



Proposal to Solano County Department of Resource Management

Shiloh IV Wind Energy Project Mitigation Monitoring

Point Impact Analysis, LLC

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hydrology and water quality, land use, noise, public services and utilities, recreation, and safety mitigation measures identified below.

The proposed scope of work assumes the Solano County Department of Resource Management or other Solano County agencies would monitor implementation of the following measures:

- AES-8, AG-6 - decommissioning
- BIO-8 - overhead power line and design specifications
- BIO-8C - letters of credit or in lieu fees for conservation easements
- BIO-8D - reimbursement
- GEO-1A and 1B, GEO-2 - geotechnical report and recommendations
- GEO-3, HYD-2A - erosion control and Storm Water Pollution Prevention Plan (SWPPP)
- HAZ-1A - Hazardous Materials Management Plan and Spill Prevention, Control, and Countermeasure Plan
- HAZ-1B - Waste Management Plan
- HAZ-2 - plans for encountering hazardous materials and soils
- LU-4 - guarantee bond or corporate surety
- SA-1A - turbine design and safety
- SA-2A and 2B - grounding and shut-off mechanisms and health and safety plan
- SA-5A and 5B - grass fire control plan and compliance with fire code requirements for access roads
- TRA-1, TRA-2, TRA-3 - traffic control plans, closures, and damage

If requested, Point Impact can prepare a supplemental cost estimate and provide additional services in one or more of these areas.

Two of the wind turbines that the Applicant will build during the Shiloh IV construction period, A12 and A14, were originally permitted under the Shiloh III EIR and Use Permit. Point Impact proposes to monitor the construction of these turbines under the Shiloh III COAs. The collection line to these turbines, however, will need to conform to the Shiloh IV COAs. Point Impact assumes that no California Environmental Quality Act (CEQA) addendum, Initial Study or other additional documentation will be necessary for the construction of the two Shiloh III turbines or other Shiloh IV project elements, but that some supplementary biological or cultural resources surveys may be necessary.

If additional CEQA documents are necessary, Point Impact will prepare a supplemental cost estimates for these services.



Drilling (HDD). Facilitate third-party review of the evaluation of HDD methods prepared by the applicant's engineering geologist.

- BIO-3: Review botanist qualifications, flagging, fueling, and storage area locations, and training session.
- BIO-4: Review site plans for minimum setbacks from vernal pools and stock ponds; review California Tiger Salamander (CTS) worker-training program, and CTS exclusion zone fencing and signs. Review applicant's Habitat Conservation Plan (HCP), if obtained, and determine scope of county monitoring responsibilities. If required, review pre-construction CTS surveys, monitor CTS avoidance measures, and review SWPPP for habitat protection measures.
- BIO-5A: Review qualifications of proponent's biologist, pre-construction nesting habitat surveys, and no-disturbance buffer zones around active nests, if applicable.
- BIO-6B: Review qualifications of proponent's biologist and pre-construction Western burrowing owl surveys.
- BIO-8B: Review qualifications of proponent's biologist, the Applicant's Avian and Bat Mitigation Plan (ABMP), pre-construction golden eagle nesting habitat surveys, site plans for risk avoidance measures.
- BIO-8C: Review nesting and habitat enhancements, as necessary, for off-site conservation land or easement and mitigation bank options for off-site avian mitigation.
- BIO-8E: Review nesting and habitat enhancements for Swainson's hawk, as necessary, for off-site conservation land or easement and mitigation bank options for off-site avian mitigation.
- CUL-1: Review site plans areas of known cultural resources and areas of new disturbance and review supplemental report, if applicable.
- CUL-2A: Review qualifications of proponent's cultural resource monitor.
- CUL-2B: Review construction plans for Unanticipated Discovery Protocol language that requires work stoppage in event of unanticipated cultural resources discovery.
- HAZ-2: Review of plans for handling, reporting, and disposing of unexpected hazardous materials encountered during construction.



mitigation and conservation easement enhancements. Mr. Jackman provided similar services for the Shiloh I, Shiloh II, Montezuma I, and Shiloh III mitigation monitoring. TRA provided similar services for Shiloh III and prepared the biological sections of the Shiloh IV EIR. The cost estimate assumes the proponent will pursue off-site mitigation in the form of an in-lieu fee or mitigation bank credit and that neither TRA, nor Mr. Jackman would have to author a report related to the review of the conservation easement; a new, off-site conservation easement would require substantially more review. Point Impact reserves the right to submit additional cost estimates if the proponent purchases and records a new off-site conservation easement in satisfaction of BIO-8C.

Due to the modifications to the turbine layout since certification of the EIR, the estimated pre-construction costs assume the proponent will submit additional noise attenuation analyses as permitted by NOI-2A. Alternatively, the applicant may furnish the County with written waivers from the property owners of residences 3, 7, 11, 13, and 14, as described in the EIR.

Mitigation Measure BIO-2B requires a third-party review of the evaluation of HDD methods prepared by the applicant's engineering geologist. Point Impact proposes to use Chris Hitchcock of Infraterra for this third-party review. Mr. Hitchcock has experience evaluating drilling conditions on other projects and is knowledgeable in the geology of the Montezuma Hills and Sacramento-San Joaquin Delta.

Based on the newest turbine layout, the pre-construction task includes comparing the layout to the area surveyed in the EIR and reviewing any additional cultural resource evaluations that may be necessary. Point Impact's cultural resources subcontractor, Colin Busby of Basin Research Associates, would carry out this review.

Point Impact assumes that the revised layout will not necessitate the review of a revised Travis radar report. If such a review becomes necessary, Point Impact will prepare a supplemental cost estimate.

Matrix and Pre-construction Plan Review Task Cost: \$36,234
(35 hrs Russell, 78.5 hrs, Koo, 60 hrs Burg, 55 hrs Dugan, 45 hrs Kalyankar, 17 hrs Jackman, 12 hrs Busby, 18 hrs H, and \$1,319 expenses)

Construction Monitoring

The Shiloh IV Wind Energy MMRP requires periodic monitoring of project construction activities to verify compliance with adopted mitigation measures:

AES-7: FAA lighting

AIR-1: Construction equipment emission controls



The proposed costs also include up to 20 conference calls during pre-construction and construction to resolve issues and verify status. If necessary, these calls may be held weekly. The costs assume that Mr. Koo would prepare agenda and Mr. Russell would conduct the calls.

Point Impact proposes to have biologist Megan Kalyankar of TRA perform the initial 11 construction monitoring sessions during March, April, May, June, July, and August 2012. Ms. Kalyankar has over five years of experience in wildlife impact assessment, special status species surveys, wetland monitoring and was responsible for biological construction monitoring on the Shiloh III project. Ms. Kalyankar will verify field compliance with the setbacks and other mitigation measures needed to protect wetlands and avoid the sensitive plant and wildlife species and their habitat identified in the Shiloh IV Wind Energy Project EIR, including, but not limited to, CTS, Western burrowing owl, and nesting raptor habitat. Ms. Kalyankar would also verify the implementation of the other measures described above and complete weekly reports for inclusion in the monthly monitoring report Point Impact would submit to the Solano County DRM.

Once major earthmoving and other construction activities that could impact sensitive biological resources are complete (expected in early to mid-June 2011), Mr. Koo from Point Impact would assume construction monitoring duties, making two trips per month in June, July, August, and September.

The estimated costs for providing the construction mitigation monitoring and reporting services discussed above are \$35,185. The estimated costs include 22 scheduled trips to the Shiloh IV Wind Energy Project construction area by Point Impact staff and biological subcontractors over the proposed 8-month construction period, assuming earthmoving activities commence on April 16, 2012 and construction ends in September. With the proposed authority and degree of impacts anticipated, the proposed number of trips should be sufficient to ensure compliance with the adopted conditions. The actual number of inspections, however, will depend on the final construction schedule and the record of compliance with conditions.

If required, additional monitoring sessions beyond the 23 construction monitoring sessions included in this scope of work would cost approximately \$950 per session for either Point Impact staff or a qualified biologist.

As with previous mitigation monitoring projects, Point Impact proposes to provide Solano County Department of Resource Management with monthly reports, summarizing the results of the reviews and monitoring tasks. The reports would include the actual construction check sheets and photographs of any significant features encountered during monitoring.

If Solano County requests unanticipated noise or cultural resource analyses, Point Impact would contract for the required studies with TRA Environmental acoustical team, or Basin Research, a cultural resource firm.



contributing to the environmental review of the Montezuma II and Shiloh IV wind plants, Mr. Koo performed the majority of the Shiloh II and Shiloh III compliance analysis and is familiar with Solano County zoning and compliance for wind projects. Mr. Koo will assist in the pre-construction review of land use and safety setbacks and will be Point Impact's primary construction monitor once the proponent ceases major earthmoving activities.

Joe Burg. Mr. Burg is an Environmental Analyst at Point Impact with training in environmental engineering, land systems, ecology, water law, and GIS. He has experience writing CEQA documents, including work on the EIR projects for the Montezuma II and Shiloh IV wind projects in Solano County. Mr. Burg will assist in the preparation of documents for the Shiloh IV compliance project.

Christopher Dugan. Mr. Dugan is Project Manager at TRA and will provide overall management of the TRA portion of the Shiloh IV compliance project. Mr. Dugan has nearly six years of experience preparing CEQA and other technical documentation in support of development projects within California. He was responsible for monitoring and reporting on the implementation of the adopted mitigation measures during construction of the Shiloh I, II, and III Wind Energy Projects and served as the deputy project manager for the Montezuma II and Shiloh IV EIR projects.

Megan Kalyankar. Ms. Kalyankar is a Biologist II and Analyst II at TRA and will provide the pre-construction plan review and construction monitoring for the Shiloh IV mitigation monitoring project. Ms. Kalyankar has over five years of experience assisting with CEQA and NEPA analysis, biological permitting, special status species surveys, wetland monitoring and biological construction monitoring. She has performed construction monitoring, special status species surveys, and wetland monitoring for a variety of projects in Solano County and beyond, including the Shiloh III Wind Energy Project.

Aaron Gabbe. Dr. Gabbe is a Senior Biologist at TRA and will work in coordination with Ron Jackman to conduct the post-construction avian monitoring for the Shiloh IV wind project. Dr. Gabbe is familiar with the post-construction mortality monitoring data available for the Montezuma Hills region and the species that are most likely to be impacted from operation of the Shiloh IV project based on his work on the Montezuma II EIR and the Shiloh IV EIR. Dr. Gabbe holds an M.S. in Natural Resources and Environmental Sciences from University of Illinois and a Ph.D. from University of California, Santa Cruz in environmental studies. Most recently, Dr. Gabbe has managed the development of the Second Administrative Draft of the Placer County HCP/Natural Community Conservation Planning (NCCP), in which he led the analysis of impacts to covered species by covered activities, development of conditions to minimize impacts on



managing a geotechnical feasibility evaluation for the PG&E Collinsville Wind Project. He is certified as both an Engineering Geologist and a Professional Geologist by the state of California.

4. Schedule and Business Conditions

Point Impact and its subcontractors are available to start work immediately upon receipt of the notice to proceed with the above scope of work. Point Impact and its subcontractors will meet the aggressive schedule proposed by enXco. Point Impact proposes to provide the above scope of work for a total estimated cost of \$79,246, including the contingency. Billing will be for actual work performed and actual expenses at the following hourly rates:

Point Impact Analysis, LLC

J. S. Russell	\$150/hour
B. Koo	\$90/hour
J. Burg	\$75/hour

TRA Environmental Sciences, Inc.

C. Dugan	\$125/hour
A. Gabbe	\$125/hour
M. Kalyankar	\$90/hour

Garcia and Associates

R. Jackman	\$89/hour
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Basin Research Associates

C. Busby	\$115/hour
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Engineering Geologist

C. Hitchcock	\$190/hour
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Point Impact may increase the above rates for work performed during the post construction monitoring by the change in the Consumer Price Index (CPI) for the previous year. A 4% escalation in hourly rates has been applied to the cost estimate for the second and third year monitoring reports.

Point Impact will apply a 5% mark-up to reasonable expenses incurred during project activities, including subcontractor expenses. Point Impact will bill automobile mileage at the prevailing Internal Revenue Service rate, currently \$0.555/mile.

APPENDIX A



**PROFESSIONAL
EXPERIENCE**
(Continued)

Environmental Science Associates, Senior Project Manager
San Francisco, CA 2000 - 2003

Mr. Russell served as senior project manager in the Energy and Information Utilities group at Environmental Science Associates. While at ESA, he managed the Environmental Impact Report for Solano County on the High Winds Project. Mr. Russell obtained Bay Area Air Pollution Control District permits and performed siting review for emergency back up generators for the City of Palo Alto Utilities District, reviewed the environmental effects of the divestiture of the Humboldt and Kern power plant for the California Public Utilities Commission, and performed technical assistance for participants in the California Climate Action Registry.

Russell Associates, Licensing and Environmental Services, Principal
Palo Alto, CA 1987 - 2000

Russell Associates provided licensing and permitting services to qualifying facilities, public power projects, and irrigations districts. Major clients included the geothermal industry, with projects at The Geysers, Imperial Valley, Coso, and Hawaii and cogeneration projects in the Central Valley. Russell Associates prepared the environmental impact reports for three 49-MW steam-injected gas turbine projects for the Northern California Power Agency (NCPA) and assisted in the management of the initial siting studies for energy projects on tribal lands.

**Dravo Engineering Companies (Gibbs & Hill), Project Manager
and Licensing Supervisor**
San Jose, CA 1981 - 1987

Managed the licensing and preliminary development for Dravo's geothermal projects in the Imperial Valley, CA. Responsibilities included the purchase of land, obtaining permits, and participation in the Imperial Valley Transmission Study Group. Mr. Russell supervised all licensing activities of the San Jose office, including licensing support for a 110-MW unit at The Geysers, CA.

Stone & Webster Engineering Corp., Licensing Consultant
Denver, CO 1980 - 1981

As an independent contractor, prepared licensing documents and attended California Energy Commission hearings for two geothermal projects.

Pacific Gas & Electric Co., Regulatory Report Coordinator and Analyst
San Francisco, CA 1974 - 1979

While at PG&E, Mr. Russell coordinated the preparation of the Applications for Certification for Geysers Units 16, 17, and 18 and represented these projects before the CEC.

**PROFESSIONAL
AFFILIATIONS**

Association of Environmental Professionals (AEP)



**PROFESSIONAL
EXPERIENCE
(Continued)**

Compliance Monitoring and Reporting

- Verified compliance of the Shiloh III, Montezuma I, and Shiloh II wind projects in Solano County, CA; assisted Solano County in verifying environmental (biological, noise, dust control) and legal (property setbacks, FAA clearance) compliance by project proponent; and performed on-site monitoring to ensure compliance with Solano County Conditions of Approval
- Prepared the California AB 32 and Climate Action Registry GHG reporting for the Northern California Power Agency power plants
- Prepared the California AB32 GHG test plan and reporting for Coso Operating Company Navy 1, Navy 2, and BLM East and West; and Ormat Nevada Inc Heber1 and East Mesa GEM 2&3 facilities.
- Prepared the California AB32 GHG exemption request letters for Ormat Nevada Inc's Heber 2, East Mesa O1 O2 and OH, and Mammoth Pacific facilities.
- Prepared the quarterly emissions reports sent to Imperial County Air Pollution Control District for Ormat Nevada Inc's Heber 1 Geothermal plant in Heber, CA

Risk Management and Process Safety Management Planning:

- Revised the CalARP Risk Management Plan for Ormat Nevada Inc's Heber 1 and Heber 2 Geothermal facilities in Heber, CA
- Prepared the CalARP Risk Manage Plan and Process Safety Management plan for Ormat Nevada Inc's North Brawley facility near Brawley, CA
- Prepared the Hazardous Materials Business Plan for Ormat Nevada Inc's North Brawley facility near Brawley, CA
- Conducted Hazard Analysis modeling using Aerial Locations of Hazardous Atmospheres (ALOHA) and RMP*COMP

Motorola, Test Engineer/On-site Support Engineer (Contractor)

Sunnyvale, CA/Schaumburg, IL

August 2007 – April 2008

Mr. Koo worked for Motorola as a test engineer and performed Quality Assurance testing on Network Management software for public safety systems sold by Motorola. For five months from August to December 2007 and April 2008, Mr. Koo worked in Schaumburg, IL representing routers development group in Sunnyvale, CA.

Motorola, Software Quality Assurance Engineer (Contractor)

Sunnyvale, CA

April 2007 – August 2007

Mr. Koo worked for Motorola as a test engineer and performed Quality Assurance testing on Network Management software for public safety systems sold by Motorola. Mr. Koo was responsible for writing tools for automated software testing.



Stanford Land Use and Environmental Planning, Intern
June 2010 - September 2010

Stanford, CA

Mr. Burg conducted field surveys for special-status species on university property. He became familiar with land management regulations and practices and used GIS software to organize survey records.

Stanford University, Lab Assistant
June 2006 - August 2007

Stanford, CA

Mr. Burg assisted with research on bioplastic production by microbes in a Civil and Environmental Engineering Laboratory. He conducted an independent life-cycle analysis of laboratory methods under development and modeled potential industrial scale-up.



MEGAN KALYANKAR, Biologist II/Analyst II

Ms. Kalyankar is an associate at TRA experienced with CEQA and NEPA analysis, biological permitting, special status species surveys, wetland monitoring, and biological construction monitoring. Ms Kalyankar has a background in biology and environmental analysis.

Ms. Kalyankar has prepared or assisted in the preparation of numerous CEQA Initial Studies and EIRs on projects ranging from golf courses and recreation areas to residential and commercial building projects to roadway and utility projects. NEPA projects have included CEs and EAs for trail and public facilities projects. In addition, Ms. Kalyankar has prepared or assisted in the preparation of a number of biological assessments, biological studies, natural environment studies and resource management plans for recreational, land management and restoration projects. She has an in-depth knowledge of environmental regulations such as the Endangered Species Act, the Migratory Bird Treaty Act, the Clean Water Act and California Fish and Game Code and has assisted with permitting requirements for a variety of projects.

Ms. Kalyankar has field experience in plant and wildlife identification, reconnaissance-level site surveys, construction monitoring, mitigation monitoring, and vegetation and wildlife monitoring. Ms. Kalyankar has experience surveying for and providing management recommendations for nesting birds and a variety of special-status species including California red-legged frog, California tiger salamander, listed butterflies, burrowing owl, western pond turtle, San Joaquin kit fox, salt marsh harvest mouse, and San Francisco dusky-footed wood rat, among others.

Selected Projects

- Assisted with the preparation of the Draft and Final EIR for the Lake Luciana Golf Course Project in Napa County.
- Assisted with preparation of the response to comments on the Draft EIR for the Folsom Lake State Recreation Area General Plan.
- Prepared the Initial Study/Mitigated Negative Declaration for the Saratoga Drive extension project in Napa, California.
- Wrote a NEPA Environmental Assessment for the Community Health Clinic Ole expansion project in Napa, California.
- Prepared the Hazardous Waste Environmental Site Assessment, Farmland Conversion Assessment and Community Impact Assessment for the South Main Street/Soda Bay Road Widening and Bike Lanes Project in Lake County.
- Acted as the project manager and primary author of the San Quentin Area Bike and Pedestrian Path Environmental Constraints Analysis in Marin County.
- Prepared the Ritz-Carlton Hotel 404(b)(1) Alternatives Analysis in Napa County.
- Prepared a biological study and Initial Study/Mitigated Negative Declaration for the Guadalupe Creek bank stabilization project, on the Guadalupe Landfill property in the City of San Jose.
- Prepared species accounts for Covered Species, performed edits, and assisted with population monitoring of the federally endangered Contra Costa Goldfield (*Lasthenia conjugans*) for the Solano County Habitat Conservation Plan.
- Performed periodic monitoring for peregrine falcon (*Falco peregrinus*), least tern (*Sternula antillarum*), brown pelican (*Pelicanus occidentalis*) and nesting western gulls (*Larus occidentalis*) and double-crested cormorants (*Phalacrocorax auritus*) as part of construction monitoring for the San Francisco-Oakland Bay Bridge East Span Project.

AARON GABBE, Ph.D., Senior Biologist I

Mr. Gabbe joined TRA in 2008 as a staff biologist skilled in conservation biology. Mr. Gabbe's Masters and Ph.D. work provided him with over 10 years experience conducting ecological research focused on interactions between plants and birds and applying science to conservation and restoration. He has conducted ecological research from start to finish: from development of data collection methodology, to data analysis, to publication. Projects include those designed to assess habitats, monitor populations, and inventory species. Having conducted field research in California, Mr. Gabbe has an excellent knowledge of California ecosystems, flora, and fauna. Prior to joining TRA, he worked on field projects where he developed the experimental design, hired, trained, and managed field crews in data collection, species identification and data reporting.

Other research work Mr. Gabbe has participated in consisted of collaboration with the Cache River Restoration Project team in Illinois where research focused on the habitat relationships and foraging behavior of floodplain forest songbirds to inform land managers on how to best restore songbird habitat. Aaron was a Crew Leader with the Sustainable Ecosystems Institute in Boise, Idaho where he managed and coordinated the activities of research assistants on a project that analyzed the effects of timber harvest and forest habitat on avian communities and collaborated with team of natural resource professionals to develop and implement monitoring protocol. Mr. Gabbe has numerous publications in journals such as *Conservation Biology*, *Restoration Ecology*, *Functional Ecology*, and *Ecology*, on topics ranging from tree species preference by foraging insectivorous birds and the implications for floodplain forest restoration, to the adaptive nature of dilute nectar: rufous hummingbird (*Selasphorus rufus*) concentration preference and constraints in nectar production patterns. He has also refereed peer-reviewed articles for *Ecology*, *Ecological Applications*, *The Auk*, and *The Wilson Bulletin*.

Selected Projects

- Shiloh IV Wind Energy Project: Prepared species accounts, peer-reviewed developer's avian and bat risk assessment, analyzed project impacts to birds and bats under CEQA, and formed mitigation measures to reduce impacts to bird and bat species.
- Shiloh III Wind Energy Project construction monitoring: Peer-reviewed pre-construction nesting bird surveys and assisted in identifying appropriate setbacks for active nests. Under contract to peer-review post-construction bird and bat mortality monitoring data, anticipated to begin in 2012-2013.
- Montezuma II Wind Energy Project: Prepared species accounts, peer-reviewed developer's avian and bat risk assessment, analyzed project impacts to birds and bats under CEQA, and formed mitigation measures to reduce impacts to bird and bat species.
- Assisting with the biological components of the western Placer County HCP/NCCP.
- Analyzed the effects of coastal San Luis Obispo County State Park operations on threatened and endangered species. His analysis is integral to development of the Oceano Dunes District HCP and EIS/EIR.
- Developed biological sections of an EIR addressing off-highway motor vehicle use in the Truckhaven area east of Anza-Borrego Desert State Park.

Educational Background

University of California, Santa Cruz

Ph.D., Environmental Studies

University of Illinois, Urbana-Champaign

Master of Science, Natural Resources and Environmental Sciences

University of Wisconsin, Madison

Bachelor of Science, Wildlife Ecology

TRA Environmental Sciences, Inc.

- Biological Compliance Monitoring Program for Pit River bald eagles (PG&E), from 1987 to present. Resident biologist in Shasta Co., CA for ongoing program to monitor status of 34 bald eagle nesting territories and conduct FERC ordered mitigation activities at PG&E's Pit 3, 4, and 5 Hydroelectric Project (FERC 233). Duties include quantifying aquatic habitat use by bald eagles of riverine and lacustrine (reservoir) habitats using capture, marking, and radio telemetry, monitoring public-use within project lands, assisting with fisheries monitoring in project reservoirs using boat-mounted electroshocker, and preparing portions of annual report to FERC. Updated Pit 3, 4, and 5 Interagency Bald Eagle Management Plan in 2009.
- PG&E Bald Eagle Mitigation and Management, 2000-present. Conducted protocol bald eagle wintering and/or breeding surveys for relicensing and/or license compliance activities for the following hydroelectric projects: McCloud-Pit (FERC 2106), DeSabra-Centerville (FERC 803), Rock Creek-Cresta (FERC 1962), Narrows (FERC 1403; Englebright Res.), Chili Bar (FERC 2155), Crane Valley Project (FERC 1354; Bass Lake), and Potter Valley (FERC 77; Lake Pillsbury) projects. For some, wrote technical reports, bald eagle management plans, sections for the Draft License Applications, and/or annual reports.
- Rock Creek-Cresta Project (FERC 1962) Recreation and Pulse Flow Biological Evaluation Studies (PG&E), 2002 to present. Field team leader conducting habitat characterizations and surveys for foothill yellow-legged frogs and monitoring effects of pulse and recreation flows on amphibian habitats and reproduction. Captured, measured, and released various life stages; used Gosner stages to age egg masses and larvae. Prepared annual reports to PG&E for agency review and presented results to the Ecological Resource Committee and the American Fisheries Society.

SELECTED PUBLICATIONS

- Jackman, R.E., W.G. Hunt, D.E. Driscoll, and F.J. Lapsansky. 1994. Refinements to selective trapping techniques: a radio-controlled bow net and power snare for bald and golden eagles. *J. Raptor Res.* 28(4):268-273.
- Jackman, R.E., W.G. Hunt, J.M. Jenkins, and P.J. Detrich. 1999. Prey of nesting bald eagles in northern California. *J. Raptor Res.* 33(2):87-96.
- Jackman, R.E., W.G. Hunt, and N. Hutchins. 2007. Bald eagle foraging and reservoir management in California. *J. Raptor Res.* 41(3):202-211.
- Jackman, R.E. and J.M. Jenkins. 2004. Protocol for evaluating bald eagle habitat and populations in California. Prepared for the U.S. Fish and Wildlife Service, Endangered Species Office, Sacramento, CA by Garcia and Associates and the Pacific Gas and Electric Company. <http://www.dfg.ca.gov/wildlife/species/docs/baldeagleprotocol.pdf>

PROFESSIONAL AFFILIATIONS

The Wildlife Society – Certified Wildlife Biologist
Raptor Research Foundation

Principal Investigator/Project Manager - U.S. Army Corps of Engineers Sacramento District Cultural Resources Studies (1985 to Present) to meet Section 106 requirements of the National Historic Preservation Act. Compliance projects have focused on flood control projects in Central California and Nevada. Services have included archaeological inventories, records searches and development of archaeological GIS, completion of Historic Properties Survey Reports and Finding of Effect documents, presence/absence testing programs, mitigation monitoring, Native American consultation and burial removal, unexpected discoveries, data recovery and other services necessary to complete compliance.

Principal Investigator/Project Manager - City of San Jose 2040 General Plan Update and Coyote Valley Specific Plan, City of San Jose (2004-2009). Responsible for CEQA level cultural resources studies for a General Plan Update and Specific Plan development including city-wide general plan update and for residential, commercial and industrial development in southern Santa Clara County. Tasks included archival research, field studies, testing programs, resource sensitivity models, development of cultural resources GIS, Native American consultation, built environment assessments, input into studies for transportation and infrastructure enhancements, and environmental compliance document technical sections.

Principal Investigator/Project Manager - 300+ Cultural Resources Studies (1980 to Present) to meet City of San Jose/Santa Clara County archaeological assessment and historic architecture review requirements for city and private projects. Worked with various City and County departments including Public Works, Planning, Redevelopment, and Transportation over the past 30 years. Tasks have included archival research, field studies, testing programs, sensitivity models, built environment assessments, input to general plan amendment, studies for transportation and infrastructure enhancements, and environmental compliance document technical sections.

Principal Investigator/Project Manager - 100+ Cultural Resources Studies (1990 to Present) to meet County of Alameda Public Works Agency archaeological assessment and historic architecture review requirements for county projects. Tasks have included archival research, field studies, testing programs, sensitivity models, built environment assessments, input to general plan amendment, studies for transportation and infrastructure enhancements, environmental compliance document technical sections.

Principal Investigator/Project Manager - 100+ Cultural Resources Studies (1980 to Present) to meet Caltrans cultural resources requirements for both archaeology and historic architecture in 15 California counties for both public and private clients with a focus on transportation improvements and bridge rehabilitations. Tasks included archival research, field studies, testing programs, sensitivity models, built environment assessments and environmental compliance document technical sections.

Principal Investigator/Project Manager for Construction Monitoring (2001-2008) at Calpine Energy Projects in Central California (Delta Energy Center, Los Esteros Critical Energy Facility, Metcalf Energy Center). Managed and deployed archaeological services including development of Cultural Resources Management Plans, completion of inventories, managed archaeological monitoring during construction and conducted site testing and data recovery programs including removal of prehistoric and historic archaeological materials and Native American skeletal remains inadvertently exposed during construction. Responsible for all reports including cultural resources closure reports to obtain certificates of compliance and operation to meet California Energy Commission certification standards.

Additional Professional Affiliations (Selected):

American Association for the Advancement of Science - Section H

American Cultural Resources Association (ACRA) – Finance Committee

American Institute of Archaeology

Association of Oregon Archaeologists

Great Basin Anthropological Conference

Nevada Archaeological Association

Royal Anthropological Society - Fellow

Society for California Archaeology

Association of Environmental Professionals

Committee of Anthropologists in Environmental Planning

National Trust for Historic Preservation

Plains Anthropological Conference

Society for Archaeological Science

Society for Historical Archaeology

References

Dr. James C. Bard
SWCA
434 Northwest 6th Avenue
Portland, OR 97209
(503) 224-0333

Mr. Richard Perry
U.S. Army Corps of Engineers
Environmental Resources Branch
1325 J Street
Sacramento, CA 95814
(916) 557-5218

Colin I Busby

Mr. John Hesler, VP and Ms. Michelle Yesney, VP
David J. Powers & Associates
1871 The Alameda, Suite 200
San Jose, CA 95126
(408) 248-3500

Others on Request
(510) 430-8441 (Office)
(510) 430-8443 (Fax)
ColinBusby@basinresearch.com



PROJECT EXAMPLES:

Mr. Hitchcock's professional background includes the following representative projects relevant to assessment of potential impacts from frac-outs associated with directional borings.

InterOil, Papua New Guinea Elk/Antelope Gas Condensate Export Pipeline (Ongoing) Project manager and lead engineering geologist for evaluation of surface fault rupture hazards and derivation of design-level ground motions for proposed 120-km-long gas export pipeline, including geotechnical drilling for directional bores beneath major rivers. Performed detailed desktop and field evaluation of slope stability, erosion, soft soils, liquefaction susceptibility, and fault crossings for proposed pipeline routes and directional bores under major rivers in triple-canopy rainforest based on interpretation of remote sensing data, LiDAR, and extensive helicopter and ground reconnaissance. Provided detailed GIS of geologic and seismic hazards with pipeline routing options.

Cache Creek Casino Natural Gas Pipeline, Pipeline Corridor Hazard Evaluation, Northern California (2008) Project manager and lead engineering geologist for gas pipeline between PG&E Line 400 and Cache Creek Casino in Capay Valley. Input for design included geotechnical drilling and detailed characterization for a major direction bore undercrossing of Cache Creek. Hazards evaluated for this study by Mr. Hitchcock included fault crossings, potential slope instability and areas of significant erosion.

Southern California Gas Company, Line 1004 Directional Bore Landslide Repair (2007) Project manager for detailed study of the geotechnical viability of mitigation options for a pipeline impacted by coastal landslides, rerouting and landslide mitigation alternatives were fully investigated. Geologic interpretation of high-resolution, publicly available IFSAR and privately-flown LiDAR data were used to evaluate alternative routes around active and potentially active landslides. Geotechnical borings through the landslide ultimately provided sufficient information for directional drilling beneath the active landslide and replacement of the existing pipeline within the directional bore, returning it to full service.

**Windfarm Siting
Feasibility Studies:**

Mr. Hitchcock's professional background includes the following representative projects relevant to windfarm development.

PG&E Collinsville Wind Project, Geohazard Site Evaluation, CA. Project manager for geotechnical feasibility evaluation of wind tower location. Tasks included site drilling, laboratory testing, and assessment of site geologic conditions and potential geologic hazards.

PG&E West Butte Wind Project, Geohazard Site Evaluation, OR. Project manager for desktop evaluation of West Butte wind farm power generation site in Oregon. Tasks included analyses of slope, rippability, geologic conditions, and potential geologic hazards for the site area.



of the Delta Risk Management Study, for probabilistic evaluation of ground shaking hazards. Work performed included analysis of geotechnical data; preparation of structure contour maps to assess locations of subsurface folds and faults; development of balanced geologic cross-sections; evaluation of uncertainty in source parameters; preparation of source parameters for inclusion in probabilistic model; preparation of technical report.

California Department of Water Resources, South Bay Aqueduct Enlargement Project (2008). Project manager for assessment of geologic hazards to the South Bay Aqueduct, the water system supplying the southern San Francisco Bay Area from the Delta. Work performed included field investigation for the Bushy Creek Pipeline, assessment of foundation conditions and landslide activity for the proposed Dyer Reservoir, evaluation of fault rupture hazard to Patterson Reservoir, and construction monitoring of landslide repairs for the Del Valle Pipeline and the South Bay Aqueduct in Fremont.

California Department of Water Resources, Del Valle Pipeline Emergency Landslide Investigation and Repair (2010). Performed investigation of landslide triggering, landslide repair construction monitoring, and pipeline replacement and backfill monitoring. Work included geologic analysis of borehole data to identify depth and geometry of slide plane. Performed topographic surveying, geologic mapping, and site inspections and monitoring during repair construction.

Environmental Assessment

Environmental Impact Reports/Studies (PEA/EIR/EIS) Preparation, Various Clients, California. Mr. Hitchcock was responsible for preparation/review of geology, groundwater, and soils sections for:

- City of Brisbane, Brisbane Baylands Project. Reviewed EIR for proposed development of approximately 700 acres of the Brisbane landfill.
- City of San Ramon, Henry Ranch Residential Development. Responsible for preparing geologic, soils, geotechnical, and seismic hazards sections.
- San Ramon Valley Unified School District, New Southwest Middle School. Responsible for preparing hydrology, water quality, geologic, soils, geotechnical, and seismic hazards chapters of the EIR document.
- PG&E San Luis Obispo Reinforcement Project, Paso Robles, CA. Reviewed proposed alternatives to replace a 70 kilovolt (kV) PG&E power line.
- Pacific Gas & Electric Company, Path 15 Transmission Corridor. Project manager for preparation of geology, soils, and seismic hazard sections and field-based assessment of foundation conditions at proposed tower locations.

REPRESENTATIVE PUBLICATIONS

Hitchcock, C.S., Gailing, R., Lindvall, S, 2008, Geotechnical assessment of mitigation of a high-pressure pipeline across active landslides: Design of a directional bore in southern California: Proceedings of the 7th *International Pipeline Conference*: Calgary, Alberta, Canada.

Hart, James D., Zulfikar, N., Lee, C.H., Dauby, F., and Hitchcock, C.S., 2004, A unique

