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**Via E-Mail**

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Re: Cottonwood Sand Mining Project (PDS2018-MUP-18-023),  
(PDS2018-RP-18-001); Log No. PDS2018-ER-18-19-007; SCH#  
2019100513

Dear Mr. Hingtgen:

This firm represents the Sierra Club San Diego Chapter (“Sierra Club”) in connection with the proposed Cottonwood Sand Mining Project (“Project”). We submit these comments to inform the County that this draft Environmental Impact Report (“DEIR”), is inadequate under the California Environmental Quality Act (“CEQA”), Public Resources Code § 21000 et seq., and the CEQA Guidelines, California Code of Regulations, title 14, § 15000 et seq. (“CEQA Guidelines”). In addition, the Project as currently described conflicts with several provisions of the San Diego County General Plan and the Valle de Oro Community Plan, as well as the County’s Zoning Ordinance.

The Project as proposed will have significant, adverse impacts on both the natural and the human environment in San Diego County. These impacts include, but are not limited to, potentially devastating effects on: local hydrology and water quality, habitat for both terrestrial and aquatic wildlife, local traffic, air quality, and noise. In addition, the Project is inconsistent with the San Diego County Multiple Species Conservation Program (“MSCP”). But none of these impacts or inconsistencies of the Project can be discerned from reading the DEIR. With regard to each of CEQA’s substantive requirements—a complete and stable project description, a thorough analysis of significant impacts, identification of feasible and enforceable mitigation measures, an analysis of a reasonable range of alternatives—the DEIR falls woefully short. As a

result, the DEIR fails to meet CEQA's fundamental purpose of providing disclosure to the public of the Project's environmental effects. The County and the applicant need to start over—beginning with revised Project objectives that allow for consideration of a reasonable range of alternatives that would be consistent with the General Plan—and prepare and recirculate a new, legally adequate DEIR.

This letter is submitted along with the reports prepared by Greg Kamman, Hydrogeologist with CBEC Eco Engineering, attached as Appendix A (“CBEC Report”); Robert Hamilton, Biologist, attached as Appendix B (“Hamilton Report”); Patrick Sutton, Senior Environmental Engineer, Baseline Environmental attached as Appendix C (Baseline Report) and Jeremy Decker, Acoustical Engineer with Salter and Associates attached as Appendix D (“Salter Report”). We respectfully refer the County to the aforementioned attached reports, both here and throughout these comments, for further detail and discussion of the DEIR's inadequacies. We request that the County reply to each of the comments in this letter and to each of the comments in the attached reports.

## **I. Introduction and Background**

The Project site is located within San Diego County's jurisdiction on land designated as Semi-Rural Regional and Specific Plan Area Land Use and zoned Open Space (S80), Specific Plan (S88), and Holding Area (S90). The proposed Project includes: a Major Use Permit to allow sand mining over a period of 10-12 years; approval of: Reclamation Plan, Landscape Plan (for revegetation), a Public Improvement Plan, right-of-way permits; and a host of discretionary permits from resource agencies. DEIR at S-2 and S-3. The Project would extract 6.4 million tons of material over a period of 10 years. DEIR at 1-3. The Reclamation Plan and revegetation would be implemented as each Project phase is completed over the 12 year period.

The majority of the proposed Project site is located in the flood plain for the Sweetwater River and within both the northeastern portion of the South County Segment and southwestern portion of the Metro-Lakeside-Jamul Segment of the adopted the MSCP subarea plans. DEIR at 2.2-2. These plan areas have already suffered extensive depletion by past development. Remaining intact habitat blocks—identified as Pre-Approved Mitigation Areas (“PAMAs”) with linkages to large open space areas—are rare. The project site is also within an area identified by the MSCP as a Biological Resource Core Area (“BRCA”), which is defined as “land that qualifies as an integral component of a viable regional ecosystem” under the County's Biological Mitigation Ordinance (“BMO”). BMO section 86.508(a). The BRCA's are areas supporting a high concentration of sensitive biological resources, which, if lost or fragmented, could not be replaced or mitigated elsewhere. The fragmentation and loss of ecological value of a

BRCA or PAMA—as exemplified by this project site—would jeopardize the assembly of a preserve system. There are no intact core areas to spare. Importantly, the whole of the Project site is designated BRCA and an important habitat corridor linkage between the McGinty Mountain/Sycuan Peak-Dehesa and Sweetwater Reservoir/San Miguel Mountain BRCAs. Hamilton Report at 1.

This Project will have serious long-term consequences, not only for the area residents, but for the San Diego County region. Those consequences include potentially devastating effects related to changes in drainage patterns, impacts to groundwater recharge, jeopardizing habitat planning efforts and loss of designated conservation lands, impacts to multiple sensitive species and their habitats, loss of open space, visual impacts, impacts to sensitive cultural sites, increased traffic congestion, an increased risk air and water pollution, and impacts to quality of life for thousands of area residents.

In a study of San Diego County regional aggregate supply in 2011, the site was not identified as a viable location for sand mining. The study surveyed lands in the San Diego region with Mineral Resource Zone classifications. San Diego Region Aggregate Supply Study 2011 at 7-16; excerpt attached as Appendix E. After accounting for the recommended 1,300-foot setback from planned residential uses to mitigate for noise, the report concluded that there would not be any potential aggregate sites with 60 or more effective acres. *Id.* at Figure 7-9 (indicating that once the recommended setback is applied, there are no available lands with Mineral Resource Zone classification along the Sweetwater River on the proposed Project site.) Thus, because of its proximity to developed and planned residential areas and environmentally protected areas, the Project site was effectively deemed unavailable for sand mining. *Id.* Moreover, as explained in detail below, the Project is inconsistent with applicable plans and ordinances, and the DEIR's analysis of these inconsistencies is deeply inadequate.

The DEIR for the proposed Project suffers from several major problems. First, the DEIR generally downplays the importance of the Project site as a wildlife linkage corridor. Second, the DEIR downplays significant impacts resulting during the 10-12 year mining operation, stating that because the project site has been developed as a golf course and because of the reclamation plan for the site, impacts from mining are temporary. DEIR at 2.2-3-32 2.2-30-2.2-41, 3.1.1-15, 3.1.1-22 and Hamilton Report at 30. to DEIR. This conclusion defies common sense; twelve years is not “short-term.” (Twelve years constitutes an entire childhood, and for many people, most of their retirement years.) A project that calls for sand and gravel mining operations over a dozen years in an area long recognized for its natural beauty, high-value biological resources, and serene environs would clearly harm biological values and degrade quality of life for residents of the area.

As discussed in more detail below, the DEIR presents overly narrow project objectives, an incomplete description of the project setting and of the project itself, and also substantially understates the severity and extent of a range of environmental impacts, and thus fails to provide adequate mitigation. In addition, in numerous instances, the DEIR also fails to adequately analyze the Project's cumulative impacts. These inadequacies require that the DEIR be revised and recirculated so that the public and decision-makers are provided with a proper analysis of the Project's significant environmental impacts and feasible mitigation for those impacts. *See* CEQA Guidelines § 15002(a)(1) (listing as one of the “basic purposes” of CEQA to “[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities”).

To ensure that the public and the County's decision-makers have adequate information to consider the effects of the proposed Project—as well as to comply with the law—the County must require revisions in the Project to make it compliant with the General Plan and other applicable plans, then prepare and recirculate a revised DEIR that properly describes the Project, analyzes its impacts, and considers meaningful alternatives and mitigation measures that would help ameliorate those impacts.

## **II. The DEIR's Flawed Description of the Setting and the Project Does Not Permit Meaningful Public Review of the Project.**

### **A. Project Setting**

Accurate and complete information pertaining to the setting of the project and surrounding uses is critical to an evaluation of a project's impact on the environment. *San Joaquin Raptor/Wildlife Center v. Stanislaus County*, 27 Cal.App.4th 713, 728 (1994); *see also Friends of the Eel River v. Sonoma County Water Agency*, 108 Cal.App.4th 859, 875 (2003) (incomplete description of the Project's environmental setting fails to set the stage for a discussion of significant effects). Here, the DEIR's deficiencies in describing the Project's setting undermine its adequacy as an informational document.

The DEIR fails to present important contextual information related to biological and hydrological resources on the Project site. For example, the DEIR describes the site as developed and including only small portions of high habitat value. DEIR at 2.2-2. However, this description belies the site's capacity to support special-status by way of providing a safe corridor to travel between conserved habitat areas. Hamilton Report at 27. As the Hamilton Report points out, the entire proposed Project site is designated for conservation in the County of San Diego's MSCP as an important wildlife movement

corridor that contributes to biodiversity and long-term sustainability of the regional conservation network.

In fact, County Planning staff, in scoping comments dated May 19, 2019 (“County Scoping Letter”), indicated that the “project contains nearly the *entire habitat linkage* between the McGinty Mountain/Sequan Peak-Dehesa Biological Resource Core Area (BRCA) and the Sweetwater Reservoir/San Miguel Mountain BRCA.” County Scoping Letter at 77; emphasis added. However, despite the fact the project site occupies a critically important location in the assembled MSCP preserve system, and regardless of MSCP requirements and clear County staff direction to analyze impacts on wildlife movement in this wildlife corridor, the DEIR omits analysis of the existing level of wildlife movement through the site. Hamilton Report at 9. Because no wildlife movement data were collected, the DEIR cannot and does not provide the “analysis of potential project impacts to wildlife movement through this linkage” Id.

In addition, the DEIR overstates project site disturbance and degradation. For instance, it incorrectly states that intermittent mining has taken place on the site up until 2016. DEIR Appendix C, Biological Technical Report, at 12. Yet, the DEIR itself contradicts this statement and clarifies that the most recent material removal was related to golf course creation of water hazards and expanded fairways. DEIR at 1-28 (“Several fairways were regraded and realigned on the southwestern end of the Project site within the now closed Lakes Course. *Although not a mining project*, materials were removed from the site.”) In another example, as explained in the Hamilton Report, the DEIR’s assertion that “[T]he site is currently an active golf course” is factually incorrect and misleading. The western third of the site is an abandoned golf course with minimal to no human presence and a landscape that has been rewilding itself for several years. Id.

Similarly, the DEIR states that current site activities such as mowing, night lighting, fencing, and noise associated with golf course operations discourage large animals from using the site as a wildlife corridor. DEIR at 2.2-19. The DEIR fails to describe the existing night lighting, the distance of the lighting from the riparian corridor, the frequency of mowing, the extent and condition of fencing, or the existing ambient noise on the site. According to the Hamilton Report, existing lighting appears to be localized and mowing appears to take place on a limited portion of the site. Hamilton Report at 22. Moreover, area residents observe that neither the active golf course or the abandoned course are lit all night such that the lighting is limited and wildlife are still likely to use the site. The DEIR’s claims that fencing on the site provides too much of a barrier for wildlife movement is not substantiated. On the contrary, some of the fences are in a state of disrepair such that animals can easily move around them. Hamilton Report at 34.

The DEIR also fails to substantiate the claim that existing ambient nighttime noise levels at the site create a disturbance for wildlife. Salter Report, attached as Appendix D at 4 and 5. In fact, as explained in the Salter report, the DEIR fails to both adequately evaluate existing ambient noise, thus failing to establish accurate baseline conditions, and fails to analyze predicted noise levels on-site and in adjacent habitat areas. *Id.* Specifically, the DEIR acoustical site assessment noise measurements, which comprised 10 to 15 minute noise measurements, are insufficient to accurately evaluate ambient noise levels. Salter Report at 3. Existing noise levels in areas are generally between 52 dBA and 55 dBA, which would not be disruptive to wildlife. *Id.*

Further, while the DEIR acknowledges that the Project site includes sensitive vegetation communities that provide habitat for a long list of sensitive species,<sup>1</sup> the DEIR entirely ignores two additional California Species of Special Concern. DEIR at 2.2-7 to 2.2-9. California Glossy Snake (*Arizona elegans occidentalis*) and Southern California Legless Lizard (*Anniella stebbinsi*), both [California Species of Special Concern] closely associated with loose, alluvial soils (such as those found on the site), and also have a high potential to occur on the project site. Hamilton Report at 3, 4 and 5. In addition, the DEIR surveys for arroyo toad (a federally endangered species) are inadequate and cannot be used to rule out the presence of this species. Hamilton Report at 27 and 28.

Perhaps most egregiously, the DEIR fails to adequately describe the existing hydrologic setting of the site and the vicinity. Specifically, the DEIR fails to describe baseline groundwater conditions at the site. Kamman Report at \_\_. This is important information from which to establish a baseline. As explained in the Kamman report, without a proper description of baseline conditions, the DEIR is unable to provide an adequate analysis of Project-related increases or decreases in groundwater recharge relative to existing conditions. *Id.* A revised analysis must include a Hydrology and Water Quality section that adequately describes the hydrologic setting.

## B. Project Description

Under CEQA, the inclusion in the EIR of a clear and comprehensive description of the proposed project is critical to meaningful public review. *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193 (“*Inyo II*”). The court in *Inyo II* explained why a thorough project description is necessary:

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<sup>1</sup> The DEIR lists 17 special-status wildlife species observed on or near the project site and nine additional species determined to have high potential to occur.

“A curtailed or distorted project description may stultify the objectives of the reporting process. 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.”

Id. at 192-93. Thus, “[a]n accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR.” *Santiago County Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 830.

The DEIR fails to describe aspects of the Project that are essential for the DEIR to provide a meaningful environmental analysis. In some cases, important aspects of the Project are omitted altogether. In perhaps the most glaring example, the DEIR fails to provide important details about the over-excavation of materials and subsequent fill using only the “waste material” from the excavation. CBEC Report at 4 and 5. The DEIR describes the use of waste material for backfilling excavated areas. DEIR at 1-12. However, as described in more detail below, the CBEC analysis indicates that waste materials alone are unlikely to be adequate to achieve the expected post-reclamation topography, significantly undermining the feasibility of the Reclamation Grading Plan. CBEC at 4.

CBEC conducted a cut fill analysis of the Project and reclamation grading plans. CBEC Report at 4 and 5. Although the DEIR’s description of this aspect of the Project is sparse and lacking in detail, CBEC estimates that over excavation and large fill areas will require 3.4 million cubic yards of backfill materials. Id. This amount of fill is almost seven times the volume of “waste” material the Project will have left after the project is completed. CBEC Report at 4 and 5; DEIR at 1-3 (extraction of 6.4 million tons with a 10 percent waste factor). Therefore, the Project site will not have sufficient waste material from the mining operation to backfill the over-excavated pits and attain the final grades as presented in the Reclamation Plan if waste material from the mining operation is the only fill material.

This gap in the project description implicates other inadequate analysis in the DEIR. For example, trucking backfill materials from off-site areas will result in increased VMT, increased air pollutants, higher greenhouse gas emissions, and increased noise. A revised DEIR should identify the off-site sources for additional materials and evaluate the transportation, air quality, greenhouse gas, and noise impacts associated with bringing the material on-site.

In another example, the DEIR fails to describe proposed uses for areas not planned for recreational uses described in the reclamation plan. These areas would be graded elevated areas, on the west and central of the proposed Project area. See red shaded areas showing graded elevated areas in CBEC Report, Figure 1. The DEIR is vague about future plans for these areas and it is unclear whether or not they will be included in conservation easements. If they are to be preserved as natural open space, this plan must be made clear in the project description and associated maps.

If the elevated areas not included in the reclamation will *not* be preserved under the proposed conservation easements, the DEIR must evaluate impacts of potential development in those locations. The DEIR states that “[F]uture development of the site is not included in the Proposed Project...” and only describes the planned recreational uses. DEIR at 1.33. The DEIR also states “Removal of the golf course could ultimately lead to the construction of housing, essential services, fire protection services, or agriculture on portions of the site outside of the floodway, although this is not proposed as part of the Project.” *Id.* The fact that there is no specific proposal for the development that could take place in these areas does not excuse the County from evaluating the potential impacts now. The areas in question would have a higher elevation (up to 10 feet) after Project implementation than they currently do. CBEC at 4. It is grading resulting from the proposed Project that will elevate these sites, making development viable, yet the DEIR maintains that the improvements are not a part of this proposed Project. DEIR at 1.33. Despite the DEIR’s unsupported assertions to the contrary, potential future development on the Project site is an integral part of the Project and must be analyzed as such, in this EIR. *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713. The DEIR must include a more detailed description of these sites and a full evaluation of related impacts. Instead, it defers the necessary evaluation to an undetermined date in the future, thereby illegally segmenting the Project.

CEQA prohibits such segmentation of a project. See *Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1229 (“when one activity is an integral part of another activity, the combined activities are within the scope of the same CEQA project” and must be analyzed together); Guidelines § 15378(a) (“‘Project’ means the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.”). Breaking the project into smaller sub-projects will lead to inadequate environmental review. See, e.g., *Bozung v. Local Agency Formation Comm’n* (1975) 13 Cal.3d 263, 283-84 (CEQA mandates that “environmental considerations do not become submerged by chopping a large project into many little ones”).

The potential new development at the proposed Project site would undoubtedly result in additional potentially significant environmental impacts that the DEIR ignores. These include, but are not limited to, construction emissions, noise, visual, and water quality impacts. However, because the DEIR never even describes the potential developments or their construction, it also fails to analyze any of these impacts or to consider mitigation measures. CEQA prohibits such omissions. CEQA Guidelines § 15378(a). It is no excuse that the description is preliminary in nature; the DEIR should include analysis of a worst-case scenario development as allowed per County land use regulations. A revised DEIR should describe the potential development and related impacts must be disclosed and analyzed now, during this CEQA process. Given the site's location, surrounding by sensitive habitat and preserved lands, and the site's importance as a wildlife corridor, this gap in the project description is especially unacceptable. A revised DEIR must either a) specify that these areas will be included in proposed conservation easements or b) identify potential uses for these sites and analyze related impacts as part of this CEQA process.

In sum, the DEIR presents an unstable and inadequate project description. This approach is not permissible under CEQA. The failure to describe the whole of the Project is a serious and pervasive deficiency, as it renders faulty the EIR's environmental impact analyses as well as the discussion of potential mitigation measures and alternatives to minimize those impacts. The EIR must provide a sufficient description of planned over-excavation of materials and fill, of the potential development on the graded elevated areas, and any other Project details. This information is necessary to allow decision makers, the public and responsible agencies to evaluate potential environmental impacts.

### **III. The DEIR Fails to Analyze and Mitigate the Project's Significant Environmental Impacts.**

CEQA requires that an EIR be detailed, complete, and reflect a good faith effort at full disclosure. CEQA Guidelines § 15151. The document should provide a sufficient degree of analysis to inform the public about the proposed project's adverse environmental impacts and to allow decision-makers to make intelligent judgments. *Id.* Consistent with this requirement, the information regarding the project's impacts must be "painstakingly ferreted out." *Environmental Planning and Information Council of Western El Dorado County v. County of El Dorado*, 131 Cal.App.3d 350, 357 (1982)

(finding an EIR for a general plan amendment inadequate where the document did not make clear the effect on the physical environment).

Meaningful analysis of impacts effectuates one of CEQA's fundamental purposes: to "inform the public and responsible officials of the environmental consequences of their decisions before they are made." *Laurel Heights Improvement Ass'n v. Regents of the University of California*, 6 Cal.4th 1112, 1123 (1993) (*Laurel Heights II*). To accomplish this purpose, an EIR must contain facts and analysis, not just an agency's bare conclusions. *Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal.3d 553, 568 (1990). Nor may an agency defer its assessment of important environmental impacts until after the project is approved. *Sundstrom v. County of Mendocino*, 202 Cal.App.3d 296, 306-07 (1988). An EIR's conclusions must be supported by substantial evidence. *Laurel Heights Improvement Ass'n v. Regents of the University of California*, 47 Cal.3d 376, 409 (1988) (*Laurel Heights I*).

CEQA does not allow a lead agency to defer critical studies regarding environmental impacts until after project approval. *See Sundstrom*, 202 Cal.App.3d 296. Nor may a lead agency satisfy CEQA by approving a project subject to conditions requiring the applicant to prepare future studies and mitigation measures, because in so doing the agency would be improperly delegating its legal responsibility to assess a project's environmental impact. *Id.* at 307. In contrast, CEQA requires the lead agency itself to prepare or contract for the preparation of impact assessments (citing CEQA § 21082.1) that reflect the agency's "independent judgement." *Id.* The fundamental concern underlying *Sundstrom* was that even if the required conditions of project approval had been adequate, the need for post-approval studies demonstrated the inadequacy of the County's environmental review prior to project approval. *Id.*

Finally, the DEIR may not avoid conducting a thorough analysis of the Project's impacts under the assumption that such impacts would be temporary. CEQA requires analysis of temporary or short-term impacts. CEQA Guidelines § 15126.2(a) (agency must analyze both short- and long-term impacts). CEQA defines a "significant effect on the environment" as "a substantial or potentially substantial adverse change in the environment." Pub Res C §21068. The CEQA Guidelines (14 Cal Code Regs §15382) expand on the statute and define "significant effect on the environment" as:

“a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance.”

An effect on the environment need not be "momentous" or "important" to meet the CEQA test for significance. Kostka and Zischke §6.44 B Evaluating Whether Effect on Environment May Be Significant. The term "significant" covers a spectrum ranging from "not trivial" through "appreciable" to "important" and even "momentous." See *No Oil, Inc. v City of Los Angeles* (1974) 13 C3d 68, 83. An agency has discretion to find a project's impacts insignificant on the basis of the scale of the project, particularly when the project's impacts are indirect and cannot reliably be predicted. *Save the Plastic Bag Coalition v City of Manhattan Beach* (2011) 52 C4th 155. An effect need not be either long term or permanent to be significant, but duration is a factor that may affect the significance of an environmental impact. *Running Fence Corp. v Superior Court* (1975) 51 CA3d 400, 416. Nothing in CEQA suggests that short-term effects cannot be of such significance as to require an EIR. *No Oil, Inc.*, 13 C3d at 85. As documented below, the Cottonwood Sand Mine DEIR fails to identify, analyze, or support with substantial evidence its conclusions regarding the Project's significant environmental impacts.

**A. The DEIR's Evaluation of Hydrology and Water Quality Impacts is Inadequate.**

The DEIR's analysis of the Project's impacts to hydrology, water quality, and flooding is inadequate because it: (a) presents an inaccurate hydraulic analysis; (b) presents an inaccurate estimate of impacts on groundwater resources; (c) fails to analyze on-site and downstream impacts, including impacts to drinking water in the Sweetwater Reservoir; (d) fails to support its conclusions with the necessary facts and analysis; and (e) fails to identify mitigation capable of minimizing the Project's significant environmental impacts.

Greg Kamman, Hydrogeologist with CBEC Eco Engineering, reviewed the Cottonwood Sand Mine DEIR hydrology and water quality analysis and the document's hydrological appendices. His report (CBEC Report), attached as Appendix A, provides a detailed evaluation of the DEIR's Hydrology and Water Quality section. We summarize some of the most critical points of that report below.

**1. The DEIR Presents an Inaccurate Hydraulic Analysis of the Project's Flood Impacts**

As explained in the CBEC Report, the DEIR fails to accurately analyze the Project's potential impacts related to flooding. CBEC Report at 2. The DEIR states that the Project will not raise off-site 100-year water surface elevations. DEIR at 3.15-19. The Hydraulic Model simulation results indicate a slight on-site increase in 100-year water

surface elevations, but the DEIR concludes that these increases would not impact off-site water surface elevations. Id.

CBEC's analysis found significant discrepancies when comparing land surface profiles of the Phase 4 model cross-sections to the Phase 4 Reclamation Plan grades. CBEC at 2. Specifically, the Phase 4 hydraulic model does not appear to incorporate the elevated fill surface into the cross-section profiles, and instead uses existing condition ground surface elevations. Id. Had the model accurately incorporated the planned elevated fill surface, the hydraulic model would have shown that the fill area would obstruct and alter hydraulic flow patterns, which would likely raise 100-year flood water surface elevations higher than disclosed in the DEIR. Id. This flaw implicates other parts of the hydraulic analysis as well. Id. For instance, this change in flow pattern could result in increased water storage on the site and increased flooding hazards downstream. Therefore, the DEIR's conclusion that impacts relating to flooding hazards would be less than significant is unsubstantiated. Id. A revised DEIR must correct this flaw and accurately assess water surface elevations during the post-reclamation phase

## **2. Inaccurate Estimate of Future Water Demands and Impacts on Groundwater Supply**

The DEIR states that project groundwater demands are primarily associated with mining operations and evapotranspiration from post-reclamation vegetation communities. DEIR at 3.1.5-15. The DEIR also asserts that estimated future water demands would be less than current golf course operation demands. Id. However, based on CBEC's review, it appears that the DEIR's estimates of future vegetation water demands is based on existing condition grades rather than the post-Reclamation grades. CBEC at 2 and 3.

CBEC's analysis concludes that with implementation of post-reclamation grades, the Project site will have large areas of ground lowering that will intersect the groundwater table, creating surface ponding. CBEC Report at 2-3 and Figures 3 and 4. CBEC's analysis found that the ground surface elevation will be lowered by approximately 18 feet in elevation on one part of the site and by approximately 6 feet at another. This change in ground surface elevation will, in turn, expose the ponded groundwater to evaporation, which will lead to a loss of groundwater. Id. The length of exposure time of ponded groundwater would vary with prolonged (multi-month to annual) exposure during wet years (see CBEC Report Figure 3). The DEIR fails to acknowledge, let alone quantify, the losses of groundwater due to surface ponding and evaporation. This potential significant impact on groundwater supply and groundwater recharge must be accurately quantified and analyzed in a revised EIR analysis.

The Project would also result in reduced depths to groundwater that are shallower than evaluated in the DEIR. CBEC at 3. This change implicates the survival of vegetation communities as mapped in the Reclamation Plan and may result in increased evapotranspiration demand, both of which have an impact on the feasibility of implementation of the Reclamation Plan. Id. In addition, a change in evapotranspiration demands, may lead to adverse impacts on groundwater supplies and groundwater recharge.

Therefore, the DEIR's conclusion that the proposed Project would have less than significant impacts to groundwater storage is unsubstantiated by the technical studies that support the claim. DEIR at 3.1.5-16

### **3. The DEIR Omits Important Analysis and Mitigation of Project Impacts On-site and Downstream.**

Another glaring flaw is the DEIR's incomplete analysis of on-site and off-site erosion impacts resulting from the Project. CBEC Report at 3 and 4. The Project's proposed 20-foot-tall rip rap structure, intended to mitigate for potential erosion and upstream head cutting, would create high velocities during periods of high river flow that would cause erosion at the base of the structure. Id. The DEIR failed to analyze conditions with high velocity flows, turbulent hydraulics and scouring. Id. Without such analysis the EIR cannot analyze the potential that this project feature will result in erosion and transport sediment and heavy metals downstream from the project. CBEC at 6 and Hamilton Report at 44. Such pollutants would impact riparian areas, aquatic wildlife, and other biological resources downstream as well as drinking water in the Sweetwater Reservoir. Id. As explained in the CBEC Report, the concentration of wash fines in the surface soil also poses impacts to water quality through increases in source and concentration of total dissolved solids (TDS) and naturally occurring metals. CBEC Report at 6. Such pollutants would then be transmitted downstream via floodwaters that bypass the project; ponds, wetlands, channel habitats that become established on fines within project boundary; and migration of water through the fines into underlying groundwater. Id. These pathways pose a direct risk to drinking water quality of receiving water bodies including both the Sweetwater Reservoir (located 2.8 miles downstream of the project site) and the underlying groundwater aquifer that supplies residential wells surrounding the site. The DEIR fails to analyze these impacts.

The DEIR implies that state regulations requiring review and oversight of the erosion control system by the Regional Water Board will ensure that potential impacts will be avoided or mitigated. DEIR at 3.1.5-12. Under well-established case law, compliance with regulations does not excuse the agency from describing Project

activities or from analyzing resulting impacts. *Oro Fino Gold Mining Corporation v. County of El Dorado* (1990) 225 Cal.App.3d 872, 885. The DEIR fails to support the conclusion that the Project's impacts on water quality are less than significant. DEIR at 3.1.5-13.

In sum, the DEIR must clearly and consistently describe the Project's elements and perform the necessary analysis prior to Project approval. Without this information, it is simply not possible to verify the accuracy of the DEIR's analysis of the Project's impact related to on-site hydrology and water quality. As to downstream impacts, the DEIR has entirely skipped over the required analysis and is wholly inadequate. A revised DEIR must include an analysis of the aforementioned significant impacts and identify feasible, effective mitigation or alternatives to avoid or minimize the impacts.

#### **B. The DEIR's Evaluation of Biological Resources Is Inadequate.**

The DEIR's treatment of biological impacts suffers from substantial deficiencies and fails to meet CEQA's well established standards for impacts analysis. The document's analysis both understates the severity of the potential harm to biological resources within and adjacent to the proposed Project site and neglects to identify sufficient mitigation to minimize these impacts. Given that analysis and mitigation of such impacts are at the heart of CEQA, the DEIR will not comply with these laws until these serious deficiencies are remedied. *See Sundstrom v. County of Mendocino*, 202 Cal.App.3d 296, 311 (1988) ("CEQA places the burden of environmental investigation on government rather than the public.").

As discussed above, the entire proposed Project site is designated for conservation in the County of San Diego's MSCP Subarea Plan as important to biodiversity and long-term sustainability of the regional conservation network. Furthermore, the Project site includes sensitive vegetation communities that provide habitat for sensitive species, including endangered and threatened species. DEIR at 2.2-42; Hamilton Report at 3 and 4. The Project will result in significant direct and indirect impacts to these sensitive communities. *Id.*

Given the importance of the affected biological resources, one would expect the DEIR's analysis to provide careful and thorough evaluation of the Project's potential impacts. Unfortunately, the DEIR's analysis is nowhere close to meeting CEQA's well-established standards for evaluating biological resource impacts. As detailed in the attached Hamilton Report, and summarized below, the DEIR presents a cursory and incomplete evaluation and lacks evidence for its conclusions. Perhaps most egregiously, the DEIR relies on false and unsupported claims that the Project conforms to MSCP

requirements to justify impact analyses and mitigation approaches intended to be used only for conforming projects. Hamilton Report at 3-27.

Under CEQA, decision-makers and the public must be given sufficient information about impacts and mitigation to be able to evaluate the impacts of a proposed project for themselves. *See* Pub. Res. Code 21061. Furthermore, analysis of impacts cannot be deferred to a later date but must be performed prior to project approval. *Sundstrom*, 202 Cal. App. 3d at 307 (“By deferring environmental assessment to a future date, the conditions run counter to that policy of CEQA which requires environmental review at the earliest feasible stage in the planning process.”). Accordingly, a revised DEIR must fully analyze and disclose these impacts and propose and evaluate feasible mitigation measures for each significant impact.

Because the report prepared by Hamilton Biological provides detailed comments on the DEIR’s biological resources analysis, we will not reiterate each of those comments here. *See* Hamilton Report attached as Appendix B. Instead, the discussion below highlights the most egregious deficiencies.

### **1. The Project is Inconsistent with Requirements for Proposed Development Within MSCP Areas.**

Because the Project site is located within designated MSCP planning areas, any proposed developed must be consistent with required Findings of Conformity. The DEIR’s MSCP consistency analysis concludes that the proposed project would comply with the Findings of Conformity, but in most cases, compliance is simply asserted rather than demonstrated. Hamilton Report at 3-27. For purposes of MSCP conformity, a proposed project is required to demonstrate conformance with eleven MSCP Findings of Conformity. *See*, Hamilton Report at 14. As explained in the Hamilton Report, nine of the eleven criteria are applicable to the Project and the proposed activities would violate all of them. *Id.* The DEIR fails to provide evidence for its conclusion that conformance has been achieved. *Id.*

To the contrary, the DEIR itself provides ample evidence that the project cannot meet the required Findings. To provide one example, the MSCP requires preservation of the biological integrity of linkages between BRCAs. Hamilton Report at 7 and 8. The DEIR implies that the Project will preserve the biological integrity of linkages between BRCAs including conservation of riparian areas. Multiple Species Conservation Program Conformance Statement For Cottonwood Sand Mining PDS2018-MUP-18-023, December 3, 2021, Section III.B.; DEIR at 45-54. However, in reality, the proposed Project would alter the floodplain and river flows that would degrade mature riparian

woodland habitat and degrade the linkage. Hamilton at 14. Destroying habitat with the unsupported promise that revegetation in a few years will restore it to habitat of equal value fails to meet MSCP standards and is thus inconsistent with MSCP findings requirements. Hamilton Report at 7-14, 20, and 35.

In another example, the MSCP Findings of Conformity require projects to minimize barriers to wildlife movement. Hamilton Report at 23. As discussed in detail in the Hamilton Report, the Project's proposed implementation of the 20-foot-tall rock riprap channel erosion barrier (drop structure) would span the entire width of the post-project floodplain, posing a barrier to wildlife movement. Hamilton Report at 23. The DEIR fails to analyze or mitigate this impact. Because the DEIR fails to recognize these massive hardscaped grade-control structures as potential barriers to wildlife movement, and provides no analysis of their potential effects on the functionality of the existing linkage/corridor, the County has no basis for finding the project in conformance with MSCP requirements. Id.

As explained in detail in the Hamilton Report, approving a project in a designated habitat linkage that violates all applicable MSCP design criteria would not only fail to conform to the MSCP, but could also render the MSCP in-operable moving forward. Hamilton Report at 23.

## **2. The DEIR's Description of the Existing Biological Setting Is Incomplete and Misleading.**

As discussed in section II above, the DEIR downplays the site's importance to the ecological health of the area. The DEIR dismisses the site's vital role as a habitat linkage between two established wildlife preserves. As explained in the attached Hamilton Report, current aerial imagery, clearly shows that urban development along Highway 94 and Highway 54 to the north of the proposed Project site effectively blocks nearly all movement of terrestrial and aquatic wildlife between Sweetwater Reservoir/San Diego National Wildlife Refuge and the McGinty Mountain Ecological Reserve. Hamilton Report, Figures 1 and 2 at pps. 2 and 3. The Project site, an MSCP-designated habitat linkage, provides by far the most viable opportunity for terrestrial and aquatic wildlife to move through this highly fragmented landscape. Id.

In addition, the DEIR overstates disturbance on the site, and entirely omits analysis of impacts to two sensitive species: California glossy snake and southern California legless lizard. Hamilton Report at 27-32. A revised DEIR must properly document the biological resources on site and thoroughly evaluate the Project's impacts to both on- and off-site biological resources.

### **3. Analysis of Significant Impacts on Biological Resources Is Incomplete and cursory.**

In some instances, the DEIR determines that the Project may have significant impacts, but then fails to determine the extent and severity of those impacts. Merely stating that an impact will occur is insufficient; an EIR must also provide “information about how adverse the adverse impact will be.” *Santiago County Water District v. County of Orange*, 118 Cal. App. 3d 818, 831 (1981). This information, of course, must be accurate and consist of more than mere conclusions or speculation. *Id.* The DEIR’s analysis of impacts to biological resources fails to fulfill this mandate in several instances.

For example, although the DEIR concludes that construction of the Project has the potential to result in significant adverse impacts to a host of sensitive animal species, several of which are federally endangered and/or threatened species, the document fails to explain the actual and specific consequences to these species. *See, e.g.*, DEIR at 2.2-26. These sensitive species include the coastal California gnatcatcher, least Bell’s vireo, loggerhead shrike, Cooper’s hawk, peregrine falcon, red-shouldered hawk, sharp-shinned hawk, two-striped garter snake, vermilion flycatcher, western spadefoot, white-tailed kite, yellow-breasted chat, yellow warbler, barn owl, and Belding’s orange-throated whiptail, to name a few. The DEIR provides scant information regarding the number of individuals of each species that will be affected or the degree to which the populations will be impacted.

In addition, the DEIR indicates that fugitive dust emissions from the Project would adversely impact plants, and animals that depend on those plants, because fugitive dust may make plants unsuitable as habitat for insects and birds. DEIR at 2.2-42. In addition, the DEIR states that “[B]reeding birds and mammals may temporarily or permanently leave their territories” to avoid extraction operations, “which could lead to reduced reproductive success and increased mortality.” *Id.* The DEIR then erroneously concludes that, with implementation of a Fugitive Dust Control Plan as a project feature, impacts to plants, birds, and mammals resulting from dust emissions would be less than significant. *Id.*

This conclusion cannot stand, for two reasons. First, under CEQA when evaluating the significance of a project’s impacts, “an EIR may not “compress[] the analysis of impacts and mitigation measures into a single issue.” *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 656. The DEIR’s failure to evaluate the impacts on biological resources from the Project’s dust emissions prior to mitigation constitutes a violation of CEQA. By assuming the implementation of measures identified

in the Fugitive Dust Control Plan as part of the Project, the EIR here did just that. And in so doing, it failed to recognize that the Project's potential to result in significant biological impacts. Yet without a significance finding, the DEIR cannot adequately identify mitigation for the impact. As was the case in *Lotus*, the EIR's failure to evaluate the significance of the Project's impacts separately from what is effectively its proposed mitigation (implementation of project design features), does not withstand scrutiny. More specifically, by conflating impacts and mitigation, the EIR fails to consider whether there may be other more effective mitigation options, thereby omitting information that is necessary for the informed decision-making and public participation that CEQA requires. *See id.* at 658; *see also San Franciscans for Reasonable Growth v. City & County of San Francisco* (1984) 151 Cal.App.3d 61, 79 (EIR is inadequate if it fails to identify feasible mitigation measures). Further, a finding of significance triggers the requirement that the Project include enforceable mitigation, as well as a monitoring program, which is lacking with the EIR's reliance on project design features as de facto mitigation. *See Lotus*, 223 Cal.App.4th at 656-57.

Second, as discussed in the Baseline Report and below, the DEIR fails to evaluate the effectiveness of the measures included in the Fugitive Dust Control Plan. Baseline at 5. As presented, the Fugitive Dust Control Plan does not ensure that impacts will be minimized. *Id.* For example, a measure related to speed limits on unpaved roads is inconsistent with a different state speed limit in the DEIR. *Id.* A measure that provides for watering unpaved roads lacks details such as how often to use water or other methods to control dust in the mining pit area. As explained in the Baseline Report, mining could disturb up to 30 acres at a time during each phase of operation. During dry weather conditions, wind erosion and equipment operation on 30 acres of disturbed sand could generate a substantial amount of fugitive dust emissions if not controlled. Baseline report at 5 and 6.

Similarly, the Fugitive Dust Control Plan is vague about how stockpiles of unused excavated materials will be managed to prevent wind erosion. *Id.* Here, the DEIR states that stockpiles that are unused for six or more months would either be seeded or covered to prevent wind erosion. DEIR Appendix I at 19. This suggests that unused stockpiles could be subject to uncontrolled wind erosion for up to 6 months before being seeded or covered, which could generate substantial dust emissions that were not accounted for in the DEIR analysis. Baseline at 6. The Fugitive Dust Control Plan's provisions for monitoring of dust emissions are equally lacking and, as written, do not ensure that dust control measures will be properly implemented, let alone effective to reduce impacts to less-than-significant levels. *Id.*

The County must do a more complete analysis of fugitive dust impacts and identify effective, enforceable measures that will minimize impacts to the sensitive plant and animal communities on- and off-site as well as sensitive receptors in adjacent residential areas. A revised DEIR should include: (1) thorough analysis of the Project's dust emissions and the resulting impacts on biological resources in the area, (2) avoidance measures as prioritized and prescribed by the BMO/MSCP, and (3) analysis of Project alternatives or mitigation measures that ensure effective mitigation of impacts or measures are adopted and are enforceable. See Guidelines § 15002(a); see also Pub. Resources Code § 21002; Guidelines §§ 15002(a)(3), 15021(a)(2); *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 443-45; County's Biological Mitigation Ordinance Chapter 5 § 86.501. Findings, Purpose And Intent ("It is further the policy of this Chapter to give greater value to the preservation of *large contiguous Biological Resource Core Area or to linkages* when formulating avoidance and mitigation requirements." [emphasis added]).

#### **4. The DEIR Fails to Adequately Evaluate the Project's Adverse Impacts on On-Site and Downstream Habitat Areas.**

As described in both the CBEC and the Hamilton Reports, the Project's effects on site hydrology would result in water stress to existing riparian habitat areas on-site and downstream of the Project site. The Project would result in myriad changes including a substantial loss of groundwater due to increased evapotranspiration from large numbers of wetland and riparian plants proposed as part of the revegetation plan and increased evaporation in ponded areas. In addition, changes in Project site topography, hydraulics, and flow that will redirect flood waters have the potential to impact existing riparian areas on-site and sensitive habitat downstream. CBEC Report at 5 and Hamilton Report at 25 and 44. The DEIR fails to evaluate these impacts.

In addition, as discussed above in section III.A.4, the Project proposes to place a large volume of wash fines from aggregate washing at the processing plant as backfill in the large pits created from excavation on the site. However, the use of this fine-grained soil will promote poor drainage conditions and may promote ponding that reduces infiltration and groundwater recharge. CBEC Report at 5 and 6. This would in turn concentrate metals and other toxins that can contaminate aquatic food webs, create algal blooms and eutrophication, and promote methylation of mercury. CBEC Report at 5 and 6 and Hamilton Report at 44. These impacts to water quality and to aquatic habitats downstream in the San Diego National Wildlife Refuge are ignored in the DEIR.

**5. The Project's Approach to Mitigation of Impacts on Biological Resources is Inadequate.**

Because the DEIR fails to adequately analyze significant impacts on biological resources on-site and off-site in the two adjacent wildlife refuges due to project-related hydrologic changes, fugitive dust emissions, and direct impacts from removal of habitat, it also fails to provide adequate mitigation to address all of the ways that biological resources will be impacted. An EIR is inadequate if it fails to identify feasible mitigation measures. *Lotus v. Department of Transportation* (2014) 223 Cal. App. 4th 645; *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal.App.3d 61, 79. An EIR is inadequate if it fails to suggest mitigation measures, or if its suggested mitigation measures are so undefined that it is impossible to evaluate their effectiveness. *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal.App.3d 61 at 79. The County may not use the inadequacy of its impacts review to avoid mitigation: "The agency should not be allowed to hide behind its own failure to collect data." *Sundstrom*, 202 Cal.App.3d at 306. The formulation of mitigation measures may not properly be deferred until after Project approval; rather, "[m]itigation measures must be fully enforceable through permit conditions, agreements, or legally binding instruments." CEQA Guidelines § 15126.4(a). Here, the DEIR's identification and analysis of mitigation measures, like its analysis of biological impacts, are legally inadequate.

**C. The DEIR's Analysis of Project-Related Air Quality Impacts Is Inadequate.**

The DEIR's analysis of Project-related air quality impacts contains numerous deficiencies that must be remedied in order for the public and decision-makers to fully understand the Project's impacts. Specifically, the evaluation of the Project's air quality impacts must be revised to address: (1) underestimation of fugitive dust emissions, (2) an insufficient mitigation plan for particulate matter emissions; and (3) deficient analysis and mitigation of project-related public health impacts, including valley fever. These issues, and other deficiencies, are discussed in greater detail in the Baseline Report, attached as Appendix C, and below.

**1. The DEIR Underestimates the Project's Particulate Matter Emissions.**

The DEIR's analysis of construction emissions grossly underestimates emissions of respirable particulate matter (PM10), a major pollutant source. Baseline at 1 and 2. The DEIR's modeling of PM10 emissions optimistically assumes that implementation of

dust controls would result in emission reductions of 98.3% to 99.4%. *Id.* However, these higher emission reductions are not supported by the references and methods cited in the DEIR, and the miscalculations substantially underestimate the total PM10 fugitive dust emissions, especially from vehicle movement. *Id.* As the Baseline report explains, when proposed Project emissions are calculated using more realistic emission reductions, estimated PM10 emissions are substantially higher.

The DEIR presented estimated PM10 emissions ranging from 83.6 to 85.0 pounds per day over the three mining phases of the project, which is below the threshold of 100 pounds per day. DEIR Table 3.1.1-8 at 3.1.1-29. Had the DEIR properly calculated the Project's emissions, it would have found that emissions would be more than twice the amount disclosed. Baseline Report at 2-4. According to Baseline's updated analysis, the total PM10 emissions would range from 182.8 to 184.2 pounds per day over the three phases of the project, which substantially exceeds the threshold of 100 pounds per day. Therefore, the project would generate PM10 emissions that result in a significant impact to regional air quality.

This flaw is particularly important because these emissions would expose workers and nearby receptors to health risks from exposure to particulate matter and other toxic air contaminants. It is well documented that short-term exposure to PM10 is associated with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease (COPD), leading to hospitalization and emergency department visits. See, <https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm>. Long-term exposure (months to years) to particulate matter is linked to respiratory mortality and lung cancer. *Id.*

A revised analysis must properly evaluate the Project's particulate emissions (prior to accounting for emission reductions from implementation of mitigations), disclose the corrected emissions of PM10, and identify feasible mitigation to minimize the impacts.

## **2. The DEIR's Mitigation Plan for Particulate Matter Emissions Is Insufficient.**

As discussed in section III.B.3 above, the DEIR wrongly included implementation of the Fugitive Dust Control Plan as part of the analysis of the Project's air quality emissions. Baseline at 5. Under CEQA, the County is obligated to evaluate the proposed Project's impacts prior to implementation of mitigation. *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 656. Moreover, even if such an approach were allowed, the DEIR did not include the Fugitive Dust Control Plan as part of the Project Description. Therefore, there is no assurance that the plan would be implemented.

Baseline Report at 5. The Fugitive Dust Control Plan should be a mitigation measure instead of a project design feature, so that the public and decisionmakers can fully evaluate the effectiveness of the control measures as part of the DEIR process and ensure implementation of dust control measures through enforceable permits/conditions. *San Franciscans for Reasonable Growth v. City & County of San Francisco* (1984) 151 Cal.App.3d 61, 79.

In addition, the DEIR fails to evaluate the effectiveness of the control measures proposed in the Fugitive Dust Control Plan. Baseline at 5 section III.B.3 above. Measures to mitigate the substantial amount of PM10 that would result from this Project should be specific and substantially more stringent. Baseline Report at 5 and 6. For example, the measures should include periodic air monitoring by a third party (when triggered by complaints), and should include specific information about how stockpiles and disturbed areas would be stabilized to prevent wind erosion, especially on the weekends.

### **3. The DEIR's Health Risk Assessment Lacks Substantial Evidence to Support Conclusions.**

The DEIR presents a Health Risk Assessment evaluating cancer risk from exposure to Project-generated toxic air contaminants ("TACs") of concern, including diesel particulate matter, silica dust and trace heavy metals. DEIR at 3.1.1-17. However, anticipated emissions from mining pit activities are not properly represented in the air dispersion model, which may result in an underestimate of health impacts to nearby receptors. Baseline Report at 7. Specifically, the modeling performed for this assessment relies on one relatively small volume source to model the emissions from mining operations across the entire subphase area. *Id.* Because the volume source modelled was so small, it is not likely representative of the actual conditions that would occur during mining operations, particularly emissions near the perimeter of the subphase area closest to sensitive receptors. *Id.* Unfortunately, the DEIR fails to specify the individual health-risk contributions from each emission source for each TAC and year of exposure, therefore, there is no feasible way to confirm the validity of the Health Risk Assessment. *Id.*

The DEIR's evaluation of Project-generated risks related to Valley Fever is also problematic. Baseline Report at 8. The DEIR's analysis of impacts related to Valley Fever, or coccidioidomycosis, acknowledges that San Diego County is a suspected endemic area for *Coccidioides* spores and has climatic conditions suitable for hosting the fungus. DEIR at 3.1.1-4. The DEIR concludes that the Project would have a less-than-significant impact related to emissions of *Coccidioides* spores because the on-site soil properties and current and past golf course turf management activities do not favor the

occurrence of the *Coccidioides* fungus. DEIR at 3.1.1-21. In addition, the DEIR relies on the Fugitive Dust Control Plan as a project design feature to control emissions of fugitive dust and other soil materials. Id.

As explained in the Baseline report, this approach fails for several reasons. First, the DEIR's analysis of Valley Fever assumes that both golf courses are still in use and therefore turf management practices (such as irrigation, fungicides, and others) preclude the presence of *Coccidioides* spores. DEIR at 3.1.1-21. However, the western third of the Project site has not been maintained for golfing activities (and therefore has not been irrigated or otherwise managed) for approximately five years. The DEIR should evaluate the possibility of soil contamination from dormant spores.

Second, the DEIR fails to provide substantial evidence that the Fugitive Dust Control Plan to control particulate matter emissions will be effective to reduce risk of Valley Fever to less-than-significant levels. This is because the Fugitive Dust Control Plan generally addresses dust emissions at the property line. Baseline at 8. *Coccidioides* spores are too small to be seen by the naked eye and are more efficient at dispersing further than dust. Id. Therefore, minimizing visible fugitive dust emissions at the property line does not address the potential for nearby residents to be exposed to airborne *Coccidioides* spores generated by Project mining activities. Id.

The DEIR's air quality analysis should be revised to provide a more thorough analysis of Project-generated risks related to Valley Fever, and should identify mitigation measures that specifically address the dust emissions generated by the disturbance of topsoil that could potentially contain *Coccidioides* spores. Id. The plan should also include measures to prevent the potential transport of *Coccidioides* spores from the Project site (e.g., thoroughly cleaning equipment and vehicles before moving offsite) and a medical surveillance program that includes periodic monitoring of workers for symptoms of Valley Fever. Id. at 8 and 9 and Letter Report by Petra Pless related to Review Draft Environmental Impact Report for Safari Highlands Ranch and Citywide SOI Update, dated November 30, 2017 at 20-34, attached as Appendix F.

**D. The DEIR's Noise Analysis Is Inadequate.**

**1. The DEIR Ignores Applicable County Noise Limits for Residential Areas.**

The DEIR explains that composite noise levels produced by mining activities would be as high as 73.7 dBA/69.9 CNEL at area sensitive receptors, exceeding County noise limits. DEIR at 2.4-17 (Table 2.4-1: Mining Operation Noise Levels). The DEIR

determines that mining activities could generate noise that exceeds the 75 dBA threshold and that impacts to nearby sensitive receptors would be significant. DEIR at 2.4-5. We do not disagree that the Project's impacts on sensitive receptors would be significant. However, the DEIR fails to disclose the extent and severity of this impact.

As an initial matter, the DEIR fails to take into account the San Diego County General Plan sound level limits opting instead to focus exclusively on the limits established by the County Noise Ordinance for the extraction industry. San Diego County has two principal noise regulations, the Noise Element of the General Plan and the Noise Ordinance. The General Plan Noise Element establishes sound level limits for noise received at noise sensitive land uses while the Noise Ordinance establishes sound level limits for noise sources. County of San Diego Guidelines for Determining Significance - Noise at p. 6. According to the General Plan, if an acoustical study confirms that greater than 60 dB CNEL would be experienced at a noise sensitive land use, modifications that reduce the exterior noise level to less than 60 dB CNEL and the interior noise levels to below 45 dB CNEL must be made to the development. See *id.* However, by relying on the far more lenient standard that would appear to be established by the County's Noise Ordinance for the extraction industry (as discussed in footnote 3, the County's documents identify inconsistent guidance relating to the allowable noise limits for the extraction industry), the DEIR fails to disclose that the Project would expose nearby sensitive receptors to noise levels that greatly exceed the sound level limit established by the General Plan.

Compounding matters, the DEIR ignores County guidelines adopted with the explicit intent to protect noise sensitive land uses from harmful noise generated by the extraction industry. The *County's Guidelines for Determining Significance – Mineral Resources* ("Mineral Resources Guidelines") explain that noise from quarry and mining activities is typically the largest environmental impact to nearby sensitive land uses. See Mineral Resources Guidelines at 7. Recognizing the threat posed by siting extraction operations in close proximity to sensitive receptors, the Mineral Resources Guidelines call for a setback area of approximately 1,300 feet to achieve allowable noise levels. *Id.* The Guidelines further state that "1,300 feet would usually attenuate typical heavy equipment noise levels of 75 to 90 dBA to the County Noise Ordinance standard of 50 dBA for daytime residential land use."<sup>2</sup> *Id.* Here, rather than establish an appropriately

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<sup>2</sup> There are numerous inconsistencies in the County's documents pertaining to the extraction industry's allowable noise limits. The *Mineral Resources Guidelines* explicitly state that a 1,300 foot buffer is usually sufficient to attenuate noise from extraction

sized buffer zone consistent with the Mineral Resources Guidelines, the Project would place excavation and reclamation activities about 100 feet from sensitive land uses, such as rural residents. DEIR at 2.4-10.

Further, as explained in the Salter report, the County Noise Ordinance includes applicable provisions that the DEIR ignores. Salter Report at 1. Specifically, Noise Ordinance section 36.404(a) states that the 75 dBA limit (the maximum one-hour average sound level allowed) applies not just at the property line, but also “at any location on a property that is receiving the noise.” Noise Ordinance § 36.404(a) and Salter Report at 1. The DEIR fails to evaluate the Project’s noise impacts against this provision. The noise limit for residential zones is 50 dBA during daytime hours. Noise Ordinance § 36.404(a).

As explained in the Salter Report, even with the proposed mitigation, Project-generated mining noise levels are estimated to range between 54 dBA and 68 dBA. DEIR, Appendix F, Tables 11 and 12, page 22 and Salter 2. Thus, the Project would exceed allowable noise levels in residential areas by 18 dB or more. Salter Report at 2. While the DEIR concludes that impacts to adjacent residents would be potentially significant, it errs in concluding that only nine receiver locations would be impacted. DEIR at 2.4-5. The Project as proposed has the potential to produce severe noise impacts to hundreds of households and the DEIR fails to disclose this impact.

In addition, the proposed mining site is in close proximity to Jamacha Elementary school, where increased noise is likely to impact classroom learning and may effect children’s cognitive development. See, [Does noise affect learning? A short review on noise effect on cognitive performance in children](#), Klatte, Berstrom and Lachmann, 2013, attached as Appendix G. Moreover, the Collaborative for High Performance School, which sets standards for background noise in schools, recently updated standards to lower the acceptable level of noise in classrooms. [https://chps.net/indoor-environmental-quality#EQ\\_P15.0](https://chps.net/indoor-environmental-quality#EQ_P15.0) . These standards, updated in 2020, reduce the baseline background noise standard to 40 dB (Leq), from the previous standard of 45 dBA. The "enhanced" goal is 35 dBA. Id. A revised DEIR must evaluate impacts to area schoolchildren.

The public has a right to know just how loud noise from the Project’s operations will be. California courts are clear on this subject. A DEIR may not “travel the legally impermissible easy road to CEQA compliance . . . [by] simply labeling the effect

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activities to achieve the County’s Noise Ordinance standard of 50 dBA for daytime residential land uses (i.e., the noise standard is 50 dBA). *Mineral Resources Guidelines* at 7. The County’s Noise Ordinance, on the other hand, appears to limit extraction industry sound to 75 dB at the property line.

‘significant’ without accompanying analysis . . . .” *Berkeley Keep Jets Over the Bay Com. v. Board of Port Cmrs.*, 91 Cal.App.4th 1344, 1371 (2001). Rather, “a more detailed analysis of how adverse the impact will be is required.” *Galante Vineyards v. Monterey Peninsula Water Management Dist.*, 60 Cal.App.4th 1109, 1123 (1997).

The revised EIR must evaluate and disclose the full extent and severity of the Project’s impacts on adjacent sensitive receptors and acknowledge the Project’s clear inconsistencies with the Mineral Resources Guidelines and the County’s General Plan requirements. Moreover, because the DEIR does not address these inconsistencies, it also fails to identify alternatives or mitigation measures that would increase the Project’s buffer distance sufficient to achieve the 50 dBA noise limit.

## **2. The DEIR Fails to Evaluate Project-Related Maximum “Single Event” Noise.**

Under well-established case law, the DEIR must also analyze the extent and severity of noise impacts based on single event noise (e.g., noise from each truck driving by, entering/exiting the Project site). Analyzing only average noise impacts has been rejected by California courts because impacted residents do not hear noise averages, but single events. *See Berkeley Keep Jets Over the Bay Committee v. Port of Oakland* (2001) 91 Cal.App.4th 1344, 1382. Single event noise levels have been shown to be likely to result in sleep and speech interference, and heightened levels of stress and annoyance. Noting that “sound exposure level [SEL] has been found to be the most appropriate and useful descriptor for most types of single event sounds,” the court in *Berkeley Keep Jets* held that the Port must prepare a supplementary noise analysis calculating the impacts of single-event sounds. *Id.* at 1382.

Here, the DEIR identified significant noise impacts from the Project on nearby residents and included estimated maximum noise levels from Project activities, leading to a conclusion of significance. In addition, the DEIR acknowledges that the County Noise Ordinance sets limitations on “impulsive” or “single event” noise of 82 dBA Lmax at residential uses, and 85 dBA Lmax for agricultural commercial, or industrial uses. DEIR at 2.4-3. Accordingly, the noise study for this Project should have analyzed the impacts of single event noise (from activities such as truck passbys adjacent to residences, rock and gravel being dropped into the metal bins of hauling vehicles, and similar momentary but commonly repeated activities) on sleep, speech, stress and annoyance levels, and should have identified adequate measures to mitigate those impacts. Salter Report at 4. A revised EIR must include analysis of such maximum noise levels.

### **3. The DEIR Fails to Properly Evaluate Existing Ambient Noise.**

The DEIR's errors extend beyond its failure to take into account the protective noise limits established by the County General Plan or to acknowledge the County's Mineral Resources Guidelines calling for a 1,300 foot buffer between a mining operation and noise sensitive land uses. The DEIR also fails to adequately evaluate ambient noise levels. As explained in the Salter Report, the acoustical site assessment only measured noise levels for 10 to 15 minute periods rather than the industry standard of measuring noise for a full 24-hour period. Salter Report at 3. A measure of 24-hour noise is also needed because the County expresses Noise Compatibility Guidelines using the Community Noise Equivalent Level (CNEL) metric, which requires a minimum of 24 hours of continuous monitoring at each location. Salter Report at 4. Moreover, several of the measurement locations were taken adjacent to roadway noise sources when many (or most) residences are not located near such noise sources. Salter Report at 3. The limited sample of existing noise conditions is not statistically valid and not representative of existing conditions and thus cannot be relied upon to describe baseline conditions. Salter Report at 3.

### **4. The DEIR Fails to Demonstrate That The Proposed Noise Barriers Will Effectively Reduce Noise.**

Notwithstanding the DEIR's deficient noise impact analysis, the document nonetheless recognizes the need to mitigate for the Project's significant noise impacts. DEIR at 2.4-13. Yet, the proposed mitigation measure simply does not and cannot reduce to insignificance these severe impacts. When a lead agency relies on mitigation measures to find that project impacts will be reduced to a level of insignificance, there must be substantial evidence in the record demonstrating that the measures are feasible and will be effective. *Sacramento Old City Assn. v. City Council of Sacramento*, 229 Cal.App.3d 1011, 1027 (1991); *Kings County Farm Bureau v. City of Hanford*, 221 Cal.App.3d 692, 726-29 (1990). There is no such evidence in the record for this Project.

The DEIR's main mitigation measure for noise impacts calls for requiring noise barriers of 8 or 12-feet. DEIR at 2.4-13. The DEIR claims that such barriers would break the line-of sight between the noise source and sensitive receptors to disrupt the noise transmitted along that direct path. *Id.* and Salter Report at 4. The DEIR also relies on depth of excavated areas to provide shielding of receptors from noise. *Id.* However, the DEIR includes no line-of-sight studies, therefore there is simply no evidence that the proposed barriers would reduce noise sufficient to protect nearby sensitive receptors from excessive noise. In fact, as the Salter Report points out, because surrounding residences

are elevated in comparison to the proposed Project site, it is highly likely that noise the barriers will be ineffective at reducing noise. Salter Report at 4.

The DEIR's failure to evaluate and mitigate the Project's noise impacts is a clear violation of CEQA. Moreover, because the EIR fails to provide feasible mitigation for the Project's significant noise impacts, it lacks the evidentiary support that impacts would be reduced to a less than significant level.

As discussed above, the revised EIR should include an alternative or mitigation calling for a 1,300 foot buffer zone consistent with the County's Mineral Resources Guidelines. See, Mineral Resources Guidelines at 15 ("Impacts from noise typically require the largest setback and past County approved noise studies indicate a setback of approximately 1,300 feet is needed for most typical extractive operations. The setback is relative to the property line and may vary depending on site specific conditions such as topography or intervening structures that reduce noise levels at the property line.") Such a measure would also be consistent with the County General Plan Policy N-5.2 (Noise-Generating Industrial Facilities) which calls for "locating noise-generating industrial facilities at the *maximum practical distance from residential zones.*"

**5. The DEIR Fails to Analyze Noise Impacts on Wildlife at the Adjacent Wildlife Refuges.**

The DEIR fails to evaluate the Project's noise impacts on adjacent wildlife habitats. The DEIR acknowledges that an increase in noise could result in significant impacts to wildlife within the wildlife corridor. DEIR at 2.2-50. Yet the DEIR provides no substantive analysis regarding noise in neighboring wildlife areas that will be subject to noise from the project operations. Salter Report at 5 and Hamilton Report at 23 and 36. As discussed above, the DEIR fails to adequately evaluate existing ambient noise in immediately proximate wildlife refuges, fails to describe project operational noise in the wildlife refuges, and fails to provide evidence that the mining operation will not impact sensitive wildlife habitat. Id.

**6. The DEIR Fails to Analyze Noise Impacts on Area Recreational Users.**

Finally, the DEIR completely ignores Project-related noise impacts to nearby trail users. Instead the DEIR ignores the decades-long impacts of the mining operation and focuses its discussion on the recreational benefits once the reclamation plan is completed. As an initial matter, as discussed above, the DEIR may not avoid conducting a thorough analysis of the Project's noise impacts under the assumption that such impacts would be

temporary. CEQA requires analysis of temporary impacts. CEQA Guidelines § 15126.2(a) (agency must analyze both short- and long-term impacts). A project that calls for sand and gravel mining operations in an area long recognized for its natural beauty and serene environs would clearly harm trail users because it would interfere with their use and enjoyment of the area. One of the purposes of open space is to provide urban users access to spaces away from the noise of urban life. The noise associated with excavation and aggregate processing activities (75 dBA and higher<sup>3</sup>) would result in the loss of connection to the natural environment. Industrial noise – like second-hand smoke – is indiscriminating; there would be no way to escape the noise except to leave the area altogether. The revised EIR must address this serious impact.

#### **E. The DEIR Fails to Adequately Analyze Traffic Hazards.**

Pursuant to Appendix G of the CEQA Guidelines, a project would have a significant impact on the environment if it would: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). DEIR 3.1.7-8. Here, the development of a sand and gravel mine immediately adjacent to an established residential community is the epitome of an incompatible land use. Adding heavy-duty trucks to area roadways has the potential to adversely affect the safe movement of all vehicular users along the roadway yet the DEIR fails to analyze these impacts.

Of critical importance, given the Project's proximity to an established residential neighborhood, the Project's heavy-duty trucks and other Project-related traffic would likely pose hazards to pedestrians and bicyclists. The DEIR states that the determination of significant hazards to pedestrians or bicyclists is determined by assessing factors including: the amount of pedestrian activity near the project; the magnitude of increased traffic on the road; and the physical conditions of the project site and surrounding area that may result in vehicle/pedestrian, vehicle/bicycle conflicts. DEIR at 3.1.7-8. The DEIR's traffic hazards analysis fails to take *any* of these factors into account. Consequently, the DEIR lacks evidentiary support that the Project would not increase hazards to motorists, pedestrians and bicyclists.

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<sup>3</sup> We note that the DEIR only discloses estimated noise levels within 100 feet of construction equipment and presents it in Leq, which is an averaging of noise over an 8-hour period. This noise metric is not representative of how people (and wildlife) experience noise.

## **1. Project Background and Environmental Setting.**

Sand extraction operations would be conducted approximately 260 days per year, on weekdays, between the hours of 7:00 a.m. to 5:00 p.m. Trucking would occur from 9:00 a.m. to 3:30 p.m. during the week. DEIR at 1-9. Every weekday, 176 heavy-duty trucks would travel on neighborhood roads. Id.

Primary access to the Project site is via Willow Glen Drive. The DEIR identifies Willow Glen Drive as a four-lane undivided roadway between Jamacha Road and Steele Canyon Road and a three-lane roadway with a two-way left-turn lane between Steele Canyon Road and the eastern Project boundary. DEIR at 3.1-7-1. Yet, Google Maps shows the segment of Willow Glen Drive adjacent to the proposed Project site (i.e., the Cottonwood golf Course) as a two-lane highway. See Appendix H. Willow Glen Drive has a speed limit of 45 miles per hour. DEIR at 3.1-7-10.

Land uses in the area include residences and several schools that would be impacted by the project. Willow Glen Drive traverses a residential neighborhood. Numerous residences abut Willow Glen Drive to the north and south. Jamacha Elementary school is located one-half mile to the south of the Project site, at the intersection of Steele Canyon Road and Jamul Drive. Valhalla High School is located three-quarters of a mile to the northwest. Hillsdale Middle School is located one-half mile to the west and Cuyamaca College is located approximately two-thirds of a mile to the west. DEIR at 1-26; 2.4-2; Figure 1-3 (Project Vicinity). Hilton Head County Park is located southwest of the Project site, just north of Willow Glen Drive.

The Project would restripe Willow Glen Drive between Steele Canyon Road and the Project driveway to provide Class II bicycle lanes on both sides of the roadway. DEIR at 3.1-7-9.

## **2. The DEIR Fails to Disclose, Let Alone Analyze, the Project's Potentially Significant Impacts to Motorists, Pedestrians and Bicyclists.**

The DEIR fails to provide *any* analysis of how the addition of 176 heavy-duty trucks to area roadways would increase the potential for passenger car/heavy-duty truck accidents. The DEIR fails to determine whether Willow Glen Drive, for example, which was presumably designed for passenger vehicles, could even accommodate heavy-duty trucks. Although trucks traveling on arterials roads can cause serious hazards—due to their comparatively slower travel speeds, or because motor vehicles may attempt dangerous maneuvers to pass these trucks—the DEIR makes no effort to disclose the

potential for increased accidents. The fact that Willow Glen Drive is a two-lane—rather than a three-or four-lane road as the DEIR asserts—increases the potential for vehicular hazards.

The DEIR also fails to provide *any* analysis of traffic hazards to pedestrians caused by the Project’s increase in motor vehicle and heavy-duty truck traffic. As an initial matter, the DEIR states that pedestrian activity in the Project area is generally low. DEIR at 3.1-7-10. The DEIR provides no documentation for this assumption. There are multiple schools in the area, as well as a County Park. Do residents of the area walk along Willow Glen Drive and Steele Canyon Road to access these schools and the park? The DEIR does not tell us. Based on Google Maps, there are no sidewalks near the proposed Project site. *See* Appendix H. If pedestrians are forced to share the road with intensive truck traffic, this would undoubtedly create a safety hazard, yet the DEIR provides no analysis of these potential impacts.

Nor does the DEIR provide any information regarding existing bicycle use on area roadways including Willow Glen Drive. The document also does not disclose whether there have been any motor vehicle accidents on area roadways involving bicyclists. Notably, the Project’s installation of bicycle lanes on Willow Glen Drive will encourage bicycle use on this roadway. Yet, here too, the DEIR fails to provide *any* analysis of traffic hazards to bicyclists caused by the Project’s increase in motor vehicle and heavy-duty truck traffic or by the installation of a bicycle lane on Willow Glen Drive. The DEIR’s failure to analyze bicycle and pedestrian safety hazards violates CEQA. *See* CEQA Guidelines § 15151; *Environmental Planning & Information Council v. County of El Dorado* (1982)131 Cal.App.3d 350, 357.

The revised DEIR must disclose and evaluate existing bicycle and pedestrian activity in the vicinity of the Project, then analyze whether the increase in both heavy-duty truck and vehicular traffic generated by the Project would cause an increase in collisions between bicycles, pedestrians and vehicles. This analysis must be supported with substantial evidence.

**F. The Project is Inconsistent With the County General Plan, the Valle De Oro Community Plan, and the County’s Zoning Ordinance.**

The state Planning and Zoning Law (Gov’t Code § 65000 et seq.) requires that development approvals be consistent with a jurisdiction’s general plan. “Under state law, the propriety of virtually any local decision affecting land use and development depends upon consistency with the applicable general plan and its elements.” *Resource Defense Fund v. County of Santa Cruz* (1982) 133 Cal.App.3d 800, 806. Accordingly, “[t]he

consistency doctrine [is] the linchpin of California's land use and development laws; it is the principle which infuses the concept of planned growth with the force of law." *Families Unafraid to Uphold Rural El Dorado County v. Board of Supervisors* (1998) 62 Cal.App.4th 1332, 1336.

Moreover, CEQA requires that EIRs analyze a project's consistency with applicable local plans, including General Plans. See *Napa Citizens for Honest Govt. v. Napa County Board of Supervisors*, 91 Cal.App.4th 342, 386-87 (2001); CEQA Guidelines Appendix G, § IX (b). Inconsistencies with a General Plan or other local plan goals and policies enacted to protect the environment are significant impacts in and of themselves and can also be evidence of other significant impacts. See *id.*; *Pocket Protectors v. City of Sacramento*, 124 Cal.App.4th 903, 929 (2004). In addition, a recent California Court of Appeal opinion specifies that a City must deny a project if it does not comply with the city's General Plan. See *Kutske v. City of San Diego*, 11 Cal.App.5th 1034, 1040-42 (2017). It is an abuse of discretion to approve a project that "frustrate[s] the General Plan's goals and policies." *Napa Citizens for Honest Gov't v. Napa County* (2001) 91 Cal.App.4th 342, 379. A project need not present an "outright conflict" with a general plan provision to be considered inconsistent; the determining question is instead whether the project "is compatible with and will not frustrate the General Plan's goals and policies." *Napa Citizens*, 91 Cal.App.4th at 379.

Here, the proposed Project does more than just frustrate the General Plan's goals. As discussed in more detail below, the Project plainly conflicts with the County's General Plan, specifically General Plan policies that protect natural drainage patterns, sensitive biological resources, and community character. Moreover, the proposed Project location in close proximity to hundreds of residences, and within a wildlife movement corridor linking two wildlife refuges, make mining on the proposed site an incompatible use on its face.<sup>4</sup>

### **1. The Project Is Inconsistent With The County's General Plan**

The DEIR acknowledges that the Project must be consistent with the County's General Plan and purports to analyze the projects consistency with various General Plan

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<sup>4</sup> "Compatible uses may include non-urbanized areas, very low density residential development, land that does not have high- cost improvements, and lands used for agriculture, silviculture, grazing, or open space (Note: there may be cases where *open space designated to protect sensitive environmental resources is not compatible to mining*). County Guidelines For Determining Significance And Report Format And Content Requirements, Mineral Resources, July 20, 2008 at 15; emphasis added.

policies and goals. The DEIR, however, glosses over numerous inconsistencies with the General Plan. In addition to misinforming decisionmakers and the public about the Project's consistency with the General Plan, this analysis underestimates the actual impacts of the Project and ignores some of the Project's most significant impacts.

The DEIR must be revised to provide a comprehensive and accurate analysis of all general plan inconsistencies. Some examples of additional inconsistencies are described below.

(a) **Biological Resources Protection Policies**

The County General Plan includes policies to ensure protection of sensitive resources. The DEIR acknowledges these policies, but fails to address the inconsistencies with the Project. The policies and inconsistencies are addressed below.

Policy COS-2.1 Protection, Restoration and Enhancement. *Protect and enhance natural wildlife habitat outside of preserves as development occurs according to the underlying land use designation. Limit the degradation of regionally important natural habitats within the Semi-Rural and Rural Lands regional categories, as well as within Village lands where appropriate.*

Policy COS-2.2 Habitat Protection through Site Design. *Require development to be sited in the least biologically sensitive areas and minimize the loss of natural habitat through site design.*

Goal LU-6 Development – Environmental Balance. *A built environment in balance with the natural environment, scarce resources, natural hazards, and the unique local character of individual communities.*

Policies LU-6.1 Environmental Sustainability. *Require the protection of intact or sensitive natural resources in support of the long-term sustainability of the natural environment.*

LU-6.7 Open Space Network. *Require projects with open space to design contiguous open space areas that protect wildlife habitat and corridors; preserve scenic vistas and areas; and connect with existing or planned recreational opportunities.*

As discussed in sections I, II, and III.B of this letter above, much of the project will be sited in, and adjacent to, biologically sensitive areas and approval of the project will result in the unmitigated loss of sensitive habitat and sensitive species. The DEIR claims the Project would be consistent with these policies because open space would be

reclaimed after mining is completed. DEIR Appendix B at B3. The DEIR states that mining activities would avoid impacts to the existing low-flow channel and the majority of native habitat that currently remains on site. *Id.* However, this conclusion is unsubstantiated. To the contrary, evidence in the record indicates that the Project would result in significant adverse impacts to wildlife habitat and wildlife movement corridors (both during mining operations and after reclamation) and to scenic views. *See* Hamilton Report, attached as Appendix B; DEIR at 2.1- 46 to 48. Moreover, reclamation would not take place for many years in the future and the success of the reclamation work is not assured. Hamilton Report at 45. Therefore, the Project does not avoid or protect sensitive habitat and conflicts with these goals and policies.

**(b) Policies Protecting Community Character and Scenic Resources**

The General Plan includes policies to conserve and enhance the County's rural setting and character and to protect communities from the harmful effects of development.

*Goal LU-2: Maintenance of the County's Rural Character. Conservation and enhancement of the unincorporated County's varied communities, rural setting, and character.*

*Policy LU-2.8: Mitigation of Development Impacts. Require measures that minimize significant impacts to surrounding areas from uses or operations that cause excessive noise, vibrations, dust, odor, aesthetic impairment and/or are detrimental to human health and safety.*

*Policy COS-11.1 Protection of Scenic Resources. Require the protection of scenic highways, corridors, regionally significant scenic vistas, and natural features, including prominent ridgelines, dominant landforms, reservoirs, and scenic landscapes.*

The large scale of the proposed Project will result in unmitigated significant aesthetic impacts as well as sustained noise, vibration, and dust impacts throughout the Project's duration of 12 plus years. DEIR at 2.1- 46 to 48. Therefore, the Project is inconsistent with this goal and policies. The DEIR acknowledges the Project's inconsistency with Policy COS-11.1, but fails to propose alternatives to address this inconsistency.

(c) **Drainage and Hydrology Protection Policies**

Policy COS-4.3 Stormwater Filtration. *Maximize stormwater filtration and/or infiltration in areas that are not subject to high groundwater by maximizing the natural drainage patterns and the retention of natural vegetation and other pervious surfaces. This policy shall not apply in areas with high groundwater, where raising the water table could cause septic system failures, moisture damage to building slabs, and/or other problems.*

Goal COS-5 Protection and Maintenance of Water Resources. *Protection and maintenance of local reservoirs, watersheds, aquifer-recharge areas, and natural drainage systems to maintain high-quality water resources.*

Policy COS-5.3 Downslope Protection. *Require development to be appropriately sited and to incorporate measures to retain natural flow regimes, thereby protecting downslope areas from erosion, capturing runoff to adequately allow for filtration and/or infiltration, and protecting downstream biological resources.*

Policy COS-5.5 Impacts of Development to Water Quality. *Require development projects to avoid impacts to the water quality in local reservoirs, groundwater resources, and recharge areas, watersheds, and other local water sources.*

As explained in the CBEC Report, the Project would result in severe alteration of natural flow regimes, would result in unmitigated impacts related to erosion and groundwater recharge, and would adversely impact downstream biological resources. CBEC Report at 5 and 6. The DEIR fails to analyze these project inconsistencies. Given that the Project will conflict with the County's General Plan policies, state and local law forbid the County from approving it.

**2. Consistency with the Valle de Oro Community Plan**

The Valle de Oro Community Plan ("VDOCP") includes a vision statement specifying that "[N]ew development will conserve natural resources and topography and will provide a pleasant, safe environment for present and future residents of Valle de Oro." VDOCP at 3. The VDOCP identifies designated Resource Conservation Areas ("RCA") within the Rancho San Diego Specific Plan. This designation is intended to preserve the community's significant natural resources. The Project site is included in designated RCA 77: Sweetwater River Floodplain. Valle de Oro Community Plan at 36 and Appendix A – Map of RCAs. Here too, the DEIR dismisses the Project's inconsistencies with the VDOCP and the significant impacts of the Project.

**(a) Goal Regarding Community Character**

**Goal:** Retain the unique balance of urban, semi-rural agricultural, and open space land uses within the community, with open space and low-density buffers that separate the community from adjacent cities and unincorporated communities, while new development within the community conserves natural resources and topography.

The Project is inconsistent with this goal of preserving community character. As discussed through this letter, the Project would alter the topography of the river bed, alter drainage and flow patterns, adversely impact myriad sensitive habitats and species, and seriously degrade an important linkage between two Biological Resource Conservation Areas. Therefore, the Project conflicts with this goal of preserving community character.

**(b) Goals and Policies Regarding Industrial Development**

**Goal:** Provide for the kind of industrial development that *does not detract from the existing character of the community*.

**Policies**

1. New industrial areas shall be *compatible with limited impact* industrial activities.

3. All industrial activities shall provide *buffering or screening* when located adjacent to residential areas.

4. Require strict regulation of all extraction industries to *minimize dust, noise, traffic, unsightly views, undesirable accumulation of water, and safety and health hazards*.

The Project would be inconsistent with these policies because the proposed sand mine is incompatible with conservation of the biologically rich open space areas that provide habitat for sensitive species. A mining operation of this scale will adversely impact existing residents and recreational uses surrounding the Project through significant unsightly views, noise, air pollution, and truck traffic.

### **(c) Goals And Policies Regarding Open Space**

**Goal:** The preservation of open space including sensitive habitat, steep slopes, canyons, floodplains, and agricultural lands; and regulation of the use of open space within the community.

#### **Policies**

9. Encourage the preservation of open space areas in which potential natural hazards exist (flood plains, fault lines, mudslides, etc).

11. Areas to be preserved as natural open space shall be included in open space easements.

As the VDOCP explains, the area of open space within the Valle de Oro Planning Area includes the Sweetwater River floodplain, the Rancho San Diego National Wildlife Refuge, and additional large areas of Rancho San Diego. Much of these areas within the County's jurisdiction are designated as BRCAs or PAMAs and are designated for protection from development. Sand mining is a highly invasive activity that would destroy much of the habitat in the Project area rather than preserve it. Therefore, the Project is inconsistent with these policies.

### **(d) Goals And Policies Regarding Conservation**

**Goal:** Promote Conservation And Planned Management Of All Valuable Resources, Natural And Man Made, And Prevent Wasteful Exploitation And Destruction Of The Resources.

#### **Policies**

1. Conserve unique resources in Valle de Oro by utilizing Resource Conservation Area (RCA) overlays and appropriate land use and zoning controls. Resource Conservation Areas for Valle de Oro are delineated on a map in this Community Plan, Figure 7. This document specifically identifies unique resources and sets forth methods which will be applied to conserve those resources.

3. Encourage the strict regulation of the uses of water bodies within the planning area to ensure that such uses are compatible with existing ecosystems.

10. The County shall monitor groundwater levels throughout the plan area and institute regulatory measures if long-term depletion of groundwater resources is occurring.

11. The County shall monitor subsurface flows of the Sweetwater River basin and institute regulatory measures if long-term depletion of the groundwater resources is occurring.

13. Only uses compatible with flooding, such as agriculture, parks, recreation, riding and hiking trails, and other open space activities shall be allowed in significant natural drainage areas.

14. Include the following significant drainage areas as Resource Conservation Areas and apply the appropriate controls:

a. The Sweetwater River Floodplain and identified contiguous high value habitats. (RCA No. 77)

17. Use Land Use Element designations compatible with areas supporting unique vegetation and wildlife habitat resources.

18. Conserve unique functional plant and wildlife habitats, particularly those supporting rare, endangered, or threatened or depleted species.

20. Encourage the maintenance and enhancement of functional plant and wildlife habitats for threatened and endangered species.

21. Protect wildlife refuge areas from noise impacts, outdoor lighting impacts, and pollution impacts from stormwater runoff.

22. Require development which is in harmony with existing topography and avoids extensive and severe grading.

29. Discourage new sources of air pollution in the Valle de Oro area.

The proposed Project is also inconsistent with the Goals and Policies regarding conservation in the VDOCP. As explained in the CBEC Report, the Project would result in changes to the natural drainage pattern of the Sweetwater River and contribute to soil erosion and water pollution both on and off-site. *See*, CBEC Report at 2-5 and Hamilton Report generally. Clearly, mass excavation of the river and floodplain that will forever alter the topography and flow regime is not in harmony with the existing topography and

does not preserve the natural state of the area. As discussed in detail in section III.A. and B. above and in the attached CBEC and Hamilton Reports, the Project will impact sensitive biological habitat on site and biological restoration areas downstream. Therefore, the Project is inconsistent with these policies.

#### **(e) Policies Related to Scenic Highways**

Goal: Utilize scenic highway corridors as one method of protecting and enhancing the appearance of scenic, historical, and recreational areas.

1. Support the protection of the scenic highway corridors in Valle de Oro as designated in the County General Plan.<sup>5</sup>

2. Scenic highway corridors in Valle de Oro are as follows: SR-94; SR-125 as an existing designated route; Jamacha Road/SR-54 from SR-94 to El Cajon; Fuerte Drive from I-8 to Chase Avenue; Willow Glen Drive, and Avocado Boulevard.

As acknowledged in the DEIR, SR 94 from SR 125 to Interstate 8 and Willow Glen Drive from Jamacha Road to Dehesa Road, which fronts the northern Project boundary are identified as scenic corridors. DEIR at 2.1-22 and 2.1-46. The DEIR also acknowledges that impacts to view from Willow Glen Drive during mining and reclamation (10-20 years until post-reclamation vegetation matures). DEIR at 2.1-32 and 2.1-47. Therefore, the Project is inconsistent with VDOCP goals and policies related to preserving scenic viewsheds along designated scenic corridors.

#### **(f) Policies Related to Noise**

Goal: protect and enhance Valle De Oro's acoustical environment by supporting the control of noise at its source, along its transmission path, and at the site of sensitive receivers.

3. Encourage land use and circulation patterns which will minimize noise in residential neighborhoods and sensitive wildlife habitat.

As explained in section III.D above, and in the attached Salter Report, the proposed Project would generate noise in excess of established standards for prolonged periods of time. DEIR at 2.4-5. The DEIR provides no evidence that the identified mitigation would be effective. Salter Report at 4. This noise will severely impact not

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<sup>5</sup> See also General Plan Conservation and Open Space Element Goal COS-11.

only area residents but also sensitive wildlife. Therefore, the Project is inconsistent with VDOCP goals and policies related to minimizing noise.

### **Consistency with the County Code of Regulatory Ordinances**

The DEIR acknowledges that mining and processing on these lands will require a Major Use Permit (MUP). Section 7358 of the Zoning Ordinance requires certain findings before any use permit may be granted or modified. These findings include:

*a. That the location, size, design, and operating characteristics of the proposed use will be compatible with adjacent uses, residents, buildings, or structures, with consideration given to:*

- 1. Harmony in scale, bulk, coverage and density;*
- 2. The availability of public facilities, services and utilities;*
- 3. The harmful effect, if any, upon desirable neighborhood character;*
- 4. The generation of traffic and the capacity and physical character of surrounding streets;*
- 5. The suitability of the site for the type and intensity of use or development which is proposed; and to*

*6. Any other relevant impact of the proposed use; and*

*b. That the impacts, as described in paragraph "a" of this section, and the location of the proposed use will be consistent with the San Diego County General Plan.*

*c. That the requirements of the California Environmental Quality Act have been complied with.*

As discussed throughout this letter, the project's significant, hydrological, biological, noise, air quality, and traffic hazard impacts, which surrounding residents would be exposed to for a dozen years or more, would impact the physical character of the surrounding rural residential uses and open space/recreational area making the project incompatible with the surrounding uses. As explained above, the Project is inconsistent with several County General Plan policies and VDOCP policies, including policies related to the protection of the County's rural character, sensitive biological resources, and scenic areas. Finally, as discussed throughout this letter, this DEIR is inadequate to comply with CEQA. For all these reasons, the County cannot make the necessary findings to grant the MUP.

### **3. Consistency with Other County Ordinances**

Moreover, the DEIR fails to analyze the Project's consistency with the County's Groundwater Ordinance, which requires analysis of potential groundwater impacts. San

Diego County Code, tit. 6, §67.701 et seq. The DEIR acknowledges this requirement but fails to actually conduct the analysis. DEIR at 3.1.5-10. A revised DEIR must evaluate potential inconsistencies and related impacts.

#### **IV. The DEIR Fails to Comply with CEQA's Mandate Regarding Alternatives Analysis.**

Under CEQA, an EIR must consider a “reasonable range” of alternatives “that will foster informed decision making and public participation.” CEQA Guidelines § 15126.6(a); *Laurel Heights I*, 47 Cal.3d at 404. (“An EIR’s discussion of alternatives must contain analysis sufficient to allow informed decision making.”). The discussion of alternatives must focus on alternatives that are capable of avoiding or substantially lessening any significant effects of the Project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. CEQA Guidelines § 15126.6(b). In addition, a “lead agency may not give a project’s purpose an artificially narrow definition,” to shape this determination but rather must “structure its EIR alternative analysis around a reasonable definition of underlying purpose and need.” *In re Bay-Delta etc.*, 43 Cal.4th 1143, 1166 (2008). In particular, using overly narrow objectives to dismiss reasonable and feasible alternatives constitutes prejudicial error. See *North Coast Rivers Alliance v. Kawamura*, 243 Cal.App.4th 647, 669-70 (2015) (where the lead agency’s overly narrow project purpose caused it to “dismiss[] out of hand” a relevant alternative, this error “infected the entire EIR”).

As a preliminary matter, the DEIR’s failure to disclose the extent and severity of the Project’s broad-ranging impacts necessarily distorts the document’s analysis of Project alternatives. As a result, the alternatives are evaluated against an inaccurate representation of the Project’s impacts. Proper identification and analysis of alternatives is impossible until Project impacts are fully disclosed.

Moreover, the DEIR’s alternatives analysis fails to live up to CEQA standards because: 1) it defines the Project objectives too narrowly and 2) it fails to analyze a reasonable range of alternatives that could significantly reduce the Project’s impacts

##### **A. The DEIR Presents Overly Narrow Objectives.**

An EIR violates CEQA if it defines project objectives so narrowly as to preclude any alternatives at all (see *North Coast Rivers Alliance v. Kawamura* (2015) 243 Cal.App.4th 647, 667), or proposes purported alternatives that conflict with project objectives only so they can be easily eliminated (see *Watsonville*, 183 Cal.App.4th at 1089).

As discussed above, the DEIR presents overly narrow and self-fulfilling project objectives. Objectives 1 and 3 effectively circumscribe and mandate selection of the Project or an alternative that is substantively similar. In particular, Objective 1 requires the project to “Recover and process construction aggregates in a financially sound and efficient manner while meeting all local, state, and federal safety requirements.” DEIR at 1-1. Objective 3 demands the extraction of “aggregate product in the amount of 570,000 tons per year (approximately one-quarter of San Diego County’s annual sand demand). Id. These objectives leave no room for consideration of anything other than development of a sand mine operation at this location. Because the objectives leave no room to consider—and are used to justify dismissal without analysis of—relevant, feasible alternatives, they preclude consideration of a reasonable range of alternatives and violate CEQA. *North Coast Rivers Alliance v. Kawamura*, 243 Cal.App.4th 647 at 669-70 (2015). The County should withdraw the DEIR and proceed with analysis of a reasonable range of alternatives, and recirculate the EIR for a complete and adequate environmental review.

#### **B. The DEIR Fails to Consider a Reasonable Range of Alternatives**

The DEIR analyzes only two alternatives to the Project, aside from the No Project Alternative: the Biological Resources Avoidance Alternative and the Noise Receptor Setback Alternative. However, both of these alternatives still result in significant impacts that have not been disclosed. Specifically, the Biological Resources Avoidance Alternative would have a reduced mining footprint and would extract the same amount of material in shorter amount of time (i.e., six years instead of ten). DEIR at 4-5. However, this alternative would not address the significant impacts to the wildlife corridor nor the impacts related to changes in hydrology that would also impact sensitive habitat and species. Therefore, the alternative does not reduce the Project’s significant biological impacts and fails to meet CEQA standards for alternatives analysis. CEQA Guidelines § 15126.6. Moreover, like the proposed Project, this alternative would result in noise impacts to area residents and would potentially result in more severe, undisclosed, unmitigated significant impacts related to groundwater supply/recharge and water quality.

Similarly, the Noise Receptor Setback Alternative would have a reduced mining footprint with a 400-foot buffer from sensitive receptors and would extract the same amount of material overall over a period of seven years rather than ten. DEIR at 4-10. First, this Alternative would remain inconsistent with County Mineral Resources Guidelines that provide for a 1,300 foot buffer between mining operations and residential uses. Second, this alternative would do nothing to ensure avoidance of MSCP protected

areas and would also result in undisclosed/unmitigated significant impacts related to groundwater supply/quality, recharge and changes to river hydraulics.

The DEIR should have also considered other feasible alternatives that would actually *substantially lessen* the Project's multiple significant impacts. The document provides no reasonable explanation as to why additional alternatives that reduce the inevitable damage from the proposed Project were not proposed. In this case, where the proposed Project is out of scale and character with the surrounding uses, and would result in many significant environmental impacts, it is especially important that the DEIR analyze alternatives that could avoid or lessen those impacts. *See* CEQA Guidelines § 15126.6(c).

As discussed above, the Project will result in significant impacts related to hydrology, biological resources, air quality, noise, and traffic hazards. Thus, the DEIR should have considered alternatives to avoid or lessen these impacts. For example, the DEIR should have analyzed a reduced extraction alternative that would limit the depth of excavation to avoid ponding that would impact groundwater resources, limit changes to hydraulics and flood flows, and avoid on-site and downstream impacts to habitat through changes in flow. The DEIR should have also analyzed a Project alternative that substantially reduces the Project footprint *and* the amount of aggregate to be extracted from the project site. Such an alternative would incorporate the 1,300 foot buffer recommended in the Mineral Resources Guidelines, reduce impacts to sensitive habitat and special status species, and provide larger buffers to separate project operations from sensitive receptors to reduce air quality and noise impacts.

Moreover, given the site's location in close proximity to thousands of homes, within an identified important habitat linkage, and immediately adjacent to a national wildlife refuge, the DEIR should have considered alternative uses for the site. For example, the DEIR should have considered an alternative that would create a mitigation land bank rather than a sand mine. The site includes habitat for multiple sensitive species, as well as riparian habitat, and wetlands habitat, all of which are mitigation credits in high demand in the San Diego County area. Hamilton Report at 42. In fact, as discussed in the Hamilton Report, a mitigation banking professional in the area has expressed a substantial interest in creating a mitigation bank at the site and has indicated that it is a feasible alternative for the site. *Id.* A revised EIR should analyze these and other alternatives that will avoid or reduce the Project's impacts.

In short, the DEIR's alternatives analysis is riddled with flaws that improperly constrain to the County's consideration of project alternatives. Moreover, the DEIR fails

to consider a reasonable range of alternatives that would “avoid or substantially lessen” the significant effects of the project. CEQA Guidelines § 15126.6

## V. Conclusion

Substantial evidence in the record shows that the Project would have a number of potentially significant impacts on the environment, including (but not limited to) impacts on groundwater resources, water quality, special status biological resources, noise, air quality, and traffic hazards. These impacts were not adequately analyzed and mitigated in the DEIR. The DEIR can support neither the findings required by CEQA nor a determination of General Plan consistency. For the foregoing reasons, the Sierra Club urges the County to delay further consideration of the Project unless and until the County prepares and recirculates a revised draft EIR that fully complies with CEQA and the CEQA Guidelines.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP



Catherine C. Engberg  
Carmen J. Borg, AICP  
Urban Planner

### Appendices:

- A – CBEC Report
- B – Hamilton Report
- C – Baseline Report
- D – Salter Report
- E – San Diego Region Aggregate Supply Study 2011
- F – Letter Report by Petra Pless related to Review Draft Environmental Impact Report for Safari Highlands Ranch and Citywide SOI Update, dated November 30, 2017
- G – Does noise affect learning? A short review on noise effect on cognitive performance in children, Klatte, Berstrom and Lachmann, 2013
- H – Google Map of Willow Glen Drive

Robert Hingtgen  
February 28, 2022  
Page 45

cc: Susan Wynn, USFWS  
Daniel Leavitt, USFWS  
David Mayer, Regional Supervisor, CDFW  
Heather Schmalbach, CDFW  
Peter Andersen  
George Courser  
Dave Hogan  
Lisa Ross  
Elizabeth Urquhart  
Dan Weber  
Barry Jantz  
Richard Miller

1477057.1

# Appendix A



Hydrology | Hydraulics | Geomorphology | Design | Field Services

February 24, 2022

Ms. Carmen Borg  
Shute, Mihaly & Weinberger LLP  
396 Hayes Street  
San Francisco, CA 94102-4421

Subject: Review Draft Environmental Impact Report  
Cottonwood Sand Mine Project, San Diego County, CA

Dear Ms. Borg:

I am a hydrologist with over thirty years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology. I have been providing professional hydrology and geomorphology services in California since 1989 and routinely manage projects in the areas of surface- and groundwater hydrology, water supply, water quality assessments, water resources management, and geomorphology. Most of my work has been in the Coast Range watersheds of California. My areas of expertise include: characterizing and modeling watershed-scale hydrologic and geomorphic processes; evaluating surface- and ground-water resources/quality and their interaction; assessing hydrologic, geomorphic, and water quality responses to land-use changes in watersheds and causes of stream channel instability; assisting and leading in the development of CEQA environmental compliance documents and project environmental permits; and designing and implementing field investigations characterizing surface and subsurface hydrologic and water quality conditions. I earned a Master of Science degree in Geology, specializing in sedimentology and hydrogeology as well as an A.B. in Geology from Miami University, Oxford, Ohio. I am a Certified Hydrogeologist (CHG) and a registered Professional Geologist (PG) in the state of California. A copy of my resume is attached.

I have been retained by Shute, Mihaly & Weinberger LLP (SMW) to review the Draft Environmental Impact Report (DEIR) for the Cottonwood Sand Mine Project located in San Diego County, California, and evaluate if the project may impact surrounding properties and the environment. Specifically, I have reviewed the DEIR, technical appendices, and project documents. Based on my review of these materials, it is my professional opinion that the DEIR is inadequate in evaluating the potential significant impacts of project actions on hydrology, water quality and biological resources. The rationale for this

opinion is based on multiple findings presented below.

## **1. Inaccurate Hydraulic Analysis of Flood Impacts**

DEIR states (pg. 3.1.5-19) that based on modeling results, the proposed project would not increase the 100-year water surface elevations at the majority of cross-section locations. The flooding analysis and HEC-RAS Hydraulic Model simulation results for the various project Phases are contained in Appendix O to the DEIR. I assume that the Phase 4 model and simulation results reflect the final project grades. To compare model cross-section geometry to the Phase 4 project grades presented on the proposed project Plot Plan and Reclamation Plan (MUP-18-023-PlotPlanAndReclamationPlan), I created Figure 1, which plots the model cross-section locations (also referred to as River Stations [RS] in Appendix O) onto the Reclamation Plan sheets.

When comparing the land surface profiles of the Phase 4 model cross-sections to the Phase 4 Reclamation Plan grades, I observed some discrepancies at the west end of the project where final grade elevations will be higher than existing grades (western area or red shading on Figure 1). It appears to me that the Phase 4 (final grade) hydraulic model does not incorporate the elevated fill surface into cross-section profiles (RS-10 through RS-90) in this area, but instead uses existing condition ground surface elevations. Figures 2a through 2d are a schematic presentation of the approximate areas and thicknesses of missing fill proposed under Phase 4, and representative of final grades, within each cross-sectional profile for RS-10 through RS-90.

The Phase 4 hydraulic analysis presented in Appendix O is flawed as it does not consider for the elevated surfaces in the fill area located in and between RS-10 and RS-90. If captured accurately in the model cross-sections, this entire fill area would obstruct and alter flow patterns, likely raising 100-year flood water surface elevations higher than those reported for this area. This would compound the on-site increases in 100-year water surface elevations reported at RS-20 and RS-60 reported for the Phase 4 hydraulic model simulations. It is my opinion that because the hydraulic model does not include these fill areas in model geometry, the Phase 4 flood analysis presented in Appendix O is inaccurate and provides incorrect estimates of the on- and off-site 100-year water surface elevations. Therefore, the DEIR conclusion of less than significant impacts to flooding hazards is not substantiated. It may also have bearing on the validity of the hydraulic analysis results used to inform the Letter of Map Revision (LOMR Case No. 20-09-2025P dated December 1, 2020, effective April 14, 2001) associated with the project and cited on page 3 of Appendix O.

## **2. Inaccurate Estimate of Future Water Demands and Impacts on Groundwater Supply**

The DEIR states that project groundwater demands are primarily associated with mining operations and evapotranspiration from post-reclamation vegetation communities and estimated future groundwater demands are significantly less than current golf course operation demands. Based on my review, it appears the Groundwater Investigation report provided as Appendix R to the DEIR estimates future vegetation water demands is based on existing condition grades not the post-Reclamation grades.

Comparison of available groundwater level data against Phase 4 (final) grades indicates there will be large areas of ground lowering that will intersect the groundwater table, creating surface ponding and generating losses due to evaporation. To illustrate this future condition, I prepared Figures 3 and 4. Figure 3 was modified from Figure 9 of Appendix R to include the post-Reclamation (Phase 4) ground surface elevations at the well sites located at the upstream/east (well Ivanhoe #11) and downstream/west (well Lakes #11) boundaries of the project site. As indicated on Figure 3, the ground surface elevation will be lowered by approximately 18 feet in elevation at well Ivanhoe #11 and by approximately 6 feet at well Lakes #11. Comparing final project grades to historic groundwater levels at these locations indicates that lowering site grades will result in reduce depth to groundwater and increased frequency and duration of groundwater intersecting and/or rising above the ground surface. As a result, the exposure of exposed groundwater to evaporation would occur for increased lengths of time, with prolonged (multi-month to annual) exposure during wet years. The aerial extent of land lowering relative to groundwater table elevations through the site is depicted in Figure 4, which plots the historical range of groundwater table elevations (blue lines), as inferred from the Ivanhoe #11 and Lakes #11 wells, against existing grades (thin black lines) and final grades (thick black lines) along the project profile. Figure 4 depicts areas and depths of potential future groundwater ponding throughout the project site.

The future losses of groundwater exposed above the ground surface by evaporation are not acknowledged or quantified in the DEIR, therefore potential impacts on groundwater supply have not been accurately quantified. Therefore, DEIR statement that the proposed Project would have less than significant impacts to groundwater storage is not substantiated by the technical studies that support the claim.

The lowering of the ground surface associated with project implementation will also result in depths to groundwater that are shallower than evaluated in the DEIR. Reduced depth to groundwater may lead to changes in the aerial extent of vegetation communities as mapped in the Reclamation Plan as well as increased evapotranspiration demands on shallow groundwater over those evaluated in the DEIR. The shallower groundwater table and routine ponding, where exposed, may also impact the survival of less water-tolerant vegetation communities, impacting the viability of the proposed Reclamation vegetation. The feasibility of the proposed Reclamation revegetation plan is also impacted by altered exposure to shallow groundwater and seasonal/wet-year ponding.

### **3. Incomplete Analysis of Sediment Erosion and Water Quality Impacts**

The project proposes construction of a 20-foot-tall rock riprap channel erosion barrier (drop structure) that spans the entire project width where the upstream end of the mined-out project floodplain transitions with the existing upstream river corridor. A second corridor-spanning drop structure is proposed immediately downstream of the Steele Canyon Road crossing. The drop structures would be constructed as a riprap faced 3:1 (horizontal: vertical) ramp down into the pit with the base keyed into the earthen bed within the pit. The drop structures are intended to mitigate for potential erosion and upstream head cutting.

Page 5 of drainage study (Appendix O) states that simulated 100-year flow velocities within the site at the completion of mining would be less than 6 feet per second (ft/s) and not considered erosive.

However, these velocities are representative of the 100-year flow, when the site is broadly and deeply

inundated and pits and depressions are full of water and much of the drop structures may be submerged. Based on my experience, without the presence of pit ponding and submergence, these types of structures would create high velocities during periods of moderate to high river flow when water is cascading over and down the face of the drop structures causing erosion in the pit at the toe (base) of the structure. These types of flows occur during storms of lesser magnitude than a 100-year event or during the onset of high flow events as flow magnitudes are ramping up to their peak and there is no pre-existing ponding.

The hydraulic analysis presented in Appendix O does not effectively evaluate or address the hydraulics of the drop structure – the modeling approach presented over-simplifies the system, eliminating the high flow velocities that would result if the pits were not full of ponded water. If a broader range of flood flows and starting conditions (i.e., presence/absence of ponding) were modeled, it is likely that there would be higher velocities, turbulent flow hydraulics and significant scour potential at the base of the drop structures. Thus, this mitigation (drop structure) imparts a potential adverse erosion impact and would elevate sediment and turbidity (TDS) concentrations of storm flow and adversely impact revegetation efforts within the pit. However, the hydraulic analysis presented in the DEIR masks and therefore disregards this project condition.

#### **4. Questionable Feasibility of Reclamation Grading Plan**

The Project proposes some very large and deep over-excavation pits during the early mining Phases that will require backfilling to attain the Phase 4 (final) post-project grades. There are also areas where finished grades will be significantly higher (up to 10 feet) than existing grades (two shaded areas of Figure 1). I refer to these two shaded areas on Figure 1 as “mounded areas” below.

The DEIR states (pg. 1-3) that approximately 4.3 million cubic yards (MCY) of material are proposed to be extracted, producing 3.8 MCY of sand and gravel for market use and the remaining 10 percent (0.5 MCY) consisting of waste material undesirable for processing. I assume the waste material appears to be the primary source of backfill material to fill over-excavation pits and create mounded areas higher than existing grades as the DEIR does not reference other sources of backfill material, either generated from the project or imported from off-site.

Based on a preliminary review of the Project Plot and Reclamation Plans, I was skeptical that there is sufficient waste material generated by the project to backfill over excavation areas and create the final post-project grades. To evaluate this issue, cbec staff georeferenced and digitized the Project Plot and Reclamation Plan contours to generate digital elevation models (DEM) of existing conditions, cumulative excavation, and final project grades. Shaded relief maps of these DEMs are presented in Figures 5 through 7. All DEM surface generation and analysis was performed using GIS and GIS analysis software.

To estimate the total volume of material extracted by the project, a volume estimate between the existing condition and cumulative excavation DEMs was performed. This comparison yielded a total extraction volume of 4.7 MCY, a slightly higher value than reported in the DEIR. To estimate the total volume of fill material required to achieve the final project grade, a volume comparison was performed between the cumulative excavation and final grade DEMs. This comparison indicates that 3.4 MCY of fill material is required to achieve the post-project final grade, a value that is almost 7 times the higher than the estimated waste material volume.

Based on my analysis, it appears there will not be sufficient waste material to backfill the over-excavated pits and attain the final grades as presented in the Reclamation Plan. The source and volume of backfill material required to achieve final project grades is not addressed in the DEIR; I would assume this material would need to be imported from an off-site source or the project plans and description needs to be modified. In either case, the impacts to the environment associated with fill import and/or revised project description to the environment have not been evaluated in the DEIR.

## **5. Potential Impacts to Existing Riparian Habitat**

Under existing conditions, the Sweetwater River low-flow channel feeds into a low-lying area that currently supports dense riparian habitat (Figure 8). This habitat exists and is supported by the water deliveries carried by the low flow channel. The proposed project final grading plan indicates the land surface would be lowered to the north and northeast of the area of dense riparian habitat, creating a lower floodplain surface of comparable elevation to the upstream end of the riparian habitat area and low flow channel. Grading will retain an earthen berm bordering the north side of the existing riparian habitat. However, the proposed floodplain and low flow channel grades upstream of the berm are very similar and would allow annual flood waters and possibly flow in the low-flow channel itself to be redirected into the created floodplain north of the earthen berm.

The removal of the high ground on the north side of the low-flow channel and creation of a wider equal elevation floodplain upstream of the entrance to the riparian habitat has potential impacts to the riparian habitat area. One impact is the redirection of high flows into the floodplain north of the berm, which otherwise would have fed into the existing riparian habitat area. Another impact is the ability for the existing low flow channel to migrate into and establish a new alignment through the floodplain north of the berm. By creating an equal elevation floodplain on both sides of the low-flow channel east of the earthen berm, the low-flow channel would be free to migrate north of the earthen berm under natural geomorphic processes (Figure 8). If this occurs, all the water deliveries conveyed by the low-flow channel would no longer feed into the existing riparian habitat area, with potential adverse consequences on this habitat. Therefore, it is my opinion that the DEIR has not sufficiently analyzed potential adverse impacts and mitigations for this existing riparian habitat area.

## **6. No Analysis on Impacts of Aggregate Wash Fines Reuse**

As part of Project operations, a large volume of wash fines (byproduct of aggregate processing/washing) will be generated from the processing plant. What percentage of the waste material constitutes wash fines is not presented in the DEIR. Regardless, I'm left to assume that wash fines would then be spread onsite and incorporated into the surface as part of site backfill and final grading.

The DEIR does not evaluate the potential impacts associated with the placement of wash fines within the project area. Placing the wash fines in a concentrated manner will create a fine-grained soil veneer promoting poorly drained conditions. The resulting fine-grained soil will have a lower permeability and lower rate of infiltration relative to existing conditions. If enough clay material is contained in the fines, it may create an impermeable barrier promoting ponding that is perched above the underlying water table. This will further reduce infiltration and groundwater recharge and may also lead to increased

water loss by evaporation. Areas that experience groundwater ponding also allow for the settling and accumulation of additional clays with each storm event – further reducing infiltration rates.

The concentration of wash fines in the surface soil also poses impacts to water quality. This practice may increase source and concentration of total dissolved solids (TDS) and naturally occurring metals. The watershed risks increased exposure to undesirable constituents contained in the fines via the following pathways: a) floodwaters that bypass the project; b) ponds, wetlands, channel habitats that become established on fines within project boundary; and c) migration of water through the fines into underlying groundwater. These pathways pose a direct risk to drinking water quality of receiving water bodies including both the Sweetwater Reservoir (located 2.8 miles downstream of the project site) and underlying groundwater aquifer that supplies residential wells surrounding the site. These potential impacts are not addressed in the DEIR.

The effects of prolonged ponding in pits lined with wash fines pose additional potential impacts to on- and off-site water quality. The wash fines will concentrate metals and other toxins that can bio-magnify in aquatic food webs. Prolonged ponding can promote algal blooms and eutrophication that cause dissolved oxygen crashes (EHC, 2016<sup>1</sup>). Anaerobic conditions and other biogeochemical processes that develop in the ponds can promote methylation of mercury, which could then migrate into the underlying aquifer (Ibid). All these impacts are common consequences associated with long-term ponding in alluvial quarry pits. Again, none of these potential adverse impacts have been addressed in the DEIR.

Please feel free to contact me with any questions regarding the material and conclusions contained in this letter.

Sincerely,

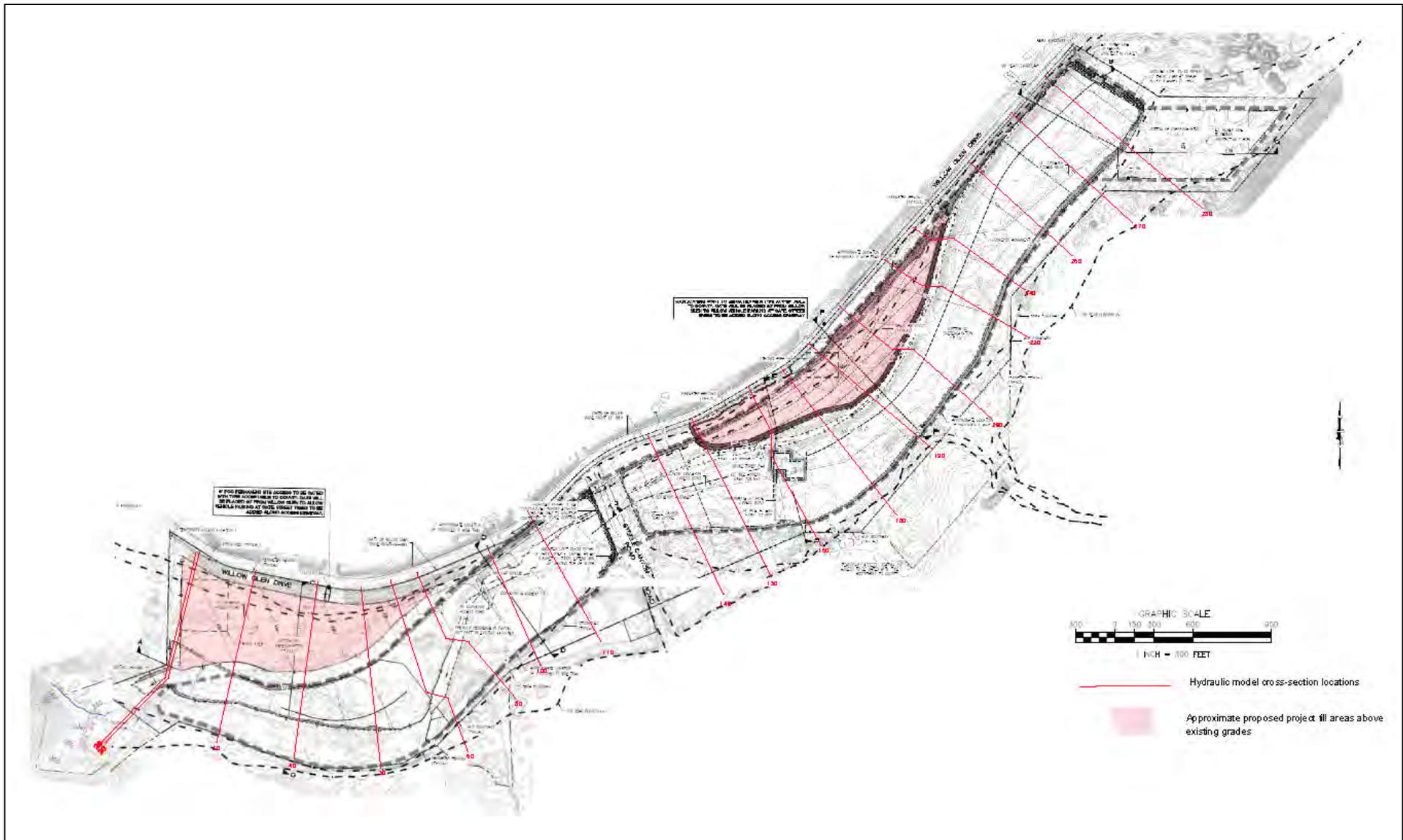


Greg Kamman, PG, CHG  
Senior Ecohydrologist



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<sup>1</sup> [EHC] Endangered Habitats Conservancy, 2016, Hanson Russian River Ponds Floodplain Restoration: Feasibility Study and Conceptual Design. San Diego, CA.



Sources:  
Appendix O: CEQA-Level Drainage Study  
MUP-18-023-Plot Plan and Reclamation Plan

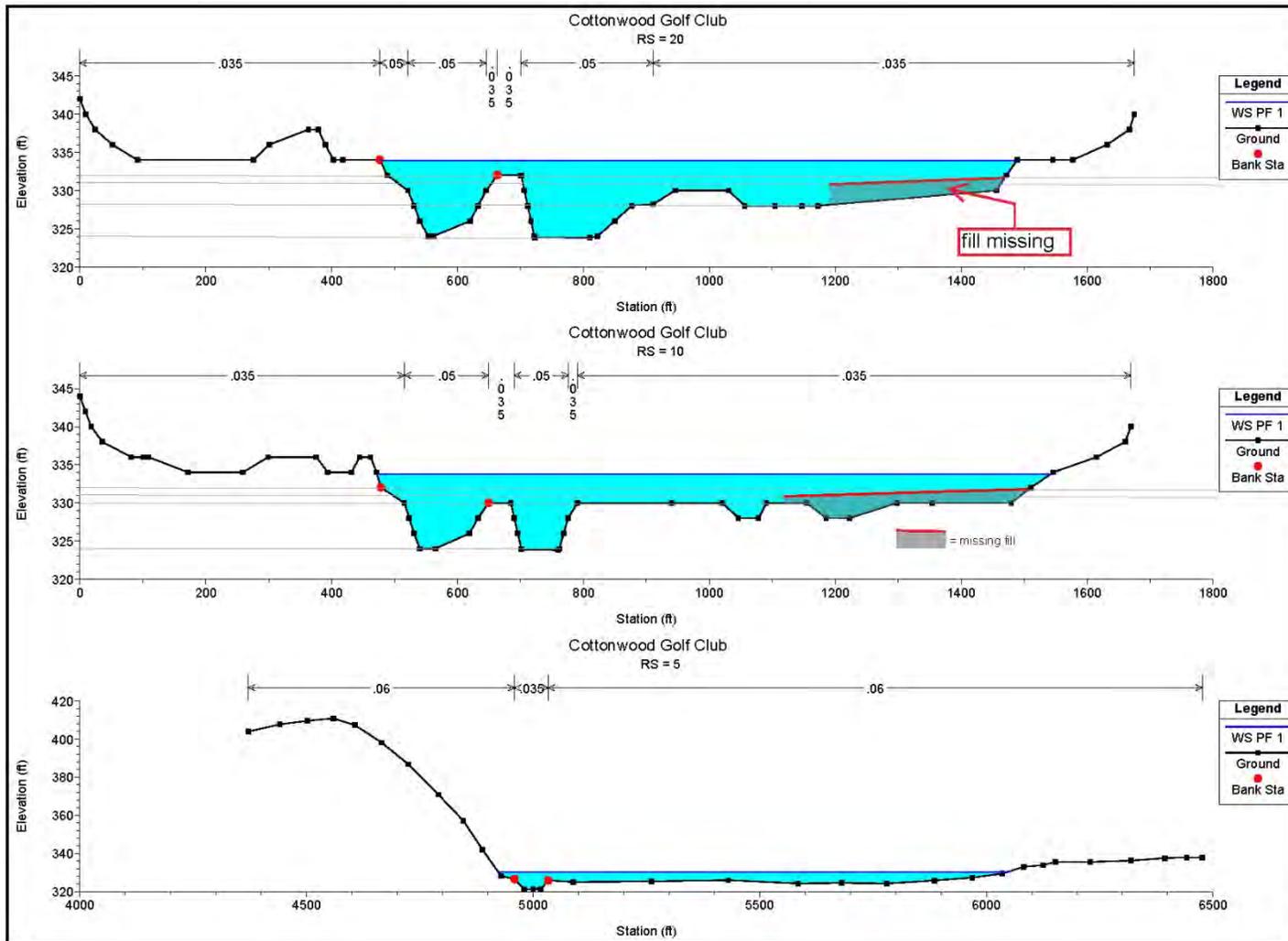


Cottonwood Sand Mine Project, San Diego County, CA  
**Hydraulic Model Cross-Section Locations**

Project No. 20-1020-4

Created By: GK

**Figure 1**



Sources:  
Appendix O: CEQA-Level Drainage Study  
MUP-18-023-Plot Plan and Reclamation Plan

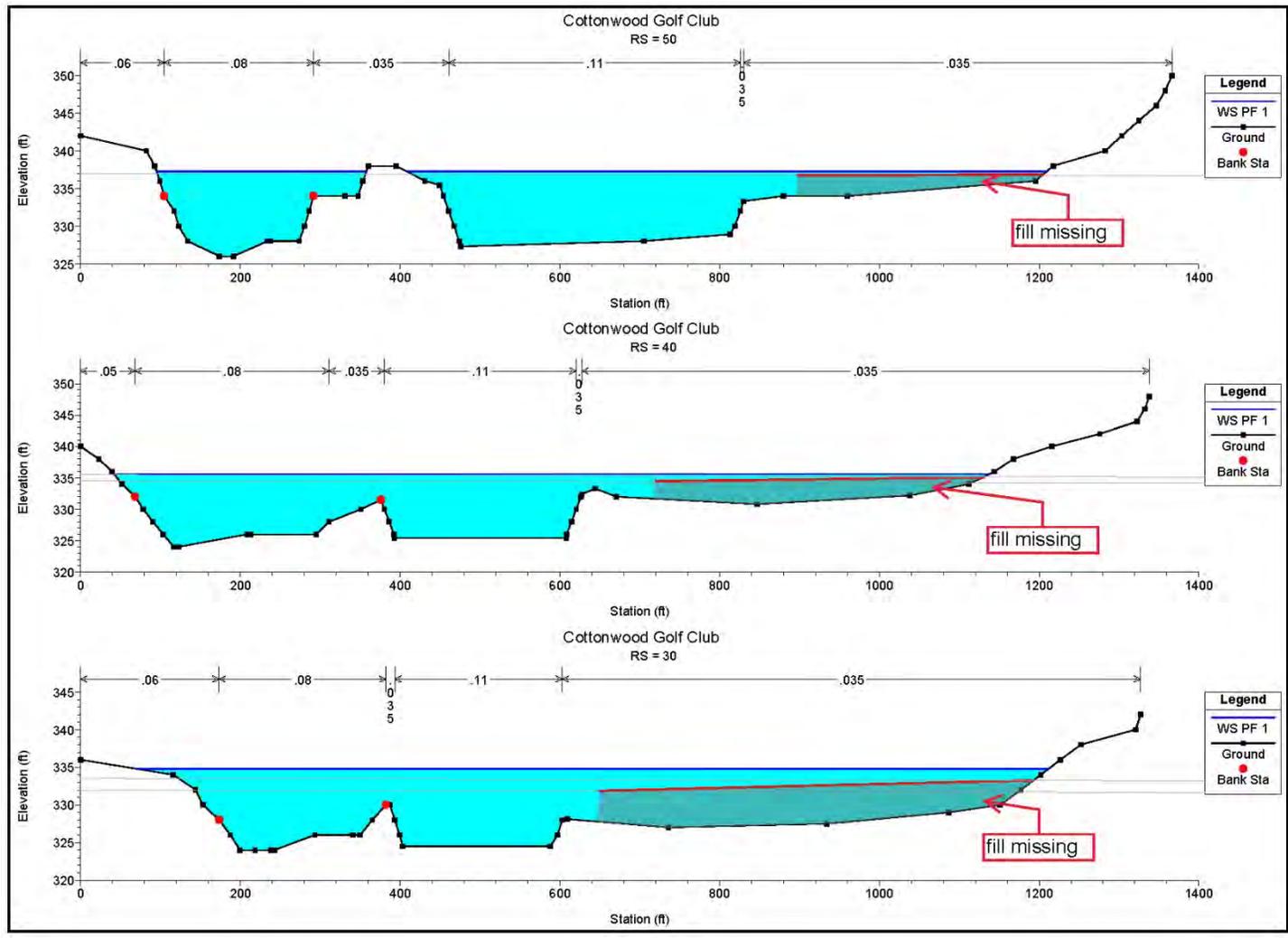


Cottonwood Sand Mine Project, San Diego County, CA  
**Hydraulic Model Cross-Section Phase 4 Profiles**

Project No. 20-1020-4

Created By: GK

**Figure 2a**



Sources:  
 Appendix O: CEQA-Level Drainage Study  
 MUP-18-023-Plot Plan and Reclamation Plan

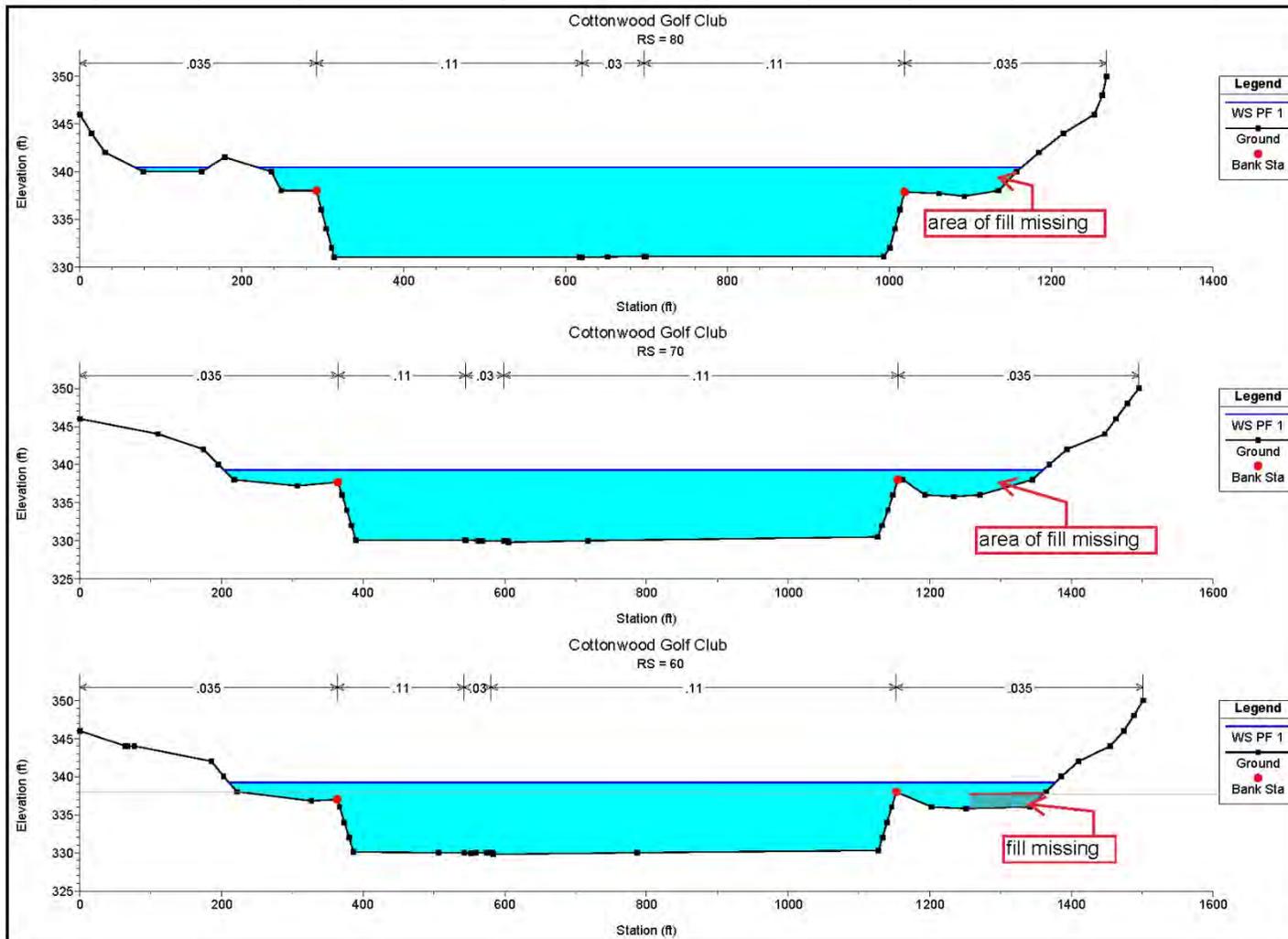


Cottonwood Sand Mine Project, San Diego County, CA  
**Hydraulic Model Cross-Section Phase 4 Profiles**

Project No. 20-1020-4

Created By: GK

**Figure 2b**



Sources:  
 Appendix O: CEQA-Level Drainage Study  
 MUP-18-023-Plot Plan and Reclamation Plan

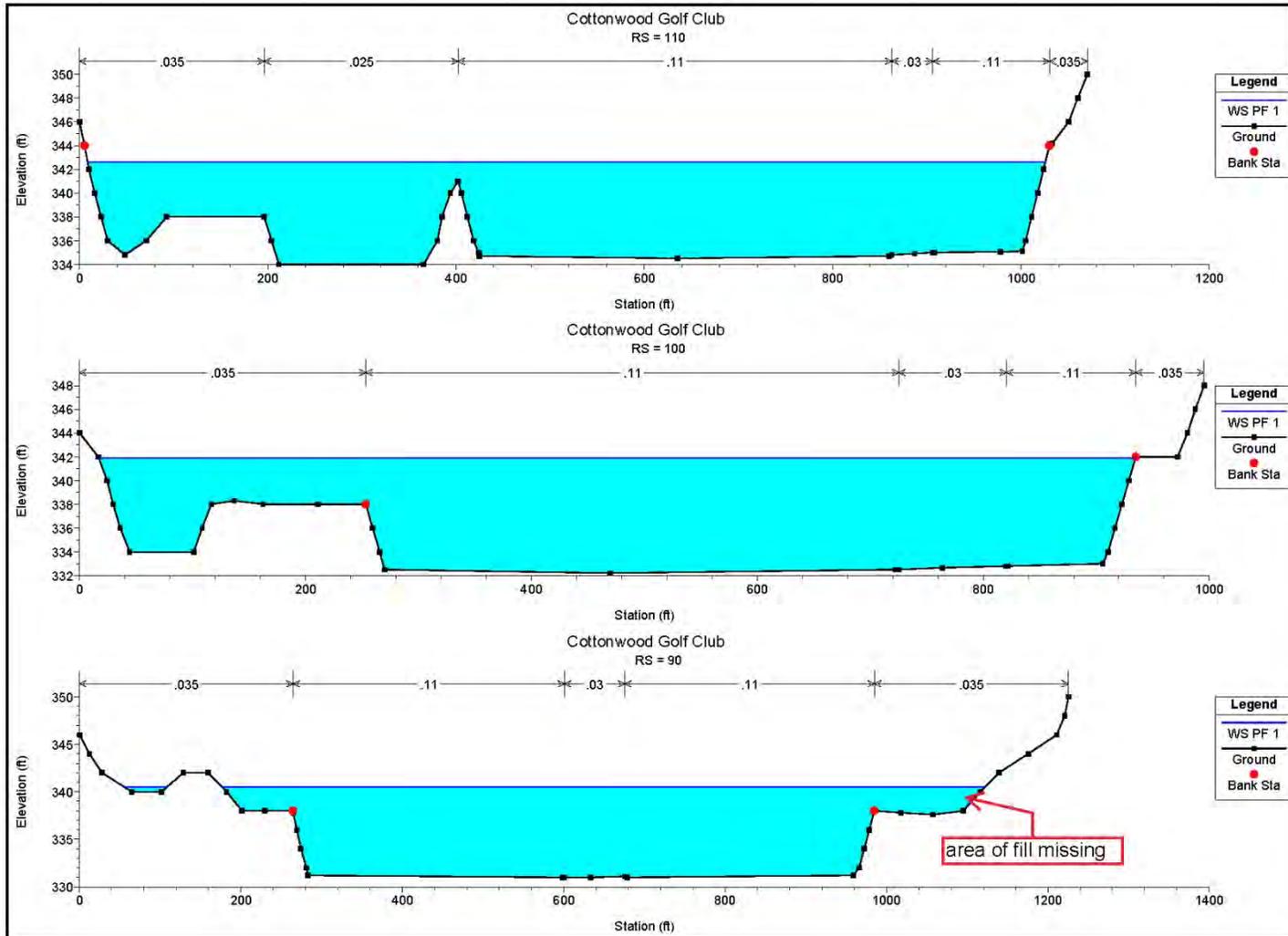


Cottonwood Sand Mine Project, San Diego County, CA  
**Hydraulic Model Cross-Section Phase 4 Profiles**

Project No. 20-1020-4

Created By: GK

**Figure 2c**



Sources:  
 Appendix O: CEQA-Level Drainage Study  
 MUP-18-023-Plot Plan and Reclamation Plan



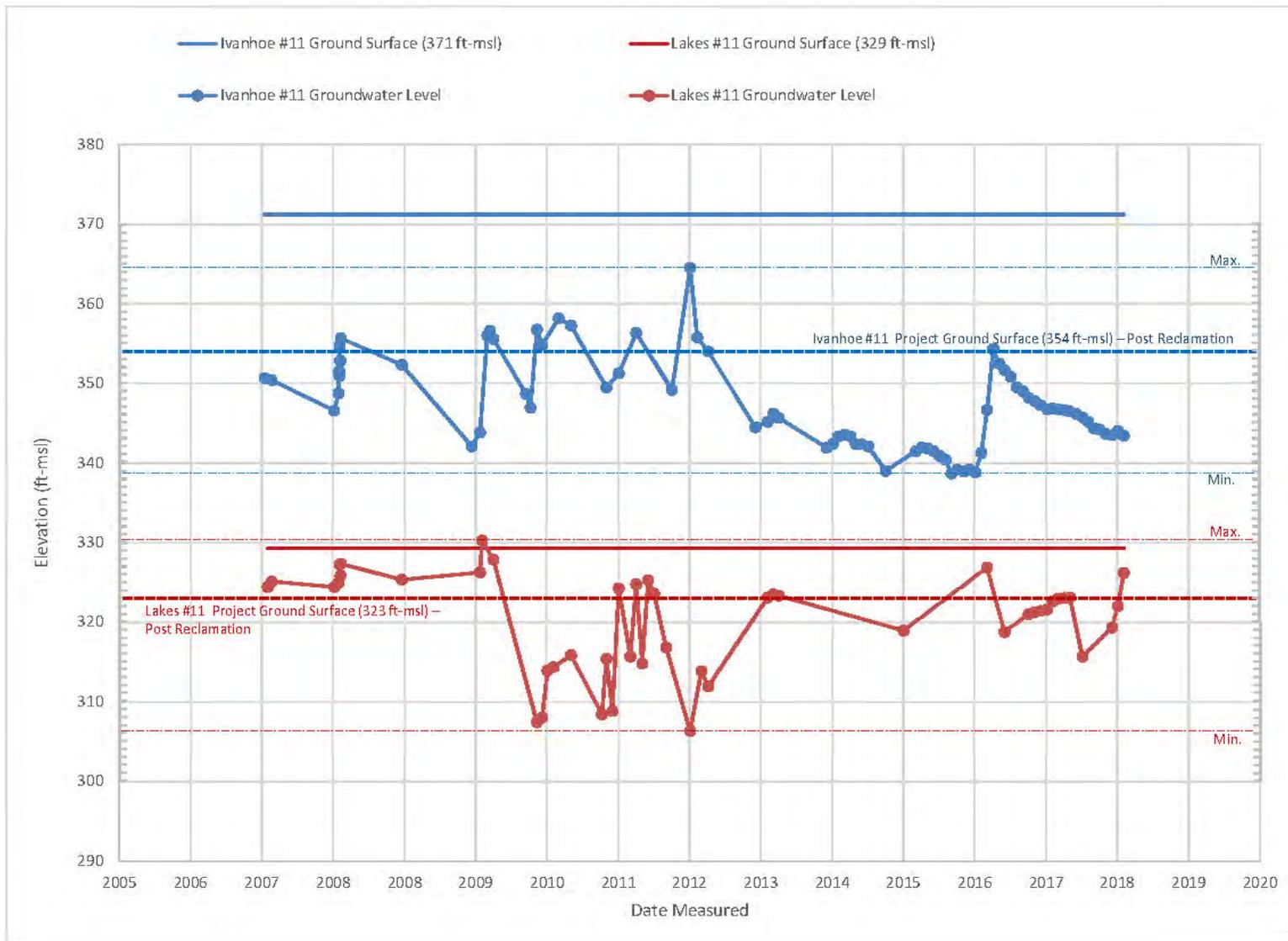
Cottonwood Sand Mine Project, San Diego County, CA

**Hydraulic Model Cross-Section Phase 4 Profiles**

Project No. 20-1020-4

Created By: GK

**Figure 2d**



Sources:  
 Modified from Figure 9 of Appendix R (Groundwater Investigation) of DEIR

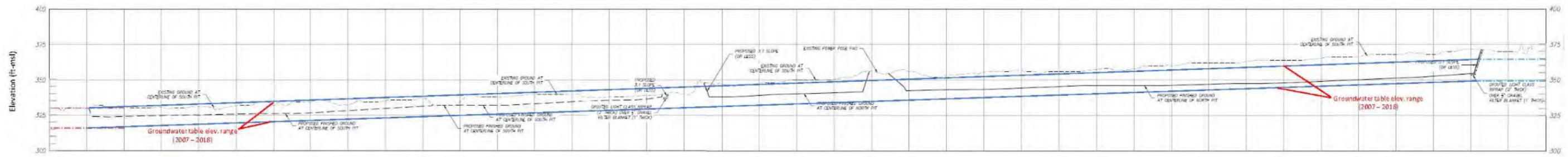


Cottonwood Sand Mine Project, San Diego County, CA  
**Groundwater Levels and Existing/Proposed Grades**

Project No. 20-1020-4

Created By: GK

**Figure 3**

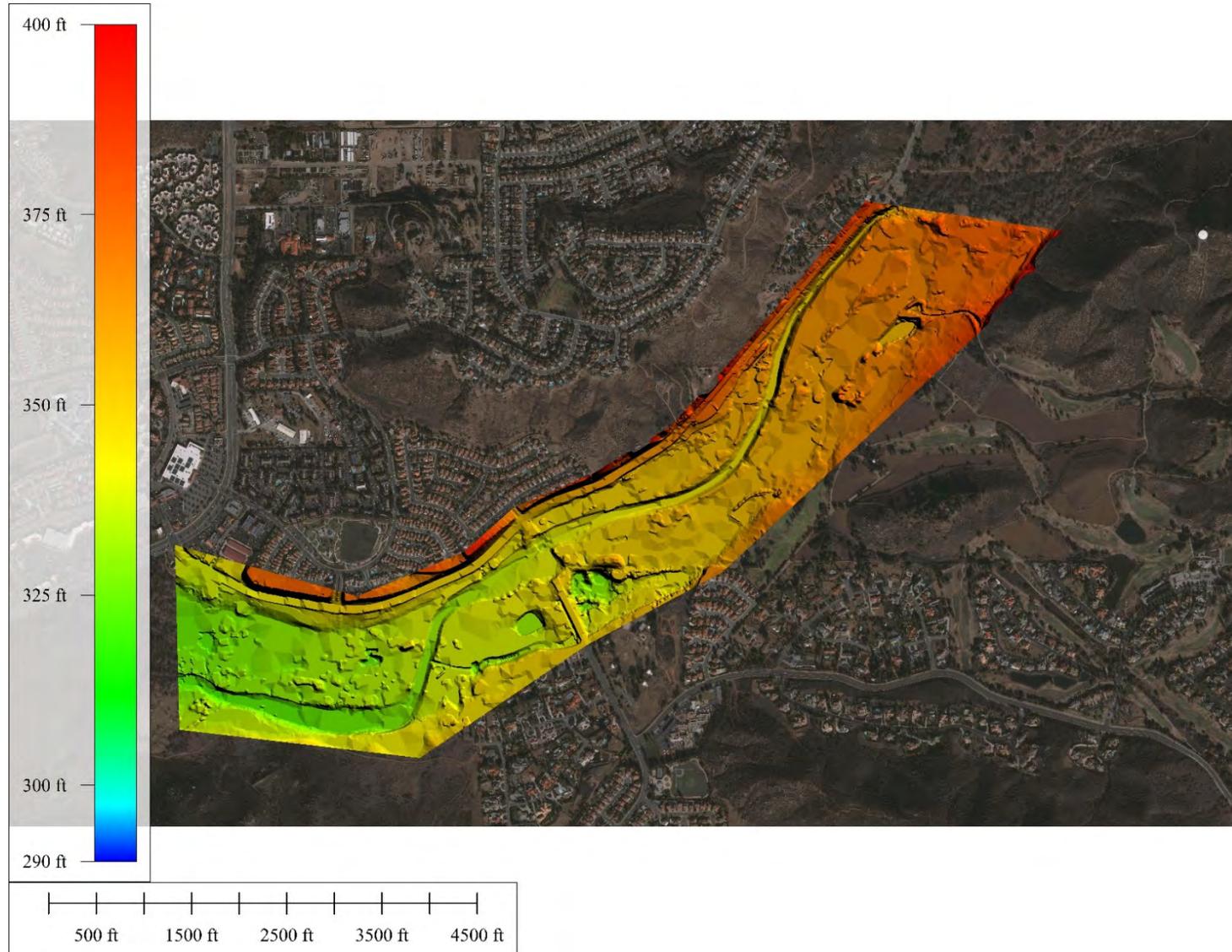


Sources:  
 Longitudinal profile from MUP-18-023-Plot Plan and Reclamation Plan



Cottonwood Sand Mine Project, San Diego County, CA  
**Groundwater Levels and Existing/Proposed Grades**

Project No. 20-1020-4	Created By: GK	<b>Figure 4</b>
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Notes:



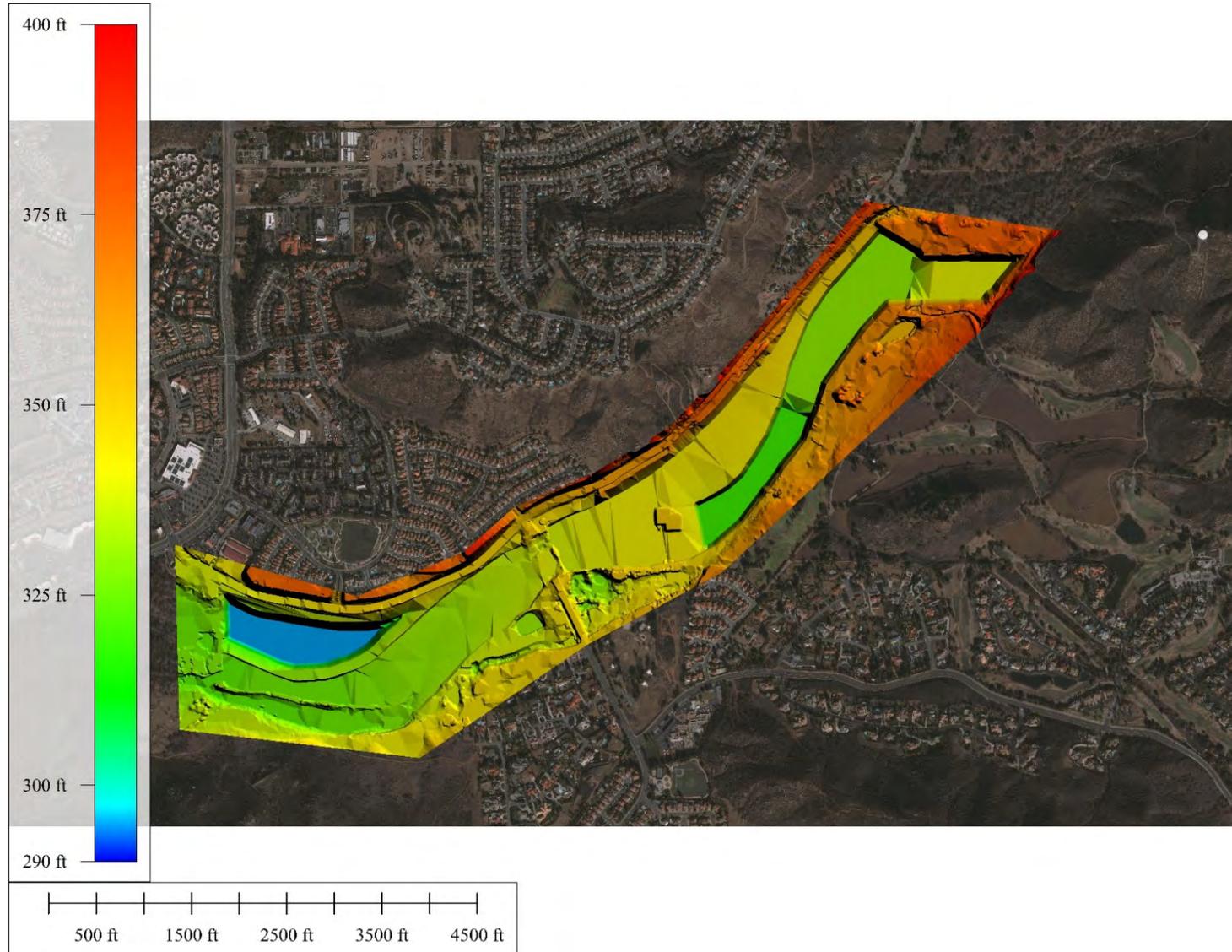
Cottonwood Sand Mine Project, San Diego County, CA

**Existing Conditions DEM Shaded Relief Map**

Project No. 20-1020-4

Created By: GK

**Figure 5**



Notes:



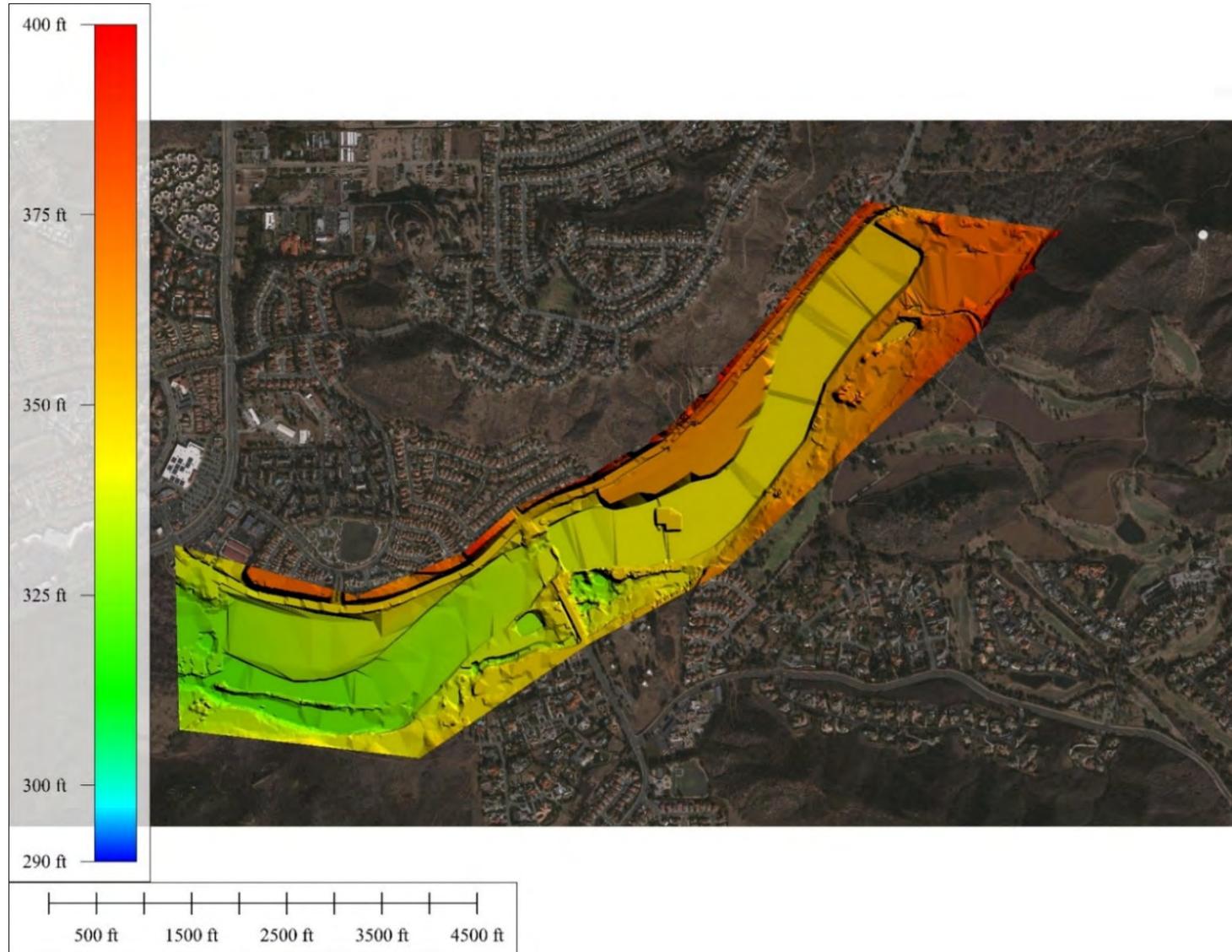
Cottonwood Sand Mine Project, San Diego County, CA

**Cumulative Excavation DEM Shaded Relief Map**

Project No. 20-1020-4

Created By: GK

**Figure 6**



Notes:



Cottonwood Sand Mine Project, San Diego County, CA

**Final Project Grade DEM Shaded Relief Map**

Project No. 20-1020-4

Created By: GK

**Figure 7**



Notes:  
Final Grade DEM at west end of Project area.



Cottonwood Sand Mine Project, San Diego County, CA

**Potential Impacts on Existing Riparian Habitat Area**

Project No. 20-1020-4

Created By: GK

**Figure 8**



Hydrology | Hydraulics | Geomorphology | Design | Field Services

## Greg Kamman, PG, CHG Senior Ecohydrologist



### Education

MS, 1989, Geology, Sedimentology and Hydrogeology,  
Miami University, Oxford, OH

BA, 1985, Geology, Miami University, Oxford, OH

### Professional Registration

1993, Professional Geologist, California, #5737

1995, Certified Hydrogeologist, California, #360

### Professional Experience

cbec, inc., eco-engineering, West Sacramento, CA,  
Senior Ecohydrologist, 2020-present

Kamman Hydrology & Engineering, Inc., San Rafael, CA,  
Principal Hydrologist/Vice President, 1997-2020

Balance Hydrologics, Inc., Berkeley, CA, Sr. Hydrologist/  
Vice President, 1994-1997

Geomatrix Consultants, Inc., San Francisco, CA, Project  
Geologist/Hydrogeologist, 1991-1994

Environ International Corporation, Princeton, NJ, Sr. Staff  
Geologist/Hydrogeologist, 1989-1991

Miami University, Oxford, OH, Field Camp Instructor and  
Research Assistant, 1986-1989

Greg Kamman is a professional geologist and certified hydrogeologist with over 30 years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology. He specializes in directing and managing projects in the areas of surface and groundwater hydrology, stream and tidal wetland habitat restoration, water supply and water quality assessments, water resources management, and geomorphology. Mr. Kamman has worked extensively throughout California's coastal watersheds and estuaries, and on multiple projects in Oregon and Hawaii.

Mr. Kamman's experience and expertise includes evaluating surface and groundwater resources and their interaction, stream and wetland habitat restoration assessments and design, characterizing and modeling basin-scale hydrologic and geologic processes, assessing watershed hydraulic and geomorphic responses to land-use change, and designing and conducting field investigations characterizing surface and subsurface hydrologic and water quality conditions. Greg commonly works on projects that revolve around sensitive fishery, wetland, wildlife, and/or riparian habitat enhancement within urban and rural environments. Mr. Kamman performs many of these projects in response to local, state (CEQA) and federal statutes (NEPA, ESA), and other regulatory frameworks. Mr. Kamman frequently applies this knowledge to the review and expert testimony on state and federal water operation plan EIR/EIS reports, Groundwater Sustainability Plans, Habitat Conservation Plans, and biological assessments.

Mr. Kamman is accustomed to working multi-objective projects as part of an interdisciplinary team including biologists, engineers, planners, architects, lawyers, and resource and regulatory agency staff. Mr. Kamman is a prime or contributing author to over 360 technical publications and reports in the discipline of hydrology, the majority pertaining to the protection and enhancement of aquatic resources. Mr. Kamman has taught the following courses: stream restoration through U.C. Berkeley Extension (2001-2008); wetland hydrology through San Francisco State University's Romberg Tiburon Center (2007 and 2012-2014); and presented webinars (2020) to California Water Boards staff on hydrologic and hydraulic modeling. He has devoted his career to the protection, enhancement and sustainable management of water resources and associated ecosystems.

### SELECTED EXPERIENCE

#### Floodplain Management Projects

##### **Flood Reduction, Mitigation Planning, and Design on Yreka Creek, Siskiyou County, CA City of Yreka as subcontractor to WRA, Inc., 2008-2010**

Mr. Kamman completed a series of field and hydraulic model investigations for restoration planning and design along Yreka Creek to reduce flood hazards and potential damage to the City's water treatment plant and disposal field infrastructure. This work also addresses and satisfies dike repair mitigation conditions stipulated by state resource agencies. While achieving these goals, Mr. Kamman tailored analyses and study objectives to assist the City in: enhancing the ecological floodplain restoration along Yreka Creek; providing opportunities for expanded public access and trail planning consistent with the goals of the Yreka Creek Greenway Project; and improving the water quality of Yreka Creek.

Key elements of this work included: review and synthesize existing information; identify and analyze the feasibility for three conceptual alternatives; and conceptual design and report preparation. Funding for implementation of restoration work over such a large area was a significant concern to the City. Therefore, designs identify and define phasing in a fashion that gives the City flexibility in implementation.



Hydrology | Hydraulics | Geomorphology | Design | Field Services

## SELECTED EXPERIENCE (CONTINUED)

### **West Creek Drainage Improvement Assessment, Marin County, CA *Marin County Flood Control, 2006-2008***

Mr. Kamman prepared a study focused on characterizing existing flood conditions and developing and evaluating flood reduction measures along West Creek in Tiburon. The work was completed through the implementation of hydrologic and hydraulic feasibility and design assessments. The conceptual design and analysis of potential flood reduction strategies (alternatives) was completed through the development of a HEC-RAS hydraulic model that simulates historic, existing and proposed project flood conditions. It was intended that the conceptual design developed under this scope of work would be of sufficient detail and quality to initiate project permitting and the environmental compliance process and documentation. Opportunities for riparian corridor and aquatic habitat enhancement were also considered and integrated into the conceptual design. Mr. Kamman also developed and assessed six alternative flood hazard reduction measures. The hydraulic model results for each alternative were compared against baseline conditions in order to evaluate their ability to alleviate flood hazards.

### **Gallinas Creek Restoration Feasibility Assessment, Marin County, CA *San Francisco Bay Institute, 2003-2005***

Mr. Kamman completed a feasibility assessment for restoration of Gallinas Creek in northern San Rafael. Restoration will require removal of a concrete trapezoidal flood control channel and replacement with an earthen channel and floodplain in a "green belt" type corridor. Work included the collection of field data and development of a HEC-RAS hydraulic model to evaluate and compare existing and proposed project conditions. Designs must continue to provide adequate flood protection to the surrounding community. The study also includes and evaluation of existing habitat values, potential habitat values, and restoration opportunities and constraints.

### **Hydrologic and Hydraulic Evaluation for Trinity County Bridge Replacement, Trinity County, CA *Trinity County Planning Department, 2002***

Mr. Kamman completed technical peer review of peak flow estimates and hydraulic design parameters associated with the replacement of 4 bridges across the upper Trinity River in Trinity County, California. A primary study component was accurately predicting the magnitude and frequency of flood releases from Trinity Dam. Numerous flood frequency analytical approaches were evaluated and used throughout this study.

### **Restoration of Lower Redwood Creek Floodway and Estuary, Humboldt County, CA *California State Coastal Conservancy and Humboldt County DPW, 2002-2003***

Mr. Kamman provided technical review for the development of a hydraulic model to evaluate river and estuary restoration alternatives along the lower portions of Redwood Creek between Orrick (Highway 1) and the Pacific Ocean. This work was completed to evaluate the feasibility for creek/estuary restoration alternatives developed by the County, and effects on flood hazards along this flood-prone reach.

In order to better address and evaluate the current flood hazards along the entire floodway and identify potential flood hazard reduction measures, Mr. Kamman was retained to update HEC-2 models previously prepared by the Army Corps, and to evaluate the impacts of vegetation encroachment (increased roughness)

and sediment deposition on floodway conveyance. Mr. Kamman expanded the Corps hydraulic model with newly completed channel surveys and channel roughness observations. The impetus for this work was to assist the County in identifying mutually beneficial strategies for ecosystem restoration and flood hazard reduction. Technical work was completed under close coordination and communication with county engineers. Study results and findings were presented at public meetings of local area landowners and stakeholders.

### **Tembladero Slough Small Community Flood Assessment, Monterey County, CA *Phillip Williams & Associates, Ltd., 1997***

Mr. Kamman completed a flood information study of Tembladero Slough near Castroville on behalf of the San Francisco District Corps of Engineers. The purpose of this work was to identify and document local flood risks existing in the community and propose potential floodplain management solutions as part of the Corps 1995/1997-flood recovery process. Work centered on conducting a field reconnaissance, reviewing available historical data, and conducting discussions/interviews with local landowners and agency personnel.

## Fluvial Projects

### **Muir Woods National Monument Bank Stabilization Plan for Conlon Creek, Marin County, CA *Golden Gate National Parks Conservancy (GGNPC), 2018-present***

Mr. Kamman developed a grading and drainage plan for the Conlon Avenue Parking Lot, located adjacent to Redwood Creek and sensitive Coho salmon habitat. More recently, he has assisted GGNPC and the NPS in assessing the planning and design for creek bank stabilization and ecological enhancement at a failed culvert on a tributary channel at the project site. This work includes constructing a HEC-RAS model to evaluate: culvert removal and channel design; fish passage; and water quality impacts. Work is currently in development of 50% engineering design.

### **Hydrology and Hydraulic Assessments for Design of Butte Sink Mitigation Bank Project, Colusa County, CA *WRA, Inc., 2017-2018***

Mr. Kamman was retained to provide hydrology and hydraulic modeling support in the development of design and Draft Prospectus for the Butte Sink Mitigation Bank (Bank). This work entailed developing the necessary hydrology information, hydraulic model and documentation to support further design, environmental compliance and agency approvals/permitting of the Bank. The main objective of work was to develop a design that provides the necessary ecological conditions and functions for successful establishment and operation of the Bank.

### **Lagunitas Creek Salmonid Winter Habitat Enhancement Project, Marin County, CA *Marin Municipal Water District, 2013-2018***

Mr. Kamman designed and led a study to evaluate opportunities to enhance winter habitat for coho and other salmonids in Lagunitas Creek and its largest tributary - Olema Creek. This work was done as a two-phase assessment and design effort. The first phase (completed in 2013) included a winter habitat assessment to evaluate existing juvenile salmonid winter habitat in Lagunitas Creek and lower Olema Creek. The results of this assessment were used to prioritize winter habitat needs, and identify opportunities for winter habitat enhancement to increase



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## SELECTED EXPERIENCE (CONTINUED)

the winter carrying capacity of coho salmon and steelhead. The second phase (completed in 2017) consisted of a designing winter habitat enhancements. These enhancements focused on restoring floodplain and in-channel habitat structures. Winter habitat enhancement work also needed to consider potential impacts to or benefits for California freshwater shrimp (*Syncaris pacifica*), a federally endangered species.

This work included field reconnaissance, topographic surveys and the preparation of final design drawings at nine different project sites. An overall self-maintaining design approach was developed to guide individual project plan, with minimal earthwork and disturbance to existing riparian and wetland habitat. Self-sustained, natural evolution of a multi-thread channel within a more active floodplain is a desired outcome of project actions. Design elements and structures are intended to enhance or restore natural hydrologic processes to promote geomorphic evolution of more active high flow (side) channels and floodplain. Design elements include construction of 24 individual log structures.

### **Lower Miller Creek Management and Channel Maintenance, Marin County, CA** *Las Gallinas Valley Sanitary District, 2013-2015*

Mr. Kamman was commissioned to formulate and implement a plan for sediment removal and improved flood flow conveyance in the Lower Miller Creek channel. The need for improved flood and sediment conveyance is driven by the following factors. Progressive accumulation of coarse sediment in the project reach had reduced area wide discharge efficiencies along Miller Creek and at District outfalls. The District had an immediate need to dredge Lower Miller Creek to protect existing operations and facilities. Miller Creek supports a population of federally listed Steelhead, and adjacent wetland areas potentially support other state and federally listed special status species. Therefore, permitting requirements and cost efficiency required minimizing the extent and frequency of channel excavation/maintenance that may adversely impact habitats in the wetland and riparian corridor.

The design objective of the project was to define and optimize an integrated channel maintenance, flood, and sediment management plan, that protects existing facilities from stream and coastal flood hazards. The plan's objective was to minimize costs and ecological impacts of future anticipated and designed maintenance activities required under District operations. Working with District Staff, Mr. Kamman developed a suite of potential project alternatives and identified a preferred approach. Mr. Kamman completed all CEQA compliance (IS/MND) and permitting. Mr. Kamman also managed and directed development of engineered drawings and assisted in bid document preparation.

Mr. Kamman provided site assessment, long term management planning and channel maintenance support to the Sanitary District to maintain flood conveyance, manage sediment aggrading at District outfalls, and improve ecological values in the intertidal Bayland reaches of Miller Creek. The creek supports multiple federal and state listed endangered species. Initial work included completing hydraulic and geomorphic assessments to characterize causes of channel aggradation, and quantify sediment yields. Assessments included evaluation of climate change impacts on habitat and flood hazards, and water quality modeling of District outfalls to quantify tidal exchange and dilution. Based on this analysis and supporting biological resource assessments, Mr. Kamman identified alternatives for channel maintenance, performed a cost benefit assessment of dredging

alternatives, and is assisted the District in developing short and long term management objectives. Mr. Kamman also led a multidisciplinary design team in the preparation of engineering plans and specifications as well as permits and environmental compliance documents.

### **Vineyard Creek Channel Enhancement Project, Marin County, CA** *Marin County Department of Public Works, 2007-2013*

Mr. Kamman managed the preparation of designs and specifications for a flood conveyance and fish habitat and passage improvement project on Vineyard Creek. Creek corridor modifications included replacing the box culvert at the Center Road crossing with a free span bridge or bottomless arch culvert (civil and structural design by others), providing modifications to the bed and bank to eliminate erosion risks to adjacent properties and improve water quality, promoting active channel conveyance of both water and sediment, and providing improved low and highflow fish passage, improved low flow channel form and enhanced in-stream habitat, repairing eroding banks, and expanding/enhancing adjacent channel floodplains. The riparian corridor was replanted to provide a low-density native understory, "soft" bank erosion protection, and increased tree canopy along the tops of banks. Mr. Kamman prepared the JARPA for the project and conducted permit compliance and negotiations with all participating resource agencies. Designs and permitting also address the known presence of Native American artifacts. This work was contracted under an expedited design schedule and phased construction was initiated the summer of 2008 and continued the summer of 2009.

### **Bear Valley Creek Watershed and Fish Passage Enhancement Project, Marin County, CA** *The National Park Service and Point Reyes National Seashore Association, 2005-2013*

Working on behalf of the NPS and PRNSA, Mr. Kamman completed a watershed assessment and fish passage inventory and assessment for Bear Valley Creek. Work included a geomorphic watershed assessment and completing field surveys and hydraulic modeling (including flood simulations) of ten road/trail crossings to identify and prioritize creek and watershed restoration efforts while considering and addressing current flooding problems at Park Headquarters – a major constraint to channel restoration efforts that would likely exacerbate flooding. Mr. Kamman also completed a suite of conceptual restoration designs (Phase 1) including: the replacement of two county road culvert crossings with bridges; channel creation through a ponded freshwater marsh (former tidal marsh); and replacement of 4 trail culverts with prefabricated bridges; and associated in-channel grade control and fishway structures. Engineered drawings and specifications were also developed for some of these sites to assist PORE with emergency culvert replacements after damages sustained during the New Year's Eve flood of 2005. Mr. Kamman also directed geotechnical, structural and civil design of project components.

Two projects were completed in 2006 on emergency repair basis resulting from flood damages suffered during the New Year's Eve storm of 2005. The two most recent projects were constructed in 2013, consisting of a large bank repair and adjacent to main access road/trail and culvert replacement further upstream on same road. The bank repair utilized bioengineering approaches including engineered log revetments and log diversion vanes.



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## SELECTED EXPERIENCE (CONTINUED)

### **Kellogg Creek Restoration Project, Contra Costa County, CA *Olberding Environmental on behalf of the Contra Costa County Water District, 2012-2013***

Mr. Kamman led the development of PS&E to restore 3,000 linear feet of riparian and associated creek corridor habitat. Project was designed as compensatory mitigation for direct and indirect impacts to jurisdictional waters from the Los Vaqueros Reservoir Expansion Project that Contra Costa Water District. Work included field investigations and data analysis to characterize hydrologic/geomorphic conditions and numerical modeling to optimize desired inundation and hydroperiods. Work was completed under subcontract to.

### **Miller Creek Sanitary Sewer Easement Restoration, Marin County, CA *Las Gallinas Valley Sanitary District, 2010***

Working on behalf of the District, Mr. Kamman completed field surveys and technical feasibility studies to develop engineering plans and specifications for a stream bank restoration project to protect an exposed sanitary sewer pipeline, stabilize incised banks, and promote an ecologically healthy stream corridor along an approximately 50 linear foot damaged reach of Miller Creek. The design includes backfill and materials to accommodate construction of a vegetated stabilized slope. The eroded bank repair included design of a 1:1 Envirolok vegetated slope with geogrid reinforced soil lifts extending eight to ten feet back from the slope face. One-quarter-ton rock will be placed in front of the Envirolok wall at the toe of the reconstructed bank to provide added scour protection. In order to perform the work, the project site will be dewatered. An existing felled tree perpendicular to the creek flow will be relocated and secured into the right creek bank with root wad remaining in active channel. All work on the bank and within the creek bed must be completed pursuant to project permits due to presence of steelhead trout.

### **California Coastal Trail Planning and Design at Fitzgerald Marine Reserve, San Mateo County, CA *WRA, Inc., 2008-2009***

Mr. Kamman provided hydrology and hydraulics expertise in the planning and design for the 0.25-mile segment of the California Coastal Trail at the Fitzgerald Marine Reserve. The project was overseen by the San Mateo County Parks Department. This segment of Coastal Trail provides improved access from the trailhead to the beach as well as a free span bridge over Vicente Creek. Greg completed the field surveys and hydraulic modeling to assist an interdisciplinary team to design the project. Understanding the hydrology of Vicente Creek and quantifying flood conditions was critical to successfully designing and constructing the free span bridge. He also evaluated how creek hydrology and coastal wave processes interact at the beach outfall in order to identify opportunities and constraints to beach access improvements (which will include crossing the creek on the beach) during both wet and dry season conditions in order to evaluate both permanent and seasonal crossing design alternatives.

### **Hydrologic Assessment and Conceptual Design for Conservation and Wetland Mitigation Bank Project, Stanislaus County, CA *WRA, Inc., 2009***

Working as a subcontractor to WRA, Inc., Mr. Kamman provided hydrology, geomorphology and engineering support for the planning and design for a Conservation and Wetland Mitigation Bank on the San Joaquin River, in the Central Valley near Newman, California. The property is currently owned by the

Borba Dairy Farms. The primary objective of the study was to characterize the hydrologic and geomorphic controls on the spatial distribution of habitat types. To meet this objective, Mr. Kamman's assessment included: (1) collecting and synthesizing hydrologic data to characterize existing and historic streamflow, geomorphic and shallow groundwater conditions; (2) filling a data gap by collecting topographic data of hydrologic features; (3) developing a hydraulic model capable of predicting water surface profiles for a range of design flows; and (4) quantifying the linkage between surface water/groundwater conditions and specific vegetation communities and habitat types through implementation of reference site assessments. Mr. Kamman also provided conceptual design and permitting support in evaluating habitat enhancement and creation opportunities on the site.

### **Redwood Creek Floodplain and Salmonid Habitat Restoration, Marin County, CA *Golden Gate National Recreation Area and Golden Gate Parks Conservancy, 2005-2008***

Mr. Kamman lead development of a preferred project alternative and final project design drawings and specifications for a floodplain and creek restoration and riparian corridor enhancement effort on lower Redwood Creek above Muir Beach at the Banducci Site. A primary objectives of the project was to: improve salmonid passage/rearing/refugia habitat; riparian corridor development to host breeding by migratory song birds; and wetland/pond construction to host endangered red-legged frog. The preferred design includes: excavation along the creek banks to create an incised flood terrace; engineered log deflector vanes; removing and setting back (constructing) approximately 400-feet of levee; creating in- and off-channel salmonid rearing and refugia habitat; reconnecting tributary channels to the floodplain; and creating California red-legged frog breeding ponds. Designs were completed in 2007 and the project constructed in the summer of 2007.

Considerable hydraulic modeling was completed to evaluate and develop means to help reduce chronic flood hazards to surrounding roadways and properties. Alternatives that included set-back levees and road raising were developed and evaluated. Detailed and careful hydraulic (force-balance) analyses and computations were completed as part of engineered log deflector designs. These were unique and custom designed structures, building on past project efforts and in consultation with other design professionals.

This project demonstrates Mr. Kamman's ability to work closely with the project stakeholders to develop a preferred restoration alternative in a focused, cost-effective and expedited fashion. This was achieved through close coordination with the NPS and the effective and timely use of design charrette-type meetings to reach consensus with participating stakeholders. Conceptual through full PS&E were completed on-time and on-budget in 2007 and was project constructed in the fall of 2007. Mr. Kamman worked closely with NPS staff to "field fit" the project, by modifying grading plans to protect existing riparian habitat. Mr. Kamman also provided construction management and oversight to floodplain grading and installation of engineered log structures. Based on field observations, the project is performing and functioning as desired.

### **Pilarcitos Creek Bank Stabilization Project, San Mateo County, CA *TRC Essex, 2006-2007***

Mr. Kamman directed field surveys and technical modeling analyses to develop restoration design alternatives for a Bank Stabilization Project on Pilarcitos Creek



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## SELECTED EXPERIENCE (CONTINUED)

in unincorporated San Mateo County, California. This work included hydrology and hydraulic design and preparation of plan sheets and technical specifications as well as a revegetation plan. Due to the importance of protecting an existing gas mainline, the design package will be completed in close coordination with TRC Essex geotechnical staff and revegetation subcontractor and PG&E civil staff. Design feasibility analyses focused on developing hydraulic design criteria for the project, including: estimates of design flood flow magnitudes (2-, 5-, 10-, 25-, 50- and 100-year floods); water surface elevation estimates for a suite of design floods; associated average channel velocities and shear stresses; and estimates for riprap sizing for channel bank toe protection. Plan sheets, technical specifications and cost estimates were provided for review and approval.

### Watershed Assessments

#### **Evaluation of Project Impacts on Oregon Spotted Frog, Klamath County, OR** *Oregon Water Watch and Earthjustice, 2016-2019*

Mr. Kamman designed a suite of hydrologic, hydraulic and geomorphic studies to evaluate proposed change operations of the Crane Prairie, Wickiup and Crescent Lake dams and reservoirs as related to harm to Oregon spotted frogs. Work began with analyzing impacts associated with proposed water delivery operations and developing a proposed alternative prioritizing protection and enhancement of frog habitat. This work followed with a technical review and critique of the USFWS's Biological Assessment. Work included preparation of four declarations for the clients.

#### **Tennessee Hollow Creek Riparian Corridor Restoration, San Francisco County, CA** *Presidio Trust, 2001-present*

Mr. Kamman has been leading and assisting the Trust and Golden Gate National Recreation Area (GGNRA) in the planning and design on over a dozen multi-objective riparian corridor restoration and watershed management projects in the Tennessee Hollow/Crissy Marsh watershed since 2001. Specific project objectives include: daylighting creeks; riparian corridor restoration; expanding Crissy Marsh; enhancing recreation, education, archeological, and cultural resource opportunities; improving water quality discharges to San Francisco Bay; and remediation of numerous landfills within the watershed. Typical initial phases of work focus on characterizing surface and groundwater conditions within each project area and identifying opportunities and constraints to restoration of natural wetlands and creek/riparian corridors. Notable challenges of this work include restoring heavily disturbed natural resources in an urban setting while integrating designs with recreation, archeology/cultural resources, education and remediation programs. Mr. Kamman has acted as lead hydrologist and designer on eight separate reaches in the 271-acre Tennessee Hollow Creek watershed and several other projects within and in the vicinity of Mountain Lake.

All task authorizations under these on-call and individual design contracts and included hydrology and water quality assessments and conceptual restoration planning and design. The project areas overlapped both the Presidio Trust and NPS-GGNRA management areas. Preliminary construction cost estimates for project alternatives within the Tennessee Hollow watershed range from \$10- to \$20- million. Several restoration projects are also tied to providing mitigation for the current San Francisco Airport expansion and Doyle Drive Seismic Improvement projects. Several projects have been constructed since 2012

(Thompson's Reach, El Polin Loop), two projects (East Arm Mtn. Lake and YMCA Reach) were constructed in 2014, and MacArthur Meadow restoration in 2016.

This work illustrates the Mr. Kamman's ability to complete a broad variety of hydrologic analyses, including: multiple years of rigorous and thorough surface water and groundwater hydrologic and water quality monitoring throughout the entire watershed to characterize and quantify existing hydrologic conditions; development of a detailed watershed-scale water budget for existing and proposed land-used conditions (capturing existing and proposed vegetation cover types and land use activities) to calculate groundwater recharge estimates input into the numerical watershed model; preparation of EA sections on water resources and water quality (NEPA compliance) regarding Environmental Conditions, proposed Impacts, and Proposed Mitigations associated with the project; preparing detailed alternative plans; and coordination and preparation of engineered plans/specifications for construction. All work was completed on budget and in a timely fashion.

#### **Mountain Lake Water Budget, San Francisco County, CA** *Presidio Trust, 2012-2017*

Mr. Kamman was retained to develop a water balance model for Mountain Lake in the Presidio of San Francisco. Through development of a water balance model, the Trust seeks to understand: the major source(s) of inflow to both Mountain Lake; anticipated seasonal (monthly) changes in water level relative to various outflow assumptions; and the relationship of surface and groundwater interaction. This information gained from this study will be used to: 1) better understand and manage lake levels for ecological habitats; 2) identify flood storage capacity of Mountain Lake and fluctuations in lake level under various storm conditions; 3) better understand and maintain wetland habitat in the east arm; and 4) complete mass balance calculations to assess water quality in and feeding into the lake.

To implement this study, Mr. Kamman developed a water budget model to identify and quantify the primary water inputs and outputs to the lake and determine major controls over water storage. Primary water budget variables analyzed includes: precipitation; evaporation/evapotranspiration; groundwater exchange; and surface runoff. This study also included a long-term field investigation completed between 2012 and 2016 to: identify all point source inputs such as culverts and drainage outlets; identify diffused surface runoff inputs from surrounding lands, including a golf course; better characterizing the function and performance of the primary lake outfall structure; monitor groundwater levels surrounding the lake; and continuously monitor lake water level and storage over a multi9-year period. These data were used to quantify water budget variables used to build the water budget model. Precipitation and barometric pressure data used in the model was provided by the Trust maintained weather station. Model daily evaporation estimates came from a variety of local area gauges maintained by state agencies.

The water budget model developed for this study is successful in accurately simulating historic water level conditions. The model using a daily time-step appears more accurate than model using a weekly time-step, but both provide reasonable agreement with observed conditions. The model is highly sensitive to groundwater exchange with the lake. The water budget is also a proven useful tool for the design and analysis of improvements to the lake outfall structure and establishing flood storage needs to protect the adjacent highway.



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## SELECTED EXPERIENCE (CONTINUED)

### **Cordilleras Creek Hydrologic Assessment, San Mateo County, CA City of Redwood City, 2002-2003**

Mr. Kamman assisted the Cordilleras Creek Watershed Coordinator in planning, seeking funding, and implementing a hydrologic and biologic assessment of the Cordilleras Creek watershed. Work completed included completing a full creek reconnaissance and channel stability assessment, preparation of a watershed assessment work plan, presentations at public meetings, and study/review of flooding issues in the watershed. Challenges faced in this predominantly privately owned watershed include removal of numerous fish passage barriers and educating/coordinating property owners.

### **Capay Valley Hydrologic and Geomorphic Watershed Assessment, Yolo County, CA Yolo County RCD, 2008-2010**

Mr. Kamman designed and supervised a hydrologic, geomorphic watershed assessment, and conceptual restoration design for the Capay Valley segment of Lower Cache Creek. Funding for the project was from a CALFED Watershed Program grant. The Capay Valley reach of Cache Creek experiences considerable stream bank erosion, which contributes to downstream sedimentation. The channel instability also threatens adjacent homes and can negatively impact the riparian habitat along the creek that functions as an important wildlife corridor from the Western Coastal Range to the Yolo Bypass. Additionally, a significant proportion of methylmercury transported into the Bay-Delta originates from the Cache Creek watershed. The main goal of this proposed study is to address both the causes and the aforementioned consequences of bank erosion.

The assessment was designed to evaluate and quantify changes in hydrologic and geomorphic conditions in response to historical changes in land-use and water development (e.g., diversions, reservoir construction, groundwater pumping, etc.). This assessment also evaluated how historic human induced changes in hydrologic and geomorphic conditions affect riparian ecology in terms of the lost or altered floodplain area, character, and inundation frequency. A key product of this assessment was to distinguish between "natural" and "accelerated" bank erosion, and to identify the underlying causes (both natural and anthropogenic) so that appropriate solutions can be developed. Desired outcomes of the study included: reduce bank erosion by developing restoration designs for typical trouble sites; produce a ranking system to prioritize sites for stabilization and restoration; contribute to community education through watershed science education and the Yolo STREAM Project outreach program; improve water quality through reduction in accelerated erosion; and contribute to riparian corridor restoration and support the RCD's Wildlife Conservation Board funded efforts to remove non-native tamarisk and around from the creek corridor. Work was completed through a broad spectrum of field and analytical investigations that received close review by the RCD, stakeholders, and a Technical Advisory Committee.

### **Ventura River Unimpaired Flow and Habitat Assessment, Ventura County, CA City of Buena Ventura and Nautilus Environmental, 2006-2007**

Mr. Kamman completed a hydrology feasibility assessments as part of evaluating the reuse of Ojai Valley Sanitary District (OVSD) effluent for other beneficial uses. Currently, OVSD discharges treatment plant effluent to the lower Ventura River. The City and OVSD recognize that the reduction in the discharge of treated effluent to the Ventura River could have an environmental effect on sensitive and

endangered species. In light of these concerns, this study was conducted to determine if a reuse project is feasible without significant environmental harm.

The assessment included hydrologic and geomorphic field and analytical assessments of past (unimpaired), current and proposed surface and groundwater flow conditions over a wide range of dry- through wet water year-types. The main objective of these analyses was to determine the linkage to water quality and aquatic habitat conditions including: flow durations; extent of gaining vs. losing reaches; low flow inundation/wetted area; and influence on barrier beach dynamics. Mr. Kamman collaborated with a team of other professionals to prepare a facility plan documenting the analyses and conclusions of respective water recycling investigations.

### **Hydrologic Analysis of FERC Minimum Flows on Conway Ranch Water Rights, Mono County, CA Law Office of Donald Mooney, 2001-2002**

Mr. Kamman completed a hydrologic analysis to evaluate if FERC's proposed Minimum Flow Plan for Mill Creek would interfere with the exercise of the Conway Ranch's water rights from Mill Creek. The approach to this analysis was to quantify the duration of time the Conway Water right was met under historic gaged and simulated proposed Minimum Flow Plan conditions. The primary objective of the analysis was to evaluate impacts during the winter period when flows are typically limited due to water storage as snow pack. Minimum Flow Plan conditions were simulated by developing a spreadsheet model that redistributes actual (historic) Lundy Lake releases in a fashion that maintains a minimum flow of 4 cfs to Mill Creek to accommodate the downstream Southern California Edison's (SCE) power plant. The analysis period for both historic and simulated Minimum Flow Plan conditions consisted of water years (WY) 1990 through 1998 to capture an exceptionally diverse range of wet and dry year-types.

The primary method used to quantify changes in flow between historical and simulated Minimum Flow Plan conditions was to prepare and compare flow duration curves for each condition during both the winter and summer periods during a variety of water year types. Model results were tabulated for each condition to determine the differences in the percentage of time target flows were equaled or exceeded. Based on these findings, Greg was contracted to complete more in-depth monthly modeling.

## Groundwater Management Projects

### **Assessments of Groundwater-Surface Water Interaction, Stanislaus County, CA The Law Offices of Thomas N. Lippe, APC and California Sportfishing Protection Alliance, 2015-present**

Since 2015, Mr. Kamman has been assessing groundwater conditions within Stanislaus County and evaluating potential impacts of groundwater pumping on surface water flow and aquatic habitat of the Stanislaus, Tuolumne and San Joaquin Rivers. Mr. Kamman completed a comprehensive review and synthesis report of available groundwater and interconnected surface water (ISW) reports and data. Using available soils, geology and hydrology information, Mr. Kamman also delineated and mapped subterranean streams and Potential Stream Depletion Areas (PSDAs) to identify stream corridors susceptible to adverse impacts from groundwater pumping. This information is intended to help Groundwater Sustainability Agencies identify potential impacts to ISW.



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## SELECTED EXPERIENCE (CONTINUED)

Most recently, Mr. Kamman has been retained to review and comment on 7 Groundwater Sustainability Plans (GSPs) for critically overdraft groundwater subbasins within or adjacent to Stanislaus County. This review focused on how GSPs address Groundwater Dependent Ecosystems (GDE) and ISW. Comments included recommendations on monitoring and study plans to identify and quantify impacts of groundwater pumping on stream flow rates and associated ecological habitats.

### **Assessment of Surface Water-Groundwater Interaction, Humboldt County, CA**

#### ***Friends of the Eel River (FOER), 2020-present***

Mr. Kamman is currently providing technical assistance in understanding surface water-groundwater interactions in the Lower Eel River Valley. Work includes reviewing and synthesizing available reports and hydrologic data and providing a science-based opinion on the role groundwater plays in supporting stream flow and aquatic habitats. This analysis addresses conditions and changes associated with seasonal and long-term wet-dry cycles. Data gaps will be identified and documented during the analysis.

This work is being completed to support FOER efforts at protecting aquatic resources within the framework of current water management practices and the public trust doctrine under California law. Additionally, this work includes providing hydrologic and hydrogeologic review, comment and recommendations during development of the basin's Groundwater Sustainability Plan (GSP) under the California Sustainable Groundwater Management Act (SGMA).

### **Scott Valley Subbasin Technical Hydrogeologist Assistance, Siskiyou County, CA**

#### ***Klamath Tribal Water Quality Consortium and Quartz Valley Indian Reservation, 2019-present***

Mr. Kamman is providing technical review and comment on the groundwater models and associated studies in the Scott Valley groundwater subbasin under the Sustainable Groundwater Management Act (SGMA) process. Work includes: review of groundwater models; synthesis and review of available groundwater quality data; assisting to identify constituents of concern; and review of the planning and technical studies being used to develop a basin Groundwater Sustainability Plan (GSP).

### **Middle Russian River Valley Shallow Groundwater Storage Enhancement Study, Sonoma County, CA**

#### ***Friends of the Eel River, 2016***

Working on behalf of Friends of the Eel River, Mr. Kamman completed a study to identify and quantify the volume of recoverable aquifer storage along two independent 6-mile reaches within the alluvial fill valley of the Russian River. The approach to this study was to quantify how channel incision has reduced shallow groundwater levels and quantify how much aquifer storage can be increased if channel bed elevations are restored to historic levels. The goal of this investigation was to identify feasible approaches to increase groundwater storage that would off-set losses associated with the termination of out-of-basin diversions from the Eel River. This work was completed through: intensive review and mapping of available groundwater level data; quantification of aquifer hydraulic properties; and calculating the shallow aquifer storage volume. In total, reclaiming the shallow aquifers within these two areas yield a total added storage volume of over 20,000 AF.

### **Green Gulch Farm (GGF)/Zen Center Water Resources Investigation, Marin County, CA**

#### ***Green Gulch Farm, 1998-2019***

Mr. Kamman completed a multi-phase study to evaluate the short- and long-term water uses and resources at GGF. Work was initiated by developing comprehensive water usage/consumption estimates and assessing available water resources, including spring, surface water, and ground water sources. Water demand estimates included quantifying potable and agricultural water usage/demands. Once reliable water supplies were identified and water usage/demand figures calculated, Mr. Kamman provided recommendation for improvements to water storage and distribution systems, land-use practices, conservation measures, treatment methods, waste disposal, and stream and habitat restoration. The initial phase of work included: in-depth review of available reports and data; review of geology maps and aerial photography; review of water rights and historic land use records; field reconnaissance including year-round spring flow monitoring; mapping and quantifying existing runoff storage ponds; and surface water peak- and base-flow estimates.

The second phase of work included identification of possible groundwater sources and siting and installation of production wells. This included sighting three drilling locations, obtaining County and State well drilling permits for a domestic water supply; coordination and oversight of driller; and directing final well construction. Upon completion of a well, Mr. Kamman directed a well pumping yield test and the collection and analysis of water quality samples (including Title 22) for small water supply system use. The final phase of work included assisting GGF with water treatment system options at the well head and integration of the groundwater supply into an existing ultra-violet light treatment system servicing spring water sources. Work was completed in 2000 with a budget of approximately \$25,000, including all driller and laboratory subcontracting fees.

### **Stanford Groundwater Assessments, Santa Clara County, CA**

#### ***Stanford University Real Estate Division, 2012-2016***

Mr. Kamman provided technical hydrogeologic services to evaluate groundwater conditions and drainage requirements associated with the construction of several new facilities on or near Page Mill Road. The main objective of this study is to determine the seasonal depth to groundwater beneath the project site under existing and potential future conditions and provide an opinion on if the project is required to comply with the City of Palo Alto, Public Works Engineering Basement Exterior Drainage Policy (effective October 1, 2006). This work included obtaining and reviewing available technical reports, maps and literature pertaining to groundwater conditions in the project vicinity. Based on this review, we have prepared a letter report of findings and recommendations.

### **Bodega Bay Wetland Water Supply, Sonoma County, CA**

#### ***Friends of Bodega Bay, 2007***

Mr. Kamman Conducted an evaluation of the groundwater underflow feeding a large coastal wetland in Bodega Bay and recommended mitigation measures for potential losses in supply associated with proposed residential development in recharge areas. Work included: long-term monitoring of ground water quality and supply; monitoring surface water and spring flow and water quality; assessing and characterizing the interaction between surface and subsurface water sources during different seasons and water year-types; developing a detailed water budget for the site to assess impacts to recharge areas; and developing a number of physical solutions to mitigate for recharge losses.



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## SELECTED EXPERIENCE (CONTINUED)

### **L.A. Department of Water and Power, Groundwater Recharge Facility Operation Study, Los Angeles County, CA ICF Consulting, 2006**

Working as a subcontractor to ICF Consulting of Laguna Niguel, California, Mr. Kamman provided technical assistance in the hydraulic modeling of sediment accumulation in selected spreading ground facilities owned and operated by the Los Angeles Department of Public Works. The object of this work is to evaluate changes in infiltration and groundwater recharge rates over time within the spreading grounds in association with sediment accumulation from turbid waters.

### **Corde Valle Golf Club Surface-Groundwater Interaction Study, Santa Clara County, CA LSA Associates, 2004**

On behalf of LSA Associates of Pt. Richmond, CA, Mr. Kamman completed a 3rd party independent review of available reports and data sets (boring logs, well water levels, groundwater quality, aquifer pump-test, and surface water monitoring) to evaluate if pumping of the Corde Valle irrigation well is adversely impacting flow in West Llagas Creek. This investigation was implemented in response to a concern expressed by California Department of Fish and Game staff regarding the potential for differential drying of the West Branch of Llagas Creek along Highland Avenue. The analysis was also complicated by the likely effects of pumping from surrounding off-site wells.

### **Aquifer Testing for Tennessee Hollow Watershed Project, San Francisco County, CA Presidio Trust, 2002**

The Mr. Kamman assisted in the design and implementation of an aquifer test at the Presidio of San Francisco. We prepared an aquifer test work plan and conducted step-drawdown and constant-rate aquifer tests at the site using both manual and electronic data collection methods. This work included interpretation of the aquifer test results using software-based solution methods and prepared a written summary of methods and findings. In addition, Mr. Kamman located, coordinated and managed a drilling effort for the logging and installation of several groundwater monitoring wells in the project area to address identified data gaps.

### **San Joaquin River Riparian Corridor Restoration Project, San Joaquin Valley, CA McBain-Trush, 2002**

Mr. Kamman completed an assessment of historic and existing shallow groundwater conditions beneath and adjacent to the San Joaquin River between Friant Dam and the Merced River. This work focused on reviewing available reports and flow/groundwater-level data to characterize surface water and groundwater interaction and implications for riparian vegetation, water quality and fishery habitat restoration. Hydrologic analyses were performed to identify the location and seasonal evolution of losing and gaining reaches an implication on future restoration planning and design efforts. The main deliverable for this analysis was a report section focused on describing the historical changes in regional and local groundwater conditions in the San Joaquin Valley and evolution of anthropogenic activities (e.g., groundwater withdrawals, irrigation drainage systems and return flows, development of diversion structures, changes in land-use; and introduction of CVP/State Water Project deliveries) and associated impacts on deep/shallow groundwater levels, surface water flows, and surface and groundwater quality.

## Tidal, Estuarine & Coastal Projects

### **Quartermaster Reach Wetland Restoration Project, San Francisco County, CA Presidio Trust, 2006-present**

Mr. Kamman was retained in 2006 as part of a multi-disciplinary team to develop restoration alternative designs for a 10-acre filled and paved site marking the historic confluence of Tennessee Hollow Creek and Crissy Marsh adjacent to San Francisco Bay. The Trust's planning documents define the main objectives for Tennessee Hollow restoration as: a) "Restoration [of Tennessee Hollow] will expand riparian habitat and allow for an integrated system of freshwater streams and freshwater, brackish, and tidal marsh, re-establishing a connection to Crissy Marsh" and b) "Restore and protect Tennessee Hollow as a vibrant ecological corridor". The project is located within the setting of a National Park and a National Historic Landmark District. Thus, another goal for the project is to protect the area's historic buildings and sensitive cultural and archeological resources to the extent possible, to enhance visitor experience to the area, and to integrate creek restoration with other urban land uses.

Mr. Kamman provided H&H technical input and consultation to the design team to develop a restoration project consisting of a creek-brackish marsh-salt marsh interface and associated upland habitats. His work included evaluating surface water, groundwater and tidal sources. In addition, the development of a hydrodynamic model has informed and guided a preferred project design, including evaluation of storm surge, road crossing and Tsunami impacts to the project. A technical challenge addressed with the use of the model included predicting and quantifying salt/brackish marsh habitat zones within the restored wetland in response to periodically but prolonged closed-inlet conditions to Crissy Marsh - a water body that serves as the downstream connection to the proposed project.

Another unique challenge to this project includes integrating restoration planning and design efforts with the replacement and retrofit of Doyle Drive, the main on/off-ramp for the Golden Gate Bridge, being replaced along the entire northern boundary of the Presidio. Mr. Kamman is providing long-term technical review of this project to the Trust with respect to impacts to water resources and associated existing ecological habitats. The Quartermaster project also falls within the managerial jurisdiction of both the Presidio Trust and NPS-GGNRA, requiring work in close cooperation with both Presidio Trust and National Park Service (NPS) staff.

### **Salt River Ecosystem Restoration Project, Humboldt County, CA Humboldt County RCD, 2005-2019**

Mr. Kamman provided hydrology, engineering and environmental compliance services towards the planning and design of river and tidal wetland restoration on the Salt River (Eel River Delta plain) near Ferndale, California, in Humboldt County. The purpose of the Salt River Ecosystem Restoration Project (SRERP) is to restore historic processes and functions to the Salt River watershed. These processes and functions are necessary for re-establishing a functioning riverine, riparian, wetland and estuarine ecosystem as part of a land use, flood alleviation, and watershed management program. The Salt River Project has three components: 1) dredging the lower Salt River and lower Francis Creek from near the Wastewater Treatment Plant downstream for 2.5 miles; 2) restoring 247 acres of wetland estuary habitat in the lower Salt River within the 440-acre former



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dairy; and 3) reducing sediment inputs from tributary watersheds. The Salt River Project was designed using an “ecosystem approach” to address hydrology, sedimentation, and fish and wildlife habitat.

As part of project feasibility assessment, Mr. Kamman completed a hydrologic and water quality monitoring program, and developed a MIKE11 hydrodynamic model of the lower Salt River and Eel River estuary in Humboldt County, for the Humboldt County RCD. The purpose of this work was to complete a hydrologic, geomorphic, and hydraulic modeling assessments of the character and dominant physical processes controlling flow of water and sediment through the lower Salt River. Land use changes in the area have caused significant aggradation and infilling of the Salt River, significantly reducing tidal exchange, fish passage, and exacerbating flooding in upland areas. A primary goal of this study is to evaluate the feasibility of proposed restoration elements intended to increase tidal prism and exchange and in-channel sediment scour and transport. The desired outcome is a sustained increase in river conveyance capacity to improve drainage of surrounding flood-prone lands and improve aquatic, wetland, and riparian habitat.

As part of project development and feasibility assessment, Mr. Kamman completed a hydrologic and water quality monitoring program and MIKE11 hydrodynamic model development of the lower Salt River and Eel River estuary in Humboldt County for the Humboldt County RCD. The purpose of this work is to complete a hydrologic, geomorphic, and hydraulic modeling assessments of the character and dominant physical processes controlling flow of water and sediment through the lower Salt River. Land use changes in the area have caused significant aggradation and infilling of the Salt River, significantly reducing tidal exchange, fish passage, and exacerbating flooding in upland areas. A primary goal of this study is to evaluate the feasibility of proposed restoration elements intended to increase tidal prism and exchange and in-channel sediment scour and transport. The desired outcome is a sustained increase in river conveyance capacity to improve drainage of surrounding flood-prone lands and improve aquatic, wetland and riparian habitat.

### **Western Stege Marsh Restoration Project, Contra Costa County, CA *Tetra Tech, 2008-2010***

Mr. Kamman provided technical hydrology and wetland hydraulics support to post-project monitoring of the Western Stege Marsh Restoration Project. His involvement began by providing an independent technical review of previous year's hydrologic monitoring results to evaluate the proposed monitoring success criteria and the rationale used to develop these criteria. This work entailed reviewing historic monitoring data and available natural slough channel geometry data-sets for San Francisco Bay area marshes. Mr. Kamman's study approach was to independently develop desired and sustainable channel geometry relationships for natural, healthy San Francisco Bay salt-marshes and compare them to the published success criteria. Greg was also retained to implement the Year 4 post-project hydrologic monitoring, with modifications to aid in better linking hydrologic processes to ecological conditions and function within the restored marsh. This work consisted of completing more targeted water level monitoring and channel geometry surveys in reference marsh areas containing desired physical and ecological attributes. These data were used to develop geomorphic success criteria (target channel geometry) more tailored to the project marsh and augment the criteria provided in available literature. Working closely with the project team of scientists, Mr. Kamman compared these

hydrologic monitoring results to available vegetation surveys to better assess the overall success and evolutionary trend of the marsh.

### **Giacomini Wetland Restoration Project, Marin County, CA *The National Park Service and Point Reyes National Seashore Association, 2003-2012***

Mr. Kamman managed a multi-year project for the NPS in the design and feasibility analysis of a tidal wetland, riparian, and freshwater marsh complex, on the 500-acre Giacomini Dairy Ranch, at the south end of Tomales Bay. The project began in 2003 and included hydraulic, hydrologic, and geomorphic assessments to characterize existing physical conditions, developing restoration alternatives, and completing hydrologic feasibility analyses. Restoration alternatives evaluated creation of a mosaic of subtidal through upland wetland and riparian habitat zones, as well as improvements to salmonid passage, red-legged frog habitat, tidewater goby habitat, and clapper-rail habitat. Emphasis was placed on completing detailed studies to quantify project-induced changes in flood frequency, magnitude and duration, impacts on water quality to local groundwater supply wells, and changes in sediment and water quality conditions in Tomales Bay.

Beginning in 2006, Mr. Kamman managed and assisted design engineers, preparing plans, specification, and cost estimates for a three phased construction schedule, that was completed in the summer of 2008. This project illustrates Mr. Kamman's ability to complete a broad variety of hydrologic feasibility analyses, including flood frequency analyses for contributing watersheds, reproducing historic flood events through numerical modeling, flow duration analysis and evaluation of environmental flow regimes, development of a water budget for created freshwater marsh and frog breeding ponds, sediment yield estimates, completing field monitoring (flow, water level, groundwater level, sediment, and water quality monitoring) to characterize existing site hydrologic and geomorphic conditions (fluvial and tidal), wind-wave setup and run-up for levee stability determination and construction design, coordinating and performing topographic and hydrographic surveys, performing hydrodynamic and water quality modeling of existing and alternative conditions, developing detailed construction cost estimates preparation of technical reports and design drawings and specifications in support of NEPA/CEQA environmental compliance, and public meeting presentation and participation. In addition, Mr. Kamman managed staff in the generation of DEM and TIN models of the existing site and all action alternatives. All work was completed on budget and in a timely fashion, despite repeated expansions to the project boundary and last minute changes driven by endangered species issues.

### **Critical Dune Habitat Restoration to Protect Threatened and Endangered Species, Marin County, CA *The National Park Service, 2009-2010***

Mr. Kamman provided and managed engineering, design, and implementation planning support for the restoration of 300 acres of critical dune habitat at Abbots Lagoon within the NPS Point Reyes National Seashore. He developed engineered drawings, technical specifications and engineer's cost estimates, and assisted NPS in defining a range of methodologies suitable to local conditions and sensitive flora and fauna. This area of the park supports the best remaining intact dune habitat, including some of the largest remaining expanses of two rare native plant communities: American dune grass (*Leymus mollis*) foredunes, and beach pea (*Lathyrus littoralis*). European beach grass and iceplant were removed from



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the project site using mechanical removal and hand removal techniques. The project goal was to remove these invasive species from approximately 135 acres of prime dune habitat in the 300-acre project site, while not impacting sensitive species and habitats. The intended result was to remobilize this historic dune field and restore their natural form and migratory processes.

This project illustrates Mr. Kamman's ability to work closely with NPS staff to balance habitat protection and restoration across the landscape. As part of project design, he developed grading plans, and specified work flow, equipment movement and access routes which minimize impacts to special status species. Extensive fencing and exclusions zone planning was required to protect existing native habitats, and minimize tracking of plant stock to or through restored sites. In addition work elements had to be structured and prioritized to maximize ground work subject to budgetary constraints and work flow uncertainties. All work has been completed on budget and in a timely fashion, even with repeated expansions to the project boundary and affected area and last minute changes driven by endangered species issues.

### **Lower Gualala River and Estuary Assessment and Management Plan, Mendocino County, CA** **California State Coastal Conservancy and Gualala River Watershed Council, and Sotoyome RCD, 2002-2005**

Mr. Kamman worked with fisheries biologists to evaluate the hydrologic and water quality conditions in the lower Gualala River and estuary and identify and evaluate potential impacts to summer rearing habitat for salmonids and other aquatic organisms. This work included: assessing how the impacts of upstream land use (logging and water diversions) have altered water delivery and water quality to the Lower River and estuary over time; characterizing the physical coastal and riverine processes controlling opening and closure of the estuary inlet and lagoon morphology; monitoring and characterizing real-time and seasonal changes in lagoon water level and water quality; and evaluating the sediment transport capacity and geomorphic condition of the lower river and estuary. Mr. Kamman took the lead in developing and editing a management plan for the lagoon, prescribing actions to preserve, protect and enhance ecological habitats (with emphasis on salmonids) within the lagoon and lower Gualala River.

This project was completed on-time and on-budget and demonstrates Mr. Kamman's ability to integrate physical, water quality and biological data and information into a coherent and understandable description of the interrelated processes controlling the aquatic ecology of a lagoon system. A big challenge on this project was completing a high-quality and defensible field monitoring program on a "shoe-string" budget. The outcome of this study provides important understanding on how and why steelhead are surviving in a heavily logged (95% private ownership) watershed. The management plan prescribes recommendations to preserve and protect the lagoon as primary rearing habitat for steelhead.

### **Suisun Bay Tidal Wetland Restoration Design, Contra Costa County, CA** **East Bay Regional Park District and LSA Associates, 1999-2005**

Mr. Kamman provided hydrologic design services to the restoration of a 55-acre tidal wetland on Suisun Bay. The design will maximize habitat for special status fish species, and (to the extent possible) habitat for other special status animal and plant species. Working with a multi-disciplinary design team, Mr. Kamman assisted in developing a design based on analysis of habitat needs,

tidal hydrodynamic and geomorphic processes, sedimentation rates and soil characteristics. Project tasks included: a site analysis defining existing ecological and hydrologic conditions; a hydrologic and biological restoration opportunities and constraints analysis to define restoration and management objectives; and hydrodynamic and sedimentation modeling to evaluate design alternatives. The final restoration and management plan included a grading plan, landscape revegetation plan and monitoring and maintenance plans. This work again illustrates his capabilities in the characterization of physical site conditions, development and feasibility analysis of project alternatives, and preparation of preliminary designs of sufficient detail to allow for environmental compliance through the CEQA/NEPA process.

### **Santa Clara River Estuary and Lower River Assessment, Ventura County, CA** **Nautilus Environmental on behalf of the City of Ventura, Public Works Department, 2003-2004**

Mr. Kamman directed a hydrologic and geomorphic assessment of the lower Santa Clara River and estuary. This work was completed for prime contractor in an effort to assist with re-permitting of treated effluent discharges to the estuary. The proposed study entailed characterizing existing and historic hydrologic and physiographic conditions and an assessment of historic changes in inflow to the estuary. This task included a comprehensive review and evaluation of available hydrologic reports and flow data within the watershed to characterize changes in flow associated with development of numerous water projects within the Santa Clara River basin. The main deliverable from this analysis was the development of a historic unimpaired flow record to the estuary based on regional regression analyses and water operations modeling. Within the estuary, Mr. Kamman designed and conducted a multi-year monitoring program of water levels, water quality (temperature, dissolved oxygen, salinity, and pH), and sand-spit morphology in order to evaluate inlet opening/closure frequency and associated changes in aquatic habitat (esp. tidewater goby) and other ecologic communities. A considerable portion of this subtask included detailed coastal process analysis (including wave power analyses and littoral sand transport), which, considered with the inflow analysis, provides a basis to evaluate the seasonal cycle of barrier beach buildup and destruction.

This project illustrates Mr. Kamman's ability to complete a broad variety of hydrologic and coastal process analyses under strict regulatory oversight. A premier study completed on this project was the development of a detailed water and salinity budget model for the estuary to evaluate the impacts of a wide variety of proposed and modified estuary inflow regimes to determine potential future water level and salinity conditions in the lagoon and impact on frequency of inlet breaching. In addition to coordinating and implementing a variety field monitoring and surveys, Mr. Kamman also provided real-time information and input to informational and negotiation meetings with state resource and regulatory agencies.

### **Eden Landing Ecological Reserve Restoration, Alameda County, CA** **East Bay Regional Park District, 2000-2003**

Mr. Kamman developed and completed hydraulic and hydrodynamic modeling assessments for the design of an approximately 1000-acre tidal marsh restoration in former Cargil salt manufacturing ponds, located a mile inland of San Francisco Bay. The restoration goals required balancing the desires to restore tidal marsh conditions to the site, while maintaining and enhancing the open water and salt



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panne habitats preferred by resident and migratory shorebirds. The restoration plan also needed to incorporate restoration objectives with remediation of high soil salinities resulting from past salt production, subsided ground elevations, dredging of new channels to the bay, existing infrastructure constraints, public access for the San Francisco Bay Trail, and preservation of several important cultural and historical sites. Hydraulic design objectives include maximizing both interior circulation and tidal exchange between the restoration parcel and the bay. A series of one-dimensional unsteady hydrodynamic models (MIKE11) were used to design the channel network, identify high velocity areas requiring erosion protection, and characterize expected habitat conditions. An important component of this design and feasibility assessment was to translate desired ecological habitat conditions identified in the EIR into specific hydrologic design criteria, considering channel velocities, scour, sediment transport, tidal water inundation frequencies and seasonality of ponding. Mr. Kamman worked closely with EBRPD civil engineers, assisting with the translation of hydraulic design criteria into final engineered drawings and specifications.

### Wetland & Pond Projects

#### **Design of California Red-Legged Frog Breeding Ponds, San Francisco Bay Area (various), CA** *The National Park Service and Golden Gate National Parks Conservancy, 1997-present*

Mr. Kamman has lead or provided hydrologic and engineering design assistance to the sighting and design of nearly two dozen breeding ponds for California red-legged frog throughout the San Francisco Bay Area. Work has been completed in Marin, Sonoma, Solano, Contra Costa, Alameda, and Santa Clara Counties under the auspices of numerous federal, state, and local county/city agencies. A common study approach consists of an initial site reconnaissance of watershed conditions and identification of potential sites. The reconnaissance is followed by a surface water hydrologic sufficiency analysis using available meteorologic and stream flow information. An important variable sought during pond sighting is the presence of migration corridors between known breeding areas and/or perennial water sources. Based on in-depth research and post-project monitoring, Mr. Kamman has refined or developed site-specific evapotranspiration estimates, which commonly do not match standard applied values. Accurate evapotranspiration rates are necessary if ponds are intended to periodically dry-down as a means to preclude undesired species such as bullfrog or mosquito fish. In many instances, a seasonal groundwater-monitoring program is implemented in order to better investigate and quantify potential and seasonal groundwater contributions. Other design challenges we commonly experience include: design of impermeable liners for ponds located in upland areas or highly permeable soils; hydraulic analyses and design of outfalls/spillways; sedimentation management/maintenance approaches; and requirements of inoculum and water used to line and fill the pond, respectively.

#### **Hydrologic Feasibility Assessment for Mana Plain Wetland Restoration Project, Kauai, HI** *State of Hawaii Department of Land and Natural Resources, 2010-2019*

Working on behalf of the Mana Plain Wetland Restoration Partnership, Mr. Kamman completed a hydrologic feasibility assessment for the Mana Plain Wetland Restoration Project proposed by the State of Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) on the island of Kauai. The Mana Plain Wetland Restoration Project site is approximately

105 acres of low-lying abandoned sugarcane fields immediately north of the Kawaiie Waterbird Sanctuary and east of the Pacific Missile Range Facility. The purpose of the Mana Plain Wetland Restoration Project is to maximize the area of constructed wetlands within the restoration site. Palustrine emergent wetlands within the project will create habitat for four species of endangered Hawaiian waterbirds and other sensitive species, including: Hawaiian stilts; Hawaiian ducks; Hawaiian coots; Hawaiian moorhen; migratory waterfowl; and migratory shorebirds. The Mana Plain is of vital importance for the recovery of endangered waterbirds species. This restoration project will be designed to provide important breeding and feeding wetland habitats on an island where; 1) wetlands have been severely degraded, and 2) mongoose, an introduced predator, have not been established.

Mr. Kamman's work on this project included technical assessments and development of proposed restoration alternatives. Analyses completed included: a synthesis of the physical site setting (topography, geology, hydrogeology and soil); reviewing available data to characterize site meteorology, surface water drainage, water quality, and groundwater conditions; preparing a detailed water budget to describe the characteristics and processes of surface water and groundwater movement into and through the project area; evaluating project feasibility, water supply alternatives and costs; and completing a flood hazard impact assessment to evaluate potential project benefits and impacts to local area flooding. Working with the project partners, Mr. Kamman developed a preferred project alternative and supported in preparation of the project Environmental Assessment document. Mr. Kamman's firm was also retained by the State of Hawaii to develop engineering designs of the project.

#### **MacArthur Meadow Wetland Restoration, San Francisco County, CA** *Presidio Trust, 2013-2016*

Mr. Kamman has been working on over a dozen independent wetland and creek restoration planning and design efforts within the Presidio of San Francisco since 2001. Most recently (2016), he developed a wetland restoration grading plan for the MacArthur Meadow Wetland Restoration Project in the central portion of the Tennessee Hollow watershed. As part of the site assessment, Greg characterized and modeled surface and groundwater interactions and identified a unique opportunity to restore 4 acres of mixed meadow, natural wetlands and creek/riparian corridor. This was possible due to the discovery of shallow groundwater conditions beneath this historically disturbed landscape. Various design components were integrated into the grading plan in order to enhance groundwater recharge and storage in the Meadow, while retarding runoff and drainage out of the wetland, including: daylighting storm drain runoff into the Meadow; reconfiguring internal channel alignments to enhance channel habitat and groundwater recharge; creation of wetland depressions to retain and recharge surface water; and removal of fill material to decrease the depth to the water table. Notable challenges of this work include restoring heavily disturbed natural resources in an urban setting while integrating designs with archeology/cultural resources, education and remediation programs.

#### **Dragonfly Creek Restoration Project, San Francisco County, CA** *Presidio Trust, 2007-2011*

Mr. Kamman designed and managed hydrologic monitoring and analysis studies in support of planning and design for riparian and wetland habitat restoration along approximately 500-linear feet of the Dragonfly Creek corridor near Fort Scott of the Presidio of San Francisco. Work has included completing subsurface



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investigations including the installation of shallow wells and a sharp-crested weir with recorder to gauge creek flows. Mr. Kamman assisted in the development and selection of a preferred project alternative, considering on-site cultural resource protection, education and resource management issues (including flood control). Mr. Kamman prepared permit applications. Major components of the project included removal of significant fill and building foundations and installation of a new creek road crossing that will maintain the historical alignment, function and architectural character of a culturally significant roadway. Mr. Kamman oversaw development of PS&E for this project, which will create mitigation wetlands for a highway earthquake retrofit project that passes through the Park.

This project illustrates Mr. Kamman's ability to complete a broad variety of hydrologic analyses, including: surface water and groundwater hydrologic monitoring to characterize and quantify existing hydrologic conditions; rainfall-runoff modeling; hydraulic modeling of flood and scour conditions (including road crossing); preservation of existing wetland habitat and vegetation communities; integration with other Presidio Trust programs; and contracting flexibility to assist in conceptual planning and environmental compliance without increasing project design costs.

### **Mori Point Sensitive Species Habitat Enhancement Project, San Mateo County, CA Golden Gate National Recreation Area and Golden Gate National Parks Conservancy, 2005-2011**

Mr. Kamman provided hydrologic analyses, sighting and engineering design (PS&E) for three California red-legged frog breeding ponds within the 105-acre Mori Point area. These efforts were completed in association and collaboration with a larger Coastal Trail improvement and ecosystem restoration effort. Quarrying and off-road vehicle use have left this site heavily scarred. The focus of restoration work was to protect the endangered San Francisco garter snake and the threatened red-legged frog. Most of this work will be focused on invasive species removal and enhancing endangered species habitat. As part of species habitat improvement, Mr. Kamman worked with project ecologists to design the ponds to optimize breeding habitat for California red-legged frog.

Work started with an initial site reconnaissance and study of watershed conditions and identification of potential sites. The reconnaissance was followed by a surface water hydrologic sufficiency analysis using available meteorological and stream flow information and installation and monitoring of shallow piezometers to quantify the proximity and seasonal variability in depth to water table. An important variable sought during pond sighting was the presence of migration corridors between known breeding areas and/or perennial water sources. Based on in-depth research and post-project monitoring for other ponds they created in the San Francisco Bay area, Mr. Kamman refined site-specific evapotranspiration estimates. Accurate evapotranspiration rates are necessary if ponds are intended to periodically dry-down as a means to preclude undesired species such as bullfrog or mosquitto fish.

Other design challenges experienced included: design of impermeable liners for ponds located in upland areas or highly permeable soils; hydraulic analysis and design of outfalls/spillways; sedimentation management/maintenance approaches; and requirements of inoculum and water used to line and fill the pond, respectively. Mr. Kamman has designed numerous ponds for the NPS and affiliates within the Bay Area, including Mori Point (constructed 2007), Banducci

(constructed 2007) and Giacomini (Phase I and Phase II constructed in 2007 and 2008) project sites.

### **Hydrologic Assessment and Restoration Feasibility Study for Shadow Cliffs Regional Recreation Area, Alameda County, CA East Bay Regional Park District, 2009-2010**

Mr. Kamman developed and implemented an assessment to identify groundwater levels and supplemental water supplies that will sustain seasonal wetland restoration areas and riparian habitats under an altered future hydrologic regime. This work will inform a forthcoming Land Use Plan Amendment for park occupying a series of former gravel quarry pits. Work included: obtaining and synthesizing available surface water and groundwater data to characterize existing hydrologic and water supply conditions and seasonal variability; quantifying the likely changes in groundwater conditions and quarry pit lake levels in association with changes in regional water transmission and groundwater recharge operations; and identifying, developing and evaluating a suite of ecosystem restoration alternatives. Other important project objectives include: improving habitat for waterfowl and wildlife; broadening recreational use; enhancing visitor education and wildlife interpretation; improve park aesthetics. Mr. Kamman evaluated a preferred park and ecosystem enhancement alternative that involves diverting high winter flows from an adjacent arroyo. This project demonstrates Greg's ability to characterize hydrologic conditions and quantify the relationship between groundwater, surface water and wetland habitat conditions, both under existing conditions and in predicting future hydrologic and ecologic conditions under an altered hydrologic regime (i.e., lower groundwater table).

### **Laguna Salada Marsh and Horse Stable Pond Restoration Project, San Mateo County, CA Tetra Tech, 2007-2009**

Mr. Kamman provided technical hydrology and hydraulics support to the planning and conceptual restoration design of Laguna Salada marsh and Horse Stable Pond, located adjacent to Sharp Park Golf Course in the town of Pacifica, California. The primary objectives of the project are: to reduce flood impacts within the project vicinity; improve sustainable ecological habitat for the endangered San Francisco garter snake and the threatened California red-legged frog; better understand and characterize the hydrologic and water quality conditions/processes affecting flood and ecological habitat conditions within the project vicinity; provide an effective pumping operation plan to meet ecological objectives; and develop appropriate hydrologic analytical approaches and models to assist Tetra Tech and the San Francisco Recreation and Park Department in the planning and design for marsh, pond, and creek restoration. The project is also a unique opportunity to connect this resource with the California Coastal Trail, the Bay Area Ridge Trail, and the surrounding GGNRA lands.

Mr. Kamman's work included completing a comprehensive review of available hydrologic and site information and implementing selected field investigations to develop and calibrate an integrated hydrology-flood routing-pond water operations model that will quantify the volume and depth of water moving through the project system. The investigation will also further characterize shallow groundwater conditions and water quality with respect to effects on Laguna Salada and Horse Stable Pond. Analytical and numerical modeling tools are being used to better characterize existing hydrologic and water quality conditions and to assist in identifying project opportunities and constraints as well as evaluate potential restoration design components - all necessary to inform a sustainable



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and successful restoration design.

### **Tolay Lake Restoration Feasibility Assessment, Sonoma County, CA *Sonoma County Agricultural Preservation and Open Space District, 2003***

Mr. Kamman completed a detailed hydrologic feasibility analysis to evaluate a suite of potential freshwater lake and wetland restoration alternatives. Sites were evaluated under existing watershed land-use practices and under existing and forecasted water demands (in the form of existing water rights/applications). Analysis consisted of developing a detailed water budget model to simulate alternative restored lake inundation areas and depths under median and dry year conditions, as well as a 50-year historic period (1947-1997) displaying highly variable rainfall and runoff supplies. Three lake restoration alternatives were evaluated based on existing topography and likely historic lake configurations. The restoration alternatives include lakes with storage volumes equivalent to 136-, 1100-, and 2550-acre feet.

### **Haypress Pond Decommissioning and Riparian and Channel Restoration, Marin County, CA *Golden Gate National Recreation Area (GGNRA), 2001-2002***

This project restored 170 meters of historic creek and riparian habitat through removal of Haypress Pond dam in Tennessee Valley within GGNRA. The goals of the project were to alleviate long-term maintenance needs and eliminate non-native bullfrog habitat threatening native California red-legged frog habitat in adjacent watersheds.

Working with the Park biologist, Mr. Kamman developed designs to decommission the dam and restore natural riparian and meadow habitat. This work included: characterization of existing topographic conditions; design of a channel profile through the proposed restoration project reach; preparation of a grading plan for the restoration project; and hydrologic and hydraulic analyses to evaluate the performance of the creek channel and flood plain below the former dam during a variety of flows. Challenges of this work included integrating sediment reuse into plans and construction phasing.

### **Damon Slough Site Seasonal Wetland Design, Alameda County, CA *Port of Oakland, 1999-2001***

Working on behalf of the Port of Oakland, Mr. Kamman completed extensive surface and groundwater monitoring and data analyses to develop a detailed water budget to assist in the evaluation and design of a 7.5 acre seasonal freshwater wetland. Primary project objectives included a design that would provide shorebird/waterfowl roosting habitat, minimize impacts to existing seasonal wetland areas, and lengthen the duration of ponding through the end of April to promote use by migratory birds. In addition to developing hydrologic design criteria, responsibilities included development of grading plans to accommodate a local extension of the Bay Trail and wetland outlet works.

## Water Quality Projects

### **Chicken Ranch Beach Soil and Groundwater Quality Investigation and Restoration Planning, Marin County, CA *Tomales Bay Watershed Council, 2007-present***

Mr. Kamman is leading scientific and engineering efforts for a wetland and riparian corridor restoration project on Third Valley Creek and Chicken Ranch Beach

in Inverness, California. The main project goals are to create a self-sustaining riparian and wetland system (requiring minimal operation and maintenance) and eliminate public exposure to high levels of bacteria that exist in a site drainage ditch discharging to the beach. The design will likely include establishing a blend of habitats, including: riparian stream corridor, seasonal/perennial freshwater marsh, and tidal/saltwater marsh.

Current efforts have included the development and implementation of a soil and groundwater quality investigation to delineate the source of elevated bacteria levels. This work includes: the collection and testing of depth-discrete soil samples; groundwater well installation, sampling and testing; and surface water sampling and testing; analysis of laboratory results; and reporting, including recommendations for further/expanded investigations. Mr. Kamman coordinated this time-sensitive sampling and analysis (six hour hold times) with Brulje and Race Laboratories in Santa Rosa.

### **Lower Miller Creek Channel Maintenance and Material Reuse Sampling Analysis Plan, Marin County, CA *Las Gallinas Valley Sanitary District, 2015***

Mr. Kamman was commissioned to formulate and implement a plan for sediment removal and improved flood flow conveyance in the Lower Miller Creek channel. Accumulation of coarse sediment in the project reach had reduced discharge efficiencies at District outfalls. Miller Creek supports a population of federally listed Steelhead and adjacent wetland/marsh areas potentially support other state and federally listed special status species. Working with District Staff, Greg developed a suite of potential project alternatives and identified a preferred approach. Mr. Kamman completed all CEQA compliance (IS/MND), permitting and oversaw development of engineered plans and specifications.

In order to evaluate if reuse of excavated material from 2,655 feet of creek corridor in upland areas was feasible, Mr. Kamman developed and implemented a Sampling Analysis Plan (SAP) pursuant to U.S. Army Corps Guidance for Dredging Projects within the San Francisco District. Sample collection, sample handling, and analysis were performed in accordance with the SAP. Results for analytes were compared to a variety of screening criteria to determine the material's suitability for reuse in aquatic environments. A full suite of chemical and physical analyses were performed on soil samples collected from 16 locations, including: metals, PAHs, PCBs, pesticides, TOC, specific conductance, pH, sulfides, percent moisture and grain-size. Mr. Kamman managed all aspects of this effort including reporting and presentations/negotiations at multi-agency meetings through the Corps Dredge Materials Management Office (DMMO).

### **Lower Pitkin Marsh Hydrologic and Water Quality Monitoring, Sonoma County, CA *Sonoma Land Trust, 2008-2010***

Mr. Kamman was retained to develop and implement a hydrologic and water quality monitoring program at Lower Pitkin Marsh outside of Forestville, California. The Pitkin Marsh area is one of the most valuable complexes of mixed riparian woodland and thicket, freshwater marsh, wet meadow, oak woodland and grassland in Sonoma County. The complex interaction of surface water, ground water, and scattered seeps and springs on the site creates unusual hydrologic conditions that promote a rare assemblage of plant species which includes several endemics. The primary objective of the hydrologic monitoring program was to understand the annual and season sources of both surface and ground water supplying wetlands. Hydrologic and water quality monitoring was



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initiated during the winter wet season of 2008/09 and will be conducted for a 12-month period through the ensuing summer dry-down and into the following wet season. Understanding how groundwater levels, spring flow and creek flow rates recede from winter wet to summer dry conditions will provide an important understanding and quantification of the seasonal variability in water supplies feeding selected wetland types. General water quality parameters (temperature, pH, specific conductance, and ORP) are measured at all monitoring locations during each visit. Nutrients (N and P) are measured in selected surface water and groundwater samples collected during at least three monitoring events, including a winter high flow, spring high base flow and summer low baseflow.

### **Pescadero Lagoon Restoration and Enhancement, San Mateo County, CA California State Coastal Conservancy, 2005-2006**

Mr. Kamman was retained to support restoration and water quality enhancement planning efforts in Pescadero Lagoon. In 2005-2006, he completed a synthesis of available hydrologic and water quality information in responding to requests for development of a hydrodynamic and water quality model of the lagoon. This model was considered as a means to identify causes for repeated fish-kills in the lagoon that occurred during initial breaching of the inlet. Mr. Kamman assisted in preparing a synthesis and model development feasibility report from this effort.

### **Water Temperature Simulations for Trinity River Fish and Wildlife Restoration Project, Trinity County, CA Trinity County Planning Department, 1994-2004**

For over a decade, Mr. Kamman completed a number of hydrology and water quality investigations in support of alternative feasibility studies on the Trinity River Fish and Wildlife Restoration Project in direct support of the Trinity River Restoration EIR/EIS. Studies involve assessing the effects of proposed flow alternatives on water temperature within and downstream of Lewiston Reservoir. Mr. Kamman was responsible for data collection, processing, and flow/temperature modeling of Lewiston Reservoir as part of a coordinated evaluation including other Trinity River system models. Another study included evaluating how project operations could be implemented or modified to optimize Lewiston Lake release temperatures to meet downstream temperature criteria and compensate for increased warming of the river associated with side channel and feather edge restoration activities. Mr. Kamman continues to evaluate how more recent water projects (raising Shasta Dam, Sites Reservoir, and the Waterfix tunnels) consider and integrate with the Trinity Restoration Project.

### **Upper Eel River Unimpaired Flow and Water Temperature Assessments, Humboldt County, CA CalTrout, 1997-1999**

Mr. Kamman evaluated changes in the natural flow regime of the upper Eel River, and developed an Upper Eel River proposed release schedule to enhance downstream Chinook and Steelhead spawning and rearing habitat. This work was triggered by proposals set forth by PG&E as part of their Potter Valley Project FERC relicensing process. Work consisted of two main investigations. The first included reviewing results of a ten year PG&E study and development of multivariate regression and stream reach (SSTEMP) temperature models to assess the effects proposed flow alternatives would have on downstream temperatures. The second investigation consisted of characterizing unimpaired flow conditions and developing a daily unimpaired flow record for use in project operation models.

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Kamman, G.R., 2017, Review Comments, Draft Environmental Impact Report, Fish Habitat Flow and Water Rights Project. Professional declaration prepared for: Friends of Eel River, March 8, 18p.

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Hydrology | Hydraulics | Geomorphology | Design | Field Services

## SELECTED EXPERIENCE (CONTINUED)

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Kamman, G.R., 2016, Declaration of Greg Kamman Plaintiff's Joint Motion for Preliminary Injunction, Prepared for Center for Biological Diversity (Plaintiff) v. U.S. Bureau of Reclamation, Case No. 6:16-cv-00035-TC (Recovery for Oregon Spotted Frog, Upper Deschutes Basin, Oregon), February 4, 8p.

Kamman, G.R., 2015, Sharp Park Project Impacts to Laguna Salada. Prepared for National Parks Conservation Association and Wild Equity Institute, April 14, 1p.

Kamman, G.R., 2014, Review of Middle Green Valley Specific Plan Project, Revised Recirculated Draft Environmental Impact Report, Solano County, CA, Sch# 2009062048. Professional Declaration Prepared for: Law Offices of Amber Kemble, August 11, 11p.

Kamman, G.R., 2012, Deposition of Gregory Richard Kamman, R.G., C.H.G., Schaefer vs. City of Larkspur, CA, Superior Court of the State on California, County of Marin. August 23, 2012.

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Kamman, G.R., 2007, Independent Model Review for Klamath Settlement Negotiations, Klamath Independent Review Project (KIRP). Prepared for Northcoast Environmental Center, November 9, 19p.

Kamman, G.R., 2007, Review of Negative Declaration for File No. UPE04-0040, Gualala Instream Flow. Professional declaration prepared for Friends of the Gualala River, October 21, 2p.

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Kamman, G.R., 1999, Review of Final Supplemental Environmental Assessment, Cirby-Linda-Dry Creek Flood Control Project. Professional declaration prepared for: Monty Hornbeck, Sunrise Office Park Owners Association; Bill Kopper/John Gabrielli, Attorneys at Law; and Sharon Cavello/Cathie Tritel, Placer Group Sierra Club, May 24, 10p.

Kamman, G.R., 1995, Variable Water Resources Available in the Area of Salinas, California. Declaration prepared for Price, Postal, and Parma, Santa Barbara, California, May, 6p.

## Conference Presentations

Kamman, G.R., 2018, Water is Life! A hydrologist's eye on the Gualala River. Presented to: Friends of the Gualala River and public, Gualala Arts Center, Gualala, CA, May 3.

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Kamman, G.R., 2015, Enhancing Channel and Floodplain Connectivity: Improving Salmonid Winter Habitat on Lagunitas Creek, Marin County, CA - Beyond the Thin Blue Line: Floodplain Processes, Habitat, and Importance to Salmonids. 33rd Annual Salmonid Restoration Conference, March 11-14, Santa Rosa, CA.

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Hydrology | Hydraulics | Geomorphology | Design | Field Services

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Kamman, G.R. and Mertz, K.A., 1989, Clay Diagenesis of the Monterey Formation: Point Arena and Salinas Basins, California. In: Abstracts with Programs, The Geological Society of America, 85th Annual Cordilleran Section Meeting, Spokane Convention Center, May 1989, Spokane, Washington, pp.99-100.

# Appendix B



## HAMILTON BIOLOGICAL

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February 28, 2022

Ms. Carmen J. Borg  
Shute, Mihaly & Weinberger LLP  
396 Hayes Street  
San Francisco, CA 94102

**SUBJECT: REVIEW OF BIOLOGICAL RESOURCE ISSUES  
DRAFT EIR, COTTONWOOD SAND MINE PROJECT  
COUNTY OF SAN DIEGO, CALIFORNIA**

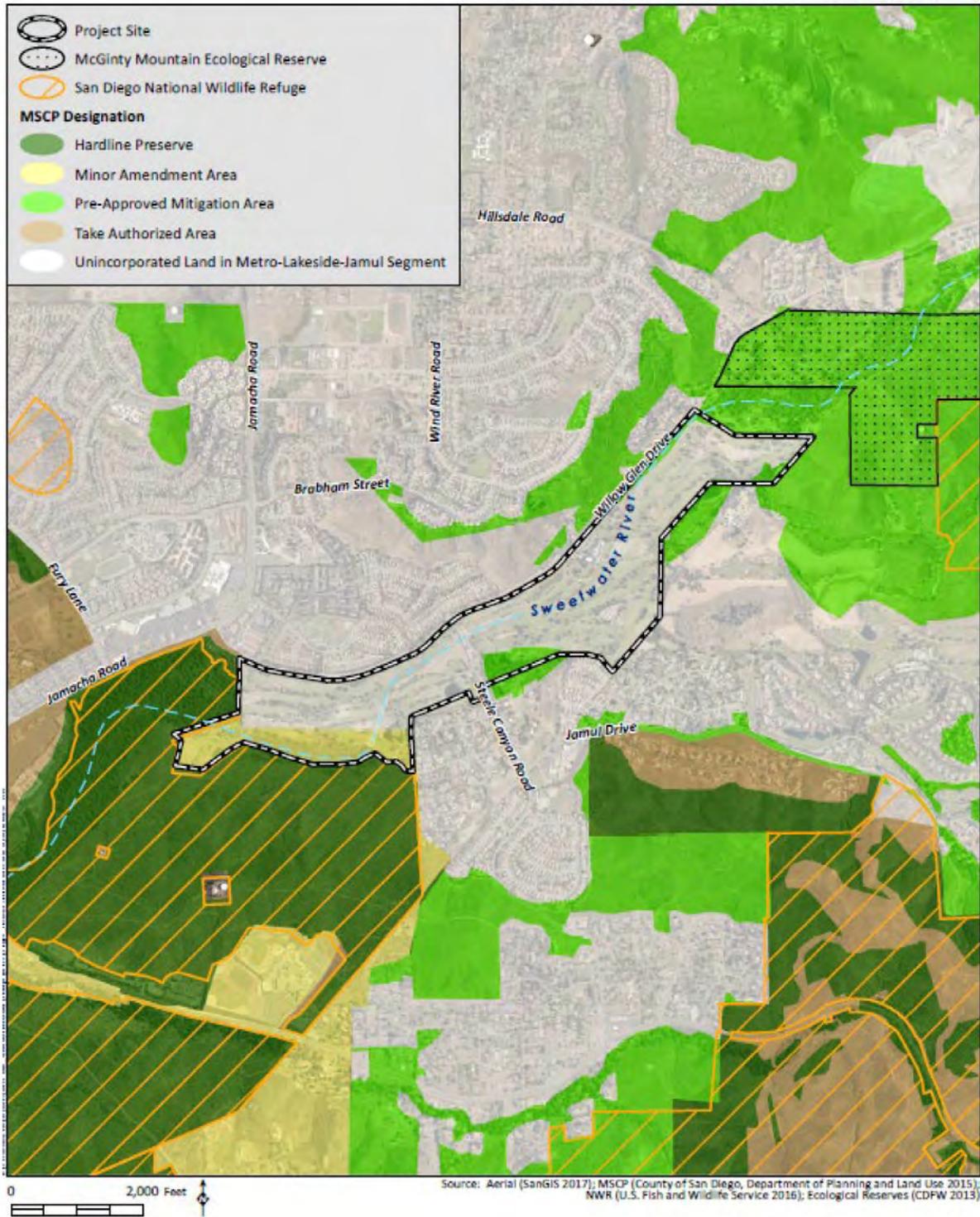
Dear Ms. Borg,

At your request, this letter provides the comments of Hamilton Biological, Inc., regarding biological issues associated with the proposed Cottonwood Sand Mine Project. The project sand mine would remove approximately 6.4 million tons of sand and other materials from approximately 251 acres in the Sweetwater River floodplain currently occupied by the Cottonwood Golf Club. The County of San Diego (County) has prepared a Draft EIR (DEIR) addressing the proposed actions. Certification of the DEIR by the County would put in place a Major Use Permit (MUP) for the mining activities, and the proposed actions require a Reclamation Plan for the proposed under the California Surface Mining and Reclamation Act (SMARA). Hamilton Biological's analysis evaluates the DEIR, including the alternatives analysis, as well as all relevant supporting appendices and the County's MSCP Findings of Conformance Statement.

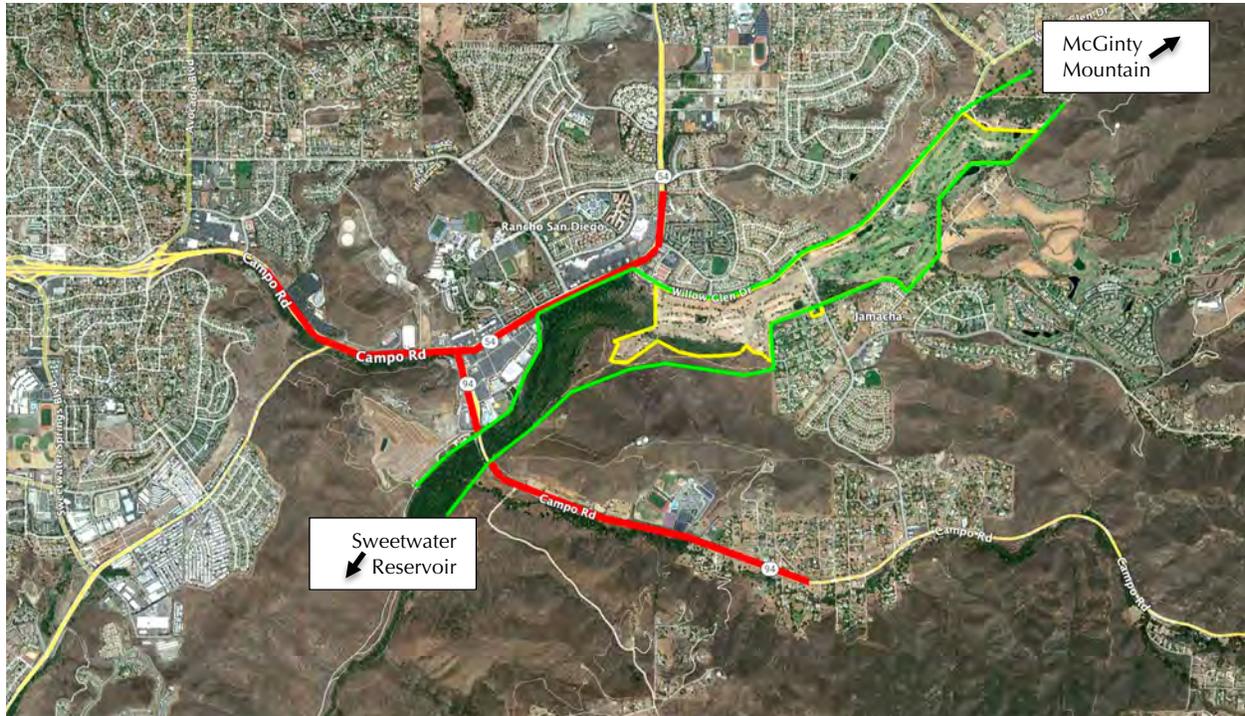
### **MSCP CONSIDERATIONS**

The project site lies within Pre-Approved Mitigation Area (PAMA) in the South County Subarea of the Multi-Species Conservation Plan (MSCP) and is identified as a Biological Resource Core Area (BRCA) and a designated habitat linkage between the McGinty Mountain/Sycuan Peak-Dehesa and Sweetwater Reservoir/San Miguel Mountain BRCA. The northeastern two-thirds of the project site consists of the still-active Ivanhoe golf course and the remainder of the site consists of the disused Lakes Course. Given these designations, the site has an important strategic role in the function of the South County Subarea MSCP. An exhibit entitled "MSCP Designations," provided on the last page of the County's MSCP Findings of Conformance Statement and reproduced on the following page, indicates the importance of this site in the regional open space system.

### MSCP Designations



**Figure 1.** Reproduction of the “MSCP Designations” exhibit provided on the final (un-numbered) page of the County’s MSCP Findings of Conformance Statement. As shown, the project site represents the only viable habitat linkage between the San Diego National Wildlife Refuge in the southwest and the McGinty Mountain Ecological Reserve in the northeast.



**Figure 2.** Current aerial imagery, without the screens used in Figure 1, showing even more clearly that urban development along Highway 94 and Highway 54 effectively blocks nearly all movement of terrestrial and aquatic wildlife between Sweetwater Reservoir/SDNWR and the McGinty Mountain Ecological Reserve. The project site, an MSCP-designated habitat linkage containing a river channel, provides by far the most viable opportunity for terrestrial and aquatic wildlife to move through this highly fragmented landscape.

## REVIEW OF THE MSCP CONFORMANCE STATEMENT

To achieve its conservation goals, the MSCP has strict requirements for projects that propose impacts to BRCA's and designated habitat linkages. The County has produced a Conformance Statement (Multiple Species Conservation Program Conformance Statement for Cottonwood Sand Mining PDS2018-MUP-18-023, December 3, 2021) that finds the proposed sand-mining and reclamation actions to be consistent with all of the MSCP's requirements. As discussed below, however, the County's findings lack both factual support and legitimate analyses. The pages of the Conformance Statement are not numbered, so references are to the page numbers specified in the PDF file downloaded from the County's web page.

### Pages 1-2: Incomplete description of existing resources

Citing the Biological Resource Report for the DEIR (Helix Environmental Planning, November 2021), the Conformance Statement lists 17 special-status wildlife species observed on or near the project site and nine additional species determined to have high potential to occur. The Helix report is incomplete, however, because it fails to mention at least two California Species of Special Concern closely associated with loose, alluvial soils, that also have a high potential to occur on the project site: California Glossy Snake (*Arizona elegans occidentalis*) and Southern California Legless Lizard (*Anniella stebbinsi*).

As described by Richmond et al. (2017:294-295, citations omitted), the adverse ecological effects of widespread sand and gravel operations across western San Diego County and the larger region have elevated the ecological importance of the relatively few areas of alluvial soil that remain:

Large portions of the southwestern United States, particularly coastal areas of western San Diego County, California, near the USA-Mexico international border, have undergone rapid development that has either eliminated or encroached upon what little is left of alluvial sand and gravel habitats. These habitats are generally found in river and stream valleys, at the base of topographic features where there is a pronounced change in slope, and in intermountain valleys. Deposits typically consist of variable grain sizes that are compactable, but retain good internal drainage. This feature makes them a preferred substrate for numerous reptiles and amphibians occurring within the region, particularly those with burying or burrowing tendencies such as the southern California legless lizard (*Anniella stebbinsi*), the California glossy snake (*Arizona elegans occidentalis*), Blainville's horned lizard (*Phrynosoma blainvillii*), the Gilbert skink (*Plestiodon gilberti*), and the western spadefoot (*Spea hammondi*).

Golf course operations may have rendered most of the site unsuitable for Blainville's Horned Lizard, but this is not true for other alluvium-dependent species, and for the California Glossy Snake in particular. As described by Richmond et al. (2017:304):

We observed *A. e. occidentalis* [California Glossy Snake] in four of the five sampling sections, including some of the most disturbed parts of the valley. Many of the 23 observations were in old agricultural plots that have been plowed or graded within the two past decades, and two were in otherwise "disturbed" or "developed" habitat. This is consistent with the observations of Klauber (1946) on *A. e. occidentalis* more than 70 years ago, where individuals were often found in association with uncultivated grasslands or cultivated fields. This suggests that as long as there is a suitable matrix of sandy habitat and appropriate prey resources, *A. e. occidentalis* will occupy intervening or surrounding areas of lower habitat quality.

Since the California Glossy Snake is nocturnal, and the Southern California Legless Lizard lives underground, general wildlife surveys are inadequate to detect these species. The project biologists did not conduct focused surveys for these species and does not mention them in their report. Since the project site's loose, alluvial soil represents ideal habitat for these species, they should be assumed present. Impacts to loose, alluvial soils required by the California Glossy Snake and Southern California Legless Lizard would be significant. The impacts would not be mitigated to less than significant by the proposed revegetation plan, even if the revegetation is successful, because the site's alluvial soils would have been removed.

The Southwestern Pond Turtle (*Actinemys pallida*) is another special-status species with potential to occur on the site that is not mentioned in the DEIR or the Conformance Statement. Again, no focused surveys were conducted for this species, so no information is available about its potential abundance or distribution across the site.

The MSCP Conformance Statement, like the DEIR itself, cannot be based upon inadequate survey information and unfounded assumptions about the project's potential adverse effects.

## **Page 2: Mitigation does not address all potentially significant impacts**

The Conformance Statement states:

Mitigation measures are proposed to mitigate potentially significant impacts to special status species, sensitive vegetation communities/habitats, and compliance with local policies/ordinances. Implementation of these mitigation measures would mitigate potential impacts to below a level of significance.

The existing linkage/corridor is 850 to 1,700 feet wide, and the proposed project would narrow the corridor to “an average width of approximately 600 feet” with a bottleneck 350-400 feet wide at the western end of the project site. For reasons discussed in this letter, the substantial narrowing of the habitat linkage represents a potentially significant impact to wildlife movement, and to the functioning of the MSCP preserve system, that cannot be mitigated to below the level of significance.

Additionally, the proposed mitigation:

- Does not address the project’s potentially significant impacts to the Glossy Snake, Southern California Legless Lizard, or Southwestern Pond Turtle, special-status species not mentioned in the DEIR and for which surveys were not conducted.
- Does not address potentially significant impacts to the Western Spadefoot, another species for which focused surveys were not conducted.
- Assumes that proposed revegetation/reclamation will fully mitigate all significant impacts to wildlife movement and MSCP preserve design, even though the proposed actions will not address the reduction in width of the regional habitat linkage, and successful replanting of the site is far from assured.

Finally, as discussed on page 25 of this letter, the report on the 2019 Arroyo Toad survey by Helix provides inadequate information to evaluate the adequacy of the survey, so it is possible that project implementation would result in significant impacts to this species that would not be mitigated to below a level of significance.

Until adequate surveys are conducted that establish the baseline ecological conditions on the project site, the County will not be able to substantiate a finding that all potentially significant impacts have been mitigated to below a level of significance.

## **Page 4: Project is not “sited in areas to minimize impact to habitat.”**

“Habitat” is a general and inclusive term that is not synonymous with “riparian and other sensitive natural communities.” The project site is designated as a regional habitat linkage, and hence a BRCA, not because it supports an abundance of “sensitive natural communities,” but because it is an expansive, park-like area that occupies an ecologically important position in the MSCP preserve system. By improperly redefining

“habitat” to refer only “riparian and other sensitive natural communities,” the County incorrectly and misleadingly treats the rest of the project site as consisting of something other than “habitat.”

To help understand the impropriety and inconsistency of the DEIR’s approach, consider the example of the California Glossy Snake. As discussed previously, this snake is an alluvium-dependent species that is rare and declining across the region due mainly to past and ongoing mining of the loose, sandy soils that comprise the most important feature of its required **habitat**. Because the DEIR fails to mention the California Glossy Snake, however, the Conformance Statement fails to make the connection that removing the loose sand from more than three-quarters of the project site represents a massive impact to the required **habitat** of this special-status species. **The project has not been sited, or otherwise limited, so as to minimize impacts to this important habitat.**

The project site provides **habitat** for many other species, such as for foraging raptors and for terrestrial wildlife moving through the area. Only by improperly redefining “habitat” to exclude the great majority of the project site – a regional habitat linkage and BRCA – can the County justify its finding that “project development has been sited in areas to minimize impact to habitat.”

**Page 7: MSCP requires that the proposed project “preserve the biological integrity of linkages between BRCAs.”**

In a documented dated May 19, 2019, commenting on the application for a Major Use Permit for the proposed project, the County Planning & Development Services stated the following on page 77:

The project **contains nearly the entire habitat linkage** between the McGinty Mountain/Sequan Peak-Dehesa Biological Resource Core Area (BRCA) and the Sweetwater Reservoir/San Miguel Mountain BRCA. **Analysis of potential project impacts to wildlife movement through this linkage will be required and BMO findings will need to be made prior to project approval.** [emphasis added in bold]

By contrast, the Conformance Statement states:

The project site **is located within an identified habitat linkage** between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and Sweetwater Reservoir/San Miguel Mountain BRCA, in the South County MSCP. As part of the reclamation process, **the proposed project would substantially improve the condition of the existing linkage** through widening of the Sweetwater River floodplain and planting of riparian habitat. **A riparian corridor would be re-established throughout the site**, which would encourage and facilitate wildlife movement within the region. Therefore, the project would ultimately conserve and enhance the functions and values of the habitat linkage in accordance with the MSCP and BMO. [emphasis added in bold]

Despite the project site occupying a critically important location in the assembled MSCP preserve system, **and a requirement to analyze wildlife movement issues**, the project biologists conducted no study of the existing level of wildlife movement through the

site. Because no wildlife movement data were collected, the DEIR cannot and does not provide the required “analysis of potential project impacts to wildlife movement through this linkage.” Instead, the DEIR attempts to dismiss the issue on page 2.2-19 by asserting vague inadequacies of the habitat linkage:

The Project site is an active golf course that is characterized by open, exposed areas that lack suitable cover and resources typically associated with wildlife movement areas. Large portions of the Project boundary are fenced along the northern, eastern, and southern boundaries, which can impede wildlife access into the site. Residential development is present to the north and south of the Project site, and Steele Canyon Golf Club occurs to the southeast. The Sweetwater River runs through the Project site, and although riparian habitat occurs upstream and downstream of the site, most of the on-site reach of the river is characterized by open areas vegetated with low growing plant species, primarily Bermuda grass, as part of the golf course development. The site is also subject to regular human activity and other disturbances associated with golf course operations (such as mowing, night lighting, and noise) that would discourage larger animals from utilizing the site.

Common birds and mammals might move through the Project site to forage and during dispersal activities; however, they would not be expected to use the site, in its current condition, as a main corridor, linkage, or specific travel route to and from important resources based on current site uses and disturbances and lack of sufficient vegetative cover to conceal larger wildlife species that may move through the area.

Photos 1-8, below, show conditions on the project site on February 10, 2022.



**Photo 1.** View, facing northeast, from near the southwestern project boundary, with riparian vegetation in the SDNWR shown in the left part of the photo. The disused Lakes Course, beyond the two white signs, consists of open areas with numerous thickets of vegetation.

*Robert Hamilton, 2/10/22*

**Photo 2.** View from the project site facing west into the SDNWR.

This was one of several gaps in the fencing along this boundary.

Any effort to completely block the movement of terrestrial wildlife through the project site with fencing would not be consistent with the site's designation as a regional habitat linkage/corridor.

*Robert Hamilton 2/10/22*



**Photo 3.** View, facing east, from near the northwestern corner of the project site. The grassy open areas of the disused Lakes Course are interspersed with numerous thickets of vegetation, and the area is not lit at night. The area appears to be well-suited to the movement of terrestrial wildlife between the SDNWR and McGinty Mountain Preserve.

*Robert Hamilton, 2/10/22*

**Photo 4.** View, facing southwest, from one of the two golf cart bridges over the Sweetwater River channel on the disused Lakes Course. Wildlife tracks were abundant in the sandy bottom of the channel. Beyond the sand lies a band of dense native riparian vegetation that runs along the southern site boundary, where two territorial male Least Bell's Vireos were recorded in 2019.

*Robert Hamilton, 2/10/22*





**Photo 5.** View, facing northeast, from the same golf cart bridge. Again, wildlife tracks were abundant in the sandy bottom of the channel. Many native wildlife species are capable of traversing this landscape, especially at night.

*Robert Hamilton, 2/10/22*

**Photo 6.** View, facing southwest, from the Steel Canyon Road bridge over the Sweetwater River channel. The disused Lakes Course appears to be well-suited to the movement of terrestrial wildlife between the SDNWR and McGinty Mountain Preserve.

*Robert Hamilton, 2/10/22*



**Photo 7.** View, facing northeast, from the Steel Canyon Road bridge over the Sweetwater River channel. The Ivanhoe Course, although still in operation, provides viable opportunities for the movement of terrestrial wildlife between the SDNWR and McGinty Mountain Preserve.

*Robert Hamilton, 2/10/22*



**Photo 8.** View, facing west, from near the parking lot for the Ivanhoe Course toward Steel Canyon Road. A dense line of trees along Willow Glen Drive, shown here, provides cover for wildlife moving through this area at night. Night-lighting is limited to the immediate vicinity of a few existing structures.

*Robert Hamilton, 2/10/22*

The DEIR's brief discussion of wildlife movement issues concludes on page 2.2-19 with the following passage:

Larger blocks of open space areas associated with the SDNWR occur further south between Steele Canyon Golf Club and Jamul that provide better access to resources and connectivity between preserved lands, open spaces areas, and pockets of undeveloped lands located to the east and west of the site. However, the presence of two major roadways, Campo Road and Jamul Drive, connecting these two communities could impede wildlife movement.

These confusing statements have nothing to do with wildlife movement through the project site. The following points are relevant:

- The habitat linkage through the project site was identified in the MSCP Subarea Plan because, despite being occupied by two golf courses (one now abandoned), this is the only viable pathway for terrestrial and aquatic wildlife to move between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel Mountain BRCA.
- Closure of the Lakes Course in 2017 increased the functioning of the wildlife linkage compared with when it was originally designated in the MSCP Subarea Plan, because the southwestern third of the project site is no longer manicured and human presence has been completely removed.
- The Ivanhoe Course, although still in use, represents a viable habitat linkage for use by terrestrial wildlife, most of which move at night, when human presence, lighting, and noise are minimal.

- Although the project biologists assert that this regional habitat linkage is of little value for wildlife, they collected no wildlife movement data in support of this conclusion.

In the absence of credible study data demonstrating that wildlife do not utilize this designated regional habitat linkage – the sole pathway between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel Mountain BRCA – the assumption must be that a variety of terrestrial and aquatic wildlife species depend upon the project site for movement between the two BRCA’s. Given the proposal to greatly narrow the existing linkage, and serious doubts about the viability of the revegetation plan raised by the hydrological analysis by Greg Kamman, the proposal to remove 6.4 million tons of material from 209.6 acres of the project site clearly would not “preserve the biological integrity” of this important linkage.

**Page 7: MSCP requires that the project “Achieve the conservation goals for covered species and habitats.”**

The Conformance Statement claims that the “proposed project achieves the conservation goals” for covered species through implementation of various mitigation measures. Figure 3, below, is an exhibit developed by hydrologist Greg Kamman showing how changes to project grades may alter the configuration of the low-flow channel that currently feeds into the band of dense riparian habitat shown in Photo 4 on page 8 of this letter, where two territorial male Least Bell’s Vireos were recorded by project biologists during the most recent focused surveys of the project site in 2019.



**Figure 3.** Exhibit developed by hydrologist Greg Kamman showing the proposed alteration of the Sweetwater River channel through the southwestern third of the project site. The existing channel alignment discharges into the area of dense riparian habitat that supports Least Bell’s Vireos along the south side of the project area.

Proposed removal of the high ground on the north side of the low-flow channel and creation of a wider equal-elevation floodplain upstream of the entrance to the riparian habitat has potential to redirect high flows into the floodplain north of the berm, which otherwise would have fed into the riparian habitat area. The re-grading could also result in the existing low flow channel migrating northward and establishing a new alignment north of the berm. If this occurs, all the water deliveries conveyed by the low-flow channel would no longer feed into the existing riparian habitat area, with potential adverse impacts to this habitat due to reduced hydroperiod. This represents a potentially significant adverse effect to the mature riparian woodland vegetation and, therefore, to the Least Bell's Vireo. This would represent a failure to achieve the MSCP's conservation goals for covered species and habitats, and would also violate Condition (f) of the BMO's exemption for sand and gravel operations ("Mature riparian woodland may not be destroyed or reduced in size due to sand, gravel and mineral extraction").

### **Pages 8-12: Project violates nine MSCP design criteria for linkages and corridors**

For project sites located within a regional linkage and/or that support one or more potential local corridors, the County must affirm that the proposed actions would not violate any of 11 numbered MSCP criteria developed to protect the most important ecological values of regional linkages and movement corridors. Nine of these design criteria are applicable to the project, and the proposed actions would violate all of them.

#### **1. Habitat Linkages as defined by the BMO, rather than just Corridors, will be maintained.**

The Conformance Statement states:

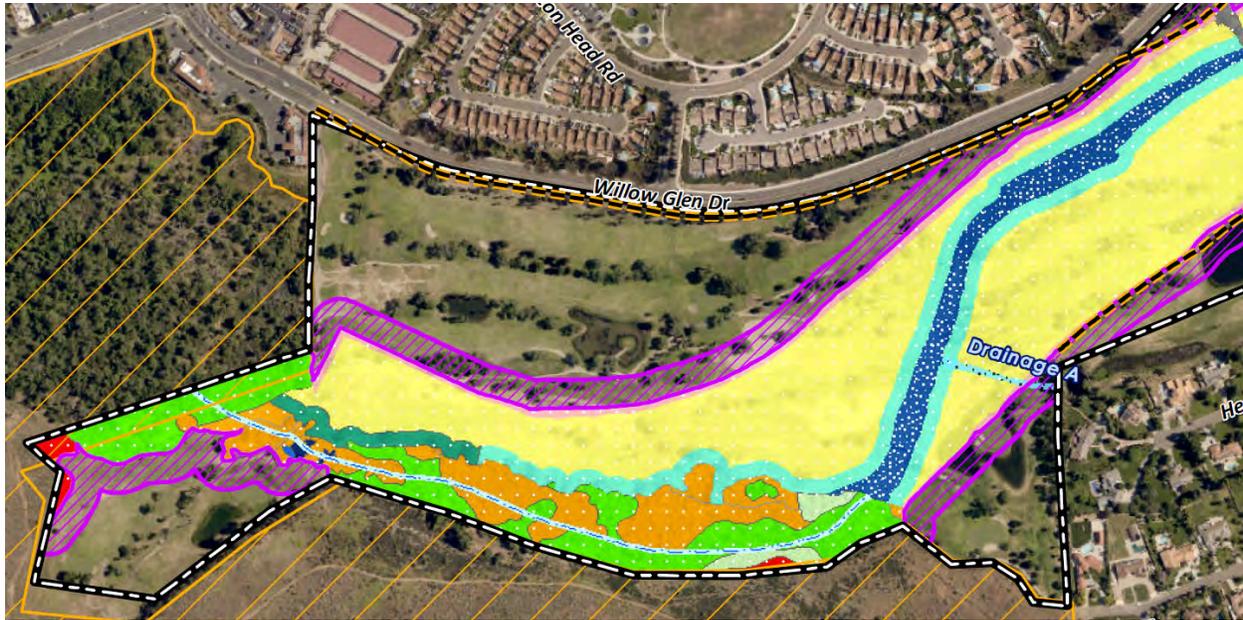
As part of the reclamation process, the proposed project would substantially improve the condition of the existing linkage through widening of the Sweetwater River floodplain and planting of riparian habitat. A riparian corridor would be re-established throughout the site, which would encourage and facilitate wildlife movement within the region. Therefore, the project would ultimately conserve and enhance the functions and values of the habitat linkage in accordance with the MSCP and BMO.

Section 86.508(d) of the Biological Mitigation Ordinance (BMO) defines "Linkage" and "Corridor" as follows:

"Corridor" is a specific route that is used for movement and migration of species. A corridor may be different from a "Linkage" because it represents a smaller or more narrow avenue for movement.

The MSCP-designated habitat linkage through the project site occupies the 100-year floodplain, which is 850 to 1,700 feet wide (see Figure 4 on the next page). The project would narrow the habitat linkage "to an average width of approximately 600 feet." Since Design Criterion 1 specifies that "Linkages . . . rather than just Corridors, will be maintained," and the proposed actions would dramatically narrow the existing **Linkage**, down to the width of a **Corridor**, the project clearly violates Design Criterion 1.

Figure 4, below, copied from Figure 1-10 in the DEIR, shows how dramatically the existing habitat linkage (i.e., the 100-year floodplain) would be reduced in the western part of the project site.



**Figure 4.** Showing in colored screens the proposed reclamation/revegetation areas in the western third of the project site. Where the river channel empties into the SDNWR, the **1,050-foot-wide Linkage** would be reduced down to a **400-foot-wide Corridor** in direct violation of Design Criterion 1.

## **2. Existing movement corridors within linkages will be identified and maintained.**

The Conformance Statement states:

The site is currently an active golf course that lacks sufficient vegetative cover to conceal and encourage wildlife movement through the linkage. As part of the reclamation process, the proposed project would substantially improve the condition of the existing linkage through widening of the Sweetwater River floodplain and planting of riparian habitat. A riparian corridor would be re-established throughout the site, which would encourage and facilitate wildlife movement through the site.

The project biologists have not conducted a wildlife movement study to identify “existing movement corridors within linkages,” as required by Design Criterion 2.

The assertion that “The site is currently an active golf course” is factually incorrect and misleading. The western third of the site is an abandoned golf course with no human presence and a landscape that has been rewilding itself for the past few years.

The assertion that the site “that lacks sufficient vegetative cover to conceal and encourage wildlife movement through the linkage” is subjective and speculative, reflecting no

actual study of wildlife movement through the area. My own observations of the existing conditions lead me to conclude that the project site provides viable movement opportunities for various types of terrestrial and aquatic wildlife, especially at night.

As shown in Photos 1-8 on pages 7-10 of this letter, the site consists of a shallow, soft-bottomed river channel running through a floodplain measuring 850 to 1,700 feet in width. The floodplain is vegetated with a mix of grasses, trees, and shrubby thickets. The western third of the site has no human presence at all, and the eastern two-thirds has no human presence at night, when most movement of terrestrial wildlife occurs. Finally, the project site represents the only viable pathway for terrestrial and aquatic wildlife to move between the McGinty Mountain/Sequan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel Mountain BRCA.

Based upon its width, mix of vegetation, lack of human presence at night, and only limited/localized night-lighting, the project site appears to be conducive the nocturnal movement of wildlife between BRCAs that exist to the southwest and northeast of the site. Since the DEIR provides no data identifying “existing movement corridors” within the designated linkage, the project does not conform to Design Criterion 2.

### **3. Corridors with good vegetative and/or topographic cover will be protected.**

The Conformance Statement states:

The site is currently an active golf course that lacks sufficient vegetative and topographic cover to conceal and encourage wildlife movement through the linkage. As part of the proposed reclamation, the project would increase topographic complexity of the site by establishing a widened Sweetwater River floodplain with bordering constructed slopes and elevated graded pads to the north and south. This would create topographic features more favorable to wildlife species movement along the linkage path. The project would also increase vegetative cover within the widened riparian corridor providing adequate coverage for wildlife species that would utilize the linkage.

The assertion that “The site is currently an active golf course” is factually incorrect and misleading. The western third of the site is an abandoned golf course with no human presence and a landscape that has been rewilding itself since golf course operations ceased in 2017.

The assertion that the site “that lacks sufficient vegetative cover to conceal and encourage wildlife movement through the linkage” is speculative and reflects no actual study of wildlife movement through the area. My own observations of the existing conditions lead me to conclude that the project site provides viable movement opportunities for various types of terrestrial and aquatic wildlife, especially at night.

The project site already comprises a wide and generally flat 100-year floodplain. The proposed actions to “increase topographic complexity of the site by establishing a widened Sweetwater River floodplain with bordering constructed slopes and elevated

graded pads to the north and south” would *constrict* the floodplain instead of expanding it, in violation of Design Criterion 1.

The DEIR provides no data or analysis in support of the notion that establishing new “constructed slopes and elevated graded pads to the north and south” would “create topographic features more favorable to wildlife species movement along the linkage path.” Adding more slopes and graded pads would only hinder the movement of wildlife through the site, in violation of Design Criterion 3.

**4. Regional linkages that accommodate travel for a wide range of wildlife species, especially those linkages that support resident populations of wildlife, will be selected.**

The Conformance Statement states:

The project site is located within an identified habitat linkage between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and Sweetwater Reservoir/San Miguel Mountain BRCA, in the South County MSCP. The site is currently an active golf course that lacks sufficient vegetative cover to conceal and encourage wildlife movement through the linkage. As part of the reclamation process, the proposed project would substantially improve the condition of the existing linkage through widening of the Sweetwater River floodplain and planting of riparian habitat. A riparian corridor would be re-established throughout the site, which would encourage and facilitate wildlife movement for a wide range of species through the site.

The existing MSCP-identified habitat linkage does “accommodate travel for a wide range of wildlife species” and does “support resident populations of wildlife.” Since the DEIR provides no wildlife movement data demonstrating otherwise, the project does not conform to Design Criterion 4.

**5. The width of a linkage will be based on the biological information for the target species, the quality of the habitat within and adjacent to the corridor, topography, and adjacent land uses. Where there is limited topographic relief, the corridor must be well vegetated and adequately buffered from adjacent development.**

The Conformance Statement states:

As part of the project’s reclamation process, the Sweetwater River floodplain, which is currently disturbed, would be expanded throughout the entire length of the project site (approximately 10,040 linear feet). The channel and associated flood prone area, currently measuring between 35 and 120 feet wide, would be substantially expanded to an average width of approximately 250 to 300 feet. This additional width would be more consistent with both historical conditions on the site and current conditions downstream of the site. The expanded floodplain would be revegetated with riparian habitat resulting in a post-project condition that would restore wildlife linkage and corridor functions and is biologically superior to the existing condition. The established widened riparian corridor would re-establish connectivity between upstream and downstream areas by providing increased vegetative cover and access to higher quality resources which would promote and facilitate wildlife use and movement in the region and local area that is currently constrained by the existing golf course

development. The project would ultimately contribute approximately 142.8 acres of preserved, rehabilitated, restored, and revegetated habitat to the linkage which will be placed within a biological open space easement.

Design Criterion 5 requires consideration of “biological information for the target species” that use the linkage/corridor, but no such information is provided in the DEIR or the Conformance Statement, so how can the County find the project in conformance?

The first sentence states that the Sweetwater River floodplain “is currently disturbed,” but the floodplain, measuring 850 to 1,700 feet wide, is occupied by two golf courses, one active and the other abandoned. The golf courses are vegetated with grasses, scattered thickets, and hundreds of mature cottonwood trees, and include several man-made lakes along with the soft-bottomed river channel. To erroneously describe the park-like landscape shown in Photos 1-8 of this letter as “disturbed” – a mapping category that the DEIR defines as an area “in which the vegetative cover comprises less than 10 percent of the surface area” – demonstrates lack of accuracy and objectivity on the part of the project biologists and the County.

The second sentence erroneously describes the “floodplain” as measuring “between 35 and 120 feet” wide through the project site. Throughout the DEIR – except in the Biological Resources section – the term “floodplain” refers the 100-year floodplain, which includes the entire project site. In the Project Description, for example, page I-33 states, “The entire site also is subject to Special Area Designator F (Flood Plain), which prohibits placement of permanent structures for human habitation in a floodway.” Appendix O, the Drainage Study-Hydraulic Analysis, refers exclusively to the 100-year floodplain.

Furthermore, in evaluating the site’s function as habitat linkage/movement corridor, the term “floodplain” is being used as a proxy for “relatively flat area that wildlife can easily move through,” not as a measure of flooding risk. **On the project site, the 100-year floodplain, which coincides with the MSCP-designated habitat linkage, measures between 850 and 1,700 feet wide. Rather than *expanding* the floodplain “to an average width of approximately 250 to 300 feet,” project implementation would *narrow* the floodplain by 600 to 1,400 feet.**

To maintain a fully functioning MSCP preserve system, the linkage between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel Mountain BRCA should be able to accommodate the movement of Mountain Lions (Cougars). Researcher Paul Beier conducted extensive radiotelemetry studies of the movement of Mountain Lions through fragmented landscapes of southern California (Beier 1995). Following are some relevant points from Dr. Beier’s research on dispersal of young male Cougars through corridors:

- “Cougars will disperse via habitat corridors in a landscape fragmented by urbanization, and some dispersers will use corridors containing un-natural features such as golf courses and major freeways.”

- “Cougars frequently used dirt roads and trails. Where dense woody vegetation impedes cougar travel, a trail or dirt road running the length of the corridor can facilitate use by cougars and discourage travel into adjacent urban areas. Mock et al. (1992) found that all functional wildlife corridors in urban San Diego County, California, had a path, drainage, railroad, or other linear feature, and speculated that these features helped guide animals through the corridor.”
- “Some native woody vegetation should be present to provide visual cover. I observed cougars move >400 m across unlit open terrain when the surrounding areas were in native woody vegetation, but they did not cross this span of open terrain with urban areas nearby on either side.”
- “If disturbance level, cover, and the other factors discussed above are suitable, I suggest that a corridor designed for use by cougars should be >100 m wide if the total distance to be spanned is <800 m, **and >400 m wide for distances of 1-7 km.** To the extent that other factors are suboptimal, and as the corridor length increases, corridor width should be increased.” [emphasis added in bold]

Dr. Beier’s study points to a need for a very wide linkage/corridor in this location, on the scale of 400 meters or more, which is comparable to the existing linkage/corridor width of approximately 259 to 518 meters (850 to 1,700 feet). His research suggests that the proposed reduction of the width of the linkage/corridor to only 76 to 91 meters (250 to 300 feet) would substantially reduce or possibly even eliminate the potential for Mountain Lions to move between Sweetwater Reservoir and McGinty Mountain.

Because the project biologists did not provide the required “biological information for the target species,” and because the proposed actions would reduce the width of the existing habitat linkage to far below that recommended for Mountain Lions in the peer-reviewed literature, the project would not conform to Design Criterion 5.

**6. If a corridor is relatively long, it must be wide enough for animals to hide in during the day. Generally, wide linkages are better than narrow ones. If narrow corridors are unavoidable, they should be relatively short. If the minimum width of a corridor is 400 feet, it should be no longer than 500 feet. A width of greater than 1,000 feet is recommended for large mammals and birds. Corridors for bobcats, deer, and other large animals should reach rim-to-rim along drainages, especially if the topography is steep.**

The Conformance Statement states:

The project would not narrow the existing wildlife linkage width. The proposed post-reclamation condition of the site would consist of an expanded Sweetwater River floodplain that would be restored and revegetated with wetland/riparian habitat. Graded slopes would be created on either side of the channel and planted with coastal sage scrub. This would increase the width of the existing linkage and restore available vegetative cover that would encourage and adequately conceal wildlife movement within the area. The preserved, rehabilitated, restored, and revegetated riparian habitat along Sweetwater River would be conserved within

a biological open space easement that directly abuts existing riparian habitat to the west located within the San Diego National Wildlife Refuge (SDNWR). The biological open space would follow the path of the river across the entire site, extending approximately 10,040 feet from end to end, with an average width of approximately 600 feet. The project does not propose any additional development following reclamation of the site, though select areas outside of the biological open space would be available for land uses allowed by the existing land use designation and zoning classifications.

Design Criterion 6 posits, "Generally, wide linkages are better than narrow ones." Project implementation would narrow the existing habitat linkage by 600 to 1,400 feet.

Design Criterion 6 posits, "If narrow corridors are unavoidable, they should be relatively short." The linkage/corridor is approximately 1.8 miles (3 km) long, and a narrow corridor is not "unavoidable."

Design Criterion 6 posits, "A width of greater than 1,000 feet is recommended for large mammals and birds." The existing linkage is 850 to 1,700 feet wide. The proposed project would substantially narrow the linkage, to "an average width of approximately 600 feet" with a bottleneck 350-400 feet wide at the western end of the project site. Furthermore, the areas proposed to be graded and not preserved as natural open space must be expected to be subject to future development, which would further degrade the site's function as a regional habitat linkage.

For these reasons, the proposed project clearly violates Design Criterion 6.

**7. Visual continuity (i.e., long lines-of-site) will be provided within movement corridors. This makes it more likely that animals will keep moving through it. Developments along the rim of a canyon used as a corridor should be set back from the canyon rim and screened to minimize their visual impact.**

The Conformance Statement states:

The project would not impair visual continuity within corridors or linkages within the local area. The site is currently an active golf course that lacks sufficient vegetative cover to conceal and encourage wildlife movement through the linkage. The proposed project would predominantly result in impacts to disturbed and developed areas associated with the golf course development; only 1.63 acres of the 209.63 acres of the onsite impacts would occur to native or sensitive habitats. These impacts would occur in 20- to 30-acre subphases across the site, rather than the entire project footprint impacted concurrently, during mining and reclamation activities leaving other portions of the site either undisturbed or in the five-year restoration and revegetation monitoring period and accessible for foraging. Reclamation of the site would include widening of the Sweetwater River floodplain and planting the area with native wetland/riparian habitat, first occurring adjacent to existing riparian habitat along the Sweetwater River channel in the western portion of the site. As mining activities progress eastward and reclamation is completed, active revegetation areas would provide a buffer between later extraction areas and existing riparian habitat off-site improving visual continuity within the linkage.

Contrary to these statements:

- Proposed grading would substantially increase the site's topographic complexity, thus reducing visual continuity.
- If the proposed riparian plantings were to succeed, this would further reduce visual continuity.
- The 209.6 acres of habitat that the DEIR and Conformance Statement write off as "disturbed and developed areas" consist of grassy areas interspersed with shrubby thickets and hundreds of large cottonwood trees, and the project biologists have collected no wildlife movement data demonstrating that the project site is not fulfilling its role as a designated habitat linkage between nearby BRCA's.
- Project implementation would narrow the floodplain, not widen it.
- The statement that "active revegetation areas would provide a buffer between later extraction areas and existing riparian habitat off-site improving visual continuity within the linkage" makes no sense. If riparian habitat were to be successfully revegetated, as promised, the resulting growth of willows and other dense riparian vegetation would inhibit visual continuity within the linkage.

Because the proposed actions would reduce visual continuity (long lines-of-site), the County has no basis for finding the project in conformance with Design Criterion 7.

**8. Corridors with low levels of human disturbance, especially at night, will be selected. This includes maintaining low noise levels and limiting artificial lighting.**

The Conformance Statement states:

The project occurs along the path of a constrained linkage that is already subjected to noise and nighttime lighting impacts associated with operation of the Cottonwood Golf Club. The reach of river traversing the site currently has low function as a wildlife corridor as it is narrow, lacks suitable vegetative cover, and is adjacent to developed golf course operations. Large portions of the project site are fenced, further impeding wildlife access across the site.

The DEIR provides no evidence that the project site is either especially noisy or heavily lit at night. In fact, the general lack of night lighting and potential sources of nocturnal noise both appear to increase the site's value as a designated habitat linkage/movement corridor in the existing condition. The proposed sand mining operation would, of course, have massive noise impacts during the day for at least ten years, and lighting of the site would also increase for the duration of mining operations.

If the extensive trail system proposed to be established as part of the project would be night-lit, this would presumably introduce more lighting to the site than occurs there in

the existing condition, even under the County's Light Pollution Code. The large graded pads that would be built as part of the project, for which the end use is undetermined, may ultimately be lit at night. The DEIR must provide a comparison between the existing and potential future lighting conditions on the site, both during mining operations and after reclamation.

The areas proposed to be graded and not preserved as natural open space must be expected to be subject to future development, with additional night-lighting, further degrading the site's function as a regional habitat linkage.

Because the proposed actions would increase both lighting and noise in the habitat linkage—definitely in the short term and almost certainly in the long term—the County has no basis for finding the project in conformance with Design Criterion 8.

### **9. Barriers, such as roads, will be minimized.**

The Conformance Statement states:

The project would not include the construction or placement of barriers in any wildlife movement paths. Currently, Steele Canyon Road crosses the site north to south bisecting the entirety of the east-west linkage; therefore, species that are currently accessing the project site and crossing below the road will continue to be able to do so following project implementation. No additional road crossings are proposed as part of the project.

Project implementation involves installing 20-foot-high bands of grouted riprap as grade-control structures across 1.74 acres of the floodplain. Two of these bands would span nearly the entire width of the post-project floodplain, one at the eastern edge of the project site and the other just west of the Steel Canyon Road bridge, and the third would be constructed across the mouth of Mexican Canyon. These bands of new hardscape pose a barrier to movement of some types of wildlife through the habitat linkage/movement corridor, which currently has no such barriers. The DEIR must analyze all potential effects of installing these massive riprap structures on the movement of various forms of wildlife through the project site.

Because the DEIR fails to recognize these hardscaped grade-control structures as potential barriers to wildlife movement, and provides no analysis of their potential effects on the functionality of the existing linkage/corridor, the County has no basis for finding the project in conformance with Design Criterion 9.

**CONCLUSION: A project in a designated habitat linkage that violates all applicable MSCP design criteria would not only fail to conform to the MSCP but could also render the MSCP inoperable moving forward.**

The County's BMO contains design criteria and mitigation standards that, when applied to projects requiring discretionary permits, protect habitats and species and ensure that a project does not preclude the viability of the MSCP preserve system. The BMO identifies 11 design criteria for linkages and corridors, providing multiple lines of

defense against any action that would erode the ecological integrity of the MSCP preserve system. The proposed project violates nine of the 11 design criteria.

A project located within an MSCP-designated habitat linkage that violates design criteria for linkages and corridors cannot be found to conform to the MSCP Subarea Plan, the BMO, or the Implementation Agreement between the County, the California Department of Fish and Wildlife (CDFW), and the US Fish and Wildlife Service (USFWS). In this case, because the biological investigations undertaken for the DEIR are inadequate and unresponsive to specific MSCP planning requirements, the County and the project biologists can point to no wildlife movement data, or any other relevant data or analyses, upon which to credibly find the project in conformance with *any* of the applicable BMO design criteria.

Preserving the function of habitat linkages and movement corridors is a fundamental tenet of MSCP preserve design in a fragmented landscape. County approval of a project within an MSCP-designated linkage/corridor that violates *nine different design criteria* would signal that all of these carefully crafted requirements can be waved away without so much as a wildlife movement study. Such an approval would completely undercut the MSCP as a predictable, credible, and hence coherent approach to regional planning.

### **Pages 12-15: Project violates Subarea Plan Findings**

The DEIR provides inadequate basis for the County to conclude that the project conforms to all applicable findings of the County Subarea Plan. As detailed below, the proposed actions would violate Findings 9 and 11.

#### **9. No project shall be approved which will jeopardize the possible or probable assembly of a preserve system within the Subarea Plan.**

The Conformance Statement states:

The proposed project will not jeopardize the preserve system assembly within the Subarea Plan. The proposed project will contribute to preserve assembly by adding 142.8 acres to the preserve that will be managed through an RMP.

The assembly, and ultimately the functioning, of the MSCP preserve system depends upon the County, USFWS, and CDFW working together to ensure that any action proposed within a designated habitat linkage be consistent with the MSCP's specified design criteria for linkages and corridors. County approval of the EIR for this proposed mining project, **which violates nine linkage/corridor design criteria**, would clearly jeopardize the assembly of a functioning preserve system. The jeopardy would arise not only from degradation of this one designated linkage/corridor, but from establishing precedent that any or all of the MSCP design criteria can be ignored when proposing impacts within designated regional habitat linkages. The County, therefore, has no basis

for finding that approval of this grossly non-conforming project would not jeopardize the possible or probable assembly of a preserve system within the Subarea Plan.

**11. Every effort has been made to avoid impacts to BRCAs, to sensitive resources, and to specific sensitive species as defined in the BMO.**

The Conformance Statement states:

The proposed project has made every effort to avoid impacts to BRCAs, sensitive resources, and sensitive species as defined in the BMO. Since the proposed project site is located within a BRCA and supports many sensitive resources, the impact footprint was concentrated within disturbed habitat and developed lands, associated with the existing golf course, minimizing impacts to sensitive resources. The proposed project does not contain covered plant species. However, the proposed project provides for the conservation of habitat for covered wildlife species including Belding's orange-throated whiptail, coastal California gnatcatcher, Cooper's hawk, least Bell's vireo, peregrine falcon, and western bluebird. Following mining activities, the site would be reclaimed and revegetated, as described in the Reclamation Plan, Revegetation Plan, and Wetland Mitigation Plan. The revegetated area, including 142.8 acres, would be preserved within an open space easement. The proposed open space will be protected by a recorded conservation easement, fencing, and signage, and will be managed and monitored in perpetuity by an approved conservancy following an approved RMP, funded by a non-wasting endowment. The proposed project is consistent with the goals of the MSCP.

The Conformance Statement provides no evidence or legitimate line of reasoning in support of its finding that the project makes "every effort to avoid impacts to BRCAs, sensitive resources, and sensitive species as defined in the BMO." Rather, the project proposes to aggressively mine for aggregate across more than three-quarters of the site (209.6 acres of 276.6 acres), with impacts to another 4.8 acres off-site.

The project site was designated as a regional linkage/corridor, and hence a BRCA, not because it supports an abundance of sensitive natural communities, but because (a) it occupies an extremely important position between two larger BRCA's, and (b) despite having been developed for golf course use, the site has many important characteristics of a valuable linkage/corridor, including:

- The existing width of 850 to 1,700 feet is comparable to the minimum habitat width recommended for use by Mountain Lions (Beier 1995).
- The linkage is a park-like setting, with the soft-bottomed channel of the Sweet-water River running through it, and with numerous vegetated thickets and hundreds of native cottonwood trees.
- Lighting, noise, and human presence are all minimal at night, when most terrestrial wildlife movement takes place.

As described in this letter, the proposed actions would substantially narrow and otherwise degrade the linkage. CEQA requires a complete description of the project setting and a legitimate analysis of all potentially significant adverse effects of the project. By

contrast, the DEIR provides no information at all about the current functioning of the existing linkage and no information regarding the abundance or distribution of several special-status species with high potential to occur within the site's alluvial soils. The project biologists, having collected only fragmentary baseline information, have no ability to acknowledge and analyze all of the project's potential impacts. Instead, the DEIR glosses over major aspects of the impact analysis while repeatedly assuring readers that the habitat linkage will be greatly improved at the end of the long mining and reclamation process. CEQA does not, however, allow the lead agency to provide an incomplete baseline that feeds into an inadequate impact analysis.

For reasons detailed in Greg Kamman's hydrological analysis, and summarized later in this letter, the ultimate success of the promised revegetation of the narrowed linkage is far from assured.

The Conformance Statement asserts, "the impact footprint was concentrated within disturbed habitat and developed lands, associated with the existing golf course, minimizing impacts to sensitive resources," but the "disturbed habitat and developed land" more closely resembles a park than the ecological wasteland misleadingly described in the DEIR and Conformance Statement (see Photos 1-8 on pages 7-10 of this letter). The project site represents the only viable conduit for terrestrial and aquatic species moving between the McGinty Mountain/Sequan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel Mountain BRCA, and yet the County did not require the Applicant to study the existing pattern of wildlife movement through the site. Therefore, the County has no information upon which to base its determination that most of the site can be aggressively mined, and the width of the habitat linkage can be substantially narrowed, while maintaining function of the linkage/corridor.

As discussed on pages 3-4 of this letter, the project biologists failed to report that the site's extensive areas of loose, alluvial soil provide high quality habitat for special-status species that are not covered under the MSCP and that have been greatly impacted by sand mining operations across the region. The California Glossy Snake, Southern California Legless Lizard, Southwestern Pond Turtle, and Western Spadefoot all have high potential to occur on the site, and would experience significant adverse effects from the proposed actions, but no surveys were conducted to determine their presence or absence, abundance or distribution across the site. Of these species, only the Western Spadefoot is so much as mentioned in the DEIR. Given their high potential for occurrence, and the lack of necessary survey information, the County must acknowledge potentially significant impacts to each of these special-status species. The County must take all feasible measures to reduce impacts to these species to below the level of significance.

As discussed on page 11 of this letter, the final reclamation grade contours depict flows in this channel being redirected into the center of the project area *and away from the existing riparian habitat*, emptying back into the southern channel near the western project boundary. The potential reduction in hydroperiod resulting from this redirection of

flow away from the existing stand of riparian woodland represents a potentially significant adverse effect to the mature woodland vegetation and, therefore, to the Least Bell's Vireo. This would represent a failure to achieve the MSCP's conservation goals for covered species and habitats, and would also violate Condition (f) of the BMO's exemption for sand and gravel operations ("Mature riparian woodland may not be destroyed or reduced in size due to sand, gravel and mineral extraction").

Because the DEIR fails to provide information demonstrating that the proposed sand mining project would minimize impacts to BRCAs, sensitive resources, and sensitive species, the County has no basis for finding that the proposed actions conform to the Subarea Plan Findings.

## REVIEW OF THE DEIR'S BIOLOGICAL RESOURCES SECTION

This section reviews specific aspects of Section 2.2 of the DEIR, Biological Resources, with reference to the Biological Technical Appendix and other appendices to the DEIR. These inadequate and misleading biological reports provide the County's justification for approving the misguided proposal to conduct extensive and aggressive sand mining in a designated MSCP regional habitat linkage.

### *DEIR provides no information on current function of habitat linkage*

In a documented dated May 19, 2019, commenting on the application for a Major Use Permit for the proposed project, the County Planning & Development Services stated the following on page 77:

The project contains nearly the entire habitat linkage between the McGinty Mountain/Sequan Peak-Dehesa Biological Resource Core Area (BRCA) and the Sweetwater Reservoir/San Miguel Mountain BRCA. **Analysis of potential project impacts to wildlife movement through this linkage will be required** and BMO findings will need to be made prior to project approval. [emphasis added in bold]

The required analysis of wildlife movement depends upon the project biologists conducting a directed study of the movement of wildlife through the site using "camera traps" or other commonly used methods. Because the necessary study was not conducted, however, all of the DEIR's assertions about shortcomings of the regional habitat linkage represent unsupported assumptions. As discussed at length earlier in this letter, the project site has many important characteristics of a valuable linkage/corridor, including:

- The existing width of 850 to 1,700 feet is comparable to the minimum habitat width recommended for use by Mountain Lions (Beier 1995). The proposed actions would substantially narrow the linkage.
- The DEIR misleadingly and inaccurately characterizes most of the existing linkage as "Disturbed" and "Developed," but the linkage is a park-like setting, with

the soft-bottomed channel of the Sweetwater River running through it, and with numerous vegetated thickets and hundreds of native cottonwood trees.

- Lighting, noise, and human presence on the project site are all minimal at night, when most terrestrial wildlife movement takes place. Each of these factors would only increase with project approval.

CEQA requires a complete description of the project setting and a credible analysis of all potentially significant adverse effects of the project. By contrast, the DEIR provides no information about the current functioning of the existing linkage and no information regarding the abundance or distribution of several special-status species with high potential to occur within the site's alluvial soils.

Because the EIR preparer collected inadequate baseline information, the DEIR glosses over major aspects of the impact analysis. Instead of analyzing all of the impacts and then describing how each potentially significant impact would be avoided, minimized or otherwise mitigated to below the level of significance, as CEQA requires, the DEIR simply assures readers that the habitat linkage will be greatly improved through the project actions. When a CEQA document relies upon an incomplete and/or misleading baseline, these flaws carry forward into a flawed and inadequate impact analysis.

### *Arroyo Toad survey report is vague and inadequate*

Appendix B to the DEIR, "2019 Arroyo Toad (*Anaxyrus californicus*) Survey Report for the Cottonwood Sand Mine Project," provides no detail about the site conditions and survey results, and so provides no evidence that a competent survey was conducted for this federally Endangered species. Specifically, the report fails to provide:

- A description of relevant site conditions encountered during the surveys.
- Representative photos of site conditions.
- Survey route(s).
- A list of amphibians detected during each survey and their relative abundance in the area(s) in which they were encountered.

Without this minimal level of information, the legitimacy of the 2019 surveys is open to question, as is the finding of no significant impact on page 2.2-39 of the DEIR.

### *Western third of site misclassified as "Disturbed Habitat"*

Page 2.2-6 of the Biological Resources section of the DEIR states [emphasis added in bold]:

**Disturbed habitat includes areas in which the vegetative cover comprises less than 10 percent of the surface area** (disregarding natural rock outcrops) and where there is evidence of

soil surface disturbance. Disturbed habitat supports a predominance of non-native and/or weedy species that are indicators of such surface disturbance (County 2010c). . . A total of 93.1 acres of disturbed habitat is mapped on site.

**By no means does the project site contain 93.1 acres “in which the vegetative cover comprises less than 10 percent of the surface area.”** Please refer to Photos 1-8 on pages 7-10 of this letter, which show that the project site is well-vegetated with grasses, scattered thickets, and hundreds of mature cottonwood trees. Also present are several man-made lakes and the soft-bottomed channel of the Sweetwater River. The existing plant communities across the entire site must be re-mapped and accurately described before the DEIR can possibly present an accurate and adequate impact analysis.

### ***DEIR’s impact analysis excludes special-status species potentially present***

Because the project biologists failed to consider all special-status species with potential to occur on the site, and conducted inadequate surveys, the DEIR’s impact analysis and findings of significance are incomplete and inadequate.

As discussed on pages 3-4 of this letter, the project biologists failed to report that the site’s extensive areas of loose, alluvial soil provide high quality habitat for special-status species that are not covered under the MSCP and that have been greatly impacted by sand mining operations across the region. The California Glossy Snake, Southern California Legless Lizard, and Southwestern Pond Turtle all have high potential to occur on the site, and would experience significant adverse effects from the proposed actions, but no surveys were conducted to determine their presence or absence, abundance or distribution across the site. Given their high potential for occurrence, and the lack of necessary survey information, the EIR must acknowledge potentially significant impacts to each of these special-status species. The County must take all feasible measures to reduce impacts to these species to below the level of significance.

### ***Western Spadefoot impact analysis is inadequate***

The Western Spadefoot, a California Species of Special Concern, is not a “covered” species under the MSCP. Because this toad is not uniformly distributed among the MSCP covered habitats (grassland, coastal sage scrub, etc.) but instead is sporadically distributed in association with certain seasonal pools adjacent to suitable upland aestivation habitats, the MSCP does not provide mitigation via the habitat tier mitigation ratios. An adequate site-specific CEQA analysis, including contributions to cumulatively considerable effects, is required independent of the MSCP.

### **Western Spadefoot status and distribution on the site**

CEQA impact analysis normally requires adequate information about the species’ abundance and distribution on the project site. In this case, because no focused study was undertaken, the project biologists have no information on the species’ occurrence on the project site. Nevertheless, because the project biologists believe the species to have high

potential to occur somewhere on the site, the DEIR provides a vague CEQA impact analysis on that limited basis.

### **Western Spadefoot life history and ecological requirements**

An adequate CEQA analysis must consider all of the species' relevant natural history and habitat requirements. Page 2.2-33 of the DEIR identifies impacts to "0.50 acre of disturbed wetland, 0.32 acre of southern cottonwood-willow riparian forest, and 3.5 acres of constructed ponds with potential to support the species." **This analysis does not adequately account for the species' natural history requirements.**

A recently published telemetry study of Western Spadefoots in southern California provides important current information on the species' life history and ecological requirements (Halstead et al. 2021), following on earlier telemetry studies in the same region (Baumberger 2013, Baumberger et al. 2019).

Western Spadefoots spend large parts of the year aestivating underground, often far away from their breeding ponds. As observed by Halstead et al. (2021:1385):

The distance that western spadefoots move from breeding pools is a key metric for western spadefoot conservation. Distance from the breeding pool indicates how much terrestrial habitat around a breeding pool might be used by western spadefoots, and provides a direct link to the effective reserve sizes needed to preserve western spadefoot populations.

...

The need for core terrestrial habitats around amphibian breeding sites is documented (Semlitsch 1998, Semlitsch and Jensen 2001, Semlitsch and Bodie 2003, Harper et al. 2008, Searcy et al. 2013), as are the negative consequences of roads separating adult habitat from breeding pools (Becker et al. 2007, Brehme et al. 2018). Ensuring that enough terrestrial habitat exists to provide the life cycle needs for western spadefoots is best measured by the predictive distribution of distance from breeding pools. The 95th percentile of the posterior predictive distribution for western spadefoot asymptotic distance from the breeding pool was **486 m** at Crystal Cove. This predicted value encompassed the maximum distance from the breeding pool of all but 1 of the spadefoots at the site. [emphasis added in bold]

Baumberger et al. (2019:6) found:

The maximum distance the spadefoots were found from the pools **ranged from 16 to 262 m (Table 1, S1 Table), with a mean maximum distance of 69 m ± 61.48.** The spadefoots used a mean of 13 burrows (SD ± 8.5), and the mean distance between burrow locations was 18 m (SD ± 24.2). They used 4–31 unique burrow sites (mean 11 ± 7.8) during the study. Nine of the 15 spadefoots (60%) reused one or more burrows at least once after moving to a different burrow. Outside of their aestivation period, the spadefoots shifted their burrow location an average of every 8 ± 7 days, and 147 of 194 (~76%) movements between burrows were ≤ 25 m. [emphasis added in bold]

In order to mitigate potential adverse effects associated with development upon Western Spadefoots, and to accommodate the movement of the toads between breeding ponds and upland aestivation sites, the USGS (Rochester et al. 2017) recommended that

the City of Santee protect an **undeveloped buffer measuring 300 to 400 meters** around Western Spadefoot breeding ponds. This range is consistent with conservation recommendations for the Western Spadefoot contained in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (US Fish and Wildlife Service 2005:II-231):

Based on calculations from upland habitat use data analyzed by Semlitsch and Brodie (2003), a minimum conservation area to preserve the ecological processes required for the conservation of amphibians may fall within a distance of approximately 368 meters (1,207 feet) from suitable breeding wetlands.

In light of the Western Spadefoot's extensive requirements for upland aestivation sites around their breeding habitats, the project's impacts to this species extend far beyond the "0.50 acre of disturbed wetland, 0.32 acre of southern cottonwood-willow riparian forest, and 3.5 acres of constructed ponds with potential to support the species." Furthermore, Western Spadefoots regularly breed in ephemeral ponds, such as those that form on dirt roads, and the project biologists did not map potentially suitable breeding habitat at this level.

Because the DEIR's analysis of potential impacts to the Western Spadefoot (1) is not based on a study to determine the species' status and distribution on the site, and (2) does not reflect the species' known life history and ecological requirements, the analysis is inadequate under CEQA.

Page 2.2-33 of the DEIR states, "Temporal loss of potential habitat during mining and reclamation activities would not affect the local long-term survival of this species." Since the DEIR's analysis of the nature and extent of potential impacts fails to account for all of the potential impacts, the DEIR provides no factual basis for this conclusion.

Page 2.2-33 of the DEIR concludes, "Following reclamation, the project would provide additional, higher quality habitat for the species through revegetation and restoration of the expanded Sweetwater River floodplain." The proposed actions would restrict, not expand, the Sweetwater River floodplain, reducing the area of suitable habitat for the Western Spadefoot. Additionally, the hydrological analysis by Greg Kamman raises serious doubts about the viability of the revegetation plan. Furthermore, given that Western Spadefoots breed in ephemeral ponds and aestivate underground in nearby alluvial uplands, the project biologists provide no factual basis for concluding that – even if restoration/reclamation is successful – the riparian and coastal sage scrub habitats to be restored along the river would represent suitable habitat for Western Spadefoots.

For all of these reasons, the DEIR's analysis of potential impacts to the Western Spadefoot is inadequate and potentially significant impacts to the species would remain after mitigation.

### ***Unsupported analysis of potential impacts to raptor foraging habitat***

Page 2.2-17 of the DEIR states:

The County (2010a) defines raptor foraging habitat as, "Land that is a minimum of five acres (not limited to project boundaries) of fallow or open areas with any evidence of foraging potential (i.e., burrows, raptor nests, etc.)." The disturbed habitat on the Project site could be considered raptor foraging habitat based on this definition since it occupies greater than five acres and supports burrows of common small mammals, namely Botta's pocket gopher (*Thomomys bottae*); however, the overall foraging value of the site is relatively low considering that the site has operated as an active golf course for decades and golf play to the west of Steele Canyon Road was only recently suspended in 2017. **Therefore, the Project site has likely not functioned as a local or regional foraging resource of importance for raptors and would provide low quality foraging habitat in its current state.** Other more expansive areas occur in the local area and region that provide better quality foraging habitat, such the SDNWR to the southwest. The area east of Steele Canyon Road is still an active golf course subject to human disturbances and maintenance activities (i.e., mowing) that could discourage and limit raptor foraging activities. [emphasis added in bold]

Project biologists recorded seven raptors on the site: Turkey Vulture, Cooper's Hawk, Red-tailed Hawk, Red-shouldered Hawk, Barn Owl, American Kestrel, and Peregrine Falcon. Nevertheless, in the absence of a raptor foraging study and without conducting any detailed analysis, the project biologists conclude "the Project site has likely not functioned as a local or regional foraging resource of importance for raptors and would provide low quality foraging habitat in its current state." As shown in Photos 1-8 on pages 7-10 of this letter, the project site provides large expanses of park-like habitat that appears to be valuable to foraging raptors. This is especially true for the southwestern third of the project site, which has been closed to human activity since the golf course closed in 2017. In the absence of a study or credible analysis supporting the DEIR's finding of no significant impact on page 2.2-40, the EIR should acknowledge potentially significant impacts to raptor foraging habitat. The County must take all feasible measures to reduce impacts to raptor foraging habitat to below the level of significance.

### ***Inadequate evaluation of habitat connectivity and wildlife corridors***

Page 2.2-18 states:

**The Sweetwater River and Sweetwater Reservoir are expected to be key components to the movement of wildlife in the region, namely birds and mammals. These resources support permanent water sources and cover for a wide range of species known to the region.** Large mammals, such as southern mule deer (*Odocoileus hemionus fuliginata*) and coyote (*Canis latrans*), would be expected to travel to and from the Sweetwater River/Sweetwater Reservoir and expansive habitat blocks associated with the SDNWR. **Large mammals would also be expected to travel along the Sweetwater River valley and riparian corridor.** [emphasis added in bold]

On page 2.2-19, the second and third paragraphs provide several erroneous and misleading statements that portray the project site as having little value as a habitat linkage/movement corridor:

The Project site is an active golf course that is characterized by open, exposed areas that lack suitable cover and resources typically associated with wildlife movement areas. Large portions of the Project boundary are fenced along the northern, eastern, and southern boundaries, which can impede wildlife access into the site. Residential development is present to the north and south of the Project site, and Steele Canyon Golf Club occurs to the southeast. The Sweetwater River runs through the Project site, and although riparian habitat occurs upstream and downstream of the site, most of the on-site reach of the river is characterized by open areas vegetated with low growing plant species, primarily Bermuda grass, as part of the golf course development. The site is also subject to regular human activity and other disturbances associated with golf course operations (such as mowing, night lighting, and noise) that would discourage larger animals from utilizing the site.

Common birds and mammals might move through the Project site to forage and during dispersal activities; however, they would not be expected to use the site, in its current condition, as a main corridor, linkage, or specific travel route to and from important resources based on current site uses and disturbances and lack of sufficient vegetative cover to conceal larger wildlife species that may move through the area.

As discussed extensively on pages 6-21 of this letter, and as shown in Photos 1-8 on pages 7-10, the project site is a BRCA that forms a wide, park-like habitat linkage between two adjacent BRCA's.

Existing fencing around the perimeter of the site has gaps adequate to allow wildlife to move through the area.

At night, when most larger mammals move across the landscape, the project site *not* subject to extensive "disturbances associated with golf course operations (such as mowing, night lighting, and noise)."

The proposed actions would violate nine of the 11 design criteria contained in the BMO for MSCP-designated habitat linkages and movement corridors.

No study was conducted to document and analyze the movement of wildlife through this important location in the MSCP preserve system, as would be required for an adequate and credible CEQA impact analysis.

For these reasons, the DEIR's treatment of habitat connectivity and wildlife corridor issues is misleading and provides an inadequate basis for analyzing potential impacts of the proposed actions on wildlife populations and on the integrity of the MSCP preserve system.

### *Inadequate impact analysis, habitat connectivity and wildlife corridors*

The DEIR's analysis of this topic (Guideline 20) is at the bottom of page 2.2-51:

The Project would not substantially interfere with the already constrained linkage between the McGinty Mountain/Sycuan Peak-Dehesa BRCA to the east and the Sweetwater Reservoir/San Miguel Mountain BRCA to the west. The Proposed Project is located within developed lands that have been altered by development of the golf course and disturbed by previous mining activities. Only 1.63 acres (0.8 percent) of the 209.63 acres of on-site impacts would be within native or sensitive habitats. Furthermore, mining would occur incrementally in 20- to 30-acre subphases leaving other portions of the site either undisturbed or in the five-year restoration and revegetation monitoring period and accessible for wildlife use. As part of reclamation, the Project would preserve, rehabilitate, restore, and revegetate native habitat along the expanded Sweetwater River floodplain, thereby restoring and improving functional connectivity within the area. The Project would conform to the goals and requirements of the County Subarea MSCP and BMO, including effects on habitat linkages and wildlife corridors. **Impacts associated with habitat linkages and wildlife corridors would be less than significant.** [emphasis in the original]

Here the DEIR raises more vague concerns about “disturbed” conditions on the site and emphasizes that “Only 1.63 acres (0.8 percent) of the 209.63 acres of on-site impacts would be within native or sensitive habitats.” As has been discussed at length in these comments, the project site is designated as a regional habitat linkage and hence a BRCA because it is an expansive, park-like area that occupies an ecologically important position in the MSCP preserve system (see Photos 1-8 on pages 7-10).

The project biologists did not conduct a study to document and analyze the movement of wildlife through this important location in the MSCP preserve system, as would be required for an adequate and credible CEQA impact analysis.

The proposed actions would violate 9 of the 11 design criteria for wildlife linkages and movement corridors specified in the BMO.

In the absence of a credible study demonstrating that wildlife do not utilize this designated regional habitat linkage – the sole pathway between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel Mountain BRCA – the assumption must be that a variety of terrestrial and aquatic wildlife species depend upon the project site for movement between the two BRCA's. Given the proposal to substantially narrow and degrade the existing linkage, and serious doubts about the viability of the revegetation plan raised by Greg Kamman's hydrological analysis, the project would entail significant adverse effects to habitat connectivity and wildlife corridors that would remain significant after mitigation.

### *Inadequate discussion of indirect effects*

The DEIR's analysis of this topic (Guideline 20) is on page 2.2-52. The first paragraph states:

The Project occurs along the path of a constrained linkage that is already subjected to noise and nighttime lighting impacts associated with operation of the Cottonwood Golf Club. The reach of river traversing the Project site currently has low function as a wildlife corridor as it is narrow, lacks suitable vegetative cover, and is adjacent to developed golf course operations. Large portions of the Project site are fenced, further impeding wildlife access across the site.

The DEIR provides no information on the existing levels of noise and night-lighting in different parts of the project site. During my field visit on February 10, 2022, I saw very few lights around the project site, and no reason to expect that the site would experience much noise at night, when most terrestrial wildlife movement takes place. I also observed numerous gaps and gates in perimeter fencing. Furthermore, since no study of wildlife movement was conducted, the assertion that "the Project site currently has low function as a wildlife corridor" is unsupported and purely speculative. When a CEQA document relies upon an incomplete and/or misleading baseline, these flaws carry forward into a flawed and inadequate impact analysis.

The second paragraph states:

Construction-related noise generated from mining and reclamation activities could temporarily impact wildlife. Mining operations and reclamation activities would require the daily use of heavy equipment that would elevate existing noise levels on site. Wildlife may be temporarily displaced from or avoid the Project site during construction activities but would be expected to return to the area was activities have ceased.

The DEIR should specify the noise levels expected from project operations and evaluate them against the published literature on noise impacts to different wildlife species known to occur in the local area.

The second paragraph also states:

Larger wildlife species, such as mule deer or bobcat, would already be discouraged from utilizing the Project site based on current golf course activity and lack of vegetative cover along the Sweetwater River.

The project biologists conducted no study of wildlife movement through the site to determine the status of larger wildlife species on the site at night, when most movement of such species takes place. As such, this statement is pure speculation.

### ***Erroneous and misleading analysis of habitat linkage width, barriers***

The DEIR's analysis of this topic (Guideline 23), on page 2.2-53, erroneously states, "The project would not further constrain existing wildlife corridors or linkages in the local area," and "The Project would not narrow the existing wildlife linkage width," and "The project would not include the construction or placement of barriers in any wildlife movement paths."

The topic of narrowing the width of the regional habitat linkage through the site is discussed on pages 12-13 and pages 15-18 of this letter, parts of which are summarized below:

- The MSCP-designated habitat linkage through the project site measures between 850 and 1,700 feet wide. The proposed project would dramatically narrow the habitat linkage "to an average width of approximately 600 feet."
- A tracking study of Mountain Lions (Beier 1995) points to a need for a very wide linkage/corridor on the project site, on the scale of 400 meters or more, which is comparable to the existing corridor width of approximately 259 to 518 meters (850 to 1,700 feet). His research suggests that the proposed reduction of the width of the linkage/corridor to only 76 to 91 meters (250 to 300 feet) would substantially reduce or possibly even eliminate the potential for Mountain Lions to move between Sweetwater Reservoir and McGinty Mountain.
- Because the project biologists did not provide the required "biological information for the target species," and because the proposed actions would reduce the width of the existing habitat linkage to far below that recommended for Mountain Lions in the peer-reviewed literature, the project would not conform to Design Criterion 5.
- Design Criterion 6 posits, "Generally, wide linkages are better than narrow ones." Project implementation would narrow the existing habitat linkage by 600 to 1,400 feet.
- Design Criterion 6 further posits, "If narrow corridors are unavoidable, they should be relatively short." The linkage/corridor is approximately 1.8 miles (3 km) long, and a narrow corridor is not "unavoidable."
- Design Criterion 6 further posits, "A width of greater than 1,000 feet is recommended for large mammals and birds." The existing linkage is 850 to 1,700 feet wide. The proposed project would substantially narrow the linkage, to "an average width of approximately 600 feet" with a bottleneck 350-400 feet wide at the western end of the project site. Furthermore, the areas proposed to be graded and not preserved as natural open space must be expected to be subject to future development, which would further degrading the site's function as a regional habitat linkage.

The topic of placing barriers to the movement of wildlife through the site is discussed on page 20 of this letter, which notes that project implementation involves installing 20-foot-tall bands of grouted riprap as grade-control structures across 1.74 acres of the floodplain. Two of these bands would span nearly the entire width of the post-project floodplain, one at the eastern edge of the project site and the other just west of the Steel Canyon Road bridge, and the third would be constructed across the mouth of Mexican Canyon. These bands of new hardscape pose a barrier to movement of some types of wildlife through the habitat linkage/movement corridor, which currently has no such barriers. The DEIR must analyze all potential effects of installing these massive riprap structures on the movement of various forms of wildlife through the project site.

The DEIR's erroneous and misleading statements concerning the narrowing of the habitat linkage through the project site, and the placement of potential barriers to wildlife movement, must be corrected and a new impact analysis prepared.

### ***Project does not minimize impacts to BRCA***

Page 2.2-57 of the Biological Resources section of the DEIR states:

The Project minimizes impacts to BRCA in accordance with the MSCP and BMO. Impacts to BRCA would be less than significant.

As an MSCP-designated regional habitat linkage/corridor, the entire project site constitutes a BRCA. As reviewed on pages 22-24 of this letter, the project proposes to aggressively mine for aggregate across more than three-quarters of the site (209.6 acres of 276.6 acres), with impacts to another 4.8 acres off-site. The DEIR provides no evidence or legitimate line of reasoning to support this finding that the project "minimizes impacts to BRCA in accordance with the MSCP."

### ***Impacts to BMO-identified linkages/corridors not acknowledged***

Number 32 in the *Guidelines for Determination of Significance* states, "Not maintain existing movement corridors and/or habitat linkages, as defined by the BMO." Page 2.2-58 of the Biological Resources section of the DEIR states:

The Project site is located within an identified habitat linkage in the South County MSCP. As part of the reclamation process, the Proposed Project would substantially improve the condition of the existing linkage through widening of the Sweetwater River floodplain and planting of riparian habitat. A riparian corridor would be re-established throughout the Project site which would encourage and facilitate wildlife movement within the region. Therefore, the Project would ultimately conserve and enhance the functions and values of the habitat linkage in accordance with the MSCP and BMO. Impacts to BMO-identified corridors would be less than significant.

The DEIR's impact analysis contains no analysis of the impact, only promises about the post-project conditions. Even if we assume that reclamation/restoration will be as successful as promised – despite a hydrological analysis by Greg Kamman that identifies important flaws in the plan – CEQA requires that the EIR identify all potentially

significant impacts and specify feasible avoidance and mitigation measures. Guideline 32 refers to BMO Design Criteria 1 and BMO Design Criteria 2, discussed on pages 12-14 of this letter:

- **BMO Design Criteria 1:** “Habitat Linkages as defined by the BMO, rather than just Corridors, will be maintained.”

Section 86.508(d) of the Biological Mitigation Ordinance (BMO) defines “Linkage” and “Corridor” as follows:

“Corridor” is a specific route that is used for movement and migration of species. A corridor may be different from a “Linkage” because it represents a smaller or more narrow avenue for movement.

The MSCP-designated habitat linkage through the project site occupies the 100-year floodplain, and measures between 850 and 1,700 feet wide (see Figure 4 on the next page). The proposed project would dramatically narrow the habitat linkage “to an average width of approximately 600 feet,” and as narrow as 350-400 feet at the western end of the project, where it interfaces with the SDNWR.

Since Design Criterion 1 specifies that “Linkages . . . rather than just Corridors, will be maintained,” and the proposed actions would dramatically narrow the existing **Linkage**, down to the width of a **Corridor**, the project clearly violates BMO Design Criterion 1 and Guideline 32. Therefore, a significant impact to the MSCP-designated habitat linkage must be identified.

- **BMO Design Criteria 2:** “Existing movement corridors within linkages will be identified and maintained.”

The project biologists have not conducted a wildlife movement study to identify “existing movement corridors within linkages,” as required by Design Criterion 2, and therefore the EIR preparer has no basis for finding that the project complies with Guideline 32.

### ***Cumulative impact analysis is flawed and inadequate***

With regard to the project’s contribution to cumulative impacts to wildlife movement, page 2.2-62 of the DEIR states:

A cumulative impact on wildlife movement has already occurred in the local area where commercial and residential development and major roadways (such as SR 94, SR 54, and Steele Canyon Road) has constrained available areas for wildlife movement. Primary wildlife use areas in the local area are located in the McGinty Mountain/Sycuan Peak-Dehesa and Sweetwater Reservoir/San Miguel Mountain BRCAs, generally associated with the SDNWR, Sweetwater River and Sweetwater Mountain Ecological Reserve, McGinty Mountain Ecological Reserve, and McGinty Mountain Preserve. These resources provide wildlife movement areas for a wide range of species known to the region. As described in Section 2.2.1.1 under Habitat Connectivity and Wildlife Corridors, and in Section 2.2.2.4 under Guideline 19, the

current function of the Project site as a linkage/corridor for wildlife movement is considered low based on previous golf course development, on-going disturbances related to golf course maintenance and operations, and lack of sufficient habitat cover to conceal wildlife movement through the site. As such, the Project is not expected to substantially interfere with the movement of wildlife species or impede the use of nursery sites.

The Project would comply with the requirements of the BMO and MSCP, including preserve design criteria related to corridors and linkages. In addition, the Project would improve habitat quality and connectivity compared to the site's current state as a golf course.

The existing condition, in which the only viable habitat linkage between two BRCA's consists of two golf courses, reflects past failure to address the cumulative impacts of sprawling development in this area. And now, despite acknowledging that "a cumulative impact on wildlife movement has already occurred in the local area," the DEIR proposes to substantially constrict the width of this last habitat linkage through an aggressive sand mining operation. The project biologists assume that the functioning of the site as a wildlife movement conduit must be "low" based on subjective, speculative, and often misleading or even false descriptions of existing conditions. For example:

- The DEIR classifies 93.1 acres of the project site as "Disturbed," which the DEIR defines as having vegetative cover of "less than 10 percent of the surface area." This is obviously false (see Photos 3-6 on pages 8-9 of this letter), but it does help to create an impression that wildlife must not be able to move through the site in the existing condition.
- The DEIR refers to existing noise, lighting, fencing, and human disturbance as factors that prevent wildlife from moving through the project site, but provides no details for a reader to evaluate. During my visit to the site on February 10, 2022, I observed numerous gaps in perimeter fencing, and it appeared to me that the site would not experience much noise, lighting, or human disturbance at night, when most terrestrial wildlife movement takes place.
- The DEIR claims that the site lacks "sufficient habitat cover to conceal wildlife movement through the site," but I did not see this during my site visit. Some parts of the site are open, but there are also scattered thickets of vegetation and lines of dense trees that appear well-suited to encouraging the movement of terrestrial wildlife through this very wide habitat linkage.

The EIR preparer asserts that "The Project would comply with the requirements of the BMO and MSCP, including preserve design criteria related to corridors and linkages," yet when each criterion is evaluated objectively, and in light of the published literature on linkages and corridors, it is clear that the project would violate all nine of the applicable BMO design criteria (see pages 12-21 of this letter).

In the absence of credible study data demonstrating that wildlife do not utilize this designated regional habitat linkage—the last remaining pathway between the McGinty Mountain/Sycuan Peak-Dehesa BRCA and the Sweetwater Reservoir/San Miguel

Mountain BRCA – the assumption must be that a variety of terrestrial and aquatic wildlife species depend upon the project site for movement between the two BRCA's. Given the proposal to greatly narrow the existing linkage, and serious doubts about the viability of the revegetation plan raised by Greg Kamman's hydrological analysis, the proposal to remove 6.4 million tons of material from 209.6 acres of the project site clearly would represent a cumulatively significant impact to wildlife movement through this important designated habitat linkage in the MSCP preserve system.

### ***Cumulative impacts to special-status species associated with alluvium***

Adverse ecological effects of sand and gravel operations across western San Diego County have elevated the ecological importance of the relatively few areas of alluvial soil that remain. As stated by Richmond and colleagues (2017:294-295):

Large portions of the southwestern United States, particularly coastal areas of western San Diego County, California, near the USA-Mexico international border, have undergone rapid development that has either eliminated or encroached upon what little is left of alluvial sand and gravel habitats. These habitats are generally found in river and stream valleys, at the base of topographic features where there is a pronounced change in slope, and in intermountain valleys. Deposits typically consist of variable grain sizes that are compactable, but retain good internal drainage. This feature makes them a preferred substrate for numerous reptiles and amphibians occurring within the region, particularly those with burying or burrowing tendencies such as the southern California legless lizard (*Anniella stebbinsi*), the California glossy snake (*Arizona elegans occidentalis*), Blainville's horned lizard (*Phrynosoma blainvillii*), the Gilbert skink (*Plestiodon gilberti*), and the western spadefoot (*Spea hammondi*).

The project's contribution to this cumulative adverse effect is a significant impact that the DEIR does not acknowledge, discuss, or analyze. The project must be reconsidered to acknowledge and avoid cumulatively considerable impacts to alluvium-dependent special-status species.

### ***Inadequate alternatives analysis***

The DEIR evaluates two potential alternatives, both of which call for intensive, large-scale mining of the project site. Both alternatives would violate the BMO Design Criteria for habitat linkages/movement corridors, and would not take into consideration the results of a wildlife movement study, since no such study has been completed for the proposed project. As such, there is no reason to expect that either project alternative could be completed without the type of significant adverse effects identified in this letter for the proposed project.

The DEIR must evaluate at least one project alternative that would, in fact, comply with all BMO Design Criteria for linkages and corridors, as determined through a legitimate study of the existing patterns of wildlife movement through the project site. Such a study would involve using "camera traps" or other commonly used and widely accepted techniques for documenting patterns of movement of different wildlife species at night, when most such movement takes place.

A type of project compatible with the site's MSCP designation as a regional habitat linkage would be to convert the project site to a mitigation bank. I recently spoke with Brian Monaghan at Wildlands, Inc., a mitigation banking company based in Rocklin, California. In 2017, before the previous landowner went into bankruptcy, Mr. Monaghan visited the site several times to conduct a detailed investigation into the site's potential for conversion to a wetland mitigation bank. In his opinion, the site has great potential for this use. Furthermore, Mr. Monaghan reports that San Diego County has a shortage of wetland mitigation credits available. Thus, it would be in the County's interest, as well as the public's interest, to evaluate a mitigation banking alternative in the EIR. Such an alternative would be consistent with the site's MSCP designation as a habitat linkage/movement corridor and would allow the landowner to profit on their investment.

## **COMMENTS ON THE CONCEPTUAL REVEGETATION/RECLAMATION PLAN**

### *Overview of the Plan*

Page 1-12 states:

Reclaimed areas would be restored to an end use of open space, multi-use trails, and land suitable for uses allowed by the General Plan and existing zoning classifications. Specifically, nearly 52 percent of the project site (142.8 acres) would be preserved in a biological open space easement to be held by the County. The reclamation plan for the riparian corridor is intended to stabilize the post-extraction landform and establish a productive native vegetative cover. For the areas outside the riparian corridor, the revegetation plan is intended to stabilize the surface and control erosion.

Approximately six inches of topsoil would be stockpiled, to be re-applied as part of the reclamation/habitat restoration process. Restoration/revegetation efforts would continue for five years or until the County determines that performance standards have been satisfied for two consecutive years, at which time the project proponent may apply for release of an unspecified financial assurance, to be required by the County. Also at that time, the project proponent may request that SMARA declare the site successfully reclaimed. Page 1-15 of the DEIR states that any areas not successfully restored within four years following the initial seeding "would be reevaluated to determine the measures necessary to improve revegetation success."

With regard to financial assurances, page 21 of Appendix M, the Conceptual Wetland Mitigation Plan, states:

A revegetation agreement shall be signed and notarized by the property owner following approval of this restoration plan and be accompanied by the required security as agreed upon by the County.

It is my understanding, from speaking to people who have been in consultation with the County and the Applicant during preparation of the DEIR, that the amount of the "financial assurance" or "security" is a sum not to exceed \$30,000. If this is incorrect, please specify the actual amount of the performance bond that would be required.

### *Critique of hydrological analysis related to revegetation/reclamation*

In a separate letter, hydrologist Greg Kamman identifies a number of flaws in the DEIR's hydrological analysis that call into question the likelihood of success of the proposed plans to revegetate the mined areas. These include:

- The Groundwater Investigation estimate of future vegetation water demands is based on existing condition grades not the post-Reclamation grades.
- Comparison of available groundwater level data against post-Reclamation grades indicates there would be large areas of ground lowering that would intersect the groundwater table, creating surface ponding and generating losses due to evaporation.
- The exposure of exposed groundwater to evaporation appears to occur for varying lengths of time, with prolonged (multi-month to annual) exposure during wet years.
- Losses of groundwater due to surface ponding and evaporation are not acknowledged or quantified in the DEIR, therefore potential impact on groundwater supply are not accurately quantified.
- The Project would also result in depths to groundwater that are shallower than evaluated. This may lead to change in the aerial extent of vegetation communities as mapped in the Reclamation Plan as well as estimated evapotranspiration demands on groundwater.
- The shallower groundwater table and routine ponding where exposed may also impact the survival of less water-tolerant vegetation communities, impacting the viability of the proposed Reclamation vegetation.
- The DEIR statement that the proposed Project would have less than significant impacts to groundwater storage is not substantiated by the technical studies that support the claim.
- The feasibility of the proposed Reclamation revegetation plan is also impacted by altered exposure to shallow groundwater and seasonal/wet-year ponding.
- The Project proposes some very large and deep over-excavation pits that would require backfilling. Some of these surfaces would result in grades that are higher than existing grades.

- The DEIR states that mining would only result in 10% of mined material being “waste material.” The waste material appears to be the primary source of backfill material.
- The use of wash fines as backfill would likely create poorly drained conditions wherever the fines are deposited, reducing the suitability of the habitat in those areas for the special-status herptiles that occupy the site’s well-drained alluvial soils (e.g., California Glossy Snake, Southern California Legless Lizard, Western Spadefoot).
- Detailed investigation by Mr. Kamman calculates 4.7 million cubic yards of excavation, versus 4.3 million cubic yards reported in the DEIR.
- Mr. Kamman also estimates that 3.4 million cubic yards of material would be required to backfill the over-excavated pits and construct the fill areas to the specifications reported in the DEIR. This is nearly 7 times the volume of “waste” material estimated to be produced through mining operations (i.e., the material that the DEIR relies upon to achieve the claimed post-project elevations).
- If the mining operations cannot generate sufficient backfill, the County and Applicant must (1) identify the off-site sources for this material, and (2) evaluate the traffic impacts associated with bringing the material on-site.
- The concentration of wash fines in the surface soil also poses impacts to water quality. This practice may increase source and concentration of total dissolved solids (TDS) and naturally occurring metals. The watershed risks increased exposure to undesirable constituents contained in the fines via the following pathways: a) floodwaters that bypass the project; b) ponds, wetlands, channel habitats that become established on backfill containing fines within the project boundary; and c) migration of water through the fines into underlying groundwater. These potential impacts are not addressed in the DEIR.

These errors in the hydrological calculations, questionable assumptions about post-mining site conditions, and other gaps in the impact analysis undermine the DEIR’s repeated assurances that the narrowed, post-project habitat linkage through the project site would be successfully revegetated/reclaimed. Each of the points raised in Mr. Kamman’s analysis must be fully addressed in order to substantiate the DEIR’s claims about revegetation/reclamation of the site post-mining.

Finally, given that tens of millions of dollars in aggregate would be removed from the site, the public can have no expectation that a “financial assurance” on the order of

\$30,000 – or even ten times that amount – would represent a sufficient financial incentive to ensure full, long-term success of the revegetation/reclamation.

## CONCLUSION

I appreciate the opportunity to evaluate the CEQA documentation for this important project. Please call me at 562-477-2181 if you have questions or wish to further discuss any matters; you may send e-mail to [robb@hamiltonbiological.com](mailto:robb@hamiltonbiological.com).

Sincerely,



Robert A. Hamilton, President  
Hamilton Biological, Inc.  
<http://hamiltonbiological.com>

Attachments: Literature Cited  
Curriculum Vitae

cc: Susan Wynn, US Fish and Wildlife Service  
Dan Leavitt, US Fish and Wildlife Service  
David Mayer, California Dept. of Fish and Wildlife  
Heather Schmalbach, California Dept. of Fish and Wildlife

## LITERATURE CITED

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- US Fish and Wildlife Service. 2005. Recovery plan for vernal pool ecosystems of California and southern Oregon. Portland, OR.

# Robert A. Hamilton

*President, Hamilton Biological, Inc.*

## Expertise

Endangered Species Surveys  
General Biological Surveys  
CEQA Analysis  
Population Monitoring  
Vegetation Mapping  
Construction Monitoring  
Noise Monitoring  
Open Space Planning  
Natural Lands Management

## Education

1988. Bachelor of Science degree in Biological Sciences, University of California, Irvine

## Professional Experience

1994 to Present. Independent Biological Consultant, Hamilton Biological, Inc.

1988 to 1994. Biologist, LSA Associates, Inc.

## Permits

Federal Permit to survey for the Coastal California Gnatcatcher and Southwestern Willow Flycatcher

MOUs with the California Dept. of Fish and Game to survey for Coastal California Gnatcatcher, Southwestern Willow Flycatcher, and Coastal Cactus Wren.

California Scientific Collecting Permit

Robert A. Hamilton has been providing biological consulting services in southern California since 1988. He spent the formative years of his career at the firm of LSA Associates in Irvine, where he was a staff biologist and project manager. He has worked as an independent and on-call consultant since 1994, incorporating his business as Hamilton Biological, Inc., in 2009. The consultancy specializes in the practical application of environmental policies and regulations to land management and land use decisions in southern California.

A recognized authority on the status, distribution, and identification of birds in California, Mr. Hamilton is the lead author of two standard references describing aspects of the state's avifauna: *The Birds of Orange County: Status & Distribution* and *Rare Birds of California*. Mr. Hamilton has also conducted extensive studies in Baja California, and for seven years edited the Baja California Peninsula regional reports for the journal *North American Birds*. He served ten years on the editorial board of *Western Birds* and regularly publishes in peer-reviewed journals. He is a founding member of the Coastal Cactus Wren Working Group and in 2011 updated the Cactus Wren species account for *The Birds of North America Online*. Mr. Hamilton's expertise includes vegetation mapping. From 2007 to 2010 he worked as an on-call biological analyst for the County of Los Angeles Department of Regional Planning. From 2010 to present he has conducted construction monitoring and focused surveys for special-status bird species on the Tehachapi Renewable Transmission Project (TRTP). He has served on the Significant Ecological Areas Technical Advisory Committee (SEATAC) for Los Angeles County.

Mr. Hamilton conducts general and focused biological surveys of small and large properties as necessary to obtain various local, state, and federal permits, agreements, and clearances. He also conducts landscape-level surveys needed by land managers to monitor songbird populations. Mr. Hamilton holds the federal and state permits and MOUs listed to the left, and he is recognized by federal and state resource agencies as being highly qualified to survey for the Least Bell's Vireo. He also provides nest-monitoring services in compliance with the federal Migratory Bird Treaty Act and California Fish & Game Code Sections 3503, 3503.5 and 3513.

**Board Memberships, Advisory Positions, Etc.**

Friends of Colorado Lagoon, Board Member (2014–present)

Coastal Cactus Wren Working Group (2008–present)

Los Angeles County Significant Ecological Areas Technical Advisory Committee (SEATAC) (2010–2014)

American Birding Association: Baja Calif. Peninsula Regional Editor, North American Birds (2000–2006)

Western Field Ornithologists: Associate Editor of Western Birds (1999–2008)

California Bird Records Committee (1998–2001)

Nature Reserve of Orange County: Technical Advisory Committee (1996–2001)

California Native Plant Society, Orange County Chapter: Conservation Chair (1992–2003)

**Professional Affiliations**

American Ornithologists' Union

Cooper Ornithological Society

Institute for Bird Populations

California Native Plant Society

Southern California Academy of Sciences

Western Foundation of Vertebrate Zoology

Mr. Hamilton is an expert photographer, and typically provides photo-documentation and/or video documentation as part of his services.

Drawing upon a robust, multi-disciplinary understanding of the natural history and ecology of his home region, Mr. Hamilton works with private and public land owners, as well as governmental agencies and interested third parties, to apply the local, state, and federal land use policies and regulations applicable to each particular situation. Mr. Hamilton has amassed extensive experience in the preparation and third-party review of CEQA documents, from relatively simple Negative Declarations to complex supplemental and recirculated Environmental Impact Reports. In addition to his knowledge of CEQA and its Guidelines, Mr. Hamilton understands how each Lead Agency brings its own interpretive variations to the CEQA review process.

**Representative Project Experience**

From 2008 to present, Mr. Hamilton has served as the main biological consultant for the Banning Ranch Conservancy, a local citizens' group that successfully defeated efforts to implement a large proposed residential and commercial project on the 400-acre Banning Ranch property in Newport Beach. Mr. Hamilton reviewed, analyzed, and responded to numerous biological reports prepared by the project proponent, and testified at multiple public hearings of the California Coastal Commission. In September 2016, the Commission denied the application for a Coastal Development Permit for the project, citing, in part, Mr. Hamilton's analysis of biological issues. In March 2017, the California Supreme Court issued a unanimous opinion (*Banning Ranch Conservancy v. City of Newport Beach*) holding that the EIR prepared by the City of Newport Beach improperly failed to identify areas of the site that might qualify as "environmentally sensitive habitat areas" under the California Coastal Act. In nullifying the certification of the EIR, the Court found that the City "ignored its obligation to integrate CEQA review with the requirements of the Coastal Act."

**Insurance**

\$3,000,000 professional liability policy

\$2,000,000 general liability policy

\$1,000,000 auto liability policy

**Other Relevant Experience**

Field Ornithologist, San Diego Natural History Museum Scientific Collecting Expedition to Central and Southern Baja California, October/November 1997 and November 2003.

Field Ornithologist, Island Conservation and Ecology Group Expedition to the Tres Marías Islands, Nayarit, Mexico, 23 January to 8 February 2002.

Field Ornithologist, Algalita Marine Research Foundation neustonic plastic research voyages in the Pacific Ocean, 15 August to 4 September 1999 and 14 to 28 July 2000.

Field Assistant, Bird Banding Study, Río Ñambí Reserve, Colombia, January to March 1997.

**References**

Provided upon request.

From 2012 to 2014, Mr. Hamilton collaborated with Dan Cooper on *A Conservation Analysis for the Santa Monica Mountains “Coastal Zone” in Los Angeles County*, and worked with Mr. Cooper and the County of Los Angeles to secure a certified Local Coastal Program (LCP) for 52,000 acres of unincorporated County lands in the Santa Monica Mountains coastal zone. The work involved synthesizing large volumes of existing baseline information on the biological resources of the study area, evaluating existing land use policies, and developing new policies and guidelines for future development within this large, ecologically sensitive area. A coalition of environmental organizations headed by the Surfrider Foundation selected this project as the “Best 2014 California Coastal Commission Vote” ([http://www.surfrider.org/images/uploads/2014CCC\\_Vote\\_Chart\\_FINAL.pdf](http://www.surfrider.org/images/uploads/2014CCC_Vote_Chart_FINAL.pdf)).

In 2010, under contract to CAA Planning, Mr. Hamilton served as principal author of the *Conservation & Management Plan for Marina del Rey, Los Angeles County, California*. This comprehensive planning document has two overarching goals: (1) to promote the long-term conservation of all native species that exist in, or that may be expected to return to, Marina del Rey, and (2) to diminish the potential for conflicts between wildlife populations and both existing and planned human uses of Marina del Rey (to the benefit of humans and wildlife alike). After peer-review, the Plan was accepted by the Coastal Commission as an appropriate response to the varied challenges posed by colonial waterbirds and other biologically sensitive resources colonizing urban areas once thought to have little resource conservation value.

## Contact Information

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## Third Party Review of CEQA Documents

Under contract to cities, conservation groups, homeowners' associations, etc., Mr. Hamilton has reviewed EIRs and other project documentation for the following projects:

- Alpine County Regional Park (park establishment, County of San Diego)
- Trails at Carmel Mtn. Ranch (golf course to residential, City of San Diego)
- Otay Village 13 (residential, County of San Diego)
- Otay Village 14, Planning Areas 16/19 (residential, County of San Diego)
- Western Snowy Plover Mgmt. Plan (resource management, City of Newport Beach)
- Rancho La Habra Specific Plan (golf course to residential, City of La Habra)
- Sanderling Waldorf School (commercial, City of Encinitas)
- Diamond Bar General Plan (open space planning, City of Diamond Bar)
- UC San Diego Long-range Development Plan (institutional, UC Regents)
- El Monte Sand Mining Project (resource extraction, County of San Diego)
- Faria/Southwest Hills Annexation Project (residential, City of Pittsburg)
- Los Cerritos Oil Consolidation/Wetland Restoration Project (resource extraction/habitat restoration, City of Long Beach)
- Safari Highlands Ranch (residential, City of Escondido)
- Newland Sierra (residential, County of San Diego)
- Harmony Grove Village South (residential, County of San Diego)
- Vegetation Treatment Program (statewide fire management plan, California Department of Forestry and Fire Protection)
- Watermark Del Mar Specific Plan (residential, City of Del Mar)
- Newport Banning Ranch (residential/commercial, City of Newport Beach)
- Davidon/Scott Ranch (residential, City of Petaluma)
- Mission Trails Regional Park Master Plan (open space planning, City of San Diego)
- Esperanza Hills (residential, County of Orange)
- Warner Ranch (residential, County of San Diego)
- Dog Beach, Santa Ana River Mouth (open space planning, County of Orange)
- Gordon Mull subdivision (residential, City of Glendora)
- The Ranch at Laguna Beach (resort, City of Laguna Beach)
- Sunset Ridge Park (city park, City of Newport Beach)
- The Ranch Plan (residential/commercial, County of Orange)
- Southern Orange County Transportation Infrastructure Improvement Project (Foothill South Toll Road, County of Orange)
- Gregory Canyon Landfill Rest. Plan (proposed mitigation, County of San Diego)
- Montebello Hills Specific Plan EIR (residential, City of Montebello)
- Cabrillo Mobile Home Park (illegal wetland filling, City of Huntington Beach)
- Newport Hyatt Regency (timeshare conversion project, City of Newport Beach)
- San Diego Creek "Emergency Repair Project" (flood control, County of Orange)
- Tonner Hills (residential, City of Brea)
- The Bridges at Santa Fe Units 6 and 7 (residential, County of San Diego)
- Villages of La Costa Master Plan (residential/commercial, City of Carlsbad)
- Whispering Hills (residential, City of San Juan Capistrano)
- Santiago Hills II (residential/commercial, City of Orange)
- Rancho Potrero Leadership Academy (youth detention facility, County of Orange)
- Saddle Creek/Saddle Crest (residential, County of Orange)
- Frank G. Bonelli Regional County Park Master Plan (County of Los Angeles)

## Selected Presentations

Hamilton, R. A. Birds of Colorado Lagoon. 2018-2019. 60-minute multimedia presentation on the history and avifauna of Colorado Lagoon in southeastern Long Beach, given at Audubon Society chapter meetings.

Hamilton, R. A. Six Legs Good/Invertebral Limit. 2012-2020. 60-to-90-minute multimedia presentation on the identification and photography of dragonflies, damselflies, butterflies, and other invertebrates, given at Audubon Society chapter meetings, Irvine Ranch Conservancy, etc.

Hamilton, R. A., and Cooper, D. S. 2016. Nesting Bird Policies: We Can Do Better. Twenty-minute multimedia presentation at The Wildlife Society Western Section Annual Meeting, February 23, 2016.

Hamilton, R. A. 2012. Identification of Focal Wildlife Species for Restoration, Coyote Creek Watershed Master Plan. Twenty-minute multimedia presentation given at the Southern California Academy of Sciences annual meeting at Occidental College, Eagle Rock, 4 May. Abstract published in the Bulletin of the Southern California Academy of Sciences No. 111(1):39.

Hamilton, R. A., and Cooper, D. S. 2009-2010. Conservation & Management Plan for Marina del Rey. Twenty-minute multimedia presentation given to different governmental agencies and interest groups.

Hamilton, R. A. 2008. Cactus Wren Conservation Issues, Nature Reserve of Orange County. One-hour multimedia presentation for Sea & Sage Audubon Society, Irvine, California, 25 November.

Hamilton, R. A., Miller, W. B., Mitrovich, M. J. 2008. Cactus Wren Study, Nature Reserve of Orange County. Twenty-minute multimedia presentation given at the Nature Reserve of Orange County's Cactus Wren Symposium, Irvine, California, 30 April 2008.

Hamilton, R. A. and K. Messer. 2006. 1999-2004 Results of Annual California Gnatcatcher and Cactus Wren Monitoring in the Nature Reserve of Orange County. Twenty-minute multimedia presentation given at the Partners In Flight meeting: Conservation and Management of Coastal Scrub and Chaparral Birds and Habitats, Starr Ranch Audubon Sanctuary, 21 August 2004; and at the Nature Reserve of Orange County 10<sup>th</sup> Anniversary Symposium, Irvine, California, 21 November.

## Publications

Hamilton, R. A. 2022. Book review: Sacramento County Breeding Birds. *Western Birds* 53:83–85.

Gómez de Silva, H., Villafaña, M. G. P., Nieto, J. C., Cruzado, J., Cortés, J. C., Hamilton, R. A., Vásquez, S. V., and Nieto, M. A. C. 2017. Review of the avifauna of The Tres Marías Islands, Mexico, including new and noteworthy records. *Western Birds* 47:2–25.

Hamilton, R. A. 2014. Book review: The Sibley Guide to Birds, Second Edition. *Western Birds* 45:154–157.

Cooper, D. S., R. A. Hamilton, and S. D. Lucas. 2012. A population census of the Cactus Wren in coastal Los Angeles County. *Western Birds* 43:151–163.

- Hamilton, R. A., J. C. Burger, and S. H. Anon. 2012. Use of artificial nesting structures by Cactus Wrens in Orange County, California. *Western Birds* 43:37–46.
- Hamilton, R. A., Proudfoot, G. A., Sherry, D. A., and Johnson, S. 2011. Cactus Wren (*Campylorhynchus brunneicapillus*), in *The Birds of North America Online* (A. Poole, ed.). Cornell Lab of Ornithology, Ithaca, NY.
- Hamilton, R. A. 2008. Cactus Wrens in central & coastal Orange County: How will a worst-case scenario play out under the NCCP? *Western Tanager* 75:2–7.
- Erickson, R. A., R. A. Hamilton, R. Carmona, G. Ruiz-Campos, and Z. A. Henderson. 2008. Value of perennial archiving of data received through the North American Birds regional reporting system: Examples from the Baja California Peninsula. *North American Birds* 62:2–9.
- Erickson, R. A., R. A. Hamilton, and S. G. Mlodinow. 2008. Status review of Belding's Yellowthroat *Geothlypis beldingi*, and implications for its conservation. *Bird Conservation International* 18:219–228.
- Hamilton, R. A. 2008. Fulvous Whistling-Duck (*Dendrocygna bicolor*). Pp. 68-73 in *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California* (Shuford, W. D. and T. Gardali, eds.). *Studies of Western Birds* 1. Western Field Ornithologists, Camarillo, CA, and California Department of Fish and Game, Sacramento, CA.
- California Bird Records Committee (R. A. Hamilton, M. A. Patten, and R. A. Erickson, editors.). 2007. *Rare Birds of California*. Western Field Ornithologists, Camarillo, CA.
- Hamilton, R. A., R. A. Erickson, E. Palacios, and R. Carmona. 2001–2007. *North American Birds* quarterly reports for the Baja California Peninsula Region, Fall 2000 through Winter 2006/2007.
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- Hamilton, R. A. 2001. Log of bird record documentation from the Baja California Peninsula archived at the San Diego Natural History Museum. Pp. 242–253 in *Monographs in Field Ornithology* No. 3. American Birding Association, Colorado Springs, CO.
- Hamilton, R. A. 2001. Records of caged birds in Baja California. Pp. 254–257 in *Monographs in Field Ornithology* No. 3. American Birding Association, Colorado Springs, CO.

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- Howell, S. N. G., R. A. Erickson, R. A. Hamilton, and M. A. Patten. 2001. An annotated checklist of the birds of Baja California and Baja California Sur. Pp. 171–203 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.
- Ruiz-Campos, G., González-Guzmán, S., Erickson, R. A., and Hamilton, R. A. 2001. Notable bird specimen records from the Baja California Peninsula. Pp. 238–241 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.
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# Appendix C



28 February 2022  
22204-00

Carmen J. Borg  
Shute, Mihaly & Weinberger LLP  
396 Hayes Street  
San Francisco, CA 94102-4421

**Subject: Review of Air Quality Analysis for the Cottonwood Sand Mine Project, Draft Environmental Impact Report**

Dear Ms. Borg:

Baseline Environmental Consulting (Baseline) has reviewed the environmental analysis of air quality impacts associated with development of the proposed Cottonwood Sand Mine Project (project). The project proposes sand mining activities on 251 acres of an approximately 280-acre site in the unincorporated community of Rancho San Diego in eastern San Diego County.

Based on our review of the Draft Environmental Impact Report (DEIR) for the proposed project, we have identified flaws in the air quality analysis, such as unsubstantiated calculations for evaluating the project's air pollutant emissions and associated health risks. Our specific concerns regarding how the DEIR analyzed potential environmental impacts related to air pollutant emissions are described in detail below.

### **Underestimated Fugitive Dust Emissions**

The DEIR quantified respirable particulate matter (PM<sub>10</sub>) emissions from the exhaust of off-road equipment operations and on-road vehicle trips, as well as PM<sub>10</sub> emissions from fugitive dust generated by mining pit operations, groundline conveyor transfers, processing area operations, on-site vehicles movement, on-road vehicle trips, and demolition activities. Based on review of the PM<sub>10</sub> calculations documented in DEIR Appendix I, it appears that the estimated fugitive dust emissions associated with on-site vehicle movement were miscalculated and substantially underestimated.

To demonstrate the calculation errors in the DEIR, Baseline has recalculated the project's PM<sub>10</sub> fugitive dust emissions using the same modeling inputs and methods reported in the DEIR. As shown in **Table 1**, the total controlled PM<sub>10</sub> fugitive dust emissions from on-site vehicle movement would be about 112.8 pounds per day. The DEIR estimated that the total controlled PM<sub>10</sub> fugitive dust emissions from vehicle movement would be about 12.5 pounds per day, which is about 100 pounds per day lower than the actual emissions.

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According to page 99 of 455 in the DEIR Appendix I (Volume 2), two control measures were assumed by the preparers of the DEIR to be fully implemented when they quantified the estimated unmitigated fugitive dust emissions generated by vehicle movement at the mining pit, processing area, and on-site haul roads: Watering twice per day and limiting vehicle speeds below 45 miles per hour (mph). The preparers of the DEIR used the Western Regional Air Partnership (WRAP) Fugitive Dust Handbook<sup>1</sup> to estimate the total reduction in fugitive dust emissions from the two control measures. According to the WRAP Fugitive Dust Handbook, watering twice per day would result in a 55% reduction in PM10 fugitive dust emissions and limiting speeds below 45 mph would result in an additional linear reduction in fugitive dust emissions.<sup>2</sup> The DEIR assumed on-site vehicles speeds would range from 5 to 15 mph, which would result in a 67% to 89% reduction in fugitive dust emissions. As shown in **Table 1**, combining the watering and speed control measures would reduce the project's total PM10 fugitive dust emissions from vehicle movement by 85% to 95%.

However, based on review of the controlled fugitive dust emissions reported on page 99 of 455 in DEIR Appendix I (Volume 2), the preparers of the DEIR miscalculated the controlled fugitive dust emissions by applying a 98.3% to 99.4% reduction in fugitive dust emissions. These higher emission reductions are not supported by the references and methods cited in the DEIR, and the miscalculations resulted in a substantial underestimate of the total PM10 fugitive dust emissions from vehicle movement.

As shown in **Table 2**, the daily PM10 emissions from all sources on the project site were updated for each mining phase of the project and compared to the San Diego County Air Pollution Control District's screening-level threshold of significance. The DEIR reported that the total PM10 emissions would range from 83.6 to 85.0 pounds per day over the three mining phases of the project, which is below the threshold of 100 pounds per day. According to Baseline's updated analysis, the total PM10 emissions would range from 182.8 to 184.2 pounds per day over the three phases of the project, which substantially exceeds the threshold of 100 pounds per day. Therefore, the project would generate PM10 emissions that result in a significant impact to regional air quality.

The DEIR should be updated to show the correct quantification of PM10 fugitive dust emissions, as well as fine particulate matter (PM2.5) emissions, from on-site vehicle movement at the mining pit, processing area, and on-site haul roads. Health risks associated with fugitive dust emissions (e.g., exposure to silica dust) should also be updated and compared to the thresholds of significance. Mitigation measures should be prepared and implemented to reduce significant impacts from dust emissions to a less-than-significant level.

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<sup>1</sup> Western Regional Air Partnership's (WRAP), 2006. WRAP Fugitive Dust Handbook. September 7.

<sup>2</sup> Applying a linear reduction means that the controlled fugitive dust emissions are equal to the uncontrolled emissions multiplied by the vehicle speed divided by 45 mph.

**Table 1. Updated Analysis of Vehicle Movement PM10 Fugitive Dust Emissions**

Location	Source	Input Parameters <sup>1</sup>			Uncontrolled PM10 <sup>2</sup>		Controlled PM10 <sup>3</sup>			
		Vehicle Weight (tons)	Average Speed (mph)	Daily VMT	Emission Factor (lbs/VMT)	Emissions (lbs/day)	Watering Control Efficiency	Speed Control Efficiency	Total Control Efficiency	Emissions (lbs/day)
Mining Pit Vehicles	Loaders	55.7	5	80	6.25	500.07	55%	89%	95%	25.0
	Excavator	58.75	5	32	6.40	204.89	55%	89%	95%	10.2
Processing Area Vehicles	Primary Loader	55.7	5	32	6.25	200.03	55%	89%	95%	10.0
	Backup Loader	25.6	5	8	4.41	35.25	55%	89%	95%	1.8
	Skidsteer Loader	3.6	5	20	1.82	36.45	55%	89%	95%	1.8
	Highway Delivery Trucks	30	15	22	4.73	104.10	55%	67%	85%	15.6
On-Site Haul Road	Fines/Backfill Haul Truck	39.3	15	48	5.34	256.46	55%	67%	85%	38.5
	Supervisor/Maintenance Truck	3.6	15	36	1.82	65.61	55%	67%	85%	9.8
<b>Total PM10 Fugitive Dust Emissions</b>										<b>112.8</b>

Notes: PM10 = respirable particulate matter; mph = miles per hour; lbs = pounds; VMT = vehicle miles travelled

<sup>1</sup> Model input parameters from page 99 of 455 in the DEIR Appendix I (Volume 2).

<sup>2</sup> Consistent with the DEIR model assumptions, the emission factor (EPA AP-42, Chapter 13.2.2 Unpaved Roads) was calculated as follows:  $E = k \left(\frac{s}{12}\right)^a \left(\frac{W}{3}\right)^b$

Where: E = PM10 emissions factors (lbs/VMT)  
a = 0.9 empirical constant  
b = 0.45 empirical constant  
k = 1.5 empirical constant  
s = 13.6% surface material silt content  
W = average weight of vehicle (tons)

<sup>3</sup> Consistent with the DEIR model assumptions, the control efficiencies for watering twice per day and limiting speeds below 45 mph are based on the WRAP Fugitive Dust Handbook. Total control efficiency calculated as follows:  $TC = 1 - (1 - SC)(1 - WC)$

Where: TC = Total control efficiency  
SC = Speed control efficiency for speed less than 45 mph  
WC = Water control efficiency for watering twice per day

**Table 2. Updated Summary of Operational PM10 Emissions (pounds per day)**

Category	DEIR PM10 Emissions <sup>1</sup>	Updated PM10 Emissions <sup>2</sup>
<b>Phase 1</b>		
Off-Road Equipment Exhaust	0.7	0.7
Mining Pit Operation Dust	59.0	59.0
Groundline Conveyor Dust	1.2	1.2
Processing Area Operation Dust	6.4	6.4
On-Site Vehicle Movement Dust	12.5	112.8
On-Road Vehicle Trips	2.9	2.9
Phase 2 Demolition	0.7	0.7
<b>Phase 1 Total Emissions</b>	<b>84.5</b>	<b>183.7</b>
<i>SDAPCD Threshold</i>	100	100
<i>Exceed Threshold?</i>	No	Yes
<b>Phase 2</b>		
Off-Road Equipment Exhaust	0.7	0.7
Mining Pit Operation Dust	59.0	59.0
Groundline Conveyor Dust	1.2	1.2
Processing Area Operation Dust	6.4	6.4
On-Site Vehicle Movement Dust	12.5	112.8
On-Road Vehicle Trips	2.9	2.9
Phase 3 Demolition	1.2	1.2
<b>Phase 2 Total Emissions</b>	<b>85.0</b>	<b>184.2</b>
<i>SDAPCD Threshold</i>	100	100
<i>Exceed Threshold?</i>	No	Yes
<b>Phase 3</b>		
Off-Road Equipment Exhaust	0.7	0.7
Mining Pit Operation Dust	59.0	59.0
Groundline Conveyor Dust	1.2	1.2
Processing Area Operation Dust	6.4	6.4
On-Site Vehicle Movement Dust	12.5	112.8
On-Road Vehicle Trips	2.7	2.7
<b>Phase 3 Total Emissions</b>	<b>83.6</b>	<b>182.8</b>
<i>SDAPCD Threshold</i>	100	100
<i>Exceed Threshold?</i>	No	Yes

Notes: PM10 = respirable particulate matter; lbs = pounds; SDAPCD = San Diego County Air Pollution Control District

<sup>1</sup> Total PM10 emissions and PM10 emissions from off-road equipment exhaust, on-road vehicle trips, and demolition are derived from Table 3.1.1-8 of the DEIR (page 3.1.1-29). The PM10 emissions from mining pit operations, groundline conveyors, processing area operations, and on-site vehicle movement are derived from page 99 of 455 in the DEIR Appendix I (Volume 2).

<sup>2</sup> PM10 emissions are updated for on-site vehicle movement as summarized in **Table 1** of this letter.

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## **Failure to Evaluate the Effectiveness of the Fugitive Dust Control Plan to Reduce Air Quality Impacts**

As described on page 3.1.1-12 of the DEIR, the project would implement a Fugitive Dust Control Plan. A copy of the plan is included in Appendix I of the DEIR. Similar to a mitigation measure, thorough implementation of the Fugitive Dust Control Plan would reduce the project's fugitive dust emissions and associated air quality impacts. The DEIR included the Fugitive Dust Control Plan in the analysis of the project's unmitigated air quality impacts. It appears that the preparers of the DEIR intended to incorporate the Fugitive Dust Control Plan into the project design; however, the plan was not identified as a design feature in the project description. Therefore, there is no assurance that the Fugitive Dust Control Plan will be implemented as a part of the project.

Based on the *Lotus v. Department of Transportation* (223 Cal. App.4th 645) decision, the DEIR should first evaluate if the project's air quality impacts would exceed the thresholds of significance without implementation of the Fugitive Dust Control Plan, and then evaluate how the plan would reduce the impacts to, or maintain them at, a less-than-significant level. Furthermore, the dust control measures described in the plan need to be analyzed for their effectiveness in reducing air quality impacts, and a mitigation monitoring or reporting plan needs to be adopted to ensure the dust control measures are implemented. Based on review of the Fugitive Dust Control Plan in DEIR Appendix I, specific concerns related to the effectiveness of the control measures in the plan are discussed below.

**Travel on Unpaved Roads.** The Fugitive Dust Control Plan limits vehicle speeds on unpaved roadways to 10 mph. However, page 3.1.1-14 of the DEIR states that vehicle speeds on unpaved roads would be limited to 15 mph, which is inconsistent with the Fugitive Dust Control Plan. The DEIR air quality analysis should be updated to address this inconsistency.

**Mining Pit Operations.** The Fugitive Dust Control Plan describes measures for watering unpaved roads, but it does not discuss how often to use water or other methods to control dust in the mining pit area. The DEIR analysis of air quality impacts assumed that watering would occur twice per day, but this is not identified as a dust control measure in the Fugitive Dust Control Plan. As stated on page 1-2 of the DEIR, mining could disturb up to 30 acres at a time during each phase of operation. During dry weather conditions, wind erosion and equipment operation on 30 acres of disturbed sand could generate a substantial amount of fugitive dust emissions if not controlled. In addition, the DEIR and Fugitive Dust Control Plan do not discuss how dust will be controlled in the mining area during nonwork days (i.e., weekends and holidays) to minimize wind erosion. The DEIR air quality analysis should be updated to clearly identify how dust control measures will be implemented in the mining pit area during both work and nonwork days.

**Exposed Stockpiles.** The Fugitive Dust Control Plan states that exposed stockpiles will be treated with water or non-toxic, environmentally safe soil stabilizers, or covered, as necessary. However, there is no clarification for determining when it is necessary to control dust from the stockpiles. Page 19 of the Air Quality Technical Report in DEIR Appendix I states that stockpiles which are unused for six or more months would either be seeded or covered to prevent wind erosion. This suggests that unused stockpiles could be subject to uncontrolled wind erosion for up to 6 months before being seeded or covered, which could generate substantial dust emissions that were not accounted for in the DEIR analysis.

**Monitoring and Enforcement.** The Fugitive Dust Control Plan is a self-implementing plan. There are no 3<sup>rd</sup> party monitoring or enforcement measures included in the DEIR or Fugitive Dust Control Plan that would ensure the dust control measures are properly implemented.

**Perimeter Air Monitoring.** The Fugitive Dust Control Plan should include periodic air monitoring along the downwind perimeter of the site with action levels to demonstrate the effectiveness of the dust control measures. If action levels are exceeded during air monitoring, then the Fugitive Dust Control Plan should identify additional dust control measures that can be implemented to ensure dust emissions are reduced below the action levels.

The DEIR should be updated to address the concerns identified above regarding the Fugitive Dust Control Plan. The DEIR should also be updated to properly incorporate the Fugitive Dust Control Plan into the project design or convert the plan into a CEQA mitigation measure and include it in the Mitigation Monitoring and Reporting Program. More importantly, the DEIR analysis of unmitigated air quality impacts should be updated to evaluate the effectiveness of control measures described in the Fugitive Dust Control Plan to reduce impacts to a less-than-significant level.

### **Health Risk Assessment Lacks Substantial Evidence to Support Conclusions**

The DEIR included a health risk assessment (HRA) for nearby sensitive receptors exposed to concentrations of toxic air contaminants (TACs) generated by the project. TACs of concern include diesel particulate matter (DPM), silica dust, and trace heavy metals, as described on page 3.1.1-17 of the DEIR:

*Operation of the Project would result in the generation of DPM emissions and fugitive dust trace TACs from the use of off-road diesel equipment, on-road haul trucks, and sand processing operations. Fugitive dust trace TACs analyzed include arsenic, beryllium, cadmium, chromium (hexavalent and non-hexavalent), copper, manganese, mercury, nickel, selenium, and crystalline silica.*

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The methodology and input parameters used for the HRA are documented in the Air Quality Technical Report included in Appendix I of the DEIR. The HRA included air dispersion modeling for the following sources of TAC emissions:

- Mining Pit Area
- Processing Area
- Conveyors
- Radial stackers
- On-site haul routes
- On-road delivery trucks

Based on the air dispersion modeling results, the HRA estimated the health risks for a sensitive receptor exposed to 17 different TACs beginning in the 3rd trimester of pregnancy for a duration of 10 years.

As summarized in Table 3.1.1-9 of the DEIR, the estimated total cancer risk at the maximally exposed individual resident was reported to be 2.9 in a million, which is below the threshold of significance (10.0 in a million). The total cancer risk seems suspiciously low, which may be due to inaccuracies in the air dispersion modeling of TAC emissions from mining operations. One volume source with footprint of about 0.6 acres<sup>3</sup> was modeled in the center of each mining subphase area, which was intended to represent the emissions from mining operations across the entire area of the subphase. Since the area for each mining subphase can range up to 30 acres, using one relatively small volume source to model the emissions from mining operations across the entire subphase area is not likely representative of the conditions that would actually occur during mining, particularly emissions that would occur near the perimeter of the subphase area closest to sensitive receptors. However, there is no feasible way to review the validity of the HRA because the individual health-risk contributions from each emission source for each TAC and year of exposure are not documented or summarized anywhere in the DEIR.

As a result, there is no reasonable method for the public or decision makers to review the validity of the HRA findings. According to *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 442, the data in an EIR must be presented in a manner to adequately inform the public and decision makers. Here, the DEIR air quality analysis lacks substantial evidence to support its conclusions and should be revised to properly document and summarize the findings of the HRA.

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<sup>3</sup> 50 meters by 50 meters.

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## Inadequate Analysis of Valley Fever Concerns

Valley Fever, or coccidioidomycosis, is an infectious disease caused by inhaling spores of *Coccidioides*, a soil-dwelling fungus. The fungus lives in the top 12 inches of soil. When soil containing this fungus is disturbed by activities such as excavation and grading the fungal spores become airborne.<sup>4</sup> As stated on page 3.1.1-4 of the DEIR, San Diego County is a suspected endemic area for *Coccidioides* spores and has climatic conditions suitable for hosting the fungus. The preparers of the DEIR concluded that the project would have a less-than-significant impact related to the potential emissions of *Coccidioides* spores because the on-site soil properties and current and past golf course turf management activities do not favor the occurrence of the *Coccidioides* fungus, and because the project would implement a Fugitive Dust Control Plan as a project design feature to control emissions of fugitive dust and other soil materials. However, the DEIR air quality analysis lacks substantial evidence to support this conclusion.

Page 3.1.1-21 of the DEIR states that the current irrigation, fertilization, and application of fungicides on the golf course of the project site deters the occurrence of *Coccidioides* fungus. However, the golf course on the western portion of the project site has been inactive since 2017. Furthermore, the use of irrigation, fertilizers, and fungicides on the eastern portion of the golf course would cease after implementation of the proposed project and the topsoil on large portions of the project site may remain undisturbed for many years before being removed for mining activities. As a result, the current golf course turf management practices would not affect the potential occurrence of *Coccidioides* fungus during future mining operations.

Page 3.1.1-21 of the DEIR also states that implementation of the Fugitive Dust Control Plan as a project design feature would reduce impacts from Valley Fever to a less-than-significant level. In addition to the concerns about the effectiveness of the Fugitive Dust Control Plan discussed above, the plan generally focuses on minimizing visible fugitive dust emissions at the property line. However, *Coccidioides* spores are too small to be seen by the naked eye, and due to the spores' very small size and buoyancy, the spores can remain aloft for great distances and thus may be present in air that appears quite clear. Therefore, minimizing visible fugitive dust emissions at the property line does not address the potential for nearby residents to be exposed to airborne *Coccidioides* spores generated during mining activities.

The DEIR air quality analysis should be revised to provide a thorough analysis of how the project would reduce Valley Fever impacts to a less-than-significant level, if feasible. The Fugitive Dust Control Plan should include measures that specifically address the dust emissions generated by the disturbance of topsoil that could potentially contain *Coccidioides* spores. The plan should also include measures to prevent the potential transport of *Coccidioides* spores from the

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<sup>4</sup> California Department of Industrial Relations, 2017. Protection from Valley Fever. <https://www.dir.ca.gov/dosh/valley-fever-home.html>. Last updated November 2017.

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project site (e.g., thoroughly cleaning equipment and vehicles before moving offsite) and a medical surveillance program that includes periodic monitoring of workers for symptoms of Valley Fever.

## **Conclusions**

Based on our review of the DEIR and supporting appendices for the proposed project, Baseline recommends that the County revise and recirculate the environmental analysis to address the environmental concerns related to the issues described above.

Sincerely,



Patrick Sutton, PE  
Senior Environmental Engineer

PS:YT:km

# Patrick Sutton, P.E.

## Senior Environmental Engineer



### Areas of Expertise

Air Quality, GHGs, Hazardous Materials, Geology, and Hydrology

### Education

M.S., Civil and Environmental Engineering, University of California – Davis

B.S., Environmental Science, Dickinson College

### Registration

Professional Engineer No. 13609 (RI)

### Years of Experience

17 Years

**Patrick Sutton** is an environmental engineer who specializes in the assessment of hazardous materials released into the environment. Mr. Sutton prepares technical reports in support of environmental review, such as Phase I/II Environmental Site Investigations, Air Quality Reports, Greenhouse Gas (GHG) Reduction Plans, and Health Risk Assessments. He has prepared numerous CEQA/NEPA evaluations for air quality, GHGs, geology, hazardous materials, and water quality related to residential, commercial, and industrial projects, as well as large infrastructure developments. His proficiency in a wide range of modeling software (AERMOD, CalEEMod, RCEM, CT-EMFAC) as well as relational databases, GIS, and graphics design allows him to thoroughly and efficiently assess and mitigate environmental concerns.

For mixed-use development projects, Mr. Sutton has prepared health risk assessments for sensitive receptors exposed to toxic air contaminants based on air dispersion modeling. He has also prepared GHG Reduction Plans to demonstrate how projects can comply with State and/or local GHG reduction goals. For large highway infrastructure improvement projects, Mr. Sutton has prepared air quality and hazardous materials technical reports in accordance with Caltrans requirements. Air quality assessments include the evaluation of criteria air pollutants, mobile source air toxics, and GHG emissions to support environmental review of the project under CEQA/NEPA and to determine conformity with the State Implementation Plan. Hazardous materials investigations include sampling and statistically analysis of aerially-deposited lead adjacent to highway corridors.

## Project Experience

**Oakland Downtown Specific Plan EIR.** Prepared a program- and project-level Air Quality and GHG Emissions analysis. Developed a mitigation measure with performance standards to ensure GHG emissions from future projects comply with the Citywide 2030 GHG reduction target.

**I-680 Express Lanes from SR 84 to Alcosta Boulevard Project.** Prepared Initial Site Assessment and Preliminary Site Investigation to evaluate contaminants of potential concern in soil and groundwater. Prepared Air Quality Report to determine the project's conformity to federal air quality regulations and to support environmental review of the project under CEQA and NEPA.

**Altamont Corridor Expressway (ACE/Forward) Project EIR/EIS.** Prepared a program- and project-level Hazardous Materials analysis for over 120 miles of railroad corridor from San Jose to Merced. Hazardous materials concerns, such as release sites, petroleum pipelines, agricultural pesticides, and nearby school sites were evaluated in GIS.

**Stonegate Residential Subdivision EIR.** Prepared a project-level Hydrology and Water Quality analysis for a residential development located within the 100-year floodplain. The proposed project included modifications to existing levees and flood channels.

**BART Silicon Valley Extension Project.** Prepared Initial Site Assessment and Hazardous Materials EIS/EIR section for extending 6 miles of proposed BART service through the Cities of San Jose and Santa Clara.

# Appendix D

28 February 2022

Carmen Borg  
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**Subject: Cottonwood Sand Mine Project, San Diego County, CA  
Acoustical Comments on Draft Environmental Impact Report  
Salter Project 22-0056**

Dear Carmen:

As requested, we reviewed Subchapter 2.4 Noise of the Draft Environmental Impact Report (DEIR) for the proposed mine project in San Diego County, CA. We also reviewed information in Appendix F (Acoustical Site Assessment Report). In summary, it is our opinion that the DEIR does not sufficiently assess or mitigation potential noise impacts.

### **County Noise Ordinance Limits for Residential Properties are Ignored**

The DEIR only addresses and applies one County Noise Ordinance limit to the project - the 75 dBA limit at the property line of an extractive use. This is based on Item E of Section 36.404 of the County Code Chapter 4, as listed below:

(e) ... The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

However, we also expect that it is required to limit the operational noise that would be transmitted to nearby residences that do not share a property boundary with the proposed mine. This would be required per Item A of Section 36.404 of the County Code Chapter 4.

(a) it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404, when the one-hour average sound level is measured at the property line of the property on which the noise is produced ***or at any location on a property that is receiving the noise.*** (emphasis added)



Per the above County Code reference, The Noise Ordinance limit for residential zones is 50 dBA during daytime hours. Even with the proposed mitigation, the DEIR predicts operational mining noise levels at all identified sensitive receiver areas to range between 54 dBA at 68 dBA (DEIR, Appendix F, Tables 11 and 12, page 22). All predicted noise levels at sensitive receivers are expected to exceed the County Noise Ordinance limit for residential receivers that do not share a property boundary with the proposed mine. This is summarized in Table 1 below. Project noise would exceed the County residential zone noise limit by up to 18 dB. By ignoring the County noise limit standards for such residential properties, the DEIR fails to identify and mitigate this significant impact of the project. It is very likely that additional minimum setback requirements would be needed to meet this County noise limit at residences.

*Table 1: Summary of DEIR Predicted Noise Compared to County Residential Zone Noise Limit*

Description	Noise Level
County Noise Ordinance limit for residential Zones that do not share a property line with the proposed mine.	50 dBA limit
DEIR predicted noise levels at all sensitive receiver areas	54 dBA to 68 dBA
<b>Exceedance</b>	<b>Up to +18 dB</b>

The application of the 50 dBA noise limit is further supported by the San Diego County “Guidelines for Determining Significant and Report Format and Content Requirements – Mineral Resources” (Mineral Resource Guidelines, Revised 30 July 2008). This County document states the following:

Noise Setbacks – Noise from quarry and mining activities is typically the largest environmental impact to nearby noise sensitive land uses (such as residential developments, industrial developments, commercial developments, and major public facilities). In order to meet the noise standards outlined in the County Noise Ordinance, an adequate setback between noise-related activities associated with extractive uses is necessary to protect sensitive land uses from noise that exceeds the allowable limits of the County Noise Ordinance. Although setback distances may vary from project to project, **a general noise setback area of approximately 1,300 feet is usually an adequate distance for most typical potential extractive operations to achieve allowable noise levels (in compliance with the County Noise Ordinance). For example, 1,300 feet would usually attenuate typical heavy equipment noise levels of 75 to 90 dBA to the County Noise Ordinance standard of 50 dBA for daytime residential land use.** It is important to note that the setback is relative to the property line of a noise sensitive land use. (San Diego County Mineral Resource Guidelines, page 15, emphasis added)

Clearly, it is policy of San Diego County to apply to Noise Ordinance 50 dBA limit to mining operations that would impact nearby residences. As currently written, the DEIR is deficient and would allow mining operational noise to exceed this County noise limit by up to 18 dB. This exceedance is significant and would be perceived as nearly four times as loud as the limiting noise level. The DEIR should be revised.

## Significant Change to Quiet Existing Environments is not Addressed

Within the relevant study area, there are sensitive receptors located adjacent to a roadway noise source (i.e., DEIR ambient measurement locations M1, M3, M5, and M6). However, there are also many residences in and around the valley that are not located near such noise sources. These may be represented by DEIR ambient measurement locations M2, M4, M7, and M8. The little data provided in the DEIR for these locations indicate that such sites in this area enjoy low background noise levels between 52 dBA and 55 dBA ( $L_{eq}$  – DEIR Subchapter 2.4, page 2.4-2, paragraph 1). Even with the proposed mitigation, the DEIR predicts noise levels at all identified sensitive receiver areas to range between 54 dBA at 68 dBA (DEIR, Appendix F, Tables 11 and 12, page 22). At many such sensitive receivers with low ambient noise, predicted mining operations are expected to substantially increase noise levels by up to 15 dB. This is summarized in Table 2 below. For reference, a 5 dB noise increase is noticeable and commonly considered significant, and a 10 dB increase in noise is generally perceived as a doubling of loudness. By ignoring the expected increase in ambient noise for such residential properties, the DEIR fails to identify and mitigate this significant impact of the project.

*Table 2: Summary of DEIR Predicted Noise Compared to Areas with Quieter Ambient Noise*

Description	Noise Level
Measured ambient noise levels at Locations M2, M4, M7, and M8 – representing homes located away from roadways	52 dBA to 55 dBA
DEIR predicted noise levels at all sensitive receiver areas	54 dBA to 68 dBA
Noise Increase	Up to +15 dB

## Ambient Noise was Not Adequately Evaluated

As part of the acoustical site assessment, ambient noise measurements were conducted in the area surrounding the project site. On one afternoon (approximately 2pm to 5:30 pm on 3 January 2019), they measured noise levels for 10 to 15 minutes at each of eight locations (DEIR Appendix F, Page 10). In our opinion, this approach is inadequate to establish baseline existing conditions. The very small sampling of acoustical data collected for the DEIR does not sufficiently characterize existing conditions. It fails to capture how noise levels vary during the entire day, particularly morning and late afternoon or evening hours when mining operations would occur. The sampling is also not statistically valid, as it only covered a very short period during one day and therefore does not demonstrate that the results are actually representative for these areas. For a project of this scale and potential impact located directly adjacent residences, it is necessary to perform an adequate survey of existing conditions.

It is also necessary to document existing noise levels using the CNEL metric because the County expresses Noise Compatibility Guidelines using the Community Noise Equivalent Level (CNEL) metric. Measuring CNEL requires a minimum of 24 hours of continuous monitoring at each location. Ideally, multiple days would be assessed to provide a statistically valid sample of daily noise levels. To determine noise impact, the expected noise levels of the project should be compared to these baseline levels.

The DEIR appears to acknowledge this as a necessary step in the analysis, as “CNEL Existing” values are presented in the cumulative noise summary tables (DEIR, several tables, pages 2.4-17 to 22). However, neither the DEIR Noise Subchapter nor the technical report in Appendix F explain where these values came from. According to the report, 24-hour levels were not measured. No other source, reference, assumption, or derivation is provided. Without this explanation, the public reader cannot sufficiently review the impact analysis. In our opinion, for a project of this scale, the cost and effort of representative 24-hour ambient noise measurements are certainly warranted. For this and other reasons stated above, the DEIR is incomplete with minimal amount of ambient noise data currently included.

### **DEIR Does Not Demonstrate Efficacy of Noise Barrier Mitigation**

Mitigation offered in the DEIR for operational mining activities includes 8 or 12-foot tall noise barriers along the edge of the site. Such solid objects are intended to break the “line-of-sight” between the noise source and receiver to disrupt the noise transmitted along that direct path. However, the DEIR provides no line-of-sight studies to demonstrate that the proposed mitigation will adequately reduce noise. In fact, we expect that many of the residences elevated on surrounding hills are not going to receive the benefit of this mitigation. As described above, we also expect such residences to be exposed to excessive noise, requiring further mitigation.

The DEIR also relies on the depth of excavated areas within the site to reduce noise with similar “acoustical shielding.” Line-of-sight studies are also not provided for this mitigation to demonstrate that the terrain during excavation would provide adequate reduction of noise. Furthermore, we expect much of the excavation to occur near the current grade elevation on-site before substantial elevation change is achieved.

### **DEIR Fails to Evaluate Maximum “Single-Event” Noise**

The DEIR solely evaluates project noise using hourly average ( $L_{eq}$ ) or daily average (CNEL) noise levels. However, we would expect such a facility to generate notable “single-event” noise from several sources, including heavy truck passbys on roadways directly adjacent to residences, rock and gravel being dropped into the metal bins of hauling vehicles, and similar momentary but commonly repeated activities. We have found such activities to generate significant noise levels. Since such noise is commonly a source of complaints, it is our opinion that the DEIR should evaluate such noise and identify appropriate mitigation to protect the community from excessive noise.

## Noise Impact on Wildlife in Not Evaluated

We also reviewed the comments on noise impact on wildlife in the DEIR Subchapter 2.2 Biological Resources. The DEIR indicates that “a significant impact to wildlife movement or nursery sites would occur if the Proposed Project would:... increase noise and/or nighttime lighting in a wildlife corridor or linkage to levels proven to affect the behavior of the animals identified in a site-specific analysis of wildlife movement.” (DEIR Subchapter 2.2, page 2.2-50, Section 2.2.2.4). However, the DEIR provide no substantive analysis regarding noise in neighboring wildlife areas that will be subject to noise from the project operations. It appears that:

1. Existing ambient noise levels were not measured or evaluated in the neighboring wildlife areas. And based on the little ambient noise data presented in Subchapter 2.4, we expect that such areas that are located away from current sources of noise (e.g., roadways) would have rather low noise levels.
2. Project operational noise levels were not predicted for neighboring wildlife areas. Without such analysis, the potential noise increase has not been evaluated adequately.
3. Noise impact on neighboring wildlife areas is largely dismissed with the assumption that these areas are already subject to noise from the Cottonwood Gold Course. However, this assumption is unsubstantiated. There is no information provided in the DEIR to support the assertion that mining operations will not significantly increase noise in sensitive wildlife habitat.

\*

\*

\*

Should you have any questions, please call.

Best,

**SALTER**



Jeremy L. Decker, PE  
Vice President

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## RESUME

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**Jeremy Decker, PE**  
Vice President



**Mr. Decker** has been an acoustical consultant with Salter since 2005. His areas of expertise include environmental noise studies, municipal master planning and noise control policies, architectural noise control, room acoustics, mechanical system noise and vibration reduction, and vibration analyses. He has consulting experience in the development and peer review of environmental noise impact analyses for public, industrial, and other commercial projects.

### Project Experience

- Decker Island Mine, Solano County, CA
- Warner Ranch DEIR Peer Review, San Diego County, CA
- Kern County Oil & Gas DEIR/FEIR/SEIR Peer Review, Kern County, CA
- Southern California International Gateway FEIR Peer Review, Long Beach, CA
- Bay Delta Conservation Plan/California WaterFix FEIR Peer Review, CA
- Redondo Beach Power Plant Noise Impact Peer Review, Redondo Beach, CA
- Idaho-Maryland Gold Mine DEIR Peer Review, CA
- Caldecott Tunnel 4th Bore Noise Impact Study, East Bay Area, CA
- Kaneohe/Kailua Sewer Tunnel Construction Noise Study, Kailua, HI
- Gateway Valley Construction Noise Impact Study, Orinda, CA
- San Francisco Fire Dept. Water Supply Facility, San Francisco, CA
- FedEx Distribution Center Noise Impact Studies, Various Cities, CA, AZ, TN
- NRG Cogeneration Facility Noise Impact Study, San Francisco, CA
- Fivepoint Amphitheater Noise Impact Study, Irvine, CA
- Kaiser Permanente Construction Noise Study, Oakland, CA
- Saltworks Site EIR, Redwood City, CA
- Egbert Data Center EIR, San Francisco, CA
- Saranap Village EIR, Walnut Creek, CA
- Fresno General Plan Update and EIR, Fresno, CA
- Daly City General Plan Update and EIR, Daly City, CA

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### Education

California Polytechnic State University, San Luis Obispo, BS Mechanical Engineering

### Professional Registration

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Acoustical Society of America  
Institute of Noise Control Engineering



San Francisco | San Jose | Los Angeles | Honolulu | Seattle  
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Acoustics  
Audiovisual  
Telecommunications  
Security

# Appendix E

# San Diego Region Aggregate Supply Study

January 2011

**Submitted to:** Caltrans, District 11  
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San Diego, CA 92110

**Submitted by:** The SANDAG Service Bureau  
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## CHAPTER 7

### CASE STUDIES AND SCENARIOS—USING THE TOOLS

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One of the objectives of this study is to develop a geographic information system (GIS) mapping and analysis tool that could be used by other regions and local governments facing aggregate supply shortages. A standard GIS overlay tool offers a starting point to help local governments focus their efforts on potential aggregate supply areas. It is important to note that while GIS mapping and analysis provides an important baseline tool; it is understood that additional groundwork will be required for site-specific suitability and aggregate quality analysis. This chapter presents various ways of using the GIS tool. In all cases presented in this chapter, the user must go to the next level and examine local zoning and set back requirements, slope of available land, the presence of natural habitats and species, the economic viability of the site, and other local factors.

#### CONSIDERATIONS FOR USING FUTURE *TransNet* MITIGATION LANDS AS POTENTIAL SUPPLY OF AGGREGATE

The *TransNet* Extension Ordinance and Expenditure Plan, approved by the voters of the San Diego region in November 2004, includes the Environmental Mitigation Program (EMP), which provides funding to mitigate habitat impacts from regional transportation projects by directing transportation project mitigation land purchases to areas that are designated as open space preserves in the region's habitat conservation plans. The EMP includes a funding allocation for habitat acquisition to offset the direct impact on upland and wetland habitat from regional and local transportation projects. The early acquisition of land for multiple projects allows large blocks of land to be acquired in advance of the traditional, project-by-project mitigation. The funding allocation also includes management and monitoring activities to help implement the regional habitat conservation plans. The allocation is tied to mitigation requirements and the environmental clearance approval process for projects outlined in the Regional Transportation Plan (RTP).

All areas of the San Diego region have been included into one of four habitat conservation plans. The Multiple Species Conservation Program (MSCP) South was adopted in 1997, covering the southern portion of the region. The Multiple Habitat Conservation Program (MHCP), completed in 2003, covers the seven jurisdictions in the north coastal San Diego region. Two plans are being prepared in the unincorporated areas of the region: the MSCP North, covering the inland areas of northern San Diego County, and the MSCP East, which extends east to the San Diego/Imperial counties border. These habitat plans provide the policy framework that allows the jurisdictions to identify how their local land use authority will be used for the continued preservation of open space and natural resources in the San Diego region.

Under the *TransNet* EMP guidelines, SANDAG and California Department of Transportation (Caltrans) staff will pursue mitigation opportunities consistent with the strategies agreed to by SANDAG, Caltrans, U.S. Fish and Wildlife Service, and California Department of Fish and Game. Existing criteria for *TransNet* EMP mitigation are as follows:

- ▶ **RTP Mitigation:** The property will satisfy one or more RTP projects as identified in *TransNet* EMP memorandum of agreement (MOA). Mitigation opportunities to meet other RTP project and local street and road projects will be considered under the term of the MOA. Certain assurances by the environmental regulatory agencies will be met.
- ▶ **Jurisdictional Land Use Plans:** Use of the site as habitat mitigation/open space is consistent with the long-range land use and transportation policies of the local jurisdiction or the jurisdiction does not object to the site being purchased for mitigation.
- ▶ **Willing Seller:** Owner of the property is a willing seller with clear title to the property, and any hazardous material identified in a Phase I environmental site assessment has been evaluated and addressed.
- ▶ **Appraisal:** The property must be appraised by a qualified, licensed appraiser in accordance with established acquisition and appraisal standards, and the first written offer will reflect the fair market value of the property.
- ▶ **Promotes Natural Community Conservation Plan (NCCP):** The proposed mitigation will contribute to the success of the San Diego regional NCCP by acquiring and restoring unique habitat areas, key populations of endangered species, and lands adjacent to existing conserved habitat lands by promoting wildlife linkages with the goals of establishing mitigation ratios in subsequent agreements pursuant to the adopted habitat conservation plans.
- ▶ **Owner/Manager:** Perpetual ownership of the land has been identified, as well as a qualified land manager. The identified owner is willing to provide a conservation easement or deed restriction to SANDAG or Caltrans upon transfer of title that contains a reversionary clause back to SANDAG or Caltrans if the land is not being managed and monitored pursuant to a resource management plan acceptable to the wildlife agencies. SANDAG, Caltrans, and the land manager have agreed upon the annual cost to manage the land and the method for funding the annual management costs.

This study explored the use of future *TransNet* mitigation lands as potential supply of aggregate. A list of factors was developed to consider the possibility of aggregate supply as a secondary result when mitigation lands are purchased. Although the EMP program is specific to SANDAG and the San Diego region, the considerations are broad and could be used by other agencies engaged in purchasing mitigation lands.

SANDAG staff consulted with the expert review panel to understand the parameters that should be considered when evaluating secondary benefits of aggregate supply. The expert review panel included environmental resource agencies, such as the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service. Two scenarios were discussed during the expert review panel focus group meetings that included the above-mentioned agencies, as well as representatives from Caltrans, San Diego Endangered Habitats League, California Air Resources Board, and California Geological Survey. In addition, the scenarios were reviewed in separate focus groups of local suppliers of aggregate, importers/transporters of aggregate, and users of aggregate. Insight and feedback were used to develop a list of factors that could be used for considering opportunities to increase aggregate supply when purchasing mitigation lands through the SANDAG EMP.

When considering the purchase of a property for mitigation, SANDAG may wish to consider the following factors identified by the expert review panel to determine if there are opportunities for increasing the regional supply of aggregate as a secondary consideration when purchasing or restoring mitigation lands.

Under what conditions could this occur?

- ▶ **On a Case-by-Case Basis:** As SANDAG seeks opportunities to secure lands for conservation, it could consider if there is a potential for increasing the region’s supply of aggregate. Decisions would be case-sensitive.
- ▶ **Pristine or Disturbed Habitat Land:** Is the desired mitigation land considered to be “disturbed?” Disturbed in this sense means altered from its original or a naturally functioning condition. If so, the land may require restoration to return the land to a previously functioning state and in so doing, there may be possibilities for increasing aggregate supply in the restoration process. Questions to ask include:
  - Is the land in a natural state?
  - Does the land suffer from natural or human disturbance that limits environmental processes?
  - Would grading and/or removal of aggregate sand and gravel restore the area to previously functioning natural state?
  - Would grading and/or removal of aggregate sand and gravel on lands cause a negative environmental impact?
- ▶ **Project Purpose:** All elements of the project must be specified in the project purpose. Questions to ask include:
  - Does the project purpose specify restoration?
  - Is the aggregate extraction needed for the project?
- ▶ **Other Considerations:** Topography, geology, and other site-specific factors also must be considered, particularly the biological resources of the area. Related questions include:
  - What types of natural vegetation communities are present?
  - What plant species does the area support? Are they natural or exotic? Are they special status species (i.e., listed as threatened, endangered, candidate or of special concern by the federal government or State of California)?
  - What animal species does the area support? Are they native or nonnative? Are they special-status species?
  - Is the area a biological resource core area? Is it part of a regional linkage or corridor?
  - Are there jurisdictional wetland or nonwetland waters (i.e., within the jurisdiction of the U.S. Army Corps of Engineers)?
  - Are there vernal pools present?

Not all actions require mitigation. If the action has no adverse environmental impacts, no mitigation is necessary. Lands meeting the above-mentioned factors could be consistent with the *TransNet* EMP strategy, and the use of *TransNet* mitigation dollars for purchasing and/or restoring the land may be appropriate.

This topic was discussed in the expert review panel focus group meetings with local suppliers, users of aggregate, and importers and transporters of aggregate. An evaluation of the economic feasibility of the situation would need to be considered to determine if this could be a viable opportunity from the local mining operators' perspective. The focus group participants indicated that the following factors should be considered:

- ▶ **Quality of Materials:** Material to be extracted is either usable in the existing or a nearby project or suitable for sale. Materials used in state transportation projects must meet Caltrans' aggregate specifications.
- ▶ **Storage and Processing of Materials:** Materials could be processed and stockpiled at the site as transporting back to the mine could be cost prohibitive. The extraction of materials, if used in a state or local government project, could be subject to SMARA regulations and require the operation to be on the Assembly Bill 3098 list and meet the necessary provisions. This would be an important factor to consider as it could mean the operation may need a mining permit and an approved reclamation plan, which could be a time-consuming process.<sup>1</sup>
- ▶ **Long-Term Perspective:** The demand for aggregate is market driven, so a long-term perspective of at least ten years is needed.
- ▶ **Economical:** The situation would have to make sense economically for the mining operator. Proximity to local roadways and quality and marketability of materials should be taken into account.

Two hypothetical situations were discussed during the expert review panel focus groups to illustrate policy implications: a Riverbed Opportunistic Scenario and an Upland Opportunistic Scenario. It is important to note that the following discussion focuses on environmental considerations. An evaluation of the economic viability of the situation would need to be considered before any conclusions could be drawn.

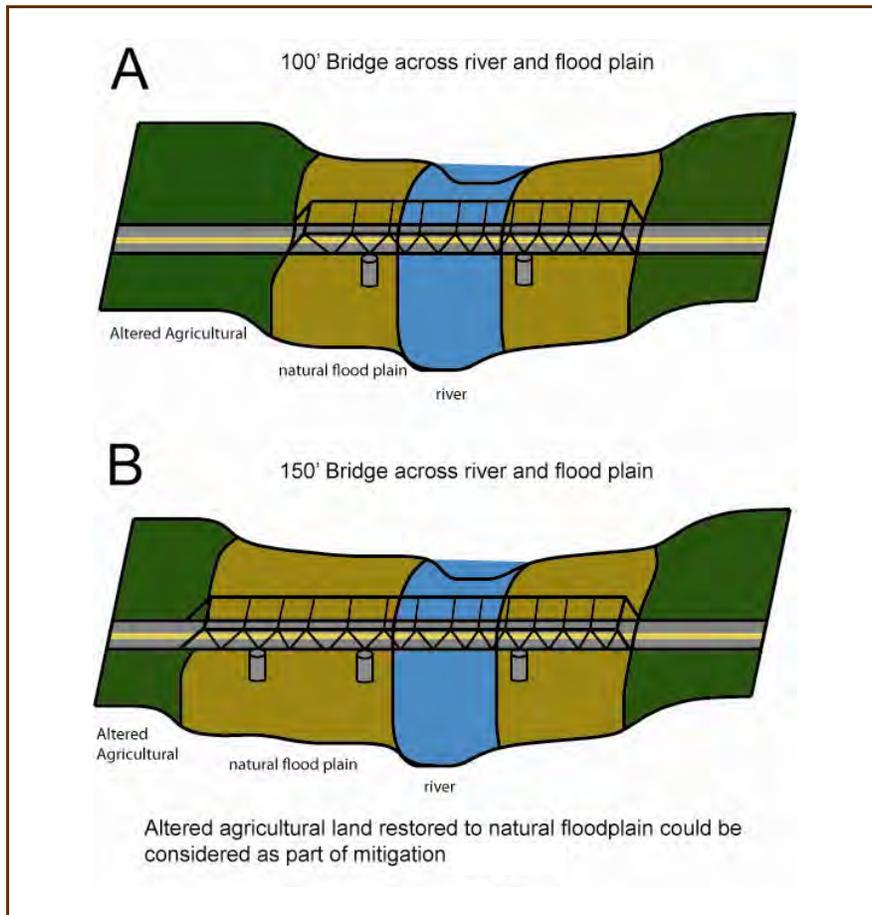
### Riverbed Opportunistic Scenario

The project purpose is to expand the bridge and restore the flood plain. The bridge spans a river and flood plain. Land surrounding the bridge has been altered by agricultural uses. In order to expand the bridge, the project requires some of the altered land to be removed. In addition, sediment is removed to restore the flood plain to a previous natural state. Aggregate materials could be used in the project and the surplus used to supplement regional supply.

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<sup>1</sup> Assembly Bill (AB) 3098 list includes all mining operations that are authorized to sell sand, gravel, aggregates or other mined materials to state or local agencies. Mining operations included on the list must have an approved reclamation plan and financial assurances (or an appeal pending with respect to the reclamation plan and financial assurances). The Department of Conservation, Office of Mine Reclamation publishes this list.

**Figure 7-1**  
**Riverbed Opportunistic Scenario**



Factors to consider when determining if there are opportunities for increasing the regional supply of aggregate as a secondary consideration when purchasing or restoring mitigation lands include:

► **Pristine or Disturbed Habitat Land**

- |   |   |  |
|---|---|--|
| 1. Is the land in a natural state?  | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| 2. Does the land suffer from natural or human disturbance that limits environmental processes?                              | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |
| 3. Would grading and/or removal of aggregate sand and gravel help restore the area to previously functioning natural state? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |
| 4. Would grading and/or removal of aggregate sand and gravel on the land cause an adverse environmental impact?             | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |

Project Purpose

- 1. Does the project purpose specify restoration?  Yes  No
- 2. Is the aggregate extraction needed for the project?  Yes  No

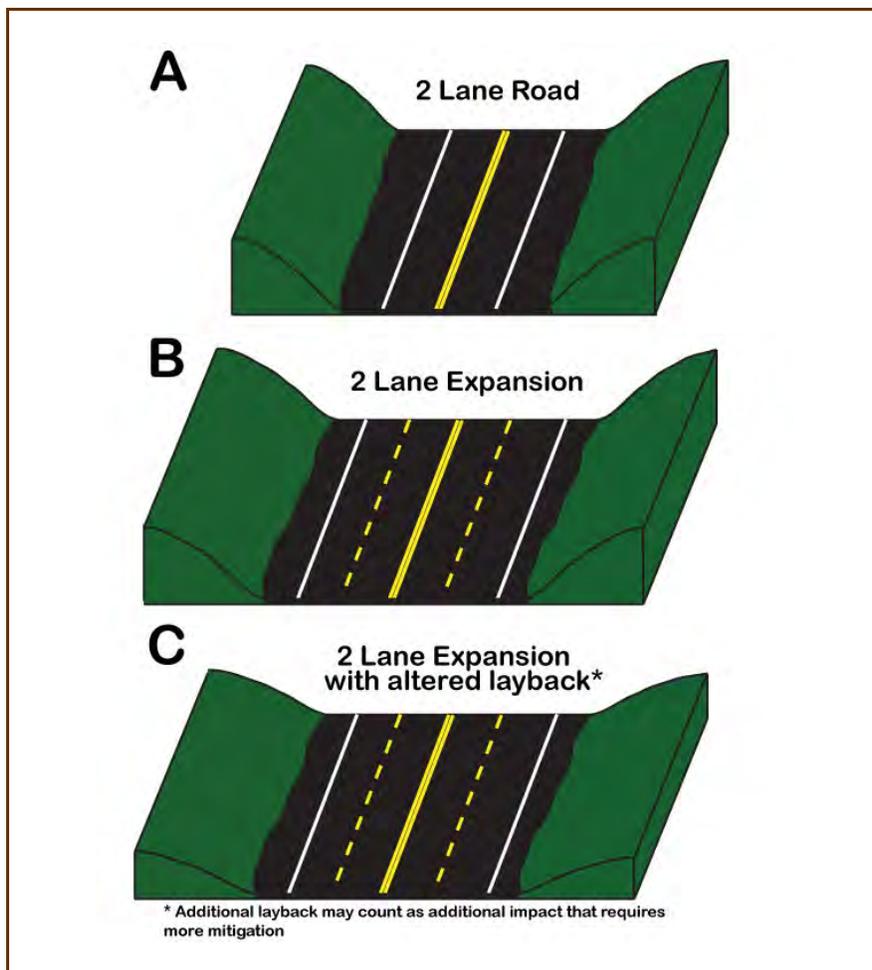
Biological Resources

- 1. Are sensitive species present?  Yes  No
- 2. Are the vegetation communities and/or geology known to support sensitive species?  Yes  No
- 3. Are vernal pools present?  Yes  No

**Upland Opportunistic Scenario**

The project purpose is to expand the freeway. The project is a two-lane expansion of a freeway (A) to freeway (B). One may want to lay back the slope even flatter (C) and use the aggregate in the project.

**Figure 7-2**  
**Upland Opportunistic Scenario**



Factors to consider when determining if there are opportunities for increasing the regional supply of aggregate as a secondary consideration when purchasing or restoring mitigation lands include:

▀ Pristine or Disturbed Habitat Land

- |   |   |  |
|---|---|--|
| 1. Is the land in a natural state?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |
| 2. Does the land suffer from natural or human disturbance that limits environmental processes?                              | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| 3. Would grading and/or removal of aggregate sand and gravel help restore the area to previously functioning natural state? | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| 4. Would grading and/or removal of aggregate sand and gravel on lands cause a negative environmental impact?                | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |

▀ Project Purpose

- |  |                              |  |
|--|------------------------------|--|
| 1. Does the project purpose specify restoration?       | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 2. Is the aggregate extraction needed for the project? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |

▀ Biological Resources

- |  |                              |  |
|--|------------------------------|--|
| 1. Are sensitive species present?  | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 2. Are the vegetation communities and/or geology known to support sensitive species? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 3. Are vernal pools present?   | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 4. Are there jurisdictional wetland or non-wetland waters?                           | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |

### Discussion of Scenarios

In the Riverbed Opportunistic Scenario, the project requires the removal of some agricultural land. The aggregate materials extracted would be used in the bridge expansion project, and grading/dredging for the project would result in helping to restore the area to its previously functioning state as a flood plain. The Clean Water Act, National Environmental Policy Act, and California Environmental Quality Act (CEQA) require that potential adverse environmental impacts be avoided, minimized, or mitigated (in that order). In this case, the impact would be positive so the expansion of the bridge would not require additional mitigation.

In the Upland Opportunistic Scenario, the project purpose does not specify additional grading for layback in a pristine area. The additional layback to the slope to obtain more aggregate would be considered an additional impact requiring mitigation.

Expert review panel representatives suggested that if the project purpose specified freeway expansion and provided aggregate to supplement the regional supply and if the extra layback would be the least environmentally damaging alternative for obtaining aggregate (compared to transporting aggregate from another location, for example), and would be in the public's best interest, then the project could potentially proceed. These decisions would need to be determined on a case-by-case basis.

The above-mentioned factors could be considered when evaluating aggregate supply possibilities when purchasing mitigation lands; however, the economic viability from the operator standpoint should be taken into consideration as well.

### **CASE STUDY: USING GIS TOOLS TO IDENTIFY FUTURE *TransNet* MITIGATION LANDS AS POTENTIAL SUPPLY OF AGGREGATE**

According to the Department of Conservation, the highest-priced aggregate in California is in the San Diego area where portland cement concrete (PCC)-grade sand is in very short supply.<sup>2</sup> So there is a need to identify sources of aggregate sand. This study explores an opportunity for linking an existing effort, such as buying and restoring of mitigation lands as in the *TransNet* EMP, with efforts to identify potential areas for aggregate sand. Although the *TransNet* EMP is specific to the San Diego region, the approach used in the case study can be repeated in other California regions to test similar scenarios.

Figure 7-3 illustrates the flowchart outlining the case-study approach. The case study builds on the GIS standard overlay analysis. It uses the GIS overlay model to identify areas that may be suitable for mitigation lands and that also may be suitable for sand extraction if needed as part of a restoration process. The GIS layers and filters used in the case study area:

- ▶ Include California Geologic Survey mineral resource zone (MRZ) areas MRZ-2 and MRZ-3, plus correlated MRZ areas for zones 2 and 3 developed in this study (explanation below);
- ▶ Include all lands inside the designated preserve area;
- ▶ Include all lands outside the designated preserve area;
- ▶ Exclude developed lands; and
- ▶ Exclude military and tribal lands as purchase of these lands is not permitted under the EMP.

Designated preserve areas are areas that have been identified for open space conservation by local jurisdictions and wildlife agencies in habitat conservation plans. The lands are not yet conserved. Conserved lands are areas that already have been conserved for open space conservation by local jurisdictions and wildlife agencies in habitat conservation plans.

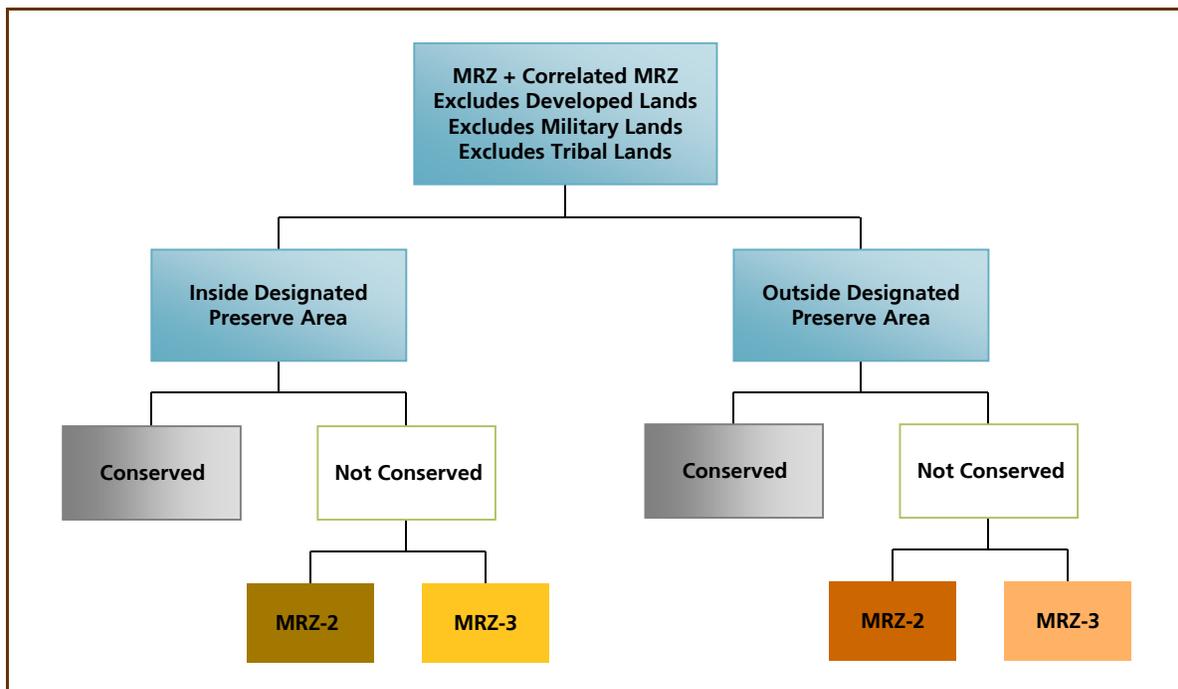
MRZ-2 and MRZ-3 lands are classified by the California Department of Conservation. MRZ-2 areas are those where geologic information indicates that significant mineral deposits are present or where it is judged that there is high likelihood for their presence. These areas typically have data from an old or existing mine or from drill holes to determine if the area is of regional or statewide significance in terms of supplying the market. MRZ-3 areas contain mineral deposits, but the significance to the region or the state cannot be evaluated due to the lack of data.

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<sup>2</sup> California Department of Conservation, California Geological Survey. (2006). Map Sheet 52: Aggregate Availability in California, p. 14.

Another filter used in this case study is referred to as correlated MRZ-2 and correlated MRZ-3. Correlated areas have similar rock type as included in the Department of Conservation’s MRZ-2 and MRZ-3. They were developed through this study with the assistance of geologists at the Scripps Institution of Oceanography. The areas are based on similar geology types as identified in available United States Geological Survey 7.5-minute quadrangle geologic maps for the San Diego region and correlated to similar rock types identified as MRZ-2 and MRZ-3 by the Department of Conservation. See Appendix C for a detailed explanation and associated maps.

**Figure 7-3  
Case Study Flowchart**



Conserved lands have certain restrictions due to the title of ownership and, therefore, were not considered in the final steps of the case study.

Figure 7-4 illustrates the result of these GIS layers and filters. The map includes MRZ-2 and MRZ-3 lands that are either inside or outside the designated preserve areas. (Conserved areas are not included.) Three areas, outlined in red, show a concentration of MRZ-2 lands. These areas may represent opportunities for combining the purchase and restoration of mitigation lands and secondary benefits of aggregate sand extraction.

It is important to understand the results presented in Figure 7-4 are based solely on a GIS overlay analysis. Evaluating the opportunities and constraints of restoring the mitigation lands and possibly extracting aggregate requires additional research and local knowledge of the geography, habitat, and political considerations of the areas.

For instance, the southern-most circled area on the map in Figure 7-4 has a concentration of MRZ-2 lands. Several active mines are located in the circled area along State Route 67 including, Channel Road, Lakeside Sand Pit, Slaughterhouse Canyon, TTT Quarry, Vigilante Quarry, and Ennis. This case study is focused on restoration and sand extraction. Several of the mines listed above are rock quarries and do not supply natural fine aggregates from alluvial riverbeds. Channel Road does produce PCC-grade sand; however, industry reports show it is scheduled to close around 2014. Reports by the Department of Conservation also have listed Ennis and Lakeside Sand to be located on land with geology suitable for producing PCC-grade sand. Also located within the circled area is El Monte Valley, which is the location of a proposed mining, reclamation, and groundwater recharge project by the Helix Water District. The district is pursuing a new, permanent water supply source by augmenting water in the El Monte Valley underground basin with highly purified, recycled water. The district is studying various options, including a sand mining component to offset costs of the project and restore critical habitat and enhance recreational activity.

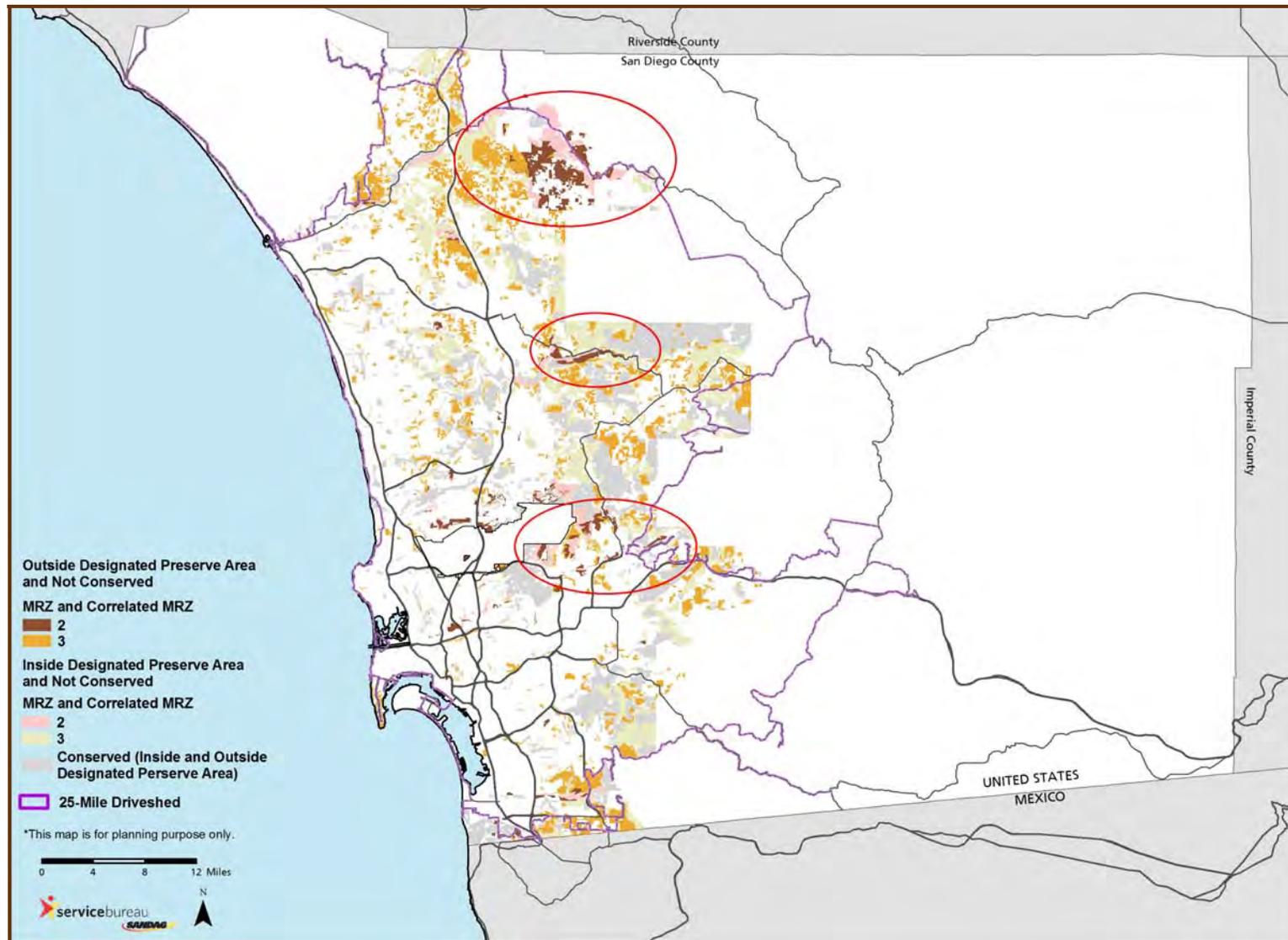
It is important to note that although this particular case study is focused on restoration and secondary benefits of sand mining, there are several mines located in the area, and since environmental agencies have indicated that potential environmental impacts may be less for expansion of an existing mine versus establishing a new mine, it may prove to be worth the effort to explore opportunities for increasing sources of aggregate by expanding the size of existing quarries in areas that already are known for mining activities. The existing mines are on lands designated as MRZ-2 areas, so these potential mineral resources lands should be recognized and considered in San Diego County's land use planning process.

The smallest circle on the map, east of Interstate 15, is San Pasqual Valley. Some of the land is inside the preserve and some outside the preserve, and both contain lands classified as MRZ-2. This area runs along the San Dieguito River and, potentially, it could be used as wetlands mitigation if it were to be restored. Restoration of this area may require the removal of sand and, therefore, may present opportunities for realizing a secondary benefit of a sand-supply aggregate. This site would be worth additional research to determine its full potential. One active mine is located within the circled area (Inland Valley Materials), but it is a rock quarry and not a source for natural sand.

The circled area farthest north on the map is the San Luis Rey River. Some of the land is inside the preserve and some outside the preserve, and both contain lands classified as MRZ-2. Some land surrounding the area is owned by tribal governments. This area used to have several active sand mines, but virtually all were close during the early 1990s. One active mine opened recently in the general area (Rosemary's Mountain), but it is a rock quarry and not a source for natural sand.

The idea in this case study is to explore opportunities for linking existing efforts such as buying and restoring mitigation lands as in the *TransNet* Program, with efforts to identify potential areas for aggregate sand. The GIS overlay analysis in the case study helps focus the user to identify areas that may be suitable for mitigation and also have a potential for aggregate sources. But the GIS model approach cannot answer all questions. Further research beyond the scope of this study is needed to determine the full potential of these areas. Research should include field studies, local knowledge of the area, soil sampling to determine grain size and quality of sand, environmental species and habitat constraints, and other project constraints, to name a few. In addition, the quality and marketability of the aggregate must be factored into the evaluation to ensure a successful match.

Figure 7-4  
Potential Areas for Mitigation and Aggregate Supply



## SCENARIOS FOR USING THE TOOLS FOR POLICY-MAKING CONSIDERATIONS

Opening a new aggregate operation is a complicated process that can cost millions of dollars and take many years. Aggregate producers invest a great deal of time and money locating potential aggregate resources and determining the quantity and quality of the aggregate, the feasibility of production, identifying potential environmental impacts, obtaining necessary permits, and conforming to relevant laws. Preliminary GIS investigations might identify potential areas at a high level, but field reconnaissance studies, sampling, and other exploration are often employed to help define the opportunities and the limitations of the potential sources of aggregate.

These considerations are important in making land use decisions as well. The GIS overlay analysis tool can be used as a starting point to evaluate different options for local land use planning scenarios. A couple of scenarios are presented in this chapter to illustrate how the tool could be used. The following maps explore various assumptions about the size of available lands for a mining operation, mitigation of adverse impacts such as noise, and proximity to infrastructure.

### Variation in Acreage of Available Land

In identifying potential available lands for aggregate, this study relied on the assumption that a minimum of 20 acres is needed to accommodate a mine. This assumption was used throughout the study in order to keep the largest number of options open to policy makers. According to several experts in the field, while 20-acre mines do exist, a more ideal size for a mining operation is more likely to be in the 40- to 60-acre range or 100-acre or greater range. These experts commented that often a large acreage is needed to accommodate required set-asides for mitigation purposes and to be sure the site will be economically viable. (The San Diego region has mining sites at various acre sizes, from about 20 acres to more than 500 acres. The average acreage for active mining sites in the San Diego region is 150 acres, including undisturbed lands and setbacks.)

For the purpose of illustrating how the GIS tool could be used, several maps showing variation in acreage are illustrated. Figure 7-5 shows the potential aggregate supply sites for areas 20 acres or greater. Figure 7-6 illustrates the potential lands for areas 60 acres or greater. Figure 7-7 is based on the idea of a super operation, where a limited number of large sites serve as the suppliers for the entire region. The minimum number of acres for this super operation is 100. Several scenarios were run for these three sizes (20 acres, 60 acres, and 100 acres).

These potential aggregate supply sites, referred to as available lands on the figures, are areas that are not developed and have not been conserved for environmental reasons nor identified for conservation at a 90-percent level.

Figure 7-5  
Available Land (20 acres or greater)

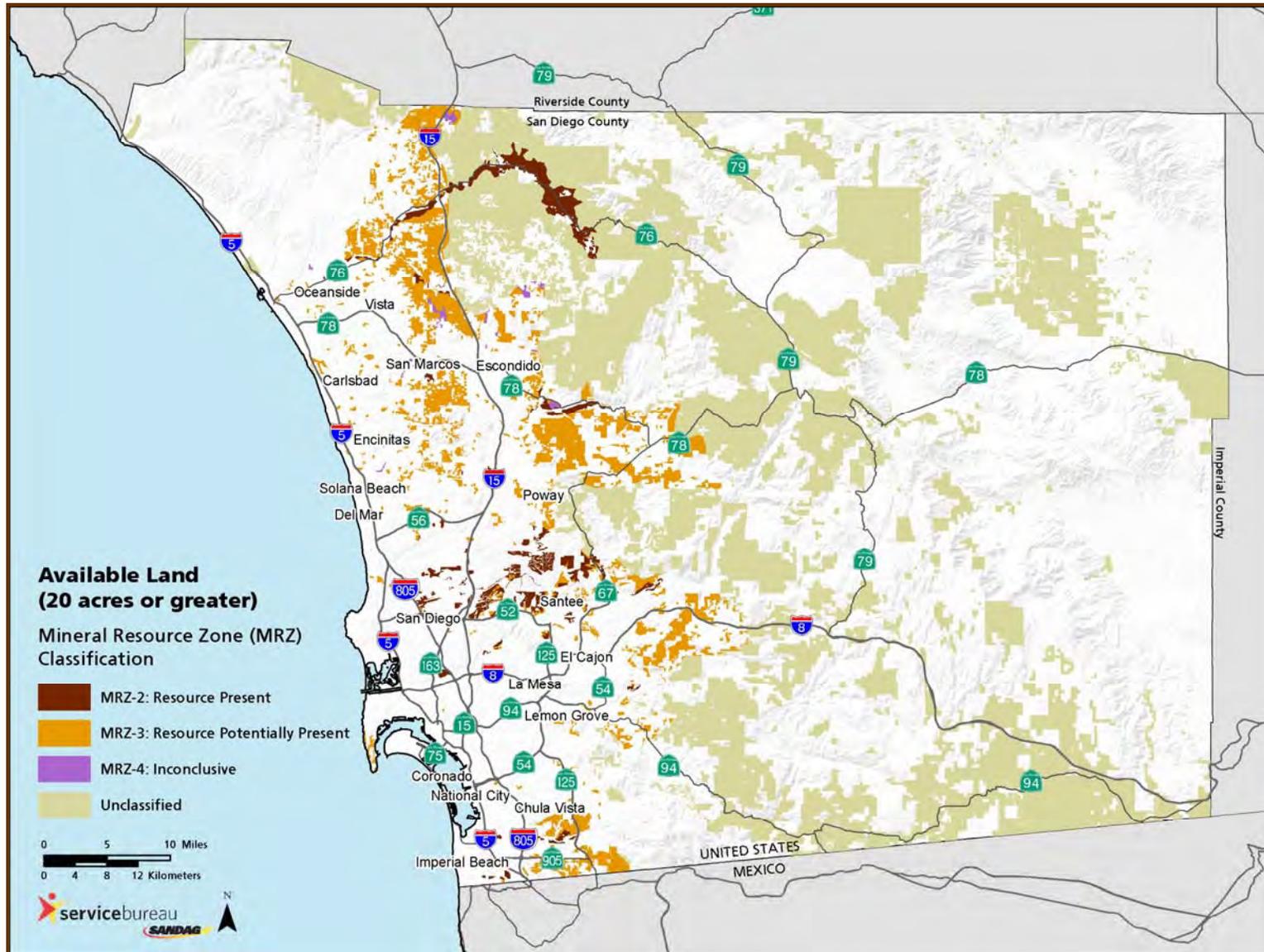


Figure 7-6  
Available Land (60 acres or greater)

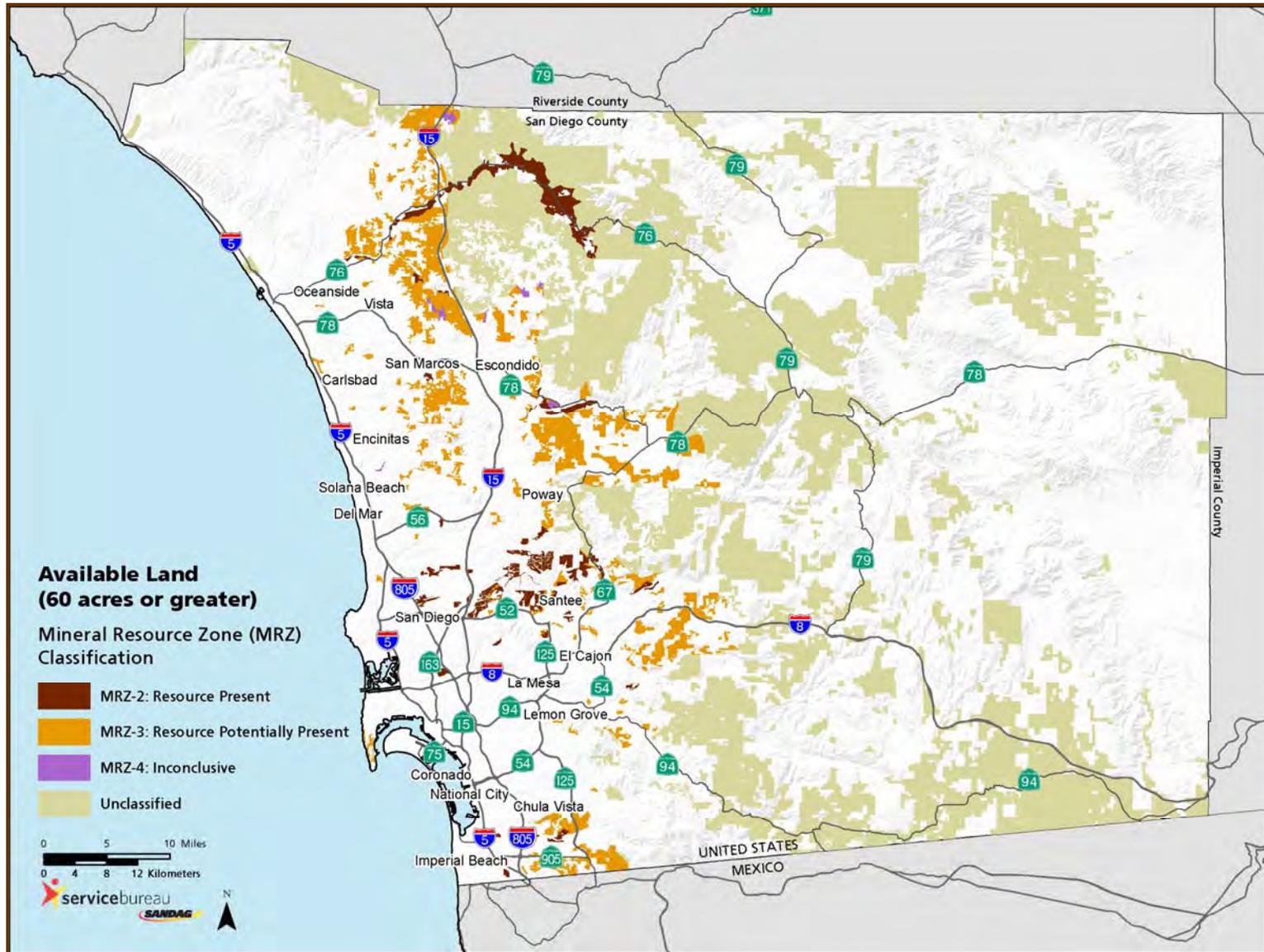
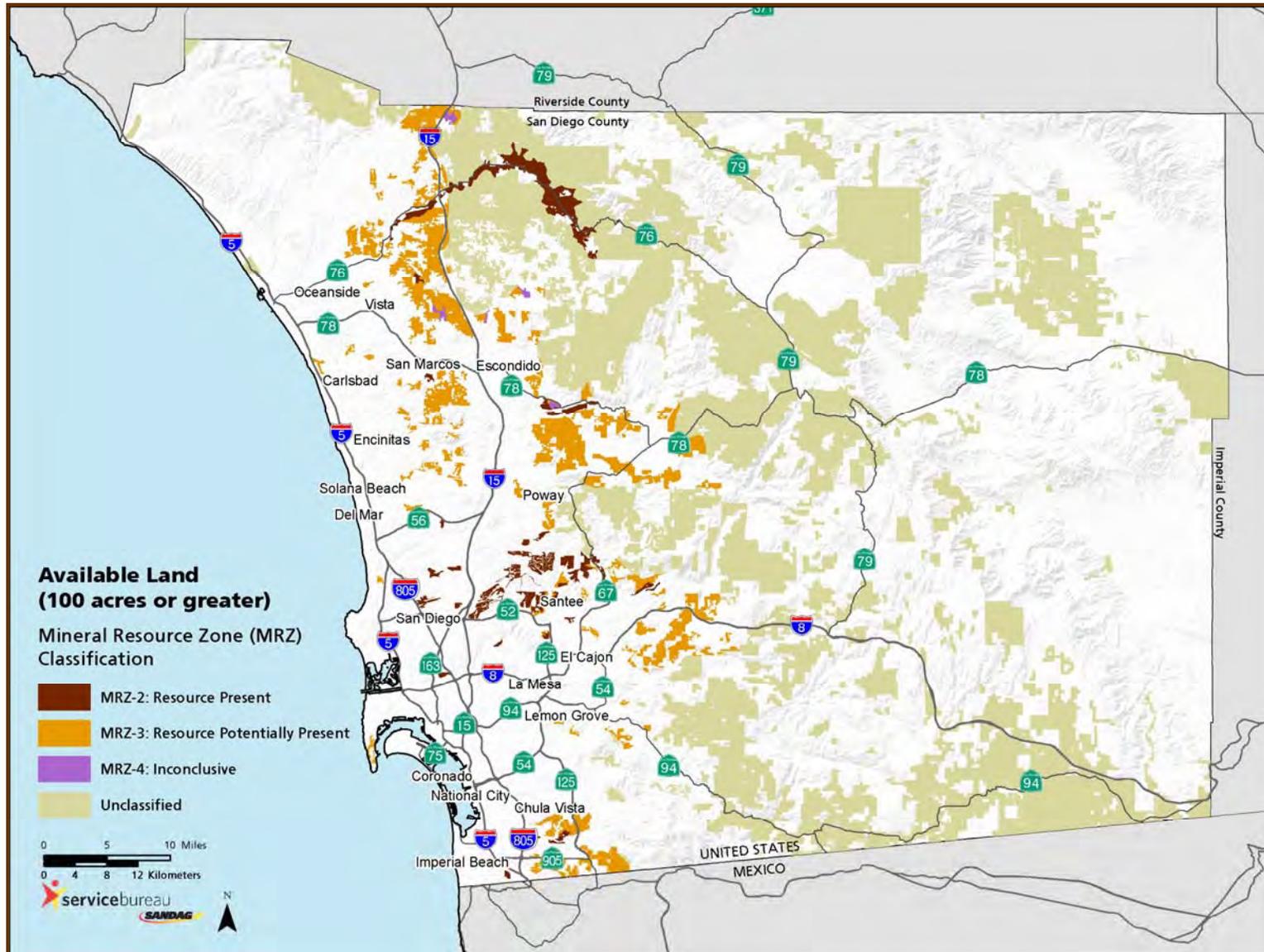


Figure 7-7  
Available Land (100 acres or greater)



## Proximity to Existing Residential Land Uses

In addition to other factors for locating a mining operation, proximity to certain land uses also plays a role. Zoning statutes or CEQA requirements could cite setbacks from residential areas to mitigate undesirable byproducts of the aggregate extraction process. Setback requirements will likely vary across jurisdictions. A 1,300-foot setback from residential areas is considered in the County of San Diego's mineral resource evaluation methodology guidelines to mitigate noise.<sup>3</sup> To illustrate different scenarios, the blanket 1,300-foot setback was applied from all residential land uses, including low-density, (less than 1 dwelling unit per 10 acres) rural, single-family areas. While these rural single-family areas are included in the potential aggregate sites inventory, when introducing the setback idea, it was determined that it should be applied from these areas as any effort to site a mine would have to address noise concerns of residents. It should be noted that the 1,300-foot setback is not an absolute requirement, and proper mitigation would be decided on a site-by-site basis. Other mitigation factors, such as topography, noise-reduction technology, or landscape design, could be used in place of setbacks, depending on the site. The 1,300-foot setback in this assumption is used to highlight areas where mitigation of impacts to local residents would be less of a concern and, therefore, potentially easier to locate a mining operation.

The following scenarios illustrate the remaining number of potential aggregate sites after a 1,300-foot setback from existing residential land uses is applied. Figure 7-8 illustrates those areas with 20 or more remaining (effective) acres after the 1,300-foot setback is applied. For this analysis, the map continued to show the entire potential aggregate site unless the encroachment from the 1,300-foot setback resulted in a potential aggregate site being reduced to less than 20 acres. The idea was that with 20 acres or greater, there may be options for locating the mining operation where impacts to local residents would be less of a concern. This same technique was used in preparing the related maps for 60 or more acres and 100 or more acres. Potential aggregate sites with 60 or more effective acres are shown in Figure 7-9, and potential sites with 100 or more effective acres are shown in Figure 7-10.

These potential aggregate supply sites, referred to as available lands on the figures, are areas that are not developed and have not been conserved for environmental reasons or identified for conservation at a 90-percent level.

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<sup>3</sup> County of San Diego, Department of Planning and Land Use, Department of Public Works. (2007). County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements: Mineral Resources.

Figure 7-8  
Available Land (20 acres or greater after 1300' setback from existing residential land)

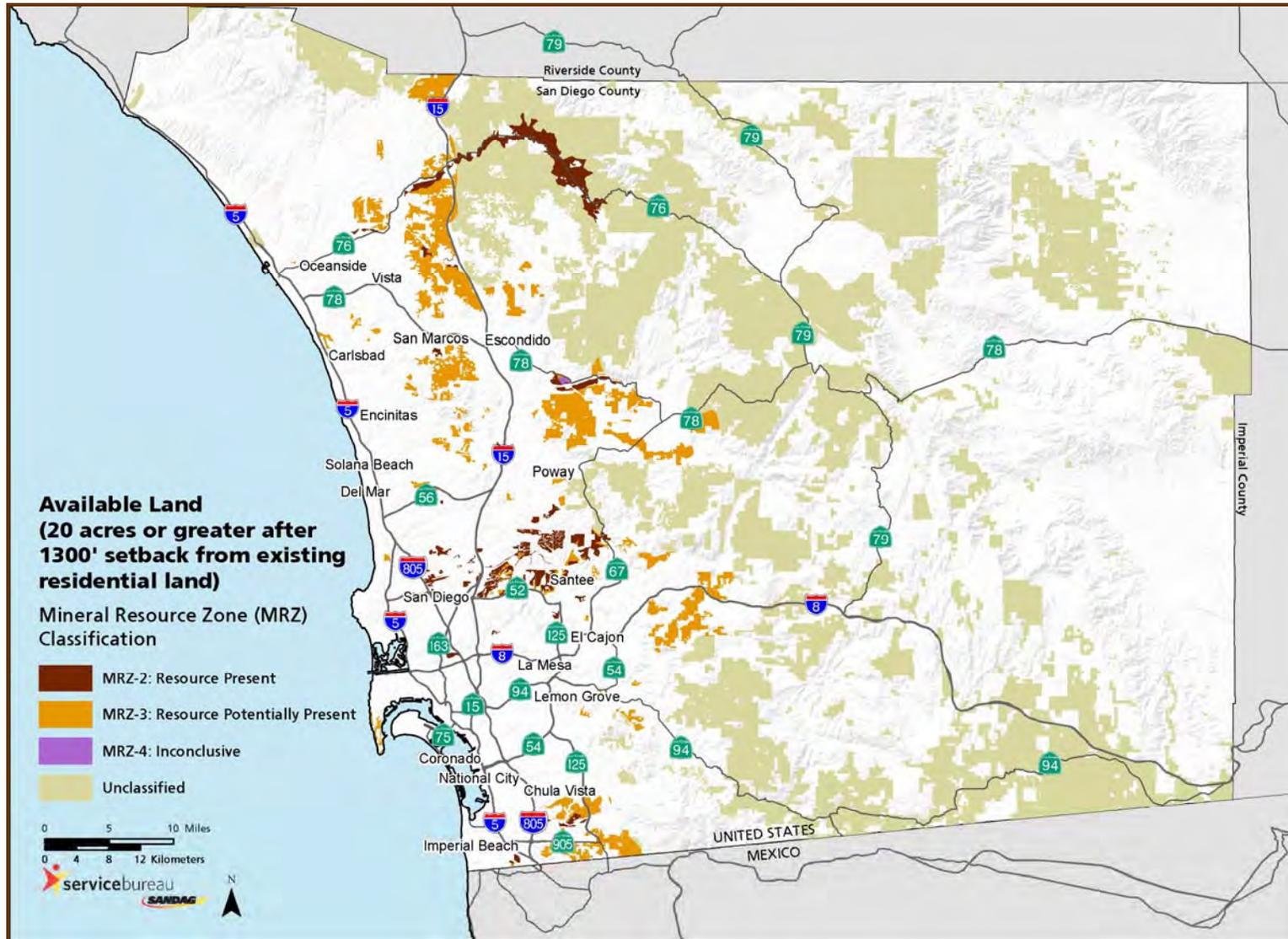
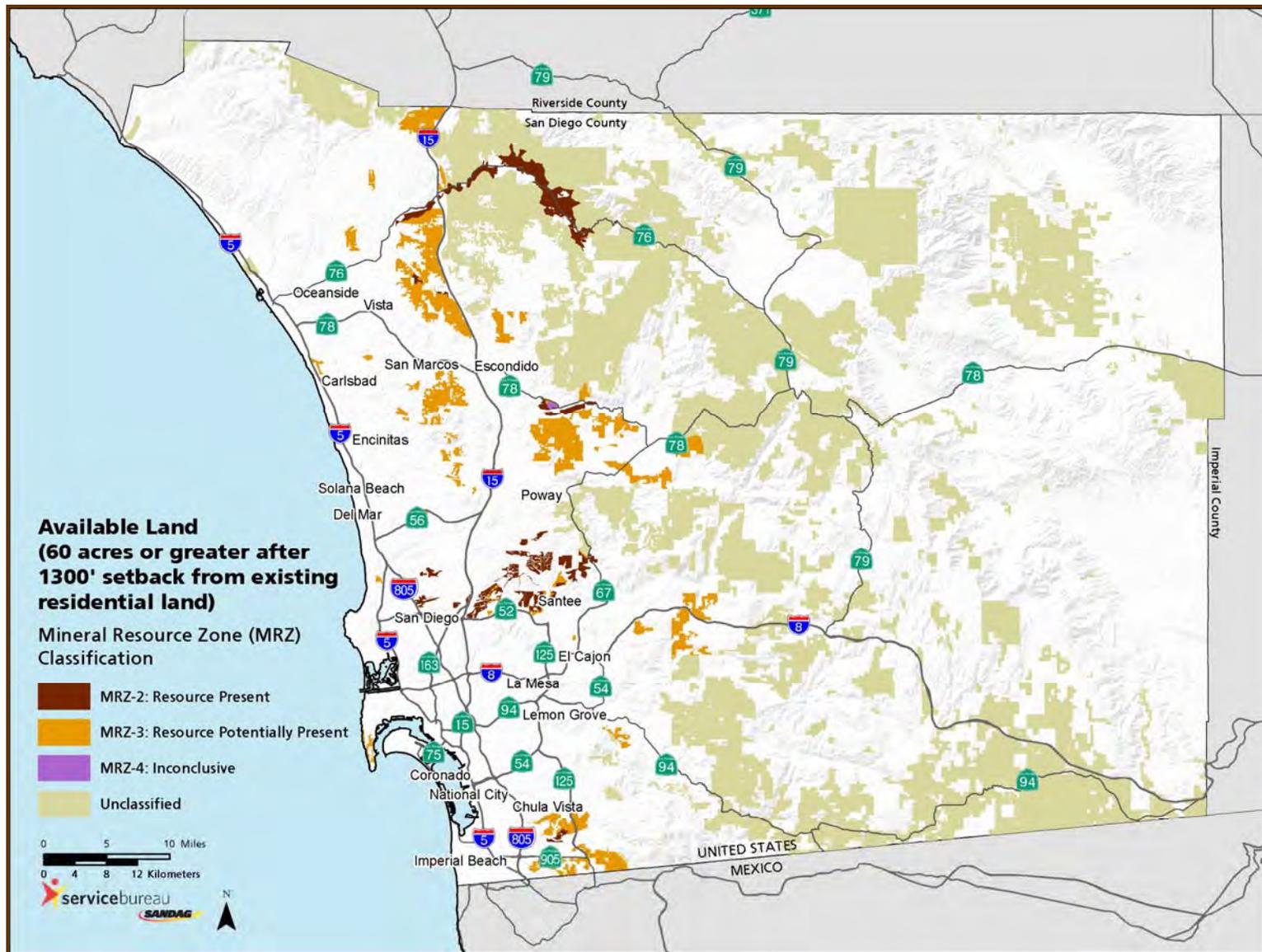
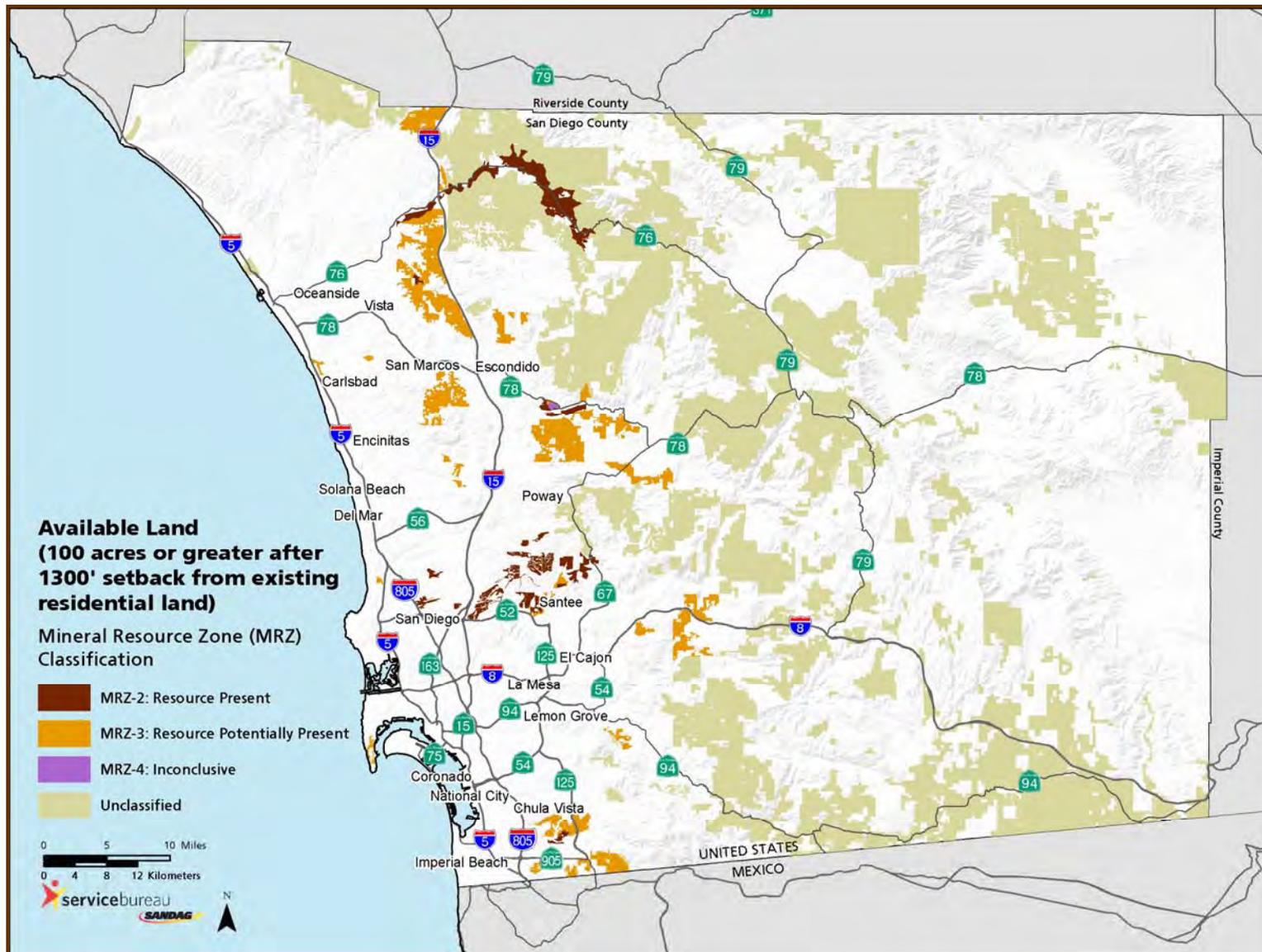


Figure 7-9  
Available Land (60 acres or greater after 1300' setback from existing residential land)



**Figure 7-10**  
**Available Land (100 acres or greater after 1300' setback from existing residential land)**



### **Proximity to 2050 Planned Residential Land Uses**

The process was then repeated based on planned 2050 residential land uses. For this assumption a blanket 1,300-foot setback was applied from all planned residential land uses in 2050. Figure 7-11 illustrates those areas with 20 or more remaining (effective) acres after the 1,300-foot setback is applied. Potential sites with 60 or more effective acres are shown in Figure 7-12, and potential aggregate sites with 100 or more effective acres are shown in Figure 7-13.

Although detailed information about existing residential land use on tribal reservations is included in the SANDAG land use database and has been validated through aerial imagery, the same level of detail is not available for planned residential land use on the tribal reservations. Planned land use is coded as “tribal reservations” and does not include the detailed information about location of residential units. Therefore, the maps likely show more land as potential aggregate sites than actually exists.

These potential aggregate supply sites, referred to as available lands on the figures, are areas that are not developed and have not been conserved for environmental reasons or identified for conservation at a 90-percent level.

Figure 7-11  
Available Land (20 acres or greater after 1300' setback from 2050 planned residential land)

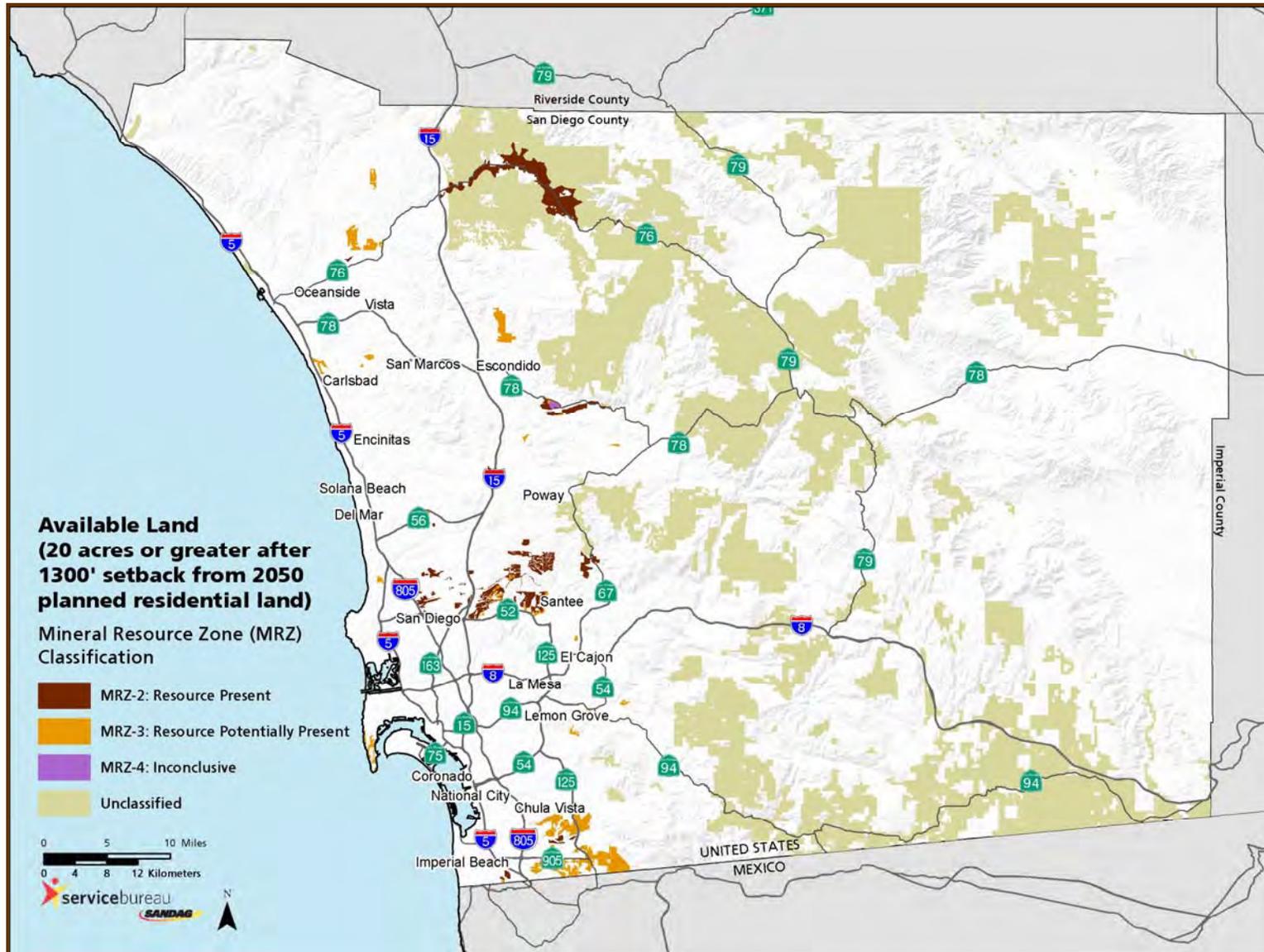
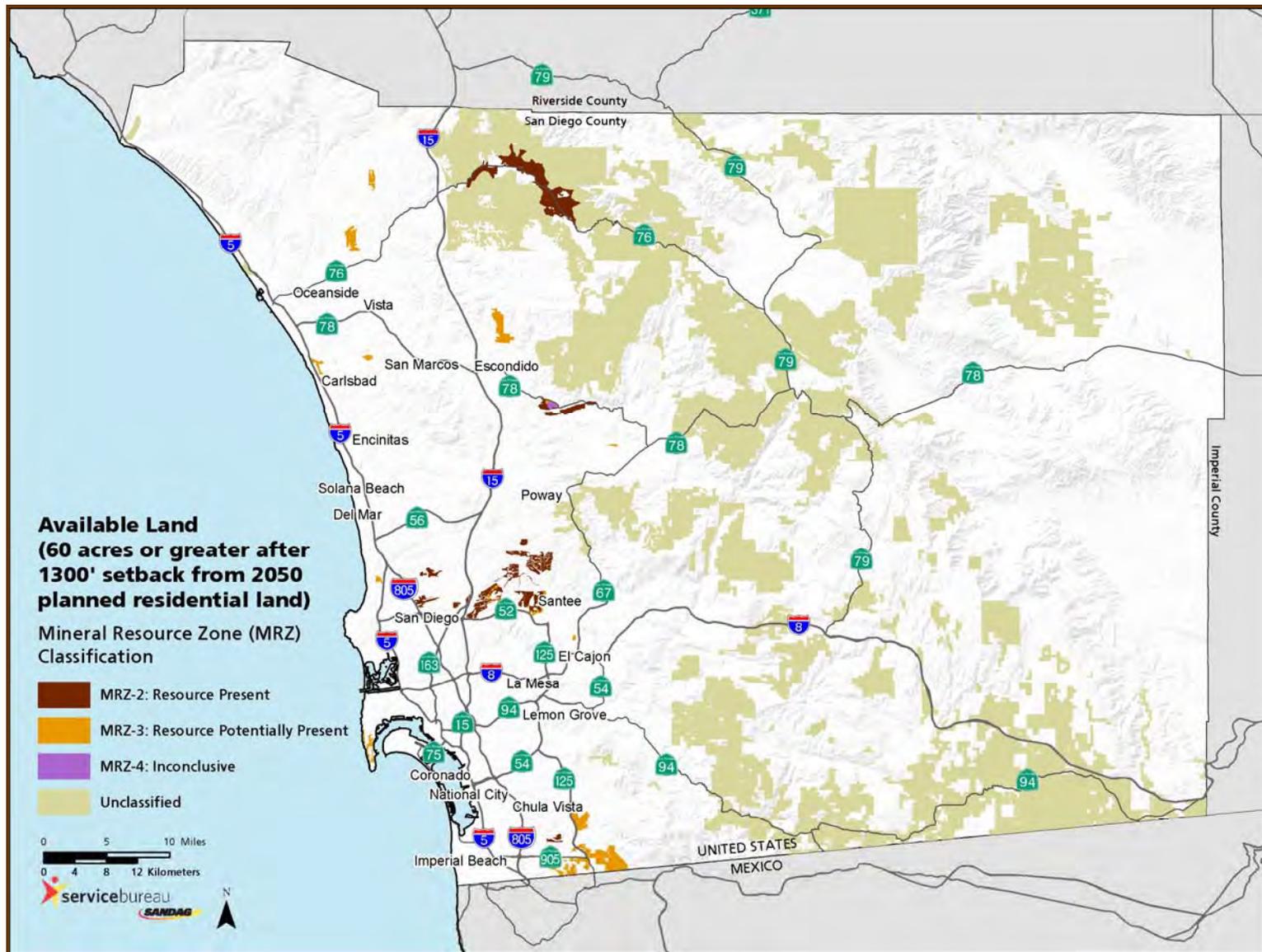
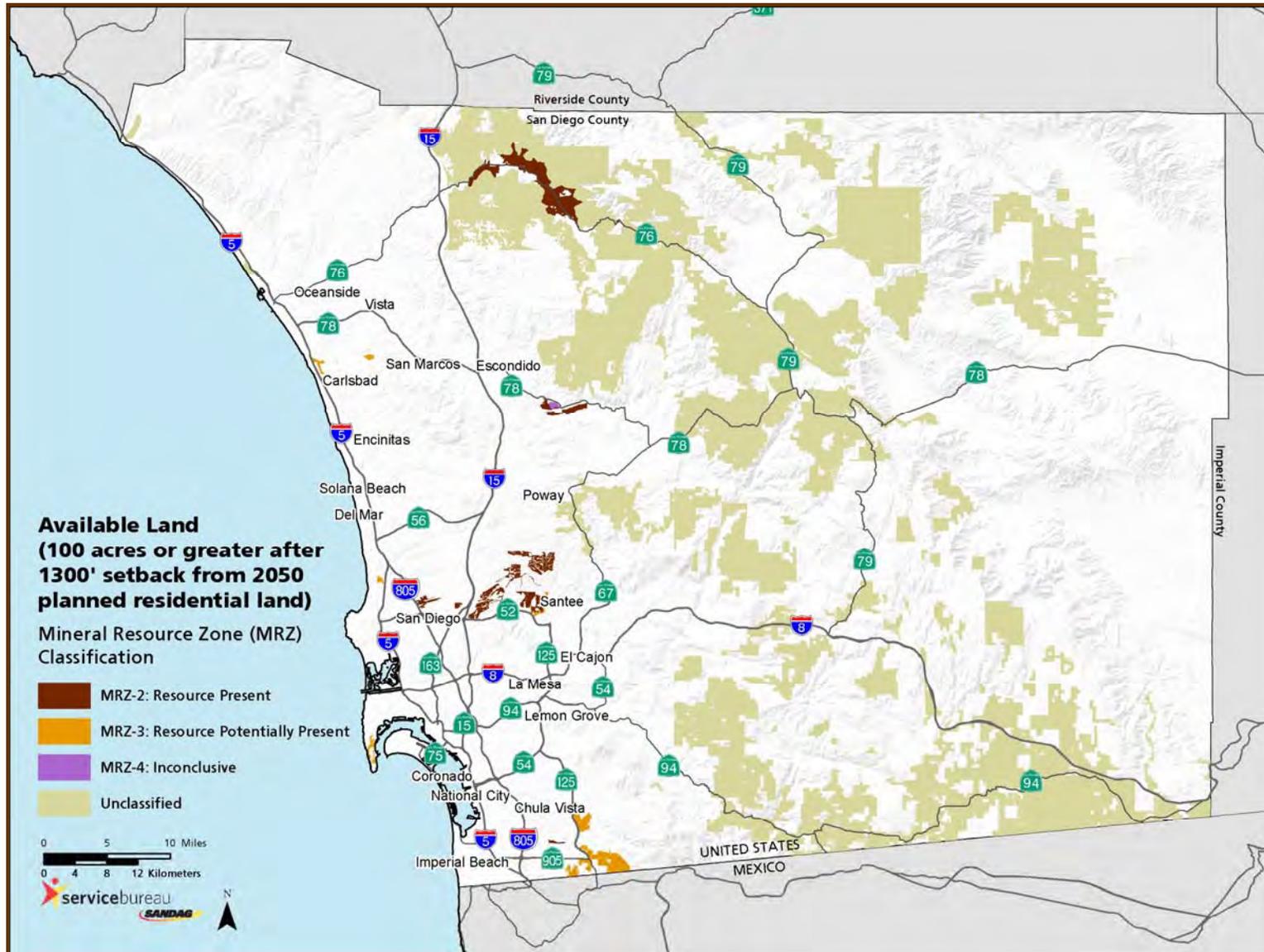


Figure 7-12  
Available Land (60 acres or greater after 1300' setback from 2050 planned residential land)



**Figure 7-13**  
**Available Land (100 acres or greater after 1300' setback from 2050 planned residential land)**



## Summary Residential Land Use Scenarios

Table 7-1 summarizes the number of available lands before and after the 1,300-foot setback based on existing and planned residential land use. This GIS exercise uses a blanket setback of 1,300 feet. Actual setback requirements vary by jurisdiction and by the specific circumstances surrounding the mine. Nonetheless, the results are revealing. The total number of available lands is reduced from 1,159 potential aggregate sites to 234 sites with the 2050 planned residential land use setback. It is important to remember that potential sites are defined as areas that are not developed and that have not been conserved for environmental reasons or identified for conservation at a 90-percent level. Mineral resource classification has not been identified for many of these lands. The potential suitability of the sites for construction aggregate will need to be evaluated on a case-by-case basis.

This exercise demonstrates how the GIS overlay tool could be used to explore scenarios. From a long-term planning perspective, it is important to consider the 2050 land use plans and the location of mineral resources, which supply the aggregate needed to build the infrastructure. Planning decisions that do not take this into account could result in costly alternatives of importing aggregate from outside or pushing aggregate mines farther east, resulting in higher transportation and environmental costs and translating into higher construction costs.

Future housing and investment in essential infrastructure, such as new and improved roads, rail links, hospitals, schools, airport facilities, and water and sewage facilities, all require aggregate. Opportunities for effective planning today will help address the availability of construction aggregate required to meet the region’s needs in the future.

**Table 7-1**  
**Number of Available Lands by Size Before and After Setback**

Size (Acreage)	No Setback	Existing Land Use 1300' Setback	2050 Land Use 1300' Setback
20 to 59	606	223	92
60 to 99	163	76	44
100 to 499	279	154	63
500 to 999	50	30	15
1,000 to 9,999	47	26	18
10,000 to 15,000	14	3	2
<b>Total</b>	<b>1,159</b>	<b>512</b>	<b>234</b>

## GIS LAYERS WITH JURISDICTIONAL BOUNDARIES

Other standard GIS layers could be added to visualize different scenarios. The following maps repeat maps showing potential aggregate supply sites at the 20-, 60-, and 100-acre sizes, but in these maps, the overlay of municipal and tribal boundaries is included. As shown in Figures 7-14, 7-15, and 7-16, the majority of available aggregate sites fall within the unincorporated areas of the region.<sup>4</sup>

<sup>4</sup> At the September 21, 2010 Board meeting, the Southern California Tribal Chairmen’s Association approved including boundaries of Federally Recognized Indian Reservations on maps.

Figure 7-14  
Available Land With Jurisdictional Boundaries (20 acres or greater)

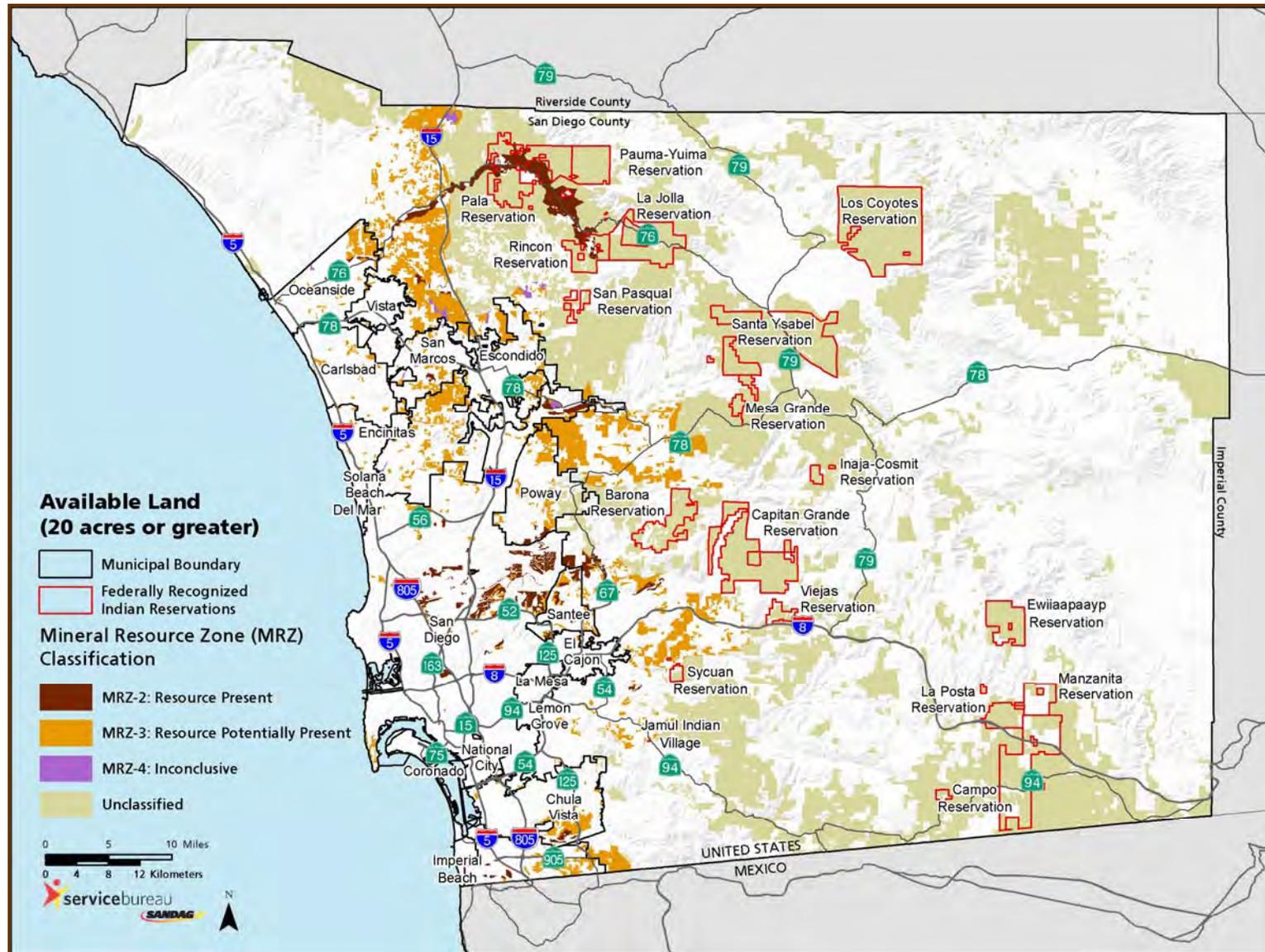


Figure 7-15  
Available Land With Jurisdictional Boundaries (60 acres or greater)

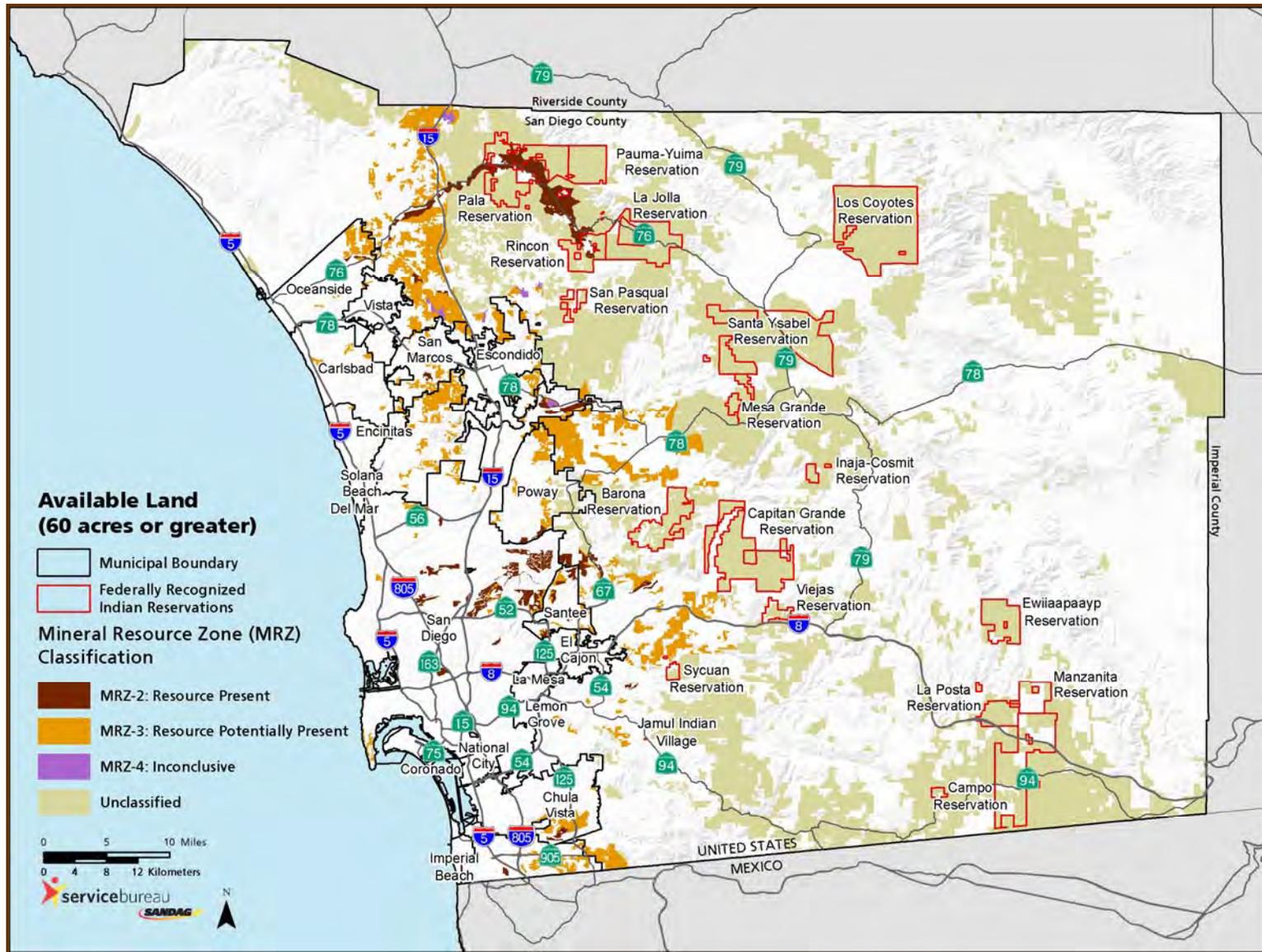
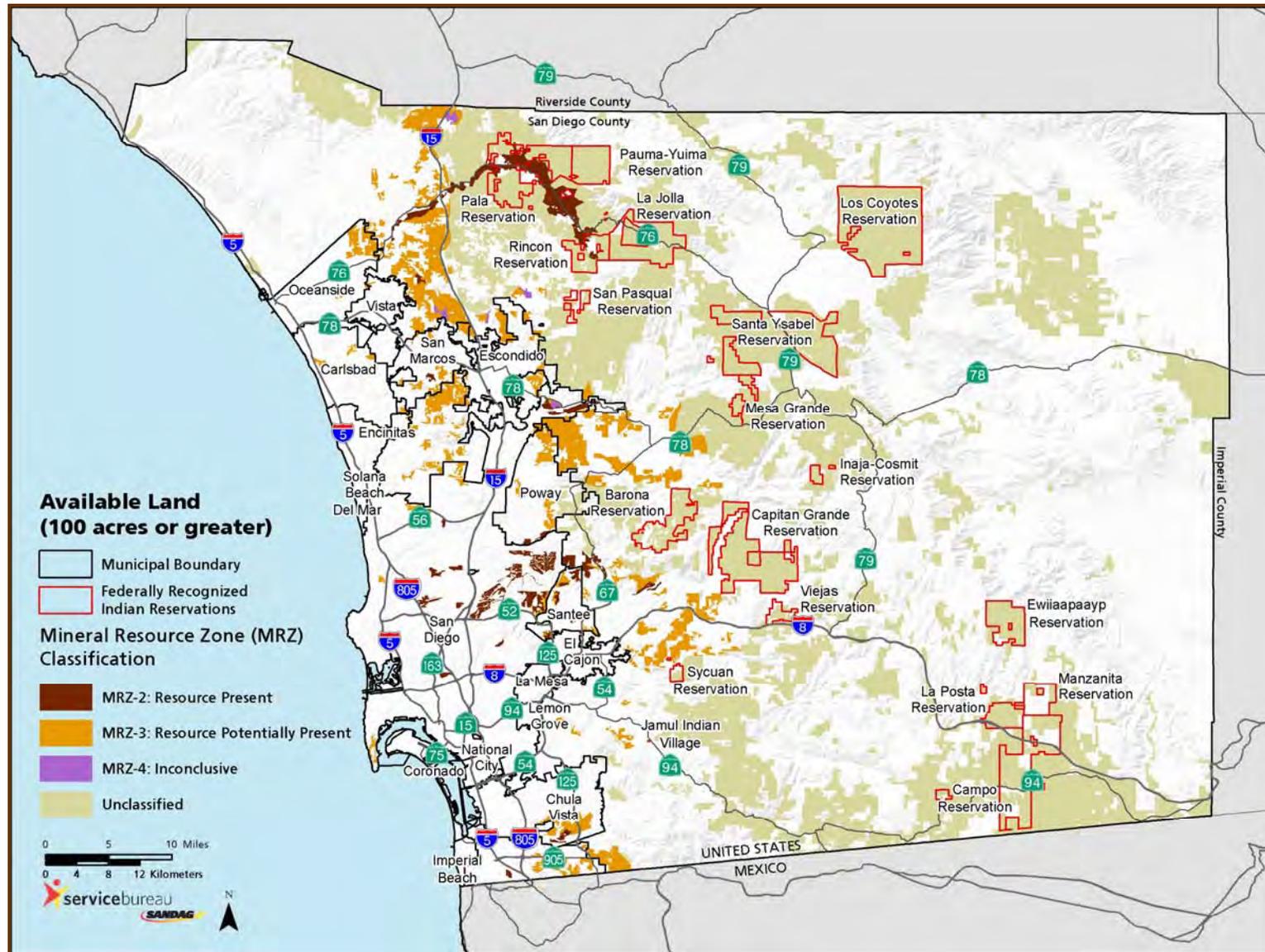


Figure 7-16  
Available Land With Jurisdictional Boundaries (100 acres or greater)



## RAIL DISTRIBUTION CENTER

An important element to consider when exploring aggregate supply is the viability of importing aggregate materials into the region. When using the GIS tools to look at aggregate supply options, one topic to consider is the potential location of a rail distribution center. During the expert review panel meetings, it was noted that adequate rail mainline access is available in the region, but that a rail distribution facility is needed to make this a viable option for aggregate importation. An investment in infrastructure, such as double-tracking and establishing a distribution center, would be needed.

Several participants suggested that establishing a rail distribution center and making other improvements was worth investigating as it could bring in aggregates to help reduce the supply gap and benefit other goods-movement efforts. It was indicated that the ideal size for a rail distribution center is 100 acres, but an efficient center could be designed on a 40- to 60-acre site along a main line. (The expert review panel mentioned that a 20-acre site could be a possibility; however, it would require the materials to be moved by truck almost immediately, while a 40- to 60-acre site could accommodate the stockpile of materials.)

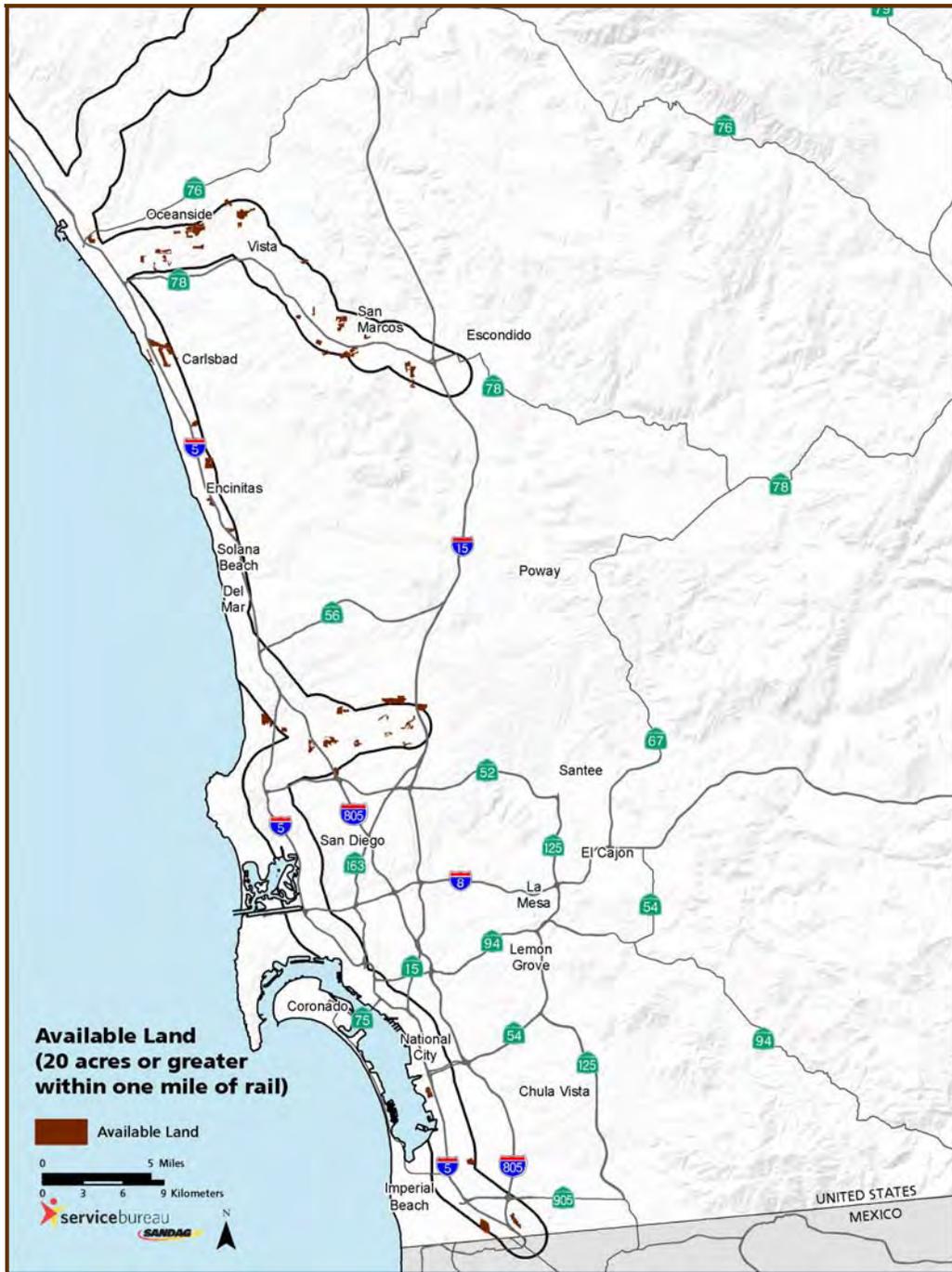
As shown in Figure 7-17, the GIS overlay analysis identified several available lands<sup>5</sup> that are 20 acres or more and located within one mile of an existing railway. Some of these sites are located near residential areas, some near marshes or lagoons, while others are coded as agricultural lands (considered available in this study). The sites would need to be evaluated on a case-by-case basis involving experts in land use, engineering, and environmental fields. Other sites that could be considered for this purpose are industrial lands located near an existing railway, such as selected sites near State Route 78. Also, there are several existing concrete batch plants located in industrial areas near railways.

The feasibility of making the infrastructure improvements and establishing a distribution center to deliver aggregate via a rail line to one or more sites may be a worthwhile endeavor. According to the expert review panel, a train of 60 hopper cars holding 100 tons of aggregate per railcar could deliver approximately one million tons of aggregate annually (one shipment three times a week) to the San Diego region and help reduce the supply gap. If the demand for aggregate cannot be met by local sources, importation by rail may become a viable option. The expert review panel noted that while generally speaking for carload service, a distance of 400 to 500 miles is the typical break-even point because aggregates are a heavy-bulk commodity that would most likely be handled in a unit train service (where the railcars are shipped from the same origin to the same destination), rail could potentially compete on a smaller distance of even 50 miles with the proper loading and unloading facilities.

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<sup>5</sup> The definition of “available lands” is provided in Chapter 5. Essentially it excludes lands coded as developed in SANDAG land use codes and excludes environmental lands coded as conserved or identified for conservation at the 90 percent level.

Figure 7-17  
Available Land Within One Mile from Existing Railway (20 acres or greater)



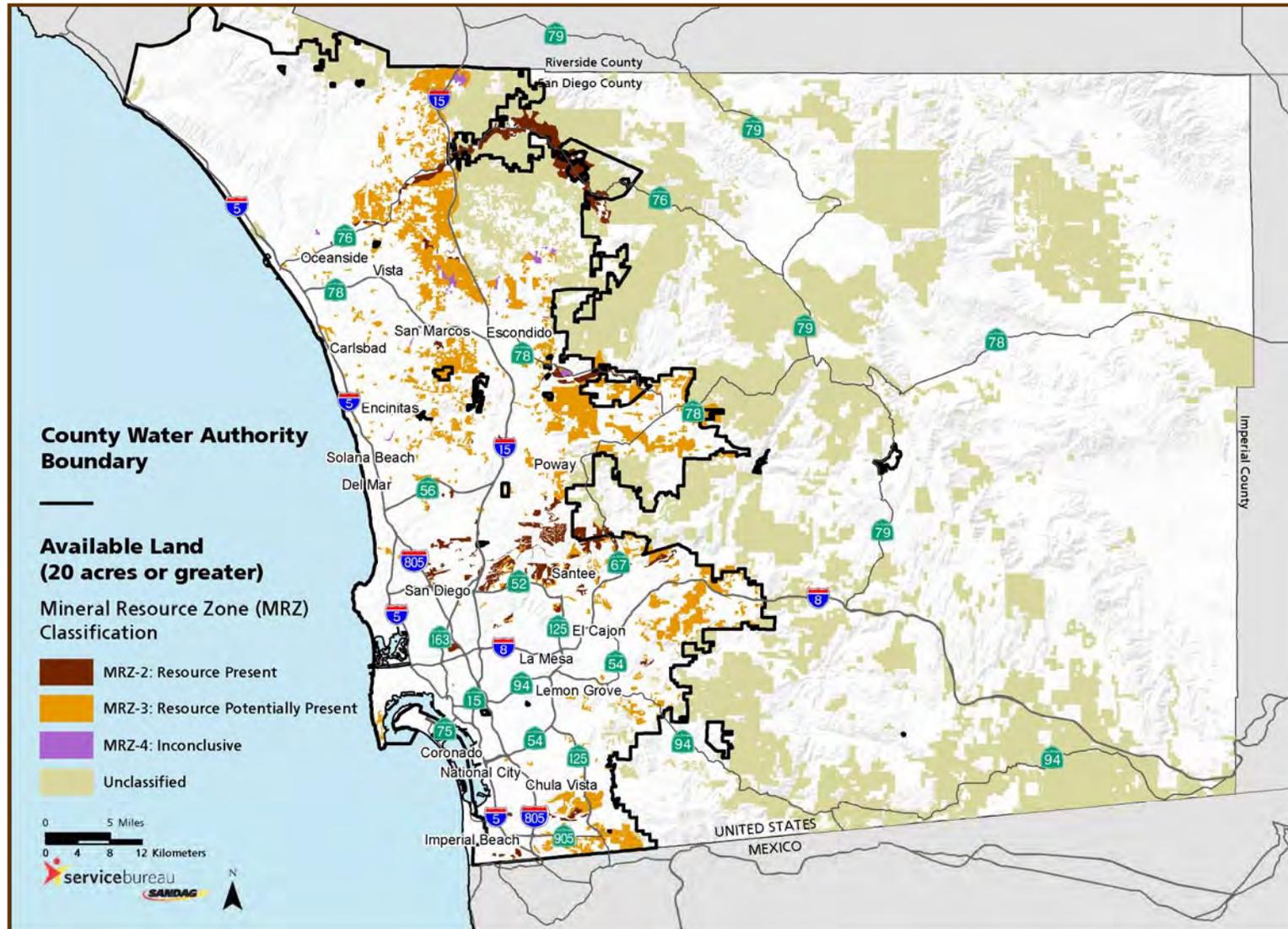
## **WATER INFRASTRUCTURE**

The processing of construction aggregate typically requires a great deal of water. This requires the availability of water infrastructure, or well water extraction (which could be cost-prohibitive). The availability of water infrastructure can be defined in terms of the service areas of the member agencies of the County Water Authority. Figure 7-18 illustrates the overall County Water Authority boundary overlaid with available aggregate sites 20 acres or greater to show which sites have access to water infrastructure.

## **SUMMARY**

This chapter illustrates several ways that the GIS tools could be used to begin exploring different options for increasing the supply of aggregate. Again, it is important to note that the GIS tools represent a starting point. In all cases presented in this chapter, the user must go to the next level and examine local zoning and setback requirements, slope of available land, sensitive habitat lands, and other local factors. The economic viability of the site for mining must be included in this evaluation.

Figure 7-18  
Available Land With County Water Authority Overlay (20 Acres or Greater)



# Appendix F

**Pless Environmental, Inc.**

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November 30, 2017

*Via Email*

Carmen Borg  
Shute, Mihaly & Weinberger  
396 Hayes Street  
San Francisco, CA 94102  
*borg@smwlaw.com*

*Re: Review Draft Environmental Impact Report for Safari Highlands Ranch and  
Citywide SOI Update, SCH No. 2015091039*

Dear Ms. Borg,

Per your request, I reviewed the Draft Environmental Impact Report (“Draft EIR”) prepared by the City of Escondido (“City”) for the Safari Highlands Ranch project and the citywide Sphere of Influence update (collectively referred to as “Project”) for review under the California Environmental Quality Act (“CEQA”).<sup>1</sup>

As discussed in the following, the Draft EIR is substantially flawed because it underestimates criteria air pollutant and greenhouse gas emissions during both construction and operation of the Project, fails to identify significant impacts, and fails to require adequate mitigation.

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<sup>1</sup> City of Escondido, Safari Highlands Ranch and Citywide SOI Update, SCH No. 2015091039, October 2017; available at: <https://www.escondido.org/environmental-impact-report.aspx>, accessed November 3, 2017.

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These mitigation measures are equally feasible for the SHR project and should be required to reduce emissions associated with architectural coatings.

### 3. Mitigation Fees

Another approach to addressing significant emissions of air pollutants is to require a mitigation fee for emissions in excess of significance thresholds. These fees can then be used to reduce emissions off-site, *e.g.*, by retrofitting the City's municipal fleet to reduce emissions. The Sacramento Metropolitan Air Quality Management District ("SMAQMD"), for example, requires the following for construction emissions that remain significant after implementation of all feasible measures:

When a project cannot fully mitigate construction emissions by implementing off-road and on-road measures, a fee may be assessed to achieve the remaining mitigation. Fees are adopted by the lead agency.

Currently the mitigation fee rate is \$30,000 per ton of emissions (July 2017). Each July the rate is adjusted. A 5% administrative fee is assessed in addition to the mitigation fee.<sup>58</sup>

Such a measure could be administered by the City or the SDAPCD.

## III. The Draft EIR Fails to Analyze Potentially Significant Health Impacts Due to Valley Fever

Valley Fever, or coccidioidomycosis (abbreviated as cocci, also known as desert rheumatism), is an infectious disease caused by inhaling the spores of *Coccidioides ssp.*,<sup>59</sup> a soil-dwelling fungus. The fungus lives in the top two to 12 inches of soil. When soil containing this fungus is disturbed by activities such as digging, vehicles, construction activities, dust storms, or during earthquakes, the fungal spores become airborne.<sup>60</sup> The Valley Fever fungal spores are too small to be seen by the naked eye, and there is no

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<sup>58</sup> SMAQMD, Construction Emissions Mitigation; available at: <http://www.airquality.org/businesses/ceqa-land-use-planning/mitigation>, accessed November 20, 2017.

<sup>59</sup> Two species of *Coccidioides* are known to cause Valley Fever: *C. immitis*, which is typically found in California, and *C. posadasii*, which is typically found outside California. See Centers for Disease Control, Coccidioidomycosis (Valley Fever), Information for Health Professionals; available at: <https://www.cdc.gov/fungal/diseases/coccidioidomycosis/health-professionals.html>, accessed November 15, 2017.

<sup>60</sup> California Department of Public Health, Valley Fever Fact Sheet, January 2016; available at: <https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ValleyFeverFactSheet.pdf>, accessed November 15, 2017.

reliable way to test the soil for spores before working in a particular area.<sup>61</sup> The California Department of Public Health has concluded:<sup>62</sup>

**Valley Fever is an illness that usually affects the lungs. It is caused by the fungus *Coccidioides immitis* that lives in soil in many parts of California.** When soil containing the fungus is disturbed by digging, vehicles, or by the wind, the fungal spores get into the air. When people breathe the spores into their lungs, they may get Valley Fever.

### **Is Valley Fever a serious concern in California? YES!**

Often people can be infected and not have any symptoms. In some cases, however, a serious illness can develop which can cause a previously healthy individual to miss work, have long-lasting and disabling health problems, or even result in death.

#### **A. San Diego County Is Endemic for Valley Fever**

The disease is endemic (native and common) in the semiarid regions of the southwestern United States.<sup>63</sup> Most of San Diego County, including the Project site, is located within the established endemic range of Valley Fever,<sup>64</sup> as shown in Figure 2. The site itself contains conditions that are known to support Valley Fever,<sup>65</sup> including:

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<sup>61</sup> California Department of Public Health, Preventing Work-Related Coccidioidomycosis (Valley Fever), June 2013; available at: <https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf>, accessed November 15, 2017.

<sup>62</sup> *Ibid.*

<sup>63</sup> Wikipedia, Coccidioidomycosis; available at: <https://en.wikipedia.org/wiki/Coccidioidomycosis>, accessed November 15, 2017.

<sup>64</sup> See, for example, Kellie Schmitt, Rebecca Plevin, and Tracy Wood, Just One Breath: Valley Fever Cases Reach Epidemic Levels, But Harm Remains Hidden, September 8, 2012 (“The cocci fungus is common in much of the southwest and in northwestern Mexico, especially in the dry earth of California’s Central Valley and in the areas around Phoenix and Tucson in Arizona. It can be found, however, in soils of the beach haven of San Diego, the wine country of Sonoma County and inland in the Sierra foothills.”); available at: <https://www.centerforhealthjournalism.org/content/just-one-breath-valley-fever-cases-reach-epidemic-levels-harm-remains-hidden>, accessed November 15, 2017.

<sup>65</sup> Kern County Public Health Services Department, Valley Fever Website, Prevention, Clues that Valley Fever May be in the Soil; available at: <http://kerncountyvalleyfever.com/what-is-valley-fever/prevention/>, accessed November 15, 2017.

animal burrows, old (prehistoric) Indian campsites,<sup>66</sup> areas with sparse vegetation,<sup>67</sup> areas adjacent to arroyos,<sup>68</sup> and areas of upper 12 inches of undisturbed soil.<sup>69</sup>

**Figure 2: Endemic Areas for Valley Fever in California**



From: Breathe California; available at:  
<http://www.breathecalifornia.org/images/health-img/Cocci.jpg>,  
accessed November 13, 2017

The number of Valley Fever cases in San Diego County has been rising since 1990.<sup>70</sup> San Diego County had the sixth highest number of reported cases statewide over the 2007–2011 period: 649 cases.<sup>71</sup> The number of reported cases in San Diego County

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<sup>66</sup> Draft EIR, p. 2.4-2.

<sup>67</sup> Draft EIR, p. 2.1-19, Figure 2.1-4A, and Figure 2.1-5A.

<sup>68</sup> Draft EIR, p. 2.0-8.

<sup>69</sup> Draft EIR, p. 2.1-11.

<sup>70</sup> Janice Arenofsky, San Diego Has Sixth Highest Rate of Valley Fever in California; Concerns Voiced that Imperial County Cases May be Under-reported, July 2014, East County Magazine; available at: <https://www.eastcountymagazine.org/cost-valley-fever-human-and-economic>, accessed November 15, 2017.

<sup>71</sup> Michael L. MacLean, The Epidemiology of Coccidioidomycosis—15 California Counties, 2007–2011, January 22, 2014, Table 5; available at: [http://vfce.arizona.edu/sites/vfce/files/the\\_epidemiology\\_of\\_coccidioidomycosis\\_collaborative\\_county\\_report.pdf](http://vfce.arizona.edu/sites/vfce/files/the_epidemiology_of_coccidioidomycosis_collaborative_county_report.pdf), accessed November 15, 2017.

has continued to rise, reaching 728 over the next five-year period, as summarized in Table 6.<sup>72</sup>

**Table 6: Reported Cases of Valley Fever in San Diego County**

Year	No. of Cases
2012	159
2013	126
2014	117
2015	168
2016	158

The year 2017 is shaping up to be the worst on record in California for people infected with Valley Fever.<sup>73</sup> According to recent provisional data provided by the California Department of Public Health (CDPH), there has been a 34 percent increase in the number of valley fever - also known as coccidiomycosis - a fungal infection caused by fungus *Coccidioides*. From January 1 through October 31, 2017, 5,121 provisional cases of Valley Fever were reported in California. This is an increase of 1,294 provisional cases from the provisional 3,827 cases reported during that same time period in 2016. These cases represent presumed and confirmed cases of infection.<sup>74</sup>

## **B. Construction Workers Are an At-Risk Population**

The California Department of Public Health (“CDPH”) specifically notes that construction workers in endemic areas for *cocci*, such as those that would build the Project, are at risk of contracting Valley Fever:<sup>75</sup>

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<sup>72</sup> County of San Diego, Reportable Diseases and Conditions by Year, 2012–2016, July 3, 2017; available at: [http://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/documents/Reportable\\_Diseases\\_and\\_Conditions\\_SDC\\_2012-2016.pdf](http://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/documents/Reportable_Diseases_and_Conditions_SDC_2012-2016.pdf), accessed November 15, 2017.

<sup>73</sup> Soumya Karlamangla, Los Angeles Times, In California, an Unexplained Increase in Valley Fever this Year, November 14, 2017; available at: <http://www.latimes.com/health/la-me-ln-valley-fever-20171114-story.html>, accessed November 15, 2017.

<sup>74</sup> Lila Abassi, American Council on Science and Health, Inexplicable Spike in Valley Fever in California, November 16, 2017; available at: <https://www.acsh.org/news/2017/11/16/inexplicable-spike-valley-fever-california-12156>, accessed November 17, 2017.

<sup>75</sup> California Department of Public Health, Preventing Work-Related Coccidioidomycosis (Valley Fever), *op. cit.*

Figure 3: Valley Fever Risk to Construction Workers



➤ In October 2007, a construction crew excavated a trench for a new water pipe. Within three weeks, 10 of 12 crew members developed coccidioidomycosis (Valley Fever), an illness with pneumonia and flu-like symptoms. Seven of the 10 had abnormal chest x-rays, four had rashes, and one had an infection that had spread beyond his lungs and affected his skin. Over the next few months, the 10 ill crew members missed at least 1660 hours of work and two workers were on disability for at least five months.

The Project involves a significant amount of grading (339 acres), requiring about 4.6 million cubic yards of cut and fill. Phase 1 would require 1,965,840 cubic yards of raw cut; Phases 2, 3, and 4 would require an estimated 840,880 cubic yards, 722,620 cubic yards, and, 1,096,590 cubic yards of raw cut, respectively. Grading would take approximately 18 months if the proposed development phases are graded concurrently. The time required to complete the grading operations for Phase 1 is estimated to be approximately five to six months. If grading is phased due to market conditions, grading for each phase may take up to six months.<sup>76</sup> Thus, significant opportunity exists to expose both on-site construction workers and on- and off-site sensitive receptors to Valley Fever spores.

Dust exposure is one of the primary risk factors for contracting Valley Fever.<sup>77</sup> Specific occupations and outdoor activities associated with dust generation such as construction, farming, road work, military training, gardening, hiking, camping, bicycling, or fossil collecting increase the risk of exposure and infection. The risk appears to be more specifically associated with the amount of time spent outdoors than

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<sup>76</sup> Draft EIR, p. 1.0-11.

<sup>77</sup> Rafael Laniado-Laborin, Expanding Understanding of Epidemiology of Coccidioidomycosis in the Western Hemisphere, *Annals of the New York Academy of Sciences*, v. 111, 2007, pp. 20-22; available at: <https://www.ncbi.nlm.nih.gov/pubmed/17395731>, accessed November 15, 2017, and Frederick S. Fisher, Mark W. Bultman, Suzanne M. Johnson, Demosthenes Pappagianis, and Erik Zaborsky, Coccidioides Niches and Habitat Parameters in the Southwestern United States, a Matter of Scale, *Annals of the New York Academy of Sciences*, v. 111, 2007, pp. 47-72 (“All of the examined soil locations are noteworthy as generally 50% of the individuals who were exposed to the dust or were excavating dirt at the sites were infected.”); available at: <https://ucdavis.pure.elsevier.com/en/publications/coccidioides-niches-and-habitat-parameters-in-the-southwestern-un>, accessed November 15, 2017.

with doing specific activities.<sup>78</sup> As the area surrounding the Project site is rural, locals and visitors who participate in outdoor activities could be exposed during construction.

The most at-risk populations are construction and agricultural workers,<sup>79</sup> the former the very population that would be most directly exposed by the Project. A refereed journal article on occupational exposures notes that “[l]abor groups where occupation involves close contact with the soil are at greater risk, especially if the work involves dusty digging operations.”<sup>80</sup> One study reported that at study sites, “generally 50% of the individuals who were exposed to the dust or were excavating dirt at the sites were infected.”<sup>81</sup>

The disease debilitates the population and thus prevents them from working.<sup>82</sup> The longest period of disability in California from occupational exposure is to construction workers, with 62% of the reported cases resulting in over 60 days of lost work.<sup>83</sup> Another study estimated the average hospital stay for each (non-construction work) case of coccidioidomycosis at 35 days.<sup>84</sup>

### **C. Sensitive Receptors Near the Project Site Are an At-Risk Population**

The California Department of Public Health and the State Health Officer have warned that “[p]eople who live, work or travel in Valley Fever areas are also at a higher risk of getting infected, especially if they work or participate in activities where soil is

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<sup>78</sup> Kern County Public Health Services Department, Prevention (“The risk appears to be more specifically associated with the amount of time spent outdoors than with doing specific activities”); available at: <http://kerncountyvalleyfever.com/what-is-valley-fever/prevention/>, accessed November 15, 2017.

<sup>79</sup> Lawrence L. Schmelzer and R. Tabershaw, Exposure Factors in Occupational Coccidioidomycosis, *American Journal of Public Health and the Nation’s Health*, v. 58, no. 1, 1968, pp. 107-113, Table 3; available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1228046/?page=1>, accessed November 15, 2017.

<sup>80</sup> *Ibid*, p. 110.

<sup>81</sup> Fisher *et al.*, 2007, *op. cit.*

<sup>82</sup> Frank E. Swatek, Ecology of *Coccidioides immitis*, *Mycopathologia et Mycologia Applicata*, v. 40, Nos. 1-2, pp. 3-12, 1970; available at: <https://link.springer.com/article/10.1007/BF02051479#citeas>, accessed November 15, 2017.

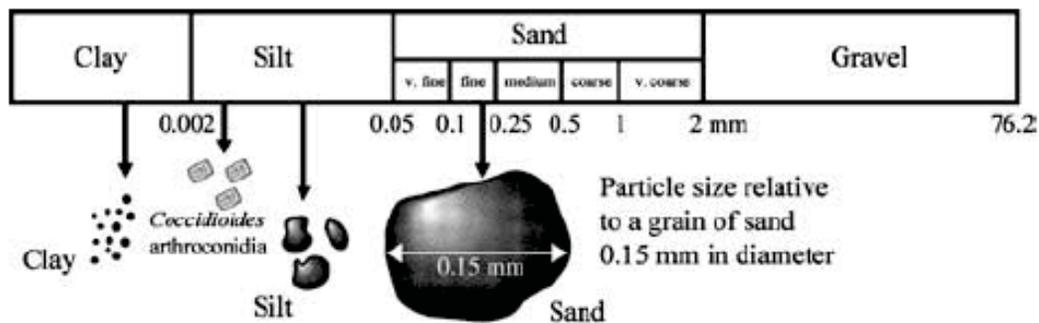
<sup>83</sup> Schmelzer and Tabershaw, 1968, *op. cit.*, Table 4.

<sup>84</sup> Demosthenes Pappagianis and Hans Einstein, Tempest from Tehachapi Takes Toll or *Coccidioides* Conveyed Aloft and Afar, *Western Journal of Medicine*, v. 129, Dec. 1978, pp. 527-530; available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1238466/pdf/westjmed00256-0079.pdf>, accessed November 15, 2017.

disturbed.”<sup>85</sup> Thus, those living, working, or recreating in the vicinity of the Project site during construction are also at risk of being affected from windblown dust, both during construction and after soils have been disturbed but lie fallow until mitigation has been implemented and/or the Project is built out.

The potentially exposed population in surrounding areas is much larger than construction workers because the non-selective raising of dust during Project construction will carry the very small spores, 0.002-0.005 millimeters (“mm”) (see Figure 4)<sup>86</sup> off site, potentially exposing large, non-Project-related populations.<sup>87,88</sup> These very small particles are not controlled by conventional construction dust control mitigation measures.

Figure 4: Size of Cocci Spores Compared to Soil Particles (in mm)



Valley Fever spores have been documented to travel as much as 500 miles,<sup>89</sup> and, thus, dust raised during construction could potentially expose a large number of people hundreds of miles away. Thus, this is a significant concern for this Project because there are sensitive receptors around the Project site, including the predominantly single-family residential neighborhoods located immediately west of the proposed project area

<sup>85</sup> California Department of Public Health, State Health Officer Warns About Dangers of Valley Fever, Number 15-055, August 4, 2015; available at: <https://www.cdph.ca.gov/Programs/OPA/Pages/NR15-055.aspx>, accessed November 15, 2017.

<sup>86</sup> Fisher *et al.*, 2007, *op. cit.*, Fig. 3.

<sup>87</sup> Schmelzer and Tabershaw, 1968, *op. cit.*, p. 110; Pappagianis and Einstein, 1978, *op. cit.*

<sup>88</sup> Pappagianis and Einstein, 1978, *op. cit.*, p. 527 (“The northern areas were not directly affected by the ground level windstorm that had struck Kern County but the dust was lifted to several thousand feet elevation and, borne on high currents, the soil and arthrospores along with some moisture were gently deposited on sidewalks and automobiles as “a mud storm” that vexed the residents of much of California.” The storm originating in Kern County, for example, had major impacts in the San Francisco Bay Area and Sacramento.)

<sup>89</sup> David Filip and Sharon Filip, Valley Fever Epidemic, Golden Phoenix Books, 2008, p. 24.

(there are schools, golf courses, churches, and agricultural operations in these neighborhoods located on Rockwood Road and Bear Valley Parkway). San Pasqual Union School is situated approximately 0.5 mile west of the project site on Rockwood Road. Additionally, the San Diego Zoo Safari Park is located just under a mile to the south of the project area.<sup>90</sup> Further, the SHR project includes residential development that would be constructed and occupied in phases; thus, occupants of the residences built in earlier phases would be potentially exposed to Valley Fever spores while construction on the later phases is ongoing.<sup>91</sup> An individual does not have to have direct soil contact to contract Valley Fever.<sup>92</sup>

#### **D. Valley Fever Symptoms**

Typical symptoms of Valley Fever include fatigue, fever, cough, headache, shortness of breath, rash, muscle aches, and joint pain. Symptoms of advanced Valley Fever include chronic pneumonia, meningitis, skin lesions, and bone or joint infections. The most common clinical presentation of Valley Fever is a self-limited acute or subacute community-acquired pneumonia that becomes evident 13 weeks after infection.<sup>93</sup> No vaccine or known cure currently exists for the disease. However, the U.S. Food and Drug Administration (“FDA”) recently granted Fast Track designation for a proposed treatment.<sup>94</sup> Between 1990 and 2008, more than 3,000 people have died in the United States from Valley Fever, with about half of the deaths occurring in California.<sup>95</sup> Between 2000 and 2013 in California, 1,098 deaths were attributed to

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<sup>90</sup> Draft EIR, pp. 1.0-7, 2.2-20, and 2.10-17.

<sup>91</sup> Draft EIR, p. 1.0-10.

<sup>92</sup> Jason A. Wilken, Patricia Marquez, Dawn Terashita, Jennifer McNary, Gayle Windham, Barbara Materna, Centers for Disease Control and Prevention, *Coccidioidomycosis Among Cast and Crew Members at an Outdoor Television Filming Event – California, 2012*, Morbidity and Mortality Weekly Report, April 1, 2014; available at: <http://europepmc.org/abstract/med/24739339>, accessed November 15, 2017.

<sup>93</sup> See, e.g., Lisa Valdivia, David Nix, Mark Wright, Elizabeth Lindberg, Timothy Fagan, Donald Lieberman, T’Prien Stoffer, Neil M. Ampel, and John N. Galgiani, *Coccidioidomycosis as a Common Cause of Community-Acquired Pneumonia*, *Emerging Infectious Diseases*, v. 12, no. 6, June 2006; available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3373055/>, accessed November 15, 2017.

<sup>94</sup> Mathew Shanley, *Valley Fever Treatment Granted FDA Fast Track Designation*, July 14, 2017; available at: <http://www.raredr.com/news/valley-fever-drug-fast-track-designation>, accessed November 15, 2017.

<sup>95</sup> Jennifer Y. Huang, Benjamin Bristow, Shira Shafir, and Frank Sorvillo, *Coccidioidomycosis-Associated Deaths, United States, 1990–2008*, *Emerging Infectious Diseases*, v. 18, no. 11, November 2012; available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3559166/>, accessed November 15, 2017.

Valley Fever.<sup>96</sup> In recent years, reported Valley Fever cases in the Southwest have increased dramatically.<sup>97</sup>

Infections by *Coccidioides ssp.* frequently have a seasonal pattern, with infection rates that generally spike in the first few weeks of hot dry weather that follow extended milder rainy periods. In California, infection rates are generally higher during the hot summer months especially if weather patterns bring the usual winter rains between November and April.<sup>98</sup> The majority of cases of Valley Fever accordingly occur during the months of June through December, which are typically periods of peak construction activity.

Typically, the risk of catching Valley Fever begins to increase in June and continues an upward trend until it peaks during the months of August, September, and October.<sup>99</sup> Drought periods can have an especially potent impact on Valley Fever if they follow periods of rain.<sup>100</sup> It is thought that during drought years the number of organisms competing with *Coccidioides ssp.* decreases and the fungus remains alive but dormant. When rain finally occurs, the spores, known as arthroconidia, germinate and multiply more than usual because of a decreased number of other competing organisms. When the soil dries out in the summer and fall, the spores can become airborne and potentially infectious.<sup>101</sup>

The recent drought conditions in southern California may well increase the occurrence of Valley Fever cases. Thus, major onsite and offsite soil-disturbing

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<sup>96</sup> Gail L. Sondermeyer, Lauren A. Lee, Debra Gilliss, and Duc J. Vugia, Coccidioidomycosis-Associated Deaths in California, 2000-2013, Public Health Reports, v. 131, no. 4, 2016; available at: <http://journals.sagepub.com/doi/10.1177/0033354916662210>, accessed November 15, 2017.

<sup>97</sup> See Centers for Disease Control; Fungal Pneumonia: A Silent Epidemic, Coccidioidomycosis (Valley Fever); available at: <https://www.cdc.gov/fungal/pdf/cocci-fact-sheet-sw-us-508c.pdf>, accessed November 15, 2017.

<sup>98</sup> *Ibid.*

<sup>99</sup> Kern County Public Health Services Department, What Is Valley Fever, Prevention, Valley Fever Risk Factors; available at: <http://kerncountyvalleyfever.com/what-is-valley-fever/risk-factors/>, accessed November 15, 2017.

<sup>100</sup> Gosia Wozniacka, Associated Press, Fever Hits Thousands in Parched West Farm Region, May 5, 2013, Updated April 29, 2016, citing Prof. John Galgiani, Director of the Valley Fever Center for Excellence at the University of Arizona; available at: <http://www.denverpost.com/2013/05/05/valley-fever-hits-thousands-in-parched-west/>, accessed November 15, 2017.

<sup>101</sup> Theodore N. Kirkland and Joshua Fierer, Coccidioidomycosis: A Reemerging Infectious Disease, *Emerging Infectious Diseases*, v. 3, no. 2, July-September 1996; available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626789/pdf/8903229.pdf>, accessed November 15, 2017.

construction activities should be timed to occur outside of a prolonged dry period. After soil-disturbing activities conclude, all disturbed soils should be sufficiently stabilized to prevent airborne dispersal of cocci spores.

The Draft EIR makes no mention whatsoever of the potential existence of Valley Fever in the area or of the health risks posed by Valley Fever from construction and/or operation of the Project and does not require any mitigation to limit the public's or workers' potential exposure to cocci. As discussed below, conventional mitigation for construction impacts is not adequate to protect construction workers or offsite sensitive receptors from Valley Fever. Thus, the Draft EIR fails to inform the public of these potential significant consequences of Project construction. The County should amend and recirculate the Draft EIR to provide an adequate assessment of Valley Fever and propose adequate mitigation.

#### **E. A Conventional Dust Control Plan Is Inadequate to Address Potential Health Risks Posed by Exposure to Valley Fever**

The conventional dust control measures that are included in Mitigation Measure MM AIR-2<sup>102</sup> are not effective at controlling Valley Fever<sup>103</sup> as they largely focus on visible dust or larger dust particles – the PM10 fraction – not the very fine particles such as Valley Fever spores. While dust exposure is one of the primary risk factors for contracting Valley Fever and dust-control measures are an important defense against infection, it is important to note that PM10 and visible dust, the targets of conventional control mitigation, are only indicators that *Coccidioides ssp.* spores may be airborne in a given area. Freshly generated dust clouds usually contain a larger proportion of the more visible coarse particles, PM10 (</=0.01 mm), compared to cocci spores (0.002 mm). However, these larger particles settle more rapidly and the remaining fine respirable particles may be difficult to see and are not controlled by conventional dust control measures.

Spores of *Coccidioides ssp.* have slow settling rates in air due to their small size (0.002 mm) and low terminal velocity, and possibly also due to their buoyancy, barrel

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<sup>102</sup> Draft EIR, pp. ES-9, 2.2-17 and 2.2-18.

<sup>103</sup> See, e.g., E. Schneider et al., A Coccidioidomycosis Outbreak Following the Northridge, Calif, Earthquake, *Journal of the American Medical Association*, March 19, 1997, v. 277, no. 1, p. 908 (“Primary prevention strategies (e.g., dust-control measures) for coccidioidomycosis in endemic areas have limited effectiveness.”); and Charles E. Smith and others, Effect of Season and Dust Control on Coccidioidomycosis, *Journal of the American Medical Association*, v. 132, no. 14, pp. 833-838, 1946 (“It was recognized that in highly endemic areas coccidioidomycosis is bound to occur even if local dust control is reasonably effective.”).

shape, and commonly attached empty hyphae cell fragments.<sup>104</sup> Thus spores, whose size is well below the limits of human vision, may be present in air that appears relatively clear and dust free. Such ambient airborne spores with their low settling rates can remain aloft for long periods and be carried hundreds of miles from their point of origin. Thus, implementation of conventional dust control measures will not provide sufficient protection for both on-site workers and the general public, especially for occupants of the earlier constructed neighborhoods during construction of the later neighborhoods and other nearby off-site sensitive receptors.

Utilization of personal and employer-driven safety practices and increased coccidioidomycosis awareness among construction workers should be considered during the planning of any construction work in coccidioidomycosis-endemic regions to prevent occupational infections and outbreaks.<sup>105</sup> In response to an outbreak of Valley Fever in construction workers in 2007 at a construction site for a solar facility within San Luis Obispo County, its Public Health Department, in conjunction with the California Department of Public Health, developed recommendations to limit exposure to Valley Fever based on scientific information from the published literature.<sup>106</sup> The recommended measures go far beyond the conventional dust control measures recommended in the Draft EIR to control construction emissions, which primarily control PM10. They include the following measures that are not required in the Draft EIR to mitigate fugitive dust emissions from the Project:

1. Re-evaluate and update your Injury and Illness Prevention Program (as required by Title 8, Section 3203) and ensure safeguards to prevent Valley Fever are included.
2. Train all employees on the following issues:
  - The soils in San Diego County may contain cocci spores;
  - Inhaling cocci spores may cause Valley fever;

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<sup>104</sup> Frederick S. Fisher, Mark W. Bultman, and Demosthenes Pappagianis, Operational Guidelines (version 1.0) for Geological Fieldwork in Areas Endemic for Coccidioidomycosis (Valley Fever), U.S. Geological Survey Open-File Report 00-348, 2000; available at <https://pubs.usgs.gov/of/2000/0348/>.

<sup>105</sup> Gail L. Sondermeyer Cooksey, Jason A. Wilken, Jennifer McNary, Debra Gilliss, Dennis Shusterman, Barbara L. Materna, and Duc J. Vugia, Dust Exposure and Coccidioidomycosis Prevention Among Solar Power Farm Construction Workers in California, accepted: March 27, 2017, published online: July 12, 2017; available at: [http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2017.303820?url\\_ver=Z39.88-2003&rfr\\_id=ori%3Arid%3Acrossref.org&rfr\\_dat=cr\\_pub%3Dpubmed&](http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2017.303820?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed&), accessed November 24, 2017.

<sup>106</sup> CDPH June 2013, *op. cit.*, pp. 4-6.

- How to recognize symptoms of Valley Fever; these symptoms resemble common viral infections, and may include fatigue, cough, chest pain, fever, rash, headache, and body and joint ache);
  - Work with a medical professional with expertise in cocci as you develop your training program and consult information on public health department websites;
  - Workers must promptly report suspected symptoms of work-related Valley Fever to a supervisor;
  - Workers are entitled to receive prompt medical care if they suspect symptoms of work-related Valley Fever. Workers should inform the health care provider that they may have been exposed to cocci;
  - To protect themselves, workers should use control measures as outlined here.
3. Control dust exposure:
- Consult with local Air Pollution Control District Compliance Assistance programs and with California Occupational Safety and Health Administration (“Cal/OSHA”) compliance program regarding meeting the requirements of dust control plans and for specific methods of dust control. These methods may include wetting the soil while ensuring that the wetting process does not raise dust or adversely affect the construction process;
  - Provide high-efficiency particulate (“HEP”)-filtered, air-conditioned enclosed cabs on heavy equipment. Train workers on proper use of cabs, such as turning on air conditioning prior to using the equipment and keeping windows closed.
  - Provide communication methods, such as 2-way radios, for use in enclosed cabs.
  - Employees should be medically evaluated, fit-tested, and properly trained on the use of the respirators, and a full respiratory protection program in accordance with the applicable Cal/OSHA Respiratory Protection Standard (8 CCR 5144) should be in place.
  - Provide National Institute for Occupational Safety and Health (NIOSH)-approved respirators for workers with a prior history of Valley Fever.
  - Half-face respirators equipped with N-100 or P-100 filters should be used during digging. Employees should wear respirators when working near earth moving machinery.
  - Prohibit eating and smoking at the worksite, and provide separate, clean eating areas with hand-washing facilities.
  - Avoid outdoor construction operations during unusually windy conditions or in dust storms.

- Consider limiting outdoor construction during the Fall to essential jobs only, as the risk of cocci infection is higher during this season.
4. Prevent transport of cocci outside endemic areas:
- Thoroughly clean equipment, vehicles, and other items before they are moved off-site to other work locations.
  - Provide workers with coveralls daily, lockers (or other systems for keeping work and street clothing and shoes separate), daily changing and showering facilities.
  - Clothing should be changed after work every day, preferably at the work site.
  - Train workers to recognize that cocci may be transported offsite on contaminated equipment, clothing, and shoes; alternatively, consider installing boot-washing.
  - Post warnings onsite and consider limiting access to visitors, especially those without adequate training and respiratory protection.
5. Improve medical surveillance for employees:
- Employees should have prompt access to medical care, including suspected work-related illnesses and injuries.
  - Work with a medical professional to develop a protocol to medically evaluate employees who have symptoms of Valley Fever.
  - Consider preferentially contracting with 1-2 clinics in the area and communicate with the health care providers in those clinics to ensure that providers are aware that Valley Fever has been reported in the area. This will increase the likelihood that ill workers will receive prompt, proper and consistent medical care.
  - Respirator clearance should include medical evaluation for all new employees, annual re-evaluation for changes in medical status, and annual training, and fit-testing.
  - Skin testing is not recommended for evaluation of Valley Fever.<sup>107</sup>
  - If an employee is diagnosed with Valley Fever, a physician must determine if the employee should be taken off work, when they may return to work, and what type of work activities they may perform.

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<sup>107</sup> Short-term skin tests that produce results within 48 hours are now available. See Kerry Klein, NPR for Central California, New Valley Fever Skin Test Shows Promise, But Obstacles Remain, November 21, 2016; available at <http://kvpr.org/post/new-valley-fever-skin-test-shows-promise-obstacles-remain>, accessed November 24, 2017.

Two other studies have developed complementary recommendations to minimize the incidence of Valley Fever. The U.S. Geological Survey (“USGS”) has developed recommendations to protect geological field workers in endemic areas.<sup>108</sup> An occupational study of Valley Fever in California workers also developed recommendations to protect those working and living in endemic areas.<sup>109</sup> These two sources identified the following measures, in addition to those identified by the San Luis Obispo County Public Health Department, to minimize the exposure to Valley Fever:

- Evaluate soils to determine if each work location is within an endemic area.
- Implement a vigorous program of medical surveillance.
- Implement aggressive enforcement of respiratory use where exposures from manual digging are involved.
- Test all potential employees for previous infection to identify the immune population and assign immune workers to operations involving known heavy exposures.
- Hire resident labor whenever available, particularly for heavy dust exposure work.
- All workers in endemic areas should use dust masks to protect against inhalation of particles as small as 0.4 microns. Mustaches or beards may prevent a mask from making an airtight seal against the face and thus should be discouraged.
- Establish a medical program, including skin tests on all new employees, retesting of susceptibles, prompt treatment of respiratory illness in susceptibles; periodic medical examination or interview to discover a history of low grade or subclinical infection, including repeated skin testing of susceptible persons.

The Draft EIR’s construction mitigation measures for fugitive dust do not include these measures. Projects that have implemented conventional PM10 dust control measures, such as those proposed in the Draft EIR, have experienced fugitive dust issues and reported cases of Valley Fever.

For example, construction of First Solar’s Antelope Valley Solar Ranch One (“AVSR1”) was officially halted in April 2013 due to the company’s failure to bring the facility into compliance with ambient air quality standards, despite similar dust control measures. A dust storm in Antelope Valley on April 8, 2013 was so severe that it

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<sup>108</sup> Fisher et al., 2000, *op. cit.*

<sup>109</sup> Schmelzer and Tabershaw, 1968, *op. cit.*, pp. 111-113.

resulted in multiple car pileups in the sparsely populated region, as well as closure of the Antelope Valley Freeway. The company was issued four violations by the Antelope Valley Air Quality Management District. Dust from the project led to complaints of respiratory distress by local residents and a concern of Valley Fever.<sup>110</sup>

At two photovoltaic solar energy projects in San Luis Obispo County, Topaz Solar Farm and California Valley Solar Ranch, 28 construction workers contracted Valley Fever. One man was digging into the ground and inhaled dust and subsequently became ill. A blood test confirmed Valley Fever.<sup>111</sup>

All of the above health-protective measures recommended by the San Luis Obispo County Public Health Department and the California Department of Public Health are feasible for the Project and must be required in an enhanced dust control plan to reduce the risk to construction workers, on-site residents, and the public of contracting Valley Fever. Many of these measures have been required by the County of Monterey in other environmental impact reports.<sup>112</sup> They are also required in the environmental impact report for the California High-Speed Train.<sup>113</sup> Even if all of the above measures are adopted, a recirculated Draft EIR is required to analyze whether these measures are adequate to reduce significant impacts due to Valley Fever to a level below significance.

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<sup>110</sup> Herman K. Trabish, Green Tech Media, Construction Halted at First Solar's 230 MW Antelope Valley Site, April 22, 2013, available at: <http://www.greentechmedia.com/articles/read/Construction-Halted-At-First-Solars-230-MW-Antelope-Valley-Site>, accessed November 24, 2017.

<sup>111</sup> Julie Cart, Los Angeles Times, 28 Solar Workers Sickened by Valley Fever in San Luis Obispo County May 01, 2013; available at: <http://articles.latimes.com/2013/may/01/local/la-me-ln-valley-fever-solar-sites-20130501>, accessed November 24, 2017.

<sup>112</sup> County of Monterey, California Flats Solar Project Final Environmental Impact Report, December 2014; available at: [www.co.monterey.ca.us/Planning/major/California%20Flats%20Solar/FEIR/FEIR\\_PLN120294\\_122314.pdf](http://www.co.monterey.ca.us/Planning/major/California%20Flats%20Solar/FEIR/FEIR_PLN120294_122314.pdf), accessed November 15, 2017.

<sup>113</sup> California High-Speed Rail Authority and U.S. Department of Transportation, California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement, Fresno to Bakersfield, Mitigation Monitoring and Enforcement Program Amendments, September 2015; available at [http://www.hsr.ca.gov/Programs/Environmental\\_Planning/final\\_merced\\_fresno.html](http://www.hsr.ca.gov/Programs/Environmental_Planning/final_merced_fresno.html), accessed November 15, 2017.



# Does noise affect learning? A short review on noise effects on cognitive performance in children

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The present paper provides an overview of research concerning both acute and chronic effects of exposure to noise on children's cognitive performance. Experimental studies addressing the impact of acute exposure showed negative effects on speech perception and listening comprehension. These effects are more pronounced in children as compared to adults. Children with language or attention disorders and second-language learners are still more impaired than age-matched controls. Noise-induced disruption was also found for non-auditory tasks, i.e., serial recall of visually presented lists and reading. The impact of chronic exposure to noise was examined in quasi-experimental studies. Indoor noise and reverberation in classroom settings were found to be associated with poorer performance of the children in verbal tasks. Regarding chronic exposure to aircraft noise, studies consistently found that high exposure is associated with lower reading performance. Even though the reported effects are usually small in magnitude, and confounding variables were not always sufficiently controlled, policy makers responsible for noise abatement should be aware of the potential impact of environmental noise on children's development.

**Keywords:** noise, cognitive performance, cognitive development, children, speech perception, listening comprehension, irrelevant sound effect, classroom acoustics

In everyday life, cognitive tasks are often performed in the presence of task-irrelevant environmental noise. Accordingly, numerous studies on noise effects on performance have been conducted since the middle of the 20th century (for reviews see Hellbrück and Liebl, 2007; Szalma and Hancock, 2011), showing that—depending on characteristics of sounds and tasks—noise of low to moderate intensity may in fact evoke substantial impairments in performance.

Most of these studies were conducted with adults. The present review, however, will focus on studies including children. Children are especially vulnerable to harmful effects of environmental noise, as cognitive functions are less automatized and thus more prone to disruption. We will report findings concerning effects of acute noise on performance in concurrent auditory and non-auditory tasks, as well as effects of chronic noise on children's cognitive development.

## EFFECTS OF ACUTE NOISE ON CHILDREN'S PERFORMANCE IN AUDITORY TASKS

Psychoacoustic studies have consistently shown that children's speech perception is more impaired than adults' by unfavorable listening conditions. The ability to recognize speech under conditions of noise or noise combined with reverberation improves until the teenage years (Johnson, 2000; Wightman and Kistler, 2005; Talarico et al., 2007; Neuman et al., 2010). With stationary noise makers, signal-to-noise ratios (SNRs) have to be 5–7 dB higher for young children when compared to adults in order to achieve comparable levels of identification of speech or nonspeech signals, with adult-like performance reached at about 6 years of age (Schneider et al., 1989; Fallon et al., 2000;

Werner, 2007). However, with maskers that vary over time, i.e., with trial-by-trial variation of the maskers' spectral composition (Oh et al., 2001; Hall et al., 2005; Leibold and Neff, 2007) or with fluctuating maskers such as single-talker speech (Wightman and Kistler, 2005), adult-like performance is usually not reached before the age of 10 years. Furthermore, children are less able than adults to make use of spectro-temporal and spatial cues for separation of signal and noise (Wightman et al., 2003; Hall et al., 2005). These findings demonstrate that children are especially prone to *informational* masking, i.e., masking that goes beyond energetic masking predicted by filter models of the auditory periphery.

Studies identified a range of linguistic and cognitive factors to be responsible for children's difficulties with speech perception in noise: concerning the former, children are less able than adults to use stored phonological knowledge to reconstruct degraded speech input. This holds for the level of individual phonemes, as children's phoneme categories are less well specified than adults' (Hazan and Barrett, 2000), but also for the lexical level since children's phonological word representations are more holistic and less segmented into phoneme units. Therefore the probability of successfully matching incomplete speech input with stored long-term representations is reduced (Nittrouer, 1996; Metsala, 1997; Mayo et al., 2003). In addition, young children are less able than older children and adults to make use of contextual cues to reconstruct noise-masked words presented in sentential context (Elliott, 1979). Concerning attention, children's immature auditory selective attention skills contribute to their difficulties with speech-in-noise perception. Children's susceptibility to informational masking has been attributed to

deficits in focusing attention on auditory channels centered on signal frequencies, while ignoring nonsignal channels (Wightman and Kistler, 2005). Behavioral and ERP measures from dichotic listening paradigms provide evidence that auditory selective attention improves throughout entire childhood (Doyle, 1973; Pearson and Lane, 1991; Coch et al., 2005; Wightman et al., 2010; Gomes et al., 2012).

Owing to the mediating role of linguistic competence and selective attention, children with language or attention disorders are still more impaired than normally developing children by noise in speech perception tasks (Geffner et al., 1996; Ziegler et al., 2005, 2009). A stronger noise effect is also evident for children tested in their second language when compared to native children (Crandell and Smaldino, 1996). Studies with adults revealed that even skilled non-native listeners, whose performance in quiet is comparable to that of native listeners, are outperformed by native listeners under conditions of noise or noise combined with reverberation (Rogers et al., 2006; for review see Lecumberri et al., 2010).

Studies reviewed so far focused on simple tasks requiring identification of isolated speech targets in noise. However, listening in everyday situations, e.g., in classrooms, goes far beyond identification of single words or syllables. Effective listening in these situations requires semantic and syntactic processing of complex oral information while developing a coherent mental model of the story meaning (Kintsch, 1988). Thus, the question arises how noise affects performance in *complex* listening tasks. Studies addressing this topic revealed noise-induced decrements in adults' memory for paired associates, sequences of unrelated words, sentences, or discourse, even with SNRs allowing perfect or near-perfect identification of the speech targets (Rabbitt, 1968; Pichora-Fuller et al., 1995; Murphy et al., 2000; Ljung et al., 2009). Only a few studies in this field included children. Klatte et al. (2010a) used a listening task requiring execution of complex oral instructions and found substantial decrements due to single-talker speech and classroom noise in elementary school children. Adults were less affected. Valente et al. (2012) reported significant impairments in discourse comprehension in 8- to 12-year-olds due to broadband noise combined with reverberation. The noise effects found in these studies could not be attributed to impaired identification. A possible explanation is that identification of degraded speech requires extra resources which are then unavailable for encoding, storage, and processing of the information (McCoy et al., 2005). In addition, age-related improvements in attentional control (e.g., Davidson et al., 2006) may contribute to children's difficulties when performing listening tasks in the presence of noise. Children are less able than adults to ignore irrelevant sounds, and thus are more susceptible to sound-induced disruption in both auditory and non-auditory tasks. We will return to this point in the following section.

To summarize, the reviewed studies document that children need more favorable listening conditions than adults for decoding and processing of oral information [but see Söderlund et al. (2007, 2010) for contrasting findings in inattentive children]. This has practical implications for the acoustical design of classrooms, since effective listening is a linchpin of school learning.

The issue of classroom acoustics has thus gained much interest during the past decades. Studies simulating classroom-like conditions of noise and reverberation reported severe impairments in children's listening performance (Yacullo and Hawkins, 1987; Jamieson et al., 2004; Bradley and Sato, 2008; Klatte et al., 2010a; Neuman et al., 2010; Valente et al., 2012). But even though international and national standards concerning ambient noise levels and reverberation in classrooms were developed in the past decades, many classrooms still do not fit the needs of young listeners (Bradley and Sato, 2008; Klatte et al., 2010b).

## EFFECTS OF ACUTE NOISE ON CHILDREN'S PERFORMANCE IN NONAUDITORY TASKS

Concerning tasks that do not involve auditory targets, studies with adults have consistently shown that especially short-term memory is sensitive to negative effects of noise. Immediate serial recall of visually presented verbal items is reliably impaired by task-irrelevant sounds (for reviews see Hughes and Jones, 2001; Beaman, 2005; Schlittmeier et al., 2012). Impairments occur with single talker speech and non-speech sounds such as tones or instrumental music, but not with continuous broadband noise or babble noise. This so-called irrelevant sound effect (ISE) occurs reliably even with low-intensity sounds, with meaningless speech (e.g., speech in a language unknown to participants), and when sound presentation is confined to a rehearsal phase after encoding of the list items. However, the ISE magnitude is determined by inherent properties of the irrelevant sound. Recall performance is specifically impaired by sounds with a changing-state characteristic, i.e., by auditory streams which consist of distinct auditory-perceptive objects that vary consecutively. For example, irrelevant sounds consisting of different syllables or tones evoke an ISE, whereas steady state sounds, e.g., continuous broadband noise or repetitions of single syllables or tones, have a minor or no effect.

Different theories have been proposed concerning the underlying mechanisms of ISE evocation. Some of these assume that irrelevant sounds have automatic access to working memory, causing specific interference with the retention of cues to serial order (Jones et al., 1995) or—in case of speech—with the retention of phonological codes (Salamé and Baddeley, 1982; Neath, 2000). Other accounts attribute the ISE to the attentional burden caused by the necessity to ignore the sounds (Elliott, 2002).

Several studies found the ISE in elementary school children (Elliott, 2002; Elliott and Cowan, 2005; Klatte et al., 2007, 2010b; Elliott and Briganti, 2012), three of which including different age groups in order to learn about the role of attention in ISE evocation by analyzing developmental change. Elliott (2002) reported a dramatic increase in the magnitude of the ISE on serial recall of visually presented digits with decreasing age. Performance drop relative to quiet was 39% in the second-graders, as opposed to 11% in the adults. The age effect was interpreted as evidence for a dominant role of attentional control in ISE evocation. In a recent study of this group (Elliott and Briganti, 2012), the age effect was replicated—albeit smaller in magnitude—but other experiments in the series yielded convincing evidence against the attentional account of the ISE. Klatte et al. (2010b) used serial recall of common nouns presented pictorially and found detrimental effects

due to background speech which did not differ in magnitude between first-grade children and adults. These and other findings (Hughes et al., 2007, 2012; Röer et al., 2011) suggest that two separate mechanisms contribute to noise-induced impairments in serial recall. On the one hand, irrelevant sounds with a changing state characteristic automatically interfere with maintenance of item or order information in short-term memory. This mechanism is the dominant source of disruption in the standard ISE paradigm, and seems to be adult-like in first-graders. On the other hand, irrelevant sounds may capture attention. The impact of attention capture depends on characteristics of the sound, and on the attentional abilities of the participants. Auditory events that are salient (e.g., of personal significance, such as one's own name), unexpected (e.g., slamming of a door), or deviant from the recent auditory context (e.g., change in voice in a speech stream) have a strong potential to capture attention. Children are more susceptible to sound-induced distraction due to limited attentional control. Accordingly, in Klatte et al. (2010b), first-graders were also impaired by a mixture of nonverbal classroom sounds, whereas older children and adults were unaffected.

Outside the realm of research on ISE, studies addressed effects of moderate-intensity environmental noise on children's performance in academic tasks. Early studies in this field provided little support for noise-induced impairments (Kassinove, 1972; Johansson, 1983). More recent results are inconsistent. Dockrell and Shield (2006) analyzed effects of babble and babble mixed with traffic sounds on third-graders performance in tests assessing reading, spelling, arithmetic, and attention. For all tests, overall scores were lower with babble noise when compared to quiet. Contrary to prediction, however, reading and spelling was even better in the babble plus traffic noise condition when compared to quiet and babble, and error rates in the attention test were higher in quiet when compared to both noise conditions. These results are difficult to interpret as children were not randomly assigned to noise conditions and instead were tested in their original class settings. As only two classes were assigned to each noise condition and class membership is known to affect academic performance (e.g., Kyriakides et al., 2009), a-priori group differences in the dependent variables cannot be ruled out.

A number of studies investigated the effects of background speech and transportation noise on delayed memory for texts in teenagers. Participants read prose paragraphs under different noise conditions and were later tested for prose memory in silence. Recall performance was impaired by meaningful speech (Hygge et al., 2003; Boman, 2004; Sörqvist, 2010), but not by meaningless speech (Hygge, 2003). Concerning transportation noise, results are inconsistent. Hygge (2003) found impairments due to aircraft noise during encoding. Sörqvist (2010) used a within-subjects design and found no effect of aircraft noise, but severe impairments due to meaningful speech. Hygge et al. (2003) and Hygge (2003) found impairments due to road traffic noise while Boman (2004) did not. Ljung et al. (2009) used a direct measure of online reading comprehension and found no effect of road traffic noise and meaningful speech on 12- to 13-year olds' comprehension scores.

Thus, all except one of the studies found impairments due to meaningful speech. This is in line with studies with adults,

showing that meaningful speech evokes stronger impairments than meaningless speech in school-related verbal tasks involving reading (Jones et al., 1990; Oswald et al., 2000; Bell et al., 2008) or story writing (Sörqvist et al., 2012). According to the interference-by-process-account (Marsh et al., 2009), meaningful speech automatically evokes semantic processes which compete with the semantic processes involved in the task. As transportation noise does not evoke such processes, its effect on reading found in some, but not all studies, is presumably due to a more general attention-capture process. In line with this argument, Sörqvist (2010) provided evidence that the participants' attentional abilities have a stronger impact on disruption evoked by transportation noise when compared to meaningful speech. Note, however, that category membership (e.g., transportation noise vs. speech) is not sufficient to predict whether or not a sound will evoke distraction. As outlined earlier, the potential of a sound to capture attention depends on characteristics such as salience, predictability, and deviance from the recent auditory context. Thus, in addition to its specific effects on semantic processing and serial recall, speech noise containing such features is able to act as distractor (Hughes et al., 2012). On the other hand, transportation noise lacking such features has no effect on performance (Klatte et al., 2007).

## CHRONIC EFFECTS OF NOISE ON CHILDREN'S COGNITIVE DEVELOPMENT

In view of the harmful effects of acute noise, the question arises whether enduring exposure to environmental noise may cause persisting deficits in children's cognitive development. Research in this field focused on indoor noise at school and aircraft noise. Concerning the former, studies yielded evidence for chronic effects on children's reading and prereading skills (Maxwell and Evans, 2000; Shield and Dockrell, 2008; Klatte et al., 2010c). Concerning aircraft noise, mixed results were reported with respect to chronic effects on children's attention (Stansfeld et al., 2005; van Kempen et al., 2010; Belojevic et al., 2012) and memory (Haines et al., 2001; Matheson et al., 2010), but exposure to aircraft noise was consistently associated with lower reading performance (see for review, Clark and Sörqvist, 2012). However, some of these studies are difficult to interpret due to methodological limitations. For example, cognitive abilities were usually measured in the children's regular classrooms, but acute noise levels were not always controlled. Thus, testing was done in noisy conditions for the exposed and in quiet conditions for the non-exposed children, resulting in confound of acute and chronic exposure (e.g., Seabi et al., 2012). In addition, aircraft noise has been found to be associated with socioeconomic status (SES) which in turn is strongly related to children's reading abilities. Thus, insufficient control of SES variables in early studies may have led to an overestimation of the noise effect (Haines et al., 2002).

The hitherto most comprehensive study in this field, the cross-sectional RANCH (road-traffic and aircraft noise exposure and children's cognition and health) study (Stansfeld et al., 2005) included children ( $N = 2844$ ) living in the vicinity of huge international airports in the UK, the Netherlands, and Spain. Whereas prior studies confined to comparisons of highly exposed and

non-exposed children, noise exposure in the RANCH study was included as continuous variable, aiming to reveal the noise levels at which the harmful effects on children's cognition begin. With SES being controlled, the authors found no effect of aircraft noise exposure on sustained attention, working memory, and delayed recall of orally presented stories, but a linear exposure-effect relationship between aircraft noise and decreasing reading comprehension. This effect is often cited as evidence for a causal role of aircraft noise in reading impairment. What is often unreported in the secondary literature is, however, that there was another exposure-effect relationship, revealing *enhanced* performance in episodic memory with increasing exposure to road traffic noise. This counter-intuitive finding remains unexplained.

Concerning the underlying mechanisms of chronic noise effects, some authors proposed that enduring exposure to noise in early childhood affects the development of basic language functions which are of special importance in reading acquisition (Evans and Maxwell, 1997; Maxwell and Evans, 2000; Klatte et al., 2010c). This is a reasonable argument in view of, on the one hand, the vulnerability of children's speech perception and short-term memory for disruption due to acute noise, and on the other hand, the important role of these functions in reading acquisition (Baddeley et al., 1998; Steinbrink and Klatte, 2008; Ziegler et al., 2009). In line with this argument, electrophysiological studies

revealed alterations in the cortical responses to speech sounds in individuals with a long-term exposure to occupational noise (Brattico et al., 2005).

## CONCLUSIONS

The reviewed studies document harmful effects of noise on children's learning. Children are much more impaired than adults by noise in tasks involving speech perception and listening comprehension. Non-auditory tasks such as short-term memory, reading and writing are also impaired by noise. Depending on the nature of the tasks and sounds, these impairments may result from specific interference with perceptual and cognitive processes involved in the focal task, and/or from a more general attention capture process.

Concerning chronic effects, despite inconsistencies within and across studies, the available evidence indicates that enduring exposure to environmental noise may affect children's cognitive development. Even though the reported effects are usually small in magnitude, they have to be taken seriously in view of possible long-term effects and the accumulation of risk factors in noise-exposed children (Evans, 2004). Obviously, the findings reported in this review have practical implications for the acoustical design of schools, for the placement of schools in the vicinity of airports, and for the policy of noise abatement.

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# Appendix G

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 El Cajon, California

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Street View - Feb 2021



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