National Park Service ("NPS") and BLM lands, and the region's fragile desert ecosystem. Unfortunately, these concerns remain largely invisible in the DEIR.

The DEIR fails to comply with CEQA in many important respects, including:

Improper Lead Agency

Santa Margarita Water District ("SMWD") is not the proper Lead Agency for the Proposed Project under CEQA. SMWD neither designed nor plans to build the Proposed Project, and the location of the dry lakes forming the heart of the Proposed Project—and thus many of its major environmental impacts—are in eastern San Bernardino county, well outside of SMWD's boundaries in Orange County. In fact, the precise scope of SMWD's ownership and operational roles are entirely unclear (see our comments on Chapter 1 below). Nor does SMWD provide any project "approval" beyond that of the other project participants (other than approval of the EIR itself). Moreover, SMWD does not have the requisite regional perspective and broad expertise to weigh the interests of the Proposed Project proponents, including SMWD itself, against the interests of the diverse stakeholders potentially adversely affected by the Project, particularly San Bernardino County, where most of the direct impacts are located. That SMWD will also be a beneficiary of Project water further undermines its status as an objective judge of the DEIR's adequacy.

Since the vast majority of direct impacts will be experienced in San Bernardino county, and since San Bernardino county is responsible for either issuing a groundwater permit or approving an exemption, the County is the proper lead agency under CEQA. The missing memoranda of understanding and suspect payments between SMWD, Cadiz and San Bernardino county create the frightening prospect of approving up to two million acre-feet of groundwater extraction from the County without so much as a hearing in that County-- a woeful abdication of authority. As it stands, citizens of San Bernardino county are most likely unaware that they are on the verge of issuing an exemption to a permit for withdrawing up to 2 million acre-feet—a fatal oversight on the County's part. The County's secondary approval as a "responsible agency" of a groundwater management plan that will effectively exempt this project from permitting is likewise unacceptable. Even then, the County is not even listed currently as a responsible agency—it is a mystery how the County could "approve" the GMMMP as a non-participant in the project. Nor is any mention made in the DEIR of the fact that the County is being *paid* by the Santa Margarita Water District to carry out its CEQA duties, which remain

largely invisible in the present EIR. What, exactly, are these duties, and why is the County being paid for them? The County must be held accountable for the loss of so much water in its jurisdiction and the associated impacts; having the County act in its proper role as CEQA lead agency for this project is a first, critical step.

Omission of Responsible Agencies

The Metropolitan Water District of Southern California and the Regional Water Quality Control Board are agencies with discretionary permitting authority over this project, and both should have been considered responsible agencies in this EIR. Overall, the EIR appears to have randomly chosen three small water districts as the lead and responsible agencies; the inclusion and exclusion from this EIR of agencies appears to be arbitrary at best.

Misleading Project Objective and Description

The DEIR's flawed project objective and description deprive the public and decision makers of the informed participation and decision making required by CEQA. The project has been divided into two components, but only one component, the groundwater export component, is adequately analyzed in the DEIR. Leaving the recharge/storage component at a less thorough "project level" of analysis than the export component violates CEQA's requirement to accurately describe the proposed project, to adequately evaluate all reasonably foreseeable impacts, and to include the entire scope of the project in the review. The Proposed Project's fundamental premise—that mining water at rates three to ten times the estimated aquifer recharge rate is sustainable, and in fact amounts to water "conservation"—is upside down, misleading, and wholly unsupported by data and analysis included in the DEIR. By its own design, the Proposed Project will pump an average of 50,000 acre-feet per year ("AFY") (approximately 16.25 billion gallons per year) for 50 years. Even describing the project as exporting an average of 50,000 AFY appears to be arbitrary, as there is no firm limit, by statute, regulation, or binding agreement, on what the project could export. The result would leave the aquifer with a deficit of between 1.1 and 2.1 million acre-feet of water. Labeling this massive withdrawal and export of groundwater as "conservation" is without basis in law or policy and stretches the limits of credulity.

Beyond the errors of omission and inconsistency explained below, the DEIR misrepresents the true nature of the Proposed Project. The actual project goal—aggressively mining water from a desert aquifer—is hidden behind green buzzwords like sustainability, conservation, and beneficial use. The Proposed Project exchanges a constitutionally-protected public good for private gain. Until the project objective matches the true project purpose, the DEIR will remain fundamentally flawed under CEQA.

Misapplied Concepts of "Conservation" and "Beneficial Use"

The DEIR claims that this project furthers the California Constitution's emphasis on water conservation and beneficial use. However, mining an aquifer and leaving it with significantly less water than when the Proposed Project would start, and causing major environmental impacts in the process, is not a reasonable understanding of "conservation."

Likewise, the DEIR's claim that exported water will be "beneficially used" appears to be based on the theory that consumptive use is the highest and greatest purpose of any water supply; this claim reflects an utterly incorrect understanding of the "beneficial use" concept and is grounded in neither law nor common sense.

Inadequate Alternatives Analysis

Similarly, the Proposed Project's objectives are so narrowly framed that a meaningful alternatives analysis is impossible because "conservation" as a project objective is only achieved through water exports. The DEIR fails to adequately discuss alternatives that would meet the meaning of the "conservation" element of the Proposed Project's title without exporting tens of thousands of acre-feet of water, or the stated objective of providing "sustainable operations" without massive drawdown of the aquifer.

Failure to Describe Potential Impacts to Water Supply, Water Quality, Waters of the U.S., Wildlife, and Air Quality and "Piecemealing" of the Proposed Project

Finally, the Proposed Project's potential impacts, particularly with regards to hydrogeology, air qualify, and wildlife, are inadequately discussed in the DEIR. The water impacts are systematically underestimated. Hydrologically, the cone of depression would be a major impact created by 50 years of pumping during the Proposed Project's lifetime, and would continue to expand well after pumping stopped—possibly for decades. Due to the long-term cone of depression, major project impacts, including subsidence and airborne dust, could not be arrested once pumping stopped, making mitigation largely ineffective. Likewise, major impacts to water quality from the storage/recharge component of the Proposed Project are given only cursory treatment in the DEIR. The DEIR also provides insufficient discussion of the impacts to sensitive plants and wildlife, and fails to sufficiently account for a likely significant increase in dust pollution due to the drying-out of Cadiz and Bristol dry lakes.

The DEIR assumes that the project will have no effect on waters of the U.S., but this is not true. The revised jurisdictional delineation of Cadiz and Bristol dry lakes erroneously changed the jurisdictional status of these dry lakes and found them to be non-jurisdictional. That jurisdictional delineation is unsupportable and should not be relied on by the project proponent. In fact, these dry lakes and their tributaries are jurisdicational waters of the U.S. and the impacts of the project on these dry lakes and their tributaries is subject to Clean Water Act permit requirements and Army Corps of Engineers jurisdiction.

The DEIR also systematically avoids analysis of the impacts on water quality of importing turbid, highly impure Colorado River or State Water Project water, and intermingling it with pristine groundwater, even though this project component is highly likely and has been studied at length. The only way to estimate the impacts of this imported water on existing water quality is through testing of the three sources and providing a detailed side-by-side comparison to evaluate the potential for groundwater degradation. This has not been done, which is a glaring and unacceptable flaw in the EIR. Degradation of groundwater is prohibited by the state antidegradation policy, State Resolution 68-16, which this project appears to violate. The omission of groundwater quality analysis is incorrectly excused by classifying the

import/recharge component as a "program-level impact"—a misguided and critically flawed interpretation of CEQA that has caused illegal "piecemealing" of project components and impacts in the DEIR. Even if the import/recharge component is only "reasonably foreseeable," it should have been thoroughly evaluated in the DEIR, but was not.

Failure to Describe Indirect, Cumulative and Growth-Inducing Impacts

This project proposes to mine 50,000 acre-feet of water per year and deliver most of it to suburban Los Angeles and Orange County. At the standard rate of .5 acre-feet per year for a household of four, that amount of water is enough for 400,000 people, or 100,000 additional households. Assuming a very high rate of 1,000 homes per development, that's enough water for at least 100 new subdivisions in LA and Orange Counties. However, the far-reaching impacts of providing 100 new subdivisions-worth of water are largely ignored in the DEIR. The impacts within the recipient water districts on new developments are indirect, cumulative and growth-inducing, and should have been properly analyzed in these different sections accordingly. A proper analysis would break down the impacts by project participant of the likely new projects that will use this water supply for each participant, and the subsequent environmental impacts of those new projects, including but not limited to the projected impacts to wildlife, noise, air pollution, and climate change caused by those reasonably anticipated developments. Along these lines, any project that has already identified the Cadiz water project as its proposed water supply must be identified in the EIR, along with anticipated impacts caused by such a project.

A second indirect effect is the impacts for the recharge pipes: a contract has been firmed for a natural gas line to transmit water, yet the impacts from this pipeline are also absent from the DEIR.

Non-Compliance with Groundwater Management Ordinance and Statute

In addition to the above CEQA violations, the Groundwater Management, Monitoring and Mitigation Plan does not comply with the San Bernardino County Desert Groundwater Management Ordinance § 33.06552, or the state groundwater management statute, California Water Code § 10753 et seq. The GMMMP does not comply with county and state law for reasons including but not limited: inadequate notice of its publication, inadequate public hearings, the inability of the GMMMP, as implemented, to adequately monitor groundwater and to adhere to the "safe yield" and "aquifer health" limitations; failure to sufficiently analyze and to provide sufficient monitoring and mitigation for the storage and recharge component of the project; failure to include a specific funding program for mitigation and monitoring; the plan's allowance for groundwater quality degradation; and providing insufficient information regarding the relationship between the expected storage/recharge component of the project and how this component contributes to the management of the groundwater basin. (Cal. Water Code §§ 10753, 10753.2, 10753.4, 10753.5, 10753.6, 10753.7; San Bernardino County Code §§ 33.06552, 33.06553). As such, the document fails to qualify as a legally adequate GMMMP under law.

II. PROPER LEAD AGENCY

A. Santa Margarita Water District Is Illegally Acting As Lead Agency for the Proposed Project

The DEIR is fundamentally flawed because it was prepared under the supervision of the improper Lead Agency under CEQA and California Law. As such, any approval of this EIR is unlawful. As the county with the greatest direct impacts from this project, and as the only agency with primary permitting authority over the groundwater extraction, San Bernardino County is the proper lead agency for this project. San Bernardino County may not approve the DEIR's groundwater management plan, and thereby exempt the project from its primary permitting authority, by approving the plan as a responsible agency for this project—that responsibility necessarily lies with the lead agency. Santa Margarita Water District is nothing more than a project participant and, at best, a responsible agency: the agency lies far from the primary impact zone and has no primary permitting authority, and it will not implement, manage or carry out a significant portion of the project.

Further, both the Santa Ana Regional Water Quality Control Board, who supervises and must certify water quality, and the Metropolitan Water District of Southern California, who played and continues to play a central role in the project, are improperly excluded as a responsible agencies under CEQA.

B. San Bernardino County is the Proper Lead Agency for the Project

Role of Lead Agency

The lead agency is defined at Public Resources Code § 21067 as "the public agency with the principal responsibility for carrying out or approving a project which may have a significant effect on the environment." The CEQA Guidelines provide detailed criteria for choice of lead agency: for a private project such as Cadiz, lead agency is the one with the greatest responsibility for supervising or approving the project as a whole. (14 Cal. Code Regs. § 15051(b); *Eller Media Co. v. Community Redev. Agency* (2003) 108 Cal. App. 4th 25, 38). Further, where a project proponent is a private company or other non-governmental entity, the "lead agency will normally be the agency with general governmental powers, such as a city or county, rather than an agency with a single or limited purpose such as an air pollution district . . . ." CEQA Guidelines § 15051(b)(1).

Both of these legal requirements mean San Bernardino County must act as lead agency for this project.

Role of San Bernardino County

The project proponent is being sponsored by a private enterprise, the Cadiz Corporation. Pursuant to CEQA Guideline § 15051, the lead agency should therefore be a general agency with broad scope and powers, such as a city or county, and not a specialized district. Under § 15051, San Bernardino County is the clearest choice for lead agency, because of the participating agencies, San Bernardino County is best characterized as the agency with broad scope and

powers to approve this project, which will impose wide-ranging impacts on the dry lakes of eastern San Bernardino County, the Mojave National Preserve ("Preserve"), and nearby wilderness areas.

Under the same CEQA guideline provision, San Bernardino County is the proper lead agency because it has the principal responsibility for approving the project. This is because of all the agencies with permitting authority over this project, only San Bernardino County has primary permitting authority, that is, the discretion to approve or disapprove the export of the groundwater, through its Desert Groundwater Management Ordinance, San Bernardino County Code § 33.06551 et seq. The Ordinance's authority implements, supplements and augments the groundwater management authority provided to the county under the Groundwater Management Act, Cal. Water Code § 10750 et seq. Between these two laws, only San Bernardino County has the ability to prohibit the drilling and operation of this project, making it the agency with the primary responsibility for approving the project.

Under the County's Desert Groundwater Management Ordinance, the pumping of groundwater in the project area requires a county-issued permit. (§ 33.06554 and DEIR 4.8-45) Despite the promised extraction of up to 2 million acre-feet of groundwater, the County appears to be intent on exempting the project from its permitting authority, by entering into a Memorandum of Understanding with the project proponent and approving a groundwater management, monitoring and mitigation plan (DEIR 4.8-45; Appendix B-1, Groundwater Management, Monitoring, and Mitigation Plan ("GMMMP") at p.15, § 1.4.3.) .) It is unclear whether the County has entered into an MOU at this time, but if it has not, then the project must apply for a groundwater management permit. If there has been an MOU, then its absence and lack of description robs the public of a key piece of decision-making information. In order to provide the public with sufficient decision-making background, all MOU's between the participating agencies related to the Cadiz project should be included in the administrative record.

Despite its having primary permitting authority, San Bernardino County is not even listed in most of the DEIR as a responsible agency,. Not having the County even as a responsible agency is an obvious, fundamental flaw of the EIR. The only indication that the County is a responsible agency is on Page 15 of the GMMMP, which indicates that the County's approval of the GMMMP is discretionary and subject to CEQA approval "with the County acting as a responsible agency." (GMMP § 1.4.3) Yet even if the County ultimately participates as a responsible agency, such relatively minor participation constitutes a legally flawed role; with primary permitting authority, including the primary authority to *exempt* the project, the County must act as lead agency for this project. The County cannot abdicate its role as primary permitting authority by acting, at best, as a responsible agency for the project.

Missing MOU and Cost-Sharing Agreement

It appears from the language of the DEIR and GMMMP that at least one MOU has already been entered into, although there are conflicting reports for what purpose. This view is supported by a SMWD memorandum referencing the MOU in October, 2011. The existence of at least one MOU suggests that San Bernardino County is going to be paid $135,000 for reviewing technical data, even though it is not listed as a responsible or lead agency for the

project., However, it is unclear what conditions are to be studied by whom, and perhaps more critically, what export and import limitations, if any are included in the MOU. Until the MOU and cost sharing agreement approved by SMWD and San Bernardino County are included in the record, and thoroughly discussed in the EIR, the document lacks crucial information allowing the public to make an informed decision and is legally flawed under CEQA.

Further, San Bernardino County has construction permitting authority on the project. This permitting authority is omitted from the list of permit approvals required in DEIR Section 3.8, p. 3-54. If the project is approved, even assuming the groundwater ordinance exemption, this authority would be another primary project approval after groundwater permitting or exemption. Under both groundwater management and permitting authorities, the County is clearly the proper lead agency with the requisite scope over project approvals under CEQA.

There are further policy reasons for choosing San Bernardino County as lead agency. The County, and its elected officials, should have the primary decision-making authority over whether to allow their public groundwater resource to be extracted and profited from on a massive scale. As it stands, the County will not even hold a hearing on the project that promises to export 2+ million acre-feet from the area and make millions from a public resource. That water belongs to the people of San Bernardino, and they deserve a right to control the conditions of the transfer through the use of the County as the lead agency for the project.

C. SMWD Is, At Best, A Responsible Agency

Role of Responsible Agency

A responsible agency is defined at Public Resources Code as a "public agency, other than a lead agency which has responsibility for carrying out or approving a project." (Pub. Resources Code § 21069). Thus the definition of responsible agency is one of omission: agencies with permitting authority and/or responsibility for carrying out the project, but not with the expertise, broad scope, or primary permitting authority of the lead agency. As such, SMWD is, at best, a responsible agency and not the lead agency for the project.

Role of Santa Margarita Water District

In contrast to the primary permitting authority and broad scope of interests represented by the County of San Bernardino, SMWD is a small agency with no apparent primary permitting authority beyond this CEQA approval. Further, SMWD has neither the requisite perspective nor expertise to assess the far-reaching environmental impacts discussed in the DEIR, or the ability to properly balance the interests of the Proposed Project proponents (including SMWD itself) against the interest of protecting the diverse ecosystems and communities that the Proposed Project would affect. Nor can this local agency properly analyze the regional impacts to air quality caused by the prospect of 100,000 new households that may be created by this water. Even if it did have primary permitting authority (which it does not), without broad perspective and expertise SMWD cannot meet CEQA's requirement for a lead agency capable of neutral, unbiased decision making and broad perspective.

SMWD's strongest argument for lead agency status is that it has already entered into an Option Agreement for the "largest portion of water supply" that the Proposed Project would provide. (DEIR, p. 1-9.) That SMWD will act as the project's largest *customer* is irrelevant for determining which agency has primary permitting authority or sufficient scope and expertise to act as lead agency. While San Bernardino County has broad jurisdiction over the area which receives the majority of direct impacts from the proposed project, as well as primary permitting authority over groundwater extraction and construction, SMWD has none of the above.

Missing MOU Hides Critical Information from Public Review

Further, SMWD is also apparently sharing CEQA costs with Cadiz. (DEIR 1-9) The DEIR provides inadequate information about the nature of this relationship as well as SMWD's ownership interest and operating role in operating the Proposed Project . The DEIR's lack of transparency regarding the nature of SMWD's MOU and Option Agreement and the CEQA cost-sharing agreement raises serious concerns. SMWD must disclose the nature of its ownership interest, what operational role it would play, the nature of the Option Agreement, and the conditions under which CEQA costs are being shared with and/or reimbursed by Cadiz. In addition, these key documents, including all cost-sharing agreements and transfers of funds for project-related purposes, should all be publically available and included in the EIR's administrative record.[1]

Other Agencies Should Be Included As Responsible Agencies

Role of Colorado River Regional Water Quality Control Board

By the terms of the DEIR (3-54), the Colorado River Regional Water Quality Control Board must provide a variety of permits for the proposed project including water quality certification and waste discharge requirements. These approvals are discretionary approvals, so that the RWQCB meets the definition of "Responsible Agency" under CEQA. Further, the proposed project attempts to get CEQA approval through approval of the current project EIR for the storage/recharge component of this project as a "component level," without proper analysis, even though the storage/recharge component will unquestionably impact existing water quality in the aquifer, regardless of source. As a result, the Colorado River RWQCB should have been named and consulted as a responsible agency on the project, and consulted accordingly. Without the Regional Board as responsible agency, the EIR approval will be invalid.

Role of Metropolitan Water District of Southern California ("MWDSC")

MWDSC was the original project proponent in the project's previous iteration, and shares primary responsibility for conception of the current project as well. MWDSC's infrastructure and participation facilitates both delivery of the water from the project, and importation of the

[1] Commenters are in the process of submitting public records act requests for all Memoranda Of Understanding between Cadiz, SMWD and San Bernardino regarding the project, as well as the relevant cost sharing agreement and a record of all transfers of payments between these agencies. All such documentation must be publically available and part of the decision-making record for the EIR.

water from the Colorado river aqueduct for the recharge/storage component of the project. Even if the water comes from the State Water Project, MWDSC is the only agency affiliated with the project who is an SWP contractor, again making MWDSC's role central. MWDSC played and continues to play a vital role in the planning, coordination and eventual implementation of the project. As such, MWDSC should have been included as a responsible agency under CEQA for the project, and the failure to have MWDSC participate and approve as such means the EIR approval will be invalid.

III. SECTION-BY-SECTION COMMENTS

1. Executive Summary

Failure to Sufficiently Analyze the Natural Gas Pipelines that Would Be Used for Water Conveyance in the Imported Water Storage Component ("Phase II")

Pages 1-11, 3-41, 3-42: The DEIR does not adequately analyze the water conveyance portion of the Imported Water Storage Component ("Phase II"), including particular components that have been identified outside the DEIR process in detail beyond the descriptions provided in the EIR, such as Cadiz's intent to purchase specific natural gas pipelines for water conveyance. *See* Cadiz Press Release, *Cadiz Advances Plans to Convert 300 Miles of Natural Gas Pipelines for Water Conveyance* (Feb. 29, 2012) (available at http://cadizinc.com/2012/02/29/press-release-cadiz-advances/) ("Cadiz Natural Gas Press Release"). The DEIR asserts that the Imported Water Storage Component is "still under conceptual development." (DEIR, p. 1-11.) However, the potential means of water conveyance seems to have advanced beyond conceptual development. Cadiz acquired an option to purchase specific gas pipelines in September of 2011, including a 220-mile pipeline owned by El Paso Natural Gas ("EPNG"). *See* Cadiz Natural Gas Press Release. The DEIR asserts only that there are various natural gas pipelines that could be used for conveyance in the Imported Water Storage Component, yet does not mention the option agreement to purchase any of these pipelines. (*See* DEIR, pp. 3-41, 3-42.) On February 28 of 2012, Cadiz made a $1 million payment to EPNG to extend the terms of the option agreement through March of 2013. *See* Cadiz Natural Gas Press Release. In light of the option agreement, and the recent payment to extend its terms, the EIR must analyze in detail the water conveyance portion of the Imported Water Storage Component. Cadiz's actions indicate that the intended use of natural gas pipelines for water conveyance is not speculative and must not be analyzed at the programmatic level, but rather at the project level. Along the same lines, all tentative proposals and agreements with MWDSC or other water agencies to import and store water should be disclosed and analyzed for impacts.

In addition, the revised DEIR must explain whether the natural gas pipelines for which Cadiz has the option agreement are intended to be used as part of the Groundwater Conservation and Recovery Component ("Phase I"). The Cadiz Natural Gas Press Release does not explain when the pipelines would be used nor for which Phase of the Proposed Project Cadiz intends to use them. If the pipelines would be used in Phase I, either in addition to or instead of the Colorado River Aquaduct, then the Phase I environmental analysis in the revised DEIR must analyze the potential environmental effects of such pipeline use.

Failure to Provide Consistent Data on Amount of Water to Be Extracted

Page ES-2: The DEIR states that the Proposed Project would retrieve up to 2 million acre-feet of stored water. However, page ES-3 states that the Proposed Project would extract an average of 50,000 AFY for fifty years—a total of 2.5 million acre-feet. The EIR must explain this half-million acre-foot discrepancy.

It is also unclear what permitting requirement would limit the water exports to 50,000 acre-feet per year. The EIR must identify what binding permit requirements would limit this export amount to the level indicated in the DEIR, or to any amount, for that matter. Without such information, the DEIR appears to be setting an arbitrary export level and one that may be far below actual anticipated exports.

Failure to Specify Duration of the Proposed Project Beyond 50 Years

Page ES-3: The DEIR states that the Proposed Project term may be extended for a limited time to allow the Proposed Project operator to comply with water delivery contracts. This limited time appears indefinite Without a 50-year limit, there is no constraint to prevent such contracts from becoming an end run around the 50-year duration of the Proposed Project. Without a firm 50-year limit, the evaluation of impacts in the DEIR is arbitrarily limited and constrained, and must be revised to correspond to the actual period in which the project may continue to operate. Conversely, in order to rely on a 50-year analysis, the EIR must specify the legal basis for a maximum time frame beyond which water delivery contracts are void/unenforceable, and justify how this time frame was determined.

Chapter 2 – Project Background

Failure to Properly Characterize the "Green Compact" as an Unenforceable Instrument

Page 2-5: The DEIR refers to the MOU between Cadiz and the Natural Heritage Institute ("NHI") as a "Green Compact" to "ensure sustainable management of approximately 70 square miles of Cadiz Property . . . ." However, the DEIR appears to mischaracterize the enforceability or binding nature of the MOU. In fact, the MOU appears to be an unenforceable instrument that in no way "ensures" sustainable management. As an initial matter, the EIR must accurately represent the character of the MOU and its inability to "ensure" sustainability.

Next, the DEIR explains that "NHI has committed to assist Cadiz in designing groundwater banking projects, identifying Project Participants, and auditing the management of

Cadiz-owned property in keeping with the Green Compact." (DEIR, p. 2-5.) However, the DEIR fails to adequately explain, that NHI's role is purely advisory and subject to attracting necessary funding.[2] NHI may well work hand-in-hand with Cadiz throughout the entire Proposed Project as suggested in the DEIR, but the "Green Compact" itself provides no such assurances. Misrepresenting the enforceability of the "Green Compact" is misleading to the public and the agency decision makers, and thwarts the informational goals of CEQA.

The EIR must explain that the "Green Compact" is an unenforceable document and that NHI's role is purely advisory and dependent on funding. As the "Green Compact" has been in force since 2009, the EIR should also explain what, if any, actions Cadiz has taken and will take as a direct result of the "Green Compact."

Chapter 3 – Project Description

The project description is insufficient because the DEIR inaccurately describes the Proposed Project one with primary goals of "conservation" and water "savings," rather than water extraction; the roles of the FVMWC and Metropolitan are insufficiently described; the electrical power component is inconsistently described; and the project objectives are misleading. These failings hinder the public's ability to analyze and comment upon the Proposed Project's potential impacts.

Failure to Properly Characterize the Proposed Project's "Fundamental Purpose"

Page ES-3: The DEIR states that the "*fundamental purpose of the Project* is to save substantial quantities of groundwater that are presently wasted and lost to evaporation by natural processes." This description misuses the word "save," which typically indicates that a resource will not be used now, but rather set aside for later use. "Save" also implies that some future harm is being presently averted. First, stating that this water mining project's purpose is to "save" water—when it would leave the aquifer with a deficit of 1.1–2.1 million acre-feet of water over 50 years—is misleading. Second, claiming that water is "saved" because evaporation is inhibited implies that evaporation itself is a harm, which requires a logical connection not supplied in the DEIR.

The "Fundamental purpose" of this project is described as "to save substantial quantities of groundwater that are wasted and lost by evaporation to the natural process." However, this does not appear to be the primary purpose of the project, because the very next paragraph provides what does appear to be the fundamental purpose: "The Project makes available a reliable water supply for Southern California Project Participants, to supplement or replace existing supplies and enhance dry-year supply reliability." This second purpose actually appears to be the primary purpose of the project, because there would be numerous means to satisfy the primary alternative besides the Cadiz export-recharge scheme, and because the purported project

[2] *See* Cadiz Press Release, *Cadiz Signs 'Green Compact' with Natural Heritage Institute* (May 14, 2009) (available at http://www.n-h-i.org/whats-new/press-item/select_category/7/article/natural-heritage-institute-and-cadiz-sign-green-compact.html?tx_ttnews[backPid]=217&cHash=5aca3543db).

purpose would not be pursued absent the water supply for Project Participants. This last point is evident because Metropolitan Water District previously withdrew its support for the project in its previous iteration, and the project itself was put on hold—not because it could not "conserve" the water in some other way, but because the impacts from the project were too great. See, e.g., Appendix B, comments by Western Envrionmental Law Center, on the impacts of the project as previously proposed by MWDSC.[3]

Further, to "save" groundwater by exporting does not appear to be a legally valid definition of "saving" groundwater. There is no precedent, legally or intuitively, for the concept of conservation-by-use, except in the upside-down world of this DEIR. Nor do any of the project participants claim that when they receive the water they will "save" it either. To the contrary, the presumption is that the water to be directed to the participants' customers for "beneficial use." The concept of "saving" the water by pumping it to water districts for customers' consumption is contrary to law and common sense.

The new EIR must revise the Proposed Project's "fundamental purpose" to indicate that the overall goal of the Proposed Project is to mine the desert aquifer and sell that water to Southern California water providers. Similarly, the EIR must make clear that the water that would be stored is for the purpose of selling it to Southern California water providers. This is also one of the main contentions of expert hydrogeologist John Bredehoeft.

Failure to Include Analysis of Groundwater Storage/Recharge on the Project Level

The Cadiz Water Project has always featured two parts in its various iterations: one part for groundwater export and the other for imported water storage and recharge. However, the DEIR claims that the proposed project is actually two components that can be evaluated in this EIR at different levels of detail under CEQA. According to the DEIR:

> "The Project has two components that would be implemented by the FVMWC. The first component—the Groundwater Conservation and Recovery Component—is ready for detailed analysis and implementation. The second component—the Imported Water Storage Component— is under development and would be implemented following completion of the first component. The first Component, analyzed in this Draft EIR at a "project-level," is required to set the stage for proceeding with the second Component, which is analyzed at a "program-level." (1-3)

As stated, the DEIR divides the proposed project into a "project-level" component and a "program-level" component, and then argues that the second component need only be evaluated in detail after the first component is implemented. (1-3) In doing so, the Cadiz DEIR fails to evaluate the project at the required level of detail under CEQA.

[3] The DEIR has also made no attempt to explain how the many serious flaws in the 2001 EIR/EIS have been corrected in the 2011 iteration. See WELC Comments, Appendix B for more information on problems with the previous EIR.

The project's multiple parts should be evaluated as a single project under CEQA, with a single EIR that evaluates the full impacts of the entire project at the "project level." The DEIR's deferring or "tiering" analysis of impacts is only permitted for secondary impacts, such as "to evaluate or formulate mitigation for 'site specific effects such as aesthetics or parking." *Environmental Protection Information Center v. Cal. Dep't of Forestry and Fire Protection* (2008) 44 Cal. 4th 459, 503. The impacts being deferred in the present case are not these types of small, isolated impacts; rather, the impacts comprise the entire second half of the same project being deferred—and in fact, constitute one of the largest environmental impacts of the entire project. This failure to evaluate all impacts equally and consistently by excluding highly likely project components constitutes illegal "piecemealing" of the project under CEQA.

The recharge/storage component will self-evidently impose major water quality impacts on the aquifer, while the import and conveyance facilities will all carry impacts of their own. These water quality impacts must be discussed in detail and assessed against the state policy against degradation of high-quality waters. Of course, the EIR does evaluate the recharge/storage in various limited contexts, just not in terms of their environmental impacts. The EIR cannot have it both ways: either the recharge/storage component is an integral part of the project and requires full, "program level" CEQA review in the present EIR, or it is a separate project that requires a separate and complete CEQA review. Demotion of the components' status does not exempt it from adequate environmental review under CEQA.

The Proposed Project Objective to Support ARZC Operations Is Speculative

Page ES-3: The DEIR states an objective, to "Support operational water needs of the Arizona and California Railroad ("ARZC") in the Project area." That this objective appears to be included in the Proposed Project's stated objectives solely to avoid federal approval to locate the pipeline within the ARZC right-of-way (thereby avoiding NEPA and other federal environmental review) is concerning. As discussed in greater detail in the Land Use & Planning section of this comment letter, it does not appear that Proposed Project operations depend on providing water to the ARZC, and the pipeline could be constructed without the provision of such services. Further, it is dubious whether the proposed fire hydrants actually qualify as a "railroad purpose" because most fires in such circumstances could not be extinguished by application of pure water. Beyond obtaining the BLM NEPA exemption, the future ARZC need for the Proposed Project's water is highly speculative and inadequately supported in the DEIR.

Failure to Provide an Accurate Project Description By Not Explaining How the Word "Conservation" in the Project Title is Consistent with the California Constitution's Water Conservation Goal

Page 3-4: The DEIR quotes the California Constitution:

> "[B]ecause of the conditions prevailing in this State the *general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable*, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is

> to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare."

California Constitution, Article X, Section 2 (emphasis added in DEIR).

The DEIR improperly emphasizes the goal of putting state waters to their fullest beneficial use, without specifically noting that the "unreasonable method of use of water" is to be prevented, and that water "conservation" is an equal goal. The Proposed Project's name, "Cadiz Valley Groundwater Conservation, Recovery, and Storage Project" places conservation first. By claiming that the Proposed Project's goal is "conservation"—here, simply extraction and sale by another name—and consistent with the state's constitution, the DEIR mischaracterizes the Proposed Project. The DEIR does not explain how, if at all, the word "conservation," as used in the state constitution, contemplates the extraction and sale of groundwater at a pumping rate far beyond the aquifer's estimated recharge rate. "Conservation" is not a synonym for "extraction" or "sale."

The Proposed Project's title is a key aspect of the project description. CEQA requires that project descriptions be accurate and not minimize the environmental effects of a project. Describing the Proposed Project as being fundamentally about conservation is inaccurate and masks the effect of leaving a more than one million acre-foot water deficit.

> Only through an accurate view of the project may affected outsiders and public decision makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal (i.e., the "no project" alternative) and weigh other alternatives in the balance. An accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR.

County of Inyo v. City of Los Angeles, 71 Cal.App.3d 185, 192 (1977).

The EIR must explain precisely how the conservation goals of the California Constitution are met by the "conservation" measures included in the Proposed Project, particularly how pumping water at a rate that leaves a water deficit in the aquifer is in fact water "conservation."

Improper Application of "Beneficial Use"

A similar problem occurs with the DEIR's casual use of the term "beneficial use." "Beneficial use" as required by both the California Constitution and Water Code is an official Water Board determination required to issue appropriative water rights. In the present context, the DEIR presumes the water will be used "beneficially" because otherwise some of it would evaporate. By this definition, only the water that would otherwise evaporate would be considered beneficially used; since only a fraction of the total would in fact evaporate, the remainder would presumptively not be beneficially used. However, "Beneficial use" is not measured by its non-use, but by what it is used for. Water sitting underground is not in and of itself a non-beneficial use, and conversely, the mere use of the water is not beneficial use without knowing what that water is intended for. So in the sense that the term is used in water law, the act of withdrawing the water from the ground is not presumptively a beneficial use. Reasonable and beneficial use is not set by an absolute standard, but depends on the facts and the

circumstances of each case. (*See, e.g., People ex rel. State Water Resources Control Bd. v. Forni*, 54 Cal. App. 3d 743, 750 (Cal. App. 1st Dist. 1976.)

Most fundamentally, the "beneficial use" of the water is not in the least bit at issue in the EIR because "beneficial use" is a threshold question to be determined by the State Water Resources Control Board for permits allowing the appropriation of surface water rights. The requirement for reasonable and beneficial use of a water right is set forth in Article 10, Section 2 of the California Constitution and Cal. Water Code § 100. Therefore, "beneficial use" in the traditional sense is irrelevant, because the DEIR lack sufficient analysis of what projects the water will be used for.

Failure to Adequately Explain the Role of the Fenner Valley Mutual Water Company ("FVMWC")

Page 3-14: The DEIR provides only a brief description of the FVMWC, stating that it is an unregulated, non-profit California mutual water company that would deliver water at cost to its shareholders. The use of a non-profit to deliver the Proposed Project water creates the implication that the entire Proposed Project is a non-profit enterprise. The DEIR does not explain whether the FVMWC shareholders would in turn sell the water, and whether they would do so at a profit, nor does the DEIR contemplate the impacts of running the project as a profit-making enterprise. That Cadiz seeks to make a profit is certainly understandable; that this objective may be hidden behind a non-profit mutual water company has the potential to mislead and prevent the public and decision makers from reasoned, informed review. The entity responsible for delivering Proposed Project water is in fact a key component of the Proposed Project. An incomplete or inadequate description of the FVMWC has the potential to taint the project description and preclude meaningful analysis of environmental impacts, project alternatives, and mitigation measures.

Failure to Consistently Describe the Proposed Project's Electrical Power Component

The project description must be accurate. *See County of Inyo*, 71 Cal.App.3d at 199. The DEIR states on page 3-40 that power would be distributed to well pads either underground *or* on overhead poles; likewise, page 3-23 states that "power lines would either be underground *or* overhead." (emphasis added). On page 3-26, the DEIR states that for well pads, "connecting utilities, including electric . . . would be buried underground within the roadway easements." The environmental effects would be different under each scenario and this decision cannot be left until a later design phase. Reasoned, informed public review and agency decision making is precluded where such a fundamental element of the power distribution system—the location of power lines—is left unclear or unspecified.

Failure to Include the General Economic Characteristics of the Project in the Proposed Project Description

CEQA Guidelines section 15124(c) requires the project description to include the general economic characteristics of a project. Although an economic analysis is included in the DEIR appendices, it is misleading to locate all economic information in the appendix without a

reference. Many readers and commentators would not be aware that the economic information is in the appendices without a reference in the Project Description chapter. Moreover, Table ES-2 states that the socioeconomic impacts of the Proposed Project are "beneficial." This claim is too difficult to assess without a description of the general economic characteristics of the Proposed Project in the Project Description chapter. Public review and accountability would be improved and facilitated by including the general economic characteristics of the project in the Proposed Project Description chapter.

The cost and benefit assumptions used in the DEIR and the Economic Impacts Report provided by John D. Husing (DEIR Appendix I); is highly flawed for numerous reasons.

The Economic Impacts Report assumes 100% of expenditures stay in the local economy, an excessive figure. Even if the pipe manufacturer, etc., is located in the county, the manufacturer of the steel in the pipe, etc., is not. And even if the owner of the pipe manufacturer is in the county, and every worker lives in the county, they will still buy some things from outside the county or go on vacation outside the county or invest some of their savings outside the county.

We do not know the appropriate 'local retention' of spending, but are suspect of anything higher than 80%, and someone who uses IMPLAN regularly, such as Dr. Husing, would surely know. The economic impact reports done for the Imperial Irrigation District to San Diego Water Authority water transfer would be a reasonable comparison, and should have been reviewed. These impact reports are incorporated here by reference as they are in the public domain and should have been reviewed by the preparers of the DEIR for review committee for social impacts of the transfer.

The study assumes that all the new facilities and underlying land will be privately owned and therefore taxable, but the specific tax liabilities for the land are unknown, and the project's transfer of ownership to FVMWC which is apparently styled as a "non-profit" would appear to exempt it from taxation. Likewise, tax liability does not appear to lie where some public agencies are involved. This is a two-edged sword. If the proponents say everything will be privately owned, then a private cost of capital will be involved, which is much higher than a public investor would have to pay on the municipal bond market. For example, 17-23% (private) versus 4-6% (municipal). So in order to justify tax revenue to the 'supplier' counties, the proponents in essence have to defend a higher than necessary debt service cost to the paying public entities on the 'demand' end. If they say the facilities or land will be partially or entirely publicly owned, the debt service cost may be lower, but so also will be the taxable base for tax revenue purposes.

The assumption that the taxable value of the new infrastructure will be equal to the investment cost is worth investigating. Counties usually assess taxable value of real property based on the market. So the value of these facilities will depend on whether there is a market for them. That will only be the case if the water purchasing entities allow the investing entities to sell the facilities without their approval, which they would be foolish to do. If there is no market, because the facilities cannot be sold except under limited circumstances, the value of the facilities will need to be determined in some other way (e.g., the present value of net cash flow).

The Economic Impacts Report is one-sided because it looks only at increased spending. But the money comes from someplace and must be repaid. Even if it comes from global capital markets, the buyers of the water must repay it, plus interest. That takes money out of a different local economy, reducing spending for something else; and therefore creating negative direct, indirect, and induced jobs in that other local economy (e.g., southern Orange County). The net impact is what society should care about overall.

We are also critical of the cost from the anticipated evaporation of that recharge/storage water would drive up costs of the project, were that water to evaporate at the same rate as the water supposedly evaporating from the dry lakes' surfaces. It appears that the evaporation rates used to justify the "conservation" principle are different from those used to justify the efficiency and effectiveness of the recharge/storage. If the same rates are used, the cost of the recharge/storage component rises considerably. This increase is left unaccounted for.

Finally, the assumption of zero opportunity cost for water from the Colorado River Aqueduct (CRA) that is stored is wrong. The cost of that water is not just the cost to take it from the Colorado River to the diversion point (or to get it from the Colorado to Cadiz), but also includes the cost to the MWD and other recipients of replacing that water when it isn't delivered. CRA water is fully used, so diverting it means other water for southern California will need to be brought in from elsewhere. And that replacement water has a cost -- which is the opportunity cost of diverting CRA water to Cadiz for underground storage.

Failure to Include an Assessment of the Proposed Project's Costs to Ratepayers

Any final or revised Environmental Impact Report should thoroughly describe the cost of the proposed project to ratepayers within the participating water districts. This should include the initial cost of the project to ratepayers; long term costs and what costs ratepayers would incur if project proponents are unable to deliver water according to the time frame or amount of current agreements. There should also be an assessment of the cost of obtaining water for the participating water districts from other sources, including an evaluation of ratepayer costs for these different alternatives. Finally, the revised or final Environmental Impact Report should assess the cost that will be incurred by homeowners whose wells may be affected by project pumping and have to establish new wells or improve existing wells.

Failure to Provide a Lead Agency in the List of Responsible and Trustee Agencies

Page 3-53: SMWD is improperly listed as a project participant and responsible agency. The DEIR should have listed SMWD as the Lead Agency, if SMWD still asserts that it is the proper Lead Agency (see the comments above regarding SMWD's role as Lead Agency).

Failure to Explain Which Agency Has Construction Permitting Authority

Pages 3-53, 3-54: The DEIR does not explain which agency has construction permitting authority. The DEIR relies on compliance with the California Building Code ("CBC") to assert that some impacts, such as various seismic impacts, would be less than significant. (*See* DEIR, p.

4.6-33.) The agency with construction permitting authority would be San Bernardino County. A public agency must confirm that the Proposed Project facilities are designed in compliance with the CBC in order to substantiate any claims that impacts would be less than significant. The EIR must explain which agency would confirm compliance with the CBC, and which agency has construction permitting authority over the Proposed Project.

Failure to Describe the Relationship between Metropolitan and SMWD

Page 3-34: The project description clearly explains that the use of the CRA, which is owned and operated by Metropolitan, is a necessary component of the Proposed Project. In fact, the Proposed Project fails without the ability to use the CRA. Nevertheless, the DEIR does not adequately describe the relationship between Metropolitan and SMWD. The DEIR does not specify whether any agreements are in place to permit Proposed Project water conveyance through the CRA. Nor are preliminary arrangements, such as a term sheet or memorandum of understanding, included or referenced. The DEIR's claim that the Proposed Project would provide a *reliable* water source for Southern California is unfounded without substantiation that an agreement has been reached with Metropolitan to convey Proposed Project water through the CRA. The EIR must adequately explain the relationship between Metropolitan and SMWD, in particular any arrangements or agreements to convey water through the CRA.

Failure to Explain Rationale for Average 50,000 AF Export

The "average export level" of 50,000 AFY is arbitrarily set as the appropriate measure for measuring project impacts, even though there is no permit in place (or required in the future) to limit the exports of groundwater beyond the physical capacity of the system. The DEIR claims that the proposed project has an export system capacity of 105,000 AFY. (4.9-6) Since there is no reason why the project cannot export this amount every year, this should be the amount considered for impacts in the EIR. Yet the project evaluates withdrawals at an "average" rate of 50,000 acre-feet per year. (4.9-5) The DEIR never explains why 50,000 would be the yearly limit, as it does not indicate that the project is required to obtain a legally-binding permit that limits withdrawals to this amount. The DEIR does note that "the State has defined "safe yield" of an aquifer as the amount of water that can be withdrawn without an undesirable result." (4.9-62) This does not constitute a firm limit on exports. Given the probable recharge levels are far lower than that estimated in the DEIR, even 50,000 AFY is not a "safe yield." In other words, there does not appear to be any set limit on pumping. If such a requirement exists, and the project will be legally limited to 50,000 AFY, the DEIR should explain how and by what permit, statute, regulation, MOU, agreement or otherwise limits exports to this level. In addition, the EIR (and underlying studies) must be revised to evaluate impacts at a repeated withdrawal level at system capacity of 105,000 AFY to evaluate the full range of impacts from the project.

Chapter 4.1 – Aesthetics

The DEIR fails to adequately analyze the potentially irreparable impacts the Proposed Project would have on the natural aesthetics of multiple areas within the region, including but not limited to the Preserve, the Yucca Valley, and five designated wilderness areas.

The DEIR's analysis of aesthetic impacts is flawed in two key respects. First, the analysis defines the affected geographic area far too narrowly. The DEIR performs an overly limited analysis by focusing on the Proposed Project area itself and how the Proposed Project may affect the aesthetics of that small area and the Cadiz Property. (*See* DEIR, p. 4.1-15, "The analysis focuses on the visual character of the Project site and selected views from the surrounding areas.") That analysis is insufficient because it disregards the potential effects that the Proposed Project may have on the sustainability of vegetation, wildlife, and migratory birds *within* the Preserve, the five wilderness areas, and other surrounding and adjoining areas. Consequently, the potential aesthetic impacts within these areas cannot be assessed because the necessary underlying data are missing. For example, the DEIR does not include any photographic documentation beyond several views to and from the Proposed Project area and the ARZC ROW. (*See* DEIR, pp. 4.1-4 to 4.1-12.) The EIR must consider the impacts the Project may have within the Preserve, the five wilderness areas, and other surrounding areas.

Second, the DEIR's analysis is flawed because it focuses only on short-term aesthetic impacts. Specifically, the analysis fails to address whether the Proposed Project would have long-term detrimental effects on the area's aesthetics by potentially impacting the sustainability of multiple resources, including vegetation, wildlife, and migratory birds within the Preserve and other surrounding and adjoining regions. Indeed, the DEIR does not even mention the potentially irreparable long-term effects the Proposed Project may have on scenic resources. The same is true of the many scenic vistas within the Preserve and other adjoining regions. The DEIR focuses on the short-term aesthetic impacts during construction and Project operations on views to and from the Proposed Project area. The aesthetic impacts to vegetation and wildlife that could result from the long-term drawdown of the aquifer are not analyzed. Yet these potential direct and indirect impacts, within the Preserve, wilderness areas, and other surrounding areas, could directly result from Proposed Project operations and, therefore, must be analyzed in the EIR.

At a minimum, CEQA requires that the EIR include a more rigorous analysis of the long-term direct and indirect aesthetic effects the Proposed Project would have on the adjoining areas, including the Preserve. It is essential to analyze how the Proposed Project would impact regional vegetation, which is integral to the region's natural aesthetic appeal. The DEIR's analyses do not support the claim that a project with such a dramatic effect on underground water levels will have no impact on the natural aesthetics of the surrounding region without more specifically analyzing how the Proposed Project would affect the surrounding and adjoining areas' scenic resources, scenic vistas, and existing visual character.

<u>Failure to Adequately Consider the Potential Adverse Effects on Scenic Vistas</u>

Page 4.1-15: As a result of the above-mentioned analytical flaws, the DEIR reaches the unfounded conclusion that the impacts to scenic vistas would be "less than significant," and that, therefore, no mitigation measures are required. (*See* DEIR, p. ES-11, Table ES-1.)

As the DEIR points out, there are five wilderness areas within approximately five miles of the Proposed Project. (DEIR, p. 4.1-3.) The Proposed Project's water reallocation would have potentially irreparable long-term effects on the regional vegetation of these areas, as well as

the vegetation within the Preserve. Adverse effects to regional vegetation would result in significant diminution of the aesthetic beauty of countless scenic vistas throughout the region. The EIR must adequately consider and analyze the long-term direct and indirect effects of the Proposed Project on aesthetic resources within the Preserve and the five wilderness areas.

Failure to Adequately Analyze the Proposed Project's Potential Adverse Effects on Scenic Resources

Page 4.1-18: The DEIR concludes without sufficient analytical foundation that there will be "no impact" to scenic resources, including but not limited to trees and rock outcroppings within the Preserve. (*See* DEIR, p. ES-11, Table ES-1.) As a result of this error, the DEIR prematurely concludes that no mitigation measures are required. (*Id*.)

According to the DEIR, "there are no designated State Scenic Highways in the Project vicinity," and "[t]he Project would have no impact on scenic resources within designated State Scenic Highways." (DEIR, p. 4.1-18.) Consequently, the DEIR concludes that the Proposed Project would have no aesthetic impact and, therefore, no mitigation measures are required. (*Id.*) However, as the DEIR points out, there are two eligible State Scenic Highways within close geographic proximity to the Project: Interstate 40 and State Route 62. (DEIR, p. 4.1-14.) The DEIR further points out that these highways, by definition, "[c]onsist[] of a scenic corridor that is comprised of memorable landscape that showcases the natural scenic beauty or agriculture of California . . . ." (*Id.*) By failing to consider the long-term aesthetic impact to these two highways, the DEIR's analysis is incomplete.

Failure to Thoroughly Analyze the Proposed Project's Potential Adverse Effects on the Existing Visual Character of the Regions Surrounding the Proposed Project Site

Page 4.1-18: For the reasons explained above, the DEIR fails to address potential long-term degradation to the existing visual character/quality of surrounding and adjoining areas such as the Preserve, the five wilderness areas, and other surrounding areas.

The DEIR's characterization of these impacts as "less than significant," (DEIR, p. ES-11, Table ES-1,) must be reconsidered in light of the possible long-term effects the Proposed Project will have on vegetation, wildlife, and bird migration in the regions surrounding the Proposed Project. The EIR must analyze the long-term direct and indirect effects to the visual character/quality of surrounding and adjoining areas that 50 years of pumping the aquifer may cause.

Wellfield Lighting

We are concerned about impacts of wellfield lighting and request that any permanent night lighting associated with the Proposed Project be shielded and controlled by a switch or motion sensor so that the wellfield lights do not remain continuously lighted. The CEQA Guidelines provide that new sources of substantial light that would adversely affect daytime or nighttime views may constitute significant environmental impact. *See* Guidelines, Appendix G. The DEIR states that "there are very few sources

of night light and glare" in the Project area. (DEIR, p. 4.1-3.) In this largely undeveloped context, any new night lighting has the potential to adversely affect nighttime views. Mitigation Measure AES-2 is insufficient because wellfield lighting could remain "on" indefinitely; some type of timer or motion sensor should be used. The EIR must substantiate that the wellfield lights are controlled such that nighttime views will not be adversely affected.

Chapter 4.3 – Air Quality

The DEIR's air quality analysis is insufficient for multiple reasons. First, the environmental baseline is not properly established. Second, the potential air quality impacts on the Mojave National Preserve are not adequately analyzed. Likewise, the Proposed Project's air quality impacts resulting from population growth outside of the Mojave Desert Air Quality Management District ("MDAQMD") plan are not properly analyzed. The impact analyses also suffer from internal inconsistencies, reliance on generalizations and assumptions, and inconsistent data sources. Finally, the mitigation measures are insufficient because they either discover the problem once it is too late to be mitigated or improperly shift mitigation responsibility to an unnamed third party. In sum, these problems amount to substantial analytical deficiencies that deprive the public and decision makers of the information required for proper participation and decision making.

The failure to assess such regional impacts also supports our concern that SMWD is not the proper Lead Agency for the Proposed Project. SMWD lacks the perspective or knowledge to weigh the interests of the Project Proponents with the public's broad environmental interests as they related to the localized air impacts of the project.

The following are detailed comments about the DEIR's air quality analysis deficiencies:

Failure to Properly Establish a Baseline for Airborne Dust

Page 4.3-16: This section states that FVMWC will install two nephelometers pursuant to the GMMMP to establish a baseline data of visibility in the valley. CEQA Guidelines section 15125(a) states that existing conditions, the "baseline," are established at the time the notice of preparation ("NOP") is published. The EIR must explain why the baseline for visibility was not established at that time.

Failure to Support the Location of the Nephelometers with Data About the Prevailing Winds

Page 4.3-16: We are concerned that the location of the nephelometers is insufficient. Two are provided, downwind from Bristol and Cadiz Dry Lakes. The DEIR does not provide adequate data to determine if nephelometers should also be placed in locations not in the direction of the prevailing wind. The frequency of the prevailing wind direction (e.g., 50% or 70%) is not included in the DEIR. The EIR should include a

wind rose, or some other representation of wind direction and frequency, to justify locating nephelometers only downwind from the two dry lakes.

Failure to Analyze Air Quality Impacts in the Mojave National Preserve

Page 4.3-18: The DEIR does not adequately justify the 10-mile radius for sensitive receptors. The Preserve is approximately 15 miles north of the Proposed Project area. We are concerned that the Proposed Project may deteriorate the air quality at the Preserve, an area visited by groups who are likely affected by air pollution. (*See* DEIR, p. 4.3-5.) The DEIR should have treated the Preserve as a sensitive receptor and analyzed the Proposed Project's air quality impacts at the Preserve.

Failure to Properly Analyze Proposed Project's Impacts on Air Quality Management Plans Outside of the MDAQMD.

Pages 4.3-10 to 4.3-11: This impact analysis is incorrectly limited to the MDAQMD air quality management plan. An EIR must identify and describe direct and indirect effects of the project in the area that is affected by the project. *See* Cal. Pub. Res. Code § 21060.5; Guidelines § 15126.2(a). The Proposed Project is regional and the affected area includes water service areas beyond the MDAQMD plan area. The EIR needs to assess, in more detail than the DEIR in Chapter 6 and Appendix J, whether the Proposed Project would cause significant population or employment growth wherever Project water would be provided, and whether such growth would cause concentrations of air pollutants and would be consistent with growth forecasts. The EIR must also assess the Proposed Project's potential cumulative impacts on regional growth and corresponding air quality. While these impacts may be seen as indirect and/or cumulative, their discussion also belongs in air quality. Once again, the scope of this required analysis indicates that SMWD is likely not the appropriate Lead Agency because its perspective and expertise is limited to a single sub-region of Southern California.

Failure to Sufficiently Analyze the Potential for the Dry Lake Beds to Generate Dust

Page 4.3-15: This section makes an absolute statement that the "reduction in groundwater levels beneath the Dry Lake would not alter the Dry Lake surface conditions or increase dust emissions in the Valley." However, this statement conflicts with two statements in preceding paragraphs. First, the text explains that the salts on the dry lake beds "tend to" form a hard crust. Merely tending to form a crust does not rise to an absolute assurance that a crust will be formed. Second, the purported crust is described as "generally resistant to wind erosion." Again, this falls short of an absolute assurance. Third, the surface crusting mechanism is said to "minimize[] airborne dust," not preclude it altogether. The EIR must explain how these general surface characteristics rise to a categorical assertion that dust will not be increased in the Valley.

The DEIR should also explain the relationship between the Proposed Project's effects on the Bristol Dry Lake and the description of the regional setting on page 4.3-4, which states that periodic high wind events lift sand and dust from the edges of Bristol

Dry Lake. That sand is the source of the Cadiz Dunes at the south end of Cadiz Valley. Page 4.3-15 asserts that the surface of this same dry lake is resistant to erosion and will form a crust-like surface when dry. The edges of Bristol Dry Lake are very likely the driest portion of the lake under current conditions. If the surface of the entire dry lake becomes like the edges now are, then it seems that periodic high winds would lift sand and dust from the entire dry lake surface. The EIR must explain how the reduction in groundwater levels will not lead to all of Bristol Dry Lake exhibiting the same sandy/dusty conditions that the lake's edges now suffer.

Likewise, the DEIR relies on HydroBio's report, *Fugitive Dust and Effects from Changing Water Table at Bristol and Cadiz Playas, San Bernardino County, California* (Aug. 30, 2011), which makes general assertions and hypotheses regarding dust at Bristol Playa. The executive summary admits that Bristol Playa produces fugitive dust erosion by high wind. The report only hypothesizes that the severity of Bristol Playa dust will diminish over time, and that changes in groundwater levels will "likely" have no effect on the amount of fugitive dust. These conclusions are not absolute and leave open a notable possibility that fugitive dust will increase due to groundwater level reduction.

This DEIR section fails to properly describe the effects of the drawdown caused by Proposed Project pumping. The text states that the "effect of the drawdown would extend toward Bristol and Cadiz Dry Lakes." However, the effects would extend all the way to the dry lakes, not just *toward* them. Evapotranspiration at the lakes would cease altogether. Indeed, the fundamental purpose of the Proposed Project is to "save" water from evaporation at the dry lakes.

The DEIR posits that two non-native plant species help to control dust, but the HydroBio report overlooks the fact that the non-native plant species purported to have changed the sand balance in the Cadiz Valley actually do not function as hypothesized. All of the species identified (Mediterranean grass, Sahara mustard, filaree, red chess, cheatgrass and Russian thistle are annual species and are not present throughout the year. Therefore, while sand balance may be influenced by these species during their growing season (spring), the movement of sand during the remaining seasons is minimally influenced by these species because their biomass is no longer present. Additionally annual plant growth in the California deserts is precipitation driven, and in some years with inadequate rainfall, annual plants simply do not germinate or grow. Their absence therefore does not change the sand balance.

<u>Failure to Properly Characterize Potential Airborne Dust as PM10</u>

Pages 4.3-15 to 4.3-16: This section describes airborne dust from the dry lakes as only a visibility concern. We are concerned that the dry lake beds could become an additional source of PM10 particulate matter. Table 4.3-2 shows that the Mojave Desert Air Basin (MDAB) is in nonattainment for PM10 under federal and state standards. The DEIR's treatment of airborne dust as only a visibility concern inadequately addresses potential effects of the dust to increase total PM10 particulates. The EIR fails to take into account the potential cumulative effect of potential airborne dust from the dry lakes.

Reasoned and informed review and decision making is precluded where potential effects are improperly characterized.

Failure to Explain Why PM10 Declined in 2009 and 2010 in the Proposed Project's Vicinity

Page 4.3-5: This section states that PM10 declined in 2009 and 2010 in the Proposed Project's vicinity. Without providing any reasons to explain the decline, a reasoned review of how the Proposed Project may affect PM10 levels, and the total cumulative effects, is not feasible.

Failure to Provide Consistent Ozone and PM10 Data Sources

Table 4.3-3: The DEIR provides data on ozone at Joshua Tree National Monument and PM10 at Victorville, without explaining why two different monitoring locations were listed. The EIR should explain why only one of the two listed locations was used to measure both pollutants.

Failure to Quantify the Cumulative Impacts on Air Quality from the Proposed Project and the Department of Energy's Planned Solar Project

Pages 4.3-20 to 4.3-21: Without any quantification, merely asserting that the cumulative impacts during construction would be significant and unavoidable does not provide sufficient information for public review or for agency decision makers to determine whether to approve the Proposed Project with a Statement of Overriding Considerations. *See* Guidelines § 17321. The revised EIR must estimate the cumulative impact of the Proposed Project and the planned federal solar project on air quality.

Failure to Properly Mitigate the Potential Impacts of Airborne Dust from the Dry Lakes

Page 4.3-16, Table 4.3-7: Because the Proposed Project would pump at a far greater rate than the natural recharge of the aquifer, the impacts of the Proposed Project could extend even after pumping stops. We are concerned that as presented, the Proposed Project's mitigation measures would only identify the problem after it is too late to correct and damage is irreparable. Dust caused by dry soil would not be mitigated by discontinuing pumping, for example, because the soil moisture would not be restored until the natural recharge occurs, which could take decades. The EIR must adequately explain how discontinuing pumping would mitigate a problem whose causes would not cease to exist upon cessation of pumping.

In addition, the DEIR does not state who will perform the annual visual observations of the soil. What qualifications must this person have? What criteria will be used to determine the soil texture and susceptibility to wind erosion? The DEIR also fails to explain the procedures and criteria that will be used during visual inspections. The EIR should explain how FVMWC has the required expert knowledge to perform

such inspections when the FVMWC does not include any independent experts, such as representatives from NPS or USGS.

We are concerned that yearly inspections are insufficient. Given the ever-expanding nature of the cone of depression, significant soil drying may occur in one year. The EIR must justify the one-year inspection intervals.

Failure to Properly Mitigate Construction Dust

Page 4.3-17: We recognize the need for dust abatement during construction and support suppression in an ecologically sound manner. However, the use of water in conjunction with construction disturbance encourages the establishment of weedy exotic vegetation and leads to possible invasion into other communities (especially such naturally disturbed vegetation types as dunes and sand fields). When dust abatement is performed, watering should not be used as a technique.

Failure to Explain the Basis for Mitigation Measure AQ-3

Page 4.3-17: Mitigation measure AQ-3 promised that "idling engines shall be shut down when not in use for over 30 minutes." Allowing idling engines to run for 30 minutes is excessive. The EIR must explain how 30 minutes was selected, and why a shorter time frame is not feasible.

Failure to Properly Mitigate Potential Dust Omissions from Fallowed Fields

Page 4.3-14: This section provides that mitigation will be carried out by the agricultural operator. If fields are fallowed as a result of the Proposed Project, then mitigation must not be pawned off to an unnamed third party. Rather, mitigation measures must be *fully enforceable* through conditions, agreements, or other means. *See* Guidelines § 15126.4(a)(2). The EIR must include mitigation measures for potentially fallowed fields and establish that the Proposed Project operator is responsible for implementing the mitigation measures.

Failure to Properly Analyze Mobile Source Pollution

Page 4.3-13: This section makes the conclusory statement that daily emissions from on-road vehicles would be substantially less than the significance thresholds without any supporting data. The EIR must substantiate this claim with an estimate of the number of trips per day and the pollution generated by each trip.

Chapter 4.4 -- Biological Resources

The DEIR fails to adequately and appropriately analyze impacts to biological resources. It fails to include updated studies for several special-status wildlife species, including: the Mojave fringe-toed lizard, (DEIR, p 4.4-47,) burrowing owl, (DEIR, p. 4.4-47,) and American

Badger. (DEIR, 4.4-48.) The Project's proposal to conduct these surveys after the EIR is certified (and sometimes only 2 weeks prior to construction) is unacceptable and stands as a failure to adequately evaluate impacts under CEQA in the current EIR, given the sensitive nature of these biological resources.

Wildlife

The DEIR fails to provide adequate baseline information for a number of wildlife species and therefore in unable to adequately evaluate the impacts to them.

1. Desert Tortoise

The desert tortoise has lived in the western deserts for tens of thousands of years. In the 1970's their populations were noted to decline. Subsequently, the species was listed as threatened by the State of California in 1989 and by the U.S. Fish and Wildlife Service in 1990, which then issued a Recovery Plan for the tortoise in 1994. The U.S. Fish and Wildlife Service recently updated the Recovery Plan[4]. Current data indicate a continued decline across the range of the listed species[5] despite its protected status and recovery actions.

The original and Updated Recovery Plans both recognize uniqueness in desert tortoise populations in California. This particular subpopulation of tortoise at the proposed project site lies mostly within the Colorado Desert Recovery unit along the boundary with the West Mojave Recovery unit[6]. Recent population genetics studies[7] confirm that the tortoises within the northern part of the Colorado Recovery unit are genetically unique from other tortoises within the same recovery unit (and tortoises to the west). While the proposed project site may have low desert tortoise densities, this particular recovery unit has also been documented to sustain very high declines in population in 2007 (-58%)[8]. The DEIR fails to identify the baseline conditions of the status of desert tortoise on the proposed project site. It fails to identify the actual number of desert tortoise estimated to be on the project site. The EIR needs to provide data-based estimates of desert tortoise population on the project site. From that determination, the EIR then needs to analyze avoidance opportunities, minimization of impacts and if impacts still can not be avoided, the impacts and mitigation. These data and analysis should be included in the REIR

Basing impact analysis on sitings of animals and scat will woefully underestimate the number of desert tortoise, particularly because of the fact that tortoises spend most of their time underground. For example, recently, desert tortoise numbers were estimated on a different

[4] http://www.fws.gov/nevada/desert_tortoise/documents/recovery_plan/RRP%20for%20the%20Mojave%20Desert%20Tortoise%20-%20May%202011.pdf

[5] http://www.fws.gov/nevada/desert_tortoise/documents/reports/2010/2010_DRAFT_Rangewide_Desert_Tortoise_Population_Monitoring.pdf

[6] http://www.fws.gov/nevada/desert_tortoise/documents/recovery_plan/RRP%20for%20the%20Mojave%20Desert%20Tortoise%20-%20May%202011.pdf

[7] Murphy et al. 2007

[8] http://www.fws.gov/nevada/desert_tortoise/documents/reports/2007_Rangewide_Desert_Tortoise_Population_Monitoring.pdf

project site north of Cadiz Valley, where only 16 desert tortoise were located on site[9]. Population estimates were calculated to be 38 desert tortoise on the site for the purposes of the "take permit" limits issued by the U.S. Fish and Wildlife Service. In subsequent clearance surveys, that limit was quickly exceeded and population estimates were recalculated to be in the range of 368 to 1001 desert tortoise on site[10].

The DEIR notes that the well field and pipeline parts of the project are "adjacent to but outside" federally designated desert tortoise critical habitat (DEIR at 4.4-19), however the proposed water infiltration basins and a monitoring well are proposed wholly and inappropriately within the boundaries of critical habitat. The DEIR fails to identify any avoidance of critical habitat and instead defaults to impact and mitigation, contrary to CEQA.

The DEIR mentions the Desert Wildlife Management Areas (DWMAs), but fails to evaluate the effects of the proposed project on the Chemihuevi DWMA, which was established by the Bureau of Land Management under the Northern and Eastern Colorado Plan specifically for conservation of desert tortoise. The ARZC right-of-way is located only 100 feet from the Chemehuevi Desert Wildlife Management Area (DWMA). Figure C1 notes that recent evidence of fresh scat of adult tortoises were found within the right-of-way, on both the east and west side of the tracks. (Appendix F-1, DEIR p. 18.) Additionally, a burrow was found within the ARZC right-of-way, and the study concluded that tortoises are likely to make "occasional forays" into the proposed construction impact area. (Appendix F-1, DEIR, p. 18.). The REIR needs to use these data as the basis for impact analysis.

The DEIR fails to evaluate the impacts of the proposed project site for desert tortoise. In fact, the project appears to lie within a key connectivity area between the Chemihuevi and Ord-Rodman DWMAs and critical habitat units. In fact the proposed project appears to be located within the USFWS-recommended Desert Tortoise Linkages between Critical Habitat/DWMA Units.[11] These connectivity areas for desert tortoise are crucial for the survival and recovery of the species, because the Desert Wildlife Management Areas that have been established for the species are inadequate in size to support the desert tortoise in perpetutity.[12] In addition, the DEIR fails to evaluate the importance of Schuyler Wash to the resident population of desert tortoise and evaluate at the local level the impact of the proposed wellfield and potential spreading basin in Schuyler Wash.

The DEIR recognizes that there are desert tortoise living on the proposed project site (DEIR at 4.4-17), however no information is provided in the DEIR about population numbers that will be affected (as discussed above) and, more over, relies on future development of a "Desert Tortoise Avoidance and Protection Plan" (DEIR at ES-14). This "avoidance and protection" plan needs to be available as part of the DEIR, because only then it is possible for the

[9] http://www.pe.com/local-news/topics/topics-environment-headlines/20110420-mojave-desert-tortoise-finds-curtail-solar-site-construction.ece

[10] http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.71302.File.dat/ISEGS_Reinitiation,%20Final%20BO.pdf

[11] USFWS 2011

[12] USFWS 2012

public and decision-makers to evaluate "avoidance" and "protection" as well as the impacts. Furthermore, for industrial facilities, the federal and state wildlife agencies typically require that desert tortoise be removed from harms way off site via translocation. The DEIR is unclear if translocation will occur, and only refers to translocation in Appendix F1 (at 43) stating "this project may require that tortoises are moved out of harm's way…". We request that in addition to the on-site desert population calculations (as requested above) that the DEIR clearly identify if desert tortoises will need to be translocated. If so, a desert tortoise translocation plan will need to be provided for public and decision maker review in the REIR. While avoidance of desert tortoise and its habitat should be the proposed project's first priority and is highly preferable because translocation results in significant mortality even over the short-term[13], only a well thought out plan, incorporating the latest techniques can decrease mortality.

The DEIR claims that a Section 7 consultation will be required (DEIR at 3-53), but absent a federal nexus which is not apparent in the DEIR, a federal "take" permit will be required through Section 10 of the federal Endangered Species Act.

The proposed mitigation compensation ratio of 1:1 is inadequate, because the habitat is currently occupied by desert tortoise and appears to lie within a crucial linkage area. Numerous recent projects that impacted occupied desert tortoise habitat have been required by state and federal agencies to mitigate at a 3:1 ratio for impacts to desert tortoise habitat, even though the projects were located outside of critical habitat and DWMA. Therefore, in order to aid in recovery of this declining species, at a minimum a 3:1 mitigation ratio should be proposed as mitigation for the impact to desert tortoise habitat on the proposed project site.

If tortoises are relocated or translocated, then the relocation and/or translocation areas need to be clearly identified and secured for tortoise conservation *in perpetuity*. This provides assurances that the animals will not have to be moved subsequently if additional projects move forward on the relocation or translocation site(s). In other words, relocation/translocation areas should be protected in perpetuity.

The DEIR's analysis of the desert tortoise in the ARZC right-of-way area indicates that the proposed project will affect desert tortoises. The ARZC right-of-way is located only 100 feet from the Chemehuevi Desert Wildlife Management Area (DWMA), an area designated in 1994 as a desert tortoise critical habitat. (DEIR, p. 4.1-3.) Figure C1 notes that recent evidence of fresh scat of adult tortoises were found within the right-of-way, on both the east and west side of the tracks. (Appendix F-1, DEIR p. 18.) Additionally, a burrow was found within the ARZC right-of-way, and the study concluded that tortoises are likely to make "occasional forays" into the proposed construction impact area. (Appendix F-1, DEIR, p. 18.)

The DEIR's analysis of the desert tortoise in the wellfield and spreading basin areas is inadequate. In the wellfield and spreading basin areas, the DEIR indicates that there is a "regional pattern of occurrence" of tortoises. However, protocol-level surveys were not conducted in these areas. *Cadiz must perform more detailed surveys along the wellfield and*

[13] Berry et al. 2011. at http://www.deserttortoise.org/abstracts/2011DTCSymposiumAbstracts.pdf

spreading basin design processes, as it indicated that it is willing to do. (DEIR, Appendix F1, Desert Tortoise Survey & General Biological Resource Assessment, page 41.)

2. *Desert Bighorn Sheep*

The DEIR's analysis of impacts to desert bighorn sheep is woefully inadequate. The DEIR fails to identify the Bighorn Sheep Wildlife Habitat Management Areas as identified and codified in BLM's Northern and Eastern Colorado Plan[14]. The proposed project lies within two important connectivity corridors for desert bighorn sheep: 1) the connection between the Ship and Marble Mountains and 2) the connection between the Old Woman and Iron Mountains. Maintaining connectivity between these identified habitat for desert bighorn sheep is essential particularly in light of climate change. The region from a little north of Chubuck to a bit east of Milligan is particularly concerning because currently sheep can travel freely in this area between the Old Woman Mountains and the Kilbeck Hills and Iron Mountains. CDFG has reports documenting a collared female bighorn sheep in the Old Woman Mountains that crossed over to the Iron Mountains where she bore and reared a lamb and then returned to the Old Woman Mountains. Epps et al. (2010) found that sheep from the Old Woman Mountains have been the source of a natural colonization to the Iron Mountains[15]. The REIR needs to address the impacts of the proposed project on the desert bighorn sheep connectivity.

Of further and perhaps greater concern is that the DEIR fails to evaluate the impact of the proposed project on the hydrology of the crucial seeps/spring/water sources in the adjacent mountains that are the lifeline to survival of the desert bighorn sheep especially during the hot summer months. The proposed monitoring of ground water is wholly inadequate to evaluate the impact of the proposed project on these irreplaceable resources for desert bighorn sheep and other wildlife that rely on them. In fact, in the absence of any pre-project investigation and data, by the time any effects of pumping are seen, it will be too late to prevent the dewatering. The proposed activities could affect natural water sources in numerous mountain ranges including the Marble, South Bristol, and Old Woman Mountains, yet this analysis is inadequately analyzed in the DEIR. In fact as the DEIR acknowledges "There is no information demonstrating a physical connection of those identified springs in the local mountains to groundwater in the alluvial aquifer where Cadiz's pumping will take place." (DEIR at Appendix H3 at pg 1 or 2697 of pdf). This lack of information is then wrongly used to conclude that "because there is little or no hydraulic connection the Project will not likely have any impact on springs" (ibid), when in fact no information is available. Additionally Appendix H4 – Spring fieldwork is not included in the DEIR.

Despite the scientific information that shows that the American southwest will be one of the first places to see the effects of climate change[16], and the effects will be a general warming despite different climate change model scenarios[17], and that warming and drying are already

[14] BLM 2002.
[15] Epps et al. 2010.
[16] http://www.scientificamerican.com/article.cfm?id=desert-southwest-may-be-first
[17] https://www.bluego.org/documents/CEP/Homewood/Cayan%20et%20al%202006.pdf

affecting the distribution of vegetation in the California deserts[18], the DEIR incorrectly identifies that "The effects of climate change on precipitation and recharge in the Bristol, Cadiz, Fenner, and Orange Blossom Wash Watersheds are uncertain" (at 4.7-6).

3. Mojave fringe-toed lizard/Sand dunes/Sand Transport System

While the DEIR recognizes that impacts will occur to occupied Mojave fringe-toed lizard (at4.4-19), it fails to analyze the sand transport system and the effects that the project will have on this important landscape scale process. Sand transport systems are critical in maintaining sand dune systems which are crucial for a suite of rare and endemic sand dunes species including the Mojave fringe-toed lizard. The project is located within a recognized sand transport corridor.[19]

The lack of studies on the Mojave fringe-toed lizard is of special concern. It is a California Species of Concern and a BLM sensitive species. (DEIR, p. 4.4-19.) Suitable habitat is only present along the pipeline route east of Danby Dry Lake. (DEIR, p. 4.4-19.) Surveys for fringe toed lizards along the ARZC right-of-way have not yet been conducted. Given the proximity of the pipeline route to the loose, windblown sand of the sand dunes (only 100 feet at its closest point), an REIR must include a thorough analysis and be available for public review before the Project moves forward. (DEIR, pp. ES-15, 4.4-11.) *The DEIR must be revised to include an analysis of the direct and indirect effects of the Project, including habitat loss, disruption of movements, breeding, and foraging that is available for the public comment.*

The DEIR fails to quantify how much habitat for the Mojave fringe-toed lizard would be impacted, or how the project would interfere with the regional sand transport corridor. Likewise, no mitigation is discussed. While Mojave fringe-toed lizards are proposed to be translocated (Bio 8 at 4.4-47), no plan is proposed to be developed, much less included in the DEIR.

The DEIR also fails to evaluate the impacts of the proposed project on Mojave fringe-toed lizard outside of the project site. As Barrows et al. (2006)[20] found, edge effects are significant for fringe-toed lizards and, in addition, the increase in predators associated with developed edges may also have a significant adverse effect on fringe-toed lizards and other species.

4. Desert Kit Fox

The DEIR mentions the desert kit fox (at 4.4-8), but fails to provide data on the presence or absence of the species on site or the locations of natal and other types of dens. Desert kit foxes are "protected furbearing mammals" under California Code of Regulations, Title 14, section 460 and may not be "taken" at any time. As such the DEIR fails to analyze the impacts to this species as required under CEQA. The REIR should identify the density of kit foxes on the proposed project site, including natal and other dens. If passive relocation is identified as an avoidance

[18] http://www.pnas.org/content/105/33/11823.full
[19] Muhs et al. 2003.
[20] Barrows et al. 2006

strategy, the DEIR must evaluate if suitable habitat occurs nearby and is not already occupied by existing kit foxes.

Other desert industrial facilities currently under construction have had significant kit fox mortality on site[21] despite (or possibly because of) "passive relocation". Additional measures should be included to monitor the dispersal and survival of the kit foxes, to assure that "take" does not occur. "Passive relocation" should not occur to occupied natal dens until after the young have dispersed.

5. Badger

As with the kit fox, badgers were identified as using the proposed project site (at 4.4-43), but the DEIR fails to provide data or an estimate of the number of badgers that will potentially be impacted by the proposed project. Literature on the highly territorial badger indicates that badger home territories range from 340 to 1,230 hectares[22], therefore it is unclear how many badger territories the proposed project will impact. Badgers are also "protected furbearing mammals" under California Code of Regulations, Title 14, section 460 and may not be "taken" at any time. . As such the DEIR fails to analyze the impacts to this species as required under CEQA. The revised or supplemental DEIR should identify the density of badgers on the proposed project site, including natal and other dens.

Because passive relocation is identified as an avoidance strategy (4.4-48), the DEIR must evaluate if suitable habitat occurs nearby and is not already occupied by existing badgers. Additional measures should be included to monitor the dispersal and survival of the badger, to assure that "take" does not occur. "Passive relocation" should not occur to occupied natal dens until after the young have dispersed.

6. Burrowing Owl

The DEIR notes that burrowing owls are located in the proposed project area (at 4.4-43). Results from the recent statewide census identified that the southeastern California harbors few Western burrowing owls[23]. Even more worrisome is the documented crash of burrowing owls in their former stronghold in the Imperial Valley. The Imperial Valley has had a recently documented decline of 27% in the past 2 years[24], resulting in an even more dire state for burrowing owls in California. Because burrowing owls are in decline throughout California, and now their "stronghold" is documented to be declining severely, the burrowing owls on this proposed project site become even more important to species conservation efforts. The recirculated or supplemental DEIR needs to evaluate the potential impact of the proposed project on this regional distribution of owls.

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[21] http://cdfgnews.wordpress.com/2012/01/24/dfg-investigates-first-cases-of-canine-distemper-in-wild-desert-kit-foxes/

[22] Long 1973, Goodrich and Buskirk 1998

[23] http://www.birdpop.org/DownloadDocuments/Wilkerson_and_Siegel_2011.pdf

[24] Manning 2009

No habitat acquisition specifically for burrowing owls is identified in the DEIR. Mean burrowing owl foraging territories are 242 hectares in size in uncultivated areas[25], although territories may be larger in arid desert regions. Therefore, additional mitigation acreage needs to be required – calculated using the mean foraging territory size times the number of owls. Using the average foraging territory size for mitigation calculations may not accurately predict the carrying capacity and may *overestimate* the carrying capacity of the proposed project site. Lastly, because the carrying capacity is tied to habitat quality, language should be included that mitigation lands that are acquired for burrowing owl be native habitats on undisturbed lands, not cultivated lands, which are subject to the whims of land use changes. The long-term persistence of burrowing owls lies in their ability to utilize natural landscapes, not human-created ones.

While "passive relocation" does minimize immediate direct take of burrowing owls, ultimately the burrowing owls' available habitat is reduced, and "relocated" birds are forced to compete for resources with other resident burrowing owls and may move into less suitable habitat, which may ultimately result in "take". A Monitoring Plan for the passively relocated birds needs to be included to assure that "take" has not occurred. Additionally if burrowing owl burrows are destroyed, constructed burrows should be identified as mitigation. Typically other projects in the California deserts have been required to construct two burrows for every burrow destroyed.

7. Golden Eagle

Surveys detected golden eagle on the proposed project site in 1999 (at pg.4.4-19), but the DEIR fails to evaluate the impact to the golden eagle territory(ies). While the project is not likely to impact golden eagles nests, because golden eagles in the desert primarily utilize cliff faces or trees for nesting, neither of which occur on the project site, the fact still remains that the proposed project has the potential to impact foraging habitat. The impact is not analyzed in the DEIR, and needs a thorough review in the REIR.

Large-scale industrial projects in the California deserts are being required to apply for a golden eagle take permit under the Bald and Golden Eagle Act. The proposed project should do so as well.

8. Cryptobiotic soils and desert pavements

The proposed project is located in the Mojave Desert Air Quality Management District area, which is already in non-attainment for PM-10 particulate matter[26]. The construction of the proposed project further increases emissions of these types of particles because of the disruption and elimination of potentially acres of cryptobiotic soil crusts. Cryptobiotic soil crusts are an essential ecological component in arid lands. They are the "glue" that holds surface soil particles together precluding erosion, provide "safe sites" for seed germination, trap and slowly release soil moisture, and provide CO2 uptake through photosynthesis[27].

[25] USFWS 2003
[26] http://www.mdaqmd.ca.gov/index.aspx?page=214
[27] Belnap 2003, Belnap et al 2003, Belnap 2006, Belnap et al. 2007

The DEIR mentions on-site cryptobiotic soil crusts (at 4.4-49) but fails to provide a quantitative evaluation of them on the site. The proposed project will disturb an unidentified portion of these soil crusts and cause them to lose their capacity to stabilize soils and trap soil moisture. The DEIR fails to provide any avoidance or minimization measures. It is unclear how many acres of cryptobiotic soils will be removed by the project. The revised or supplemental DEIR must identify the extent of the cryptobiotic soils on site and analyze the potential impacts to these diminutive, but essential desert ecosystem components as a result of this project. The implications of cryptobiotic soil disturbance and the effects on air quality must also be analyzed.

Additionally, the DEIR does not discuss desert pavements which are another key surface stabilizing feature of desert soils. The DEIR needs to quantify the acreage of desert pavement that occurs in the proposed project area and then evaluate the impacts including to the air quality from disturbance of desert pavement.

Wildlife Connectivity

In addition to the desert tortoise specific connectivity identified above in desert tortoise section, the DEIR fails to adequately evaluate general wildlife connectivity issues and the potential project impacts to connectivity corridors and linkages identified in the propose project area.. Recent desert connectivity studies identify the project area as a key linkage area between the Stepladder Mountains and the Mojave National Preserve[28]. This important issue needs to be thoroughly analyzed in an updated or supplemental EIR.

Plant Communities

While the DEIR notes that Stabilized or Partially Stabilized Desert Dunes and Stabilized or Partially Stabilized Desert Sand Fields occur on the proposed project site (DEIR at 4.4-4), the description of the species that occur in these communities suggest that they may indeed be rare plant alliances as defined by the California Department of Fish and Game[29], including the *Dicoria canescens - Abronia villosa* (Desert dunes) Alliance. Numerous rare alliances that include species documented on site occur under the broader category of Mojave Wash Scrub (DEIR at 4.4-3 through 4.4-4), yet the DEIR fails to adequately describe the types of Mojave Wash Scrub that occur on site, much less quantify the amount (acreage) as a basis for impact evaluation. Because the DEIR fails to quantify and accurately describe the plant communities, decision makers and the public can not evaluate the impacts to the common or rare plant communities.

Protected Plants

While the DEIR recognizes the San Bernardino County's Desert Native Plant Protection Ordinance (at pg. 4.4-53), it fails to include all species covered under that ordinance. In fact the

[28] http://www.scwildlands.org/downloads/DesertLinkageNetworkFINAL.pdf
[29] https://nrmsecure.dfg.ca.gov/FileHandler.ashx?DocumentID=24716&inline=1

ordinance[30] incorporates the State Desert Native Plants Act[31], which includes additional species that were documented on the proposed project site (at Appendix F2) that require permits including:

- All species of the family Cactaceae (cacti), except for the plants listed in subdivisions (b) and (c) of Section 80072
- All species of the genus Cercidium (palo verdes).
- Acacia greggii (catclaw).

While we support the avoidance of plants protected under both the San Bernardino Ordinance and the State Act, the DEIR's Bio mitigation measure 17 states that if avoidance is not possible the plants will be "moved or replanted" (at pg.4.4-53), and then based on this mitigation concludes that the impact is less than significant with mitigation. There are fatal flaws in DEIR's conclusion. First, the DEIR fails to evaluate or identify the number of plants that will be avoided versus the number that will need to be moved or replanted. Secondly, while little information is available on transplantation of desert plants, transplantation of rare plants has over a 90% failure rate.[32] Revegetation of desert lands is notoriously prone to failure[33], suggesting that the mitigation to move and replant species will likely result in mostly mortality rather than survival. Furthermore the potential for moving or replanting a creosote ring is unprecedented and likely unsuccessful. Despite the fact that no inventory of the number of creosote rings was provided in the DEIR, much less the number that would need to be moved or replanted, creosote rings are large, ancient plants, ranging from hundreds to over ten thousand years old[34] and successful transplantation of these ancient deep-rooted species is unlikely. Therefore, based on the mitigation proposed, the impact to these species will indeed be significant.

Rare Plants

The DEIR appears to rely on a *draft* rare plant report where surveys were conducted during a single three-day spring season rare plant survey in 2011 to evaluate the presence/absence of rare plants (at Appendix F3). It is unclear from the draft rare plant report (Appendix F3), exactly where the surveys occurred. In the summary it states that "The 2011 rare plant surveys were concentrated within the proposed pipeline route and …… This area is referred to as the "study area" throughout this report. <See comment gca3>" (Appendix F3 at pg.1). In the Methods section of Appendix F3, it states that "The survey area consisted of 100 feet on both sides of the Arizona and California Railroad Company's (ARZC) railroad tracks." (at pg. 10). No other survey data are provided for the remaining portions of the project site – specifically the proposed well field area, much less the proposed infiltration basin site. Therefore the DEIR fails to provide adequate baseline information on the status of rare plants on the proposed project site.

[30] https://www.co.**san**-**bernardino**.ca.us/countycodes/pdf/89-04.pdf
[31] www.dfg.**ca**.gov/habcon/**plant/cadesertplantact**.html
[32] Fiedler 1991
[33] Lovich and Bainbridge 1999
[34] Vasek 1980

In addition, the proposed project site is located in an area of the California desert that receives monsoonal precipitation during the summer, prompting germination and flowering of unique summer and fall annuals, some of which are rare. Because the rare plant surveys were only performed in the spring, none of these unique late summer/early fall annuals could ever have been detected. State and federal wildlife agencies recognize the importance of these late summer/early fall surveys and require them for other industrial developments in this part of the California desert. Therefore the absence of botanical surveys in late summer/early fall renders the data on rare plants incomplete.

With incomplete data, the DEIR fails to evaluate the impacts to rare plant species. Absent these essential and comprehensive surveys, the DEIR cannot accurately evaluate the impact to rare plants without first knowing what is on site. These surveys must be performed and the results of these surveys incorporated into the revised or supplemental DEIR.

Phreatophytes

Desert phreatophytes are legendary for their deep-rooting, and can utilize groundwater up to 40 feet to 200 feet deep, depending on the species. These phreatophytic communities often occur on the margins of dry lake beds in the Colorado, Sonoran, Mojave, and Great Basin deserts typically below 4,000 feet in elevation, but also along washes and other areas where consistent groundwater is available. These groundwater-dependent plant communities are also sensitive communities recognized by the California Natural Diversity Data Base (CDFG 2003) and BLM. The DEIR fails to actually identify the plant communities that occur around the Bristol and Cadiz lakes, instead focusing on just three plants species. Instead the DEIR relies on remotely sensed analysis, that incorrectly assumes that phreatophytic vegetation is identified by "denser growth, larger plants" (at Appendix F4), which is an incorrect assumption for desert phreatophytic vegetation. Other known phreatophytes that are documented in the proposed project area include the palo verde, smoke tree, and cat's claw, yet these species are not included in the groundwater effects analysis (at Appendix F4). Furthermore, it has been commonly documented that decreasing water tables often result in plant water stress and reduced live biomass in phreatophytes.[35] Therefore the DEIR's analysis of the impact of groundwater pumping on phreatophytic plant communities is flawed because it is based on incorrect assumptions about phreatophytic vegetation. The REIR will need to provide adequate field surveyed data and base the impact analysis on more accurate modeling.

The DEIR Fails to Provide Crucial Mitigation Plans for Biological Resources

Several of the mitigation measures in the DEIR call for future plans to be developed including:

- Desert Tortoise Avoidance and Protection Plan (ES-14)
- A 5-year Maintenance and Monitoring Plan (ES-15)
- A Habitat Compensation Plan (ES-15)

[35] Naumburg et al. 2005.

- Sensitive-status species and sensitive habitat restoration plan (at ES-15)
- Habitat compensation plan (at ES-15)
- Waters of the State mitigation plan (at ES-17)

All of these plans are key components to evaluating the adequacy of the avoidance, minimization and mitigation to biological resources by the proposed project. Their absence makes it impossible to evaluate the impacts from the proposed project. Each of these plans needs to be included with and thoroughly analyzed in the EIR.

In addition, other key plans are required but not addressed in the DEIR. They include but are not limited to:

- Translocation plan for Mojave fringe-toed lizards;
- An avian and bat protection plan
- Transplantation plan for native trees;
- Desert kit fox and badger "passive relocation" plans;
- Burrowing owl relocation and monitoring plan;
- Raven reduction plan;

As above, without an opportunity for decision makers and the public to review the clear avoidance, minimization and mitigation measures set forth in these plans, it is impossible to evaluate the impacts and adequacy of any proposed measures.

The Project Must Comply with the Endangered Species Acts

The project is subject to the Endangered Species Act ("Act"), and must fully comply with the Act's provisions. Section 9 of the Endangered Species Act of 1973, and Federal regulations issued pursuant to section 4(d) of the Act, prohibit take of endangered and threatened species without a special exemption. 16 U.S.C. 1531 et seq. Section 7 of the Act requires Federal agencies to consult with the United States Fish and Wildlife Service ("USFWS") should it be determined that their actions may affect federally listed threatened or endangered species. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by USFWS to include significant habitat modification or degradation that actually kills or injures a listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by USFWS as an action that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

Private landowners, corporations, state or local governments, or other non-Federal landowners who wish to conduct activities on their land that might harm species that are listed as endangered or threatened should develop a Habitat Conservation Plan (HCP), designed to offset any harmful effects the proposed activity might have on the species.

The California Endangered Species Act (CESA) prohibits the taking of an endangered or threatened species except in limited circumstances. Specifically, under section 2081 of the Fish and Game Code, CDFG may grant permits ("ITPs") allowing the taking of an "endangered species, threatened species, and candidate species" if the take is incidental to an otherwise lawful

activity, the impacts are minimized and fully mitigated, and the applicant ensures adequate funding to implement and to monitor compliance with and effectiveness of the mitigation measures. (Fish & G.Code § 2081 (a)-(b).) The DEIR fails to provide adequate information about avoidance or minimization measures for the state threatened desert tortoise. Additionally, it fails to provide clear mitigation in order to evaluate if the fully mitigated standard has been met.

Inadequate Analysis of Cumulative Impacts to Biological Resources

The cumulative impact analysis for biological resources is wholly inadequate. In addition to the inadequate and inaccurate impact analysis of the proposed project as detailed above, the cumulative analysis, while listing many of the current or reasonably foreseeable future projects still concludes "the impacts of the proposed Project would not contribute considerably to a cumulatively significant impact to biological resources in the eastern California deserts" (at 5-32). However, no quantitative analysis is provided upon which to base that determination. Even with "mitigation", industrial projects result in decreased habitat, and mitigation is not off-setting those impacts.[36] Furthermore, "considerably" is unclearly defined. A much more comprehensive cumulative impact analysis is needed in the REIR.

Chapter 4.5 – Cultural Resources

Failure to Provide Adequate Information Regarding Field Survey

Pages 4.5-22, 4.5-23: The DEIR outlines a field survey in which surveyors searched for cultural resources by walking on either side of the railroad. However, the DEIR does not detail if or how the surveyors determined whether any subsurface cultural resources exist. Given that cultural resources may be hundreds of years old and easily buried in the desert environment, it is unclear whether any attempt was made to identify possible cultural resources that are not readily visible. The EIR must explain how the surveyors determined whether subsurface cultural resources existed.

Failure to Provide Analysis of Ineligibility of Cultural Resources

Page 4.5-23: The DEIR subsection entitled "Significance Evaluation of Cultural Resources" identifies forty-one resources located or updated within the pipeline area during the field survey. The DEIR proceeds to outline ten of these resources in Table 4.5-3, but dismisses the remaining thirty-one because "they do not appear to be eligible for listing in the CRHR [California Register of Historic Resources] and are therefore not considered significant under CEQA." The DEIR does not explain why these thirty-one resources are not eligible for listing in the CRHR. The DEIR also misstates the law by stating that a resource not eligible for listing is by default not considered significant under CEQA. While a resource listed in the CRHR is a "historical resource" under CEQA Guidelines § 15064.5(a)(1), unlisted or ineligible resources are not categorically excluded; a lead agency may choose to treat such resources as "historical

[36] Moilanen et al. 2009; Norton 2008

resources." *Id.* § 15064.5(a)(4). The DEIR's conclusory language and dismissal of the majority of the affected cultural resources without explanation demonstrates a lack of a "sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences." Guidelines § 15151. The EIR must provide relevant information about all affected cultural resources, and explain the criteria used to determine whether a resource is eligible for listing in the CRHR. If a resource is not eligible, the EIR must explain why it was nevertheless not considered significant.

Failure to Investigate Possible Cultural Resources in the Wellfield Area

Page 4.5-29: The DEIR provides insufficient and incomplete information regarding cultural resources in the wellfield portion of the Proposed Project area. The DEIR details the resources found in the pipeline area, but completely neglects the wellfield area. The DEIR admits that "[l]ess than 10 percent of the wellfield portion of the project area has been previously surveyed. . . . No archeological survey of the wellfield portion of the Project area was conducted as part of this study . . . ." The DEIR continues to note that the condition of previously and potentially eligible resources "have not been confirmed, nor has it been determined the number and types of any cultural resources that might be present in the wellfield portion of the Project area." Without complete information regarding possible cultural resources in the wellfield area, the DEIR has insufficient data to reach the conclusion that all the cultural resource impacts would be "less than significant with mitigation."

Failure to Adequately Analyze Impacts on Resource CA-SBR-9853H (the ATSF Railroad, Parker Cutoff) and Resource CA-SBR-11583H (the Cadiz-Parker Road)

Page 4.5-40: The DEIR fails to adequately analyze impacts on the ATSF Railroad, Parker Cutoff and the Cadiz-Parker Road that would result from surface and subsurface disturbance during construction. On page 4.5-41, the DEIR notes:

> Potential impacts to significant cultural resources can include both surface disturbance by vegetation removal and by the movement of large construction vehicles and equipment and subsurface disturbance through excavation or grading. Damage or destruction of significant historical resources would be a significant impact.

However, the DEIR does not sufficiently consider these impacts when evaluating the Proposed Project's effects on the above-named resources. The DEIR states that the proposed pipeline would be constructed "at least 50 feet" from the ATSF railroad, but then qualifies that statement and admits that "in some areas the pipeline may need to cross under the railroad." (DEIR, p. 4.5-40.) Additionally, the DEIR states that there would be "no significant impacts" to the Cadiz-Parker Road although that road would be used during Project construction. The dirt road dates to 1916 and the DEIR does not address that the use of heavy machinery and construction traffic on the Road may have the potential to alter the Road's integrity. The DEIR fails to support its conclusions with adequate analysis. The EIR must specifically explain why using jack and bore or directional drilling construction would not impact the eligibility of the ATSF Railroad, Parker Cutoff for listing in the CRHR. The EIR must also substantiate the conclusory claim that the

Cadiz-Parker Road's eligibility for CRHR listing would not be affected by heavy machinery and construction traffic.

Avoidance of Critical Analysis of Archeological Resources

Page 4.5-43: The DEIR has not identified the possible archeological resources that may be affected by the Proposed Project and has instead deferred analysis of the issue, depriving the public and government decision makers of the information needed to make informed decisions about the Project. The DEIR explains that a portion of the Project area, including the wellfield, has not yet been surveyed and would require "a survey and identification of cultural resources" at a later time. An EIR may not "simply defer any statement setting forth a significant environmental effect of a proposed project." *Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal.App.4th 182, 205 (1996). The DEIR recognizes that unidentified resources may be affected. The EIR must identify and address the potential effects of the Proposed Project on those resources.

Chapter 4.6 – Geology & Soils

The "Geology and Soils" analysis suffers from many of the same defects as the remainder of the DEIR. The analytical models use inappropriate time frames and estimated water recharge rates. Mitigation measures are described as effective when the problems they purport to solve, such as subsidence, are by their very nature unsolvable by the time the problems are discovered. These analytical deficiencies do not support the conclusions reached in this chapter and do not provide support for reasoned and informed decision-making.

Failure to Use Appropriate Time Frame for Recovery Period

Page 4.6-28: The time frame used by Geoscience in preparing its groundwater flow and transport model is inadequate. The model assumes a recovery period of 50 years, which would begin after the Proposed Project's 50 years of pumping. The impacts from the Proposed Project, however, would continue well beyond the 50-year recovery period. The cone of depression is expected to continue growing even after 50 years of pumping. (*See* DEIR, Appendix H1A, Geoscience Support Services, Inc., *Volume 1: Report – Cadiz Groundwater Modeling and Impact Analysis*, p. 49 (Sep. 1, 2011).) Recovery could take up to 400 years. Under California law, "[d]irect and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and *long-term effects*." Guidelines § 15126.2(a) (emphasis added). The model fails to account for "long-term effects." Accordingly, the EIR must justify the assumption of a recovery period of 50 years.

Failure to Use a Reasonable Recharge Rate

Page 4.6-28: The Project Scenario unreasonably assumes a recharge rate of approximately 32,000 AFY. Per the hydrology comments in this letter, the best estimate of recharge is approximately 16,000 AFY. The EIR must recharacterize the 16,000 AFY "sensitivity scenario" as the "Project Scenario."

Failure to Use Proper Annual Pumping Rates in the Groundwater Model

Page 4.6-28: The groundwater model used the average of 50,000 AFY of pumping to determine the effects on the aquifer. However, the Proposed Project would pump between 25,000 and 75,000 AFY. The model's conclusions are therefore unreliable because they do not accurately reflect the yearly fluctuations in pumping. The maximum pumping rate is *three times* the planned minimum, indicating that the Proposed Project's effects on groundwater levels, the freshwater-saline interface, and subsidence in maximum pumping years would vary considerably from the effects in average and minimum pumping years. The environmental effects seem likely to be proportional to the amount of water pumped. By using an average number, the DEIR fails to account for these potential yearly variations, especially in years where significantly more than the average would be pumped. Accordingly, the EIR must substantiate the use of the 50,000 AFY average in the groundwater model. In addition, the EIR must estimate the actual pumping rate for each year of the Proposed Project to provide accurate geological data.

Failure to Properly Characterize the Feasibility of Correcting Geologic Impacts

Page 4.6-29: This section states that the action criteria are set for each impact area, "thus insuring [sic] adequate time to implement the corrective actions and avoid significant impact." The DEIR fails to establish what constitutes an adequate time and the effectiveness of each corrective actions. In addition, the DEIR is misleading because it implies that *corrective* actions can in fact be taken. However, some geologic impacts cannot be corrected. Once subsidence has occurred, it cannot be undone. Nor can a landslide or liquefaction be reversed. Because some impacts cannot be corrected, it is impossible to ensure that adequate time even exists to be able to correct the impacts. The EIR must explain how the "adequate time" will be calculated to correct geologic impacts that may be uncorrectable by their nature.

Failure to Mitigate the Potential Impacts of Subsidence

Page 4.6-38: Mitigation measure GEO-1 incorrectly asserts that subsidence can be arrested. First, subsidence in itself is an environmental impact. Repairing damaged structures may cure one of the effects of subsidence, but does not arrest subsidence. Revising pumping locations might also be ineffective because subsidence could occur as the result of overall drawdown, not just in isolated areas related to well location. Finally, stopping pumping is unlikely to arrest subsidence because the pumping rate is well beyond the natural recharge rate and the aquifer would take decades to recover. Therefore, the mitigation measures—reduced pumping, revision of pumping locations, stopping all extraction, and repairing damaged structures—would be unlikely to arrest subsidence. Accordingly, the DEIR's conclusion that the impact of subsidence is "less than significant" may not be justified. The EIR must explain precisely how these mitigation measures would arrest subsidence within a reasonable time frame, individually and in concert.

Chapter 4.7 – Greenhouse Gas Emissions

The greenhouse gas ("GHG") emissions analysis is insufficient because it unreasonably interprets uncertainty to the benefit of the Proposed Project and fails to explain the parameters of

the impact analysis, including which benchmark is adopted. Furthermore, it provides mitigation options that are impossible to gauge in the absence of an adopted benchmark. Although the CEQA Guidelines grant significant discretion to the Lead Agency to choose how to analyze a given project's GHG effects, the agency must "make a good-faith effort, based to extent possible on scientific and factual data." Guidelines § 15064.4(a). It is not in good faith to analyze only one possible scenario, especially considering the uncertainty, to conclude that the Proposed Project is necessary for reliable water delivery in Southern California.

Failure to Consistently Describe the Effects of Climate Change on Precipitation and Recharge

Pages 4.7-6 to 4.7-7: This section is internally inconsistent. It acknowledges that the effects of climate change on precipitation and recharge in the Project area watersheds are "uncertain," (DEIR, p. 4.7-6.,) but the uncertainty is then unreasonably resolved in favor of the Proposed Project. It concludes that the "total amount of natural recharge that occurs each year in the basin should be relatively unchanged over the long-term." (DEIR, p. 4.7-7.) That, however, is inconsistent with the "general consensus" that "climate change is expected to shift precipitation and snow melt patterns." (DEIR, p. 4.7-6.) If more winter precipitation is in the "form of rain, instead of snow," it is likely that the seepage rate will also decline. Without addressing the potential decline in seepage rate or discussing other scenarios, the DEIR unreasonably states that "[c]urrent geological assessments of the aquifer system . . . suggest that the Proposed Project's recharge rate is *unlikely to be materially affected* by climate change." (DEIR, p. 4.7-7 (emphasis added).) Finally, the claim that "relatively little has been written about the impacts of climate change on groundwater recharge" is also unsubstantiated. (*Id.*) Given this uncertainty, the EIR should consider more than just one scenario as a result of climate change than the one that favors the Proposed Project. Without a "good-faith effort," the claims of stability are unreliable and cannot inform public participation and decision-making. Guidelines § 15064.4(a).

Failure to Explain the Parameters of the Impact Analysis for GHGs

Page 4.7-19: This section does not explain why only measures W-1 through W-5 were selected for review. Although these are the only measures listed under the heading "Water" in Table 4.7-2, other measures might also be applicable. Measure T-4, Vehicle Efficiency Measures, could apply to construction and operation vehicles. Measure I-1, Energy Efficiency and Co-Benefits for Audits for Large Industrial Sources, could apply to the natural gas turbines used to power the wells. The EIR must explain why only measures W-1 through W-5 were chosen for review and in the alternative, consider including other measures.

4.9. Hydrology

The DEIR fails to provide an adequate analysis of the current hydrogeologic conditions and reasonably foreseeable impacts of the Proposed Project. The technical models and analyses underlying the DEIR rely to varying degrees on insufficient, unclear, and/or inconsistent data, an opaque process, and improper analysis, which in turn lead to scientifically unsupportable conclusions. The DEIR's impact analysis and monitoring/mitigation planning, which depend on

these scientific findings, are therefore unreliable. Further, impacts caused by the storage and recharge components of the Proposed Project receive only cursory treatment. And, by not providing sufficiently reliable information to foster informed public participation and decision-making, the hydrogeological analysis in the DEIR fails to meet the informational requirements of CEQA.

The following comments are based on the commissioned expert reports of Dr. John Bredehoeft, an exceedingly well respected hydrogeologist and a contributor of multiple reports on the 2001 project (for 2001 reports, see Appendix B to these comments; incorporated in the present comments by reference), and Andrew Zdon, Principal Hydrogeologist for Johnson Wright environmental consulting. These reports were commissioned by NPCA to facilitate an independent review of the water supply as assessed in the DEIR and underlying studies. Mssrs. Bredehoeft and Zdon's reports are both incorporated fully by reference, and related to the contents of the DEIR below.

As a result of the widely differing accounts of groundwater recharge in the proposed project, and the repeated habit of the project proponent to vastly overstate the recharge, a neutral estimate of recharge should be provided by USGS and relied upon to judge impacts. USGS has already provided such an estimate, in fact, and this estimate should be re-confirmed and relied upon as a neutral, independent source. Due to its expertise in groundwater management and estimation, USGS must be directly involved in the entire environmental review process and, if the Proposed Project were to be implemented in any form, monitoring and mitigation.

Summary of Water Issues:

1. The estimation of recharge rates is fundamentally flawed because it is at least twice that of any other recharge rate assessed by other experts. The recharge analysis further (i) unreasonably characterizes other experts' estimated recharge rates; (ii) uses old U.S. Geological Survey ("USGS") evapotranspiration data without explaining why newer data is not used; and (iii) does not explain why it uses substantially different hydrologic parameters than the other models. Both independent hydrogeologists contracted by commenters estimated the actual recharge at between 14,000 and 16,000 AFY, and Dr. Bredehoeft suggests that the actual rate may be far lower. With such low recharge rates, both experts agree that the fundamental purpose of this project cannot be conservation and must be considered groundwater mining and export

2. The evapotranspiration of water to be exported is grossly overstated; actual evapotranspiration would occur at a small fraction of that estimated in the DEIR. This poor measurement is important because the project's primary stated purpose, conservation, is supposedly measured by the amount of water exported that would otherwise evaporate. Yet the evaporation rate is far lower than the DEIR uses as its rate. If avoided evaporation is the main metric for judging the success of the proposed project

and the preferred alternative, then the project is a resounding failure. For supposed justification of the project, the use of a grossly exaggerated rate is unacceptable.

3. The cone of depression is improperly measured; the cone caused by pumping will continue to expand for over 100 years—long after pumping stops. The DEIR fails to adequately account for the fact that this continued expansion of the cone of depression will be uncontrollable by groundwater management or other proposed mitigation activities in the basin, and does not adequately discuss or analyze the impacts created from a long-term cone of depression.
4. The monitoring and mitigation plan does not have sufficiently defined milestones and decision points to overcome the uncertainty associated with the technical analyses. By the time an impact is discovered, it will likely be too late to mitigate the problem through groundwater management, particularly after pumping has already stopped. For example, the monitoring of the springs is insufficient because visual inspection is unlikely to reveal problems until it is too late to mitigate the damage.
5. The monitoring and mitigation plan lacks sufficient independent oversight. Groundwater management will be under the sole direction and control of the Fenner Valley Mutual Water Company ("FVMWC"). Further, the Technical Review Panel does not have any representatives from local stakeholders, such as the BLM or Mojave National Preserve.
6. The Geohydrologic Assessment of the Fenner Gap Area (aquifer testing) largely ignores hydrologic data gathered over the last 20 years. Among our concerns are that: (i) data from Cadiz's own wells are largely excluded; (ii) the relationship of the new data to the previously collected data is left unexplained; (iii) there is no evidence that the aquifer testing was performed according to independent standards; (iv) the true static groundwater levels are questionable; and (v) corrections to groundwater elevations for barometric pressure changes are not explained. As a result, the data provided by this aquifer testing are unreliable. Subsequent impact analysis and mitigation planning based on this data and analysis is similarly unreliable and inadequate.
7. The groundwater impacts analysis is flawed because the possible subsurface underflow to the south of the upper Fenner Watershed (beneath Mojave National Preserve) is not adequately explained. The projected effects of climate change—most notably reduced rainfall—are not adequately addressed in the impact analysis. Moreover, model impacts are not evaluated after 100 years—even though the cone of depression will continue to expand after 100 years and groundwater storage may take up to 440 years to recover.
8. The impacts of the Proposed Project on springs are not sufficiently explained because of missing data and confusing and incomplete analysis.
9. The DEIR fails to sufficiently acknowledge and address impacts from the imported groundwater component mixing with the unadulterated groundwater. The DEIR does not explain how this activity will comply with State Resolution 68-16.

1. Failure to Properly Estimate the Groundwater Recharge Rates

The estimation of recharge rates included in the report, *Cadiz Groundwater Conservation and Storage Project* ((CH2M Hill, 2010), presented as Appendix A in Volume 2 of *Cadiz*

Groundwater Modeling and Impact Analysis (GSSI, Sep. 1, 2011), DEIR, Appendix H1B), results in an unreasonably high estimate, more than double the estimate reached by our two hydrology experts and others, that is not supported by the data and analyses in the DEIR. The rationality of the entire Proposed Project depends largely on the relationship between the annual pumping rate and the recharge rate. Without proper support for the estimated recharge rate in the DEIR, the Proposed Project's impacts cannot be adequately predicted and could extend well beyond 100 years. The DEIR itself posits that recharge could take up to 400 years using the lower recharge estimate. With such a broad potential time span, proper monitoring seems impossible and the effectiveness of proposed mitigation measures is largely speculative.

In 2010, CH2M Hill performed a modeling analysis using the USGS programs INFIL3.0 and MODFLOW to re-evaluate the estimated groundwater recharge that was previously estimated by Geoscience Support Services (1999). Based on these efforts, the average annual "recoverable" water quantities for the Fenner Watershed area are estimated at 30,191 AFY and 2,256 AFY for Orange Blossom Wash (32,447 AFY combined). Both of the hydrogeologists contracted by commenters view this result as grossly overstated.

As part of the hydrogeologist Andrew Zdon's review and analysis, he used a discharge evaluation based on more recent evapotranspiration data than were used in the CH2M Hill analysis. Continuous micrometeorological data collected over a four year period in Death Valley were used to estimate evapotranspiration rates over the area evaluated (DeMeo, et.al. 2003). Our analysis resulted in more consistent and generally improved estimates of groundwater discharge than in previous studies (San Juan, et.al. 2004). The resulting midpoint evapotranspiration rate estimates were 0.13 feet per year (ft/yr) for salt-encrusted playa and 0.15 ft/yr for bare-soil playa. Assuming the 0.15 ft/yr evapotranspiration rate, it can be assumed that there is 8,947 AFY of evapotranspiration losses from the Bristol and Cadiz playas (based on the area in which evapotranspiration takes place in the model). Taking our analysis one step further and adding the estimated annual pumpage from the basin of approximately 5,000 AFY (and assuming that the basin is in hydrologic balance or inflow equals outflow), an estimated recharge of approximately 14,000 AFY (plus the volume of spring discharge) can be inferred from the Johnson-Wright expert report. Of note is that total spring charge has not been estimated in the DEIR. The estimated recharge of approximately 14,000 AFY plus spring discharge is very similar to the best estimate of Davisson (2000, 2012). Dr. Bredehoeft's report estimates recharge at a slightly higher but similar level, 16,000 AFY. However, Bredehoeft also believes the actual rate could be much lower.

As a comparison, the recharge volumes estimated in the DEIR are greater than the natural recharge to the Coastal Plain of Orange County basin (29,000 AFY) (California Department of Water Resources, 2004), and the combined recharge from stream flow in the Bishop Creek to Big Pine Creek region (and inclusive of intermediate streams) of the eastern Sierra Nevada (Danskin, 1991).

The following are more detailed comments on the recharge estimation report. All citations are to *Cadiz Groundwater Conservation and Storage Project* (CH2M Hill, 2010) unless otherwise indicated.

a. CH2M Hill's analysis used old evapotranspiration rates when newer data was available.

(Page 4-17 – Section 4.2.4, Discussion of Groundwater Flow Model Results)

The EIR must explain why it did not use USGS's Death Valley data to determine evapotranspiration rates in the Project area.

b. Total spring charge is improperly excluded from this analysis.

The EIR must explain why total spring charge was excluded.

c. This analysis misrepresents the work of other experts—Davisson and Rose

(Page 4-8 – Section 4.1.8.1, Comparison to Most Recent Recoverable Water Estimates)

The text states, "INFIL3.0 simulation results compare favorably to GSSI (1999) watershed water balance modeling results and the Davisson and Rose (2000) Maxey-Eakin recoverable water estimate of 29,815 AFY . . . ." Davisson and Rose presented a range of groundwater recharge estimates (referred to as "recoverable water" in the CH2M Hill report) ranging between 7,864 AFY to 29,185 AFY. Personal communications between Mr. Zdon and Davisson (January 18, 2012) indicate that a best estimate of groundwater recharge based on their work would be closer to the regional precipitation-elevation curve of 16,214 AFY. The 29,185 AFY estimate was a maximum estimate. Therefore, the estimated recharge rate developed by CH2M Hill (2010) and Geoscience Support Services (1999) generally represents a two-fold increase in estimated recharge in comparison to other estimates. The EIR must explain why Davisson and Rose's maximum recharge rate was not properly represented, and explain the impacts of this misrepresentation on the findings and conclusions of the recharge analysis. The EIR must also explain the impact of using the properly characterized Davisson and Rose best estimate of recharge (16,241 AFY), particularly how the findings and conclusions would differ.

d. The groundwater recharge analysis is opaque and relies on non-disclosed assumptions.

(Page ES-5, Validation of Recoverable Water Estimate, Paragraph 1)

The three-dimensional model described in the DEIR was constructed using the USGS program MODFLOW. Given that calibrated hydraulic conductivity values

described appear to vary considerably from those calibrated hydraulic conductivity values described in the Impact Analysis (Geoscience Support Services, 2011), it is unclear on what assumptions the CH2M Hill numerical model was based. The EIR must describe and explain these assumptions.

e. The groundwater recharge analysis does not explain how evapotranspiration was modeled.

(Page ES-5, Validation of Recoverable Water Estimate, Paragraph 1)

Evapotranspiration losses from the playas play a key role in the hydrologic budget. The EIR must explain how playa evapotranspiration was modeled.

f. The analysis improperly relies on substantial generalizations instead of performing a sensitivity analysis, which enhances uncertainty and unreliability.

(Figures 2-10 through 2-12)

The figures indicate that for the purposes of the recharge evaluation, large areas (in the hundreds of square miles) are assumed to have similar characteristics. Given the local landscape, it is clear that substantial generalization is incorporated into these figures and the resulting analyses. More detailed mapping of surface conditions would not likely be feasible under typical project constraints. Therefore, in order to account for these generalizations or unknowns, the INFIL3.0 modeling must be subject to a sensitivity analysis of input parameters (i.e., evaluate the effect of altering input parameters on model results) to evaluate sensitive parameters that may have a high degree of uncertainty leading to overall model uncertainty.

g. The groundwater recharge analysis fails to explain why two different models were used—CH2M Hill and GSSI—and fails to explain why the hydrological parameters of the models are substantially different.

(Page 4-10)

Referenced here is a numerical model developed by CH2M Hill that varies substantively from that presented by the GSSI model previously discussed. The EIR must explain the differences between the two models and why the CH2M Hill model (which was apparently completed prior to the GSSI model) is reliable given the substantial differences in hydrologic parameters used, results of sensitivity analyses, and calibration. The EIR must explain the assumptions used in the CH2M model and how they compare to the assumptions used in GSSI's model.

h. There is no evidence that the CH2M Hill Model was performed in accordance with standard practice.

(Page 4-10)

Standard documentation of numerical groundwater flow modeling efforts, as described by ASTM, Anderson and Woessner (1992), and others, is not provided. The EIR must provide this standard documentation to enable the model to provide substantive support for the estimated groundwater discharge.

i. <u>This analysis improperly uses geologic data from Texas instead of from the Project area.</u>

(Page 4-17 – Section 4.2.4, Discussion of Groundwater Flow Model Results)

The EIR must describe why carbonate rock units from the Death Valley region, which are correlative with those carbonate units in the Project area and which have been extensively studied, were not evaluated in lieu of more distant carbonate rocks from Edwards Aquifer in Texas.

2. <u>Evapotranspiration is grossly overestimated in calculating the amount of recoverable water and the related estimate of "conservation" of water that would otherwise evaporate</u>

(Page ES-3, Paragraph 2) The text states that "Total recoverable water, therefore, is equal to the amount of recharge to the groundwater system in the Fenner Watershed, which is approximately equal to the amount of groundwater flow through Fenner Gap through the alluvial and carbonate rock units." With respect to this statement, the total recoverable water would actually be the amount of recharge to the groundwater system minus any evapotranspiration losses from springs and spring vegetation. The EIR must explain why its calculation of the total recoverable water does not consider evapotranspiration losses.

More importantly, the Johnson-Wright report provides extensive critique of the flawed use of evapotranspiration. Evapotranspiration rates "allowed to vary substantially between recharge scenarios even though evapotranspiration would be unlikely to change." (J-W p.10) According to that report, "Evapotranspiration rates of greater than 50 ft/yr for Cadiz Dry Lake and 20 ft/yr for Bristol Dry lake are "substantially" above the pan evaporation rate, and nearly <u>five times</u> the evapotranspiration rate for Cadiz Dry Lake. "These are geologically unreasonable evapotranspiration rates for use in the model….that the evapotranspiration rates had to be increased to the extent described above indicates that there is a problem elsewhere in the model." (Johnson-Wright p.10)

Further points on evapotranspiration:

- (JW-10) The EIR's evapotranspiration rate is <u>ten times</u> the USGS evapotranspiration rate from playa soils in Death Valley.

- (JW-10) Cadiz dry lake is where most of the evapotranspiration is claimed to occur, yet **<u>the evapotranspiration model did not include most of Cadiz dry lake</u>.** Using such a rough (and, as it turns out, wildly inflated) estimate of evapotranspiration as a basic data

point to evaluate impacts in the EIR is unacceptable and a blatant failure to accurately assess project impacts. If the model boundary actually included Cadiz dry lake, such wild estimates could have been lessened or avoided entirely. On a related note, there was no sensitivity analysis performed for

- The analysis used geologically unreasonable evapotranspiration rates:

  (Page 36)

  The evapotranspiration rates used, greater than 50 ft/yr for Cadiz Dry Lake and 20 ft/yr for Bristol Dry Lake, are substantially above the pan evapotranspiration rate (nearly five times the pan evapotranspiration rate for Cadiz Dry Lake) and therefore geologically unreasonable. According to the text, "maximum evapotranspiration rates used were based on model calibration results in order to obtain a more reasonable evapotranspiration from the dry lakes and a better match between the model-calculated and observed water levels." GSSI Report (2011b), p. 36. That the evapotranspiration rates had to be increased to the extent described above indicates that there is a problem elsewhere in the model.

  The text also states that "Results show an average of 19 inches/year over those cells where evapotranspiration is occurring in this run which is a reasonable average." This is approximately ten times USGS's estimated evapotranspiration rate from playa soils in Death Valley.

  The text states that, "For Cadiz Dry Lake, the maximum evapotranspiration rate was adjusted by a factor of approximately 2.5 from the maximum evapotranspiration rate of the Bristol Dry Lake due to the fact that most of the Cadiz Dry Lake area is outside of model boundary." This statement suggests that the model grid was either not widespread enough (thereby improperly constructed) or that there was a flaw in the logic behind evapotranspiration calibration. Concentrating evapotranspiration discharge in one location as a means to calibrate groundwater elevations when a substantial portion of the discharge from evapotranspiration is not taking place at that location in which groundwater levels are being calibrated is not appropriate. This would be analogous to a hypothetical significant discharging production well at a distant location being moved to this location in the model to assist with model calibration and suggests a need to expand the grid to encompass Cadiz Dry Lake. The EIR must explain why Cadiz Dry Lake was assigned an evapotranspiration rate 2.5 times the rate of Bristol Dry Lake solely because Cadiz Dry Lake is outside of the model boundary. The 2.5x multiplier is arbitrary as currently unsubstantiated in the DEIR. The EIR must also explain why the model grid does not include Cadiz Dry Lake since the evapotranspiration rates from this dry lake bear directly on the hydrological resources and impacts of the Proposed Project.

  The high evapotranspiration rates appear to be symptomatic of the amount of water that is needed to be discharged from the playa based on the existing

recharge estimate. This symptom was present in the previous modeling (GSSI, 1999) where in lieu of the evapotranspiration rates being increased to the extent they are in the current analysis, the discrepancy was resolved with an extinction depth of 100 feet below ground surface (described in the current analyses is geologically unreasonable[37]).

The EIR must substantiate the evapotranspiration rates used in the model, and explain why the rates are treated as variables for the purpose of calibrating the model instead of as constants, or near-constants.

Finally, there is the issue of the relative evaporation rate of the recharge/storage water when sitting in recharge ponds, and whether that water evaporates at the same rate as the water supposedly evaporating from the dry lakes' surfaces. It appears that the evaporation rates used to justify the "conservation" principle are different from those used to justify the efficiency and effectiveness of the recharge/storage. This discrepancy must be reconciled in the EIR.

3. <u>Flawed Analysis of Cone of Depression</u>

Cones of depression are only measured for immediate post-pumping and 50 years after pumping ceases; the cones of depression should show how groundwater elevations change over time given the proposed management regime, and should be illustrated for over 100 years as the cone will continued to expand (meaning that groundwater levels will continue to decrease.) Given the cone of depression will continue to expand even after 50 years of shutdown, "it will likely be too late to make substantive changes in groundwater management to mitigate the problem." (Johnson-Wright W-8; 12; 14)

4. <u>Failure of Monitoring/Mitigation Plan to Prevent or Reduce Potential Future Impacts</u>

The Proposed Project proposes to substantially reduce the volume of groundwater in storage and reduce groundwater levels over much of the groundwater basin. Given the large scope of the Proposed Project, and the sheer size of the planned cone of depression, it may take many years before groundwater level and/or spring impacts are identified. As shown in the impact analysis by the cone of depression that continues to expand even after 50 years of shutdown (at year 100), by the time an impact occurs, it will likely be too late to make substantive changes in groundwater management to mitigate the problem. This will be particularly true for those impacts that begin to arise after the Proposed Project has already ceased pumping. The Proposed Project lacks needed proactive groundwater management that would prevent unintended impacts from occurring to surrounding land owners and sensitive receptors.

The absence of a more rigorous spring monitoring program with specified thresholds and triggers for reduced or ceasing pumping is not appropriate. Visual observations of changes in spring flow will only begin to be obvious when a significant impact to a

[37] The current extinction depth used is 15 feet below ground surface.

spring is already occurring. Given the time lag between shutting off pumping and the growth of the outer edges of the cone of depression, an observed impact will likely be too late to be protect the springs and their associated habitat. The DEIR and its accompanying analysis fail to demonstrate that the proposed spring monitoring will detect an impact in time to protect the springs and their associated habitat.

The groundwater and spring monitoring/mitigation plans must be re-evaluated and a more in-depth investigation into the impacts on springs must be performed. In particular, the sources of the spring water must be identified. Among the questions that need to be answered are: (i) whether any of the springs are fed through fractures; and (ii) whether the springs are only fed from surface runoff. The DEIR explains that the cone of depression would reach the same elevation as Bonanza Springs. The EIR must explain any effects on Bonanza Springs caused by the cone of depression reaching the same elevation. The revised monitoring/mitigation plan must include specific measurable conditions that would trigger specific actions to reverse and/or remedy any effects on springs. The mitigation plan in the DEIR is insufficiently general and lacks effective trigger points.

5. <u>Failure of Monitoring/Mitigation Plan and Technical Review Panel to Include Independent Oversight</u>

FVMWC will manage the Proposed Project and implement the Groundwater Management, Monitoring, and Mitigation Plan ("GMMMP"). The parties that comprise FVMWC are the participating water providers (including SMWD), Cadiz, and the Arizona and California Railroad (ARZC). (*See* DEIR p. 3-14.) Local stakeholders, such as the Mojave National Preserve, BLM, local landowners, and Native American Tribes and Land Trusts are excluded from the management/mitigation process. This lack of stakeholder involvement means that there will be a lack of adequate independent oversight over the Project operations and mitigation. Moreover, the Technical Review Panel fails to include any technical representatives to represent these other stakeholders (e.g., landowners, BLM, USGS, etc.). As presented, the Technical Review Panel will consist of one member of FVMWC, one member from San Bernardino County (under an MOU with FVWMC), and one member jointly selected by the County and the FVMWC.

This lack of stakeholder participation and exclusion from the Technical Review Panel is particularly troubling in light of two important facts. First, most of the natural groundwater in the Fenner Valley originates in the mountains located in the Mojave National Preserve. *See* NPS Scoping Comments, p. 3. Second, the USGS has extensive knowledge of the hydrogeological conditions of the Project area, the surrounding areas, and the region. The USGS prepared extensive data to support NPS scoping comments on this Project and performed extensive hydrological analyses concerning the prior Cadiz project in 2000. The involvement of USGS and other stakeholders is necessary to ensure that the Project's effects on local and regional hydrological systems and dependent ecosystems are properly monitored, understood, and mitigated where necessary.

A EIR should include important stakeholders in Proposed Project management (monitoring and mitigation) and the Technical Review Panel, or explain why they were excluded.

6. <u>Failure to Properly Analyze Past and Existing Aquifer Conditions</u>

Geoscience Support Services, Inc. (GSSI) prepared a report on existing aquifer conditions, the *Geohydrologic Assessment of the Fenner Gap Area* (presented as Appendix C of Volume 2 of the *Cadiz Groundwater Modeling and Impact Analysis* (GSSI, Sep. 1, 2011), DEIR, Appendix H1C.) That report is unreliable because there is a lack of sufficient key data to adequately evaluate the interpretation of the aquifer results. Without this data, any analyses that depend on the aquifer conditions as a baseline are inherently suspect and presumably unreliable, and therefore insufficient for CEQA purposes.

The following are more detailed comments on the aquifer testing. All page citations are to the *Geohydrologic Assessment of the Fenner Gap Area* unless indicated otherwise.

- <u>The report largely ignores hydrologic data gathered over the last 20 years.</u>

  (Page 5 – Purpose and Scope)

  Substantial hydrologic work has been conducted at the proposed project area over the past 20 years. This past work should be used as an existing data resource that the new work can build upon. Instead, the DEIR's geohydrologic assessment appears to start the process anew, and provides little discussion as to how the newly developed data fit into the overall framework of previous investigations and results. A EIR must answer the following questions: Why was the hydrologic data collected over the last 20 years largely ignored? Are the aquifer test results conducted since 2009 consistent with previous test results in the area? Has the conceptual model for the Fenner Gap area changed significantly or has the current investigation simply confirmed previous information?

- <u>The report largely excludes data from Cadiz's previously installed wells.</u>

  (Page 5 – Purpose and Scope)

  The exclusion of Cadiz's previously installed wells is unexplained. A revised DEIR should explain why the DEIR largely excluded the data corresponding to these wells, and how those data fit with the models and conclusions included in the DEIR.

- <u>There is no evidence that the aquifer testing was performed according to independent standards.</u>

  (Page 21 – Section 4.4, Analysis of Pumping Test Data)

Providing testing results according to independent standards is standard practice and should be reported for aquifer testing reports, as documented by ASTM and other experts. (e.g., Kruseman and de Ridder, 2000.) Independent testing results should be included in order to properly evaluate the Proposed Project and its associated impacts, and in order for reasoned conclusions to be drawn. A EIR must provide pumping rate data (which can be presented in graphical form) that is sufficient to evaluate changes in drawdown characteristics as presented in the aquifer test figures.

- Insufficient detail is presented to evaluate the aquifer test data and results.

  (Page 21 – Section 4.4, Analysis of Pumping Test Data)

  The DEIR fails to provide any details regarding the actual operation of the aquifer tests. Some of the questions that need to be answered in order to allow public review of the aquifer test data and results are: At what distance away from the discharging well or monitored wells did discharge take place and where did the discharge go? Could percolation of discharged water have influenced groundwater-level data, for example at MW-6, where according to Figure 8, there appears to have been no seal emplaced other than the surface concrete pad? Results of pumping rate monitoring during testing are not presented. How was flow rate monitored, at what frequency, and within what parameters were pumping rates to be maintained during testing? Were those parameters achieved? For new wells, discharge permits are commonly required. Were any required or obtained for this project? Without answers to these questions, proper analysis of the aquifer test data is impossible, and conclusions are not properly supported.

- The true static groundwater levels were not substantiated.

  (Page 6 – Section 2.4, Field Reconnaissance)

  The purpose of the pumping that was ongoing as of November 11, 2009, is not clearly explained. The EIR must clarify if there was an aquifer test ongoing. If so, the results must be reported. The EIR must also clarify if periodic groundwater monitoring was conducted on TW-1 and TW-2, and associated monitoring wells, prior to the aquifer testing to assure that true static groundwater levels were established prior to aquifer testing. This is crucial because full recovery from the step discharge test run on TW-1 had not been achieved prior to initiating the constant discharge test at TW-1 during 2009 (Figures 10 and 13), and the use of an improper static groundwater level could affect parameter evaluation.

- The corrections in groundwater elevations for barometric pressure are not explained.

Figure 18 notes that groundwater elevations were corrected for barometric pressure. The EIR must describe and explain the magnitude of these corrections.

- <u>There are insufficient data to discern if Well TW-2 has fully recovered.</u>

  (Figures and Associated Text)

  Late time recovery data analyzed for TW-2 appear to match the fully recovered data, therefore resulting in a very high transmissivity estimate. Although the well appears to be fully recovered, without the aquifer test data (even the hand measured water level measurements typically collected for backup purposes), it is difficult to discern if the well had fully recovered. Also, there appears to be a typographical error concerning the date of the TW-2 recovery test in the table summarizing aquifer test results.

- <u>The existing conditions in Fenner Gap are misrepresented.</u>

  (Page 4 – Photograph)

  The photo shows a flowing stream on the floor of Fenner Gap. This flowing water must have been derived from either pumped groundwater or surface runoff immediately after a storm event as there is no flowing water typically on the floor of Fenner Gap. The inclusion of the photograph without context is misleading as to the typical conditions present. The EIR should include a caption that explains the source of the water on the floor of Fenner Gap.

- <u>The hydraulic conductivity of fanglomerate is not sufficiently substantiated.</u>

  (Page 12 – Photograph)

  The photo shows that the fanglomerate has been lithified (evident by both the competence of the core and the natural fracture characteristics presented). Given the ragged nature of the sharp fracture visible, the fracture displayed in the photograph does not appear to have been caused naturally. Rather, the fracture is more likely the result of a break that occurred during the coring, or boxing, of the core. If the material in the photograph is typical, it can be expected that the hydraulic conductivity of the fanglomerate should be substantially less than unconsolidated basin fill material. The EIR should describe and explain the hydraulic conductivity of the fanglomerate in comparison to that of the basin fill material.

- <u>The permeability of the granitic rock is not sufficiently described/explained.</u>

  (Page 16 – Section 4.2.5)

This section states “Granitic and metamorphic basement rock forms the subsurface margins of the aquifer system within the project area (Freiwald, 1984). This basement rock is generally impermeable but can have significantly increased permeability along well developed fracture zones which are associated with the numerous faults that cross Fenner Gap.” This is an important statement as the figures depicting modeled hydraulic conductivities do not provide reference to model zonation for aquifer parameters and in what areas for instance hydraulic conductivity values represent specific hydrogeologic units. The EIR must specify where the fractured granitic rocks of higher permeability are modeled as opposed to other granitic rocks. This would allow for the appropriateness of model zonation to be more readily evaluated given the absence of available model files.

7. <u>Failure to Properly Model Groundwater Flow and Solute Transport</u>

The groundwater flow and solute transport modeling (*Volume 1: Report – Cadiz Groundwater Modeling and Impact Analysis*, GSSI, Sep. 1, 2011) is flawed and unreliable because there is insufficient data about changes in groundwater elevation that will result from the development of the cone of depression over the next 100 years. Additionally, evapotranspiration rates are improperly treated as a variable to calibrate the model, and the aquifer’s current inability to stabilize after only 5,000 AFY of pumping is not explained. The model’s sensitivity analysis is flawed because it was not performed in accordance with third-party standards. Moreover, the sensitivity analysis is misleading because it was actually a series of separate recalibrated models rather than one collective model. This improper and insufficient analysis provides unreliable data and conclusions that cannot support the stated impact and mitigation analysis, thereby precluding meaningful public participation and informed decision making.

Numerical groundwater flow and solute transport modeling was conducted for the impact analysis of the proposed project (GSSI, 2011b). Numerical models are ideal tools to evaluate transient, three-dimensional groundwater issues in that the complexities of the groundwater system can be evaluated in detail, and assumptions of how the groundwater system works can be tested for internal consistency. As is discussed in the detailed modeling comments below, there appears to be a problem associated with the conceptual model as highlighted by the numerical modeling effort.

Overall, the model software used, construction (with one caveat described below), including discretization, and packages used were appropriate given the conditions present. However, a problem arises with either the estimated recharge, or the aquifer parameters (either in values or spatial representation), that results in the need for unrealistically high evapotranspiration rates to be required to calibrate the model. It appears that these high evapotranspiration rates were needed to allow the amount of water discharged from the Bristol and Cadiz Playas to accommodate the estimated recharge rate. This issue was also apparent in previous modeling (GSSI, 1998), where in lieu of high evapotranspiration rates, an unrealistic extinction depth (100 feet below ground surface, which has been changed to 15 feet in the current analysis) was used to

accommodate the amount of discharge needed to calibrate the model given the estimated recharge.

The following are more detailed comments on the groundwater modeling. All citations are to *Volume 1: Report – Cadiz Groundwater Modeling and Impact Analysis* (GSSI, Sep. 1, 2011) unless otherwise indicated.

a. The analysis fails to provide comparative data from similar groundwater projects.

The EIR must discuss any other approved groundwater "conservation" or "exportation" projects that had planned storage losses of this magnitude. The existence of such projects would provide invaluable comparative data concerning environmental impacts, project management, and mitigation.

b. Insufficient groundwater data is provided for the duration of water table drawdown.

(Page 9 – Groundwater Elevations)

The presentation of the development of the cone of depression is overly limited because data is only provided for the end of pumping and 50 years after pumping ceases. Related groundwater elevations are therefore lacking. Well hydrographs must be included that show how groundwater elevations change over time under the proposed management scheme. The drawdown maps are sufficient. However, the groundwater elevation maps are insufficiently detailed due to the 100-foot contour interval. Given that drawdown continues to expand in areal extent after 100 years, the hydrograph timeframes should expand out to the timeframe at which that condition ceases to exist. This is particularly important in evaluating the effectiveness of the GMMMP and its meaning in relation to proposed project groundwater pumping and the ability of the Proposed Project to achieve its stated objectives or meaningful time-dependent groundwater elevation and/or spring flow protective procedures. The EIR must provide hydrographic information that shows how groundwater elevations will change for the duration of the Proposed Project, as long as the cone of depression continues to expand, and as long as water table drawdown will occur. Without this information, the effectiveness of the proposed GMMMP cannot be sufficiently assessed.

c. The analysis does not sufficiently explain why the aquifer will be so slow to recover after pumping.

(Page 9 – Groundwater Level Drawdown)

There appears to be a delay in the aquifer's response to the proposed project pumping. As shown on the associated figures of project pumping (Figures 64 and 65 for example – see northeast extent of drawdown), the reach of the cone of depression is more extensive in the 100-year scenario (after 50 years of recovery) than the 50-year scenario (at the end of project pumping). This is the case with all

scenarios, which indicates that should unforeseen impacts occur as a result of project pumping, and even if project pumping is halted immediately, the impacts will continue to manifest for an extended period of time (greater than the length of time pumping was conducted) before recovery begins to take place. Therefore, the aquifer system will be very difficult to manage under the monitoring and mitigation plan. The revised EIR must explain why the system is so slow to recover in all pumping scenarios. The effectiveness of management and mitigation depends largely on the aquifer's ability to recover.

d. Evapotranspiration rates are improperly treated as a variable to calibrate the model.

(Page 36)

The evapotranspiration rate was allowed to vary substantially between recharge scenarios even though evapotranspiration would be unlikely to change given that the playa soils would remain unchanged, climate factors would be unchanged, and assuming the groundwater levels would be above the extinction depth allowing evapotranspiration to take place. The EIR must explain why the evapotranspiration rate was not treated as a constant, or near-constant for variations in local conditions.

e. The analysis fails to explain why the aquifer has not stabilized in response to current pumping.

(Page 39 – Section 6.2, Steady State Model Calibration)

The text states that "Twelve water level targets located in the Fenner Gap area were carried over from the Fenner Gap model (see Appendix A); however, a water level of five feet was added to each water level measurement based on transient water level data suggesting an approximately 5 ft. decline in heads in the Fenner Gap from predevelopment conditions." Given the limited pumping that has occurred in the Fenner Gap area in the past, the implications of this five foot groundwater level decline over a significant area must be discussed. The GSSI Report (2011c) states that, "Therefore, the stresses caused by Cadiz agricultural pumping have not created sufficient recharge (from vertical leakage or induced recharge) to sufficiently stabilize water levels." Therefore, the aquifer has not been able to stabilize with only approximately 5,000 AFY of pumping. That the aquifer has been unable to reach an equilibrium condition with this amount of limited pumping is alarming, especially given that the proposed pumping is ten times greater on average (50,000 AFY) and 15 times greater in peak pumping years (75,000 AFY). The expanded pumping in the Proposed Project is very unlikely to "increase recharge" and ameliorate the problem. This is illustrated by the calibration graphs (Figures 32 through 34), which show groundwater level declines over time in the Fenner Gap area as opposed to groundwater-level declines that would temporarily occur as a response to pumping and would stabilize as a new equilibrium is reached. Also, the vertical scale of the

hydrographs is expanded substantially, making discerning groundwater level trends difficult.

The EIR must explain if, when, and how the aquifer is expected to reach equilibrium after 50,000 AFY average pumping when the aquifer is currently unable to reach equilibrium after only 5,000 AFY of pumping. The EIR must also explain whether groundwater level declines are expected to be permanent or temporary. Finally, the EIR must decrease the vertical scale in the hydrographs so that evaluating changes and fluctuations in groundwater levels is possible.

f. The analysis provides inconsistent data concerning predicted storage losses.

(Page 12 – Groundwater in Storage)

There appears to be some discrepancy in pumping or storage terms as presented. The change in storage of an aquifer is equal to the groundwater inflow (recharge) minus the outflow (pumping, evapotranspiration). In the case of the Proposed Project's two "sensitivity" scenarios, the outflow (assuming only pumping) would be 50,000 AFY for 50 years. Based on the two scenarios (16,000 AFY of recharge; and 5,000 AFY of recharge), the storage loss after 50 years then would be a minimum of 1.8 million AFY, and 2.25 million AFY, respectively. These figures are somewhat higher than the storage losses predicted by the model. The storage losses presented above are minimums as the initial years of the Proposed Project would include a period of evapotranspiration losses from the playas (and to a lesser extent, from the springs) that would yield larger storage losses than predicted by the model.

The EIR must discuss the change in storage described above in comparison to model-predicted storage loss estimates of 1.68 million AFY, and 2.16 million AFY, respectively. Without clarification, the discrepancy is indicative of a significant data input error in the model with respect to either insufficient pumping rate or an excessive amount of recharge. This issue could have been evaluated if SMWD had made the modeling files available in electronic format.

g. The analysis presents conflicting data regarding predicted changes in groundwater storage.

(Page 58 – Findings – Groundwater in Storage)

The predicted changes in storage produced by the Groundwater Equation (inflow minus outflow equals change in storage) differ from those predicted in the model. The EIR must explain why these data are different and which is correct.

h. The sensitivity analysis does not conform to standard practice and is misleading.

(Page 8)

The text states that "The purpose of the sensitivity scenarios was to evaluate the potential ranges of worst case impacts by (1) reducing the amount of available natural recharge, and (2) increasing the distances between the wells within the proposed project wellfield." This "sensitivity" analysis does not represent the form of a sensitivity analysis that is standard practice, as described in ASTM, Anderson and Woessner (1992), and other references. Performing a sensitivity analysis is a standard part of evaluating the calibration of a modeling effort. The purpose of the sensitivity analysis is to evaluate the uncertainty in the calibrated model caused by uncertainty in aquifer parameters, stresses and boundary conditions. In a sensitivity analysis, these model parameters and conditions are changed systematically to evaluate how changes in each result in changes in head. The more a change in the parameter or condition causes a greater change in head, the more sensitive the parameter is. Sensitive parameters for which there are little ground-truthed information (for instance a sensitive hydraulic conductivity zone for which there are no aquifer test data) will indicate greater uncertainty in the predictive capability of the model.

The DEIR's sensitivity analysis is lacking and must be revised to comply with standard practice, such as ASTM or Anderson and Woessner (1992), to evaluate uncertainty. Proper sensitivity analysis assesses the sensitivity of all variables in a model. To do this, one variable at a time is changed while holding all others constant. The revised sensitivity analysis should follow this procedure or justify why another procedure is appropriate.

Next, the sensitivity analysis as performed is problematic in that changes in model results resulting from natural recharge are not comparable because the head distribution is affected by changes in model construction (well locations), aquifer parameters and evapotranspiration rates for the lower recharge scenarios. The analysis therefore mixes results and assumptions. If two wellfield configurations were to be evaluated, each configuration should have been tested against each of the separate recharge scenarios. As these analyses currently stand, the "sensitivity" analyses actually represent separate simulations based on differing assumptions. Proper sensitivity analysis must be performed that tests the two wellfield configurations against each of the recharge scenarios.

i. <u>The sensitivity analysis, to evaluate model uncertainty, is not performed in accordance with standard practice.</u>

(Page 43 – Section 6.4 – Sensitivity Analysis)

The only parameters for which a typical sensitivity analysis was conducted were for specific yield/storativity and vertical leakance, which in our experts' experience modeling alluvial groundwater basins of the desert southwest are commonly the least sensitive parameters in the flow model. Aquifer parameters such as hydraulic conductivity (on a zonal basis), evapotranspiration rate, recharge and other solute transport characteristics must be tested for sensitivity in

accordance with the method used for specific yield/storativity and vertical leakance.

j. The sensitivity analysis is mischaracterized as such and is actually a series of separate simulations.

(Page 44 – Section 7.1 – Description of Model Scenarios)

The "sensitivity" scenarios involved changing model parameters which are not sensitivity scenarios, but rather separate, recalibrated models or simulations. The changes in model parameters will serve to minimize any effect of changing the recharge or wellfield distribution of wells. The "sensitivity" scenarios must be recharacterized as separate, recalibrated models, or simulations.

k. The hydraulic conductivity data of fanglomerate is inconsistent.

(Page 32 – Hydraulic Conductivity)

The hydraulic conductivity value ranges used appear to be reasonable based on aquifer testing, although based on the photograph of fanglomerate core, it is hard to conceive that the fanglomerate in the geohydrologic assessment would yield hydraulic conductivities of up to 60 ft/day. Additionally, the areal distribution of specific hydraulic conductivities associated with specific aquifer units is not readily apparent in the figures where zonation is instead represented by hydraulic conductivity only. The EIR must explain the discrepancy between the photograph and the value ranges used in the model and explain why zonation is represented only by hydraulic conductivity.

l. The sensitivity analysis fails to account for the inconsistent hydraulic conductivity value ranges.

(Page 32 – Hydraulic Conductivity)

Changes in the effect of natural recharge on the model results have been minimized by recalibrating the aquifer parameters, thereby minimizing the effect of the change in recharge. Essentially, instead of evaluating the model sensitivity to recharge based on the calibrated numerical representation of the groundwater system, three distinct numerical groundwater flow models with differing conceptual models in relation to wellfield design, aquifer parameterization and evapotranspiration have been developed. The EIR must explain why three distinct numerical groundflow models were developed instead of basing the model on the calibrated numerical representation of the groundwater system.

m. The computer modeling process suffers from a lack of transparency.

(Page 27 – Computer Code)

The computer modeling platform is not disclosed in the analysis. The EIR must explain which platform was used to develop the model, and whether it is commercially available (e.g., Groundwater Vistas, GMS, Visual MODFLOW). Proper analysis by the public is impossible without knowing the computer platform used.

n. The uncertainty of the model has not been tested in an adequate manner.

(Page 61 – Model Limitations and Uncertainty)

The use of programs such as MODFLOW2000 and PEST greatly simplifies the sensitivity analysis process and it is unclear why this aspect of calibration evaluation was neglected or not presented. Although the aquifer parameters, including specific yield/storativity and vertical leakance, have been tested, the more likely sensitive parameters such as hydraulic conductivity from individual parameter zones, and evapotranspiration rate which were used as calibrated parameters have not. Additionally, given the issues associated with the need to use unrealistically high evapotranspiration rates to calibrate the model and serve as a mechanism to discharge sufficient water to allow the volumes of recharge to enter the modeled domain and maintain calibration, there is a problem with the conceptual model, or the representation of the conceptual model. Therefore, there is substantial uncertainty associated with any of the predictive results provided in the impact analysis. (See comments below.) The EIR must explain why programs such as MODFLOW2000 and PEST were not used for sensitivity analysis, and why the more likely sensitive parameters were not assessed in favor of less sensitive parameters.

7a. Failure to Properly Analyze Groundwater Impacts

The numerous failings of the groundwater flow and solute transport modeling described above (*Volume 1: Report – Cadiz Groundwater Modeling and Impact Analysis*, GSSI, Sep. 1, 2011) make any subsequent impact analysis unreliable and therefore an insufficient basis to support informed and reasoned public participation and decision-making. The specific failings of the impact analysis are as follows:

o. The effects of subsurface flow from under the Mojave National Preserve are insufficiently understood and described.

(Page 49 – Impact Analysis)

The outer limits of the cone of depression would likely still be expanding after 100 years. The cone is anticipated to extend to elevations approaching Bonanza Spring, thereby potentially affecting this important spring. Decades after the Proposed Project ends, additional impacts may still be identified as a result of earlier pumping. If an impact is identified at a spring or for a surrounding groundwater user, changes to groundwater management (if pumping is still

occurring) may be too late to adequately be protective of surrounding receptors. Additionally, increased hydraulic gradients upgradient from the project as a result of expansion of the cone of depression will result in greater subsurface underflow to the south out of the upper Fenner Watershed (beneath Mojave National Preserve), the effects of which are not understood and/or adequately described. The EIR must explain the effects of the subsurface underflow that is expected to occur beneath the Mojave National Preserve.

p. The impact analysis fails to consider the reduced rainfall expected as a result of climate change.

(Page 49 – Impact Analysis)

It can be expected that as less precipitation occurs as snowfall (as is predicted over the course of the Proposed Project) less water will recharge the aquifer. The EIR must account for projected reductions in rainfall as a result of climate change as well as any corresponding reductions in recharge rates. Including climate change in the data is particularly important because impacts on springs are expected to last up to 500 years, as evidenced by studies of springs (e.g., CH2M Hill, 2011). The EIR must explain why the impact analysis period does not match the analysis period for the springs.

q. The impact analysis period does not sufficiently correspond to the time frame of expected groundwater recharge.

(Page 54 – Table Regarding Groundwater Storage)

The text describing the table states, "*The following table summarizes the cumulative annual changes in groundwater storage at the end of 50 years (end of project pumping) and 100 years (end of model simulation) for each model scenario . . . .*" Of note is that the table then presents time for groundwater storage to recover after project pumping is stopped ranging from years 117 to 440. It is clear then that the end of model simulation was not 100 years. The EIR must explain why model impacts were not evaluated beyond 100 years, particularly in light of the continuously expanding cone of depression after 100 years as shown in the "sensitivity" scenarios presented.

8. Failure to Properly Analyze the Project's Effects on Springs

CH2M Hill prepared the *Assessment of Effect of the Cadiz Groundwater Conservation Recovery and Storage Project Operations on Springs* ((Aug. 3, 2011), DEIR, Appendix H3). That report does not sufficiently analyze the impacts of the Proposed Project on springs because of missing data and confusing and incomplete analysis. As a result, the significance of any impacts on springs cannot be properly assessed and the appropriateness of monitoring plans and effectiveness of mitigation plans cannot be

assessed. Without improved data and analysis, the type of reasoned and informed public participation and decision making CEQA requires is not possible.

a. The analysis is missing key information.

Discharge at springs generally occurs as a combination of both free discharge of flowing water and evapotranspiration from groundwater dependent vegetation and evaporation from soil in the subsurface. Therefore, the discharge of a spring can be substantially greater than the free flowing water observable at the surface. Figures 1-15 are missing from the report. The text references Figures 1-15, yet the figures in the document start at Figure 16. The EIR must clarify if Plates 1 through 15 are the missing Figures and, if not, include Figures 1-15.

b. The analysis fails to specify the source of key underlying data.

The analysis utilizes groundwater flow model results, but it is unclear (given that this is a CH2M Hill report) whether the numerical model used by CH2M Hill for evaluating underflow beneath Fenner Gap, or the GSSI model used to conduct the impact analysis, was used in the evaluation. The description of the extent of drawdown does not appear to match with the description in the impact analysis (GSSI, 2011). The EIR must explain which numerical model was used by CH2M Hill to conduct the evaluation of the springs.

c. The analysis fails to include geochemical analysis to evaluate sourcing.

An assessment of the springs should have included a geochemical analysis of springs to evaluate sourcing. The current analysis appears to spend more time and resources identifying the dryness of the desert environment. Figures of a dry wash with a bullet point identifying that no water is present, or photographs of dry voids in carbonate rocks high in the Marble Mountains where no springs are known does not contribute to the overall understanding of those springs present and potential effects of the project on those springs. Of note is the absence of a photograph of Bonanza Spring, the closest spring to the proposed extraction wellfield. The results of the canvassing and accounting of existing springs in the basin, including a discussion of the results of the geochemical sampling noted as having taken place and a spring discharge estimate, would have provided more beneficial information with respect to the groundwater budget and overall groundwater flow system. The EIR must provide a geochemical analysis of each spring in the basin to evaluate sourcing. The EIR must also provide a spring discharge estimate for each spring in the basin. Lastly, the EIR should provide a photograph of Bonanza Spring.

In sum, the DEIR's flawed hydrogeological analysis undercuts the reliability of the remainder of the DEIR's analyses. The impact analysis is largely dependent on the difference between the pumping rate and the recharge rate, which in turn depends on accurate baseline information about the existing state of the aquifer. The design of the monitoring and mitigation plan likewise

depends on accurate identification of significant environmental impacts, as does the cumulative impacts analysis. Project alternatives must be weighed in light of the impacts caused by the proposed project in relation to the project baseline. For the reasons described above, we believe that the hydrogeological analysis is insufficient to support a thorough analysis of the Proposed Project's impacts, and design of its monitoring and mitigation measures. The changes and additions described above are necessary to support a reasoned analysis and to allow effective public participation and agency decision-making.

9. Failure to Measure Impacts on Groundwater Quality

The imported groundwater storage and recharge component will negatively impact water quality of the underground aquifer. This is because the groundwater is of a much higher water quality than the imported water, either that from the Colorado river or the State Water Project. The DEIR does not evaluate these impacts, nor does it explain how these impacts would not violate the state anti-degradation policy, Resolution 68-16. This omission is a basic and fundamental flaw in the DEIR's analysis of the proposed project, and is legally deficient without a thorough analysis of these impacts.

Chapter 4.10 – Land Use and Planning

The lands surrounding the Proposed Project site are owned and managed by BLM, the State of California, NPS, and numerous private landowners including conservation organizations. In addition, local Native American tribes regard certain lands in the Proposed Project vicinity as sacred.

There are five designated wilderness areas located within a five mile radius of the Proposed Project Area: the Trilobite, Cadiz Dunes, Old Woman Mountains, Sheephole Valley, and Turtle Mountain Wilderness Areas. The Cadiz Dunes Wilderness Area is located west of and adjacent to the proposed water conveyance pipeline along an approximately five-mile-long portion of the ARZC ROW. At its closest point, the Cadiz Dunes Wilderness is only 100 feet west of the ARZC right-of-way. Given the close proximity of the Proposed Project to the wilderness areas, the Proposed Project proponents must demonstrate that it does not impair the nearby wilderness areas.

Impacts on Federal Reserved Water Rights

When Congress designated lands in the California desert as wilderness areas, the U.S. expressly reserved a "quantity of water sufficient to fulfill the purpose of [the] Act." *See* California Desert Protection Act of 1994, 16 U.S.C.A. § 410aaa-76. The Act's purpose includes preserving the unrivaled scenic, geologic and wildlife values of the wilderness areas, perpetuating their significant and diverse ecosystems, and protecting and interpreting ecological and geological features. The DEIR has failed to adequately demonstrate that the Proposed Project will not adversely impact the sensitive dunes areas, including their unique dune plants and wildlife.

The DEIR also fails to adequately address and quantify the impact of the Proposed Project on the United States' reserved water rights. To the contrary, as pointed out in the other parts of this comment letter, the Project Proponents failed to engage the USGS, BLM, or NPS at any stage of the environmental analysis. Their failure to partner with important stakeholders and expert agencies leaves decision makers and the public without sufficient information to evaluate the Proposed Project.

Inadequate Permitting for use of Right-of-Way over Federal Land

Page 3.53: The DEIR lists the agreements, permits, and approvals the Proposed Project proponents believe are necessary to implement the Proposed Project. The Proposed Project includes construction of a 43-mile pipeline running from the Cadiz wells to the Colorado River Aqueduct. The DEIR indicates that Cadiz intends to build much of this pipeline on an ARZC-held right-of-way over federal land. The DEIR indicates that Cadiz has an agreement with the ARZC to use this right-of-way, but does not intend to seek the federal government's permission to do so.

The agreement between ARZC and Cadiz Real Estate, LLC is cited in the DEIR, (e.g., DEIR, p. 1-8,) but is not contained in the appendix and its specific terms are not provided. The document granting ARZC this right-of-way over federal land is also not included. Without access to these documents, members of the public and decision makers are without sufficient information concerning the DEIR's assertions regarding the scope of ARZC's right-of-way.

In addition, the DEIR incorrectly asserts that the Proposed Project escapes federal environmental review because the full extent of the pipeline's passage over federal land will be within ARZC's right-of-way, (DEIR, p. 2-5,) and the Cadiz project will further a railroad purpose. In November 2011, the Department of Interior ("DOI") issued Solicitor's Opinion M-37025, which explains that a "railroad's authority to undertake or authorize activity within" the type of right-of-way the ARZC is allowing Cadiz to use, is limited to "those activities that derive from or further a railroad purpose." The "railroad purposes" identified in the DEIR include access to power meters located along the tracks; fire hydrants; an access road; and speculative future benefits such as water for passenger terminals that ARZC is "contemplating operating in the future" and access to 10,000 gallons of water per day for vegetation control, washing rail cars, offices, and "other contemplated improvements." (DEIR, p. 2-4.) We do not agree with the DEIR's conclusion that such "purposes" are, in fact, sufficiently related to railroad use to qualify as "railroad purposes" merely in order to allow the Proposed Project to evade federal approval and NEPA review. The practical use of water fire extinguishers along the right of way, for example, would be extremely limited to those rare instances where water would in fact extinguish an oil or chemical-based fire—attempting to extinguish a chemical fire with water may in fact exacerbate the situation and quite literally fuel the flames.

The purpose of the Proposed Project is clearly to mine the desert aquifer to provide water to Southern California water districts. The "railroad purposes" identified in the DEIR do not provide a legally sufficient basis for the Proposed Project to evade federal approval and NEPA review. Before constructing a pipeline over federal land, Cadiz must receive the permission of the DOI and/or BLM. Permission to build must be contingent on full review under NEPA, including the preparation of an environmental impact statement ("EIS"), and would require the

involvement of the U.S. Fish and Wildlife Service for consultation pursuant to Section 7 of the Endangered Species Act.

Chapter 4.11 – Mineral Resources

Failure to Provide an Accurate Baseline for Active Metals Mining

Page 4.11-2: The DEIR provides an inaccurate baseline by failing to include current data regarding any active metals mining operations. According to the DEIR, "the USGS website for tracking active mining operations identified no active metals mining operations as of 2003." (DEIR, p. 4.11-2.) The DEIR fails to account for the possibility that various metals mining operations may have been initiated since 2003.

Failure to Provide Effective Mitigation Measures for Effects on Existing Salt Mining Operations

Page 4.11-10: The action items under Mitigation Measure MIN-1 are not sufficiently described to assess their effectiveness. It is not clear that reducing pumping, revising pumping locations, or even stopping pumping altogether would arrest the adverse effects of the Proposed Project on the salt mines. The cone of depression is expected to grow for many years after pumping stops, so stopping pumping seems unlikely to mitigate the impacts caused by pumping. Injection wells may be effective mitigation, but there is insufficient detail about how such wells would operate to assess their effectiveness. Compensation could be effective mitigation for the salt mine operators, but insufficient detail is provided and the compensation is not part of an enforceable agreement. The EIR must describe the implementation of the mitigation measures with greater specificity. In particular, the EIR must explain (1) the process for determining how much to reduce the pumping; (2) the process for determining where to relocate the pumps within the wellfield; and (3) the process to determine the location and capacity of injection wells. The EIR must also structure the compensation to salt mine operators as part of an enforceable agreement that explains how the compensation amount would be determined and the time frame for payments.

Chapter 4.12 – Noise

Failure to Substantiate Finding of No Significance

Page 4.2-10: This section improperly concludes that noise during Proposed Project operations would have a less than significant impact. This conclusion is not supported by any data about the noise generated by wells or the effectiveness of the acoustical well covers.

Chapter 4.14 – Recreational Analysis

The DEIR's analysis of recreational impacts is inadequate. First, the analysis fails to estimate the number of visitors to wilderness areas surrounding the Proposed Project. Second,

the DEIR fails to adequately analyze recreational impacts resulting from the Project construction. Rather, the analysis assumes that no substantial impacts will occur from the initial construction of the Project. In addition, the analysis assumes there will be no future construction, but that assumption is inconsistent with the DEIR's commitment to monitor and mitigate the impacts from the Project. The DEIR also improperly concludes that the expansive vistas offered by the natural area will mitigate the visual impacts of the project because the Project area will seem small in comparison. (DEIR, p. 4.14-3 ("The expanded wellfield and spreading basin would be visible from distant views but would not disrupt the expansive vistas from higher elevations . . . ").) Finally, the DEIR fails to analyze whether any degradation to wildlife areas will have long-term social and economic effects, which are important in determining whether a project has a significant impact on the environment.

Chapter 6 – Growth Inducement Potential

The DEIR provides inadequate treatment of the indirect growth inducement potential of the Proposed Project. An EIR must "[d]iscuss the ways in which the proposed project could foster economic or population growth . . . , either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth . . . ." Guidelines § 15126.2(d).

The Proposed Project includes the export of 50,000 acre-feet per year, enough water to support 100,000 households or 400,000 additional people each year. While the DEIR acknowledges that the Proposed Project would contribute toward "significant and unavoidable" growth impacts in the Project Water Area of Use, (*see* DEIR, p. 6-62,) the cursory and limited explanations in Section 6.3 and Appendix J are insufficient to "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities." Guidelines § 15002. Table 6-34 incorporates by reference various city and county General Plan EIRs, but these EIR's could not have foreseen the impacts provided by the proposed project because they were completed prior to the proposed project.[38] The estimated ability for the 50,000 AFY to support new communities and development in the water districts which will receive the water must be analyzed, both in this chapter under growth inducement, and in the previous chapter under cumulative impacts. The likely increase in development within the recipient water districts as a result of the additional water exports should be accounted for in both sections, but is not.

DEIR Appendix J purports to summarize the findings of the General Plan EIRs covering the project's water delivery areas, but its vague phrasing does not provide meaningful information and is deficient as it only indicates which cities and counties have indicated that direct or indirect inducement of substantial population growth is a significant and unavoidable impact. (DEIR, p. J-3, 6, and 15.) The underlying analyses that support these significance determinations are missing. The EIR must justify the significance determinations in Appendix J and provide specific land use, air, and other environmental indicators that the Proposed Project

[38] The DEIR also violates CEQA by failing to "state where the incorporated documents will be available for inspection." CEQA Guidelines § 15150(b).

would contribute to the significant and unavoidable growth impacts identified in the general plan EIRs.

Chapter 7 – Alternatives Analysis

The alternatives analysis is premised on the assertion that the Proposed Project's Groundwater Conservation and Recovery Component would have less than significant impacts after mitigation to biological resources, hydrology, and water quality. (DEIR, p. 7-1.) As discussed above, the DEIR does not contain sufficiently accurate hydrogeological data to allow an accurate comparison of the impacts of the various non-Project alternatives. Additionally, the rejected alternatives of conservation and phased implementation must be fully considered, and the additional alternative of a sustainable removal rate must be more thoroughly analyzed.

One of eight central objectives listed in Section 3.2 of the DEIR is to "[l]ocate, design, and operate the Project in a manner that minimizes environmental effects and provides for long-term sustainable operations." (DEIR, p. 3-6.) This goal is unattainable under the current plan. As described, the Proposed Project has a working lifespan of 50 years, followed by anywhere from 60 to 400 years of inactivity to bring the aquifer back to its pre-Project levels. That is *not* a sustainable project—it is a water mining operation. Sustainability alternatives would include the no-project alternative, an agricultural alternative that draws less water than is replaced, and a water conveyance project that draws less water than is replaced. The EIR must fully consider each of these alternatives.

Failure to Consider What Further Conservation Benefits Could Be Obtained If Water Agency Project Participants Funded Conservation Rather Than the Proposed Project

Pages 7-6 to 7-7: The water conservation alternative was rejected on the ground that all of the water agency Project Participants are already implementing conservation measures. But this reasoning does not address the possibility that further gains could be realized if additional funds were directed to conservation efforts rather than the Proposed Project. Further conservation efforts could substantially decrease demand for water provided by the water agency Project Participants and have a net positive effect on the environment—thereby achieving increased water supply reliability for Southern California water providers without taking the substantial risks associated with depleting the aquifer. The DEIR asserts that additional water conservation measures would lead to water supplies that "would be less reliable and subject to shortages in dry years." (DEIR, p. 7-7.) But without additional information in the DEIR it is impossible to assess whether this conclusion is correct. This deficiency in discussion of relative conservation measures by the districts can be seen in stark relief by comparing the discussion of conservation in this EIR with that in the 2001 EIS/EIR, as reflected in the comments provided on the previous EIS/EIR by Western Environmental Law Center. See Appendix B, Comments by Western Environmental Law Center, at 4-5 (incorporating the previous EIS/EIR by reference.) Although the WELC comments were highly critical of MWDSC's attempts to justify its use of "conservation," at least the district *attempted* to

quantify its efforts, while the water districts in the present DEIR have made no such effort.

Beyond the omission of sufficient data, there are also other reasons to doubt the DEIR's findings with regard to the alternatives analysis. For example, the DEIR asserts that long-term savings from the Three Valleys Municipal Water District alone will be at least 19,200 AFY in 2020. (DEIR, p. 7-8.) It would be arbitrary and capricious not to consider further conservation as a legitimate alternative in the EIR.

Unwarranted Dismissal of the Phased Implementation Alternative

Page 7-39: As discussed at length above, the accuracy of the DEIR's evapotranspiration and recharge estimates is highly questionable. As such, the DEIR errs in concluding that under the Phased Implementation Alternative, no "significant impacts of the proposed Project" would "be avoided or lessened." (DEIR, p. 7-40.) Drawdown of the aquifer at the rate of 50,000 AFY or more could result in numerous significant impacts throughout the watershed. A more complete Phased Implementation Alternative could well be superior to the Proposed Project because potential negative effects could be closely monitored and possibly mitigated before they become catastrophic. "An EIR is an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes *before they have reached ecological points of no return*." *Laurel Heights Improvement Assn. v. Regents of Univ. of California*, 47 Cal.3d 376, 392 (1988) (internal quotation omitted) (emphasis added). To determine whether the Phased Implementation Alternative would enable the Proposed Project's impacts to be discovered before reaching an ecological point of no return, the EIR must use accurate evapotranspiration and recharge estimates.

There Is No Project Alternative That Provides For "Sustainable Operations," Which Is One of the Eight Avowed Project Objectives.

Page 7-40: Only the Reduced Project Alternative calls for a 25 percent reduction in the total proposed groundwater withdrawal. This alternative allows for removal of 75,000 AFY for 25 years. Given that the DEIR's high-end estimate for recharge is 32,447 AFY, (DEIR, p. ES-3,) and that as explained above, the actual recharge rate is likely closer to 16,000 AFY, it is irrational to consider the Reduced Project Alternative to be sustainable.

Chapter 8 – Irreversible and Irretrievable Commitment of Resources

Section 15126.2(c) of the CEQA Guidelines requires Project proponents to discuss any significant irreversible environmental changes caused by a project, including the use of nonrenewable resources. A project results in an irreversible and irretrievable commitment of resources if it:

1. Involves a large commitment of nonrenewable resources;
2. Creates primary and secondary impacts that generally commit future generations to

similar uses;
3. Involves uses in which irreversible damage would result from any potential environmental accidents associated with the project; or
4. Proposes consumption of resources that are not justified (e.g., the project involves the wasteful use of energy).

See Guidelines § 15126.2(c).

The DEIR characterizes the groundwater pumped from the aquifer as a renewable resource that is naturally recharged on an ongoing basis, and asserts that without pumping it will be "lost" to evaporation. (DEIR, p. 8-2.) Claiming that the water will otherwise be "lost" enables the Project proponents to conclude that the Proposed Project involves no irreversible or irretrievable commitment of groundwater resources. But the Proposed Project results in an irreversible or irretrievable commitment of groundwater resources under every model calculation or alternative analysis discussed in the DEIR. The Project would mine an average of 50,000 AFY. Even using the Project proponents' most optimistic estimate of a 32,000 AFY recharge rate, there will be an 18,000 AFY recharge deficit that will take more than a century to replace. The discrepancy between the pumping rate and the recharge rate is further exacerbated in light of the DEIR's disclosure that the initial years of the Project is expected to pump as much as 75,000 AFY—more than double the DEIR's most generous recharge rates—and as much as fourteen times the lowest recharge estimate of 5,000 AFY. Groundwater should not be classified as renewable when the estimates contained in the DEIR itself indicate that it could take anywhere from 117 years to 440 years for the aquifer to return to its pre-project level. (DEIR, Appendix B-1, Table 4-5.) This is not renewability on a meaningful human time scale.

Climate Change Issues Related to the Project

NPCA's scoping comments, dated March 29, 2011, requested that the DEIR include assessments of whether: 1) it is realistic to assume that recharge rates for a desert aquifer will remain constant over a 50 year period in light of climate change and the natural variability of desert hydrologic systems; 2) how the increasing variability in precipitation in the Southwest, drought, and increased evaporation due to higher temperatures that are predicted with climate change might affect Project recharge estimates over a 50 year period; and 3) whether there will be sufficient water available in the Colorado River for the Imported Water Storage Component based on the natural variability of hydrologic systems, climate change, and the changing demographics of the American West. The DEIR does not adequately address these concerns.

The DEIR acknowledges that there is a "general consensus that climate change will cause general warming . . . a shift in precipitation and runoff patterns," and that aquifer recharge can be difficult to quantify due to variable factors including: precipitation, stream density, ambient temperature, wind speed, and the amount of solar radiation. (DEIR, p. 4.7-6.) Yet the Project Proponents maintain that the Proposed Project's annual recharge rate is "unlikely" to be materially affected by climate change since it is "reliant on seepage from the hard rock formations underlying the mountain ranges rather than surface runoff or alluvial recharge." (DEIR, p. 4.7-7.) The DEIR fails to address where the seepage from the hard rock formations originates, and whether that water flow would itself be affected by climate change. If some of

the water seeping through hard rock formations originates as precipitation, then climate change-induced shifts in precipitation levels could have substantial effects on the aquifer's recharge rate. The EIR must address the origin of the seepage and indicate whether or not climate change could affect this source of recharge.

The DEIR assumes that the aquifer will average a recharge of approximately 32,000 AFY (*see e.g.*, DEIR, p. 4.9-38.) However, as explained above, a more accurate estimate is that the current recharge rate is actually around 16,000 AFY. The DEIR claims that even if the next 100 years were extremely dry and natural recharge were reduced by up to 85 percent, the Proposed Project would still result in a less than significant impact to groundwater resources. (DEIR, p. 4.9-15.) But if the Project Proponents wish to claim that an 85 percent reduction in recharge would result in a less than significant impact to groundwater resources, the DEIR should base this estimate on the plausible 16,000 AFY baseline rather than the unlikely 32,000 AFY baseline. This would require an analysis of the effects of a recharge rate of 2,400 AFY (fifteen percent of 16,000 AFY).

The DEIR also notes that the California Department of Water Resources ("DWR") has made a series of recommendations regarding how the state and local water agencies should address climate change. Agencies are directed to:

> (a) provide sustainable funding for statewide and integrated regional water management; (b) fully develop the potential for integrated regional water management; (c) aggressively increase water use efficiency; (d) practice and promote integrated flood management; (e) enhance and sustain ecosystems; (f) expand water storage and conjunctive management of surface and groundwater resources; (g) fix Delta water supply, quality, and ecosystem conditions; (h) preserve, upgrade, and increase monitoring, data analysis and management; (i) plan for and adapt to potential sea level rise; and (j) identify and fund focused climate change impacts and adaptation research and analysis.

(DEIR, p. 4.7-7.) Rather than follow DWR's recommendation to find more efficient use and management of existing water supplies, the Proposed Project seeks to add a new (vulnerable) water supply that is subject to the same climate change impacts as the Colorado River Basin and the Bay-Delta. (DEIR, p. 4.7-7.) The EIR must address why the Project Proponents are not taking steps to follow the DWR's recommendations before attempting to extract valuable groundwater supplies.

CONCLUSION

Cadiz and SMWD have proposed an aggressive water mining project that should have San Bernardino County acting as lead agency, and places a fragile desert ecosystem at great risk of irreversible harm. The DEIR's analysis falls well short of accurately describing the Proposed Project and its impacts, or providing assurances that the Proposed Project is designed in a sustainable way that minimizes environmental impacts. Instead, the analyses point toward a future of uncertain effects that seem largely incapable of mitigation once discovered. The

Proposed Project places the Mojave National Preserve and surrounding federally-designated wilderness in harm's way without adequately assessing the nature and significance of the risk.

Given the breadth of required additional analyses, the risks involved, and the number of potentially impacted stakeholders, we believe that prudence and caution demand a return to the beginning of the environmental review process. That process should include additional stakeholders, including Native American Tribes, the National Park Service, BLM, USGS, and others, and should include both a new EIR and an Environmental Impact Statement prepared by the federal government.

Our precious water resources must not be traded for short-term gain without the assurances of sustainability that a coordinated and fully inclusive CEQA/NEPA review would provide. This Proposed Project has a troubled history; a nearly identical version was rejected 10 years ago after undergoing a combined CEQA/NEPA review. Many of the same problems regarding problematic ownership, leadership, economic justification and funding remain with this project, as laid out in the earlier news reports by Michael Hilzik of the Los Angeles Times and the extensive policy advocacy provided by the Pacific Institute (See Appendix B.) The present DEIR does not identify what has changed to justify the project now, beyond Cadiz' taking over the federal component, which hardly seems like a justification at all. The problems were so great in the previous version that Met nixed the project; given this troubled past, the present iteration must not escape complete, thorough analysis, and the review and approval of neutral, expert agencies that are financially independent from the Proposed Project proponents. The goals of CEQA, as well as NEPA, demand as much.

The Proposed Project must only proceed if approved by the proper lead agency and utilizing a complete and thorough EIR. That is impossible under the present review process due to an improper lead agency, an inaccurate project description, and repeated gross understatement of impacts presented in the DEIR. There must be a new EIR prepared under the proper lead agency, with all permitting agencies acting as responsible agencies, and USGS participating in the analysis and providing a neutral assessment of groundwater recharge. Until these changes are made and a new EIR is issued by San Bernardino County, the project's approval will prejudicially violate CEQA.

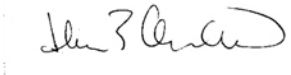
Thank you for the opportunity to provide these comments.

DATE: March 13, 2012

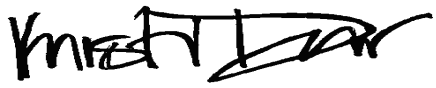
Signed,

/S/
Seth Shteir

California Desert Field Representative
National Parks Conservation Association



Ileene Anderson,
Biologist/Public Lands Desert Director
Center for Biological Diversity



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Drew Feldmann
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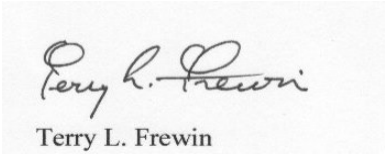

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Barbara Boyle
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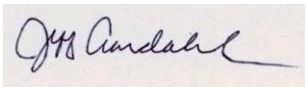

Jeff Aardahl
California Representative
Defenders of Wildlife

Sidney Silliman
Board of Directors
Desert Tortoise Council

/S/
Kim F. Floyd
Conservation Chair
San Gorgonio Chapter Sierra Club

Conner Everts
Southern California Watershed Alliance
Desal Response Group

/S/
Gerry Goss
President
Desert Survivors

ATTACHMENTS TO COMMENTS ON CADIZ 2011 DEIR

Appendix 'A': Studies and General References (non-Biological)

A. Hydrologic Review of the Draft Environmental Impact Report, Cadiz Water Project, by Andrew Zdon, Principal Hydrogeologist, Johnson-Wright Consultants, Inc. prepared for National Parks Conservation Association (February 1, 2012)

B. Comment on the Hydrogeology of the Cadiz Water Project by John Bredehoeft, Ph.D, prepared for National Parks Conservation Association and the Center for Biological Diversity (March 4, 2012)

C. Memorandum to Santa Margarita Water District Board of Directors from Dan Feron, "Reimbursement Payment to County of San Bernardino per the Memorandum of Understanding Concerning the Cadiz Valley Water Conservation, Recovery and Storage Project" (Excerpted from page 11 of October 26, 2011 minutes from Santa Margarita Water District board meeting, dated October 26, 2011)

D. Press Release, "Cadiz Advances Plan to Convert 300 Miles of Natural Gas Pipelines for Water Conveyance" (February 29, 2012)

Appendix 'B': Documents from 2000-2002 EIR/EIS Review

A. Comments on 2001 Cadiz EIR/EIS by Western Environmental Law Center

B. Hydrogeology Study on Cadiz Project, Prepared by Dr. John Bredehoeft, Ph.D.

C. Air Study on Cadiz Project, Prepared by Dr. John Giles

D. Michael Hilzik, "Critics Raising Concerns About Cadiz Water Project," *Los Angeles Times* (May 19, 2002)

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