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July 19, 2023

City of Fort Bragg
Attention: June Lemos, MMC, City Clerk
416 North Franklin Street
Fort Bragg, CA 95437
cdd@fortbragg.com

Subject: Proposal for Environmental Impact Report, Operable Unit E Mill Pond Remediation

Dear Sir/Madam:

Integral Consulting Inc. (Integral) and our teaming partner, EMC Planning Group, are excited to submit this proposal to support the City of Fort Bragg (City) in its environmental review under the California Environmental Quality Act (CEQA) for the Operable Unit E Mill Pond Remediation Project.

We understand the Mill Pond remediation work is of much interest to the City and the Fort Bragg community as a whole because of its distinctive placement adjacent to the coastal trail and its long history. We are prepared to manage this complex project and deliver quality consulting services for the City, its community, the regulating stakeholders, and the longevity of the environment. Our team brings this unique combination of qualifications:

- Our past experience at the site, which will allow us to come up to speed quickly and provide a depth of understanding of the project components and complexities
- Our skilled professionals with expertise in not just CEQA, but remediation projects and the specific requirements associated with working in the coastal zone
- Our relationships and past work experience with the regulators, permitting authorities, and the engineering team responsible for the remedial design
- Our ability to clearly communicate to the public and other stakeholders and foster collaboration and problem-solving.

Our team of CEQA, remediation, and subject matter experts bring decades of experience implementing similar projects in Northern California and along the California coast, a proven track record of successful environmental documents, and the ability to become a trusted advisor and partner for the City.

We look forward to working with you on this project, which we understand is very important to the City and the community. Please contact me at (707-953-8192 or bdeshields@integral-corp.com with any questions.

Sincerely,



Bridgette DeShields
Principal and Technical Director, Permitting & Planning



integral

Proposal
Environmental Impact Report
Operable Unit E Mill Pond Remediation

Prepared for
City of Fort Bragg
416 North Franklin Street
Fort Bragg, CA 95437

Prepared by
Integral Consulting Inc.
2455 Bennett Valley Road, Suite C101
Santa Rosa, CA 95404
sales@integral-corp.com

July 19, 2023

INTEGRAL-CORP.COM

A. FIRM DESCRIPTION

Integral Consulting Inc. (Integral) is an environmental science and engineering firm that provides technical and strategic support to help our clients minimize yesterday's impacts, comply with today's demands, and plan for tomorrow's needs. Starting in 2002, Integral has grown into a national firm with more than 220 employees distributed from Portland, Maine, to Honolulu, Hawaii. With 45 staff in California offices located in Santa Rosa, San Francisco, Brisbane, Point Richmond, and Santa Cruz, Integral provides local expertise in planning and permitting, including numerous projects along the California coast. Integral and its teaming partner, EMC Planning Group, have exceptional experience in preparing California Environmental Quality Act (CEQA) documents in coastal environments. Integral specializes in doing so for remedial construction-related projects, often in waterfront/coastal settings. EMC Planning Group specializes in work along the California coast.

Integral staff are very familiar with the Former Georgia-Pacific Mill site and have excellent working relationships with the agency staff involved in overseeing the remedial program as well as the technical consultants and Fort Bragg community members. Integral understands the key components of a remediation project and how to tailor the impact analyses. We also have a track record of producing documents that generate little to no agency or stakeholder comment, even for highly visible, complex, and high-profile projects. This is because we work from the start to understand the key concerns of each agency and stakeholder group. Our community engagement experiences have prepared us to listen, work collaboratively, and deliver for our client and their community.

WHY INTEGRAL CONSULTING & EMC PLANNING GROUP?

- *Extensive experience completing CEQA documents and permitting remediation projects.*
- *Prior experience on the Fort Bragg Mill site, including relationships with agency staff and the engineering team assigned to the project.*
- *Broad expertise in remediation, coastal hazards, and permitting that will benefit the City of Fort Bragg and the project as a whole.*
- *Successful community engagement, including work in the California Coastal Zone and Fort Bragg specifically.*
- *Skills and experience for long-term trusted advisor relationship with the City of Fort Bragg.*

Teaming Partner

Integral will be joined by teaming partner EMC Planning Group. EMC Planning Group is a full-service interdisciplinary land-use and environmental planning firm located in Monterey, California. Since the firm's inception in 1978, EMC Planning Group's team of 25 has gained rich experience in a broad range of land use and community planning, development, and entitlement services, as well as environmental documentation and compliance. The firm translates that experience into concrete, focused results in a timely and cost-effective manner to its extensive list of public and private sector clients in communities of varying scale throughout California. EMC Planning Group

has completed environmental impact reports (EIRs) for complex and multifaceted projects along the California coast.

Subconsultants

The following subconsultants will support the Integral/EMC Planning Group team in delivering the highest quality product for the City and its people.

Illingworth & Rodkin provides a complete range of consulting services related to noise impact assessments, having completed more than 5,500 projects over 35 years in architectural acoustics, community noise and vibration, industrial noise and vibration control, energy production noise, hydroacoustics, tire/pavement noise research, transportation noise, and air quality/greenhouse gas (GHG) studies. I&R provides support for environmental studies, noise and air quality assessments for environmental studies (e.g., EIRs), noise and air quality technical studies for transportation projects, and more.

Artistic Engineering is the leading photo simulation firm in the country. Its team of designers offers experience in a wide array of 3D photo simulation and related visual services. By combining its illustration and artistic skills with the ability to assess plans and technical schematics, Artistic Engineering can deliver the most accurate photo simulations in the industry. Its services include photo simulations/proposed project envisioning, architectural renderings, project illustrations, project animations and more.

Rate of Service

Please see Attachment D for the rate of services for the proposed staff.

Capabilities of Integral Consulting and EMC Planning Group Team

CEQA and NEPA Compliance Services

The team's CEQA work specifically focuses on environmental remediation and infrastructure projects. Because we conduct investigation and remediation work, our CEQA team has an in depth understanding of the key factors of a remediation project that need to be considered. We work collaboratively with the technical team designing the remedy and the oversight agencies to achieve mutual success. Our team collectively has completed more than 800 CEQA and National Environmental Policy Act (NEPA) environmental compliance projects for public and private sector clients throughout California. The team as a whole possesses technical expertise and experience in preparing the following:

- Initial Studies (IS)
- Mitigated Negative Declarations (MNDs)
- EIRs
- Environmental Assessments/Environmental Impact Statements
- CEQA/NEPA Noticing

- CEQA Thresholds of Significance
- CEQA Findings
- Mitigation Monitoring and Reporting Plans.

In-house technical consultants possess specific expertise to address the following environmental issues, among others:

- Visual Impact Assessments
- Biological and Cultural Resource Impact Assessments
- Hazards and Hazardous Materials Evaluations
- Air Quality Modeling and Impact Assessments
- Greenhouse Gas Assessment and Analysis
- Climate Change/Sea-Level Rise.

Coastal Planning and Local Coastal Programs

Our team of experts is uniquely qualified to assist jurisdictions within California with their coastal planning and permitting projects. We have extensive experience working with various counties, cities, special districts, and commissions on projects within coastal areas, and specific experience working on long-range coastal planning documents such as Local Coastal Programs (LCPs). Some of the services our firm offers include the following:

- LCPs, LCP Updates, and LCP Amendments
- Coastal Zoning Updates
- Coastal Development Permit Processing
- Coastal Land Use Feasibility Studies
- Coastal Vulnerability Assessments
- Sea-Level Rise and Coastal Hazards Analysis
- Coastal Hazards Planning and Adaptation Strategies
- Coastal Habitat Assessments and Environmental Sensitive Habitat Area
- Environmentally Sensitive Habitat Area Mapping; and
- Regulatory Constraints Analysis.

Biological Resources

Our team members have performed biological work throughout California, and our biologists have experience addressing special status species issues in the tideland, marsh, riparian corridor, foothill, grassland, and coastal forest environments. The team's biologists offer clients adaptive, innovative solutions to environmental compliance challenges. Biological resources consulting services include:

- Biological Literature Reviews, Database Searches, and Field Surveys
- Biological Constraints Analyses and Plant Community Mapping
- Focused Surveys and Habitat Assessments for Special-Status Species
- Preliminary Assessment and/or Delineation of Wetlands and Waters of the U.S.
- Special-Status Species Surveys and Reports
- Biological Monitoring
- Pre-Construction Focused Surveys and Construction Monitoring
- Mitigation Planning and Monitoring including Habitat Restoration Design
- Regulatory Agency Consultation, Permitting, and Compliance
- Permitting and Regulatory Compliance.

Air Quality and Greenhouse Gas Emissions Assessment

Our team provides air quality and GHG analysis services for public and private clients. Analyses typically address impacts of implementing individual public works or land development projects and forecasting the impacts of implementing land use plans (e.g., general plans, specific plans). Air emissions and GHG are modeled using the California Emissions Estimator Model (CalEEMod) and supplemented as needed with other analytical tools such as the Emissions Factor Model (EMFAC). GHG impact analysis methodologies have and will continue to evolve; local plans for reducing GHG emissions remain the main tools for identifying those expectations and the actions to meet expectations. Air quality management plans of local air districts are used as a basis for assessing the significance of impacts.

Archaeological/Cultural Resources

EMC Planning Group offers archaeological surveys in compliance with CEQA and NEPA, record searches, private archaeological surveys and testing, project planning and feasibility studies, data recovery, archaeological construction monitoring, and National Register of Historic Places (NRHP) and California Register of Historic Resources nomination and evaluation. This includes Section 106 compliance.

Our team can also assist public clients with tribal consultation requirements pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18. Tribal consultation tasks include requesting tribal representative lists and Sacred Lands File records from the Native American Heritage Commission (NAHC); drafting consultation letter offers and responses for client review and distribution; taking part in government-to-government consultation meetings with tribal representatives and lead agency staff; and providing tribal cultural resource mitigation guidance to lead agency staff. Our approach to tribal consultation assistance ensures that clients are prepared to engage with tribal representatives in a respectful, mutually beneficial, and legally adequate manner while still achieving project objectives and desired outcomes.

Resources of Integral Consulting and EMC Planning Group Team

The Integral/EMC Planning Group team has over 45 staff in the Bay Area as well as access to Integral's more than 150 technical staff nationwide to accomplish the goals set out in the proposal and the unknown challenges that may be encountered. We also have strategic alliances with qualified subcontractors if those are needed for special/technical studies. We are committed to providing our top subject matter experts to bear for this project and have the capacity to take on this work, which is likely to span 20 months or more.

B. RELEVANT EXPERIENCE

The examples below showcase the experience of Integral and EMC Planning Group completing relevant projects individually as well as a teaming partner. This collaboration experience produces efficiencies and allows experts to focus on their specific areas.

Environmental Planning and Permitting, Investigation, Remediation, and Related Services at a Former Sawmill in Northern California, Fort Bragg, California

Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Program Manager, Regulatory Strategy, CEQA, Permitting, Community Engagement

Integral staff were involved in managing a multiyear, multisite investigation and remediation project at a former sawmill site in northern California slated for mixed use redevelopment. Primary constituents of concern were PCBs, VOCs, dioxins/furans, and petroleum hydrocarbons. The assessment included both the 415-acre mill site as well as an offsite ranch area. Tasks included site investigations at five operable units (including sediments within a complex of ponds) and offshore sediments, risk assessment (human health and ecological), pond and offshore sediment sampling, remedial planning, environmental review and permitting, construction, demolition, and oversight, and negotiations with multiple regulatory agencies.



The project included multiple regulatory and permitting requirements specific to the coastal zone of California that required integration of archaeologists, Native American monitors, biologists, botanists, marine mammal specialists, and geotechnical and other engineering disciplines. Integral completed multiple investigation and monitoring reports, a remedial investigation, two remedial action plans, and three CEQA documents. We obtained permits from the Coastal Commission and others for implementation of the work. Site-specific assessments were conducted for upland areas and ponds. Accomplishments included successful cleanup and environmental review for the coastal trail parcel, a no further action finding for large areas of the site and the offshore sediments, implementation of various remedial measures (including CEQA document development under the California Department of Toxic Substances Control [DTSC] as the lead agency), and an initial strategy to address pond sediments and a jurisdictional dam. Integral obtained permits and achieved site certification for the offsite ranch and coastal portion that was transferred to the city to create a coastal trail. Work included significant public outreach and communications, assisting in the purchase and sale process with the City of Fort Bragg and the Coastal Conservancy, and working with the team developing the Specific Plan for the site.

Piers 39 to 43½ Sediment Remediation, San Francisco, California

Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Program Manager, CEQA Lead
Carolina Zuri	Integral Consulting	Project Manager
Paula Gill	Integral Consulting	Biological Resources/Permitting Lead
Samantha Eanes	Integral Consulting	Air Quality, Hazards and Other CEQA Documentation
Sam Blakesley	Integral Consulting	Aesthetics, Noise and Other CEQA Documentation
Conner Schultz	Integral Consulting	GIS



Integral is the lead CEQA and permitting consultant on a multi-phased sediment remediation project with the Regional Water Quality Control Board as the lead agency. An IS/MND was completed for the project with a CEQA addendum currently in preparation. Other ongoing work includes preparation of application packages for Section 10 of the River and Harbors Act and Section 404 Clean Water Act (CWA) authorizations from the U.S. Army Corps of Engineers (USACE)—including formal Endangered Species Act Section 7 consultations with the National Marine Fisheries Service (NMFS),

Regional Board applications pursuant to the CWA and Porter-Cologne Act, California Department of Fish and Wildlife (CDFW) Incidental Take Permit, and Bay Conservation and Development Commission (BCDC) permit applications (Coastal Zone Management Act consistency). We completed a Biological Resource Assessment and Biological Assessment and oversaw cultural resource assessments document. Integral staff conducted the air quality and GHG assessments and transportation analysis. We participated in public outreach efforts and coordinated with responsible agencies. Strategic planning to streamline the process has included working closely with the project proponent (PG&E) and its engineering team to refine the project description to minimize impacts, and developing a permitting plan and approach, including initiating early inter-agency coordination and mitigation planning. Project also involved developing and negotiating mitigation and restoration plans.



South of Tioga Mixed Use Project EIR, Habitat Conservation Plan and Permitting, and Project Staff Support, Sand City, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge, Land Use Planning and Zoning Lead
Teri Wissler Adam	EMC Planning Group	Project Manager, CEQA Lead
Ron Sissem, MRP	EMC Planning Group	Greenhouse Gas Assessment and Analysis Lead
Janet Walther, MS	EMC Planning Group	Biological Resource and Permitting Lead
Stuart Poulter, AICP, MCRP	EMC Planning Group	CEQA Documentation
Shoshana Lutz	EMC Planning Group	CEQA Documentation

EMC Planning Group assisted the City of Sand City with processing a major redevelopment project in an industrial section of the city. The 10.64-acre project site is located partially within the coastal zone, approximately a quarter mile from the beach. The project includes 420 multi-family residential units, 216 hotel rooms, a restaurant, and a



conservation easement on a 0.9-acre dune area. EMC Planning Group provided staff support for application processing, managed the CEQA process, prepared an EIR, prepared a habitat conservation plan, prepared NEPA documentation, and obtained permits from the U.S. Fish and Wildlife Service (USFWS). The EIR was certified, and the project was approved.

Major environmental issues addressed in the EIR included impacts to special-status plants and wildlife, including the reduction of Monterey spineflower population; potential loss or disturbance of western red bat; loss of Smith’s blue butterfly habitat and potential loss or disturbance of Smith’s blue butterfly; potential loss or disturbance of black/silvery legless lizard and coast horned lizard; potential loss or disturbance of special-status western burrowing owl; potential loss or disturbance of special-status Townsend’s big-eared bat; potential loss or disturbance of protected nesting birds; loss of coastal dune scrub habitat; and loss of regulated trees.

Other issues addressed in the EIR that required mitigation measures included visual resources, air quality, cultural resources, soil erosion, noise, transportation, and water demand.

The EIR developed for this project is attached as our submission for Section H, Sample Work Product.

Remedial Strategy, CEQA and Permitting for a Harbor Renovation and Remediation Project, San Francisco, California

Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Principal-in-Charge, Regulatory Strategy
Paula Gill	Integral Consulting	Biological Resources/Permitting Lead

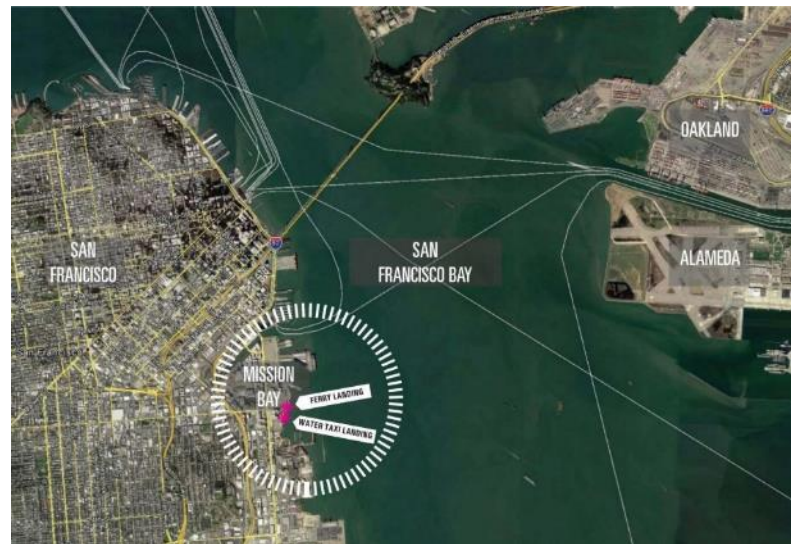
East and West Harbor are located along Marina Green. Historical manufactured gas plant activities resulted in placement of PAH-contaminated sediment in the offshore in an area that is now East Harbor. In order for the harbor to be dredged and renovated, the contaminated sediment required remediation. The lead agency is the Regional Water Quality Control Board (Water Board). Integral's work has included remedial strategy, determining the adequacy of CEQA documents, and permitting, as well as consideration of capping designs. Integral also developed a hydrodynamic model to support remedy design and had input into the site characterization plan. Integral also developed a Categorical Exemption and obtained permits from BCDC, USACE, and Water Board for an interim remedial measure. The project is currently undergoing a remedy redesign and Integral in the role of trusted advisor to the lead agency and project proponent, who are working jointly on the project through a cost share agreement. Integral provides valuable advice on regulatory, permitting and CEQA strategy as well as managing project scheduling.



Mission Bay Ferry Landing Project, San Francisco, California

Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Principal-in-Charge, Regulatory Strategy, Permitting/CEQA
Carolina Zuri	Integral Consulting	Engineering and Field Support

Integral served as engineer of record for design of an engineered cap required to address contaminated sediments encountered during development of a new ferry terminal located in the Mission Bay area of San Francisco. The Port of San Francisco led the project with a goal to enhance regional water-based public transportation and emergency response in the fastest growing Mission Bay and Central Waterfront areas of the city of San Francisco. During site characterization, concentrations of PAHs above acceptable concentrations were found in site sediments in a portion of the dredge prism. Integral was responsible for evaluation of capping options, modeling PAH breakthrough in various cap configurations, preparation of engineering drawings and specifications, costing, permitting and close coordination with the dredging and ferry terminal designers. The design of the cap included an erosion protection layer (marine mattress) to protect the underlying sediment and isolation sand cap from hydrodynamic forces caused by vessel traffic, tidal currents, and storms. Permit support included submittal preparation and meeting attendance as required for a multi-agency review with USACE as lead agency.



Manufactured Gas Plant Remediation, Solano County, California

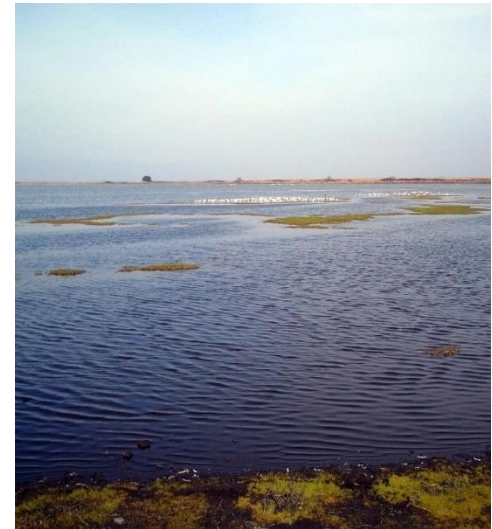
Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Principal-in-Charge, CEQA Lead
Paula Gill	Integral Consulting	Permitting Lead

Integral staff were retained to secure project authorizations for remediation of a manufactured gas plant site that includes work within the Mare Island Strait. Tasks include CEQA support (an addendum to a prior IS/MND under DTSC as the lead agency) and preparation of applications for multiple resource agencies to authorize proposed project components. Agencies involved included USACE, Water Board, CDFW, BCDC, and NMFS.

PG&E, Shell Pond Remediation Project, Contra Costa County, California

Team Members & Role		
Name	Company	Role
Paula Gill	Integral Consulting	Principal-in-Charge, Permitting Lead
Bridgette DeShields	Integral Consulting	CEQA and Compliance

On behalf of PG&E, the regulatory aspects of a 73-acre remediation project in Contra Costa County have been managed from 2014 to present. Tasks include coordination with multiple resource agencies (USACE, Water Board, CDFW, BCDC, USFWS, and NMFS) to authorize proposed project components. Regulatory support to the team has facilitated successful navigation of a complex permitting process to achieve the demanding permitting schedule. Attaining appropriate authorizations (multiple Nationwide Permits [NWP] and Regional General Permit [RGP] emergency authorizations) has required strategic planning to avoid elevation of the USACE review to an individual permit and elevation of USFWS determination regarding effects to listed species (including Ridgway’s rail and salt marsh harvest mouse).



The Shell Pond site is a 73-acre former wastewater treatment pond located at the foot of McAvoy Road in Bay Point, California. Located within a larger 292-acre parcel owned by PG&E, the former treatment pond was constructed and operated by Shell Oil to manage liquid wastewater from its operations. DTSC oversees and approves all remediation work conducted at the site.

PG&E is working with research scientists from the University of California, Berkeley; DTSC; Contra Costa County; and regulatory agencies (USACE, Water Board, CDFW, and USFWS) to study methods to remediate the former treatment pond in a manner that minimizes community impacts. In 2013, PG&E conducted a preliminary study to determine whether plants could grow in the waste and be used to remove or break down chemical contaminants through a process called phytoremediation. The preliminary study findings were positive, and PG&E is working to acquire the necessary permits to conduct a larger phytoremediation study.



CEQA and Permitting for Remediation at a Former Wastewater Plant, Larkspur, California

Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Principal-in-Charge, CEQA and Compliance
Paula Gill	Integral Consulting	Permitting Lead
Bridgette DeShields	Integral Consulting	CEQA and Compliance

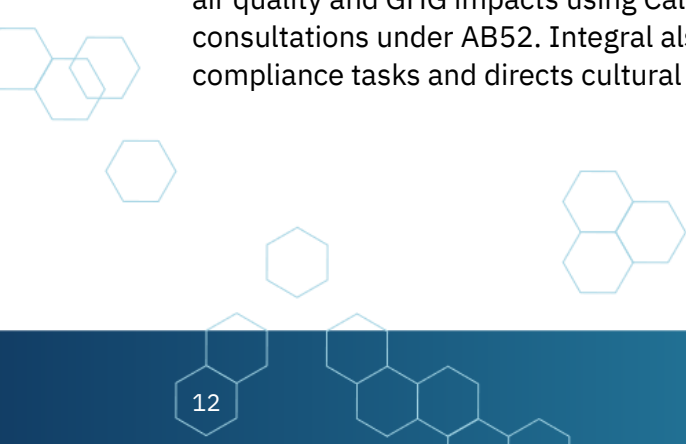
Developed a CEQA document (IS/MND) for a former wastewater plant with PCB contamination. The lead cleanup agency was EPA Region 9 (for TSCA) but the Ross Valley Sanitary District was the lead for CEQA, with the City of Larkspur being the responsible agency. Integral worked with the District and its engineering consultant, Kennedy-Jenks, in developing the remedial plan and the CEQA documents. The assessment included an evaluation of air quality impacts using CalEEMod and GHG impacts as well as tribal consultations under AB52. We also updated the site’s wetland delineation and worked with the USACE to evaluate seasonal wetland impacts and related requirements. Follow-on work included obtaining grading and other permits for implementation of the remediation with the City of Larkspur and Marin County. We also closed out an existing construction stormwater permit and updated the site stormwater controls.



CEQA and Permitting for Sewer Infrastructure Program, Marin County, California

Team Members & Role		
Name	Company	Role
Bridgette DeShields	Integral Consulting	Principal-in-Charge, CEQA Lead
Samantha Eanes	Integral Consulting	Project Manager, Air Quality, Hazards and Other CEQA Documentation
Paula Gill	Integral Consulting	Permitting and Compliance

Integral is the lead CEQA consultant and assists with permitting for the Ross Valley Sanitary District’s sewer improvement program. Integral has completed more than a dozen CEQA documents ranging from categorical exemptions to IS/MNDs. Assessments include evaluations of air quality and GHG impacts using CalEEMod, biological resource evaluations, and tribal consultations under AB52. Integral also assists in permitting, biological monitoring and other compliance tasks and directs cultural resource assessments.



Fort Ord Base Reuse Plan and Environmental Impact Report, Unincorporated Monterey County, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge and Project Manager, Land Use Planning and Zoning Lead, CEQA Lead



This precedent-setting base reuse plan received the American Planning Association 1997 Outstanding Planning Award for “Comprehensive Planning in a Small Jurisdiction” for the Fort Ord Reuse Plan and Fort Ord Reuse Plan EIR. Fort Ord was President Clinton’s national model for base reuse planning. The plan addressed the design, policy, financial, and environmental challenges of converting the 28,000-acre military base to civilian uses.

The program provides for:

- California State University at Monterey Bay
- University of California Monterey Bay Science and Technology Center
- Monterey Peninsula College
- Several new mixed use, transit-oriented villages
- A municipal airport, two existing golf courses, planned resorts, housing and a veteran’s cemetery
- A mile long beach front state park and other recreational areas
- 17,000 acres of habitat management lands
- Public services, financing, and implementation.

EMC Planning Group created a land use plan map, policy framework, and jurisdictional plan elements in preparing the Fort Ord Reuse Plan. EMC Planning Group also wrote a local jurisdiction/reuse agency permitting process, prepared CEQA compliance documents, and shepherded the plan to its approval by the Fort Ord Reuse Authority.

Fort Ord Transportation Network Elements and State Route 68 Improvements EIR/EA (CEQA/NEPA), Permitting, and Wetland Mitigation Plan and Monitoring, Unincorporated Monterey County, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge and Project Manager, Land Use Planning and Zoning Lead, CEQA Lead



EMC Planning Group prepared this environmental document for the Fort Ord Reuse Authority and the City of Monterey. Planned improvements included York Road, Upper Ragsdale Drive, and Ryan Ranch connections to South Boundary Road, and State Route 68 Improvements from State Route 218 to York Road. The improvements planned for State Route 68 are located within the City of Monterey. A small portion of the intersection of State Route 68 and State Route 218 are within the City of Del Rey Oaks. The proposed connector roads are located within

the former Fort Ord and were annexed by the City of Monterey. A portion of the Ryan Ranch Road connection is also within the City of Del Rey Oaks. In addition to the CEQA and NEPA documentation, EMC Planning Group also assisted the City of Monterey with obtaining permits from the USACE, the California Department of Fish and Game, and Water Board.

The environmental analysis focused on aesthetics (SR 68 is a State Scenic Route), sensitive biological resources including wetlands, cultural resources, and changes in traffic patterns. As a follow up contract with the City of Monterey, EMC Planning Group is conducting quarterly monitoring of wetlands mitigation implemented by the City of Monterey during project implementation.

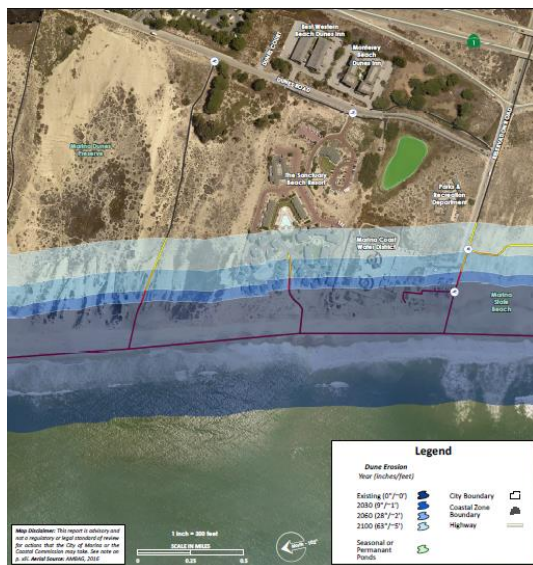
Carmel Coastal Engineering and Adaption Planning, Carmel-by-the-Sea, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge and Project Manager, Land Use Planning and Zoning Lead
Esme Wahl	EMC Planning Group	Coastal Consistency Analysis Lead
Dave Revell, Ph.D.	Integral Consulting	Sea Level Rise & Coastal Hazards Lead
Matthew Jamieson	Integral Consulting	Project Manager, GIS Lead

The project is a coastal engineering and hazard assessment for sea level rise and climate adaptation planning. The Scope of Services for this Agreement is the first phase of a multi-phase adaptation planning project. The project began in 2022 and is ongoing.

Marina Local Coastal Program/Coastal Hazards Updates, Marina, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge and Project Manager, Land Use Planning and Zoning Lead
Esme Wahl	EMC Planning Group	Coastal Consistency Analysis
Dave Revell, Ph.D.	Integral Consulting	Sea Level Rise & Coastal Hazards, Social Vulnerability Report Contributor
Matthew Jamieson	Integral Consulting	Project Manager, GIS Lead, Social Vulnerability Report Contributor
Sam Blakesley	Integral Consulting	Social Vulnerability Report Contributor



In 2018, EMC Planning Group teamed with Dr. Dave Revell to support the City of Marina in preparing LCP updates. The focus of the work in Marina was to provide the City with a comprehensive coastal hazards component of the City’s LCP that addressed sea-level rise within the coastal zone, which included coastal erosion, flooding and other hazards, vulnerability, and adaptation. In 2022, EMC Planning Group teamed with Integral to identify necessary amendments to the City’s LCP Land Use Plan to ensure consistency with Coastal Act provisions and the Coastal Hazards and Sea Level Rise Draft LCP documents. The project is ongoing.

Monterey Local Coastal Program Updates, Monterey County, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge and Project Manager, Land Use Planning and Zoning Lead
Dave Revell, Ph.D.	Integral Consulting	Sea Level Rise & Coastal Hazards



In 2015, EMC Planning Group teamed with Dr. Dave Revell to assist the City of Monterey with updating and consolidating the City’s existing Land Use Plans, to prepare a Coastal Implementation Plan, and to attain LCP certification so that the City could obtain regulatory authority to issue permits within the coastal zone. EMC Planning Group’s primary tasks were to facilitate public outreach and public workshops, prepare a single land use plan that consolidates all five subareas of the City, and to prepare an implementation plan. Dr. Revell was on the team to assist with an assessment of sea-level rise, coastal hazard vulnerability, and adaptation

strategies. These strategies were documented in the 2016 City of Monterey Final Sea Level Rise and Vulnerability Analyses, Existing Conditions and Issues Report. In 2021, EMC Planning Group teamed with Dr. Revell to prepare an update to the City’s LCP.

Pacific Grove Local Coastal Program, Pacific Grove, California

Team Members & Role		
Name	Company	Role
Michael Groves, AICP	EMC Planning Group	Principal-in-Charge and Project Manager, Land Use Planning and Zoning Lead, CEQA Lead

In 2014, EMC Planning Group assisted the City of Pacific Grove and the California Coastal Commission with updating the City’s certified LCP. A primary project objective was to provide an efficient and consistent coastal zone development review process administered by the City that promotes sustainable development, coastal access, and conservation of coastal resources consistent with the California Coastal Act and the City’s General Plan. However, because



the City’s Land Use Plan was certified in 1991, new information and circumstances had occurred that required an update of the City’s certified Land Use Plan in addition to development and certification of an Implementation Plan. The Background Report and Vulnerability Assessment document prepared by EMC Planning Group formed the backbone of the update and was completed and approved by Coastal Commission staff early in the process.

C. KEY PERSONNEL QUALIFICATIONS

The organization chart below identifies roles and responsibilities of key personnel.



Integral and EMC Planning Group will form a coordinated and seamless team, working together on the project deliverables. Integral will be the overall lead and lead the overall strategy, ensure the quality of work products, and our Program Manager, Ms. DeShields will be the main point of contact for the City, leveraging prior site experience and relationships with the regulatory agency staff and stakeholders. EMC Planning Group brings both coastal project EIR experience and subject matter experts.

Resumes of all proposed staff can be found in Attachment A. Biographies for key personnel and select specialists are provided below.

Biographies for Key Personnel and Specialists

Bridgette DeShields, Principal/Program Manager/PIC, Integral Consulting

Ms. DeShields has been an environmental consultant, specializing in the investigation and remediation of contaminated sediments, including permitting and planning, for more than 35 years. She has a long and extensive history with the former Fort Bragg Mill property, having managed the project from 2006 through 2012. During that time, she obtained numerous permits for work on the site from the California Coastal Commission and others, completed multiple CEQA documents, managed the prior dam project while interfacing with the Division of Safety of Dams, and led numerous investigations and the remediation program. Ms. DeShields worked closely with the cleanup agencies (Water Board and DTSC) and City staff throughout that time and made numerous presentations at public and City Council meetings. Her work was instrumental in the investigation, environmental review, permitting, and implementation of the coastal trail project. She led the initial investigations of the Mill Pond.

Ms. DeShields specializes in developing CEQA documents for remediation projects, some of which are showcased in Section B. She worked with Kennedy-Jenks to develop an IS/MND for a soil remediation project for a sewer district in Marin County and was since retained to provide all of the CEQA support for the district's sewer system maintenance and upgrade program. She is currently engaged by the San Francisco Water Board for the CEQA document for a complex sediment remediation project along the San Francisco Waterfront. Last year she completed a CEQA addendum for DTSC for a manufactured gas plant site remediation on the Vallejo waterfront. She provides permitting support for Pacific Gas and Electric Company, the Port of San Francisco, and others. She is also engaged in public outreach for these projects/clients and others, including leading the public engagement strategy for a federal Superfund site in San Francisco.

Ms. DeShields has successfully worked with federal and state agencies, building trust-based relationships. She has found that the key to success is to plan up front, communicate early and frequently, develop clear and concise documents that anticipate the key issues, and work collaboratively and creatively to develop solutions that can be seen as "win-wins."

Carolina Zuri, E.I.T., QISP, Senior Engineer/Project Manager, Integral Consulting

Ms. Zuri is an environmental engineer and project manager specializing in groundwater and sediment remediation, potable water treatment, industrial stormwater compliance, data interpretation, and fluvial geomorphology. She has more than 10 years of experience focused on evaluating impacts on natural surface water and groundwater systems and on designing hydraulic models, restoration projects, and remediation actions to improve the quality of aquifers and

aquatic ecosystems. Ms. Zuri also provides support for the review of state and federal laws, rules, and regulations to evaluate applicable environmental policies for projects related to NEPA and CEQA. As a Qualified Industrial Stormwater Practitioner, she provides support for compliance with the current Industrial General Permit, improving existing best management practices (BMPs) and designing new, advanced BMPs, and helping clients manage communications with local regulators and agencies.

Dave Revell, Ph.D., Principal/Coastal Geomorphologist, Integral Consulting

Dr. Revell is the principal leading Integral's Coastal Climate Risk and Resilience team. He is a coastal geomorphologist with more than 25 years of experience studying marine, coastal, and estuarine processes, working to integrate science and management of coastal processes and climate change. Dr. Revell has served as a technical advisor and facilitator to multiple federal, state, and local jurisdictions related to ocean and coastal management especially at the intersection of how physical processes and human alterations affect coastal hazards (sea-level rise, tsunamis, wave flooding, erosion), habitats, and human use. He has been involved in a wide variety of contentious community stakeholder processes, including evaluating erosion hazard alternatives, climate change vulnerability impacts, lagoon and fisheries management, water quality, and marine spatial planning. Much of his work involves physical process research and spatial analysis to facilitate communication of science to inform decision-making. Dr. Revell currently advises multiple local jurisdictions and agencies on dune and sediment management, climate change, estuary processes, inlet management, and LCP updates. Dr. Revell will oversee the coastal hazards and vulnerability analyses and ensure that the findings are adequately reflected across all of the project elements.

Sean Culkin, P.G., C.H.G., Consultant/Hydrogeologist, Integral Consulting

Mr. Culkin is a consulting professional with more than 10 years of experience serving private and public sector clients. He is a California registered professional geologist and certified hydrogeologist whose experience includes site characterization, modeling, quantitative hydrogeology, and regulatory compliance. He has developed a solid track record of successful project execution and has provided technical guidance and oversight for numerous projects throughout the western United States, including geotechnical investigations related to construction dewatering, transit alignments, water supply, and power plant operations.

Paula Gill, PWS, Regulatory Specialist, Integral Consulting

Ms. Gill brings expertise to the Integral team in the environmental regulatory field with a background in assessment of environmental resource and regulatory authorization requirements, construction compliance, and compensatory mitigation establishment. She has more than 18 years of experience gained while serving as a Regulatory Specialist in the consulting field and as a Regulatory Project Manager with the USACE, San Francisco District. She is a Professional Wetland Scientist and has extensive experience helping clients navigating the USACE CWA and Rivers and Harbors Act permitting process. This process includes obtaining CWA Section 404 approval and supporting consultation with other federal and state agencies pursuant to the federal Endangered Species Act. Ms. Gill is a versatile project manager who has worked on a range of projects including commercial and residential development, energy, transportation, and environmental remediation. Ms. Gill is prepared to ensure high quality document standards,

facilitate effective communication between clients and regulatory agencies, and provide an efficient path toward project entitlement.

Matthew Jamieson, Project Scientist/Coastal Specialist, Integral Consulting

Mr. Jamieson is a project scientist with nearly 20 years of coastal and geospatial analyses. He works extensively with geographic information systems (GIS) with an extensive background in geographic science, coastal processes, and digital art. Mr. Jamieson has been working professionally with GIS technology since 2004 and has focused on applying GIS to coastal hazard modeling and analysis since 2014. Mr. Jamieson holds an M.F.A. in digital art and new media and has been working for many years with artists and scientists to communicate complex spatial and environmental information. Having worked on a diverse range of projects, Mr. Jamieson has developed skills in data visualization, scripting for task automation, web programming, designing interactive experiences, reporting, and 3-dimensional visualization. He will lead the coastal hazards and vulnerability assessment analysis.

Michael J. Groves, AICP, Senior Principal/PIC, EMC Planning Group

Mr. Groves founded EMC Planning Group in 1978. Mr. Groves is involved in project management and coordination of a full range of planning projects completed by the firm. His focus within the firm is on client representation for urban and regional planning projects; coastal planning efforts; conceptual design; real estate due diligence and site evaluation studies; land use planning and permitting efforts; and city, county, school district and special district planning and permitting. Coastal planning has been a special focus for Mr. Groves, having participated in the preparation of seven LCPs since 1982.

In addition, from 1995 to 1997, Mr. Groves served as project manager for the Fort Ord Reuse Plan, a national award-winning policy document for the largest base closure in the United States. The Plan became the model for base closures under President Clinton.

Stuart Poulter, AICP, MCRP, Senior Planner/Project Manager, EMC Planning Group

Mr. Poulter joined EMC Planning Group in 2015. His responsibilities include project management and preparation of ISs and EIRs in compliance with CEQA and the NEPA. Mr. Poulter has extensive experience preparing and managing the preparation of CEQA documentation, including EIRs, for increasingly complex and controversial projects. He possesses a diverse array of project experience and expertise, ranging from programmatic/large-scale projects such as general plans and housing elements to smaller scale residential, educational, recreational, and commercial development for public and private clients. Mr. Poulter's EIR preparation experience has focused on addressing impacts associated with aesthetics and visual resources, historical resources, noise, and wildfire hazards.

Mr. Poulter has demonstrated experience across a range of project types including coastal development and infrastructure, recreation facilities, school sites, residential subdivisions, transportation facilities, and commercial/tourism development. In addition, Mr. Poulter has assisted small local coastal cities, including the cities of Sand City and Carmel-by-the-Sea, in a contract planning capacity. In his capacity as a contract planner with these cities, Mr. Poulter has assisted with permitting and application processing for a variety of current and long-range

planning projects involving issuance of coastal development permits, LCP amendments, and conducting outreach with Coastal Commission staff on behalf of public clients.

Esme Wahl, Associate Planner, EMC Planning Group

Ms. Wahl joined EMC Planning Group in April 2023. Her area of expertise is in coastal planning, and she has extensive experience in coastal development permitting, local coastal plan amendments, coastal resiliency and adaption planning, and habitat management and restoration projects.

Ms. Wahl previously worked for the California Coastal Commission as a Coastal Planner where she collaborated with local governments on issues such as sea-level rise adaption planning, groundwater basin sustainability, and public access maximization. She worked with the counties of San Luis Obispo and Monterey to ensure local projects were consistent with Coastal Act and LCP policies. Specific projects Ms. Wahl worked on include major infrastructure projects, sensitive habitat mitigation projects, and redevelopment of coastal armoring.

Janet Walther, Principal Biologist, EMC Planning Group

Ms. Walther joined EMC Planning Group in 2003 and has been working in the biological field since 2000. She earned a bachelor of science degree in ecology and systematic biology in 2000 and a master of science degree in coastal watershed science and policy in 2014. She is responsible for performing botanical and wildlife surveys; wetland and waters of the U.S. determinations; data analysis; and report preparation in support of management agreements, permits, habitat mitigation, and mitigation monitoring. She assists clients in complying with the federal Endangered Species Act, California Endangered Species Act, Sections 401 and 404 of the CWA, California Fish and Game Code, the California Coastal Act, and local (county and/or city) regulations. Her responsibilities include project management and preparation of documentation in compliance with CEQA and NEPA. Coastal biological resources and planning have been a focus for Ms. Walther, and she has worked on a number of biological survey and permitting projects in the Coastal Zone, including private Coastal Act compliance projects, LCPs, and sea-level rise and vulnerability assessments.

Patrick Furtado, Senior Biologist, EMC Planning Group

Senior biologist Patrick Furtado joined EMC Planning Group in 2020. Mr. Furtado has extensive experience working in coastal ecosystems in California, including sandy and rocky intertidal zones, beaches, coastal dunes, tidal salt marshes, and the coastal estuaries of San Francisco Bay and Elkhorn Slough. Prior to joining EMC Planning Group, Mr. Furtado was the lead field botanist for the San Mateo Fine Scale Vegetation Map and conducted dozens of botanical surveys along the San Mateo County coast in a wide variety of coastal habitats. He has also worked with many special-status coastal species, including western snowy plover, Ridgway's rail, Tidestrom's lupine, and salt marsh harvest mouse. He has additionally worked on several tidal wetland restoration projects including the San Francisquito Creek Flood Protection Project: Conceptual High-Tide Refuge Habitat Enhancement Plan and the McInnis Marsh Restoration Feasibility Study. At Golden Gate National Recreational Area, Mr. Furtado conducted two years of monitoring of western snowy plover populations on Ocean Beach. Under the employ of EMC Planning Group, Mr. Furtado conducted a biological survey of the Hopkins Marine Station for a sea-level rise and vulnerability assessment.

Vanessa Potter, Associate Archaeologist, EMC Planning Group

Ms. Potter joined EMC Planning Group in June 2023 as an Associate Archaeologist. She is responsible for conducting archaeological surveys, database inquiries, Sacred Lands records searches, Native American consultation, archaeological testing, and making recommendations for listing through the California Register of Historical Resources (CHRIS) and the NRHP. Other responsibilities include preparing cultural resources sections of environmental documentation in compliance with CEQA and NEPA. Ms. Potter has worked in the fields of archaeology and anthropology since 2000, and specializes in resources management, ethnography, and project curation.

D. REFERENCES

References are provided below for both Integral and EMC Planning Group work. Additional references are available upon request.

Pacific Gas & Electric Company (Integral)

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Port of San Francisco (Integral)

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City of Carmel-by-the-Sea (Integral and EMC Planning Group)

Brandon Swanson, Director, Community Planning and Building
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City of Sand City (EMC Planning Group)

Vibeke Norgaard, City Manager, City of Sand City
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County of Monterey (Integral and EMC Planning Group)

Mike Novo, Management Specialist, Monterey County Housing and Community Development
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E. PROJECT UNDERSTANDING, APPROACH AND SCOPE OF WORK

Attachment B provides our detailed scope of work, which will be refined after contract award and the kickoff meeting. Below is a summary of the scope and its key benefits to our Team's approach.

We understand the EIR is needed to support discretionary action by the City, the California Coastal Commission, and DTSC associated with issuance of a Coastal Development Permit for the remedial activities and proposed mill pond dam repairs and DTSC's action to approve the remediation plan. As such, we understand the project needs to be 1) consistent with the regulatory requirements of the Lead Agency, Responsible Agencies and Trustee Agencies; 2) protective of human and ecological health; and 3) result in providing effective flood control and water quality benefits. The project also needs to gain community acceptance.

In 2022, DTSC issued an amendment to the Site Investigation and Remediation Order for the Mill Site, which among other things specified the City be the Lead Agency for implementing CEQA and identified the need for an EIR. Therefore, this is the assumed environmental document. The City has indicated preparation of an Initial Study could be a good approach to focus the impact analysis and we concur. We also understand the project description and remedial design are somewhat in flux based on community/stakeholder input and additional work is needed to develop alternatives. We see the need for two phases, the first being to work with the City, involved agencies, applicant team, and stakeholders to clearly define the project and potential alternatives. The second phase being successful completion of the EIR process.

As such, the City needs a consultant to "hit the ground running" and be prepared to meet with the project proponent, their engineering team, and the regulators as one of the first tasks. The consultant needs to critically evaluate the remediation and engineering approach, plans, and alternatives, as well as prior studies that could support the environmental review, and be a trusted advisor for City staff. Our expertise and knowledge, as reflected in our qualifications above, put our team in a unique position to achieve this goal.

Another key component includes the ability to work collaboratively with all parties, including DTSC and the engineering team (Kennedy-Jenks) to come up with a clear and stable project description, including alternatives, that will resonate with the public while remaining feasible and implementable. Our team is prepared to deliver this collaboration, as we have done for several projects. We routinely work with the engineering teams to refine plans to minimize impacts and the need for mitigation measures. We have direct experience working with Kennedy-Jenks for the Larkspur Landing project (highlighted in Section B) and are doing the same type of coordination for our waterfront projects in San Francisco.

Environmental impact assessment requires a technical understanding of natural processes and how those processes might be affected by proposed development. Our goal is to conduct thorough research and analysis of environmental impacts and provide clients with complete informational documents for use by decision makers. What we deliver above others, is that we don't stop once the documents are completed. We understand the real value we can provide is to communicate the information from these documents to the decision makers to achieve project success. We understand that the City is looking for a consultant team that can not only prepare a competent analysis of environmental impacts but can specifically address the following key issues.

Consistency with Regulatory Requirements

Having obtained permits for multiple phases of work on the mill site in the past and based on past work with the specific staff at the Water Board (Craig Hunt) and DTSC (Kim Walsh and others) involved in the Mill Site, our Program Manager, Bridgette DeShields, understands what the agencies are looking for. In addition, many of our team members, such as Paula Gill, Dave Revell, and Michael Groves have broad and deep relationships with the permitting agencies we can leverage for success. We know the key is early and consistent engagement with the agencies to get their input and feedback. We will work with the City and other stakeholders to set a schedule for agency consultations.

Seamless Coordination with DTSC Processing of Remedial Action Plan (RAP) for OU-E

Because our key team members have completed numerous projects working with the DTSC, including staff in the Berkeley office, for more three decades, the team understands DTSC's processes, statutory and policy requirements, and key concerns for a project of this type. Integral staff and specifically our Program Manager, Bridgette DeShields, is well known and respected by DTSC staff. The DTSC supervisor, Kim Walsh, actually reported to Ms. DeShields when they both supported the Fort Bragg Mill Site project at a prior consulting firm. Members of the Team have produced environmental documents on behalf of DTSC for projects in Northern California. We will be able to assist the City in understanding DTSC requirements and in working with both DTSC and the engineering team.

Public Involvement in Environmental Review Process

Members of the team have been involved with developing community profiles, public participation plans, frequently asked questions (FAQ)s, public facing project websites, organizing, managing and presenting at public meetings, holding public workshops, design charrettes, and presenting at City Council and planning commission meetings. Ms. DeShields did all this and more in her prior work on the Mill Site. We understand the principles of community engagement and communication and will work collaboratively with the City and other stakeholders to develop a strategy and approach. This may include more workshops and small group meetings, rather than large community meetings (except where those are required). We find that small group interactions with key stakeholders is a better approach to gaining community understanding and acceptance.

Complete Understanding of the City's Local Coastal Program (LCP) Requirements

We understand the project's consistency with the City's LCP, including the Coastal General Plan and the Coastal Land Use and Development Code, is important, as is understanding the requirements of the CCC. Our team have worked with the CCC on numerous coastal projects, including the prior Mill Pond dam repair and demolition. We will assist the City in navigating these regulatory programs, and the EIR will evaluate any conflicts with local or state plans. Maintaining coastal access for the public in a safe manner during the construction work is also important.

Other key components include the following:

- Assessing the proposed Mill Pond Dam Improvement to critically evaluate the existing information and identify additional geotechnical and other studies needed to provide a robust evaluation of the alternatives
- Incorporating considerations of sea level rise, tsunami hazards, increased erosion, and climate change concerns as appropriate

- Evaluating wetlands under the CCC's definition, including wetland fill impacts and potential mitigation
- Consultation with SHPO and facilitating formal Government-to-Government consultation between the City and Sherwood Band of Pomo Indians
- Quantifying impacts on traffic, recreation, and other factors related to the construction project and working with the applicant to minimize impacts where possible.

F. BUDGET AND SCHEDULE OF CHARGES

Attachment C provides the preliminary not-to-exceed budget and Attachment D provides the rates or services (i.e., billing rates) for key and supporting personnel. The hourly rates in Attachment D would apply for any additional or expansion of tasks identified during the project. The RFP indicates 6 meetings under submittal requirements, but we have scoped and budgeted up to 8 in person meetings (consistent with the responses to questions). The RFP requests a per meeting cost (assumed in-person, full day); we are providing a range as different types of meetings will have different costs (based on the number of professionals that need to attend and the amount of preparation). Per meeting costs would range from approximately \$2,500 to \$10,000.

The overall estimated cost is \$567K and is based on the Scope of Work in the RFP and assumptions provided above and in Attachment B. The EIR tasks (including noticing) themselves make up approximately \$375K of the budget. Due to the controversial nature of the project as well as the many stakeholders and the public interest in the project, a large portion of the budget, over \$120K alone, is allocated for in-person meetings, hearings, and public outreach. Project management, regular meetings and coordination are approximately \$35K, and the remaining tasks are approximately \$37K.

Multiple rounds of review of documents by not just the City but multiple agencies and the applicant also result in significant costs. A significant number of comments on the Draft EIR (both during internal and public review) is assumed as well. Our close coordination will serve to minimize internal comments, but multiple reviewers with potentially conflicting comments (and priorities) can be challenging. These costs can be refined during project implementation.

Note that, as indicated in the RFP, additional technical studies are not to be scoped or costed and will happen after award and review of documents. At the project kickoff meeting, we will work with City staff to refine the scope and throughout the process, we will work to manage the expenditures. We believe it is likely that additional funding will be needed for studies and other tasks, either for our team or from the applicant.

We will work to keep on top of scope changes, communicate those to the City, and manage the overall budget. We believe our past experience on the project and agency and stakeholder relationships will lead to cost efficiencies.

G. WORK SCHEDULE

Attachment E shows a preliminary schedule. The schedule will be refined during the kickoff meeting. Given the up-front work needed to define the project and alternatives and the public involvement steps, we believe the entire Scope of Work will take approximately 20 months to complete, at minimum.

H. SAMPLE WORK PRODUCT

See attached thumb drive for a sample EIR for a complex coastal zone project (South Tioga). We have also provided links below to other CEQA documents (specifically for remediation work) completed by Integral, including those with DTSC or the Water Board as the lead agency.¹

- [Pier 39 to 43 ½ Sediment Remediation IS/MND](#)
- [Vallejo MGP Addendum to the IS/MND](#)
- [Larkspur Landing PCB Remediation IS/MND](#)

I. INSURANCE

Our team has reviewed the insurance requirements and can meet them.

J. CONSULTANT AGREEMENT

Our team has reviewed the template agreement and has no major concerns of objectives. We would note that in Section 3.1, under Commencement and Completion of Work, it states that “services shall be performed in strict compliance with the schedule set forth in the Scope of Work.” However, the schedule for the project will not be fully under the control of the CEQA consultant.

¹ DTSC and the Water Board both only will be the lead on NDs or MNDs – they generally will request a local agency take the lead agency role for an EIR, as is the case in Fort Bragg presumably.



Bridgette R. DeShields

Principal

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Education & Credentials

M.S., Environmental Management, University of San Francisco, San Francisco, California, 1998

B.S., Biochemistry, University of California, Davis, California, 1986

Continuing Education

Hazardous Waste Operations and Emergency Response 40-Hour Certification (1994; refreshers 1995-present)

Loss Prevention System

Certified Project Manager

Professional Affiliations

Society for Environmental Toxicology and Chemistry

Bay Planning Coalition

Western Dredging Association

Ms. Bridgette DeShields has more than 35 years of experience and is a specialist in regulatory strategy, site investigation, site remediation, sediment and water quality management, environmental toxicology, and environmental permitting and planning. She has managed programs ranging from large site investigations to screening and quantitative ecological and human health risk assessments. She also designed and participated in dredging program management, field evaluations, bioaccumulation studies, literature reviews, and specially designed study programs. Her work has been focused on sediment assessments and waterfront projects with natural resource components and complex regulatory frameworks. She also has extensive experience in navigating California regulatory and permitting programs. Ms. DeShields also has expertise in prepared environmental documents under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Ms. DeShields has provided litigation support and expert testimony in the areas of water quality, regulatory compliance, human and ecological risk assessment, waste disposal under California and federal regulations, and Superfund cost allocation. She has developed excellent working relationships with regulatory agency staff, including federal agencies, state agencies in California and Oregon, natural resource trustees and local agencies.

Ms. DeShields represents the interests of the Bay Area refineries on San Francisco Bay water and sediment quality issues as a representative for the Western States Petroleum Association, serving as chair of the Regional Monitoring Program (RMP) Technical Review Committee since January 2000. She has taught courses on risk assessment, sediment assessment and remediation, and TSCA compliance.

Relevant Experience

WATER MANAGEMENT

Mercury Total Maximum Daily Load (TMDL) Review, San Francisco Bay, California — Reviewed the draft TMDL for mercury document prepared by the San Francisco Regional Water Board and provided review comments relative to technical approach and evaluations as well as implementation issues. Issues of concern identified included bioaccumulation into fish tissues and research required to adequately characterize the levels and processes associated with methylmercury content in bay sediments, surface water, and fish/shellfish tissues. Source characterization and control was also an issue of concern.

San Francisco Bay Regional Monitoring Program, San Francisco Bay, California — Has served on the Regional Monitoring Program (RMP) Technical Review Committee (TRC) since January 2000 and has been the committee chair for over 10 years. Provides technical review and oversight of the monitoring and related research programs. Areas of focus include sediment, water and biota tissue characterization; PCBs, mercury, nutrients, PAHs, pesticides, and selenium; stormwater runoff, emerging contaminants (including PFAS and microplastics); fate and transport modeling as well as identifying sources, pathways and loadings.

Evaluation of TMDLs in the Los Angeles Area — Did a comprehensive literature review and evaluation of TMDLs for contaminants, bacteria and trash in the LA region as part of litigation support. Prepared technical reports evaluating best management practices. Also reviewed fish consumption advisories, TMDL target development, toxicity evaluations, and proposed management measures.

Shell Mounds Project, Ventura, California — Reviewed technical reports regarding shell mounds offshore that remained after removal of drilling rigs. The public and the Coastal Commission want the structures removed. Assessed chemical and biological data and provided recommendations.

SEDIMENT INVESTIGATION

Sediment Assessment, San Diego, California — Evaluated sediment chemistry and toxicity in marine sediments at a site where the main COCs included PCBs and metals. Assessed the data relative to California's Sediment Quality Objectives (SQO) program and negotiated an approach with the RWQCB. Also participated in the SQO stakeholder advisory committee.

Extended Site Sediment Investigation, Sausalito, California — Developed both a work plan and a sampling and analysis/quality assurance plan for the collection of Horseshoe Bay sediment data as part of an extended site inspection in support of the base realignment, closure of the U.S. Army East Fort Baker Facility, and transfer of the property to the National Park Service. Managed sampling efforts and conducted aquatic bioassays and chemical analyses of sediments. The study was designed to determine if historical East Fort Baker operational practices had caused any adverse impact to the adjacent Horseshoe Bay sediments of sufficient magnitude to warrant dredging. Assessed the data to describe the presence and extent of sediment contamination and associated risks to aquatic biota and wildlife, and presented an extended site investigation report. Risks were shown to be minimal and no action was concluded based on the risk evaluation.

Sediment Investigation and Bioavailability Assessment, Kansas — Led an effort to characterize sediments in drainage channels leading from a former smelter site to a river in Kansas. Chemicals of concern included arsenic, cadmium, lead, and zinc. The field program included bulk sediment and porewater, including measures of acid volatile sulfide and simultaneously extracted metals and other parameters that were used in a weigh-of-evidence approach to assess risks to human and aquatic receptors. Successfully applied the approach to limit the findings of impacts to areas just downstream from the former facility.

Sediment Investigation, Pittsburg, California — Conducted a sediment sampling and analysis program to evaluate potential risks to aquatic receptors offshore of a petroleum coke loading terminal. Sediment cores were collected, examined for the presence of coke, segmented, and



analyzed for metals and PAHs. Used the results to evaluate whether aquatic communities exposed to offshore sediments were at risk from the presence of coke, and whether any remedial activities were needed. Conducted solid-phase bioassays on the samples with elevated coke content. Showed that the sediment, although containing high levels of coke, were not toxic to aquatic life and that chemical contaminant levels were at or below screening level. No remedial activities were deemed necessary.

Portland Harbor Superfund Site Investigations, Portland, Oregon — Represented a client on the Portland Harbor Light Products Study Group. This group is investigating the distribution and potential effects on PAHs and other petroleum-related compounds in sediments within Portland Harbor as part of the Portland Harbor Superfund site investigations. Conducted a spatial analysis of the extent of PAH contamination within Portland Harbor to evaluate whether elevated levels of PAHs could be associated with light petroleum products terminals.

Sediment Assessment and Remediation Evaluation, Portland, Oregon — Supported sediment assessment, risk assessment and remedial design effort for a former industrial property on the Willamette River. Assisted in developing a work plan for conducting a field investigation that includes sediment sampling, bioassay testing, coring, and passive sampling. The site was a former pesticide and chlor-alkali manufacturer, and COCs included DDT, monochlorobenzene, dioxins/furans, sodium perchlorate, and hexavalent chromium. Also evaluated the cleanup goals for PCBs.

Baypoint Oil Spill, Pittsburg, California — Compiled data on the nature and extent of PAH and petroleum contaminants in sediment and surface water resulting from the spill. Staff conducted a toxicological and spatial analysis to determine the degree and spatial extent of the impacts. In addition, used PAH profiling (i.e., expanded PAH analysis) to evaluate the source of PAHs detected at various locations to distinguish impacts from the spill material from ambient conditions and other potential sources. Identified two distinct source materials.

Maintenance Dredging Project, Port of San Francisco, California — Managed the port's dredging program for 3 years, including designing and implementing sampling and analysis plans (SAPs), applying for and negotiating permits, designing and managing upland disposal of sediment, managing and inspecting dredging contractors, and conducting water-quality and circulation studies. Represented the port at meetings of local stakeholder working groups, including the long-term management strategy for San Francisco Bay meetings and the sediment quality guidelines working group. Negotiated dredged material suitability and permit conditions with the Division Material Management Office (DMMO), consisting of USACE, EPA, the Bay Conservation and Development Commission, RWQCB, CDFW, and the National Marine Fisheries Service. Prepared budgets, evaluated alternatives for dredged material disposal, and managed a project to design an upland rehandling facility for PAH-contaminated sediments.

Maintenance Dredging Program, Moss Landing Harbor District, California — Managed the maintenance dredging program for Moss Landing Harbor, the largest fishing port between San Francisco and Los Angeles, for more than 4 years, including the successful preparation and implementation of SAPs, dredging plans, testing reports, and post-dredge reports. The main COC in sediments was DDT. Worked with USACE, CCC, and RWQCB in establishing a multiyear permit. Also responsible for designing, constructing, and operating an upland disposal site and restoring the site into a visitor-serving recreational area, including restoration of native coastal dune



habitats, and working with USFWS pursuant to designation of the area as critical habitat. . Developed a CEQA document for the North Harbor expansion project which involved addressing coastal erosion issues and protection of eelgrass beds. Gave presentations at public meetings, interfaced with the press, and worked with a local congressman, as well as EPA's congressional liaison. An assessment was conducted to support a dredged material management plan for navigational dredging of Moss Landing Harbor. Developed a work plan, summarized background information, and conducted a screening-level modeling analysis to estimate concentrations of pesticides in offshore sediments following a hypothetical set of dredging events. The results of the model were used to estimate ecological effects of dredged material placement over time. Analysis included a review and compilation of available information and literature for the site, evaluation of transport dynamics in the highly complex canyon environment, screening-level modeling of the mixing conditions at the disposal location (DCORMIX), transport and deposition of the suspended material plume (SSFATE), and recovery analysis (RECOVERY). The preliminary risk assessment and the supporting screening-level modeling analysis were summarized in a draft report and submitted for independent peer review. Peer review findings recommended additional data collection and modeling work to further support the conclusions of the screening-level study. Revisions to the report were in response to requests by the peer review panel. The conclusions of the report support the continued dredging and aquatic disposal of the dredged material, with no unacceptable risks.

San Mateo-Hayward Bridge Seismic Retrofit Project, San Mateo, California — Assisted with environmental review and permitting. Key environmental issues included potential contamination of bay sediments; associated water-quality impacts; impacts to seasonal wetland habitat; temporary alteration or closure of public facilities; potential entrainment of steelhead trout during hydraulic dredging; and potential impacts to fish and marine mammals from noise, vibrations, and turbidity during construction. Conducted studies to assess the level of contamination of bay sediments to be dredged as part of the construction. Consulted with member agencies of the DMMO, investigated on-land and aquatic disposal options, and developed detailed cost estimates for these options. In addition, reviewed environmental databases, California Department of Transportation (Caltrans) maintenance records, and effluent data from outfalls in the vicinity of the bridge to investigate the potential for sediment contamination. Prepared a SAP for sampling and testing sediments in accordance with DMMO requirements (Tier II), which was approved by the DMMO and Caltrans. The results of the sediment testing were incorporated into agency permit application packages. Assisted in preparing the public notice to support an individual permit application from USACE under Section 404 of the federal Clean Water Act.

REMEDIAL DESIGN

Sediment Capping Design for a New Ferry Terminal, San Francisco, California — As part of the design team, working on a project involving development of a new ferry terminal. Because of the presence of contaminated sediments, additional dredging and a sediment cap will be required. The team designed the sediment cap and developed specifications. Provided input on remedial strategy and permitting considerations and mitigation planning. Integral also led the field oversight for capping of contaminated sediments.

Sediment Remediation and Upland Source Tracing Activities, Electrical Generating Station, Hawaii — Since 2014, Integral has been providing a range of technical services to a private party



in association with the planned Superfund cleanup of PCB-impacted sediments in Pearl Harbor. Activities have included review and comment on RI/FS documents prepared by others for the U.S. Navy, sediment transport modeling to ensure remedy efficacy, and site-specific ecological risk assessment to support selection of alternative remedial action levels. The risk assessment included co-located sediment and invertebrate biota sampling to support site-specific risk calculations. The net result of these activities is a better, less costly proposed remedy and expected additional improvements to the final remedy during remedial design. Current work includes remedial design, permitting, and TSCA compliance. Other activities include developing a permitting plan for source removals in upland areas, outfalls and other conveyances.

Engineering Evaluation and Cost Analysis (EE/CA) and Remedial Design for Yosemite Slough, San Francisco, California — Supported the PRP group in coordinating with the EPA Region 9 effort to develop an EE/CA for this site. Assisted EPA's consultant by developing work plans and reports to support the EE/CA and assisting in the development of cleanup goals and permitting strategies. Also involved with risk evaluations, source investigations, and historical data evaluations, as well as the development of remedial alternatives. Studies conducted include geotechnical assessments, evaluations of the biologically active zone, and natural attenuation. Currently engaged in pre-design studies for the remedy.

Waterfront Sediment and Upland Area Remedial Action, Eureka, California — Led a team for a sediment investigation and remedial action planning program to address offshore sediments and upland soils contaminated with metals and PCBs in downtown Eureka. PCB contamination was managed with oversight from the RWQCB (no involvement necessary from EPA's TSCA group). Developed risk-based cleanup goals, an RAP, and an implementation plan, as well as mitigation plans for avian species and eelgrass. Successfully negotiated approval of the RAP with the North Coast RWQCB. Ultimately, the site will be redeveloped as open space and waterfront commercial development.

FEASIBILITY STUDIES

Environmental Investigation, Feasibility Study, Risk Assessment, and Related Services at a Former Industrial Facility, San Francisco Bay Area, California — Led the investigation, risk assessment, and feasibility study for a 10-acre parcel containing two freshwater lagoons adjacent to San Francisco Bay. Constituents of concern include metals, thiocarbamate, organochlorine pesticides (OCPs), and PCBs. Assessment included a treatability study to evaluate the effectiveness of carbon amendment to reduce leachability and bioavailability of constituents. Lead agency was DTSC with involvement from EPA on TSCA compliance. Also conducted human and ecological risk assessments and developed a feasibility study that included a combination of excavation, treatment, and capping/cover. Several natural resource trustee agencies were also involved in the project due to the proximity to sensitive habitats that support special-status species, including California clapper rail. Led the regulatory and permitting strategy efforts for the project as well

SITE INVESTIGATION

Site Assessment and Screening Evaluation, Former Machine Shops, Alameda, California — Conducted several rounds of investigation, both upland and offshore, for a 4 acre site in Alameda that had been used as a machine shop for over 50 years. Contaminants included



metals, PCBs, TPH and VOCs. Developed a risk-based screening framework for evaluating potential site redevelopment and in support of due diligence efforts.

Site Assessment, Remediation, and Facility Closure at a Former Chemical Plant, Elk Grove Area, California — Led a team in conducting site investigation and developing plans and implementing remedial activities at a former resin manufacturing facility. Chemicals of concern included phenolics, toluene, ethylbenzene and xylenes. Developed site-specific cleanup goals protective of groundwater, soil vapor, and human exposure. Developed a demolition and facility closure plan and implemented a sampling program. Developed a remedial action plan and managed the excavation activities. Negotiated entrance into DTSC's voluntary cleanup program and achieved closure from both DTSC and Sacramento County with no land use restrictions by demonstrating acceptable post-remedial conditions.

Environmental Investigation, Remediation, Risk Assessment, and Related Services at a Former Sawmill in Northern California, Fort Bragg, California — Managed a multiyear, multisite investigation and remediation project at a former sawmill site in northern California slated for mixed use redevelopment. Primary constituents of concern were PCBs, VOCs, dioxins/furans and petroleum hydrocarbons. The assessment included both the 415-acre mill site as well as a ranch area offsite. Tasks included site investigations at five operable units (including sediments within a complex of ponds) and offshore sediments, risk assessment (human and ecological), background evaluations, dioxin characterization, pond and offshore sediment sampling, remedial planning, construction, demolition, and oversight, and negotiations with multiple regulatory agencies. The site is a high profile project managed by DTSC, but with input from RWQCB, CDFW, USFWS, NOAA, city and county agencies, and CCC. The project included multiple regulatory and permitting requirements specific to the coastal zone of California that require integration of archaeologists, Native American monitors, biologists, botanists, marine mammal specialists, and geotechnical and other engineering disciplines. Completed multiple investigation and monitoring reports, a remedial investigation, two remedial action plans (RAPs), and a risk assessment. Implemented 3 years of remedial actions for soil and groundwater including bioremediation of the petroleum-impacted soils. Also conducted a complex quantitative analysis to develop background levels for dioxins as well as a method for source identification. Conducted site-specific bioaccumulation assessments for metals and dioxins/furans in upland soils and pond sediments. Successes include a no further action for large areas of the site and the offshore sediments, implementation of various remedial measures, and a strategy to address pond sediments and the jurisdictional dam. Also achieved site certification for the offsite ranch and coastal portion. The coastal portion was sold/transferred to the city to create a coastal trail.

Comprehensive Investigation and Remedial Planning and Implementation, Antioch, California — Served as project manager for a comprehensive investigation and remediation project at a closed paper mill. Developed work plans and technical reports in support of investigation activities under the AB2061 program. In addition, risk-based screening levels (RBSLs) were developed and presented in a report as were background levels. The background level report developed upper-bound background concentrations for metals using DTSC guidance but also presented an approach and rationale for determining whether dioxins/furans detected onsite were due to ubiquitous anthropogenic sources or site-related sources. Site investigations were conducted at eight properties. Chemicals evaluated included metals, dioxins/furans, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PAHs, OCPs, and



herbicides. Risk evaluations were conducted for each of the subject properties based on an unrestricted land use scenario to support sale/transfer of the properties. Completed an RI/FS work plan to assess soil and groundwater and an underground utility investigation. Also, developed an RAP and a California Environmental Quality Act document and completed activities pursuant to DTSC's Public Participation Guidance Manual, including developing a mailing list and an initial fact sheet and community survey; interviewing community members and local officials; developing a public participation plan (which included a community profile); and conducting a public meeting and responsiveness summary.

PERMITTING

Remedial Strategy, CEQA and Permitting for a Harbor Renovation and Remediation Project, San Francisco, California — Work has included remedial strategy, determining the adequacy of CEQA documents and the need for a CEQA addendum, and permitting for a remediation project on the San Francisco Waterfront that also involves marina renovation. Developed a Categorical Exemption and obtained permits from the San Francisco Bay Conservation and Development Commission, USACE, and the RWQCB for an interim remedial measure. Working on permitting and pre-CEQA studies for the next phase.

CEQA and Permitting for PAH Remediation Site, San Francisco, California — Lead consultant for CEQA and permitting for a project involving multiple pier areas along the San Francisco Waterfront. The project will include dredging and capping of PAH-contaminated sediment with the RWQCB as the lead agency for CEQA. Permitting agencies include the USACE, Water Board and BCDC with consultations on essential fish habitat and endangered species with the CDFW, NOAA/NMFS and USFWS.

CEQA and Permitting for Remediation at a Former Wastewater Plant, Larkspur, California — Developed a California Environmental Quality Act (CEQA) document (mitigated negative declaration) for a former wastewater plant with PCB contamination. The lead cleanup agency is EPA Region 9 (for TSCA) but the Ross Valley Sanitary District was the lead for CEQA. The assessment included an evaluation of air quality impacts using CalEEMod and greenhouse gas impacts as well as tribal consultations under AB52. Also updated the site's wetland delineation and worked with the USACE to evaluate seasonal wetland impacts and related requirements. Follow-on work included obtaining grading and other permits for implementation of the remediation with the City of Larkspur and Marin County. Also closed out an existing construction stormwater permit.

CEQA and Permitting, Sewer Rehabilitation Projects, Ross Valley Sanitary District — Lead on all permitting and CEQA work for RVSD. Includes obtaining permit from the USACE, CDFW (e.g., streambed alteration permits), and others for sewer rehabilitation, sewer replacements, sewer extensions and other related projects. Also conducts CEQA compliance reviews and CEQA documents, as needed. These have included Notice of Exemptions and Initial Study/Mitigated Negative Declarations.

Categorical Exemption for a Former Resins Plant, Elk Grove Area, California — Worked with DTSC's CEQA group to develop a categorical exemption (CatEx) for a remedial measure at the facility involving phenolics and solvents in subsurface soil. In order to move forward with the



CatEx, cultural resources and biological resources at the site needed to be investigated. Also developed fact sheets and a community mailing list.

Risk Evaluation for Placement of Dredged Sediments at Winter Island, Winter Island Reclamation District, Sacramento Delta, California — Developed “acceptability” criteria for placing contaminated sediments along levees at Winter Island. The Winter Island Reclamation District needed 500,000 yd³ of sediments to rehabilitate levees and, particularly, needs silty material to “cap” the levees and prevent erosion. Worked with the San Francisco RWQCB to develop levels of contaminants acceptable for material placed on levees, and also developed management and engineering practices to prevent erosion and migration of placed material to a nearby wetland. Contaminants evaluated included metals, PAHs, PCBs, and DDT.

CEQA and Coastal Zone Permitting for Remediation at a Former Sawmill, Fort Bragg, California — Developed CEQA documents (categorical exemptions and mitigated negative declarations) for three separate interim remediation projects, developed fact sheets and a project website, attended and presented at public meetings, and led negotiations with multiple regulatory agencies. The site was a high profile project managed by DTSC and included multiple regulatory and permitting requirements specific to the coastal zone of California that required integration of archaeologists (due to sensitive subsurface cultural resources on the site), Native American monitors, biologists, botanists, marine mammal specialists, and geotechnical and other engineering disciplines. The CEQA documents supported two remedial action plans (RAPs). Also worked with City land use planners to incorporate the final remediation projects into a Specific Plan and EIR for the site reuse. The coastal portion was sold/transferred to the city to create a coastal trail. The three interim remedial measures were completed successfully.

CEQA and Coastal Permitting for Remediation at a Waterfront Site, Eureka, California — Completed a CEQA document (mitigated negative declaration) for a remedial action program to address offshore sediments and upland soils contaminated with metals and PCBs in downtown Eureka. Project included upland excavation and dredging. Worked with various permitting agencies including the City of Eureka (lead CEQA agency), North Coast Regional Water Quality Board (lead remediation agency), USACE, CCC, the local Harbor District, CDFW, USFWS, and NOAA to issue project permits. Obtained a Nationwide 38 permit and water quality certification as well as a coastal development permit. Project included restoration of shoreline habitat and addressing impacts to benthic communities. Ultimately, the site will be redeveloped as open space and waterfront commercial development.

CEQA and Public Participation for Two Former Mills, Antioch, California — Developed a CEQA document (mitigated negative declaration) for DTSC for an interim remedial measure at a former pond, including assessment of two federally endangered plant species and cultural resources. Also completed activities pursuant to DTSC’s Public Participation Guidance Manual, including developing a mailing list and an initial fact sheet and community survey; interviewing community members and local officials; developing a public participation plan (which included a community profile); and conducting a public meeting and responsiveness summary.

HUMAN HEALTH RISK ASSESSMENT

Human Health Risk Evaluation, Redevelopment Project, Newark, California — Assessed risks and assisted in the development of remedial action plans for a site that is part of a large transit-



oriented development. Site includes multiple parcels that were former industrial sites. Contaminants include pentachlorophenol, volatile organic compounds (VOCs), metals, and dioxins/furans. Scope also included development of a risk management plan, soil management plan, community protection plan (including an air quality monitoring program for protection of offsite residents), and health and safety plans and guidelines and well as assessment of risks due to VOCs in air during and post-construction. Developed guidelines for utility workers that could be exposed to contaminated groundwater and soil (as well as vapor in trenches) during installation and maintenance of infrastructure. Evaluated soils for offsite disposal, including profiling of soils for landfill disposal and conducting an evaluation if RCRA listed wastes.

Human Health and Ecological Risk Assessment at a Former Petroleum Refinery, Lawrenceville, Illinois — Prepared work plans for the human health and ecological risk assessment, including a problem formulation document. Conducted a baseline ecological risk assessment and baseline human health risk assessment (BHHRA) using the data collected as part of the remedial investigation. Provided strategic consulting related to the remedial investigation and risk drivers for remediation. Participated in agency meetings with Illinois EPA regarding risk assessment tasks. Several unique and innovative approaches were used, including use of area-weighting with Thiessen polygons to estimate exposure point concentrations, which overall improved risk estimates; site-specific prey tissue data; site-specific bioassays; and lead bioavailability testing, which also provided more site-specific estimates of bioavailability and risks and overall lower risk estimates. The risk assessment assumed a presumptive remedy area that also resulted in an overall more favorable impression of residual site risks. A site-specific assessment of lead bioavailability was also conducted.

Risk Assessments for Perchlorate at Space and Missile Propulsion System Test Facility, California — Performed three risk assessments to assess potential perchlorate exposures. The first risk assessment, submitted to DTSC, was conducted to provide support for the Resource Conservation and Recovery Act post-closure permit application process for a former onsite station and three surface impoundments. Human health-based screening levels (HBSLs) for perchlorate in soil were developed based on a range of regulatory recommended provisional toxicity criteria for various exposure scenarios. The second risk assessment was submitted to the California RWQCB and consisted of both human health and ecological risk evaluations of potential exposures to perchlorate in soil and groundwater at three onsite areas. HBSLs for perchlorate in soil were developed based on direct contact exposures; protection of groundwater; and provisional toxicity criteria recommended by both Cal/EPA's Office of Environmental Health Hazard Assessment and EPA. The third risk assessment was conducted to support potential compliance issues associated with the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Risk assessment methodologies were used to characterize and assess potential releases of perchlorate from onsite operations in order to evaluate notification responsibilities specified under Proposition 65 regulations. RBSLs were developed for ecological and human health receptors to support a site-wide RAP. Supported real-time decision-making during remediation and conducted a post-remedial risk assessment for this 5,000-acre site. The sitewide risk assessment assessed excavation and regraded areas and included land use restrictions where necessary to specify acceptable future uses. Assessed both human and ecological receptors, soil, groundwater, and surface water.



Risk-Based Assessment at a Former Tannery Site, Santa Cruz, California — Conducted a risk assessment for former tannery based on specific site development plans. Evaluated potential exposures to chemicals in soil and groundwater for future residents and office and construction workers. Chemicals of concern included chromium(VI) and arsenic as well as VOCs and TPH. The risk assessment was used to inform the redevelopment plan. Provided target cleanup levels for soil and participated in public outreach programs, including presentations at city planning and city council meetings. Lead agency was the California DTSC. Site has now been built out as a mixed use live-work arts center.

Development of Approach for Assessing Risks to Livestock for Petroleum Hydrocarbons, Nationwide — Developed a framework to determine when livestock should be included in a risk evaluation, and estimated risks of petroleum hydrocarbon exposure to livestock. A conceptual site model was developed to assess whether complete and significant exposure pathways exist at a given site. To estimate potential risks, TRVs, and drinking water and soil, RBSLs for petroleum hydrocarbons, including crude oil, benzene, toluene, ethylbenzene, and xylene, and PAHs were developed for a variety of livestock receptors. The TRVs and RBSLs developed for this framework were comparable to human health RBSLs and other published livestock guidelines. The approach can be adapted for assessing other chemicals (i.e., metals, PCBs, pesticides).

Risk Evaluations for Forest Products Sites, California — Conducted risk-based screening assessments at several sites in Northern California on former sawmill sites. Sites include both Water Board and DTSC lead and evaluation of future residential and commercial land uses. Contaminants include petroleum products, metals, and dioxins/furans as well as some VOCs and semivolatile organic compounds (SVOCs). Also assessed waste management options for soil.

Assessment of Lead in Soil, Santa Rosa, California — Conducted a risk assessment for soils along the Santa Rosa Creek corridor for the Sonoma County Environmental Health and Sonoma County Water Agency. Evaluated risks for a residential property adjacent to the creek as well as within the creek corridor itself. The primary issue was lead in soils from placement of fill material.

Toxicology Evaluation of Remedial Action Objectives, California — Conducted an in-depth assessment of outdated remedial action objectives for a specific contaminated site in California. Reevaluated the toxicology and quantitative risk assessment for a specific unregulated contaminant of concern at the site. Calculated new screening levels based on updated risk assessment methodologies to ensure that remediation actions remain protective of public health.

Risk Assessment of Expedited Remedial Action Program, Golden Technology Site, Santa Rosa, California — Complete site assessment and risk assessment activities, primarily for VOCs, at a site consisting of three parcels of land located in the southern portion of the City of Santa Rosa zoned for commercial use. DTSC was the lead agency for the program.

ECOLOGICAL RISK ASSESSMENT

Sediment Investigations and Ecological Risk Assessment, Oakland Army Base, Oakland, California — Managed a program to evaluate potential risks to ecological receptors from contaminants in offshore marine sediments and a small freshwater marsh habitat as well as upland areas. Developed an ecological risk assessment work plan and sediment SAP, including a



tiered chemical and biological testing program designed to focus the investigation on the areas and chemicals of most concern, thus reducing costs. Conducted bioassay and bioaccumulation tests at 12 stormwater outfalls to evaluate potential impacts to aquatic receptors, amphibians, birds, mammals, and plants potentially exposed to chemicals. Risks from ubiquitous anthropogenic contamination were factored out. Successfully negotiated approval of these plans, as well as the risk assessment results, with EPA, DTSC, RWQCB, and resources agencies including CDFW, USFWS, and NOAA. This work supported current redevelopment efforts by the City and Port of Oakland. Currently supporting East Bay Regional Parks, who will receive a portion of Parcel 1 at the Former Oakland Army Base, in working with the Army, the RWQCB, and DTSC to develop a mutually agreeable remedy for offshore sediments. The main contaminant is PCBs. Developed a technical framework, providing technical assistance, and facilitating discussions between parties to complete a record of decision.

Fort Ord Ecological Risk Assessments, Monterey, California — Performed quantitative human health and ecological risk assessment at 41 sites. Human receptors included residential, commercial/industrial, and recreational users. Ecological receptors included aquatic life, mammals, birds, reptiles, insects, and plants. Developed toxicity reference values (TRVs) and site-specific exposure assessments. Evaluated the results of bioassays on aquatic organisms and plants. Assessed possible impacts to special status species, characterized sites, conducted fate and transport analyses, and modeled exposure and effects. Site-specific studies included butterfly and lizard population surveys; collection and analysis of site-specific plant, reptile, and mammal tissues; a plant health and condition study; a leaf litter study; and an enhanced preliminary assessment for the offshore marine environment. Primary contaminants of concern were lead and other heavy metals associated with small arms, dioxins in burn-pit areas, petroleum hydrocarbons from motor pools (a site-specific total petroleum hydrocarbon [TPH] cleanup level was developed), and explosive compounds. Pesticides and PCBs were also found at some of the sites. Worked with the regulatory agencies (mainly EPA and DTSC, but with selected and focused involvement of USFWS, CDFW, and NOAA for specific aspects) in a cooperative manner, such that the agencies have been very supportive of innovative techniques for site characterization and risk assessment. Made presentations at public and technical group meetings and have presented data jointly with agency at scientific meetings. Worked with U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) to develop methods to evaluate the bioavailability of lead and site-specific conditions at small arms firing ranges. The record of decision has been signed for all sites at Fort Ord. Additional work was undertaken at the unexploded ordnance range site, where the risk evaluation was conducted. Site-specific field studies on lead uptake into plants, insects, lizards, and small mammals have been conducted as well as site-specific bioavailability jointly with USACHPPM. The risk assessment included using this site-specific data and an approach aimed at balancing site cleanup, risk reduction, and preservation of rare and declining habitats is being used. This analysis was used to develop site-wide cleanup levels and a site-wide cleanup approach for this 8,000-acre area.

Ecological Risk Assessment in a Desert Environment, Topock, California — Technical lead for an ecological risk assessment for several dry wash areas in the Mohave Desert near an operating facility. Main chemical of interest is chromium (total and hexavalent) as well as a number of other metals. Developed a conceptual site model and risk assessment work plan and contributed to site characterization work. Completed a groundwater risk assessment.



Ecological Risk Assessment for Sulphur Bank Mercury Mine, Clear Lake Oaks, California — Conducted a terrestrial ecological risk assessment for the upland portions of the mine site. Mercury is the main contaminant of concern, although other metals with elevated levels were evaluated as well. Evaluation included assessing spatial scale of risks in relation to native plant populations and balancing restoration goals with cleanup efforts. Developed risk-based action levels for seven receptors and incorporating information about speciation/bioavailability of metals onsite. An assessment of cultural issues (ceremonial uses of plants and ingestion of game animals) important to the adjacent tribe was included. Tribe members participated in the scoping process, and the ultimate remedy was negotiated with EPA and the tribe representatives.

Ecological Risk Assessment, Presidio of San Francisco, California — Conducted a basewide study to develop cleanup levels for aquatic and terrestrial receptors for the feasibility study to support future uses and redevelopment of the Presidio. Developed cleanup levels for metals, pesticides, PCBs, VOCs, and SVOCs as well TPH constituents. Negotiated the approach with the regulatory agencies and presented the cleanup levels at public meetings (restoration advisory board and other community work groups). Provided technical review and oversight of other contractors' assessments, including other ecological risk evaluations and several studies to develop action levels for TPH. Conducted an evaluation to develop site-specific cleanup levels for TPH diesel and fuel oil in the freshwater riparian zone. Crissy Field Area: Conducted an HHRA for recreational receptors theoretically exposed to soil excavated from one area onsite to create a wetland, and disposed of at areas on site slated for future recreational use. Chemicals of concern included metals and PAHs. Used information from the risk assessment to finalize construction plans for the wetland. Lobos Creek Area: Conducted a data review and remedial investigation that recommended no further action for the creek and watershed.

Site Remediation Project, Casmalia, California — Developed work plans, developed biological and endangered species reports, and negotiated an ecological risk assessment approach for the Casmalia Site Remediation Project, a former hazardous waste landfill site in central California. Conducted a multipathway, multispecies ecological risk assessment to address residual contamination from closed ponds and pads and areas around multiple capped landfills that held metals, solvents, PCBs, pesticides, sludges, and oily wastes. Species of concern at the site included red-legged frogs, western spadefoot toad, southwestern pond turtle, and other threatened and endangered species in both upland and aquatic areas. The ecological remedial assessment is designed to focus on areas that will not undergo presumptive remedies (i.e., landfill caps), mainly the liquid impoundments and some upland portions of the site used for disposal of waste. The approach focused on functional groups of receptors representing important components of the food web and will be conducted on a site-wide basis and in a phased manner. Participated in subcommittee meetings with the regulatory agencies and with the technical committee. Assisted the PRP group with issues related to natural resource damages and habitat restoration/mitigation. Produced a biological species and habitat survey report and an assessment of risks to burrowing mammals through inhalation of burrow air as part of the interim progress report for the RI/FS. Site-specific background levels, selection of chemicals of potential concern, and the ecological risk assessment have been completed and approved. A site-specific study of bioaccumulation and bioavailability was conducted. Following approval of the remedial investigation, developed cleanup goals and provided input to the Feasibility Study and selection of remedial alternatives.



Ecological Assessment of Petroleum Hydrocarbons, San Francisco, California — Provided technical review of Tier 1 and Tier 2 screening levels for ecological receptors in the marine ecological protection zone of the San Francisco Airport developed by RWQCB. Reviewed and commented on the 3-dimensional migration models and bioassay tests used to develop TPH cleanup levels. Reevaluated the likelihood of petroleum hydrocarbons (TPH-diesel and benzene) in groundwater and soil detected near terminals at San Francisco Airport to migrate to San Francisco Bay. Estimated effects of TPH and benzene on aquatic receptors in the bay using site-specific information. Revised cleanup developed based on the results of this evaluation.

Ecological Assessment of Stormwater Runoff to a Freshwater Marsh, Fairfield, California — Conducted a screening ecological assessment to evaluate the effects of metals and organic compounds in stormwater runoff and seepage from a natural spring on aquatic and terrestrial receptors at a freshwater marsh. Conducted a biological inventory to select indicator species for the assessment. Developed screening criteria based on applicable state and federal freshwater sediment and surface-water criteria. Identified areas of concern and recommended additional site characterization.

Milepost 68 Oil Spill, Utah — Conducted an ecological risk assessment to evaluate potential effects on aquatic and wildlife receptors potentially exposed to petroleum products in freshwater marsh sediments due to a pipeline break. A cleanup level of 20,000 parts per billion for total PAH was negotiated with EPA, USFWS, and the State of Utah.

VAPOR INTRUSION

Vapor Intrusion Evaluations — Working on several sites in northern and southern California where chlorinated VOCs are chemicals of concern (COCs). Services include site assessment, indoor and outdoor air monitoring, risk evaluations, regulatory agency negotiations, and developing mitigation plans. Projects range from operating facilities to commercial/industrial and residential redevelopment projects. Sites include those under both the Regional Water Quality Control Board (RWQCB) and California Department of Toxic Substances Control (DTSC) lead, as well as some sites under County lead. Sites are in Oakland, South San Francisco, Sunnyvale, Mountain View, and Napa. Also working on two sites in the Los Angeles/Orange County areas. Issues range from characterization of soil vapor and indoor air, to determination of remedial needs and mitigation measures. Also assessed Proposition 65 notification requirements for two sites and provided guidance on risk communication. Several sites are contaminated due to releases from former dry cleaners with chlorinated VOCs.

Risk Communication and Risk Assessment, San Francisco, California — Evaluated site data (soil, groundwater, soil vapor and indoor air) for a daycare center that was formerly a dry cleaner site. Assessed the potential for adverse health effects to daycare workers and children through site-specific risk assessment. Developed a communication plan and talking points and presented findings at a meeting with parents and daycare workers. Assisted in the development of recommended actions/next steps.

Soil Vapor and Indoor Air Evaluation, Napa, California — Assessed risk and developed risk communication plans for a large former dry cleaner site with a plume extending under homes and a bed & breakfast. Developed a communication plan, fact sheet and talking points for residents and other neighbors. Also assisting in the development of soil vapor and indoor air



sampling plans. Constituents of concern were TCE, PCE and vinyl chloride. Site is under the lead of the SF RWQCB. Remedial action planning is ongoing.

Soil Vapor and Indoor Air Evaluation, Oakland, California — Assessed risk for a large former UST site with residual NAPL and benzene. The groundwater plume extended under an apartment building with a basement and adjacent commercial buildings. The property owner of the apartment was concerned about residents; an indoor air sampling program was developed. Met with the regulatory agency to discuss the next steps and additional data needs to support a risk assessment and site cleanup plan. Additional characterization and remedial action planning is ongoing.

LITIGATION SUPPORT

Litigation Support for Contract Dispute, East Bay Area, California — Testified in a case involving trucking of soils from a construction site and disposal of those soils. Provided expert testimony on the requirements for waste characterization in California and the definition of “clean soils” under California and federal regulations and common practices.

Litigation Support for Contaminated Sediments, San Francisco Bay, California — Provided expert support on a 3-party litigation case involving an advocacy group and metals contamination in an estuary.

Litigation Support for Contract Dispute, San Diego, California — Provided an support for a mediation process involving a dispute over payment for disposal of materials as hazardous waste. Required knowledge of California and federal waste regulations.

Litigation Support for PCBs — Consulting expert for multiple cases involving PCB contamination.

Publications

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DiMundo, G.M., and B.R. DeShields. 2002. Development of area-weighted EPCs for lead at small arms firing ranges in a risk assessment. *Soil and Sediment Contamination* 11(3).

Krause, P.R., McDonnell, K.A., and B.R. DeShields. 2000. The beneficial reuse of dredged material for upland disposal. <https://www.coastal.ca.gov/sediment/reusepaper.pdf>

DeShields, B.R., R. Meredith, D. Griffin, T. Laughlin, and B. Collins. 1998. The use of field methods to evaluate the toxicity of lead to plants at a small arms firing range. pp. 166-183. In: *Environmental Toxicology and Risk Assessment: Seventh Volume*. E.E. Little, B.M. Greenberg, and A.J. DeLonay (eds). ASTM Stock #: STP1333. American Society for Testing and Materials, West Conshohocken, PA.



DeShields, B.R. 1998. Uptake of lead from soil at a small arms firing range into plants. Master's Theses. 1021. <https://repository.usfca.edu/thes/1021>

Presentations / Posters

DeShields, B., B. Kellems, and K. Purcell. 2019. Investigation and design considerations for active harbors with contaminated sediments. Platform presentation at Tenth International Conference on the Remediation and Management of Contaminated Sediments, New Orleans, LA. February 11-14.

DeShields, B., P. Trowbridge, and J. Davis. 2018. The value of regional monitoring data for remedial investigation, design, and performance. Poster presented at Sediment Management Work Group, Spring Symposium, San Diego, CA. April.

Pattanayek, M., and B. DeShields. 2017. Value in refining risk assessments for remedial design. Poster presentation. 38th Annual Meeting of the Society of Environmental Toxicology and Chemistry, Minneapolis, MN. November 12-16.

DeShields, B., and F. Wolf. 2015. Let them eat fish: Addressing conservatism in environmental risk assessment. Presented at the Eighth International Conference on Remediation of Contaminated Sediments in New Orleans, LA.

DeShields, B., M. Pattanayek, P. Spadaro, and N. van Aelstyn. 2015. The perfect is the enemy of the good: A rational approach to PCB cleanup goals and source control for San Francisco Bay. Presented at the Eighth International Conference on Remediation of Contaminated Sediments in New Orleans, LA.

Wolf, F., and B. DeShields. 2015. An assessment of the lower Willamette coupled sediment and food web model: Predicting future concentrations of total PCBs in fish tissue. Presented at the Eighth International Conference on Remediation of Contaminated Sediments in New Orleans, LA.

Pattanayek, M., and B. DeShields. 2011. Using a multiple line of evidence approach for determining a remedial footprint for sediment. Presented at the 32nd Annual Society of Environmental Toxicology and Chemistry Conference in Boston, MA.

Bonnevie, N., D. Rigg, J. Gravenmier, M. Beauchemin, T. Iannuzzi, B. DeShields, and P. Dody. 2011. An integrated evaluation of methods and approaches for assessing bioavailability of contaminants in sediments. Presented at the 32nd Annual Society of Environmental Toxicology and Chemistry Conference in Boston, MA.

DeShields, B., L. Brouwer, D. Edge, and J. Raming. 2010. Uptake of dioxins/furans from pond sediments into plants and benthic invertebrates. Presented at the Dioxin 2010 Conference in San Antonio, TX.

Orr, T., D. Maffett, M. Pattanayek and B. DeShields. 2010. Development of tissue-based mammalian toxicity reference values for use in ecological risk assessment. Presented at the 31st Annual Society of Environmental Toxicology and Chemistry Conference in Portland, OR.



DeShields, B., T. Iannuzzi, K. Jenkins, N. Bonnevie, D. Edge and P. Krause. 2009. The importance and application of background and reference data/information in risk assessment and management- critical issues and case studies. Presented at the Fall 2009 Sediment Management Work Group Meeting in Saratoga Springs, NY.

Meyer, C., N. Bonnevie, K. Jenkins, and B. DeShields. 2008. How do you define exposure areas that are relevant to the biology of populations? Presented at the 29th Annual Society of Environmental Toxicology and Chemistry Conference in Tampa, FL.

Amweg, E., S.L. Huntley, B.R. DeShields, and S.E. Holm. 2007. Determination of site-specific ambient PCDD/PCDF concentrations at a fly ash/wood combustion site by polytopic vector analysis (PVA). Presented at the 28th Annual Society of Environmental Toxicology and Chemistry Conference in Milwaukee, WI.

Orr, T., M. Pattanayek, B. DeShields, and C. Baker. 2007. Reducing uncertainty in ecological risk assessment using site-specific measures of bioavailability. Presented at the 28th Annual Society of Environmental Toxicology and Chemistry Conference in Milwaukee, WI.

Goodrum, P.E., M. Kohberger, T. Negley, T. Orr, B. DeShields, and J. Gleason. 2007. A practical decision process for calculating exposure point concentrations for spatially explicit risk assessments. Presented at the 28th Annual Society of Environmental Toxicology and Chemistry Conference in Milwaukee, WI.

DeShields, B.R., S. Huntley, M. Pattanayek, J. Nedoff, M. Noble, and M. Bartee. 2006. Evaluation of burrow air and development of soil gas screening levels for ecological receptors. Presented at the 27th Annual Society of Environmental Toxicology and Chemistry Conference in Montreal, QC.

DeShields, B.R., M. Pattanayek, J. Nedoff, and K. Walsh. 2006. A comparison of lead bioavailability data by the in vitro method. Presented at the 27th Annual Society of Environmental Toxicology and Chemistry Conference in Montreal, QC.

DeShields, B.R. 2005. Food chain modeling of lead in soil for ecological risk assessment at Fort Ord, California: adaptation of the physiologically-based extraction test for lead in soil and plants. Presented at the Cal/EPA Workshop on Bioavailability of Lead and Arsenic Using In Vivo and In Vitro Measurements.

DeShields, B.R., M. Pattanayek, G.M. DiMundo, and N. Navarro. 2004. Uptake of antimony, copper, and lead into plants, invertebrates, reptiles and mammals at a small arms firing range in central California. Presented at the 25th Annual Society of Environmental Toxicology and Chemistry Conference, Portland, OR.

DiMundo, G.M., B.R. DeShields, and N. Navarro. 2002. Heavy metal uptake into plants, lizards, and mammals from soil at a small arms firing range. Presented at the 24th Annual Society of Environmental Toxicology and Chemistry Conference, Austin, TX.

DeShields, B.R., J.J. Gravenmier, M. Pattanayek, and C.F. Kemos. 2001. A framework for developing sediment screening levels. Presented at the Society of Environmental Toxicology and Chemistry 22nd Annual Conference, Baltimore, MD.



Pattanayek, M., B.R. DeShields, J.J. Gravenmier, C.F. Kemos, and N. Navarro. 2001. Wildlife screening level benchmarks for evaluating bioaccumulation potential. Presented at the Society of Environmental Toxicology and Chemistry 22nd Annual Conference, Baltimore, MD.

Gravenmier, J.J., and B.R. DeShields. 2000. Toxicity and ecological impacts of petroleum coke. Presented at the Society of Environmental Toxicology and Chemistry 22nd Annual Conference, Nashville, TN.

DeShields, B.R., M. Pattanayek, P. McClaren, and J. Stilwell. 2000. Using sediment trend analysis (STA) to evaluate the distribution of DDT-contaminated sediments in the Monterey Submarine Canyon. Presented at the Society of Environmental Toxicology and Chemistry 22nd Annual Conference, Nashville, TN.

DeShields, B.R., D. Griffin, and J. Stilwell. 1999. Framework for a dredged material ecological risk assessment at Moss Landing Harbor. Presented at the Society of Environmental Toxicology and Chemistry 20th Annual Conference, Philadelphia, PA.

DeShields, B.R., D. Griffin, and J. Stilwell. 1999. Development of a DDT screening level for Moss Landing Harbor. Presented at the Society of Environmental Toxicology and Chemistry 20th Annual Conference, Philadelphia, PA.

DeShields, B.R., D. Griffin, and J. Stilwell. 1998. Dredging Moss Landing Harbor: Stuck in the Mud. Presented at the Society of Environmental Toxicology and Chemistry 20th Annual Conference, Charlotte, NC.

DeShields, B.R., S. Book, R. Wood, and D. Griffin. 1996. Comparison of methods used to assess human health and ecological risks from petroleum releases. Presented at the Society of Environmental Toxicology and Chemistry 17th Annual Meeting, Washington, DC.

DeShields, B.R., E.T. Hawkins, and W.R. Alsop. 1995. Site-specific water quality criteria—case studies of available methodologies. Presented at the Society of Environmental Toxicology and Chemistry 2nd Annual World Congress, Vancouver, BC.

DeShields, B.R., M.E. Stelljes, E.T. Hawkins, and W.R. Alsop. 1995. Ecological risk assessment: lessons learned. Presented at the Society of Environmental Toxicology and Chemistry 2nd Annual World Congress, Vancouver, BC.

DeShields, B.R., M.E. Stelljes, E.T. Hawkins, W.R. Alsop, and W. Collins. 1995. An evaluation of the contaminant impacts on plants serving as habitat for an endangered species. Presented at the Society of Environmental Toxicology and Chemistry 2nd Annual World Congress, Vancouver, BC.

DeShields, B.R., M.E. Stelljes, W.R. Alsop, and E.T. Hawkins. 1995. Ecological risk assessment at Fort Ord: uncertainties related to critical toxicity values. Presented at the Society of Environmental Toxicology and Chemistry 5th Annual Meeting of NorCal, Santa Cruz, CA.

DeShields, B.R., J.J. Gravenmier, and S.R. Hansen. 1993. A step-wise treatability study on a refinery effluent. Presented at the Society of Environmental Toxicology and Chemistry 3rd Annual Meeting of NorCal, Oakland, CA.





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Senior Engineer

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Education & Credentials

M.S., Environmental Engineering, Università degli Studi di Firenze, Florence, Italy, 2010

B.A., Environmental Engineering, Università degli Studi di Firenze, Florence, Italy, 2007

California Industrial General Permit Qualified Industrial Stormwater Practitioner (QISP) (License No. 228)

Engineer in Training, California (License No. 168645)

Continuing Education

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2015, refreshers 2016-present)

First Aid/CPR/AED Certified (2015, refreshers 2016-present)

Industrial Stormwater Compliance Workshop (2015)

Professional Affiliations

Leadership Committee, Women in Environment, Bay Area Chapter

Mentoring Committee Chair, Women in Environment, Bay Area Chapter

Ms. Carolina Zuri is an environmental engineer specializing in groundwater and sediment remediation, potable water treatment, industrial stormwater compliance, cost estimating, data interpretation, and fluvial geomorphology. She has more than 10 years of experience focused on evaluating impacts on natural surface water and groundwater systems and on designing hydraulic models, restoration projects, and remediation actions to improve the quality of aquifers and aquatic ecosystems, also through forensic analysis. Ms. Zuri's background also includes geotechnics and geophysics, environmental impact analysis, and environmental health engineering. As a Qualified Industrial Stormwater Practitioner, she provides support for compliance to the current Industrial General Permit, improving existing best management practices (BMPs) and helping design new, advanced BMPs. Ms. Zuri also provides support for the review of state and federal laws, rules, and regulations to evaluate applicable environmental policies for projects related to NEPA and the California Environmental Quality Act (CEQA). Ms. Zuri is also part of the leadership committee of the nonprofit organization Women in Environment's Bay Area chapter and chair of the Mentoring Committee of the organization.

Relevant Experience

REMEDIAL DESIGN

Chlorinated Solvent Cleanup Site, South San Francisco, California — Provided support for the pre-design investigation at a site containing a dissolved-phase chlorinated solvent plume underlying multiple properties, to fill existing delineation and hydrogeologic data gaps and refine the conceptual site model. Supported the *in situ* enhanced reductive dechlorination (ERD) design and the remedial action plan for the site.

Former Dry Cleaner Site, Northern California — Project manager for ongoing monitoring and remediation of volatile organic compound (VOC) contamination, under Regional Board oversight. Helped develop the *in situ* ERD design and prepare and submit regulatory documentation.

LITIGATION SUPPORT

Litigation Support, PFAS Water Treatment and Site Remediation Complaint, City of Stuart, Florida — Team leader for the evaluation of a claim regarding the occurrence and mitigation of per- and polyfluoroalkyl substances (PFAS) in groundwater, including potable groundwater supplies (*City of Stuart, Florida v. 3M Company et al.*, MDL 2:18-mn-2873-RMG, Case No. 2:18-cv-03487-RMG, U.S. District Court, District of South Carolina, Charleston Division). Work included extensive document and data review, evaluation of existing conventional treatment system,



design, and cost opinion for installation and operation of additional long-term potable water treatment systems. Ongoing matter.

PFAS Treatment Litigation Support, Hopatcong, New Jersey — Team leader for the resolution of claims associated with PFAS occurrence in multiple potable groundwater supply wells (*Borough of Hopatcong v. 3M Company et al.*, Case 2:20-cv-12551-CCC-JBC, U.S. District Court for the District of New Jersey). Work includes document and data review, evaluation of current well system, design and cost estimate to install and operate long-term potable water wellhead treatment systems and associated infrastructure, and preparation of an expert report. Ongoing matter.

PFAS Treatment Litigation Support, Gadsden, Alabama — Provided support to the team for the evaluation of claims regarding the occurrence and mitigation of PFAS in surface drinking water supplies (*The Water Works and Sewer Board of the City of Gadsden v. 3M Company et al.*, Case No. 31-CV-2016-900676.00, Superior Court of Etowah County, Alabama). Worked on data analysis, development of cost opinions for installation and operation of long-term potable water treatment systems, and preparation of an expert report on the matter. Settled matter.

Litigation Support Related to Fate and Transport of Contaminants, Superfund Site, Mountain View, California — Project manager for response to EPA claim of historical chlorinated solvent releases to groundwater from sanitary sewers. Conducted a review of engineering reports and as-built drawings to develop a sewer timeline since 1960s, historical sewer forensic geochemical analyses, hydrogeologic analysis, and focused PRP identification. The results of the investigation and analyses demonstrated that hot spots purported to be from sewer leakage in the 1960s were from other chlorinated solvent sources and newly identified PRPs. Ongoing matter.

Litigation Support, Potable Water Treatment Claims, Fresno County, California, Confidential Client — Project manager for resolution of claims in five cases involving occurrence of 1,2,3 trichloropropane (1,2,3-TCP) in potable groundwater supply wells (e.g., *Del Rey Community Services District vs. The Dow Chemical Company, et al.*, Case No. CGC-12-522921, Superior Court of the State of California in and for the County of San Francisco). Work included evaluation, design, and cost opinions for installation and operation of long-term potable water wellhead treatment systems and associated infrastructure and claims. Settled matters.

Litigation Support, Potable Water Treatment Claims, Atwater, California, Confidential Clients — Project manager for resolution of a claim associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (*City of Atwater v. Shell Oil Company et al.*, Case No. SCVSS 120627, Superior Court of the State of California for the County of San Bernardino). Work similar to Fresno County cases. Settled matter.

Litigation Support, Potable Water Treatment Claims, Tulare County, California, Confidential Clients — Project manager for resolution of claims in seven cases involving the occurrence of 1,2,3-TCP in potable groundwater supply wells (*City of Dinuba vs. The Dow Chemical Company et al.*, Case No. CGC-17-561379, Superior Court of the State of California in and for the County of San Francisco). Retention scope similar to Fresno County cases. Settled matter.

Litigation Support, Cement Plant, Seattle, Washington, Confidential Client — Project manager for evaluation of sediment remediation cost estimates to support potential settlement under tolling agreement. Worked on forensic analysis of historical sediment accumulation, and on an



independent cost estimate for use in expert report to compare with plaintiff and insurer estimates. Case resolved.

ENVIRONMENTAL IMPACT ASSESSMENT

CEQA Review for Piers 39–45 Remediation Project, San Francisco, California — Worked on an addendum to an initial study/mitigated negative declaration for CEQA review for remediation of PAH-contaminated sediments in the intertidal and subtidal areas near Pier 39–45 in San Francisco Bay. Specific areas of environmental analysis and review include transportation, geology and hydrogeology, and water quality studies for incorporation into the CEQA document.

CONTAMINATED SEDIMENTS

Mission Bay Ferry Landing Project, San Francisco, California — Supported the design of an engineered cap to address contaminated sediments at a ferry terminal. Assisted with AutoCAD drawings, specifications, and costing.

STORMWATER MANAGEMENT

Stormwater Compliance Support to Sawmill Compliance Group, Northern California — Project manager for a compliance group of sawmills in northern California. Provided support as QISP to each member of the group. Updated each individual Stormwater Pollution Prevention Plan (SWPPP), reviewed monitoring results, and prepared appropriate documentation for compliance on the California Water Board's Stormwater Multiple Application and Report Tracking System (SMARTS) throughout the stormwater year.

Stormwater Permit Compliance Audit and Recommendations, Davenport, California — Provided support for an audit of stormwater improvements at an operating sawmill to bring it into compliance with California's Industrial General Permit. Examined stormwater flow patterns, stormwater discharge locations, areas of industrial activity, and potential stormwater pollutant source areas at the facility. Developed a list of recommended, new and modified, stormwater BMPs.

DATA ANALYSIS

Ardenwood Creek Flood Protection and Restoration Project, Newark, California — Analyzed topographic data and determined areas where available data were poor or nonexistent. Performed extensive data collection of topography and bathymetry within relevant channels of the project area and in the surrounding floodplain. Supported the design phase of three Ardenwood Creek reaches and mitigation wetlands; provided drawings and 3-dimensional surface renderings using AutoCAD Civil 3D.

San Gregorio Large Woody Debris (LWD) Design Alternatives, San Gregorio, California — Assisted in developing a Hydrologic Engineering Center river analysis system (HEC-RAS) 1-dimensional hydraulic model to identify typical channel depths and velocities, for design of LWD structure alternatives for fish-rearing habitat opportunities. Provided technical AutoCAD Civil 3D drawings of the structures.

Yellowjacket Creek Fish Passage Restoration, Sonoma County, California — A historical water diversion structure created an impassable barrier over the past several decades. In close



coordination with National Oceanic and Atmospheric Administration Fisheries staff, provided strategic planning and fish passage design expertise to restore access for sensitive salmonids to several miles of Yellowjacket Creek. Collected topographic survey data, participated in the design of a structure to restore hydraulic conditions suitable for juvenile and adult salmonid passage, and produced AutoCAD 3-dimensional surface renderings and detailed drawings.

Geomorphological Evaluation of Redwood Creek, Sonoma Valley, California — Performed field analyses (cross sections, longitudinal profile, and pebble counts) to determine the river processes and the reasons for failure of some preexisting restoration projects, which led to the construction of artificial structures in the riverbed and their destruction by the river itself.

Sacramento-San Joaquin System Reoperation Study, California — Analyzed hydrologic model run output data to help identify potential options for reoperation of the state's flood control and water supply system, to meet water supply reliability standards, reduce flood hazard, and protect and restore ecosystems. Based on Bay-Delta and Central Valley ecosystem studies, developed a number of custom metrics (using the Palantir Metropolis platform) to evaluate the effects that the available model scenarios predicted for the most common Central Valley animal and plant species. Suggested different scenarios based on preliminary results.

Bay Delta Conservation Plan Review, California — Using Palantir Metropolis, organized and manipulated output data from the California Department of Water Resources CalSim model (with different alternatives for the State Water Project and Central Valley Project), to help panel members compare modeling results and assist them in formulating assumptions and conclusions.

MODELING

Stanislaus River Floodplain Inundation Model Critique, California — Collected data; created a hydrologic model using SMS and SRH-2D modeling software. Built a geographic information system to develop a floodplain habitat model to correlate flows and inundated areas

Modeling Review of Salinas River Stream Maintenance Program (SMP) Draft Environmental Impact Report (EIR), Salinas, California — Assisted The Nature Conservancy (TNC) in reviewing the existing HEC-RAS model of the Salinas Valley to evaluate the SMP draft EIR. Developed a 2-dimensional hydrodynamic model of the valley to develop an approach for TNC to assess floodplain reconnection alternatives for combined flood risk reduction and restoration.

Hydrodynamics and Sediment Transport Model Comparison for Toce River and Pallanza Bay, Lago Maggiore, Italy — Reviewed the existing environmental fluid dynamics code (EFDC) model of the area and updated the model based on most recent data. Assisted with interpreting the field hydrodynamic and sediment transport measurements data with the EFDC model results. Helped compare EFDC model results with the results of Stanford University's updated unstructured nonhydrostatic terrain-following adaptive Navier-Stokes simulator (SUNTANS) model of Pallanza Bay.

Publications

Stein E., M. Cover, C. O'Reilly, J.J. Hayes, A.E. Fetscher, R.A. Ambrose, L.S. Fong, R. Guardado, C. Solek, G.M. Kondolf, C. Alford, and C. Zuri. 2011. Evaluation of stream condition indicators for



determining effects of direct hydromodification via stream bank armoring. Prepared for the State Water Resources Control Board. Technical Report 643. Southern California Coastal Water Research Project, Costa Mesa, CA.

Rinaldi M., N. Surian, F. Comiti, M. Bussetini, B. Lastoria, and C. Zuri. 2011. Guida illustrata alle risposte: Manuale tecnico-operativo per la valutazione e il monitoraggio dello stato morfologico dei corsi d'acqua. Istituto Superiore per la Protezione e la Ricerca Ambientale. Roma, Italia.





David L. Revell, Ph.D

Principal

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Education & Credentials

Ph.D., Earth Sciences,
University of California, Santa Cruz, 2007

M.S., Oceanography and Marine Resource Management, Oregon State University, Corvallis, Oregon, 2000

B.A., Geography, and B.A. Environmental Studies, University of California, Santa Barbara, California, 1998 and 1996

Continuing Education

Postdoctoral Research, Institute of Marine Sciences, University of California, Santa Barbara, April 2007–April 2008

Dr. David Revell is a coastal geomorphologist with more than 25 years of experience studying marine, coastal, and estuarine processes, working to integrate science and management of coastal processes and climate change. He has served as a technical advisor and facilitator to multiple federal, state, and local jurisdictions related to ocean and coastal management especially at the intersection of how physical processes and human alterations affect hazards, habitats, and human use. He has been involved in a wide variety of contentious community stakeholder processes ranging from evaluating erosion hazard alternatives to climate change vulnerability impacts to lagoon and fisheries management, water quality, and marine spatial planning. Much of his work involves physical process research and spatial analysis to facilitate communication of science to inform decision-making. Dr. Revell currently advises multiple local jurisdictions and agencies on dune and sediment management, climate change, estuary processes, inlet management, and local coastal program updates.

Relevant Experience

COASTAL RESILIENCY

West Cliff Drive Adaptation and Management Plan, Santa Cruz, California — Developing a neighborhood scale/transportation corridor adaptation plan along iconic West Cliff Drive in Santa Cruz, balancing coastal erosion, transportation, recreation, and community visioning. Specific work tasks included hazard modeling, local coastal program policy development, and social vulnerability and economic and engineering analyses. A substantial public outreach included a technical advisory committee, focus groups, and other stakeholders to identify different community adaptation visions to be evaluated by all disciplines to identify the most effective adaptation pathways through time and to develop land use policies to integrate into local coastal and city planning documents. Led a diverse team of geologists, engineers, economists, ecologists, and transportation planners on the project.

Statewide Synthesis of Public Trust Sea Level Rise Reports, California — Reviewing and synthesizing all of the legislatively mandated AB 691 sea level rise reports for the California State Lands Commission. These reports were required from grantees of subtidal and intertidal public trust resources and included vulnerabilities, economic impacts, and potential adaptation strategies for a host of ports, harbors, and wharves in California. Each report was evaluated for completeness, common themes in vulnerabilities, adaptation approaches, and economic ramifications. A statewide synthesis report will be developed and submitted to the legislature



which will include making recommendations on future funding streams and legislative actions to guide future California public trust adaptation investments.

CLIMATE IMPACT ASSESSMENT

Vulnerability Assessment for Power Generating Stations, City of Oxnard, California — Served as an expert witness to conduct a vulnerability assessment for the energy and infrastructure facilities within the coastal zone in the City of Oxnard from current and future coastal hazards. The assessment employed a variety of modeling work completed as part of the Nature Conservancy's Coastal Resilience Ventura project. This assessment provides the City with information to review the California Energy Commission application for additional energy development at the Mandalay Generating Station. The vulnerability assessment also bolsters the City's understanding of the timing and failure of the Ormond Beach Generating Station as the City considers methods to remove aging energy infrastructure.

Natural Gas and Electricity Vulnerability Assessment for the San Diego Region, California — As part of the 4th California Climate Assessment, led the coastal hazard and sea level rise assessment for the SoCal Natural Gas and San Diego Gas and Electric Utility infrastructure. Work included evaluation of COSMOS 3.0 modeling, U.S. Department of Defense hazard modeling, and integration of all modeling initiatives into the vulnerability assessment by filling data gaps and interpreting the modeling results.

Poseidon Desalination Plant, Huntington Beach, California — Evaluated current and existing hazards to a proposed desalination plant in Huntington Beach, California. Projections to the proposed facility were evaluated as well as cumulative impacts to the surrounding community. Work included evaluating and interpreting existing modeling, reviewing engineering designs, permit conditions, mapping, and report writing. Future work will include agency consultation and meeting attendance.

Sea Level Rise Study, Imperial Beach, San Diego, California — Teaming with USC Sea Grant, conducted a sea level rise vulnerability and adaptation study in Imperial Beach, San Diego, California. With funding from the State Coastal Conservancy, led the City through a facilitated process to characterize existing and future vulnerabilities, identify potential adaptation strategies, and help educate the local community to garner support for implementing of prioritized actions. An expanded scope, with San Diego Foundation funding, enabled an economic analysis and expanded educational outreach to elected officials and regional partners to be included. Part of the project built technical capacity within the City to support future incorporation of new relevant data. Key partners in the initiative are the Tijuana River National Estuarine Research Reserve, the Port of San Diego, and the U.S. Navy.

Local Coastal Program Update with Sea Level Rise, City of Marina, California — With a teaming partner, updating the City of Marina Local Coastal Program (LCP) with funding from the California Coastal Commission. Work includes technical analysis, mapping, and completion of the Existing Conditions, Vulnerability, and Adaptation Plan report. Will lead stakeholder engagement on the vulnerabilities and potential adaptation strategies to the City Council, Planning Commission, and public outreach process.



Resilient Coastal Adaptation Project, Ventura County, California — Conducting a vulnerability and fiscal impact study for the County of Ventura to support adaptation planning and LCP policy updates. This project includes data analysis, hazard modeling to round out data gaps in the COSMOS 3.0 and Coastal Resilience hazard modeling, integration with the economic team, and public outreach and communication.

Local Coastal Program and General Plan Update, Carpinteria, California — Working with a teaming partner in updating the City of Carpinteria LCP and General Plan. Specific tasks are to conduct a vulnerability study and fiscal impact study and work with the steering committee and city to incorporate the findings into policy. This project has included data analysis, evaluation and interpretation of various Coastal Hazard model outputs (COSMOS 3.0 and Coastal Resilience), and public outreach and communication.

Local Coastal Program, City of Monterey, California — As part of a consultant team, updated the City of Monterey LCP with funding from the California Coastal Commission. Work included technical analysis, hazard modeling and mapping, and completion of the Existing Conditions and Vulnerability Report. Led presentations on the vulnerabilities and potential adaptation strategies to the City Council, Planning Commission, and stakeholder engagement process.

Local Coastal Update for Sea Level Rise, Oxnard, California — For the City of Oxnard, guided a teaming consultant to conduct a vulnerability study and adaptation plan in support of the LCP update. This project has included data analysis, additional adaptation modeling, integration with the economic team, and public outreach and communication.

Local Coastal Program, City of Carlsbad, California — Participated on a team to support the LCP update process. Provided technical advice on interpretation of hazard modeling, adaptation, and outreach. Presented on adaptation options and wrote the sections on various adaptation strategies to community work groups, and provided scientific input to the City Council, Planning Commission, and stakeholder process including review of proposed LCP policies and implementation plan language.

Local Coastal Program, City of Pacific Grove, California — Participated on a team to support the LCP update process. Work included technical analysis, hazard modeling and mapping, and outreach. Presented on various adaptation strategies to community work groups, and provided scientific input to the City Council, Planning Commission, and stakeholder process including review of proposed LCP policies and implementation plan language.

Incorporation of Climate Change into the Local Coastal Program, Goleta, California — Worked for the City of Goleta to update and draft its LCP policies to include climate change impacts consistent with the California Coastal Commission Guidance on sea level rise. This work included a vulnerability assessment, a coauthored fiscal impact section, identification and evaluation of adaptation strategies to provide policy recommendation, and sections of the LCP related to coastal hazards.

Pacific Institute Coastal Infrastructure and Vulnerability Impacts Assessment, California — With funding from the Ocean Protection Council as part of the 2008 California Climate Impacts Assessment through the California Energy Commission, conducted the first California statewide coastal hazard assessment resulting from sea level rise. This groundbreaking project, the first of



its kind on the U.S. West Coast, mapped projected future coastal erosion and coastal flooding hazards. To complete this project, developed a new methodology that evaluated geomorphic response of various backshore types by applying a total water level methodology; collaborated with climate change researchers at Scripps, USGS, and Oregon State University; organized and engaged a technical and regulatory peer review team on methods and results; and collaborated with Pacific Institute on a vulnerability assessment associated with coastal hazards, which was published in the Pacific Institute Report titled *The Impacts of Sea Level Rise to the California Coast*.

Monterey Bay Sea Level Rise Vulnerability Assessment, Monterey and Santa Cruz Counties, California — With funding from the California Coastal Conservancy, the Natural Capital Project, and the City of Capitola, managed a project and led technical work to model projected climate change impacts to the coast of Monterey Bay at a scale suitable for planning purposes. The project was overseen by a Monterey Bay region wide technical advisory group comprising research institutions (University of California, Santa Cruz [UCSC]; Naval Postgraduate School; Moss Landing Marine Laboratories; California State University, Monterey Bay; and USGS), local planning agencies (Santa Cruz, Monterey Counties, Cities of Monterey, Santa Cruz, Seaside, Sand City, Capitola), and other technical experts. Uncertainty in the sea level rise projections were represented by mapping a variety of projected impacts and then overlapping them and developing an uncertainty index that showed relative risk of coastal hazard impacts.

The Nature Conservancy's Coastal Resilience Program, Ventura County, California — Working through an interactive stakeholder process with multiple agencies, local government representatives, and several nonprofit organizations, led a technical team that modeled current and potential future coastal and fluvial hazards for a variety of climate change scenarios, representing sea level rise and changes to rainfall and sediment delivery, for the Ventura County coastline, including Mugu Wetlands, the Santa Clara River, and the Ventura River. Applied a habitat evolution model (Sea Level Affecting Marsh Migration, SLAMM) to predict long-term wetland conversion with sea level rise, as well as to identify areas of ecological vulnerability based on potential adaptation strategies. SLAMM model results were then used to calculate the greenhouse gas emissions related to multiple adaptation strategies. Local communities and the U.S. Department of Defense are using the results to evaluate vulnerabilities and consider adaptation strategies.

Coastal Resiliency: Phases 1 and 2, Santa Barbara, California — With funding from the California Coastal Commission, the Coastal Commission, and the Ocean Protection Council, modeled projected coastal hazards exacerbated by sea level rise the Santa Barbara County coast at a scale suitable for planning purposes. Deliverables included projected future coastal hazards, which include a new integrated approach of stepping through time eroding the coast and flooding newly eroded areas through hydraulic connectivity. More information on results is available at Santa Barbara County Coastal Resilience through The Nature Conservancy.

Technical Review of FEMA Coastal Flood Maps, County of Ventura, California — Reviewed the recently released Preliminary Coastal Flood Insurance Rate Maps for the County of Ventura. Specific work focused on the technical review of modeling assumptions, calculations, and geomorphic interpretation to evaluate the accuracy and shortcomings of the new proposed



regulatory maps. The final report has been submitted to FEMA to consider additional work to improve the mapping accuracy.

San Lorenzo River Lagoon Management, Santa Cruz, California — In collaboration with the City of Santa Cruz, working to manage the San Lorenzo River lagoon and balance often competing priorities of flood reduction, endangered species, public safety, recreation, and water quality. Extensive agency engagement has permitted a variety of different approaches to the lagoon mouth management including multiple innovative approaches to opening the lagoon mouth, while balancing often competing priorities. Work has included technical analysis, mapping, conceptual construction plans, onsite field observations, fieldwork, construction support, permitting, and report writing.

Santa Clara River Estuary: Scientific Review Panel, Ventura County, California — As a member of a consent decree-appointed science advisory panel, reviewing technical reports, model results, field data, and summary reports to provide a recommendation on future wastewater discharge levels from the Ventura Wastewater Reclamation Facility. Coordinating with other scientists and consultants to develop independent scientific recommendations to support permitting, policy, and community infrastructure planning. The review panel recommendation will be used to develop Regional Water Quality Control Board permits as well as a basis for a recycled water facility in the City of Ventura.

Goleta Slough Sea Level Rise Vulnerability and Adaptation Study and Ecosystem Management Plan Update, California — Managed an adaptation study to reevaluate the study area based on projected sea level rise as part of a plan to update the Goleta Slough Ecosystem Management Plan prepared by the Goleta Slough Management Committee and adopted by the City of Santa Barbara in 1997. Through a facilitated stakeholder process and technical analyses, the study assessed vulnerability and risk to both natural and human resources and infrastructure. Based on results of the vulnerability assessment, recommended a series of adaptation strategies that included both capital improvements and policy recommendations. Led the technical analyses and provided guidance and direction to subcontractors.

COASTAL GEOMORPHOLOGY

Goleta Beach Erosion Projects, County of Santa Barbara, California — Assisting the County of Santa Barbara in multiple stakeholder processes and technical studies related to the substantial erosion to Goleta Beach County Park catalyzed by the 1997-1998 El Nino erosion wave. Studies have included peer-reviewed scientific research and technical studies on various adaptation strategies with several alternative park reconfigurations and managed retreat options. Peer-reviewed other technical modeling and led a technical team to conduct wave run-up and climate change modeling to support the Environmental Impact Report on a managed retreat strategy. Throughout the process, presented research results to stakeholder group.

Surfer's Point Managed Retreat, Ventura, California — Provided geomorphic evaluation of the site, input on the engineering and design quantities, and developed the monitoring plan for the Surfer's Point Managed Retreat project, which included the removal of a public parking lot, nourishment of 50,000 cubic yards of cobbles, construction and planting of native dunes, and subsequent monitoring. Actively coordinating with the City of Ventura (on a volunteer basis) to



ensure that sand augmentation and monitoring results are consistent with the original design concepts.

Neskowin Shoreline Assessment, Neskowin, Tillamook County, Oregon — In response to high rates of erosion and sea level rise that have diminished the beaches and now threatens homes and roads in Neskowin, Oregon, analyzed the viability of various coastal erosion mitigation strategies on an eroding shore, utilizing existing information from local academic institutions (Oregon State University) and agencies (including the Department of Geology and Mineral Industries). Applied experience completing assessments for similar high-energy wave-exposed coastal areas. Performed modeling to evaluate physical changes from various adaptation strategies and provided conceptual level engineering cost estimates for each strategy to inform community decision-making. The community was striving to find a balance of private property protection with maintenance of a sandy beach to support the tourist economy.

Technical Evaluation of Erosion Mitigation Alternatives and Regional Sediment Management Plan for Southern Monterey Bay, California — Managed an evaluation of erosion mitigation alternatives (adaptation strategies) for Southern Monterey Bay to support development of a regional strategy to address coastal hazards. Twenty-two different erosion mitigation measures were evaluated, including land use planning tools, soft engineering solutions, and hard engineering solutions. The measures were compared using a variety of criteria including an innovative effectiveness criterion, which ranked each measure's merit at protecting upland property and beach widths (a highly valued community resource). The study then compared the costs and benefits of each measure over multiple time horizons by tracking the physical impacts of each measure on the beach and upland through time. The holistic cost-benefit analysis included accounting for beach recreation and ecosystem services in addition to traditional storm damages. While this initial study did not include climate impacts directly, it began to inform adaptation strategies across the region.

Hybrid Cobble and Dune Restoration Project, Cape Lookout State Park, Oregon — Developed an erosion response plan that incorporated dune historical shoreline change analysis, El Nino changes, and geomorphological interpretation for a living shoreline hybrid cobble and dune restoration project to protect Cape Lookout State Park. The project included conceptual design, coastal processes analysis, modeling, construction management, and project monitoring. Led the coastal analysis, modeling, and conceptual design as well as provided onsite construction management of prison labor and developed the initial monitoring plan. Following completion, the monitoring program was funded by the U.S. Army Corps of Engineers as part of the Section 227 Innovative Shoreline Protection program and the Oregon Department of Geology and Mineral Industries. The living shoreline project remains effective to present day.

CLIMATE CHANGE

USGS-UCSC Coastal Processes Study for Santa Barbara and Ventura Counties, California — Conducted research and managed the UCSC research team on a collaborative project with USGS to study large-scale coastal processes of the Santa Barbara littoral cell. Examined seasonal changes through extensive field data collection campaigns and conducted numerical modeling to further inform observations of short-term and seasonal changes and provide insights into long-term shoreline evolution.



Adjunct Professor, Monterey Institute of International Studies, California — Co-instructed graduate level courses on International Marine Science and Policy and Sustainable Coastal Management. Assisted with framing the strategic planning for the Center for the Blue Economy with specific emphasis on climate change opportunities.

Publications

Revell, D., P. King, J. Giliam, J. Calil, S. Jenkins, C. Helmer, J. Nakagawa, A. Snyder, J. Ellis, and M. Jamieson. 2021. A holistic framework for evaluating adaptation approaches to coastal hazards and sea level rise: A case study from Imperial Beach, California. *Water* 13(9):1324. <https://doi.org/10.3390/w13091324>.

Garner, K.L., M.Y. Chang, M.T. Fulda, J.A. Berlin, R.E. Freed, M.M. Soo-Hoo, D.L. Revell, M. Ikegami, L.E. Flint, A.L. Flint, and B.E. Kendall. 2015. Impacts of sea level rise and climate change on coastal plant species: A case study in the central California coast. *PeerJ Prints* 3:e958. <https://doi.org/10.7717/peerj.958>.

Langridge, S.M., E.H. Hartge, R. Clark, K. Arkema, G.M. Verutes, E.E. Prahler, S. Stoner-Duncan, D.L. Revell, M.R. Caldwell, A.D. Guerry, M. Ruckelshaus, A. Abeles, C. Coburn, and K. O'Connor. 2014. Key lessons for incorporating natural infrastructure into regional climate adaptation planning. *Ocean & Coastal Management* 95:189-197. <https://doi.org/10.1016/j.ocecoaman.2014.03.019>.

Weaver, C.P., C. Brown, J.A. Hall, R. Lempert, D.L. Revell, D. Sarewitz, and J. Shukla. 2013. Climate modeling needs for supporting robust decision frameworks. *Wiley Interdisciplinary Reviews: Climate Change* 4(1):39-60.

Revell, D.L., R. Battalio, B. Spear, P. Ruggiero, and J. Vandever. 2011. A methodology for predicting future coastal hazards due to sea-level rise on the California coast. *Climatic Change* 109(1):251-276.

Orme, A.R., G.B. Griggs, D.L. Revell, J.G. Zoulas, C. Chenault, and H. Koo. 2011. Beach changes along the southern California coast during the twentieth century: A comparison of natural and human forcing factors. *Shore and Beach* 79(4):38-50.

Revell, D.L., J.E. Dugan, and D.M. Hubbard. 2011. Physical and ecological responses of sandy beaches to the 1997-98 ENSO. *Journal of Coastal Research* 27(4):718-730.

Barnard, P.L., D.L. Revell, D. Hoover, J. Warrick, J. Brocatus, A.E. Draut, P. Dartnell, E. Elias, N. Mustain, P.E. Hart, and H.F. Ryan. 2009. Coastal processes study of Santa Barbara and Ventura Counties, CA. U.S. Geological Survey Open-File Report 2009-1029. U.S. Geological Survey, Reston, VA. <http://pubs.usgs.gov/of/2009/1029/>.

Dugan, J.E., D.M. Hubbard, I. Rodil, and D.L. Revell. 2008. Ecological effects of coastal armoring on sandy beaches. *Marine Ecology* 29:160-170.

Revell, D.L., and G.B. Griggs. 2006. Beach width and climate oscillations along Isla Vista, Santa Barbara, California. *Shore and Beach* 74(3):8-16.



Presentations / Posters

Paulik, L.B., J.B. Wright, and D.L. Revell. 2020. Communicating risks of sea level rise to benefit coastal resiliency and adaptation. Platform presentation at SETAC North America 41st Annual Meeting, SciCon2 Virtual Meeting. November 15-19.

Revell, D.L., P. Barnard, and N. Mustain. 2008. Influence of harbor construction on downcoast morphological evolution: Santa Barbara, California. Published in Coastal Disasters '08 Conference, April, North Shore, HI.

Revell, D.L., J.J. Marra, and G.B. Griggs. 2007. Sandshed management. Special issue of Journal of Coastal Research-Proceedings from International Coastal Symposium 2007, Gold Coast, Australia.





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Education & Credentials

M.S., Geosciences,
Pennsylvania State University,
University Park, Pennsylvania,
2007

B.A., Earth and Planetary
Sciences, Johns Hopkins
University, Baltimore,
Maryland, 2005

Professional Geologist:
California (License No. 8845),
Delaware (License No.
S4-0011402)

Certified Hydrogeologist:
California (License No. 990)

Continuing Education

Hazardous Waste Operations
and Emergency Response 40-
Hour Certification (2007;
refreshers 2008 through 2017)

First Aid and CPR Certified
(2008)

QSP/QSD Training (2011)

Professional Affiliations

Groundwater Resources
Association of California

National Ground Water
Association

Mr. Sean Culkin is a consulting professional with more than 10 years of experience serving a diverse range of projects. He is a California registered professional geologist and certified hydrogeologist who leverages his skills in analytical and quantitative hydrogeology to support both private and public sector clients. His experience includes site characterization, water resources management, project management, conceptual site model development, soil and groundwater remediation, remedy optimization, geotechnical analyses, and regulatory compliance. He has developed a solid track record of successful project execution and has provided technical guidance and oversight for numerous projects throughout the United States. Mr. Culkin has extensive experience with industry-standard groundwater modeling software applications and has used site-specific numerical and analytical groundwater models to support both remediation system design, geotechnical and dewatering operations, and basin-wide resource management planning for groundwater and surface water supplies.

Relevant Experience

REMEDIAL DESIGN

Remediation of Current and Former Military Facilities, California and Nevada — Developed work at a portfolio of military facilities through longstanding partnership with 8(a) contractor and U.S. Army Corps of Engineers. Work included construction of calibrated flow and transport models within several regional aquifer systems. Used calibrated models as the basis for a groundwater model optimization effort to maximize the effectiveness of the extraction/injection well network for active remediation of chlorinated solvents. These efforts successfully informed efficient installation and operation of capture wells concurrent with a treatment system redesign. Used flow models to perform ongoing capture zone analysis to assess ongoing successful treatment system performance, as well as fate and transport models to demonstrate long-term migration of contaminants.

Former Wood Treating Facilities, Various Locations, United States — Lead hydrogeologist for characterization and remediation of former wood treating sites in a variety of geologic settings, including riparian, coastal, and shallow karst environments. Developed site characterization work plans for feasibility studies and data gaps analysis. Prepared technical documentation on the fate and transport of dense nonaqueous-phase liquid and remediation feasibility. Developed site-specific groundwater models to assess fate and transport of PAHs and support remedy

Nevada Water Resources
Association

Association of California Water
Agencies

alternative design. Provide strategic and technical support of existing consultant teaming partners.

RCRA Corrective Action, Brunswick, Georgia — Used density-dependent groundwater flow and transport modeling to assist project team's reinterpretation of the conceptual site model for offsite migration of VOCs for a revised corrective action approach. Updated previous consultant's model to more accurately simulate coastal aquifer dynamics. Used particle tracking and 1-dimensional transport and attenuation models to support offsite plume characterization.

Hydrogeologic Assessment at a PFAS Site, Confidential Location — Supported hydrogeologic assessment of a site impacted by per- and polyfluoroalkyl substances (PFAS). Performed aquifer test analysis, groundwater model updates, and containment system optimization.

Perchlorate Groundwater Remediation Project, San Francisco Bay Area, California — Provided technical oversight for the assessment and remediation of a sedimentary basin contaminated with perchlorate resulting in impacts to private and municipal water users. Characterized basin hydrostratigraphy and contributed to conceptual model development via sonic core logging, aquifer pumping and injection tests, monitoring of a basin-wide transducer network, pneumatic slug testing, and lateral/vertical plume delineation from a network of nested monitoring wells and domestic pumping wells. Characterized basin groundwater flow, as well as groundwater-surface water interactions, via chemical and isotope analysis. Developed the conceptual design and performance estimates for an innovative remediation well network via analytical solutions, flow and transport modeling, and model optimization techniques. Efforts significantly reduced client implementation costs. Led the team that designed and implemented an efficient groundwater monitoring network to meet stringent regulatory requirements. Developed a regional groundwater flow model to support of treatment system design and remedial optimization. Performed statistical analysis for evaluating an approved natural attenuation remedy for a portion of the basin. These efforts contributed to substantial reduction of monitoring time and expenditure by the client and successful remediation of private water supply wells.

Groundwater Remediation Operations, Superfund Site, San Fernando Valley, California — Contributed to ongoing updates to the basin conceptual site model via well log analysis/correlation and evaluation of depositional histories. Acted as team leader for extensive hydrogeological field investigation, including aquifer testing, slug testing, and down-hole electromagnetic flow logging. These analyses, along with review of available well logs, contributed to a successful update of the conceptual site model and remedial strategy. Delineated contaminant distribution of chlorinated solvents, metals, and 1,4-dioxane through geostatistical interpolation that filled significant data gaps and improved understanding of plume delineation.

Soil and Groundwater Remediation of a Former Chemical Production and Storage Facility, San Francisco Bay Area, California — Led groundwater monitoring program on dynamic, multi-consultant site with ongoing in situ remediation of chlorinated solvents. Responsible for RCRA regulatory compliance and was lead author on report deliverables. Oversaw aquifer testing and characterization, including short-term pumping tests and slug tests. These tests provided relatively low-cost, efficient characterization of aquifer properties of contaminated areas with minimal waste generation that contributed to *in situ* remediation design.



Characterization and Groundwater Remediation of an Industrial Facility, Los Angeles, California

— Led the monitoring/reporting program for remediation of a chlorinated solvent site and directed subcontractors. Used geospatial analysis to implement sampling frequency reduction for the monitoring well network and reduce costs. Characterized local hydrostratigraphy via well logs and an in-well transducer network. Assessed injection well operations for the West Coast Basin Barrier Project to address concerns about potential interaction with contaminants in coastal aquifers.

Characterization and Groundwater Remediation of a Former Chemical Production Facility, Los Angeles, California

— Employed analytical element modeling to assist groundwater remediation system design. These models provided an efficient platform for design of injection/extraction well configuration and operations. Acted as groundwater monitoring and reporting program leader and directed the industrial client's offsite data management contractors, which resulted in substantial cost savings for routine analysis and reporting.

Agricultural Well Investigation, Northern California

— Performed ambient and dynamic down-hole flow logging at wells on an organic farm that had been impacted with chlorinated solvents. Calculated groundwater and contaminant mass flux through screen intervals for other flow pathways. Characterized well construction and hydrostratigraphy through a video log of open rock boreholes. Oversaw pump reinstallation and well maintenance. The resulting analysis provided the basis for successful ongoing well operations to maintain groundwater availability from the wells.

Remediation of a Brownfield Site, San Francisco Bay Area, California — Characterized site geology, hydrogeology, and extent of solvent and metals contamination via direct-push sampling and logging. Oversaw an *in situ* bioremediation pilot study for enhanced reductive dechlorination that led to successful full-scale injection operations and eventual site closure and redevelopment.

WATER MANAGEMENT

Water Resources Management, Olympic Valley, California — Project manager and lead groundwater modeler supporting the public utility client and associated private property developers, including developments undergoing environmental impact studies. Represented the client at public-facing meetings. Performed groundwater model calibration and utilized the updated model for long-term planning operations for client. Successfully developed criteria for estimating long-term maximum groundwater supply within the valley that refined and improved on previous investigations. Provided review and evaluation of local hydrogeology to assist developers with property dewatering and construction operations for a large resort hotel.

Groundwater Resources Management, Santa Cruz County, California — Provided project management and technical oversight for a group of public clients utilizing a shared groundwater resource within Santa Cruz County. Coordinated with environmental impact report team of consultants and agencies for planned supplemental water supply projects within the basin. Authored documents pursuant to the California Sustainable Groundwater Management Act that resulted in acceptance of basin boundary modifications by the California Department of Water Resources and promoted sustainable groundwater management through basin consolidation. Led construction of groundwater-surface water models in conjunction with the U.S. Geological Survey and made presentations to the basin Technical Advisory Committee. This model will



provide a robust platform to test a number of groundwater management alternative strategies within the basin. Developed and ran site-specific flow and transport models to evaluate impact of seawater intrusion, resulting in updated management objectives for the basin that improved on previous methods.

Groundwater Study for Diablo Canyon Power Plant, California — As lead hydrogeologist, conducted an assessment of available groundwater resources for this nuclear power plant. Worked with geotechnical engineering teaming partners to characterize the local geology and groundwater flow system to make updates to the existing site conceptual model. Developed potential water supply alternatives and provided recommendations to the utility client.

Simulation of Groundwater Flow, Hawaii — Used groundwater models to simulate groundwater flow and seawater intrusion dynamics in a coastal volcanic aquifer. These models were used to assess the ecological risk of heated wastewater discharged to offshore through the aquifer. This work was performed in support of discharge permitting for a proposed bioenergy facility.

Water Budget Study, City of Oakland, California — Developed an analytical tool to estimate average water demand for public properties based on landscaping type and evapotranspiration data. Estimated values were generally corroborated by water use data from the city. Results were used to inform future water use strategies.

LITIGATION SUPPORT

Groundwater Modeling Related to Residential Development, San Francisco, California — Lead expert hydrogeologist on a team of geotechnical and structural engineers supporting litigation related to a high-profile residential development in downtown San Francisco. Constructed site-specific 3-dimensional geologic models as well as groundwater models for analysis of local hydrogeology and the impact of construction dewatering. Gave formal presentations of technical findings to the mediation groups. Quickly developed a detailed conceptual site model of the downtown San Francisco groundwater basin. Worked with geotechnical engineer partners to develop a 3-dimensional time history of subsurface material property changes in the vicinity of the building. These efforts contributed to a favorable settlement for the property developer.

Comingled Groundwater Plume, Confidential Location, Delaware — Provided expert opinion for allocation of damages from a large, comingled groundwater plume where the municipal water supply had been impacted by metals. Developed a detailed time-history of plume development and migration from multiple source areas, using empirical and groundwater model data sources. Made recommendations for refined allocation metrics and authored associated technical documentation. Case ongoing.

Microplastics Fate and Transport Evaluation, Northern California — Produced opinions on the fate and transport of microplastics from telecommunications infrastructure based on research and site investigation. This expert work resulted in a favorable outcome for the client to continue project planning and construction.

Superfund Site, Portland, Oregon — Produced expert report for litigation surrounding a specific parcel of a large industrial Superfund site. Worked with counsel to refine and redevelop a complex fate and transport conceptual site model of interconnected surface water and



groundwater pathways at this multiparty site. Also developed a model for estimating mass loading of key contaminants from surface water runoff to Portland Harbor and authored expert report documentation of model results. Case ongoing.

PFAS Litigation Support, Various Locations, Nationwide — Provided technical analysis of PFAS fate and transport in the vicinity of various industrial facilities and large municipal water suppliers. Reviewed hydrologic data and developed analytical models to calculate riverine contaminant flux time histories.

Construction Dewatering Effects on Groundwater Flow, Seattle, Washington — Analyzed the impact of numerous construction dewatering projects on groundwater flow and contaminant transport in the vicinity of an urban redevelopment project. Performed groundwater drawdown and capture analysis. The revised hydrogeologic conceptual model supported expert testimony on site contamination transport history.

Groundwater Investigation, Santa Cruz County, California — Led groundwater pumping well, stream/aquifer interaction, and sampling investigations in response to state and coastal commission inquiries in Santa Cruz County, resulting in successful resolution with the state for the agricultural landowner.

GEOTECHNICAL

Construction Dewatering Projects, Los Angeles Basin, California — Oversaw all phases of planning, scoping, permitting (including NPDES), performance, and data collection associated with aquifer characterization to aid in dewatering design and subsurface construction plans. Analyzed pumping and slug test data to evaluate projected inflow during construction dewatering. Results of the investigations led to substantial improvements over the dewatering contractor recommendations and averted large future costs and engineering difficulties for the clients. Utilized analytical element and traditional numerical flow models to evaluate the effects of dewatering systems on the local hydrogeology. Used models to perform forensic analysis to improve the clients' understanding of unsuccessful dewatering designs.

Transit and Utility Alignment Projects, Los Angeles Basin, California — Provided technical support for aquifer tests associated with dewatering activities for subsurface transit alignments. These projects included the Westside Subway Extension, as well as water pipeline alignments.

Publications

Culkin, S. 2013. Use of genetic algorithm optimization for operational management of extraction wells within a mature groundwater plume, Monterey Bay, California. *MODFLOW and More 2013*.

Chamberlain, W.C., S. Culkin, and X. Xu. 2012. Hydrogeologic characterization in the development of underground structures—Los Angeles Basin, California. *Environmental and Engineering Geoscience* 18(3):295-308.

Culkin, S. 2008. Implications of rate-limited mass transfer for aquifer storage and recovery efficiency. *Ground Water* 46(4):591-601.



Presentations/Posters

Culkin, S. 2019. Evaluation saltwater-freshwater dynamics in coastal aquifer conceptual site model development and groundwater management. Platform presentation at AEHS 29th Annual International Conference on Soil, Water, Energy, and Air, San Diego, CA. March 18-21.

Culkin, S. 2017. Using cross-sectional models to develop proxy measurable thresholds for seawater intrusion. SGMA Conference, Tools for Developing a GSP, Groundwater Resources Association of California, Modesto, CA.

Culkin, S. 2016. Using cross-sectional models to develop measurable objectives for saltwater intrusion. 2016 Annual Meeting Program, Modeling Extremes: Drought to Flood and In-Betweens, California Water and Environmental Modeling Forum, Folsom, CA.

Culkin, S. 2013. Hydrogeological characterization in the development of underground structures—Los Angeles Basin, California. 2013 Annual Meeting Program with Abstracts, Association of Environmental & Engineering Geologists, Seattle, WA.

Culkin, S. 2007. Understanding aquifer storage and recovery efficiency in a clastic-limestone aquifer, Charleston, South Carolina. *Geological Society of America Abstracts with Programs*, Vol. 39. No. 1.

Culkin, S., and A.M. Franzese. 2004. Distinguishing between provenance changes and sorting effects on the Rb-Sr systematics in glacial and Holocene South Atlantic sediments. AGU Fall Meeting Abstracts.





Paula C. Gill, PWS

Principal

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Education & Credentials

M.S., Plant Biology, University of California Davis, Davis, California, 2002

B.S., Biology and Environmental Science, University of Denver, Denver, Colorado, 1999

Continuing Education

Wetland Training Institute, Basic Wetland Delineation (2006)

USACE, Introductory Regulatory, Baltimore, Maryland (2007)

USACE, Cultural Resources, Santa Fe, New Mexico (2007)

USACE, Wetland Delineation, Fort Collins, Colorado (2008)

USACE, Advanced Regulation and NEPA, Salt Lake City, Utah (2009)

USACE, Coastal Permitting, San Francisco, California (2012)

Aquatic Resources Mitigation Workshop, Travis Air Force Base (2011)

California Rapid Assessment Method, Practitioner

Ms. Paula Gill has 16 years of experience as a regulatory and wetland specialist working in the environmental arena. She served as a regulatory project manager with the U.S. Army Corps of Engineers (USACE), San Francisco District, providing expedited permit evaluation and related services for California Department of Transportation (Caltrans)-designated priority projects and other programmatic efforts to support efficient decision-making related to applications for Department of the Army permit activities. During this time, she gained experience with linear transportation projects while serving as the USACE liaison to Caltrans. She has evaluated Department of the Army permit applications, compliance, and enforcement cases for activities in waters of the U.S. within the regulatory authority of the Clean Water Act (CWA) and the Rivers and Harbors Act.

Ms. Gill is a versatile project manager who has worked on a range of projects from commercial and residential development, energy, transportation, and environmental remediation. She is prepared to ensure high quality document standards, facilitate effective communication between clients and regulatory agencies, and provide an efficient path toward project entitlement.

Relevant Experience

PLANNING AND PERMITTING

Manufactured Gas Plant Remediation, Solano County, California — On behalf of client, was retained to secure project authorizations for remediation of a manufactured gas plant site that includes work within the Mare Island Strait. Tasks include California Environmental Quality Act (CEQA) support and preparation of applications for multiple resource agencies to authorize proposed project components. Agencies involved included USACE, Regional Water Quality Control Board (Water Board), California Department of Fish and Wildlife (CDFW), Bay Conservation and Development Commission (BCDC), and the National Marine Fisheries Service (NMFS).

Shell Pond Remediation Project, Contra Costa County, California — On behalf of client, managed a 73-acre remediation project in Contra Costa County from 2014 to present. Tasks included coordination with multiple resource agencies to authorize proposed project components. Agencies involved included USACE, Water Board, CDFW, BCDC, and U.S. Fish and Wildlife Service (USFWS). Provided regulatory support to the team to facilitate successful navigation of a complex permitting process and achieve the demanding permitting schedule.

Achievements & Awards

2011 San Francisco USACE,
District Employee of the Year

Commander's Award for
Civilian Service

Piers 39–43½ Sediment Remediation Project, San Francisco, California —Responsible for attaining project authorization for the multiphased sediment remediation project. Ongoing work includes preparation of applications packages for Section 10 Rivers and Harbors and 404 CWA authorizations from USACE (including formal Section 7 consultations with the NMFS), Water Board applications pursuant to the CWA and Porter-Cologne Act, CDFW incidental take permit, and BCDC permit applications. Work also requires permit applications for incidental harassment of marine mammals within the project footprint. In addition, provided support of the CEQA effort through completion of a biological resource assessment document.

Fort Mason East Harbor Sediment and Piers 39–43½ Sampling Investigations, San Francisco, California — Responsibilities include attaining authorization for sediment investigation projects to inform proposed in-bay remediation projects. Work has included preparation of applications for Section 10 Rivers and Harbors authorizations from USACE (including informal Section 7 consultations with the NMFS) and Porter-Cologne Act authorizations from the Water Board.

California Department of Transportation, District 4, Regional General Permit 33, Bay Area Counties, California — Served in the development of USACE Regional General Permit 33 for Caltrans, District 4, routine work activities. The purpose of the work is to establish an authorization allowing for expedited authorization of frequently occurring work. Responsibilities include coordinating with Caltrans staff, facilitating preapplication meetings with relevant agencies (e.g., USACE, USFWS, and Water Board), and tailoring program description according to agency input. Responsibilities also include authoring the Department of the Army application to reflect the developed program.

California Department of Transportation, District 4, Programmatic Letter of Concurrence, Bay Area Counties, California —Participated in the development of a biological assessment in support of consultation with USFWS for routine work activities for 11 special status species. The purpose of the work is to establish a consultation allowing for expedited authorization of frequently occurring work as authorized under Regional General Permit 33. Responsibilities include coordinating with Caltrans staff, facilitating meetings with USFWS, and producing documentation.





Matthew Jamieson

Project Scientist

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Education & Credentials

M.F.A., Digital Art and New Media, University of California Santa Cruz, Santa Cruz, California, 2014

B.A., Geography, University of Guelph, Guelph, Ontario, Canada, 2002

GCert, Geographic Information Systems, Hunter College, New York, New York, 2010

Continuing Education

Spanish Immersion, Vida Verde School, Quito, Ecuador, 2006

3D Modeling I, Pratt Institute Continuing and Professional Studies, New York, New York, 2010

Achievements & Awards

Art2NRS Program Grant, Project: Sagehen a Proving Ground: Mapping and Visualizing Climate Change in the High Sierras, 2014

Graduate Student Researcher Grant, Project: Rising Sea Levels of the San Francisco Bay, 2013

Mr. Matthew Jamieson is a geographic information systems (GIS) professional with a background in geographic science, coastal processes, and digital art. Mr. Jamieson has been working professionally with GIS technology since 2004 and has focused on applying GIS to coastal hazard modeling and analysis since 2014. Mr. Jamieson holds an M.F.A. in digital art and new media and has been working for many years with artists and scientists to communicate complex spatial and environmental information. Having worked on a diverse range of projects, Mr. Jamieson has developed skills in project management, reporting, coastal process modeling, scripting for task automation, data visualization, web programming, designing interactive experiences, and 3-dimensional visualization.

Relevant Experience

DATA ANALYSIS

Coastal Vulnerability and Sea Level Rise Analysis for West Cliff Drive, Santa Cruz, California — Working with a consultant team, performed an assessment of coastal hazards along a scenic and highly trafficked 3-mile stretch of coast. Working closely with engineers, ecologists, and other members of the consulting team, translated various spatial data sets and conducted a full assessment of existing conditions. Historical data were also analyzed using georeferenced historical surveys and compared with modern ones to determine erosion rates and areas of concern along both horizontal and vertical areas of the cliff. These data were valuable in constructing a site-specific erosion hazard layer accounting for various levels of risk tolerance. Erosion hazard layers were then used to determine private and city infrastructure and assets at risk, as well as potential changes to land use and ecologies. Through stakeholder meetings, the team developed adaptation, mitigation, and monitoring strategies.

South San Mateo Coast Sea Level Rise Vulnerability Assessment and Adaption Plan, San Mateo County, California — Conducted a sea level rise vulnerability assessment, economic impact analysis, and adaptation study for the open coast portion of South San Mateo County, California. Modeled coastal hazards and habitat evolution, identified existing and future asset vulnerabilities, mapped and visualized potential adaptation strategies, and helped to lead local community and stakeholder outreach meetings. The work will help the county prioritize future study as well as pathways towards sea level rise and coastal hazard adaptation strategies for the county's south coast region.



Resilient Coastal Adaptation Project, Ventura County, California — Conducted a sea level rise vulnerability and fiscal impact study for 29 miles of coastline in Ventura County, California. This included hazard mapping, identification of vulnerable assets and infrastructure, data analysis, reporting, and working with the economic team to identify fiscal impacts. This work was in support of adaptation planning and Local Coastal Program policy updates.

Design of Conceptual Adaptation Alternatives for Future Sea level Rise in Captiva, Florida — Worked closely with a local government to identify current and future sea level rise vulnerabilities and adaptation needs. This led to the identification of priority areas for adaptation planning and the development of five conceptual adaptation approaches to mitigate the potential impacts from coastal hazards and sea level rise. The designs took into consideration the physical properties and exposure of the coastline as well as the built environment. Strategies incorporated all-natural elements, such as mangroves and salt-tolerant vegetation, and hybrid designs that included the incorporation of natural elements with manufactured or hardened materials.

Sea Level Rise Vulnerability and Fiscal Impact Assessment for Miramontes Point, Half Moon Bay, California — Worked to model coastal erosion hazards and determine site-specific vulnerabilities for a 1-mile stretch of coast in Half Moon Bay, California. The project involved research and analysis of historical erosion, beach change, the wave environment, and the lithology of the cliffs. Using this information, the team modeled cliff erosion extents with sea level rise. Hazard extents were used in a vulnerability assessment to determine the timing of impacts to a golf course, coastal trail, and hotel. The vulnerability assessment was then used to inform an economic impact assessment and adaptation plan.

Sea Level Rise Vulnerability Report for Stanford's Hopkins Marine Station, Pacific Grove, California — Conducted a sea level rise vulnerability assessment and adaptation plan for Stanford University's coastal marine laboratory in Pacific Grove, California. The project involved locating all building, utility, and biological resources and assets across the 11-acre campus, and working with the coastal engineering team to model and visualize the extent of wave runup and coastal erosion. The coastal hazards data were used to conduct a site-specific level of hazards analysis detailing locations of building and utility sensitivities, and how dynamic wave pressures and flood depths could impact these assets. Working with Stanford's Land, Buildings & Real Estate Department, the team identified a series of sea level rise trigger points, and developed an adaptation plan involving short- to long-term strategies.

Tsunami Exposure and Vertical Evacuation Plan, Honolulu, Hawaii — Working with state and federal partners, performed an analysis on the Island of Oahu for emergency evacuation by foot. The analysis included locating all road and trail networks, potential barriers to evacuation, and any vertical evacuation routes to safer locations. The analysis included building a high-resolution digital elevation model from light detection and ranging (LiDAR) data, and then performing an evacuation analysis that combined tsunami runup extents, land use types, slope, and barriers in a cost-weighted surface. This surface was used to determine evacuation distances and times for each structure on the island, as well as optimal evacuation routes. This analysis was then combined with demographic and location information for vulnerable members of the community and was used to inform evacuation strategies for communities on the island.



Increasing Pace and Scale of Wood Utilization: Forestry and Wood Utilization Analysis for the Eastern Central Sierra and Western Nevada, Truckee, California — Working with a team of forestry consultants, performed a forest structure survey on more than 300,000 acres of land in eastern California and western Nevada centered around Reno, Nevada. Forest structures were determined from both publicly available data sets and novel approaches. Novel approaches involved developing a cognitive neural network with machine learning to determine forestry characteristics from forest inventory survey data, and building an imputation engine using a nearest-neighbor strategy to determine forest structure from known data locations. The analysis included determining forest structure, ownership, fire history, and access data for approximately 1 million landscape units. Each unit was given a forest treatment strategy under numerous scenarios, and this was used to develop a watershed-scale plan for restoring ecological and fire resilience. A wood utilization analysis was also conducted that incorporated treatments and watershed access, hauling costs, mill capabilities, economic constraints, and planning given the spatial distribution of species. The project is part of an effort to encourage an industry around small-diameter timber, to find a market for low-value wood, and to develop incentives and technologies that can help restore ecological function and fire resiliency.

PlaNYC Parks Climate Resiliency Report, New York, New York — In a collaborative effort with the Mayor's Office and the Parks Planning Office, performed a climate resiliency analysis that encompassed the city's 28,000 acres of parkland and 14 miles of beaches and dunes. The spatial analysis investigated the potential effects of future sea level rise and storm surge on parkland and park assets, changes in the urban heat island effect and its relationship to parkland, and how parks can play a role in climate change mitigation and adaptation strategies. Some outcomes from the analysis included identifying where to locate cooling stations, where to focus tree planting efforts, access to add green space, and coastal resiliency planning.

NYC Parks and Playground Access Report, New York, New York — In an effort led by the Parks Planning office, performed an analysis that included determining the location of every park access point and public and privately accessible playground. A network analysis was conducted to determine the accessibility of the city's parkland, as well as identify potential locations where park access could be improved. Statistics from all of the city's neighborhoods were then analyzed and ranked according to their park and playground accessibility. This information was paired with demographic, economic, and cultural attributes to determine where and what park improvements should be prioritized in each community. Maps and reports were then created for field surveys and community workshops, and the feedback from these efforts was incorporated into further spatial analysis. Information from this effort was incorporated into the city's PlaNYC goals, which influenced planning and policy decisions for the city.

RISK COMMUNICATION

Aquapuncture: An Interactive Exploration of Santa Cruz County Watersheds, Santa Cruz, California — Participated in a team that created an interactive exhibit on the nature of water, water use, and land use practices that influence water in Santa Cruz County, California. The exhibit was on display for 2 weeks at an exhibition culminating in a 2-year investigation involving fieldwork, interviews, research, and mapping. This project coincided with community discussions on the city's water future as it was in the midst of a record drought and a debate on a ballot measure to consider a desalination facility. The interactive exhibit included photographs, quotes, video, and a large digital touch screen that included an artistically rendered interactive map of



Santa Cruz County. The map allowed the audience to take a tour across five regions of the county and depicted images, stories, and information on water and land use relationships. The exhibit was attended by a diverse range of community members including students, professors, artists, and city council members. It also coincided with a series of presentations and talks to foster engagement and discussion about broader freshwater water sustainability and resiliency in the county.

On the Deep Wealth of This Nation, Aberdeen, Aberdeenshire, Scotland — In an effort led by an environmental artist, developed an expansive environmental assessment of the country of Scotland, which culminated in an internationally touring art exhibit that appeared at numerous galleries, museums, and biennales. The effort included working with a diverse group of scientists and citizen collaborators and brought together their insights to map out ideas on the future sustainability of Scotland in a visually arresting and informative manner. Over its many iterations, the project included creating more than twenty 10- by 10-ft maps, each variously collaged with local stories, photography, and poetics. The work addressed various aspects of the public commons, such as the soil, water, forest biota, air, and community networks. The goal of the work was to provoke thought and discussion on integrating community and individual actions with ecological functions, as well as understanding how harvesting from the landscape can benefit ecological functions.

Hazards Exposure Reporting and Analytics (HERA), Menlo Park, California — Working with a team that included coastal and geographic scientists, database engineers, and GIS analysts, helped develop a web-based interactive mapping and data visualization platform to communicate community exposure to coastal hazards and sea level rise. The project is a broad-based effort to improve community awareness of coastal hazard risk under future sea level rise and coastal storm scenarios, as well as making the science of coastal hazards accessible in a manner that encourages experiential learning and exploratory engagement. The project involved a full web development cycle, including pitching and prototyping, writing scripts to automate geoprocessing tasks, developing a visual template for the experience, and working on data visualization and interactive maps using a modern web development framework. The project has been showcased in community workshops and events throughout California and has proved valuable for community stakeholders to understand future levels of risk.

SITE INVESTIGATION

St. Marks National Wildlife Refuge Existing Habitat and Boundary Mapping, St. Marks, Florida — Working with U.S. Fish and Wildlife Service biologists, refuge managers, and prescribed fire staff, developed a GIS database that included an updated refuge boundary along both land and sea and an updated habitat layer. Boundaries were developed through a combination of scanning and geolocating paper documents, as well as fieldwork using GPS to verify refuge boundary markers throughout the 68,000-acre refuge. Water boundaries were delineated using digital elevation models and aerial surveys. Habitat types were developed by scanning and integrating historical fire management plans, along with input from staff and field observations. The completed habitat layer encompassed historical and present habitat types, ongoing and future treatment activities, and notable species of concern. The data set proved valuable in migrating refuge biological and fire treatment planning activities from paper to digital and opened up many avenues for future spatial analysis.



Sagehen, a Proving Ground: An Ecology and Paleobotany Study to Identify Plant Clusters That Can Move Up the Watershed, Sagehen Creek Field Station, Tahoe National Forest, California —

As part of an effort led by an environmental artist, in collaboration with a museum of art and the environment in Reno and the University of California Berkeley, participated on a team that worked to identify, analyze, and implement a plan to plant clusters of eastern Sierra plant species at five locations throughout the Sagehen Creek watershed near Truckee, California. The process included a thorough watershed investigation for the identification of optimal planning locations, a paleobotanical survey, modeling of future bioclimatic forcing to determine likely species migrations, and implementation of the plan. Enacting the plan involved preparing the sites by clearing existing vegetation, constructing fencing, planting, and over the course of a year, making ongoing visits to water, mulch, and care for seedlings. The process of monitoring and reporting is ongoing, and future exhibitions will emerge that include novel cartography, video, data visualization, and site tours.

Publications

Revell, D., P. King, J. Gilliam, J. Calil, S. Jenkins, C. Helmer, J. Nakagawa, A. Snyder, J. Ellis, and M. Jamieson. 2021. A holistic framework for evaluating adaptation approaches to coastal hazards and sea level rise: A case study from Imperial Beach, California. *Water* 13(9):1324. <https://doi.org/10.3390/w13091324>.

Jones, J.M., K. Henry, N. Wood, P. Ng, and M. Jamieson. 2017. HERA: A dynamic web application for visualizing community exposure to flood hazards based on storm and sea level rise scenarios. *Computers & Geosciences* 109:124–133.

Jones, J.L., M.R. Jamieson, and N.J. Wood. 2016. Community exposure to tsunami hazards in Hawai'i. Scientific Investigation Report 2016-5053, U.S. Department of the Interior, U.S. Geological Survey.

Presentations/Posters

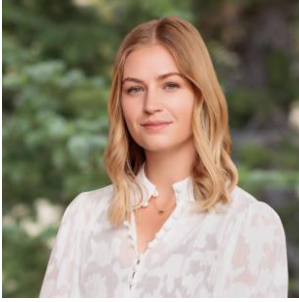
Jamieson, M., J. Jones, N. Wood, and J. Jones. 2016. Using data-driven documents (D3.js) for effective visualization of community exposure to sea level rise and storm surge around San Francisco Bay.

Platform presentation. American Association of Geographers Annual Meeting, San Francisco, CA. March 29–April 2.

Jamieson, M. 2016. Variations in exposure and sensitivity to far-field tsunamis in the state of Hawai'i. Poster presentation. NASA Ames Earth Science Laboratory, Mountain View, CA. February.

Jamieson, M. 2015. Community exposure and sensitivity to far-field tsunamis in Hawai'i. Poster presentation. CalGIS 2015: 21st Annual California GIS Conference, Sacramento, CA. June 1–3.





Samantha Eanes, P.E.

Project Engineer

(415) 787-6309

New York, NY

seanes@integral-corp.com

Education & Credentials

B.S., Environmental Engineering, Michigan State University, East Lansing, Michigan, 2015

Licensed Civil Engineer, California (License No. 92635)

Continuing Education

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2016; refreshers 2017–present)

First Aid and CPR certified (2018–present)

Professional Affiliations

Member, Women in Environment, Bay Area Chapter

Ms. Samantha Eanes is licensed professional engineer in the state of California with a focus on project management, environmental remediation, stormwater management, site investigations, and water quality. Ms. Eanes has more than 5 years of experience in supporting environmental permit compliance for both civil construction projects and industrial facilities. Her responsibilities have included coordinating sampling programs, performing in-field quality assurance oversight, overseeing the operation and maintenance of groundwater monitoring wells, and writing Phase I environmental site assessments.

Relevant Experience

REMEDIAL DESIGN

Groundwater Injections at Chlorinated Solvent Cleanup Site, South San Francisco, California —

Oversaw enhanced reductive dechlorination injections at site with chlorinated volatile organic compound contamination in groundwater. Assisting with data review and analysis to determine the effectiveness of injection events.

Groundwater and Soil Remediation at Former Army Depot, Lathrop, California —

Served as technical lead for ongoing monitoring and remediation efforts. Guided technical review of CERCLA reporting requirements. Prepared internal cost estimates used in contract negotiations for the operation and maintenance of groundwater treatment systems at the project site.

Remedial Investigation and Feasibility Study, Remediation of Abandoned Mines, Nevada —

Supported site characterization and performed sediment sampling to determine the extent of contamination at abandoned mine lands. Contributed to field sampling plans, health and safety plans, and RI/FS reports.

Oversight of Contaminant Investigation and Delineation at Former Naval Air Station, Humboldt County, California —

Conducted oversight during a field investigation and delineation of subsurface petroleum contaminants. Oversaw the direct-push soil sampling effort of more than 200 soil borings.

LITIGATION SUPPORT

Potable Water Treatment Claims, Confidential Client — Provided technical support in litigation project involving the occurrence of per- and polyfluoroalkyl substances in potable groundwater



supply wells. Conducted document review and prepared presentations of findings for client. Ongoing matter.

STORMWATER MANAGEMENT

Emergency Levee Repairs, Sacramento County, California — Ensured compliance with California's Construction General Permit at numerous emergency levee repair sites. Determined project risk levels, wrote stormwater pollution prevention plans, recommended site-specific stormwater best management practices, conducted field inspections, and facilitated coordination between the client(s) and the Central Valley Regional Water Quality Control Board.

REGULATORY COMPLIANCE

Waste Discharge Compliance for Parks Facilities, Central California — Prepared documents to bring small domestic wastewater treatment systems at recreational parks areas into compliance with Regional Water Quality Control Board (RWQCB) general waste discharge requirements, including Notice of Applicability, Report of Waste Discharge, and regular monitoring reports. Selected monitoring equipment based on permit requirements, developed written monitoring instructions, trained parks employees on correct procedures, and reviewed quarterly monitoring data for compliance before submission to the RWQCB.

Hazardous Waste Manifesting, California — Served as designated reviewer (certified under DOT Hazardous Waste Manifest training) for hazardous waste generated from civil construction and military facility demolition projects, analyzed RCRA and non-RCRA waste streams for compliance with regulations, reviewed waste characterization and laboratory data, checked for acceptance at disposal facilities, and provided signature on hazardous waste manifests.

WATER QUALITY MONITORING

Maintenance Dredging Monitoring and Support, Stockton Deepwater Ship Channel, California — Conducted required turbidity monitoring during active maintenance dredging operations. Performed inspections of upland placement sites for dredge materials and contributed to Section 404 compliance reporting. Participated in presentation of findings of methylmercury control study to regulatory agencies.





Conner Schultz

Project Scientist

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Seattle, WA

cschultz@integral-corp.com

Education & Credentials

B.A., Environmental Business,
University of Redlands,
Redlands, California, 2016

Continuing Education

Coursera AI for Everyone
(2018)

MATLAB Deep Learning
Onramp (2018)

Hazardous Waste Operations
and Emergency Response 40-
Hour Certification (2019;
refreshers 2020 to present)

Basic Offshore Safety
Induction and Emergency
Training (including Helicopter
Underwater Escape Training
and Emergency Breathing
System) (2020)

First Aid and CPR certified
(current)

Transportation Worker
Identification Credential
(current)

Professional Affiliations

Member of Young
Environmental Professionals

Mr. Conner Schultz is an environmental consultant with experience in data collection, analysis, and management and in GIS. He extends his use of applications, such as ArcGIS and QGIS, with additional programming languages that include SQL and MATLAB®, to perform quantitative analyses and to develop supporting data visualizations. Mr. Schultz assists in analyzing both spatial and non-spatial data for a variety of projects, including environmental risk assessments, natural resource damage assessments, and RI/FSs. Since joining Integral in early 2019, he has been a contributing member to Integral's sediment-profile and plan view imaging (SPI-PV) field survey team. He supports SPI-PV field surveys, and conducts PV image analysis and SPI-PV data post-processing. He also has performed analyses to support the development of custom image processing algorithms using deep learning and machine learning methodologies. In addition, Mr. Schultz has served as a project manager for three projects with responsibilities that include cost management, resource allocation, and successful deliverable tracking and client communication.

Relevant Experience

RENEWABLE ENERGY

Wind EMF Assessment, East Coast, United States — Served as lead project manager and provided support to a team modeling electromagnetic fields (EMFs) produced by offshore and onshore wind farm operations. Served as GIS project lead and was responsible for preparing data visualizations in support of assessing the associated impacts of electro- and magneto-sensitive species.

Offshore Wind Farm Baseline Surveys, East Coast, United States — Served as lead for post-survey PV image analysis for four proposed offshore windfarm lease areas and export cable routes off the U.S. Atlantic coast. Managed the pre-processing of the acquired images, conducted extensive image analysis using the Coastal and Marine Ecological Classification Standard, and generated supporting data visualizations used in the technical reporting. Assisted field team lead in the collection of SPI-PV images and benthic grab samples to document and analyze baseline conditions at the proposed wind farm site during the July 2021 survey.

SAMPLING

Offshore Wind Farm Baseline Surveys, East Coast, United States — Served as lead for post-survey PV image analysis for four proposed offshore windfarm lease areas and export cable routes off the U.S. Atlantic coast. Managed the pre-processing of the acquired images, conducted extensive image analysis using the Coastal and Marine Ecological Classification



Standard, and generated supporting data visualizations used in the technical reporting. Assisted field team lead in the collection of SPI-PV images and benthic grab samples to document and analyze baseline conditions at the proposed wind farm site during the July 2021 survey.

Ward Cove Long-Term Monitoring, Ketchikan, Alaska — Assisted in the collection and processing of surface sediment samples for chemical analysis and benthic fauna. Served as field lead and in a support role for collection of SPI-PV images prior to construction of a marine terminal used for docking of future cruise lines. Analyzed SPI-PV images and assisted in mapping for final data report.

Former Port Blakely Mill, Bainbridge Island, Washington — Assisted field team lead in conducting an intertidal site-walk using a handheld SPI system to capture SPI images as part of a RI/FS and draft cleanup action plan to gather baseline conditions of a former pulp mill site. Analyzed SPI-PV images and assisted in the interpretation of results.

SITE ASSESSMENT

Former Port Blakely Mill, Bainbridge Island, Washington — Assisted field team lead in conducting an intertidal site-walk using a handheld SPI system to capture SPI images as part of a RI/FS and draft cleanup action plan to gather baseline conditions of a former pulp mill site. Analyzed SPI-PV images and assisted in the interpretation of results.

MODELING

Standardized and Cost-Effective Benthic Habitat Mapping Tools for Marine and Hydrokinetic Site Environmental Assessments, U.S. Department of Energy — Worked closely with a computer vision/pattern recognition professional to create a standard operating procedure (SOP) for curating images used to estimate sediment grain size from sediment profile images. The SOP was used to sort more than 100,000 images to develop and train a neural network to expedite the process of detecting grain size in future images. Similar approaches are currently in development to assist in detecting apparent redox potential discontinuity, penetration depth, and other features of interest.

GIS DESIGN

Invasive Species Detection, Methow Conservancy, Winthrop, Washington — Identified and annotated an invasive plant species (whitetop) using orthomosaics developed from drone surveys over a 400+ acre area within a land conservancy. The process involved locating patches of whitetop, assigning a certainty assessment, and using these annotations to help the training of a deep neural network being developed to automatically detect whitetop from aerial imagery.

GIS Technical Support, Multiple Projects — Created and designed maps using the ArcGIS platform, as well as open sources mapping software (e.g., QGIS). Generated visualizations of spatial data for use in allocation, remediation, and restoration projects. Incorporated various ArcGIS extensions to create sophisticated interpolations of point-based measurements that were subsequently used to support additional high-level analyses and reporting efforts.



ECOLOGICAL MODELING

Toxicology Modeling Support, Confidential Location — Supported a team using AQUATOX® to model and analyze single species- and ecosystem-level effects of a specific herbicide in edge-of-field waterbodies. Helped with model calibration, validation, testing, and sensitivity analysis in addition to assisting with comprehensive literature reviews and report writing.

PROJECT MANAGEMENT

Project Management Support, Multiple Projects — Provided project management services, including updating schedules, managing financial administration, and allocating resources for multiple modeling projects. Managed client communications and subcontracting. Assisted in facilitating communications between all project stakeholders.

GROUNDWATER SAMPLING

Groundwater Monitoring, Wood Treatment Superfund Site, Bellingham, Washington — Supported field team lead for biannual groundwater sampling event and assisted in the long-term groundwater compliance monitoring of an active Superfund site. Collected groundwater samples using low-flow purging methods and dedicated bladder pumps.

OCEAN MODELING

Offshore Wind Farm Baseline Surveys, East Coast, United States — Served as lead for post-survey PV image analysis for four proposed offshore windfarm lease areas and export cable routes off the U.S. Atlantic coast. Managed the pre-processing of the acquired images, conducted extensive image analysis using the Coastal and Marine Ecological Classification Standard, and generated supporting data visualizations used in the technical reporting. Assisted field team lead in the collection of SPI-PV images and benthic grab samples to document and analyze baseline conditions at the proposed wind farm site during the July 2021 survey.

SITE INVESTIGATION

Ward Cove Long-Term Monitoring, Ketchikan, Alaska — Assisted in the collection and processing of surface sediment samples for chemical analysis and benthic fauna. Served as field lead and in a support role for collection of SPI-PV images prior to construction of a marine terminal used for docking of future cruise lines. Analyzed SPI-PV images and assisted in mapping for final data report.

Presentations/Posters

Sackmann, B., G. Revelas, K. Whitehead, C. Schultz, and C. Jones. 2020. Artificial intelligence and computer vision for cost-effective benthic habitat characterizations. Poster presentation at the Ocean Sciences Meeting. Co-sponsored by the American Geophysical Union, the Association for the Sciences of Limnology and Oceanography, and The Oceanography Society, San Diego, CA. February 16-21.



Education & Credentials

M.L., Environmental Law and Policy, Vermont Law School, South Royalton, VT, 2023

M.S., Environmental Sciences and Policy; Ecology, Johns Hopkins University, Baltimore, MD, 2007

B.S., Zoology; Concentration in marine mammal ecology, Humboldt State University, Arcata, CA, 1999

Continuing Education

Planning for Climate Change National Conservation Training Center (2019)

Facilitation Skills for Scientists and Resource Managers (2014).

Analysis of Stream Management Actions. NOAA and USFWS (2009)

Bioengineering Field School. Salmonid Restoration Federation (2008)

Fish Passage Design and Engineering Workshop. Salmonid Restoration Federation and the CDFW (2007)

Culvert and Road Drainage Practices. Central Coast Field School (2007)

Ecological and Geomorphologic Principles of Stream Restoration. Maryland Department of Natural Resources, the Johns Hopkins University (2006)

U.S. Army Corps of Engineers PROSPECT Regulatory Courses I - IV (2006-2007)

Jacqueline Meyer

Senior Science Advisor

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Jacqueline Meyer has over 20 years of experience in the environmental regulatory field. She is currently a Senior Science Advisor for Integral Consulting. Prior to joining Integral, she was the Senior Fisheries and Marine Mammal Specialist for Johnson Marigot Consulting, LLC. She served as a Senior Endangered Species Biologist and as the National ESA Section 7 Coordinator for NOAA's National Marine Fisheries Service (NMFS), at NMFS headquarters, and as a Senior Fishery Biologist for NMFS, West Coast Region. Jacqueline has experience with ESA, MSA and MMPA compliance. She is a versatile and knowledgeable biologist having worked on a wide variety of projects at regional and national levels. She has worked on large infrastructure projects involving transportation, bridge construction, dam removal. She also has experience with projects involving renewable energy, fish passage design, and wetland, riverine and stream restoration. Jacqueline is prepared to provide technical expertise and quality assurance and control review of documents to facilitate effective communication between clients and regulatory agencies.

Relevant Experience

BIOLOGY

Carmel River Reroute and San Clemente Dam Removal Project, Carmel River, Monterey County, CA — Lead consulting fish biologist for NMFS on the largest dam removal project in California. Collaborated closely with the entire consultant team, and other federal, state and county agency personnel. Completed ESA section 7 consultations (biological opinions) and evaluated plans for the river reroute, restoration components, fish passage, flow conditions and all aspects required for the project throughout the duration from project planning, biological resource effects analyses, removal of the dam to post-restoration of the river monitoring.

Los Padres Dam Fish Passage Project, Carmel River, Monterey County, CA — Lead consulting fish biologist for NMFS on a fish passage project for the Los Padres Reservoir and Dam on the Carmel River. Collaborated closely with the entire consultant team, and other federal, state and county agency personnel. Completed ESA section 7 consultation (biological opinions) and evaluated plans for the dam bypass, fish passage system and water releases, and participated in all team planning and permitting activities for the project.

Carmel River Floodplain Restoration and Environmental Enhancement (Carmel River FREE) Project, Carmel, CA — Lead biologist for NMFS on a large scale, nature-based, multi-benefit flood protection, riparian and estuarine habitat restoration project located at the mouth of the Carmel River and the Carmel Lagoon. Collaborated with permitting agencies and stakeholders during



early scoping and planning phases for the project. Provided technical assistance and review of documents related to biological resources and lagoon hydrologic processes necessary to develop the Draft Environmental Impact Report/Environmental Assessment for the project.

ADDITIONAL TECHNICAL EXPERIENCE

- ESA Lead biologist, Acoustics Technical Team, NMFS Office of Protected Resources, Headquarters (2017-2021)
- California Fish Hydroacoustics Coordinator, NMFS West Coast Region (2008-2017)
- Fisheries Hydroacoustics Working Group, Technical Team Facilitator and NMFS Co-lead (2010-2017)
- ESA Section 7 Instructor, USFWS National Conservation Training Center (2017-2021)





Sam Blakesley

Scientist

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Santa Cruz, CA

sblakeskey@integral-corp.com

Education & Credentials

M.A., Ocean & Coastal Resource Management; International Environmental Policy, Middlebury Institute of International Studies, Monterey, California, 2019

B.A., Environmental Studies, University of California, Santa Cruz, California, 2016

Continuing Education

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2020)

Sam Blakesley is an environmental scientist with 8 years of experience studying ocean and coastal resource management, climate change, and the interaction of science and policy. He has chaired ocean conservation nonprofit chapters, served as coordinator for multiple long-term water quality monitoring programs, and has been involved in a wide variety of coastal resilience projects ranging from sea level rise vulnerability assessments and watershed restoration projects to economic valuations of resources. Most recently, Mr. Blakesley worked with executive leadership for the State of California on marine science, policy, economics, and environmental justice to inform coastal and climate change resilience strategies.

Relevant Experience

COASTAL RESILIENCY

State Science and Policy Fellowship, Sacramento, California — Awarded an executive level Sea Grant fellowship, affording the opportunity to be involved in a wide array of state level policy development and adaptation planning. The primary focus of the fellowship was to proactively plan for sea level rise. Facilitated the development, review, and synthesis of legislatively mandated Assembly Bill 691 reports for the California State Lands Commission. The reports were required from all major ports, harbors, and wharves in California and included vulnerability assessments, economic impacts, and potential adaptation strategies such as beneficial reuse of dredge sediment for mudflat augmentation and levee protection. Reviewed remedial action plans for contaminated sites to ensure that mitigation strategies are consistent with sea level rise projections. Scored and recommended improvements to research proposals with regard to coastal sediment movement, living shorelines, and the placement of dredged material in San Francisco Bay. Supported the State's marine renewable energy efforts by acting as a liaison for the State Marine Renewable Energy Working Group.

Mangrove Restoration Project, Rincon Del Mar, Colombia — Collected baseline carbon stock data to support decision-making processes and provided the local community with economic incentives to restore and protect 500+ hectares of mangrove forest. Based on carbon estimation methodologies and monitoring guidelines, this project secured international partnerships for Blue Carbon funding. This project accelerated practical action at the local level to clean and restore the mangrove and develop waste management programs while increasing fish nursery habitat.



Water Quality Monitoring and Education Program, Santa Cruz, California — Directed a long-term water quality monitoring and education program that required the training and management of an evolving team of 15+ volunteer citizen scientists, coordination of all sample collection, and oversight of laboratory operations. The project culminated in a large coastal water quality database for Santa Cruz and was the largest, most consistent citizen-science water quality program in the U.S. The data collected ultimately helped the Cowell Beach Water Quality Working Group identify and mitigate bacteria pollution hot spots, which resulted in the removal of Cowell Beach from the #1 spot on the “Beach Bummer” list.

Younger Lagoon Reserve Scientific Tour Curriculum, Santa Cruz, California — Utilized basic scientific tools to develop methods for assessing abiotic factors such as dissolved oxygen, temperature, salinity, turbidity, nutrients, and soil testing in Younger Lagoon, part of the University of California Natural Reserve System. Once methods were developed, built a curriculum for Seymour Marine Discovery Center docents to follow when leading student and public tours. The information and data collected from these tours are used to understand both short- and long-term dynamics within the lagoon and the surrounding coastal ecosystem.

West Cliff Drive Adaptation and Management Plan Survey, Santa Cruz, California — Conducted contingent valuation surveys to simulate willingness-to-pay for the utility that local residents and visitors receive from West Cliff Drive’s natural resources and ecosystem services. This survey assessed projected sea level rise and erosion scenarios and how they will affect future access.

ENVIRONMENTAL MONITORING

Fieldwork Mentorship, San Lorenzo Valley, California — Guided student fieldwork, data collection, and water quality sampling sessions for a high school’s environmental monitoring program. Once data were collected, led students through laboratory processes and methodologies to help them develop their senior projects and follow QA/QC protocols. Reviewed students’ reports and judged final products at the school district’s science fair.

CLIMATE IMPACT ASSESSMENT

Middlebury Institute Sustainability Council, Monterey, California — Conducted audits of greenhouse gas emissions resulting from campus wide electricity, trash, water, and fuel usage; presented technical findings to the council; and identified cost saving opportunities through efficiency improvements. Acted as liaison between the school administration and student body to promote and fundraise for sustainable initiatives on campus.

Publications

Wright, D.M., and S.G. Blakesley. 2014. A geospatial analysis of fecal indicator bacteria concentrations in coastal riparian systems. Lower San Lorenzo River Watershed, Santa Cruz, County, CA, Water Year 2014. Surfrider Foundation. Available at: publicfiles.surfrider.org/SantaCruz_WrightDaniel_BacteriaPollutionAnalysis_161005.pdf



Presentations/Posters

Blakesley, S. 2016. In the bowels of Cowell's: An analysis of fecal indicator bacteria water quality impairment at Cowell Beach. 2016 University of California, Santa Cruz Environmental Symposium. Santa Cruz, CA.

Blakesley, S. 2015. The Blue Water Task Force. California State University Monterey Bay and Monterey Bay Marine Sanctuary Currents Symposium. Seaside, CA.

Invited Presentations/Panels/Peer Reviews

Emergency and Long-Range Planning. Propeller Club's Storms, Flooding, and Sea-level Defense Conference. December 3, 2019.

AB691: Proactively Planning for Sea-Level Rise. California Association of Harbor Masters and Port Captains 71st Annual Conference. September 5, 2019.





Michael J. Groves, AICP
PRESIDENT/SENIOR PRINCIPAL

PROFESSIONAL EXPERIENCE

Mr. Groves founded EMC Planning Group in 1978. Through his leadership and commitment to excellence in client service and the hiring of highly qualified team members, Mr. Groves has successfully established the firm as one of the leading land use and environmental planning firms in California. With his vast experience as a land use and policy planner, Mr. Groves has provided project management for over 750 planning projects, within more than 150 California cities, counties, and special districts.

Mr. Groves is involved in project management and coordination of a full range of planning projects completed by the firm. His focus within the firm is on client representation for urban and regional planning projects; coastal planning efforts; conceptual design; real estate due diligence and site evaluation studies; land use planning and permitting efforts; and city, county, school district and special district planning and permitting. A special focus since 1982 for Mr. Groves has been on coastal planning, having participated in the preparation of seven Local Coastal Programs (LCPs).

From 1995 - 1997, he served as project manager for the Fort Ord Reuse Plan, a national award-winning policy document for the largest base closure in the United States. The Plan became the model for base closures under President Clinton.

EDUCATION

B.A. University of California at Santa Barbara, Environmental Studies & Geography (double major), 1977

PROFESSIONAL CERTIFICATION

AICP - American Institute of Certified Planners, Professional Certification, 1990-Present

PROFESSIONAL ACHIEVEMENTS AND AWARDS

- Professional Certification, American Institute of Certified Planners, 1990-Present
- Initiative Measure Author
- Awards, *City of Guadalupe 2042 General Plan Update*, 2022
 - Comprehensive Planning, Small Jurisdiction, Award of Excellence-APA California Chapter, Central Coast Section Outstanding Planning Document (2023)
- Awards, *City of Salinas Economic Development Element*, 2014
 - Outstanding Planning Document-AEP (2016)
 - Economic Planning and Development Award of Excellence-APA California Chapter, Northern Section (2015)
 - Economic Planning and Development Award of Merit-APA California Chapter (2015)
- Award, *Fort Ord Reuse Plan Reassessment*, 2012
 - Best Practices Award of Merit- APA California Chapter, Northern Section, 2013
- Award, *Fort Ord Reuse Plan and EIR*, 1997
 - Comprehensive Planning in a Small Jurisdiction - National Planning Award for Outstanding Planning, APA National Chapter

PROFESSIONAL ASSOCIATIONS AND COMMUNITY INVOLVEMENT

- Member, American Planning Association
- Former Member, Monterey Peninsula Water Management District, Policy and Technical Advisory Committees
- Former Member, Sand City Habitat Conservation Task Force
- Member, Ventana Chapter, Sierra Club
- Head Coach, Monterey High School Baseball Program, 1980-Present
- Member, National High School Baseball Coaches Association (ranked 51st winningest coach nationwide)
- Member, California High School Baseball Coaches Association and Hall of Fame Member (ranked 2nd winningest coach statewide)
- President, Save Our Sports (SOS), Local Non-profit Supporting Student Athletes and High School Baseball and Softball
- Former President, Foster Parent Association, Santa Cruz County
- Former Member, Child Welfare Services Systems Improvement Steering Committee
- Former Member, Community Leadership Council - Ending Oppression Worldwide



Teri Wissler Adam

SENIOR PRINCIPAL

PROFESSIONAL EXPERIENCE

Ms. Wissler Adam joined the firm in 1991 and has been a principal since 2001. Her area of expertise is in California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) compliance.

Ms. Wissler Adam directs the CEQA and NEPA compliance projects for the firm. She has been responsible for a large variety of private projects, including residential, commercial, industrial, mixed-use, and large specific plan and general plan projects. She has also managed several projects for public facilities, such as recycled water projects, roadway projects, bikeway projects, bridge projects, elementary schools, high schools, and college campuses, and other public facilities, such as health clinics, landfills, child development centers, and federal research facilities. She has represented public clients throughout Monterey County, San Benito County, Santa Clara County, Merced County, San Luis Obispo County, San Mateo County, Santa Cruz County, and as far south as Los Angeles County.

EDUCATION

B.S. California Polytechnic State University at San Luis Obispo, Business Administration, Concentration in Environmental Management, 1991

PROFESSIONAL ACHIEVEMENTS

- Presenter, CEQA Seminar, Lorman Education Services
- Presenter, CEQA Workshop, Association of Environmental Professionals
- Member, Association of Environmental Professionals
- Contributor, *Environmental Mitigation Handbook*, California's Coalition for Adequate School Housing, February 2009
- Past Director/President/Newsletter Editor, Monterey Bay Area Chapter, Association of Environmental Professionals

PROFESSIONAL ASSOCIATION

- Member, Association of Environmental Professionals



Ron Sisseem, MRP

SENIOR PRINCIPAL

PROFESSIONAL EXPERIENCE

Mr. Sisseem worked for EMC Planning Group for three years writing environmental impact reports in the 1980s before taking on international assignments with USAID and the World Bank. His international experience includes national resource and protected area management in Mongolia, environmental auditing/impact evaluation to address business development lending risks in Bosnia and Herzegovina, clean technology deployment in India to reduce greenhouse gas emissions, and environmental compliance for USAID-funded economic development projects.

In 2002, Mr. Sisseem returned to EMC Planning Group and has been a principal since 2016. His primary responsibilities are to manage large land planning and environmental review projects. He assists public agencies with California Environmental Quality Act (CEQA) compliance for diverse, complex projects; manages preparation of specific plans and general plans; and manages planning and entitlement processes for private clients.

Mr. Sisseem is the firm's climate change/greenhouse gas emissions specialist. He manages climate change impact analyses for CEQA documents, consults local agencies on integrating climate planning strategies/policy/emission reduction measures into advanced planning documents (e.g. general plans and specific plans), and consults developers on climate change mitigation project design.

EDUCATION

M.R.P. University of North Carolina at Chapel Hill, Urban and Regional Planning, 1995

B.S. University of California at Santa Barbara, Geography, 1982

B.A. University of California at Santa Barbara, Environmental Studies, 1982

PROFESSIONAL ACHIEVEMENTS

- Awards, *City of Salinas Economic Development Element*, 2014
 - Outstanding Planning Document-Association of Environmental Professional (2016)
 - Economic Planning and Development Award of Excellence-American Planning Association, California Chapter, Northern Section (2015)
 - Economic Planning and Development Award of Merit-American Planning Association California Chapter (2015)
- Presenter, Advanced CEQA Workshop, Association of Environmental Professionals (2009, 2010, 2013)
- Authored "A Guide to Maximizing Profits and Business Stability through Environmental Management," produced by the World Bank
- Federation of Bosnia, Ministry of Environment Achievement Award for advancement of environmental management in Bosnia



Stuart Poulter, AICP, MCRP

SENIOR PLANNER

PROFESSIONAL EXPERIENCE

Mr. Poulter joined the firm in 2015. His responsibilities include project management and preparation of initial studies and environmental impact reports in compliance with the California Environmental Quality Act (CEQA), with a primary interest and project experience in addressing impacts associated with historical (built) resources and wildfire hazards.

Mr. Poulter has demonstrated experience across a range of project types including recreation facilities, school sites, residential subdivisions, transportation facilities, coastal development/infrastructure, and commercial/ tourism development. In addition, Mr. Poulter provides staff support services to various municipal planning departments, where he processes permit applications including: general plan, specific plan, and zoning amendments; tentative maps; urban service area amendments; conditional use/ coastal development permits; staff level historic evaluations; and architectural and site reviews. Processing development applications includes plan review and comments to the applicant, preparation of staff reports, findings, and resolutions, and presentations at public hearing. Additionally, he provides private clients with permit processing and entitlement assistance, constraints analysis, land use assessments, and feasibility analyses.

Prior to joining the firm and while completing his graduate degree in City and Regional Planning at Cal Poly-San Luis Obispo, Mr. Poulter worked as an environmental planning intern/technician in the private sector where he was responsible for the preparation of environmental documents in compliance with CEQA/NEPA and the preparation of permit application packages for various coastal and inland projects.

EDUCATION

M.C.R.P. California Polytechnic State University-San Luis Obispo, City and Regional Planning Program, Environmental Planning Concentration, 2015

B.A. Santa Clara University, History, 2008

PROFESSIONAL CERTIFICATION

AICP – American Institute of Certified Planners, 2018-Present

PROFESSIONAL ASSOCIATIONS

- Secretary, Monterey Bay-Silicon Valley Chapter Board of Directors, Association of Environmental Professionals, 2017-2019
- Member, Association of Environmental Professionals, 2014-Present
- Member, American Planning Association, California Chapter, 2014-Present

PROFESSIONAL DEVELOPMENT COURSES

- Introduction to Land Use Planning for Wildfires in California, CAL FIRE & Community Wildfire Planning Center (CWPC), March 2023
- CLE International – CEQA Conference (San Francisco), December 2022
- Cultural Resource Management: CEQA, NEPA and Section 106, UC Davis Continuing and Professional Education, January 2022

PUBLICATIONS

- Master's Capstone Project: *Recreational Trail Signage Plan and Draft Trail Map for California Polytechnic State University, San Luis Obispo*. June 2015. California Polytechnic State University, San Luis Obispo.



Zane Mortensen, MS

ASSOCIATE PLANNER

PROFESSIONAL EXPERIENCE

Mr. Mortensen joined the firm in April 2022, as an Assistant Planner to provide support in the preparation of environmental planning and land use documents for a variety of development projects such as residential sites, schools, subdivisions, specific plans, hospitals, and recreational facilities. Primary responsibilities involve conducting air quality and greenhouse gas emissions modeling and analysis, as well as the preparation of environmental review documentation in compliance with CEQA/NEPA regulatory standards.

In May 2019, he was awarded a Master's of Science degree from the Environmental Science Graduate Program at California State University, Monterey Bay (CSUMB). During his academic career, he developed a range of skills to apply to environmental issues within the community while working on projects for both State and County entities. He also had the opportunity to participate in research focused on the development of water treatment technology aimed at remediating agricultural pollutants from local tributaries.

Upon receiving his Master's of Science degree in Environmental Science from CSUMB, Mr. Mortensen was hired by the Rural Community Assistance Corporation to facilitate planning efforts that supported drinking water, wastewater, and stormwater infrastructure development for low-income rural communities. His role largely involved overseeing State funded consolidation efforts between small rural community water systems and larger local utility providers.

EDUCATION

- M.S. California State University Monterey Bay, Environmental Science, 2019
- B.S. California State University Monterey Bay, Environmental Science Technology and Policy, 2017
- A.S. Cerritos College, Natural Sciences, 2015
- A.A. Cerritos College, Automotive Mechanical Repair, 2013

CERTIFICATIONS & TRAINING

- UC San Diego CEQA Practice Certification, current enrollment
- The Safe Drinking Water Act, 2019
- Advanced Water Treatment, 2019
- Successful completion Grade I Wastewater Plant Operator Examination, 2014

PUBLICATIONS

- *Current Conditions and Restoration Scenarios for the Carmel River and Riparian Corridor at the Rancho Cañada Parcel of Palo Corona Park: Carmel Valley CA*, Central Coast Watershed Studies, March 2019
- *Hydrology and Water Quality of the Big Sur Land Trust Property in Carr Lake*, Central Coast Watershed Studies, April 2019
- *Isolation of Microbial Populations with the Ability to Use Pesticides as a Sole Carbon Source in Multichannel Woodchip Bioreactors under a Controlled Environment*, American Chemical Society, October 2018



Esme Wahl

ASSOCIATE PLANNER

PROFESSIONAL EXPERIENCE

Ms. Esme Wahl joined EMC Planning Group as an Associate Planner in April 2023. Her area of expertise is in coastal planning, and she has extensive experience in coastal development permitting, local coastal plan amendments, coastal resiliency and adaption planning, and habitat management and restoration projects.

Ms. Wahl previously worked for the California Coastal Commission as a Coastal Planner where she collaborated with local governments on issues such as sea-level rise adaption planning, groundwater basin sustainability, and public access maximization. She worked with the counties of San Luis Obispo and Monterey to ensure local projects were consistent with Coastal Act and Local Coastal Program policies. Specific projects Esme worked on include major infrastructure projects, sensitive habitat mitigation projects, and redevelopment of coastal armoring.

Ms. Wahl earned a Bachelor's of Science in Earth Science with a concentration in Environmental Geology from the University of California at Santa Cruz. Coursework included coastal geology, ecology, biology, environmental policy, GIS, California native plants, geologic hazards, coastal adaption, groundwater modeling, and climate dynamics. Esme gained valuable experience in formal research data collection and interpretation at the University of California Santa Cruz, where she participated in a coral research program.

EDUCATION

B.S. – Earth Science, Environmental Geology concentration, University of Santa Cruz, 2021. Graduated with highest honors.

SKILLS

- ArcGIS
- MS Word, Excel



Janet Walther, MS

PRINCIPAL BIOLOGIST

PROFESSIONAL EXPERIENCE

Ms. Walther joined the firm in 2003 and has been working in the field of biology since 2000. She is responsible for performing botanical and wildlife surveys; wetland and waters of the U.S. determinations; data analysis; and reports in support of management agreements, permits, and mitigation monitoring. She assists clients in complying with the Federal Endangered Species Act, California Endangered Species Act, Sections 401 and 404 of the Clean Water Act, California Fish and Game Code, and local (county and/or city) regulations.

Ms. Walther works with clients to design projects to avoid or minimize impacts to threatened and endangered species. Where impacts are unavoidable, she helps create mitigation strategies and the application documents necessary to obtain the required permits, including habitat conservation and land management plans.

In addition to her experience in biological survey and reporting, Ms. Walther is responsible for preparation of environmental documents in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). She produces a variety of graphics for use in environmental and natural resources documents and routinely works with ArcGIS, AutoCAD, and Adobe Illustrator/Photoshop.

In previous positions, Ms. Walther inventoried both native and non-native species in compliance with regulatory requirements, and assisted in preparing California Energy Commission Applications for Certification for four major power plant projects in California. She also conducted biological survey work in southern California and the High Desert and wetland and endangered species survey work in Nevada, Arizona, Georgia, and Florida.

EDUCATION

- M.S. California State University Monterey Bay, Coastal Watershed Science and Policy, 2014
- B.S. California Polytechnic State University at San Luis Obispo, Ecology and Systematic Biology, 2000 - Concentration: Environmental Management

CERTIFICATES AND TRAINING

- Biology and Management of California Tiger Salamander Workshop, Elkhorn Slough Coastal Training Program, 2007
- Biology and Management of California Red-legged Frog Workshop, Elkhorn Slough Coastal Training Program, 2007
- OSHA 40-hr HAZWOPER Certificate, 2001 and 8-hr Refresher Training, 2002-2007
- California Pesticide Application Certification, 2003/2004
- Army Corps of Engineers Wetland Delineation Training, 2002

PROFESSIONAL ACHIEVEMENT

- Contributor, *Environmental Mitigation Handbook*, California's Coalition for Adequate School Housing, February 2009



Patrick Furtado, MS

SENIOR BIOLOGIST

PROFESSIONAL EXPERIENCE

Mr. Furtado joined the firm in 2020 and has been working in the fields of biology and regulatory compliance since 2008. He has extensive experience conducting field surveys in central California, in particular with special-status species such as burrowing owl, northern spotted owl, western snowy plover, bank swallow, Swainson's hawk, Ridgway's rail, coho salmon, mission blue butterfly, vernal pool branchiopods, giant garter snake, San Francisco garter snake, San Francisco dusky-footed woodrat, salt marsh harvest mouse, San Joaquin kit fox, and Tidestrom's lupine.

He has been approved by the U.S. Fish and Wildlife Service as a qualified biologist for several projects involving California red-legged frog and California tiger salamander. He conducts nesting bird surveys, focused botanical inventories, and large-scale vegetation mapping. He is a plant and wildlife biologist with experience across a wide diversity of California habitats.

He helped design, implement, and monitor a variety of wetland and riparian restoration projects. He has also conducted regulatory agency coordination for wetland issues with the U.S. Army Corps of Engineers, California Department of Fish and Wildlife, Regional Water Quality Control Board, and California Coastal Commission.

Mr. Furtado specializes in biological fieldwork, resource management, regulatory permitting, planning, and preparation of technical reports. His expertise extends across a wide range of California ecosystems including fresh and salt water marsh, riparian woodland, vernal pool, grassland, chaparral, oak woodland, coastal scrub, and coniferous forest. He integrates multiple disciplines including wildlife surveys, remote sensing and GIS analysis, riparian and wetland hydrology, plant systematics and taxonomy, vegetation mapping and classification, fluvial geomorphology, habitat assessment, soil classification, wetland delineation, historical ecology, and invasive species management.

EDUCATION

- M.S. San Francisco State University; Conservation Biology, 2012
- B.S. University of California, Berkeley; Forestry and Natural Resource Management, 2007

CERTIFICATES AND TRAINING

- Society of Wetland Scientists – Certified as *Professional Wetland Scientist*, PWS #3041, 2018
- Morphology and Identification of Flowering Plants Workshop*, Jepson Herbarium, 2006
- Rare Plants of Eastern San Luis Obispo County Workshop*, California Native Plant Society, 2010
- Basic Wetland Delineation*, San Francisco State University, Romberg Tiburon Center's Wetland Science Series, 2010
- Classification of Vernal Pool Plant Communities Workshop*, California Native Plant Society, 2010
- Plant Taxonomy Training*, California Native Plant Society, 2010
- Phylogeny, Taxonomy, and Name Changes in the California Flora Workshop*, Jepson Herbarium, 2011
- Measuring and Monitoring Plant Populations and Vegetation*, California Native Plant Society, 2012
- Wetland Hydrology Workshop*, San Francisco State University, Romberg Tiburon Center's Wetland Science Series, 2012
- Grassland Ecology, Identification, and Monitoring Workshop*, California Native Grasslands Association, 2012
- California Natural Diversity Database Training*, California Department of Fish and Wildlife, 2013
- Wetland Indicator Plants Workshop*, San Francisco State University, Romberg Tiburon Center's Wetland Science Series, 2013
- Amphibians of the San Francisco Bay Area Workshop*, Laguna de Santa Rosa Foundation, 2014
- Tidal Wetland Restoration and the Horizontal Levee Workshop*, San Francisco Bay, National Estuarine Research Reserve, 2014
- California Tiger Salamander Ecology Workshop*, Laguna de Santa Rosa Foundation, 2015
- Rare Pond Species Survey Techniques Workshop*, Laguna de Santa Rosa Foundation, 2015
- Field Practices: Hands-On Restoration Implementation and Maintenance*, California Native Grasslands Association, 2015

PROFESSIONAL AND ACADEMIC ASSOCIATIONS

- The Wildlife Society – Western Section
- California Native Plant Society



Katherine Hardisty-Cranstone

ASSISTANT BIOLOGIST

PROFESSIONAL EXPERIENCE

Mrs. Hardisty-Cranstone joined EMC Planning Group in May 2023 as an Assistant Biologist. Responsibilities include general biological field surveys; focused surveys/habitat assessments for special-status wildlife species; jurisdictional wetland and waterway delineation; regulatory agency coordination, permitting and compliance support; and the preparation of resources technical reports and CEQA/NEPA biological resource impact analysis.

Mrs. Hardisty-Cranstone's skills include plant collection and identification, trail maintenance, and invasive species removal. She is additionally proficient at GIS mapping, ArcGIS, and ArcMAP. Previous experience includes working as an Assistant Biologist for Rana Creek Cohabitat Co where she performed vegetation surveys, nesting bird surveys, construction monitoring, day and night surveys for, bats, California red-legged frogs, and California tiger salamanders, and assisted in California red-legged frog relocation efforts. In addition, she wrote biological assessments for the California Coastal Commission, CEQA/NEPA compliance, and county, state, and federal agencies.

During her university years, Mrs. Hardisty-Cranstone worked for the Colorado State University Herbarium and performed vegetation surveys and plant collections. She also spent time with the Colorado Conservation Corps performing fuels mitigation work in the foothills of Fort Collins.

EDUCATION

B.S. Colorado State University;
Fish, Wildlife, and Conservation Biology,
Concentration in Wildlife Biology, 2017

Field Studies: Todos Santos, Mexico; Karatu,
Tanzania

CERTIFICATES AND TRAINING

- Western Burrowing Owl Workshop, July 2022
- SWPPP Certification, August 2022

PUBLICATIONS

- Author, *Rust in Peace: Abandoned and run around, derelict vessels have turned the Delta into a shifting graveyard that moves with the tide*, Outdoor California, Volume 80, No. 4, July 2019



Vanessa Potter, MA

ASSOCIATE ARCHAEOLOGIST

PROFESSIONAL EXPERIENCE

Ms. Potter joined EMC Planning Group in June 2023 as an Associate Archaeologist. She is responsible for conducting archaeological surveys, database inquiries, Sacred Lands records searches, Native American consultation, archaeological testing, and making recommendations for listing through the California Register of Historical Resources (CHRIS) and the National Register of Historic Places (NRHP). Other responsibilities include preparing cultural resources sections of environmental documentation in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

Ms. Potter has worked in the fields of Archaeology and Anthropology since 2000, and specializes in resources management, ethnography, and project curation. Previous work experience includes founding her own ethnographic analysis company. She also held the positions of Research Assistant and Project Assistant within the Archaeology departments for various universities and research institutes.

EDUCATION

- M.A. San Jose State University, Applied Anthropology, 2010
- B.A. University of Hawaii, Manoa; Anthropology, 2000

AWARDS

- Microgrant in Applied Anthropology from San Jose State University, 2009

PUBLICATIONS

An Inventory of Paleoindian Ormentation, Current Research in the Pleistocene, Volume 22, 2005

A class III cultural resources survey of 38.25 acres near Ina and Artesiano roads, Town of Marana, Pima County, Arizona, Published Tucson, Arizona: WestLand Resources, 2005.

A class III cultural resources survey of 5.36 acres near Cortaro Farms Road, Pima County, Arizona: Desert Son Survey, Tucson, Arizona: WestLand Resources, 2005.

A class III cultural resources survey of approximately 0.1 acres in Willcox, State Route 186: SR 186 Willcox ADOT permit, Tucson, Arizona: WestLand Resources, 2005.

A class III cultural resources survey of approximately 3.5 acres near State Route 77, for the Steam Pump Development, Oro Valley, Pima County, Arizona, Tucson, Arizona: WestLand Resources, 2005.

A class III cultural resources survey of approximately 6.9 acres for State Route 287 in Casa Grande, Arizona: SR 287 Casa Grande ADOT permit, Tucson, Arizona: WestLand Resources, 2005.

Class III cultural resources survey of 54.35 acres near Snyder Hill Road and Desert Sunrise Trail: Snyder Hill Estates, Tucson Arizona: WestLand Resources, 2005

A class III cultural resources survey of 2.28 acres near River Road and First Avenue, Pima County, Arizona, 1090 East River Road due diligence, Tucson, Arizona: WestLand Resources, 2005

A class III cultural resources survey at the Highway 80 and Country Club 35-acre property, Cochise County, Arizona, Tucson, Arizona: WestLand Resources, 2006

A class III cultural resources survey of 21 acres at Pima Mine Road, Pima County, Arizona, Tucson, Arizona: WestLand Resources, 2006

A class III cultural resources survey of 22 acres in Benson, Cochise County, Arizona: White Rock Canyon, Tucson, Arizona: WestLand Resources, 2006

A class III cultural resources survey of 55 acres west of Benson, Cochise County, Arizona, Tucson, Arizona: WestLand Resources, 2006

ATTACHMENT B: SCOPE OF WORK

In accordance with instructions provided in the Request for Proposals (RFP), our team will perform the following tasks and prepare the following deliverables:

- Estimated project timeline
- Meetings (with City staff, agencies, the public, and other stakeholders)
- CEQA notices
- Administrative Draft Environmental Impact Report (EIR),¹ Screencheck Draft EIR, and Draft EIR (for public review)
- Administrative Final EIR (including responses to comments)² and Final EIR
- CEQA resolution and findings, and statement of overriding considerations.

We understand that preparation of new technical documentation (i.e., studies) other than standard CEQA analyses (if needed) are not part of this scope of work but could be future tasks.

The scope provided below is based on our current understanding of the project and will be refined after the kick-off meeting and discussions with the agencies/applicant. The scope may be refined further during implementation. The 18 tasks listed in the RFP have been consolidated into 14 tasks below. We have reordered tasks somewhat to follow the assumed workflow. Submittals and filings will occur as described in the RFP and as required by state law.

Task 1: Kick-Off Meeting and Initial Site Visit

Our team will attend an in-person kick-off meeting with City staff and the applicant team (and possibly the Department of Toxic Substances Control [DTSC]) to discuss topics including communications protocols, key environmental issues, potential public controversy, potential project alternatives, etc. In conjunction with the in-person kick-off meeting, our team will conduct an initial site visit to document and photograph the existing project site setting and conditions.

¹ Includes review of existing technical documentation and identification of addition data/information needs as well as peer review of new technical documentation provided by the project proponent/applicant or others.; we are also including an initial study based on discussions in the pre-proposal meeting.

² If significant new information is added, a Revised Draft EIR may be required; for costing purposes, it is assumed this will not be required as the scope of a Revised Draft EIR is difficult to predict.

Task 2: Project Management/Coordination and Progress Meetings

Our team will provide ongoing project management, including coordination with subconsultants, City Planning staff, and regulatory agencies. We will attend periodic progress meetings (2 hours per month, assumed to be virtual) with City staff and possibly other agencies/stakeholders. Our team will also develop and maintain a project schedule and prepare status reports on a monthly basis.

Task 3: Review Background Information/Technical Studies, Identify Data/Additional Technical Information

Our team will review and utilize all of the project materials and previously prepared studies (listed at the end of the RFP) prior to completing Task 4 and the consultations under Task 5 to have a thorough understanding of the project context. This task also includes peer review of to-be-submitted, applicant-prepared technical studies and relevant CEQA analysis, including the updated biological resources report and archaeological resources report.³ Upon review of the pertinent documents and studies, our team will make recommendations for any additional studies. The City and/or the applicant will contract either with our team or appropriate experts to complete additional technical studies (additional studies conducted by our team are not included but a scope and cost could be provided in the future). We will analyze the relevance of the data provided in the existing technical studies and incorporate as appropriate in the EIR.

Task 4: Prepare Initial Study and Distribute Notice of Preparation/Informational and Public Scoping Sessions

Our team will review the project description (PD) identified by the City and Mendocino Railway (the applicant) in consultation with DTSC and the California Department of Water Resources' Division of Safety of Dams (DSOD) along with other responsible agencies such as the North Coast Regional Water Quality Control Board (Water Board) and create the PD for the EIR. We will prepare the draft notice of preparation (NOP), including an initial study (IS) that describes the topics to be analyzed in the EIR and addresses all environmental topics included in the CEQA Guidelines Appendix G Environmental Checklist (CEQA checklist). The IS will 1) identify environmental issues that will be addressed in further detail in the EIR and 2) adequately address the remaining IS topics. This approach will help to focus the EIR to those environmental issues that are most relevant. Based on our preliminary understanding of the proposed project, we assume the following environmental topics will not be addressed further in the EIR:

- Agriculture and Forestry Resources. There are no agricultural resources on or in the vicinity of the project site.

³ It is assumed that existing background documents and studies currently being updated will be provided in a timely manner. This includes an updated feasibility study and remedial action plan (RAP). We will also review DTSC's comments on technical studies/reports.

- Land Use and Planning. The project would not divide an established community. The EIR will include a thorough analysis of the Local Coastal Program (LCP) policies applicable to the project area.
- Mineral Resources. This section will address any known mineral resources in the area.
- Population and Housing. The project would not affect population or housing.
- Public Services. It is anticipated that there would be no impacts or that the impacts would be less than significant to public services.
- Wildfire. The project site is not in a wildfire hazard area.

Our team will review and incorporate all City staff comments and edits, as well as comments from DTSC and the applicant, and produce a final IS and NOP.

Although not listed in a specific task, the public involvement section of the RFP discusses informational sessions for the public. The format and timing for such meeting(s) will be discussed at the kick-off meeting; costs for one meeting (assumed to be in person) are included under this task (early in the process but likely after meetings with DTSC and the applicant). Multiple smaller group meetings could be useful, and a cost could be provided separately.

Our team will also assist City staff with holding up to two public scoping meetings during the 30-day public scoping period to receive comments from the agencies and public on the proposed scope of the EIR as well as one informal information session for the public. It is assumed these meetings will be in person. Our team will develop and present materials and information for the meetings and prepare a written summary of environmental issues raised at the scoping meetings. Additional meetings may be identified during Tasks 1, 2 and 5.

Task 5: Consultation with Agencies & Tribal Consultation

Task 5.1: Agency Consultation

Our team, in coordination with City staff, will participate in consultations with DTSC, DSOD, the California Coastal Commission (CCC), the Water Board and, at minimum, the following agencies, to obtain early input for the EIR and eventual permitting process:

- California Department of Fish & Wildlife (CDFW);
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Army Corps of Engineers (USACE).

We will follow up with each of the agencies that does not provide an initial written or verbal response or take part in the public scoping process. Other agencies (e.g., Caltrans, State Water Board) may be consulted for specific EIR topics.

We anticipate this consultation process will be ongoing. Our team will be a trusted advisor, providing City staff with the information needed to address comments, questions, and concerns from the agencies. We assume an initial inter-agency meeting (in person) and 3–4 additional agency meetings (assume all to be virtual meetings). An in-person meeting with tribal representatives can likely be arranged at the same time as other scoped meetings.

Task 5.2: Tribal/SHPO Consultation Assistance

Our team will assist City staff in compliance with Assembly Bill (AB) 52. We understand that the primary tribe will be the Sherwood Band of Pomo Indians, but we will obtain a list of culturally and regionally affiliated tribes from the Native American Heritage Commission (NAHC) and prepare a notifications letter consistent with AB 52. We have budgeted to attend two 1-hour meetings (assumed to be virtual) with the tribe.

In addition, we understand that there are known cultural/archaeological resources on or very near the project site. As noted in the RFP, the City anticipates consultation with the State Historic Preservation Officer (SHPO) pursuant to Public Resources Code Section 5024, which requires consultation with SHPO for state-owned properties with known cultural/historical resources. Our team will coordinate and assist City staff with this consultation process, and assumes two 1-hour virtual consultation meetings will be held with SHPO staff.

Task 6: Prepare Administrative Draft EIR

Our team will prepare an administrative draft EIR (ADEIR) for review by the City, DTSC, CCC, DSOD, and the applicant, incorporating responses to the NOP. The ADEIR will include an environmental setting and executive summary, will provide a brief summary of the proposed project (PD; see Task 4), and will utilize analysis from all applicable technical studies, providing clear and concise tables and exhibits. Environmental impact topics will include existing conditions, applicable regulations, potential project impacts, potential consequences, significance conclusions, and identification of mitigation measures, as necessary. The documents will include a table with each significant effect and the proposed mitigation measures, and alternatives to reduce or avoid that effect, as well as areas of controversy known to the lead agency and issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects. The ADEIR will also include an evaluation of consistency with applicable City of Fort Bragg LCP goals and policies.

Having a stable PD is important prior to initiating the ADEIR to avoid rework and to progress on a reasonable schedule, making Tasks 1-4 vital to a successful ADEIR. Our expertise with the site, stakeholders, and CEQA documents for remediation projects makes our team uniquely qualified to lead this effort. The PD developed under Task 4 will be refined for the EIR.

For all topics, our team incorporates relevant responses to the NOP and information obtained from other public agencies. Electronic versions the ADEIR, as well as two hard copies, will be provided to City staff and other reviewers. We have highlighted our approach to the most relevant CEQA topics below.

Aesthetics

The City's General Plan (Map CD-1) notes that the site is located within an area designated for "protection and enhancement of scenic views on the former Mill Site," which were to be addressed in a specific plan that has yet to be adopted by the City. According to the California Department of Transportation (Caltrans) State Scenic Highway System Map, the project site is immediately west (approximately 700 ft) of an eligible state scenic highway, State Route 1 (SR 1). Creation of light and glare that adversely affect day or nighttime views will also be investigated, as well the proposed project's potential to substantially degrade the visual character of the area.

Artistic Engineering will provide up to four visual simulations to present the visual impacts of the project. In addition to the evaluating the checklist items, the following tasks will be completed:

- Photograph the project area.
- Describe views to the project area applicable viewsheds and scenic resources and SR 1.
- Present existing and proposed images of the project site.
- Evaluate the visual effects of the proposed project (using the CEQA checklist).
- Identify General Plan policies that may serve as mitigation measures and/or present additional mitigation measures.

Air Quality

The project site is located in the North Coast Air Basin (air basin). The Mendocino Air Quality Management District (air district) has jurisdictional authority within the air basin. The proposed project would generate criteria air pollutant emissions during construction. Operational impacts are not anticipated. This section of the EIR will address whether the project would conflict with or obstruct implementation of the applicable air quality standards, result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment, and produce air pollutant concentrations that could create risk for public health.

CalEEMod will be used to calculate construction-related criteria air pollutants and greenhouse gas (GHG) emissions generated by the proposed project. Data inputs to the model will be based on detailed project information provided by the applicant, with our team providing the City/applicant with a checklist of construction equipment and project phasing information needs. All modeled results will be presented in appendices to the EIR.

The following tasks will be completed:

- Briefly describe the physical and climatological characteristics of the air basin, existing air pollutant conditions, and health effects of air pollutants.
- Review current air district documents, policies, and regulatory requirements applicable to the proposed project.
- Correspond with the City/applicant to solicit detailed construction related information, including anticipated equipment types, number, and durations of use for onsite construction activities; material import/export (verify information in PD submittal information to date); daily construction worker number and anticipated vehicle trip number; and construction schedule and phasing, which will be used as inputs to CalEEMod to accurately quantify construction emissions.
- Model up to two scenarios to quantify construction criteria air pollutants and GHG emissions under unmitigated, and if necessary, mitigated conditions. The model methodology, assumptions, and results will be summarized in the EIR.
- Compare CalEEMod results to the air district's construction thresholds to determine if the proposed project would result in significant impacts.

Sensitive receptors may be within 1,000 ft of onsite construction activities. Receptors could be exposed to construction sources of toxic air contaminants (e.g., diesel particulate matter from construction equipment) as well as contaminants from the impacted materials being excavated. Until more information about the project is known, there is some uncertainty about whether a quantitative or more qualitative health risk assessment is needed. We have assumed a more qualitative approach can be utilized for costing purposes. Our team has worked with engineering teams on remediation projects to develop control measures that reduce impacts to less than significant, and both helped develop and implemented the DTSC's Community Air Monitoring Plan guidance to reduce exposures during remedial construction.

Biological Resources

The Mill Pond Site supports a number of environmentally sensitive habitat areas (ESHA) and habitat for both state- and federally listed species. Numerous biological studies have been conducted since 2005, and we understand a revised report is currently underway. The following outlines tasks to conduct a review of background documentation, conduct a reconnaissance-level biological survey, and prepare a peer review letter report based on the revised biological study, in addition to preparing an ADEIR section, addressing biological resources.

Bio Task 1 Background Research

Tasks include compiling and reviewing available project information, including aerial photographs, and conducting a review to determine the special-status species that have been recorded as occurring within the general project vicinity based on current database

searches of the CDFW's *California Natural Diversity Database*, the California Native Plant Society *Rare and Endangered Plant Inventory*, the USFWS *Endangered Species Program*, and other biological studies conducted in the vicinity of the project site, if available.

Bio Task 2 Reconnaissance-Level Field Survey

Task includes completing a biological field survey to verify analyses and conclusions documented in the biological study currently being updated, including principal plant communities, the potential for special-status species and their habitats, wildlife movement corridors, potentially jurisdictional wetlands and waterways, regulated trees, and other significant biological resources.

Bio Task 3 Peer Review Letter

A letter will be prepared and submitted to the City based on a review of the biological study currently being updated and the reconnaissance-level survey. One round of peer review is anticipated. Any responses to the peer review by the applicant's consultants will be considered during preparation of the EIR section. Note that our recommendations may also include the need for additional specific or protocol-level surveys to be conducted during an appropriate time of year. Protocol- or focused-level surveys for specific plant and/or animal species are not included in this proposed scope of work.

Bio Task 4 EIR Section

The biological resources section of the EIR will be prepared, describing existing habitats, plant and animal species found on the project site, and the occurrence of and/or potential for special-status species and their habitats. If needed, one or more figures will be prepared to illustrate habitat types and the location(s) of special-status species occurring on or in the vicinity of the project site. This section will address project consistency with applicable requirements of the relevant regulatory/permitting agencies.

Cultural and Tribal Cultural Resources

According to the 2012 *Mill Site Specific Plan (Preliminary Draft)*, portions of the specific plan area (which includes the Mill Pond site) were formerly occupied and visited by Native Americans, and cultural resources have been discovered on the site. A portion of the specific plan area has been designated an archaeological district, and the site has a number of National Register of Historic Places (NRHP)-eligible archaeological deposits. The locations of cultural resource deposits must remain confidential under state and federal law. According to City staff, the City has been in active consultation with the Sherwood Valley Band of Pomo Indians since the closure of the former mill, and several members of the tribe live south of the mill site near Noyo Headlands Park. While specific locations of sensitive cultural and/or tribal cultural resources are not yet known, given that the project site is within or in proximity to a sensitive archaeological district, there is a high potential to accidentally discover cultural or tribal cultural resources onsite during any ground disturbance.

In addition, according to the 2022 *Dams Within Jurisdiction of the State of California (Dams Listed Alphabetically by County)*, the Mill Pond Dam was originally built in 1885 and, according to the City, may be included in previous surveys of cultural and historic resources. Given the dam's age and the possibility of it being included in previous cultural and historical resource surveys, there is a possibility that the dam could be eligible for listing as a historical resource on the California Register of Historical Resources and/or the NRHP. A resource's eligibility for listing would, in turn, make it a historical resource under CEQA.

A qualified archaeologist will conduct the following steps to complete the cultural and tribal cultural resources evaluations:

- Review available background research including site plans, maps, aerial photographs, and the background reports listed in the RFP.
- Conduct a peer review of the updated archaeological report that will be prepared and submitted to City staff by the project applicant and provide a letter report describing the results of the peer review.
- Incorporate information based on the outcome of the required tribal consultation process between the City, the Sherwood Valley Band of Pomo Indians, and any other tribes requesting consultation under AB 52.

Based on feedback from City staff, it is assumed that the Mill Pond Dam has been evaluated in previous cultural and historic resource surveys. This will be confirmed upon authorization to proceed and review of the available historic reports/evaluations/surveys. If it is determined that the dam was not evaluated, it may be necessary to amend the contract to provide a historic evaluation to be performed by a qualified architectural historian.

Energy

The proposed project will require energy for construction. The primary common source of energy consumption based on similar construction-related projects is the fuel use in vehicles traveling to and from the project site and onsite construction vehicles. The impact evaluation will assess whether the energy needs of the project would be wasteful, inefficient, or unnecessary, or if it would conflict with a state or local plan for renewable energy or energy efficiency. This evaluation will be qualitative in that there are not quantified thresholds of significance against which project demand can be compared. However, electricity, natural gas, and fuel demand will be quantified for information purposes based CalEEMod results.

Geology/Soils

The DSOD has determined that the existing Mill Pond dam would be structurally unsound in a maximum credible earthquake (8.0). The intention of the proposed dam improvement

project is twofold: 1) structurally stabilize the dam; and 2) create a smaller area contained by the dam in order to remove the dam from DSOD jurisdiction.

Geology/Soils Task 1

The impact evaluation will address earthquakes, liquefaction, landslides, erosion, expansive soils, and paleontological resources. The following tasks are proposed:

- Review available soils, geologic, and geotechnical reports prepared for the project, or those that may include applicable information.
- Conduct a paleontological resources records search (construction activities could result in soil erosion and unintended discovery of unknown paleontological resources).
- Present the existing geologic and soils setting at the project site.
- Discuss the geologic, erosion, and paleontological impacts associated with the proposed project.

A detailed geotechnical study is not included but could be scoped and implemented as a supplemental task.

Geology/Soils Task 2

As noted in the RFP, the City of Fort Bragg is located just onshore from the “California Triple Junction,” an active tectonic environment with the potential to generate near-field tsunamis. Our team will assess the potential impact of coastal hazards, including those associated with sea-level rise, including storm wave runup, coastal erosion, and tsunamis. Storm wave runup exacerbated by Sea-level rise could lead to inundation of portions of the site, accelerate coastal erosion processes, and affect the stability of upper-bluff portions of the project site.

The City’s LCP consists of the Coastal General Plan and the Coastal Land Use and Development Code. This section will include an analysis of the proposed project’s consistency with environmental goals and policies in these regulations. The policy analysis will focus on public access, coastal visual resources, recreation, marine environment, land resources, and sea-level rise (SLR), as well as other applicable environmental policies. Some of these assessments will be added to the recreation and other sections of the EIR.

Our team will utilize the analysis included in the background documentation listed in the RFP as well as any forthcoming Sea-level rise analysis studies being prepared by the City of Fort Bragg and County of Mendocino, General Plan, General Plan EIR, the 2012 *City of Fort Bragg Climate Action Plan*, and other relevant materials. The scope of work for this EIR section is as follows:

- Review the Coast and Geodetic Survey and USGS Science Application for Risk Reduction tsunami inundation maps, as well as emergency response/evacuation plans, policies, and procedures applicable to the proposed project.
- Review existing and forthcoming storm wave exposure due to SLR modeling including the those being led by the City of Fort Bragg and County of Mendocino, as well as the USGS CoSMoS for the North Coast of California. The team will make suggestions for site-specific storm wave exposure modeling if deemed necessary.
- Review existing and forthcoming coastal cliff retreat due to SLR including those being led by the City of Fort Bragg and County of Mendocino, the USGS CoSMoS for the North Coast of California, and the Pacific Institute. The team will make suggestions for site-specific coastal cliff retreat modeling if deemed necessary.
- Provide a review of background materials and site context including but not limited to wave environment, coastal geology, littoral transport, and impacts from prior storm and tsunami events.

Greenhouse Gas Emissions

The GHG impacts of a project can be found to be less than significant if the project is consistent with a qualified plan for reducing GHG emissions. The City of Fort Bragg adopted the *City of Fort Bragg Climate Action Plan* in 2012 (City of Fort Bragg 2012). However, it no longer qualifies as a plan against which the consistency of the proposed project can be assessed. Further, the air district has not adopted a GHG reduction plan that might be referenced for the analysis. In the absence of a local GHG reduction plan, the air district recommends that local agencies reference adopted Bay Area Air Quality Management District (BAAQMD) guidance for GHG thresholds of significance to assess the significance of GHG emissions for projects in Mendocino County.

BAAQMD recently adopted a performance standard-based analysis approach for evaluating GHG impacts in CEQA documents. The guidance can be found in the 2022 *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans* (BAAQMD 2022). BAAQMD did not adopt a construction threshold of significance, reasoning that GHG emissions from construction represent a very small portion of a project's lifetime GHG emissions. The proposed thresholds for land use projects are designed to address operational GHG emissions, which represent the vast majority of project GHG emissions. Given no quantified or performance-based thresholds from BAAQMD, construction GHG emissions from the proposed project will be quantified and presented for informational purposes, with an assumption that the GHG impact will be less than significant.

The following tasks will be completed:

- Briefly summarize the existing climate change setting.
- Briefly summarize applicable existing climate change policy and regulatory setting.

- Present features of the project that reduce energy demand, if any.
- Present GHG emissions as quantified using CalEEMod.

Hazardous Materials

Following decades of timber operations, the Mill Site has required substantial environmental cleanup of hazardous materials. The City invoked the Polanco Redevelopment Act, bringing cleanup efforts under the oversight of DTSC, which has divided the Mill Site into five geographic areas called “Operable Units.” Currently most of the 415-acre Mill Site has met DTSC cleanup goals, with the majority of the areas identified for further remedial actions within Operable Unit (OU)-E (the project site), which includes ponds (Ponds 1 through 9, and the North Pond). The applicant is currently in the process of preparing an addendum to the Feasibility Study to address DTSC’s (and the public’s) requests for additional alternatives analysis to those proposed in the applicant submitted *Draft OU-E Remedial Action Plan (RAP)*.

This section will discuss the remediation project in terms of its potential to cause harm to the environment or public through the accidental release of hazardous materials during remedial construction. The EIR will not evaluate the appropriateness of the remedy, as that is the role of the DTSC’s process. The scope of work for this EIR section is as follows:

- Review the application materials, with background documentation and information provided by the applicant related to the presence of hazardous materials and how the remedy will be implemented (from the RAP) and additional information provided by DTSC.
- Present the existing setting associated with hazards and hazardous materials.

Given our team’s extensive experience with developing CEQA documents for DTSC and other lead agencies for remediation projects, we can work with the City and project applicant to identify measures to reduce impacts to less than significant.

Hydrology and Water Quality

This section of the EIR would address whether the proposed project would violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality; result in significant erosion; and/or impact flood control. The project objectives include effective flood control and water quality benefits. The following tasks are proposed:

- Identify the potential for water quality impacts associated with the project.
- Identify the potential for flooding associated with the project.

Noise

The proposed project would not result in any operational noise; however, construction-related traffic and onsite construction work would create noise. Illingworth & Rodkin will conduct a construction noise analysis including the following tasks:

- Calculate construction equipment noise levels. Construction information provided by the project applicant will be used to assign noise levels for each of the identified pieces of equipment/operations. Noise levels from individual pieces of construction equipment, and from each phase of construction, will be calculated at the nearest receptors.
- Calculated noise levels will be compared to applicable thresholds to identify potential impacts at sensitive receptors in the area.

Recreation

The remedial construction activities will take place adjacent to the coastal trail, an important resource and amenity for locals and tourists alike. Remedial construction could temporarily impede or cause a rerouting of the trail for public access. An assessment of potential expansion of recreational facilities will be presented. A review of impacts to pedestrian and bicyclist access will also be undertaken under Transportation.

Transportation

The proposed project would not result in operational transportation impacts. However, construction of the project could result in impacts to traffic patterns and congestion. Vehicle miles traveled (VMT) during construction will be reported but is less relevant for a project that is solely construction and temporary. The VMT data will primarily be used in the Air Quality, GHG Emissions, and Energy sections. Construction-related trip generation data will be obtained from the applicant, and an impact assessment will be conducted. Information from the applicant will be needed to quantify truck traffic and proposed routes. Level of service information and standards, including those provided in the City's General Plan, will also be assessed. Consultation with Caltrans may be required.

Utilities and Service Systems

The project would not result in long-term impacts on water systems, wastewater systems, stormwater drainage facilities, telecommunication facilities, or power facilities but could have temporary impacts, which would be assessed. The impact on waste facilities, although expected to be minimal, will be evaluated.

Alternatives and Additional CEQA Topics

An analysis of three alternatives, including the no project alternative, are included in the budget. The impact analysis will include a discussion of consistency with applicable

regulatory requirements. As listed in the RFP, it is our team's understanding that the following two alternatives have been developed by City staff with DTSC staff:

- **City/DTSC Alternative 1—On-site terrestrial treatment process options.** The potential for onsite terrestrial consolidation/treatment of sediments could affect the feasibility of the removal of contaminated sediments from Ponds 1, 2, 3, 4, 6, 7, 8 and the North Pond.
- **City/DTSC Alternative 2—Variations on containment method.** This could include variations such as hybrid alternatives that include removal/containment/treatment technologies.

Additional CEQA alternatives may be developed in discussion with City staff, the applicant, and DTSC as well as public input. A scope and cost for evaluating any additional alternatives will be submitted to the City if additional alternatives are deemed necessary for the EIR.

Additional CEQA topics to be addressed in the EIR include the following:

- Cumulative Impacts
- Significant and Unavoidable Impacts
- Growth-Inducing Impacts.

Task 7: Respond to Internal Comments/Prepare Screencheck Draft EIR

We understand that there will be at least two rounds of review: City and DTSC followed by the applicant, CCC, and DSOD. Our team will review and incorporate all City comments on the ADEIR prior to the second round of review and incorporate all review comments into the screencheck draft EIR. As necessary, our team will meet with City staff and other reviewers (up to three virtual meetings) to discuss sections of the ADEIR. Screen check sections of the EIR will then be provided as outlined in the RFP with the schedule for other screencheck EIR sections as determined per the project schedule.

Task 8: Draft EIR, Notice of Completion, and Notice of Availability

Our team will revise the screencheck draft EIR and prepare a draft EIR for public review. Our team will provide an electronic copy of the draft EIR for City staff as well as submit the document in electronic format to the State Clearinghouse (SCH), local and regional agencies, and others as directed. Our team will provide two hard copies for public review at the Fort Bragg Public Library and City Hall. Other hard copies can be provided upon request (not included in our costs).

We recommend setting up a special email address for public comments; we will begin reviewing and addressing comments during the 45 (or 60) day public review period. A 45-day public comment period was assumed for the schedule.

Our team will also prepare the Notice of Completion and Notice of Availability and upload the appropriate notices to the SCH. We will coordinate with City staff for mailing the CEQA Notices to public agencies and filing any documents with the County Clerk's office. All CEQA Notices will be provided in electronic format.

Task 9: Public Hearing on Draft EIR

As stated in the RFP, the City Council is required to hold a public hearing on the draft EIR during the public review period (elsewhere in the RFP, it lists two public meetings for the draft EIR). For costing purposes, only one meeting was assumed, but a second meeting would be a lesser level of effort. For this task we will attend a City Council meeting (assume in-person attendance) to make a brief presentation on the draft EIR and take notes on verbal comments received on the draft EIR as well as provide support to City staff. City staff will provide meeting minutes and/or a video recording of the City Council hearing.

Task 10: Response to Comments (and Revised Draft EIR, if needed)

Upon completion of public review period, our team will evaluate the comments received on the draft EIR and prepare written responses in consultation with City staff, in the format and under the timeline specified in the RFP, and revise the document based on City comments/input. The budget accommodates responding to up to 50 unique comments on the draft EIR. If the level of effort needed to respond to comments exceeds that, a contract amendment may be required. The response to comments will be circulated for review.

This scope of work and our cost estimate assumes the draft EIR will not need to be revised and recirculated, as it is difficult to anticipate the level of effort for a revision. If that need arises, a scope and budget will be prepared at the time, and we will follow the process outlined in the RFP.

Task 11: Administrative Final EIR, Final EIR and Mitigation Monitoring and Reporting Program

Our team will prepare an administrative final EIR in the form of response to comments/errata document, including a draft response to comments document, and draft mitigation monitoring and reporting program (MMRP) in electronic format, which will be submitted to the City and the agencies for review and comment (one round of comments assumed).⁴ The final EIR will include the components listed in the RFP as well as the final MMRP.

⁴ The RFP does not specify review by the applicant. If required, this additional round of review may require additional funding.

Task 12: Certification Hearing

The City Council is required to hold a public hearing on the certification of the final EIR. Our team will attend and make a brief presentation in person.

Task 13: CEQA Resolution, Findings & Statement of Overriding Considerations

Our team will prepare draft and final (PDF and Word) CEQA resolution and the required findings of fact. Our team will also prepare draft and final (PDF and Word) statement of overriding considerations (if necessary) for City staff's use in the final EIR certification and project approval hearing materials.

Task 14: Presentation of Findings/Public Meetings

Our team will also assist City staff with the presentation of final EIR, MMRP, CEQA findings and statement of overriding considerations at the Planning Commission hearing to consider the Coastal Development Permit. The cost estimate includes our team's in-person attendance at one Planning Commission meeting to consider the Coastal Development Permit.

An optional task (not included in the primary task cost estimate) is attendance of one City Council meeting and one Coastal Commission meeting, if the project is appealed. A cost will be provided in the event of an appeal.

General Assumptions

We assume that for all document reviews, City staff will distribute the documents for review to the appropriate City staff and will coordinate preparation of the City's comments. A comprehensive set of the comments will be sent to our team identifying specific revisions.

As discussed above, some meetings will be in person and some virtual. We scoped up to 8 in-person meetings and at least 10 virtual meetings, plus 2 hours per month of virtual coordination meetings for an assumed 20-month project duration. Costs for meetings are within the various tasks.

It is also assumed that the City will pay any filing fees.

**Preliminary Budget
Fort Bragg Mill Pond EIR and Public/Regulatory Support**

Section F - Attachment C - Budget and Schedule of Charges	Task Breakdown																														
	Task 01		Task 02		Task 03		Task 04		Task 05		Task 06		Task 07		Task 08		Task 09		Task 10		Task 11		Task 12		Task 13		Task 14				
	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	
Total																															
Title	Rate	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost		
Principal/Program Manager	\$285	336	\$95,760	10	\$2,850	40	\$11,400	24	\$6,840	50	\$14,250	40	\$11,400	60	\$17,100	16	\$4,560	8	\$2,280	12	\$3,420	24	\$6,840	12	\$3,420	12	\$3,420	16	\$4,560	12	\$3,420
Senior Engineer/PM	\$190	286	\$54,340	10	\$1,900	50	\$9,500	24	\$4,560	40	\$7,600	16	\$3,040	60	\$11,400	10	\$1,900	8	\$1,520	8	\$1,520	20	\$3,800	16	\$3,040	8	\$1,520	8	\$1,520	8	\$1,520
Senior Scientist	\$190	62	\$11,780	0	\$0	0	\$0	12	\$2,280	16	\$3,040	0	\$0	20	\$3,800	10	\$1,900	4	\$760	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Project Engineer	\$175	216	\$37,800	0	\$0	0	\$0	20	\$3,500	20	\$3,500	8	\$1,400	80	\$14,000	24	\$4,200	12	\$2,100	12	\$2,100	16	\$2,800	20	\$3,500	4	\$700	0	\$0	0	\$0
Scientist	\$150	78	\$11,700	0	\$0	0	\$0	8	\$1,200	10	\$1,500	0	\$0	40	\$6,000	16	\$2,400	0	\$0	0	\$0	4	\$600	0	\$0	0	\$0	0	\$0	0	\$0
Associate Engineer	\$145	120	\$17,400	0	\$0	0	\$0	0	\$0	20	\$2,900	0	\$0	100	\$14,500	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Specialists																															
Principal/SLR, Coastal	\$285	34	\$9,690	0	\$0	0	\$0	4	\$1,140	0	\$0	16	\$4,560	8	\$2,280	0	\$0	0	\$0	0	\$0	0	\$0	6	\$1,710	0	\$0	0	\$0	0	\$0
Principal/Regulatory	\$285	38	\$10,830	0	\$0	0	\$0	8	\$2,280	8	\$2,280	8	\$2,280	8	\$2,280	0	\$0	0	\$0	0	\$0	0	\$0	6	\$1,710	0	\$0	0	\$0	0	\$0
Consultant/Geology/Hydrogeo	\$220	44	\$9,680	0	\$0	0	\$0	8	\$1,760	8	\$1,760	0	\$0	20	\$4,400	4	\$880	0	\$0	0	\$0	2	\$440	2	\$440	0	\$0	0	\$0	0	\$0
Project Scientist/SLR/Coastal	\$175	42	\$7,350	0	\$0	0	\$0	8	\$1,400	8	\$1,400	4	\$700	10	\$1,750	0	\$0	8	\$1,400	0	\$0	4	\$700	0	\$0	0	\$0	0	\$0	0	\$0
GIS	\$140	38	\$5,301	0	\$0	0	\$0	0	\$0	20	\$2,790	0	\$0	8	\$1,116	0	\$0	2	\$279	4	\$558	0	\$0	4	\$558	0	\$0	0	\$0	0	\$0
Non-technical																															
Editorial	\$130	64	\$8,320	0	\$0	0	\$0	0	\$0	8	\$1,040	0	\$0	24	\$3,120	2	\$260	12	\$1,560	0	\$0	8	\$1,040	10	\$1,300	0	\$0	0	\$0	0	\$0
Project Coordinator	\$125	20	\$2,500	0	\$0	20	\$2,500	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Subtotal Labor - Integral		1378	\$282,451	20	\$4,750	110	\$23,400	116	\$24,960	208	\$42,060	92	\$23,380	438	\$81,746	82	\$16,100	54	\$9,899	36	\$7,598	78	\$16,220	76	\$15,678	24	\$5,640	24	\$6,080	20	\$4,940
Title	Rate	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost		
Senior Principal	\$275	174	\$47,850	14	\$3,850	20	\$5,500	8	\$2,200	12	\$3,300	12	\$3,300	50	\$13,750	6	\$1,650	6	\$1,650	0	\$0	16	\$4,400	4	\$1,100	14	\$3,850	4	\$1,100	8	\$2,200
Senior Planner	\$195	544	\$106,080	14	\$2,730	25	\$4,875	24	\$4,680	50	\$9,750	20	\$3,900	189	\$36,855	30	\$5,850	20	\$3,900	12	\$2,340	80	\$15,600	16	\$3,120	14	\$2,730	36	\$7,020	14	\$2,730
Associate Planner	\$165	176	\$29,040	0	\$0	0	\$0	8	\$1,320	40	\$6,600	2	\$330	96	\$15,840	6	\$990	0	\$0	4	\$660	20	\$3,300	0	\$0	0	\$0	0	\$0	0	\$0
Specialists																															
Principal Biologist	\$210	28	\$5,880	0	\$0	0	\$0	2	\$420	0	\$0	8	\$1,680	11	\$2,310	1	\$210	0	\$0	0	\$0	6	\$1,260	0	\$0	0	\$0	0	\$0	0	\$0
Senior Biologist	\$170	32	\$5,440	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	30	\$5,100	2	\$340	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Archaeologist	\$125	44	\$5,500	0	\$0	0	\$0	12	\$1,500	0	\$0	4	\$500	24	\$3,000	2	\$250	0	\$0	0	\$0	2	\$250	0	\$0	0	\$0	0	\$0	0	\$0
Assistant Biologist	\$125	60	\$7,500	0	\$0	0	\$0	10	\$1,250	0	\$0	0	\$0	50	\$6,250	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Graphics	\$140	40	\$5,600	0	\$0	0	\$0	0	\$0	8	\$1,120	0	\$0	28	\$3,920	0	\$0	0	\$0	0	\$0	4	\$560	0	\$0	0	\$0	0	\$0	0	\$0
Non-technical																															
Production Manager	\$125	36	\$4,500	0	\$0	0	\$0	0	\$0	4	\$500	0	\$0	8	\$1,000	4	\$500	8	\$1,000	0	\$0	8	\$1,000	4	\$500	0	\$0	0	\$0	0	\$0
Admin/Production	\$115	18	\$2,070	0	\$0	4	\$460	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	2	\$230	8	\$920	4	\$460	0	\$0	0	\$0	0	\$0
Subtotal Labor - EMC		1152	\$219,460	28	\$6,580	49	\$10,835	64	\$11,370	114	\$21,270	46	\$9,710	486	\$88,025	51	\$9,790	34	\$6,550	18	\$3,230	144	\$27,290	28	\$5,180	28	\$6,580	40	\$8,120	22	\$4,930
Total Labor			\$501,911		\$11,330		\$34,235		\$36,330		\$63,330		\$33,090		\$169,771		\$25,890		\$16,449		\$10,828		\$43,510		\$20,858		\$12,220		\$14,200		\$9,870
Subcontractors																															
Illingworth & Rotkin			\$4,000		\$0		\$0		\$0		\$0		\$0		\$4,000		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
Artistic Engineering			\$8,000		\$0		\$0		\$0		\$0		\$0		\$8,000		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
Burden	10%		\$1,200		\$0		\$0		\$0		\$0		\$0		\$1,200		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
Subtotal - Subcontractors			\$13,200		\$0		\$0		\$0		\$0		\$0		\$13,200		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
Other Direct Costs																															
Direct Project Expenses	6.00%		\$30,115		\$680		\$2,054		\$2,180		\$3,800		\$1,985		\$10,186		\$1,553		\$987		\$650		\$2,611		\$1,251		\$733		\$852		\$592
Travel Costs - Integral	\$350		\$5,950	2	\$700		\$0		\$0	6	\$2,100	2	\$700		\$0		\$0		\$0	4	\$1,400		\$0		\$0	2	\$700	0	\$0	1	\$350
Travel Costs - EMC	\$500		\$4,900	2	\$700		\$0		\$0	3	\$1,050	2	\$700		\$0		\$0		\$0	4	\$1,400		\$0		\$0	2	\$700		\$0	1	\$350
Production Costs			\$8,400		\$0		\$0		\$0		\$500		\$100		\$200		\$0		\$3,000		\$500		\$0		\$3,000		\$500		\$100		\$500
Postal/Deliverables			\$800		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$600		\$0		\$0		\$200		\$0		\$0		\$0
Misc (CNDDDB, Paleo Search)			\$750		\$0		\$0		\$0		\$0		\$0		\$750		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0
Burden	10%		\$995		\$0		\$0		\$0		\$50		\$10		\$95		\$0		\$360		\$50		\$0		\$320		\$50		\$10		\$50
Subtotal - ODCs			\$51,910		\$2,080		\$2,054		\$2,180		\$7,500		\$3,495		\$11,231		\$1,553		\$4,947		\$4,000		\$2,611		\$4,771		\$2,683		\$962		\$1,842
TOTAL BUDGET			\$567,021		\$13,410		\$36,289		\$38,510		\$70,830		\$36,585		\$194,202		\$27,443		\$21,396		\$14,828		\$46,121		\$25,629		\$14,903		\$15,162		\$11,712



Billing Rates – 2023/2024 Operable Unit E Mill Pond Remediation Project

Integral Consulting Inc.		EMC Planning Group	
Title	Rates (\$)	Title	Rates (\$)
Principal	285	Senior Principal	275
Consultant	220	Principal Biologist	210
Senior Engineer/Scientist	190	Senior Planner	195
Project Engineer/Scientist	175	Senior Biologist	170
Engineer/Scientist	150	Associate Planner	165
Associate Engineer/Scientist	145	Archaeologist	125
Assistant Engineer/Scientist	140	Assistant Biologist	125
GIS	140	Graphics	140
Editor	130	Production Manager	125
Project Coordinator	125	Admin/Production	115

OTHER CHARGES

1. Subcontractor services, equipment, and materials are charged at cost plus 10%.
2. Direct project expenses including general administration, long-distance telephone calls, online meetings, routine project conference calls, routine U.S. Postal Service and express mailings, and incidental printing and copying are charged at a flat rate of 6% of total direct labor charges.
3. Large print and copy jobs produced in house (> 500 pp. total) are billed at a rate of \$0.10/page (8.5"×11") for black and white copies and \$1.00/page (8.5"×11") for color copies. Plotter use is billed at \$4.00/sq. ft. (bond) and \$7.00/sq. ft. (glossy).
4. Field equipment is charged in accordance with Integral's standard rates. A schedule of equipment rates is available upon request. Health and safety costs for field activities are charged at a rate of \$50 per field day per individual.
5. Travel/transportation and per diem costs are billed at cost. Personal-owned vehicle mileage is billed in accordance with IRS guidelines.
6. Literature acquisition, production services, shipping, and project purchases are charged at cost plus 10%.

