integral

Statement of Qualifications
County of Hawaii

NOTICE TO PROVIDERS OF PROFESSIONAL SERVICES (HRS 103D-304)

Integral Consulting Inc.

June 30, 2024

INTEGRAL-CORP.COM

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Submitted via email to: recreation@hawaiicounty.gov

June 30, 2024

Reference No. P585

Mr. Maurice Messina, Director
Department of Parks and Recreation
County of Hawaii
101 Pauahi Street, Suite 41
Hilo, Hawai'i 96720

Subject: **Statement of Qualifications and Letter of Interest**

Dear Mr. Messina:

Integral Consulting Inc. (Integral) is pleased to provide this statement of qualifications to provide services in support of the County of Hawaii Notice to Providers of Professional Services. The categories of service to be considered include:

- **PR.2) Industrial Hygiene (Hazardous Materials Survey, Assessment & Planning**

This statement of interest contains the following components:

1. Attachment 1: Office Locations
2. Attachment 2: Key Staff Resumes
3. Attachment 3: Integral Promotional Literature
4. Attachment 4: Form DPW 120, Certificate of Insurance, P.E. Licenses

Our team includes the best and brightest minds in the industry to tackle our client's most challenging issues and implement value-based environmental and engineering solutions. Our team of permitting and planning, engineeing (civil, environmental, coastal), and other subject matter experts bring decades of experience implementing similar projects throughout Hawaii.

June 30, 2024

We thank you for your consideration and look forward to the opportunity to serve you under this contract. If you should need additional information, please feel free to contact me.

INTEGRAL CONSULTING INC. LOCATION

With 24 offices nationwide and 1 in Mexico, Integral offers a highly qualified team of science and engineering professionals and support staff. Integral has been present in Hawaii since 2008.

Integral's Hawaii staff understand the local issues and regulatory complexities of working in Hawaii. We support local businesses and governmental entities with permitting, operational compliance, and solutions to complex environmental issues, and have developed effective, long-term working relationships with federal, state, and local regulators and agencies.

PROJECT TEAM

Silvia Barber is an environmental scientist with 14 years of consulting experience who is based in Hawaii and serves as the primary point of contact for Hawaii clients. Ms. Barber has a background in science, environmental management, and natural resource economics. Ms. Barber graduated with a M.S. degree from UH Manoa, has managed site investigation and remediation projects across nearly all the Hawaiian Islands, and has supported projects led by federal and state agencies across the U.S.

Robert Walker, P.E., is a highly experienced coastal engineer with 19 years of expertise in coastal and marine projects. He specializes in dredging and dredged material management, coastal analyses and studies, shoreline protection, the design of waterfront facilities, and nature-based coastal hazard mitigation. Mr. Walker's proficiency goes beyond planning, design, and field investigations—he also excels in guiding clients through the complex regulatory permitting process, successfully securing local, state, and federal permits for numerous complex coastal projects. In addition, Mr. Walker brings valuable expertise in hydrographic surveying, sediment sampling and analysis, construction management, and environmental compliance services for dredging and coastal and waterfront construction projects.

Avram Frankel, P.E., is a professional engineer, technical expert, and program manager with more than 30 years of experience. He is a licensed P.E. in six states including Hawaii. Mr. Frankel has experience on a wide range of commercial/industrial, municipal, state, and federal sites regulated under numerous state and federal programs.

Craig Jones, Ph.D., is a principal ocean and environmental engineer with 20 years of experience based in Santa Cruz, California. His experience includes developing and executing engineering and science projects for government agencies and the private sector to

characterize offshore environmental sites. In addition, his experience includes riverine, lacustrine, estuarine, and coast processes involving hydrodynamics, waves, sediment, and contaminant transport. Prior to joining Integral, Dr. Jones worked as a Senior Environmental and Ocean Engineer with Sea Engineering, Inc.

David Revell, Ph.D., is a principal coastal geomorphologist with more than 25 years of international experience in coastal resilience and adaptation based out of Santa Cruz, California. His experience includes studying marine, coastal, and estuarine processes, and working to integrate science and management of coastal processes and climate change. 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 management programs and policies. Dr. Revell voluntarily supports the North Shore Coastal Erosion Working Group to identify adaptation options to the extreme erosion witnessed in recent years.

Dave Anning, Ph.D., has a broad environmental background with qualifications in marine science, environmental tourism management, economics, and geography. Dr. Anning is active in coastal resilience, offshore wind and marine renewable energy, natural resource damage assessment, and environmental, social, and governance (ESG) planning and analysis sectors.

INTEGRAL HAWAII TEAM

Our Hawaii office is located in central Oahu. Integral currently has the following staff based in Hawaii:

- Silvia Barber—Senior Consultant
- Robert Walker, P.E. —Principal
- Erin Petrosian—Consultant (based on the Big Island of Hawaii)
- Tai Maaz—Scientist
- Patrick Niemeyer—Scientist (based on the Big Island of Hawaii)
- Taylor Caster—Project Engineer
- Zoe Curley—Assistant Scientist
- Brenda Lee—Office Manager/Project Coordinator

Additional key staff located in Integral mainland offices, supporting Hawaii projects:

- Avram Frankel, P.E.—Managing Principal/Principal Engineer
- David Revell, Ph.D.—Principal, Coastal Resilience
- Craig Jones, Ph.D.—Director, Marine Science and Engineering

- Dave Anning, Ph.D.—Senior Economist, Coastal Recreation and Natural Resources.

EXPERIENCE

Integral is a science and engineering consulting firm providing technical and strategic support to address health, environmental, economic, and natural resource challenges. We are leaders in developing science-based approaches and cost-effective solutions to complex climate challenges in the private and public sectors. Our 240+ professionals and support staff are in 24 U.S. and 1 international offices. We have a broad array of scientific specialties from geologists and oceanographers to economists and environmental engineers, among many others.

An overview of our company and our core services is presented in our statement of qualifications, included as Attachment 3. A fully completed DPW Form 120 is included as Attachment 2. Attachment 4 includes the insurance certificate.

CIVIL AND ENVIRONMENTAL ENGINEERING

Integral designed and implemented remediation of arsenic and dioxin contaminated land on a Hawaii Island Community Development Corporation property in North Kohala, Hawaii, to be developed as residential housing. Remediation in 2016 resulted in cleanup to residential land use standards, and a No Further Action determination by the Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Office. Integral has recently completed a sediment, biota, and soil sampling program in Pearl Harbor, along with our teaming partner Sea Engineering, Inc., in support of the engineering design for sediment dredging and capping. DOH HEER staff observed Integral's sediment sampling activities along the shores of Pearl Harbor. Integral just completed the engineering design of various environmental remedies in Pearl Harbor involving contaminated sediments, producing biddable specifications and drawings. Integral has been managing and implementing a significant soil sampling program for the Hawaii Department of Education, Facilities Division, on various islands since 2016; DOH HEER is involved and providing oversight. Integral assisted the County of Hawaii with the closure of two landfills (the former metal scrap yard portions of the landfills), including remedial engineering design, environmental sampling, contractor bid procurement support, and construction observation.

ENVIRONMENTAL PLANNING & DUE DILIGENCE

Integral staff have supported due diligence efforts for property and business transactions ranging from small sites and parcels to large commercial/industrial facilities. In many cases, systematic and strategic evaluation of potential liabilities was also required. In Hawaii, Integral has performed Phase I and II Environmental Site Assessments on large tracts of agricultural land transitioning from pineapple and sugarcane to new diversified agricultural uses. The Phase II investigations included sampling of environmental media and laboratory analyses.

Integral staff have also prepared Environmental Assessment under HRS 343 for our Hawai'i clients. Recent relevant projects include the County of Hawaii related to the remediation and closure of a former scrap yard located on state land in Kona, Hawaii, and an Environmental Assessment for in-water work at a Kaneohe residence to support construction of a fixed dock.

COASTAL ENGINEERING—CLIMATE RISK AND RESILIENCE

Integral conducts and applies the best science and modeling approaches to assist our clients in addressing climate-related challenges and identifying the best, most feasible solutions. Our Coastal Climate Risk and Resilience practice utilizes a 360° approach to develop robust solutions that evolve over time for our clients. Our services include coastal hazard modeling, property resiliency and vulnerability assessment, adaptation planning that develops future pathways balancing, economic analyses with changing risks. We prioritize the use of nature-based approaches and sound policy development before relying on strictly engineered solutions. Our Integral staff have worked on climate risk and resilience projects in California, Florida, Oregon, Texas, and Australia. Our experts have been engaged for two projects in Hawaii commencing in 2023, examining adaptation pathways in areas threatened by erosion and inundation on Oahu and Maui.

ECONOMICS—NATURAL RESOURCES

Integral economists support clients with valuation of natural capital and ecosystem services, and the use of this value information in public policy development and funding allocation. Our economists have expertise in benefit–cost and economic impact analysis, including examining the fiscal importance of tourism and recreational expenditures and assets for municipal and agency budgets. Of particular relevance to the Hawaiian context, Integral's economists have specialized skills in the assessment of values associated with human use of the coastal zone, and the valuation of impacts due to natural hazards and climate change, including loss of ecological functions. We conduct technically sound analyses and provide effective communications to assist decision-makers and inform stakeholders. Integral's economics team is currently engaged on two Hawaiian projects, examining the recreational value and cultural importance of coastal public spaces, and identifying funding and financing options for managed retreat.

COASTAL ENGINEERING—HARBORS/MARINAS AND DREDGING

Integral staff have significant expertise in the planning, design, and regulatory permitting of small-craft harbors and waterfront facilities. Project experience includes floating docks, fixed piers, boat launch ramps, and site layout design – and includes new facilities as well as the maintenance and repair of existing infrastructure. Dredging and dredged material management project experience includes navigation dredging for ports and harbors, maintenance dredging of marinas and small-craft harbors, and dredging for beneficial reuse for shore protection

projects. Our staff also has extensive experience in contaminated sediment management, dredged material disposal design, sediment investigations, and water quality monitoring for dredging and waterfront construction projects.

ENVIRONMENTAL PERMITTING

Integral works closely with regulatory agencies at a federal, state and county level to obtain the required permits, approvals, authorizations and determinations necessary to implement our clients projects. Integral has obtained permits ranging in complexity from grading permits to support our civil designs to Environmental Assessments to support large scale projects with cross-jurisdictional oversight.

REFERENCES—CLIENTS

Integral is well respected in the Hawaii environmental business and regulatory community. The following offices may be contacted for client references:

- **State of Hawaii Department of Education.** Integral has provided environmental consulting services to the Department of Education since 2016. Contact person: Gary Bignami, Environmental Services Division, (808) 784-5067.
- **Hawaiian Electric Company, Inc. (Hawaiian Electric).** Integral has provided environmental consulting and engineering services to Hawaiian Electric companies (HECO, HELCO, and MECO) since 2008. Contact person: David Martin, Environmental Manager, (808) 543-4504.
- **County of Hawaii Department of Environmental Management.** Integral has provided environmental consulting and engineering services to the County of Hawaii since 2011. Contact person: Greg Goodale, Solid Waste Division Chief, (808) 961-8515.
- **Goodsill Anderson Quinn & Stifel LLP.** Integral has supported Goodsill Anderson and their clients on various litigation and non-litigation projects since 2008. Contact person: Lisa Munger, Environmental Attorney, (808) 547-5600.

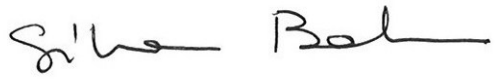
REFERENCES—REGULATORY AGENCIES

The following person is familiar with Integral's staff and capabilities, and may be contacted for references:

- **Roger Brewer,** DOH HEER Office, Honolulu, (808) 586-4249.

June 30, 2024

Sincerely,



Silvia Barber
Senior Consultant
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Attachment 1

Office Locations

Office Locations and Contact

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(667) 225-5410
Sarah Scott
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Attachment 2

Resumes

Avram Frankel, P.E.

Managing Principal, Business Director, Investigation and Remediation

(415) 787-6301

San Francisco, CA

afrankel@integral-corp.com

Mr. Avram Frankel is a professional engineer, technical expert, and program manager with more than 30 years of experience on a wide range of commercial/industrial, municipal, state, and federal projects regulated under numerous state and federal programs. A civil and environmental engineer licensed in California, Oregon, Washington, Colorado, Georgia, and Hawaii, Mr. Frankel provides his clients with strategic risk management and technical analysis in support of due diligence, redevelopment, technology evaluation, site investigation, water treatment, remediation, and legal/litigation matters. With a focus on enhancing health and safety, restoration of drinking water aquifers, and delivery of potable water, he has overseen the design, costing, installation, and optimization of groundwater remediation and water treatment systems across the U.S. over a wide range of site scales, geologies, and technical complexities. As a program manager and technical strategist, Mr. Frankel's experience on large, complex, and performance-based projects is extensive, including the successful remediation of plumes measured in miles in challenging stakeholder environments and under litigation or settlement conditions. He has also served as a consulting and testifying expert on numerous litigation matters, including pre-trial and trial testimony.

Over his career, Mr. Frankel has addressed emerging contaminants of the past and present, including hexavalent chromium, perchlorate, per- and polyfluoroalkyl substances (PFAS), and 1,2,3-trichloropropane (1,2,3-TCP). A seasoned practitioner, he has considerable expertise in the preparation of high-stakes deliverables, incentive-based contract documents, expert technical reports, cost evaluations, and risk-reducing strategies to achieve environmental goals for an appropriate lifecycle cost.

Education & Credentials

M.S., Environmental Engineering, Northwestern University, Evanston, Illinois, 1995

B.A., History, with Honors, Johns Hopkins University, Baltimore, Maryland, 1989

Licensed Civil Engineer, California (License No. C59980)

Licensed Civil Engineer, Oregon (License No. 89636PE)

Licensed Civil Engineer, Washington (License No. 54003)

Licensed Professional Engineer, Georgia (License No. PE41986)

Licensed Professional Engineer, Colorado (License No. PE.0057535)

Licensed Professional Engineer, Hawaii (License No. 19758-C)

Professional Affiliations

Member of National Ground Water Association

Member of American Water Works Association

Member of Groundwater Resources Association of California

Relevant Experience

SITE REMEDIATION

Chlorinated Solvent Remediation, Multiple Sites, Northern California — Directing the evaluation and remediation of multiple chlorinated solvent sites in Northern California under Regional Board and local voluntary cleanup oversight. Sites involve implementation of a variety of *ex situ* and *in situ* groundwater treatment technologies in drinking water aquifers including enhanced reductive dechlorination (ERD), zero-valent iron chemical reduction, colloidal activated carbon adsorption, and use of permeable reactive barriers.

Reese Center, Reese Air Force Base, Lubbock, Texas — Served as program director for

implementation of $43.5 million drinking aquifer restoration RCRA project that achieved regulatory closure under a performance-based contract. Remediation included 200-gpm directed groundwater recirculation system with granular activated carbon (GAC) treatment and *in situ* ERD to treat a 3-mile-long trichloroethylene (TCE) plume in the Ogallala aquifer resulting from industrial sewer releases. Within 6 years, the plume footprint was reduced by 90 percent. All compliance wells achieved maximum contaminant levels 8 years from installation of systems. Oversaw soil remediation activities. Negotiated multiple RCRA permit modifications. Robust groundwater fate and transport modeling supported all groundwater remediation and guided adaptive design and remedy optimization. This is one of the largest cleanups and closure of a TCE plume of this magnitude to date in the U.S.

Downey Landing, Downey, California — Served a s the program director for the guaranteed closure of a $16 million Phoenix award–winning aquifer restoration project in a drinking water aquifer that achieved regulatory closure under a voluntary cleanup program. This guaranteed remediation of chlorinated volatile organic compounds (CVOCs) in a drinking water aquifer was implemented on behalf of a multiple stakeholder group and facilitated a massive site redevelopment, including retail center, movie studio, and new hospital. Oversaw ERD remediation of a 1.5-mile-long plume before, during, and after redevelopment under a voluntary remediation program. Project included soil closure after soil vapor extraction and *in situ* chemical oxidation remediation. Negotiated groundwater closure framework with the state based on site-specific, attenuation-based cleanup goals. Creative approach addressed commingled plume issues discovered after contract execution. Achieved no further action for groundwater.

RCRA Corrective Action, Brunswick, Georgia — Served as principal-in-charge for the assessment and development of remedial alternatives to address volatile organic compounds (VOCs) at an active industrial site. Developed alternate integrated remedial approach to address offsite plume migration and meet RCRA regulatory goals while addressing third-party litigation. Led team that reinterpreted conceptual site model to support revised interim corrective action approach.

Potable Water Treatment System Design, Fresno County, California — Oversaw evaluation of 1,2,3-TCP treatment requirements for a two-well private water supply system and design of a GAC wellhead treatment system to remove 1,2,3-TCP including construction cost estimate.

Former Cooling Tower Manufacturing Site, Merced, California — Led development of remedial approach and fixed price costing for the $15 million guaranteed remediation of a large hexavalent chromium and arsenic groundwater plume in a drinking water aquifer. Performed optimization of existing 500-gpm groundwater extraction and treatment system to meet compliance goals and reduce operating costs. Oversaw development and implementation of soil and *in situ* bioremediation groundwater remedies.

Guaranteed Remediation Program for Seven Power Plants, Various Sites, Texas — Served as program director for the $26 million guaranteed closure of 36 areas of concern at 7 power plant sites in south Texas. Liability transfer facilitated repowering/redevelopment of critical energy resources. Implemented a variety of soil and groundwater remediation programs to complement risk-based closure approaches. Within 7 years, all sites were closed via multiple innovative regulatory and technical strategies under the Texas Risk Reduction Program.

Soil and Groundwater Remediation at Former Pesticide Plant, Lathrop, California — Served as senior advisor for development of an alternative aquifer restoration strategy to significantly enhance mass removal and close a longstanding liability. Alternative included aggressive excavation of source soil

fumigant and sulfolane mass in soil and *in situ* delivery of oxygen to address shallow groundwater source zones. In addition, the program included a 300 gpm revised groundwater extraction, GAC/bioreactor treatment, and reinjection system that dramatically increased mass removal to reduce lifecycle costs. Negotiated complex waste discharge requirements permit revision to support system modifications, including innovative groundwater containment and background monitoring program for both the shallow and regional aquifers.

Soil and Groundwater Remediation at Former Ordnance Facility, Hollister, California — Served as project manager and lead engineer for a site impacted with hexavalent chromium, chlorinated solvents, and perchlorate. Implemented *in situ* anaerobic bioremediation in source areas, resulting in significant decreases in groundwater chemical concentrations, including achievement of perchlorate and hexavalent chromium soil and groundwater cleanup goals. Achieved first perchlorate cleanup in vadose soil using *in situ* biological reduction methods. Led design, procurement, construction oversight, commissioning, and operation of a 250-gpm groundwater containment system, including bioreactor and GAC to treat anions and CVOCs.

Guaranteed Remediation Program, Del Monte Center, Monterey, California — Served as program director for performance-based remediation of CVOCs in fractured bedrock at a former dry cleaners site at an active downtown outdoor mall. Implemented soil excavation, soil vapor extraction for soils, and *in situ* ERD systems for soil and groundwater in a drinking water aquifer. Site liability reduced to limited monitoring program.

Former Pharmaceuticals Plant, Flint River, Albany, Georgia — Served as program director for $13 million guaranteed remediation of multiple groundwater plumes in a drinking water aquifer and more than 50 RCRA units to facilitate site demolition and redevelopment. Oversaw costing, design, and implementation of soil and groundwater remedial systems and negotiation of RCRA permit modifications. Systems included air sparging, soil vapor extraction, and *in situ* anaerobic oxidation to address multiple toluene and methylene chloride plumes.

Guaranteed Remediation Program, Fig Garden Village, Clovis, California — Served as program director for performance-based remediation of VOCs in deep groundwater in a drinking water aquifer at a former dry cleaners site at an active outdoor mall. Completed all remediation in 10 years and protected multiple nearby city water supply wells from adverse impacts. Site liability reduced to annual monitoring.

Baylands Recovery Project, Menlo Park, California — Served as project manager and lead engineer for the completion of a remedial action plan and remedial design for a lead-impacted salt pond and upland area. Despite difficult regulatory, environmental, and technical implementability concerns given the soft site sediments, the remedial action plan and remedial design were accepted by all stakeholders within the required project timeframe and resulted in regulatory closure.

Product Recovery and Groundwater Treatment, Port of Oakland, Oakland, California — Served as project manager and lead engineer for a diesel product recovery and GAC and groundwater treatment system associated with Vision 2000 port redevelopment. System design was completed quickly to meet the port's compliance, financial, and engineering requirements. Oversaw system design, construction, startup, and operation. Efforts resulted in rapid completion of construction in midst of port terminal expansion and regulatory closure.

Singer-Friden State Superfund Site, San Leandro, California — Project manager and design engineer for a 200-gpm GAC groundwater remediation system to treat CVOCs to drinking water cleanup goals.

Led design, procurement, construction oversight, and system commissioning. Efforts resulted in completion of key client milestone on time and on budget.

Lorentz Barrel and Drum Superfund Site, San Jose, California — Designed large dual-phase extraction system at this Superfund site to treat soil and groundwater including GAC treatment for CVOCs and benzene, toluene, ethylbenzene, and xylenes in soil vapor and groundwater. Oversaw design, procurement, construction, and commissioning of groundwater remediation system and asphaltic concrete cap. Earned a commendation from EPA for completing the remedial action on time and on budget.

PFAS

Fire Training Area Assessment and Remediation, Denver County, Colorado — Principal in charge for the investigation and remediation of a fire training area with PFAS in soil and groundwater overlying a drinking water aquifer. Successfully advanced site into state voluntary cleanup program. Completed site investigations, preliminary remedial alternatives evaluation, pre-design studies, soil remedy design, and implementation of soil excavation and capping interim measures. Currently designing *in situ* colloidal activated carbon (CAC) interim measure.

Paulsboro Well #7 Potable Water Treatment, Paulsboro, New Jersey — Senior technical advisor for the design, construction, and commissioning of a 1,000–gpm PFAS potable water GAC wellhead treatment system to deliver potable water meeting stakeholder requirements to a small rural community. Involved the rapid completion of predesign studies, including bench-scale testing, to support settlement and lay the groundwork for a successful design—the first of its kind for perfluorononanoic acid removal. Supported stakeholder coordination during design and oversaw contractor procurement. The project is operational and meeting all regulatory, owner, and client requirements.

PFAS Sorptive Media Treatment Technology Evaluations, New Jersey — After completion of an initial technology screening that selected GAC and anion exchange resin (AER) for additional evaluation, oversaw bench testing of both technologies to treat PFAS in groundwater extracted from beneath an active chemical production facility. Evaluated ion exchange field pilot testing program in support of full-scale operation. Led engineering study comparing bench-scale GAC results to full-scale performance.

PFAS Groundwater Remediation and Reuse Integrated Remedy, New Jersey — Senior advisor for the design, permitting, and construction of a large groundwater extraction, PFAS treatment, and reinjection system to capture and treat groundwater coupled with injection and reuse to sustain drinking water supply.

PFAS Remediation Technology Evaluations, Multiple Locations and Clients — Senior advisor evaluating PFAS soil and groundwater remediation, and potable water treatment technologies to address proposed and promulgated regulatory criteria. Work includes consideration of combined remedies, alternative mitigation options (e.g., replacement wells, well modifications, alternate supply), and bench- and pilot-scale testing of site remediation and potable water treatment technologies, including GAC, CAC, *in situ* soil stabilization/solidification, and thermal treatment.

EXPERT TESTIMONY

Litigation Support, Potable Water Treatment Complaint, Centre, Georgia — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in surface drinking

water supply (*Town of Centre v. 3M Company et al.*, Case No. 13-CV-2017-900049, Circuit Court of Cherokee County, Georgia). Ongoing matter.

Litigation Support, Expert Report, and Expert Witness Testimony; Water Treatment Complaint, Rome, Georgia — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in surface drinking water supplies (*City of Rome v. 3M Company et al.*, Case No. 19-CV-02405-3, Superior Court of Floyd County, Georgia). Prepared expert report and provided deposition testimony. Settled.

Litigation Support, Expert Report, and Expert Witness Testimony, Dalton, Georgia — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS at a wastewater land disposal site (*Jarrod Johnson, Individually, and on Behalf of a Class of Persons Similarly Situated, v. 3M Company, et al.*, Civil Action No. 4:20-cv-0008-AT, U.S. District Court, Northern District of Georgia, Rome Division). Prepared expert report and provided deposition testimony. Ongoing matter.

Litigation Support, Expert Report and Expert Witness Testimony, Water Treatment Complaint, Gadsden, Alabama — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in surface drinking water supply (*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). Prepared expert report and provided deposition testimony. Settled.

Litigation Support, Potable Water Treatment Complaint, Nassau County, New York — Retention as testifying expert for evaluation of claims associated with occurrence of PFAS in potable groundwater supply wells (14 cases in the U.S. District Court for the Eastern District of New York). Ongoing matters.

Litigation Support, Potable Water Treatment Complaint, Hopatcong, New Jersey — Retention as testifying expert for evaluation of claims associated with occurrence of PFAS in 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). Ongoing matter.

Litigation Support, Potable Water Treatment Complaint, Pequannock, New Jersey — Retention as testifying expert for evaluation of claims associated with occurrence of PFAS in potable groundwater supply wells (*Pequannock Township v. 3M Company et al.*, Case 2:21-cv-01367, U.S. District Court for the District of New Jersey). Ongoing matter.

Litigation Support and Expert Witness Testimony, Water Treatment Complaint, Town of Ayer, Massachusetts — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in groundwater, including potable groundwater supplies (*Town of Ayer v. 3M Company et al.,* MDL 2:18-mn-2873-RMG, Civil Case No. 2:19-cv-03120-RMG, U.S. District Court, District of South Carolina, Charleston Division). Filed expert report. Ongoing matter.

Litigation Support and Expert Witness Testimony, Water Treatment and Site Remediation Complaint, City of Stuart, Florida — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of 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). Filed expert report. Settled.

Litigation Support and Expert Witness Testimony, Water Treatment Complaint and Site Remediation Complaint, City of Sioux Falls, South Dakota — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in groundwater, including potable groundwater supplies (*City of Sioux Falls v. 3M Company et al.*, MDL 2:18-mn-2873-RMG, Civil Case

No. 2:19-cv-18060-RMG, U.S. District Court, District of South Carolina, Charleston Division). Filed expert report. Ongoing matter.

Litigation Support and Expert Witness Testimony, Multiple Complaints, Nationwide — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in soil and groundwater including potable groundwater supplies (In re: Aqueous Film-Forming Foams Products Liability Litigation, Case No. MDL 2:18-mn-2873-RMG, U.S. District Court, District of South Carolina, Charleston Division). Support includes technical and regulatory evaluations. Testified at Science Day proceedings in October 2019.

Litigation Support, Potable Water Treatment Complaint, Middlesex, New Jersey — Retention as testifying expert for evaluation of claims associated with occurrence of PFAS in potable groundwater supply wells (*Middlesex Water Company v. 3M Company et al.*, Civil Action No. 18-CV-15366, U.S. District Court for the District of New Jersey). Filed expert report. Settled.

Litigation Support and Expert Witness Testimony, Multiple Counties, California — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in surface and groundwater including potable groundwater supplies (*Orange County Water District et al. vs. 3M Company et al.,* Case No. 30-202001172419-CU-PL-CXC, Superior Court of the State of California for the County of Orange). Ongoing matter.

Litigation Support and Expert Witness Testimony, Corona, California — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in groundwater including potable groundwater supplies (*City of Corona Utility Authority v. 3M Company, et al.,* Case No. CVR12100800, Superior Court for the State of California for the County of Riverside). Ongoing matter.

Litigation Support and Expert Witness Testimony, Atwater, California — Joint retention as testifying expert for resolution of 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). Support included technical and regulatory evaluation, design, and cost opinions for installation and operation of long-term potable water wellhead treatment systems and associated infrastructure and claims. Deposition and trial testimony.

Litigation Support, Expert Report, and Expert Testimony, Morgan and Limestone Counties, Alabama — Retention as testifying expert for the evaluation of claims regarding the occurrence and mitigation of PFAS in potable water supplies (Tommy Lindsey, Lanette Lindsey, and Larry Watkins, Individually, and on Behalf of a Class of Persons Similarly Situated, vs. 3M Company, et al., Case No. 5:15-cv-01750-MHH, U.S. District Court, Northern District of Alabama, Northeastern Division). Prepared expert report and provided deposition testimony. Settled.

Multiple Depositions, Pre-filed Direct Testimony and Fact Witness Testimony, U.S. District Court for the Eastern District of California on behalf of Merck and Co., 2012 — As previous project manager and program director, supported client in defense of third-party class action lawsuit claiming local community health impacts from both past wood treatment plant operations and current remedial efforts. Depositions and trial testimony supported verdict for client.

Deposition, Expert and Rebuttal Reports, Expert Testimony on Remedial Costs and Other Damage Claims, Superior Court of Washington for King County, Confidential Clients — Technical expert for evaluation of past remedial action effectiveness and defense of claims at a former industrial dry cleaning site undergoing redevelopment (Washington Builders LLC et al v. 700 Dexter LLC et al., Case No. 16 2 30634-9 SEA, Superior Court of Washington for King County). Prepared expert and rebuttal reports.

Provided testimony at deposition. Settled.

Litigation Support, Potable Water Treatment Complaint, City of Fresno, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (*City of Fresno v. Shell Oil Company, et al.,* Case No. CGC 107-461557, In the Superior Court of the State of California for the County of San Francisco). Provided initial damage estimates.

Litigation Support and Expert Report, Potable Water Treatment Complaint, Hemet, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (City of Hemet v. The Dow Chemical Company, et al., Case No. 18-CV-02022, U.S. District Court, Central District of California). Expert report filed. Retention scope similar to Atwater case. Settled.

Litigation Support, Potable Water Treatment Complaint, Private Wells, Various Counties, California — Joint retention as testifying expert for resolution of claim associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (Golden State Water Company v. The Dow Chemical Company, et al., Case No. 18-CV-08199, U.S. District Court, Central District of California). Retention scope similar to Hemet case. Settled.

Litigation Support, Potable Water Treatment and Replacement Water Supply Complaint, Upland, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (City of Upland: West End Consolidated Water Company v. The Dow Chemical Company, et al., Case No. 5:19-cv-00842-MWF (SPx), U.S. District Court, Central District of California). Retention scope similar to Hemet case. Settled.

Litigation Support and Expert Report, Potable Water Treatment and Replacement Water Supply Complaint, Arcadia, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (*City of Arcadia v. The Dow Chemical Company, et al.,* Case No. Case No. 2:18-cv-10139-MWF, U.S. District Court, Central District of California). Retention scope similar to Hemet case. Expert and rebuttal reports filed. Settled.

Litigation Support, Potable Water Treatment, Multiple Complaints, Kern County, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (e.g., Arvin Community Service District v. The Dow Chemical Company, et al., Case No. CGC 12-522788, Superior Court of the State of California in and for the County of San Francisco). Retention scope similar to Atwater case. All matters settled.

Litigation Support, Potable Water Treatment, Multiple Complaints, Tulare County, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (e.g., London Community Service District v. The Dow Chemical Company, et al., Case No. VCU278903, In the Superior Court of the State of California in and for the County of Tulare). Retention scope similar to Atwater case. All matters settled.

Litigation Support, Potable Water Treatment, Multiple Complaints , Group 3 Cases, Various Counties, California — Joint retention as testifying expert for resolution of claims associated with occurrence of 1,2,3-TCP in potable groundwater supply wells (e.g., City of Manteca v. The Dow Chemical Company, et al., Case No. SCVSS 120627, In the Superior Court of the State of California in and for the County of San Bernardino). Retention scope similar to Atwater case. All matters settled.

Litigation Support, Potable Water Treatment, Multiple Complaints, Group 2A Cases, Various Counties, California — Joint retention as testifying expert for resolution of claims associated with occurrence

of 1,2,3-TCP in potable groundwater supply wells (e.g., Monte Vista Water District and City of Chino v. The Dow Chemical Co., et al., Case No. CIVDS 1800720, In the Superior Court of the State of California in and for the County of San Bernardino). Retention scope similar to Group 3 cases. All matters settled.

Litigation Support, Potable Water Treatment, Multiple Complaints, Fresno County, California — Testifying expert for resolution of claims in five cases involving occurrence of 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). Retention scope similar to Atwater case. All matters settled.

Settlement Negotiation Support, Potable Water Treatment Claim, Kern County, California, Confidential Clients — Joint retention as expert for resolution of claim associated with occurrence of 1,2,3-TCP in potable groundwater supply wells at multiple agricultural production facilities. Developed designs and cost opinions. Settled.

Settlement Negotiation Support, Potable Water Treatment Claim, San Joaquin County, California, Confidential Clients — Joint retention as expert for resolution of claim associated with occurrence of 1,2,3-TCP in potable groundwater supply wells in multiple cities. Developed designs and cost opinions. All matters settled.

Settlement Negotiation Support, Potable Water Treatment Claim, Stanislaus County, California, Confidential Clients — Joint retention as expert for resolution of claim associated with occurrence of 1,2,3-TCP in a potable groundwater supply well owned by a municipality. Developed designs and cost opinions. Settled.

Settlement Negotiation Support, Potable Water Treatment Claims, Tulare County, California, Confidential Clients — Joint retention as expert for resolution of claim associated with occurrence of 1,2,3-TCP in a potable groundwater supply wells at a public school. Developed designs and cost opinions. Settled.

Settlement Negotiation Support, Potable Water Treatment Claim, Sacramento County, California, Confidential Clients — Joint retention as expert for resolution of claim associated with occurrence of 1,2,3-TCP in a potable groundwater supply wells owned by a municipal utility. Developed designs and cost opinions.

Litigation Support, Industrial Facility, Brunswick, Georgia, Confidential Client — Technical expert for review of claims and evaluation of interim remedies related to a third-party claim of VOC contamination in groundwater (Lanier Parkway Associates, LLC et al. v. Hercules Inc. et al.).

Legal Support, Superfund Site, California, Confidential Clients — Technical expert for review of claims by EPA of historical chlorinated solvent releases to groundwater from sanitary sewers at a Superfund site. Ongoing matter.

Litigation Support, Former Smelter Site, Selby, California, on behalf of Celanese Corporation — Review of a former industrial facility to evaluate claims of historical site impacts. The evaluation included historical review of photogrammetry and temporal process engineering to produce a compelling conceptual site model that resulted in plaintiff abandoning claims.

Settlement Support, Minnesota, Confidential Client — Supported client team in developing costing of remediation scenarios and risk management options, including insurance, financial, and other potential risk management mechanisms, to facilitate successful settlement negotiations between

client and a major utility at a former manufactured gas plant site.

Settlement Support, Utility Strike Emergency Response, Long Island, New York, Confidential Client — Evaluated damage claims against client and prepared expert report presenting technical underpinnings of defense strategy. Supported deposition preparations.

Litigation Support, Cement Plant, Seattle, Washington, Confidential Client — Technical expert for review of claims and evaluation of sediment remediation cost estimates to support potential settlement under tolling agreement. Oversaw completion of independent cost estimate for use in expert report to compare with plaintiff and insurer estimates.

Allocation Support, Former Rocket Launch Facilities, California, Confidential Client — Technical expert for defense of claims at active U.S. Department of Defense site. Coauthored expert report covering soil and groundwater cost recovery claims at four sites. Developed alternate allocation model that significantly reduced projected pre-settlement damages.

Publications

Frankel, A.J. 2021. On per- and polyfluoroalkyl substances: Suggested resources and considerations for groundwater professionals. *Groundwater* 59(4):481-487. http://dx.doi.org/10.1111/gwat.13101

Wuerl, B.J., L.M. Owsianiak, A. Frankel, and B. Molnaa. 2004. *In situ* anaerobic bioremediation of perchlorate-impacted vadose zone soil. Proceedings. The Eleventh Symposium in the Groundwater Resources Association of California's Series on Groundwater Contaminants, ClO4– 2004—Perchlorate in California's Groundwater, Glendale, CA.

Frankel, A., L.M. Owsianiak, B.J. Wuerl, and J.F. Horst. 2004. *In situ* anaerobic remediation of perchlorate-impacted soils. Proceedings. 2004 National Ground Water Association Remediation Conference: Site Closure and the Total Cost of Clean-up, New Orleans, LA.

Presentations

Sherman, S., M. Tulich, and A. Frankel. 2023. Using 3-dimensional modeling and field monitoring for an optimized remedial injection program. Panel presentations published in the proceedings of the 32nd International Conference on Soil, Water, Energy and Air, March 20–23, San Diego, CA.

Uselman, L., and A. Frankel. 2023. PFAS state regulations in drinking water: A look back. Poster presentation. 32nd International Conference on Soil, Water, Energy and Air, March 20–23, San Diego, CA.

Sherman, S., M. Tulich, and A. Frankel. 2022. Using three-dimensional modeling and real-time field monitoring for an optimized remedial injection program at a CVOC-contaminated site. Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 24, Palm Springs, CA.

Livermore, D., and A. Frankel. 2022. The importance of CSM verification: Implications for source identification, monitoring, and remediation. Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 24, Palm Springs, CA.

Frankel, A.J. 2021 . PFAS remedial strategies. Panel Chair and Presentation. Panel presentations

published in the proceedings of the 30th International Conference on Soil, Water, Energy and Air, March 19–22, San Diego, CA.

Uselman, L., and A. Frankel. 2021. Putting Colorado's current & future PFAS regulation in a national context. Conference of the Colorado Management Society, September 14.

Tulich, M., A. Frankel, and S. Sherman. 2021. The value of 3-dimensional implicit modeling to support *in situ* remediation design at a PCE-contaminated site. 30th International Conference on Soil, Water, Energy and Air, March 19–22, Virtual Conference.

Halmstad, A., and A. Frankel. 2021. Post ERD injection site dynamics: Long-term trends at a VOC contaminated site in Monterey, CA. 30th International Conference on Soil, Water, Energy and Air, March 19–22, Virtual Conference.

Martin, M., A. Frankel, and K. Brodock. 2018. Lessons learned from implementation of a potable water wellhead treatment system for a long chain perfluoroalkyl acid. Poster presented at the First Annual Groundwater Congress, September 25–27, West Sacramento, CA.

Halmstad, A., A. Frankel, D. Moser, T. Wotan, and C. Sandefur. 2018. Lessons learned from ERD implementation at a CVOC contaminated site in Monterey, CA. Oral Presentation. 27th International Conference on Soil, Water, Energy and Air, March 19–22, San Diego, CA.

Frankel, A., J. Anderson, and P. Goodrum. 2016. Water quality standards for perfluoroalkyl compounds, crossroads between regulatory toxicology and remedy selection. Oral Presentation. 10th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, CA.

Frankel, A. 2015. Lessons learned from redevelopment and reuse of federal and private sector industrial sites. Oral presentation. 31st International Conference on Soils, Sediments, Water, and Energy, Amherst, MA.

Frankel, A., T. Trent Henderson, E. Putnam, and P. Hall. 2006. Selection of bioreactor and LGAC to treat groundwater with perchlorate, nitrate, and hexavalent chromium. Oral presentation. Groundwater Resources Association of California's Symposium, Perchlorate: Progress Toward Understanding and Cleanup, Santa Clara, CA.

Frankel, A., S. Potter, and L. Cecan. 2006. Fate and transport modeling with dual domain and residual source to guide remedial approach evaluation. Oral presentation. 2006 National Ground Water Association Groundwater Summit, San Antonio, TX.

Frankel, A., S. Potter, and L. Cecan. 2005. Fate and transport modeling with dual domain and residual source. Oral presentation. 2005 National Ground Water Association Remediation Conference: Site Closure and the Total Cost of Clean-up, Houston, TX.

Wuerl, B.J., A. Frankel, N. Morgan-Butcher, and J. Ely. 2005. Enhanced *in situ* co-reduction of perchlorate, hexavalent chromium, and halogenated VOCs in groundwater. Oral presentation. 2005 National Ground Water Association Conference on MTBE and Perchlorate: Assessment, Remediation, and Public Policy, San Francisco, CA.

Frankel, A., and B.J. Wuerl. 2005. *In situ* anaerobic remediation of perchlorate-impacted soils. Oral

presentation and paper. 2005 National Ground Water Association Conference on MTBE and Perchlorate: Assessment, Remediation, and Public Policy, San Francisco, CA.

Frankel, A., L.M. Owsianiak, and J. Peters. 2004. Development of an animated site conceptual model to support groundwater remediation data gap identification and resolution. Oral presentation. Groundwater Resources Association of California's 13th Annual Meeting and Conference, Rohnert Park, CA.

Wuerl, B.J., L.M. Owsianiak, A. Frankel, and B. Molnaa. 2004. *In situ* anaerobic bioremediation of perchlorate-impacted vadose zone soil. Oral presentation. The Eleventh Symposium in the Groundwater Resources Association of California's Series on Groundwater Contaminants, ClO4– 2004 —Perchlorate in California's Groundwater, Glendale, CA.

Frankel, A., L.M. Owsianiak, B.J. Wuerl, and J.F. Horst. 2004. *In situ* anaerobic remediation of perchlorate-impacted soils. Oral presentation. 2004 National Ground Water Association Remediation Conference: Site Closure and the Total Cost of Clean-up, New Orleans, LA.

Invited Participant, Expert Panels, and Workshops

Frankel, A. 2023. Coupled aquifer restoration and water reuse—evolution of an integrated solution. Regenesis Distinguished Speaker Series. July 20, Webinar. https://youtu.be/948–jokXQA?si=NYGFIryPo3KnGxLD

Frankel, A., J. Talbert, and J. Hackman. 2023. Regulatory action: History and horizon. Panelist. 31st American Bar Association Annual Toxic Tort & Environmental Law Spring Conference with a Focus on PFAS, April 21, Scottsdale, AZ.

Frankel, A. 2021. Remediation game changers and key drivers past and present—plus perspectives on PFAS. Regenesis Distinguished Speaker Series. August 25, Webinar. https://www.youtube.com/watch?v=rKekm0vBowg

Frankel, A. 2021. National Groundwater Association Fate of PFAS: From Groundwater to tap Water. Concluding Panel Discussion. June 23, Virtual Conference.

Frankel, A. 2021. Thoughts on PFAS litigation: A technical expert's perspective. Oral Presentation. Law Seminars International PFAS Regulation and Litigation in California, February 12, Virtual Conference.

Frankel, A. 2021. PFAS remedial strategies. Panel Chair and Presentation. 30th International Conference on Soils, Sediments, Water, Energy and Air, Virtual Conference.

Frankel, A. 2020. PFAS roundtable: Industry and regulatory outlook. Panel Discussion, October 1, Webinar hosted by Water & Wastes Digest. https://www.ect2.com/content/pfas-roundtable-industry-and-regulatory-outlook.

Frankel, A. 2019. PFAS occurrence and treatment: Key observations. Oral Presentation. Law Seminars International PFAS Litigation Conference, December 9, San Diego, CA.

Frankel, A. 2019. A short list of remediation game changers and key drivers past and present—a 30-year perspective. Oral Presentation. National Groundwater Association Groundwater Week, December 4, Las Vegas, NV.

Frankel, A., and M. Martin. 2019. PFAS wellhead treatment considerations—Intersection of water supply with plume remediation. Oral Presentation. National Groundwater Association PFAS Management, Mitigation, and Remediation Conference, June 19, Westerville, OH.

Frankel, A. 2019. PFAS Remedial Strategies. Panel Chair and Presentation. 35th International Conference on Soils, Sediments, Water, and Energy, Amherst, MA.

Frankel, A., S. Sliver, and D. Henrich. 2018. Plenary Session: PFAS. Oral presentation and panel discussion. 2018 National Groundwater Association Groundwater Week, December 3–6, Las Vegas, NV.

Frankel, A., K. Gettmann, and A. Bass. 2018. PFAS Panel: Oral presentation and panel discussion. 2018 Environmental Law Conference at Yosemite, September 19–21, Fish Camp, CA.

Frankel, A. 2018. State of the Practice – Advances in *In Situ* Remediation. Panel chair and organizer. 27th International Conference on Soil, Water, Energy and Air, March 19–22, San Diego, CA.

Frankel, A., and R. Keenan. 2016. Guiding decisions and managing risk – Environmental applications of decision analysis and probabilistic evaluation current state of practice. Panel Chair. 32nd International Conference on Soils, Sediments, Water, and Energy, Amherst, MA.

Frankel, A. 2015. California Brownfields reuse and transactions. Panel chair and organizer. 25th International Conference on Soil, Water, Energy and Air, San Diego, CA.

Silvia Gianetti Barber

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Ms. Silvia Barber is a scientist and experienced project manager with more than 14 years of consulting experience, specializing in site investigation and remediation and litigation support. She excels in managing complex projects and executing large field efforts with an interdisciplinary approach and has a deep understanding of designing and implementing incremental sampling methodology. Ms. Barber has successfully integrated handheld x-ray fluorescence (XRF) analyzers with other analytical methods in the design of several large sampling programs. Her extensive experience includes investigating sites contaminated with lead, arsenic, and organochlorine pesticides, as well as supporting environmental due diligence for large portfolios of properties. She has also successfully supported litigation efforts, reconstructing evidence related to historical facilities and their chemical use. With an academic background in environmental science, agriculture, and natural resource economics, Ms. Barber provides a unique perspective in addressing environmental issues related to agriculture.

Education & Credentials

M.S., Natural Resources and Environmental Management, University of Hawai'i at Manoa, Honolulu, Hawai'i, 2008

M.A., Philosophy of Science, Università degli Studi di Milano, Milano, Italy, 2000

Certified Lead-Based Paint Activities Risk Assessor: Hawai'i (Certification No. PB-0957)

Continuing Education

Olympus Vanta Handheld XRF Safety Training (2021)

Hazardous Waste Operations and Emergency Response 8-Hour Supervisor Training Certification (2017)

Lead Risk Assessor Initial Course (2017)

Lead Inspector Initial Course (2017)

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2009, followed by yearly refreshers)

Current Red Cross First Aid, CPR, and AED Certified

Certificate in Marketing & European Public Relations, Ateneo Impresa, Rome, Italy (2001)

Relevant Experience

SITE ASSESSMENT

Assessments of Hazardous Materials in Soil, Various Public Schools Statewide, Hawai'i — Project manager of two investigation projects for the State of Hawai'i Department of Education, Facilities Division. The projects consist of building-exterior soil studies at more than 150 school campuses in Hawai'i, including development of sampling strategies, field implementation, and determining mitigation actions. Field activities include use of both XRF and incremental soil sampling. Developed recommendations and soil management plans for soil containing metals (primarily arsenic and lead) or organochlorine termiticide compounds at concentrations above regulatory action levels.

Assessment of Herbicide Drift Claim, Hawai'i — Provided pre-trial expert services on a case involving alleged herbicide drift. Reviewed scientific evidence and laboratory reports to assess the validity of the damage claims.

Phase I and II Environmental Site Assessments, Hawai'i, Continental U.S., Canada, and Europe — Coordinated Phase I and II environmental site assessments in support of real estate transactions involving commercial and industrial properties, and portfolios of commercial properties for the car rental industry. Phase II site assessments involved soil, groundwater, and air testing.

Professional Affiliations

Member of Hawai'i Association of Environmental Professionals (2009 to present)

Phase I and II Environmental Site Assessment of Former Honouliuli Internment Camp, Hawai'i — Conducted a Phase I environmental site assessment of a former World War II internment camp on the island of Oahu. Now the Honouliuli National Monument, the site was acquired from a private landowner. The due diligence process included review of archaeological reports and other historical documents.

Dust Monitoring Study, Hawai'i — Designed and coordinated sampling activities to assess airborne fugitive dust concentrations at various farms across the State of Hawai'i. Used air sampling pumps and portable TSI Dust Trak™ units to generate real-time, continuous dust concentration readings for various particle sizes. The study documented correlations of dust with human activities and with meteorological conditions.

Phase I and II Environmental Site Assessments of Agricultural Lands, Hawai'i — Conducted site assessments of former pineapple and sugarcane fields acquired by agricultural businesses for growing seed crops. Conducted site assessment of properties used for seed crop production. Main contaminants were residual pesticides (arsenic, dioxins, organochlorine and organophosphate pesticides, and total petroleum hydrocarbons). Analyzed arsenic concentrations using XRF.

Slope Analysis, Seed Corn Producer, Oahu, Hawai'i — Classified and quantified tillable, pasture, and unusable acres on a property using slope data with ArcGIS 9.2.

REMEDIAL DESIGN

Remedy Selection and Design, Select Public Schools, Hawai'i — As project manager, coordinated the selection of remedies to address soil contamination at schools in the Hawai'i District. Also coordinated the production of engineering design documents for the selected remedies, consisting of soil excavation and removal, and cap-in-place remedies. Providing environmental oversight of remedy implementation including pre-, during, and post-construction.

Investigation, Remedy Design, Remedy Implementation Oversight, and Site Closure at a Lead-Impacted Site, Kona, Hawai'i — Project manager for the oversight of a remediation project at a former scrap metal recycling facility with lead-contaminated soil and debris. Conducted multiple site investigations to evaluate removal action alternatives. Quantified lead concentration in more than 100 discrete soil samples via innovative use of XRF technology. Performed air sampling to assess exposure of onsite workers. Prepared an environmental assessment for the site remediation considering ongoing and future uses of the property by the County. Helped with engineering design for the selected remedy. Provided oversight of the implementation of the remedial action, which consisted of soil and debris excavation and removal. Currently assisting the client in gaining regulator's approval of a proposed remedy modification based on site constraints.

Sediment and Upland Source Tracing and Control at Electric Power Generating Station, Hawai'i —Project manager for a range of projects conducted for an electrical utility in association with the U.S. Navy's planned Superfund cleanup of PCB-impacted sediments in Pearl Harbor. Activities included a PCB source tracing and control project at the power plant to identify continuing upland sources of PCBs and ensure that those sources are mitigated; engineering design plans, drawings, and specifications development for various remedial areas with historical

PCB contamination in accumulated sediment in water bodies, pipes, and tunnels; permitting support to obtain federal, state, and local approvals for the remedial actions; and ongoing support to the facility with TSCA requirements regarding PCBs.

SAMPLING

Background Metal Study, Hawaiian Islands — Conducted a study for the Hawai'i Department of Health to identify background concentrations of metals in Hawaiian soils; findings were intended for use in setting action levels. Reviewed and statistically analyzed published data to establish upper thresholds in metal concentrations. Designed and implemented a soil sampling plan, and collected soil samples across the Hawaiian Islands.

Upper Columbia River RI/FS, Washington — Participated in the collection and processing of sediment samples from 34 remote beaches extending over 150 miles of river in northeastern Washington State. The main chemicals of concern were heavy metals.

Berry's Creek Superfund Site RI/FS, Bergen County, New Jersey — Participated in sampling biota from Berry's Creek and from surrounding waterways and wetlands. The main chemicals of concern were mercury and PCBs. Biota included perch, blue crab, fiddler crab, and mummichog. Sampling methods included gill nets, cast nets, and traps. Responsibilities included sample collection, handling, and processing.

Portland Harbor Superfund Site RI/FS, Portland, Oregon — Participated in surface and subsurface sediment sampling to define vertical and horizontal extent of contaminants at a Superfund site on the Willamette River. The main chemicals of concern were organochlorine pesticides (DDx). Sampling methods included drilling sediment boreholes from a barge. Responsibilities included sample collection, handling, and processing.

LITIGATION SUPPORT

Cleanup Liability and Divisibility Analysis, California — Project manager leading a team to review historical documents covering nearly a century of operation at a secondary lead smelter. Supported development of expert and rebuttal reports for a group of potentially responsible parties in litigation framework. Analyzed historical releases to support development of divisibility arguments. Functioned as primary contact with supervising law firm providing project management, financial control, and technical support.

Quantification of Remedial Cost Allocation, Alaska — Provided expert services to an oil company for litigation involving groundwater contamination. Conducted GIS analyses and reviewed scientific evidence to support the allocation of remedial costs among the parties involved.

Evaluation and Quantification of Settlement Scenarios, Honolulu, Hawai'i — Provided expert services on a high-profile EPA litigation matter involving illegal storage and disposal of hazardous waste. Conducted forensic analysis of EPA removal actions and costs in support of the sentencing process.

PCB Sources, New Jersey — Provided expert services to a chemical company for litigation involving sediment contamination at a Superfund site. Reviewed historical documentation to identify possible sources of PCBs at an industrial facility.

ENVIRONMENTAL ECONOMICS

Avocado Industry Analysis, Hawai'i — Coordinated a project funded by an Extension Service special grant to investigate the use of locally grown avocados instead of imported avocados. Identified avocado cultivars with the highest potential for grafting and propagation.

SITE INVESTIGATION

Assessments of Hazardous Materials in Soil, Various Public Schools Statewide, Hawai'i — Project manager of two investigation projects for the State of Hawai'i Department of Education, Facilities Division. The projects consist of building-exterior soil studies at more than 150 school campuses in Hawai'i, including development of sampling strategies, field implementation, and determining mitigation actions. Field activities include use of both XRF and incremental soil sampling. Developed recommendations and soil management plans for soil containing metals (primarily arsenic and lead) or organochlorine termiticide compounds at concentrations above regulatory action levels.

SITE INVESTIGATION AND SOIL REMEDIATION

Assessments of Hazardous Materials in Soil, Various Public Schools Statewide, Hawai'i — Project manager of two investigation projects for the State of Hawai'i Department of Education, Facilities Division. The projects consist of building-exterior soil studies at more than 150 school campuses in Hawai'i, including development of sampling strategies, field implementation, and determining mitigation actions. Field activities include use of both XRF and incremental soil sampling. Developed recommendations and soil management plans for soil containing metals (primarily arsenic and lead) or organochlorine termiticide compounds at concentrations above regulatory action levels.

REMEDIAL INVESTIGATION

Investigation, Remedy Design, Remedy Implementation Oversight, and Site Closure at a Lead-Impacted Site, Kona, Hawai'i — Project manager for the oversight of a remediation project at a former scrap metal recycling facility with lead-contaminated soil and debris. Conducted multiple site investigations to evaluate removal action alternatives. Quantified lead concentration in more than 100 discrete soil samples via innovative use of XRF technology. Performed air sampling to assess exposure of onsite workers. Prepared an environmental assessment for the site remediation considering ongoing and future uses of the property by the County. Helped with engineering design for the selected remedy. Provided oversight of the implementation of the remedial action, which consisted of soil and debris excavation and removal. Currently assisting the client in gaining regulator's approval of a proposed remedy modification based on site constraints.

Sediment and Upland Source Tracing and Control at Electric Power Generating Station, Hawai'i —Project manager for a range of projects conducted for an electrical utility in association with the U.S. Navy's planned Superfund cleanup of PCB-impacted sediments in Pearl Harbor. Activities included a PCB source tracing and control project at the power plant to identify continuing upland sources of PCBs and ensure that those sources are mitigated; engineering design plans, drawings, and specifications development for various remedial areas with historical PCB contamination in accumulated sediment in water bodies, pipes, and tunnels; permitting

support to obtain federal, state, and local approvals for the remedial actions; and ongoing support to the facility with TSCA requirements regarding PCBs.

SITE REMEDIATION

Investigation, Remedy Design, Remedy Implementation Oversight, and Site Closure at a Lead-Impacted Site, Kona, Hawai'i Project manager for the oversight of a remediation project at a former scrap metal recycling facility with lead-contaminated soil and debris. Conducted multiple site investigations to evaluate removal action alternatives. Quantified lead concentration in more than 100 discrete soil samples via innovative use of XRF technology. Performed air sampling to assess exposure of onsite workers. Prepared an environmental assessment for the site remediation considering ongoing and future uses of the property by the County. Helped with engineering design for the selected remedy. Provided oversight of the implementation of the remedial action, which consisted of soil and debris excavation and removal. Currently assisting the client in gaining regulator's approval of a proposed remedy modification based on site constraints.

Publications

Barber, S.G., C. Chan-Halbrendt, J. Krishnakumar, T.J. Radovich, and K. Love. 2008. Hawai'i avocado industry analysis, part 2. EI-15. University of Hawai'i Cooperative Extension Service, Honolulu, HI.

Barber, S.G. 2008. Consumer preferences for avocados in Honolulu, Hawai'i: Latent class analysis of a conjoint choice experiment. Thesis. University of Hawai'i at Manoa, Honolulu, HI.

Presentations/Posters

Barber, S. 2018. Do you have a fugitive dust problem? World Ag Expo. Tulare, CA. February 13-15.

Barber, S. 2012. Arsenic in soils of former sugarcane plantation, Island of Hawai'i. ESRI International User Conference. San Diego, CA. July 23-28.

Barber, S.G. 2008. Consumer preferences for Hawaiian grown avocados. 2008 College of Tropical Agriculture and Human Resources Student Research Symposium, Honolulu, HI.

Invited Participant, Expert Panels, And Workshops

National Business Institute Seminar: Environmental Liabilities in Real Estate Transactions. Invited speaker. December 2016.

Hawai'i Tropical Fruit Growers 18th Annual International Conference: Sustainable Diversification of Tropical Fruit. Served as moderator. September 2008.

Education & Credentials

B.A., Marine Chemistry, University of San Diego, San Diego, California, 2005

Continuing Education

Supervisory Training, Hawai'i Employers Council, 24-Hour (2023)

Women's Leadership Training, Dale Carnegie, 40-Hour (2022)

OSHA 10-Hour (2019) and OSHA 30-Hour (2010)

NPDES, UIC and Wastewater Operator Training (2017)

U.S. Department of Transportation Hazardous Materials (2010, 2016, 2018, 2021)

Hazardous Waste Operations and Emergency Response, 40-Hour (2015, 2017)

National Fire Protections Association 70E, Lockout/Tagout, Electrical Safety (2017, 2019, 2021)

Laser Safety Officer (2019, 2021)

Rope Access/Rescue (2019, 2021)

Fall Protection Competent (2017, 2019, 2021)

Environmental Regulations,

Erin Petrosian

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Ms. Erin Petrosian specializes in environmental permitting and planning for developments during project design, construction, startup, and operations. She has consulted in this capacity on behalf of a wide variety of clients, including private power, alternative energy, research and development, manufacturing, industrial production, and residential development. Key products delivered by Ms. Petrosian include permit applicability studies, permitting schedules, permit applications, technical mitigation, testing and operating plans, permit compliance registers, and permit inventories.

Relevant Experience

REGULATORY COMPLIANCE

Environmental Compliance Plan, Concrete Coring Company, Hawai'i — Developed the environmental compliance plan for a concrete coring company, and integrated procedures and requirements within the overall EHS program for the facility. Conducted an inventory of all industrial activities and operations performed by the company on the island of Oahu. Performed a comprehensive applicability study to identify relevant environmental regulations, summarized compliance justification and requirements for each applicable regulation, identified minimum qualification and training requirements for personnel and subcontractors, and provided a list of records that should be retained to substantiate compliance with applicable regulations at a federal, state, and local level.

Environmental Program Oversight, Bellows Air Force Station (BAFS), Waimanalo, Hawai'i — Provided environmental consulting services to the environmental point of contact at BAFS. Prepared the site-specific hazardous waste management plan and solid waste management plan. Conducted a facilitywide air emissions inventory and permit applicability study. Conducted annual UIC testing and monitoring and documented results in report format for submission to the Hawai'i Department of Health.

HYDROLOGIC MODELING

Environmental Assessment of Process Seawater Discharge, Kailua-Kona, Hawai'i — Served as project manager for the environmental assessment of process water effluent used for the propagation of microalgae. Participated in conducting water quality analysis and monitoring, hydrogeological modeling, and conceptual site modeling to support compliance with water quality criteria for Class AA waters and obtain permit approval for the installation and operation of a UIC well for disposal of industrial wastewater.

Reporting and Recordkeeping, 40-Hour (2006)

Public Relations Training (2006)

Hazardous Waste Training (2006, 2010)

First Aid, CPR, AED, Wilderness First Aid (2011, 2017, 2021, 2023)

Professional Affiliations

Chamber of Commerce, Hawai'i Island

American Society of Safety Professionals

American Planning Association

RENEWABLE ENERGY

Biomass Fired Power Plant, Pepeekeo, Hawai'i — Responsible for environmental project management during construction of a 21.5 MW biomass-fired power plant. Worked as part of a team of contractors to convert a historical coal-fired power plant into a biomass burning facility. Oversaw all environmental permit applications to support construction. Obtained stormwater management permits and fulfilled all associated engineering, construction, sampling, and reporting requirements. Served as project lead for the refurbishment of three large production wells, three large underground injection control (UIC) wastewater wells for disposal of once-through cooling water, and hydrogeological modeling to support approval of UIC wastewater well installation. Updated zoning and state land use designations from agricultural to industrial to ensure conforming land use. Coordinated public notice and public hearing requirements to support changes to land use designations. Characterized and properly disposed of, or managed onsite, all hazardous materials and waste, including petroleum-contaminated soil, lead-based paint, asbestos, PCBs, mercury, and miscellaneous industrial products. Served as project lead and liaison with State Historic Preservation Department for archeological surveying and inventorying. Implemented and maintained compliance with the Special Management Area permit.

HEALTH AND SAFETY

Environmental, Health, and Safety Risk Framework, Hawai'i — Developed and implemented an organization-wide environmental, health, and safety (EHS) management system for the W.M. Keck Observatory, located at the summit of Maunakea. The EHS management system was developed according to standard risk assessment and control strategies and established objective criteria for how to mitigate hazards at the facility. The framework included a risk assessment matrix and established appropriate response and resourcing expectations for high, medium, and low risks. Implementation included the socialization of new values and principles through engagement with internal stakeholders, both in leadership and at the staff level. Implementation of the EHS risk framework systematized EHS processes into day-to-day business activities and tangibly improved the EHS culture within the organization.

Environmental, Health, and Safety Audit, Hawai'i — Served as project manager for a third-party audit at the W.M. Keck Observatory, for both the headquarters facility in Kamuela, Hawai'i, and the summit facility at the summit of Maunakea. Oversaw a comprehensive audit to document areas of noncompliance with EHS rules and regulations within the organization. Prioritized, budgeted, and secured appropriate funding and labor to coordinate response actions for 150 findings, including engineering, design, and installation activities for infrastructure modifications; updates related to programmatic and procedural deficiencies; revisions to equipment maintenance and inspection schedules; and updates for recordkeeping and administrative processes.

SITE INVESTIGATION AND SOIL REMEDIATION

Lead Soil Removal, Umauma Bridge, Hawai'i — Oversaw and monitored lead-based paint and lead soil disturbance activities to protect workers' health and the environment during refurbishment and reconstruction of the Umauma Bridge in North Hilo. Responsible for ensuring workers followed protective procedures to reduce exposure and minimize lead dust generation during construction. Performed personnel air monitoring to quantify exposure to construction workers during dust generating activities, including sanding, grinding, needle gun removal, welding, and excavation.

Performed soil testing on material excavated during construction of bridge footings, scrap metal, and other lead-coated waste material. Characterized more than 2,208 cubic yards of lead-contaminated soil as hazardous or nonhazardous waste and oversaw the proper packaging, transport, and disposal of lead waste according to federal, state, and local regulation.

SITE INVESTIGATION

Pesticide-Impacted Soil, Punahou School, Hawai'i — Performed environmental soil sampling to establish the extent and magnitude of contamination at Punahou School during Phase 1A of the Punahou Re-development Master Plan. Prepared a site-specific and programmatic environmental hazard management plan to establish proper identification and handling procedures for soil confirmed or suspected to contain pesticides at hazardous levels. All work was completed in accordance with the Hazard Evaluation and Emergency Response (HEER) Technical Guidance Manual.

Na'alehu Seed Dipping Vat, Soil Remediation, Na'alehu, Hawai'i — Prepared and implemented the sampling and analysis plan to determine the lateral and vertical extent of fungicides, dioxins and furans, heavy metals (lead, arsenic, mercury), and organochlorine pesticides at a former seed dipping vat at the former Hutchinson Mill in the Ka'u District. Summarized results in the site investigation and environmental hazard evaluation report.

Ritz Carlton Soils Remediation Project, Waikiki, Hawai'i — Authored and implemented the sampling and analysis plan to determine the lateral and vertical extent of heptachlor and heptachlor epoxide contamination at the subject property utilizing multi-incremental sampling and decision unit techniques. Provided written guidelines for soil management during construction activities, including decontamination procedures, soil excavation and handling requirements, stockpiling and storage requirements, and soil sampling and disposal criteria. Developed an environmental hazard management plan to establish engineering and institutional controls to manage contaminated soil in-place to support issuance of the No Further Action with Restrictions determination from the Hawai'i Department of Health. All work was completed in accordance with the HEER Technical Guidance Manual.

North Kohala Former Pesticide Mixing Area, Hawai'i — Authored and implemented the sampling and analysis plan to delineate the lateral and vertical boundary of pesticide (PCP, dioxin) and heavy metals (lead, mercury, arsenic) contamination at the subject property. Prepared an environmental hazard evaluation based on sampling results, and prepared and executed a detailed remedial action plan, including excavation, hauling, disposal, and confirmation sampling methodologies to remove contaminated soil from the subject property. Summarized results in the remedial action report and obtained No Further Action letter from the Hawai'i Department of Health. All work was completed in accordance with the HEER Technical Guidance Manual.

Robert A. Walker, P.E.

Principal, Coastal Engineering

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Mr. Robert Walker is a highly experienced coastal engineer with 19 years of expertise in coastal and marine projects. He specializes in dredging and dredged material management, coastal analyses and studies, shoreline protection, the design of waterfront facilities, and nature-based coastal hazard mitigation. Mr. Walker's proficiency goes beyond planning, design, and field investigations—he also excels in guiding clients through the complex regulatory permitting process, successfully securing local, state, and federal permits for numerous complex coastal projects. In addition, Mr. Walker brings valuable expertise in hydrographic surveying, sediment sampling and analysis, construction management, and environmental compliance services for dredging and coastal and waterfront construction projects.

Education & Credentials

M.S., Geoscience, Coastal Geology, University of Hawai'i at Manoa, Honolulu, Hawai'i, 2017

M.S., Civil (Coastal) Engineering, Old Dominion University, Norfolk, Virginia, 2010

Graduate Certificate in Coastal Engineering, Old Dominion University, Norfolk, Virginia, 2008

B.A., Spanish, North Carolina State University, Raleigh, North Carolina, 2004

B.S., Environmental Engineering, North Carolina State University, Raleigh, Virginia, 2003

Professional Engineer (Civil), Hawai'i, (License No.14549)

Professional Engineer (Civil), California, (License No. 79483)

Professional Engineer (Civil), North Carolina, (License No. 36186)

Leadership in Environment and Energy Design Accredited Professional (LEED AP) (2008)

Professional Affiliations

American Shore & Beach Preservation Association

Coasts, Oceans, Ports and Rivers Institute (COPRI)

Relevant Experience

COASTAL RESILIENCE

Congressional Report on Coastal Shoreline Erosion, American Samoa, Guam, Hawai'i, Northern Mariana Islands, Puerto Rico, and U.S. Virgin Islands — Worked alongside a team of national experts to evaluate hazards associated with sea level rise and coastal erosion to road infrastructure located within U.S. Island jurisdictions (American Samoa, Guam, Hawai'i, Northern Mariana Islands, Puerto Rico, and U.S. Virgin Islands).

Evaluation of Nature-Based Shoreline Stabilization in Saipan Lagoon, Northern Mariana Islands — Saipan Lagoon, located off the west coast of Saipan in the Northern Mariana Islands, consists of a barrier reef backed by a broad, shallow lagoon and narrow calcium carbonate beaches. A recent U.S. Army Corps of Engineers (USACE) coastal storm damage reduction study had proposed construction of a 2-mile-long seawall as the recommended alternative to protect coastal infrastructure. Using funding from National Fish and Wildlife 2Foundation, provided coastal engineering expertise to develop nature-based approaches to shoreline stabilization within Saipan Lagoon. Project activities included conducting field investigations, developing conceptual design alternatives, participating in stakeholder engagement, assisting with the development of a master plan, and serving as a project liaison to USACE.

State Park Shoreline Restoration, Pierce County, Washington — Evaluated potential restoration opportunities for aquatic and riparian habitat that has been affected by the presence of a wooden bulkhead and several wooden groins at two locations within the park. The objective that guided each alternative was reducing the number of artificial structures while protecting the upland recreation features of the park. The evaluation of alternatives included shoreline change and erosion mapping

American Society of Civil Engineers

based on light detection and ranging (LiDAR) and aerial photography, wave hindcasting, and analysis of sediment transport.

Living Shoreline Project, Federal Point Boating Access, Fort Fisher, North Carolina — Designed a rock sill breakwater in combination with coastal wetland plantings to provide a living shoreline concept, offering enhanced habitat and water quality benefits while ensuring adequate shoreline protection from the open southwest fetch of Buzzards Bay. Other services included planning and design to fill the existing upland basin and relocate the boat ramp to the south side of the site, capture and treat all stormwater runoff through a constructed wetland system, and dredge the new navigation channel. In addition to design, responsible for all coordination with regulatory agencies and securing all required permits from state and federal agencies.

Peninsula Beach Erosion Study, City of Long Beach, California — Evaluated coastal erosion and summarized shoreline protection alternatives for the chronically eroding shoreline. The study provided an overview of coastal processes and an evaluation of both short- and long-term management schemes involving beach nourishment.

Wailuku-Kahului Wastewater Reclamation Facility Shore Protection, Maui, Hawai'i — Provided coastal engineering and environmental permitting support for this project, which involved shoreline protection of the existing wastewater reclamation facility. An existing rock revetment protects a portion of the site; however, due to lack of funding, the original project was never completed to its full intended extent. This project involved an evaluation of shore protection alternatives for the unarmored shoreline of the site, including beach nourishment, hardened structures, and a combination thereof. Provided support to the engineering team, coordination of geotechnical explorations, and regulatory coordination with USACE.

CLIMATE IMPACT ASSESSMENT

Impacts of Climate Change on Human Health and Medical Infrastructure, Ocracoke Island, North Carolina — Conducted site investigations, community and stakeholder engagement, research, and analysis to evaluate coastal hazard vulnerability on the barrier island community of Ocracoke, North Carolina. The project focused on impacts to public health and medical infrastructure. Led all aspects of the project and was the primary author of the final report, which included detailed analyses of existing climate and health risks, as well as mitigation strategies and funding opportunities for their implementation.

Assessment of Health Vulnerability to Climate Change, Florida Keys — This project consisted of site investigations, stakeholder engagement, research, and analyses to assess the impacts of climate change to public health across the Florida Keys. Assembled a multidisciplinary team of scientists, engineers, physicians, and experts in disaster preparedness and emergency management, coordinated in-person site investigations and stakeholder engagement, as well as managed a team that collected extensive information about existing climate risks, infrastructure, and medical resources throughout the Keys. Also coordinated the development of the final report, which provided a detailed analysis of existing climate and health risks.

Climate Change Tool for Island Communities, Nationwide — Led the development of a web-based tool to assess climate change preparedness and vulnerability for island communities at the healthcare facility level. Users of the tool are presented with questions that relate to climate change hazards, social vulnerability, medical vulnerability and preparedness, and facility or community vulnerability and preparedness. Inputs are then used to estimate the climate change hazard risk based on an

equation that incorporates hazard probability, severity, vulnerability, and preparedness. Results are presented in summary graphs that plot the overall climate hazard risk as well as the individual components of vulnerability and preparedness. A second output page provides resilience strategies that are tailored to the site-specific information gathered by the tool.

COASTAL SCIENCE

Ocean Outfall Evaluation and Design, New Hanover County, North Carolina — Served as part of a team responsible for collecting oceanographic data, such as water current directionality, velocity, and tidal variations; performing water quality modeling to provide regulatory agencies with an impact analysis of the proposed discharge of water treatment plant effluent; planning and design of outfall structure; coordinating the NPDES permitting effort; and conducting public meetings to discuss the new outfall structure and its potential impact to various user groups.

Coastal Hazard Assessments, Various Sites, Oahu, Hawai'i — Provided coastal hazard vulnerability assessments for three similar-scoped projects located on the island of Oahu, Hawai'i. One project site in Hau'ula was provided to the prospective buyer in support of an oceanfront property purchase, and another in Kahuku provided insight with respect to a potential transfer of property. An expert testimony report was provided in support of a litigation case located at Sunset Beach.

Identification of Submarine Groundwater Discharge in the Pūpūkea Marine Life Conservation District, Oahu, Hawai'i — This project involved using unmanned aerial vehicles and fixed-wing aircraft equipped with thermal infrared cameras to collect sea surface temperature data within the tidepool area of the Pūpūkea Marine Life Conservation District on the North Shore of Oahu, Hawai'i. The locations and extent of submarine groundwater discharge were identified based on measured temperature differences between groundwater plumes and surrounding ocean waters, and comparison with field measurements of temperature and salinity. Led all field investigations, data analysis, and reporting.

Inlet Monitoring and Maintenance, New Hanover County, North Carolina — Conducted hydrographic surveys, beach profile surveys, and aerial photography analyses for this migratory tidal inlet in southeastern North Carolina. Assisted in developing a final report of findings and recommendations for inlet management activities.

Beach Monitoring and Analysis, Holden Beach and Ocean Isle Beach, North Carolina — Conducted cross-shore beach profile surveys in combination with hydrographic survey data and shore parallel survey transects at mean low water, top of berm, and vegetation line. Survey data were analyzed and merged to provide the local governments with an accurate depiction of existing conditions and a planning tool for moving forward with strategic coastal management initiatives.

COASTAL ENGINEERING

Hawai'i Kai Marina and Entrance Channel Maintenance Dredging, Honolulu, Hawai'i — Provided coastal engineering, environmental planning, and regulatory permitting services to the Hawai'i Kai Marina. Professional engineering services have included dredging design, soil and sediment investigations, coastal structure design, beach nourishment, and dredged material placement design documents for three upland sites within the marina. Served as the engineer of record for numerous initiatives within the marina, and led all regulatory permitting efforts with agencies such as USACE, Hawai'i Office of Planning, and City and County of Honolulu, and successfully obtained multiple 401 water quality certifications from the Hawai'i Department of Health. Additional services have included the management of all environmental compliance aspects for the marina's in-water projects, construction

management for coastal and marine construction, and hydrographic surveying.

Wave Analysis and Hydraulic Loading Study, Nags Head, North Carolina — Provided extensive wave and water level analysis in support of a new oceanfront pier in the Outer Banks of North Carolina. Upon determination of desired design conditions, hydraulic loadings on pier components were provided to the structural engineer of record. Additional services included an evaluation for potential pile scour due to waves and currents.

South River Boat Basin Waterfront Improvement, North Carolina — Provided marine engineering services for needed improvements to the North Carolina Division of Marine Fisheries' South River Boat Basin. Facility improvements consisted of approximately 4,000 cubic yards of maintenance dredging in the basin, approximately 1,720 linear ft of roadway improvements to the facility, a new 15-ft-wide boat launch ramp, new mooring dolphin pile clusters, and a new 113 linear ft by 5-ft-wide timber access pier.

Coastal Engineering Study for Liquid Natural Gas Facility, Mozambique, Africa — Served as the coastal engineer for a front-end planning study for a proposed liquid natural gas facility. Analyzed various considered alternatives to evaluate their impact on sediment transport and shoreline response at the site. Mitigation measures such as beach nourishment, coastal armoring, and site layout design were considered based on the potential for increase or decrease in erosion or accretion and associated mitigation in the form of shoreline protection or stabilization and dredging requirements.

Beach Nourishment Using Upland Borrow Source, Holden Beach, North Carolina — Provided planning and permitting of a shoreline protection project using sand from an upland borrow source. Responsibilities included an evaluation of the suitability of the sediments for beach nourishment, volume calculations for the most suitable material, and regulatory permitting for these activities.

Dredging of Wharves A1–A7, B1–B3, and Drydocks 1–3, Pearl Harbor, Hawai'i — Served as design engineer for this maintenance dredging project, which provided maintenance dredging of critical berthing and vessel drydock areas. Due to elevated concentrations of contaminants of concern within the dredge footprint, careful design considerations were necessary to achieve the project requirements while avoiding cost-prohibitive environmental remediation.

Rhine Channel Contaminated Sediment Cleanup, Newport Beach, California — Provided engineering design, cost evaluations, sediment investigations, and the preparation of contract and construction documents for this contaminated sediment cleanup project. The project involved the dredging of approximately 100,000 cubic yards of contaminated sediment with beneficial reuse via disposal at the Port of Long Beach for a slip fill development project, and the replacement of approximately 130 dock guide piles to ensure docks were stabilized with the post-dredge depths. As the project moved into construction, served as the onsite construction manager representing the City of Newport Beach as the primary point of contact throughout the duration of the project. The project, which was completed under budget and ahead of schedule, was the largest dredging project ever undertaken by the City of Newport Beach.

Morro Bay State Park Marina Maintenance Dredging, Morro Bay, California — Served as engineer-of-record responsible for developing a cost-effective dredging program to remove shoaled material from within the navigation channel and recreational marina. Led the development of design drawings and technical specifications, and then led the bid advertisement and contractor selection process. As the project moved into construction, provided limited construction management services, including providing technical expertise related to contract specifications, and regulatory compliance monitoring

and reporting.

Middle Harbor Redevelopment Program, Port of Long Beach, California — Served as onsite construction management support for a demolition and dredging project at the Port of Long Beach. Worked alongside Port staff providing technical expertise on dredging and marine construction issues for this project. Served as a liaison between the designer, contractor, and Port to solve problems expeditiously and minimize cost increases related to changed conditions. Responsible for coordinating requests for information, contractor submittals, acceptance and payment surveys, and change order negotiation, among other duties.

Brisbane Marina and Entrance Channel Maintenance Dredging, Brisbane, California — Served as engineer of record for this project, which involved dredging of 140,000 cubic yards of material from the entrance channel and marina. Dredged material was disposed of at the SF-11 disposal site within San Francisco Bay.

Rainbow Harbor Entrance Channel Dredging, Long Beach, California — Provided engineering design and limited construction oversight for the removal of approximately 25,000 cubic yards of material from the entrance the harbor. The intent of this project was to improve navigation conditions in support of the TransPac sailing competition that departs from Rainbow Harbor each year.

Dredging and Sediment Management, Town of Ocean Isle Beach, North Carolina — Provided geotechnical investigations, engineering design, regulatory permitting, and construction management services for two independent hydraulic dredging projects, which involved approximately 10 miles of residential waterway canals in southeastern North Carolina. Designed dredged material placement sites using artificial islands originally constructed by USACE. These efforts required an in-depth understanding of sediment characteristics, drainage patterns, and dewatering strategies to ensure water levels could be maintained at optimal levels during various stages of the project. In addition to leading the design, permitting, and regulatory coordination aspects of the project, administered the bid advertisement process and served as construction manager for the town. Other project elements included public presentations and responding to stakeholder's concerns prior to and during the projects, documenting construction activities in the field, and ensuring that the contractor successfully upheld environmental constraints and project specifications.

Navigation Channel Shoaling Analysis and Rock Jetty Design, Cedar Island, North Carolina — Performed a shoaling analysis and evaluated alternatives to minimize shoaling of the entrance channel at the public boating access area. Cost estimates and final recommendations for various alternatives such as advanced maintenance dredging, deposition basin and extension of the existing rock jetty were provided to the client, the North Carolina Department of Environment and Natural Resources. Responsible for all regulatory coordination and obtained all permits from state and federal agencies, and coordinated the public comment aspects of the project.

Keauhou and Honokohou Small Boat Harbors, Keauhou, Hawai'i — Provided engineering and permitting services for these two tsunami damage repair projects for two sites impacted by the March 2011 Tohoku tsunami. Project work involved repairs to the existing loading pier, crib wall revetment, seawall, and navigation hazards removal as well as miscellaneous repairs to upland infrastructure at the site. With extensive coral colonies present within the direct project impact area, managed marine biological surveys and the development of a suitable coral transplantation program. Responsible for obtaining the necessary permits and approvals from USACE, NOAA-National Marine Fisheries, and State of Hawai'i Department of Health 401 water quality certification.

Marine Corps Base Hawai'i Marina Improvements, Kaneohe, Hawai'i — Provided engineering and permitting support services for this project, which involved significant upgrades to the marina, including a new floating wave attenuator, new floating docks, and rehabilitated boat launch ramp.

Pier 200 Replacement, Haleiwa Small Boat Harbor, Haleiwa, Hawai'i — Provided environmental permitting services to secure the necessary state and federal permits and approvals for this project. In addition to securing the necessary permits with USACE, also managed the marine biological surveys for the project and provided an engineering evaluation of the proposed flexible mooring system for the project.

Public Boating Access Area, Morehead City, North Carolina — Provided engineering design, permitting, and construction management services to the North Carolina Wildlife Resources Commission for significant expansion and site improvements to the public boating access facility. The project involved dredging of the navigation channel and launch ramp area, new boat launch ramp and dock construction, new parking and drive aisle layout, and onsite stormwater treatment through an innovative constructed wetland system.

DREDGED MATERIAL MANAGEMENT

Dredged Material Beneficial Reuse Analysis, Figure Eight Island, North Carolina — Gathered all existing data concerning native sediment characteristics along beach profile transects for Figure Eight Island and Hutaff Island, as well as dredged material deposited in USACE disposal islands along the Atlantic Intracoastal Waterway in North Carolina. Coordinated further geotechnical investigations of dredged material disposal areas and performed sediment compatibility analysis for beach nourishment using updated technical standards set forth by the North Carolina Division of Coastal Management.

Portlock Beach Beneficial Reuse of Dredged Material and Beach Nourishment, Oahu, Hawai'i — This project consisted of dredging the entrance channel to the Hawai'i Kai Marina on Oahu, Hawai'i, to restore navigable depths and beneficially reuse dredged sediment as a source for beach nourishment at Portlock Beach. Coordinated and conducted geological site investigations, topographic and hydrographic surveys, and led the engineering design, state and federal permitting, and construction management aspects of the project.

Kapalama Container Terminal, Honolulu Harbor, Hawai'i — Served on the design team and was responsible for coordinating geotechnical explorations, topographic and hydrographic surveys, and conducting additional field investigations of existing site conditions. Assisted with dredging design for approximately 400,000 cubic yards with dredged material disposal sites including upland disposal, slip fill at Snug Harbor, and offshore disposal at the South Oahu Ocean Dredged Material Disposal Site. Also led development of the site demolition plans, which included extensive research of the State of Hawai'i Department of Transportation (HDOT) files, as well as numerous on-land and in-water investigations to better understand the existence of historical structures within the project footprint. Attended meetings with the owner on behalf of the design team and served as a liaison between regulatory agencies, the design team, and HDOT project staff.

Dredging at South Channel and Halawa Stream, Pearl Harbor, Hawai'i — Served as design engineer and assistant project manager for this maintenance dredging project, which consisted of restoring the required navigation depths. The project involved upland disposal of dredged material at a nearshore confined disposal facility for contaminated sediment, as well as open-ocean disposal at the South Oahu Ocean Dredge Material Disposal Site.

Marina Bay Yacht Harbor Channel Maintenance Dredging, Richmond, California — Provided construction management services during this maintenance dredging project in addition to providing design services and the preparation of bid documents. Due to elevated PCB levels at the site, dredge areas were sectioned off with disposal at two locations in the San Francisco Bay depending on the level of contamination. This required careful coordination with the dredging contractor and regulatory agencies to ensure that material was properly disposed of in accordance with all permit conditions. The presence of eelgrass within the immediate vicinity of the dredge area required special coordination to delineate sensitive areas and establish a safe buffer between dredging operations to ensure these biological resources were not impacted. Assisted in reviewing contractor's progress surveys, performing volume calculations, conducting weekly construction meetings, processing payment applications, responding to requests for information, and ensuring the target dredge depths were achieved in accordance with the owner's expectations.

SEDIMENT INVESTIGATION

Alamitos Bay Marina Contaminated Sediment Dredging, Long Beach, California — Served as design engineer tasked with developing a cost-effective dredge plan for the Basin 1 marina in Alamitos Bay. This marina, which had not been dredged since initial construction in the 1960s, posed a variety of design challenges due to uncertainties with regards to existing structures. A well-planned field investigation provided sufficient information to finalize the dredge design with little impact to the project budget. Alternative analysis for a variety of dredge plans was carried out to achieve the desired balance between removing contaminated material to the levels required by the regulatory agencies, while negotiating existing structures and staying within the project budget.

Otay River Estuary Restoration Project Sediment Characterization, San Diego, California — Authored the data needs assessment, sampling and analysis plan (SAP), and summary report, and implemented and managed all geotechnical explorations for this restoration project, which lies within the San Diego Bay National Wildlife Refuge. Based on the initial analytical results of samples collected in the Otay River and adjacent floodplain, assessed the vertical and horizontal extents of contaminants of concern throughout the site and recommended a secondary sampling strategy.

PLANNING AND PERMITTING

Planning and Permitting New Floating Dock, Sand Island, Honolulu, Hawai'i — Provided environmental planning and regulatory permitting services in support of a new dock. Obtained all regulatory permits and authorizations in an expedited timeframe to meet small-vessel research priorities after the closing of the Snug Harbor facility, which included a Section 401 water quality certification from the Department of Health, city and county Shoreline Management Act permit, Section 10 permit from USACE, and coastal zone management federal consistency determination from the State of Hawai'i Office of Planning. Other services included managing the shoreline certification survey, performing additional site surveys to evaluate coral impacts, and preparing a coral mitigation plan and best management practices plan.

Marina Rehabilitation, Kaneohe, Hawai'i — Provided environmental planning, regulatory permitting, environmental compliance, and limited construction management services for this project, which involved the rehabilitation of marina guide piles and floating docks. Permitting efforts included obtaining authorization from USACE and the Hawai'i Department of Health (401 water quality certification). Biological assessments of marine species within the project area were provided pre- and post-construction to satisfy avoidance and minimization requirements as they relate to essential

fish habitat evaluations with the National Marine Fisheries Service, and a mitigation plan was developed for the project due to the existence of the state-protected black-lipped oyster located on the existing docks planned for demolition. Additional services performed included pre-, during- and post- water quality monitoring and limited construction oversight.

Hilo Harbor Pier 2 and Nawiliwili Harbor Pier 1 Cement Pipeline Improvements, Hilo, Hawai'i and Lihue, Hawai'i — Provided environmental planning, regulatory permitting, engineering design, and construction management services for these two similar-scoped projects in Hilo and Nawiliwili Harbors on Maui and Kauai, respectively. The projects involved the replacement of cement conveyance pipelines below Pier 1 in Nawiliwili Harbor and Pier 2 in Hilo Harbor, Hawai'i. After securing the necessary environmental permits/authorizations, led the engineering design and worked with HDOT Harbors Division to also receive its approval to move forward with construction. As these projects moved into construction, provided limited construction management and oversight, including submittal review, site inspections, and final reporting to HDOT-Harbors.

Hickam Harbor Marina and Rainbow Bay Marina Site Improvements, Honolulu, Hawai'i — Supported the U.S. Navy for two projects at Joint Base Pearl Harbor-Hickam on Oahu, Hawai'i. One project involved providing repairs to the floating docks at Rainbow Bay Marina, and the other consisted of the construction of two gangways at Hickam Harbor. Tasked with obtaining state and federal permits and approvals from regulatory agencies such as USACE and Hawai'i Department of Health, as well as managing water quality monitoring and site surveys related to sensitive marine species.

Ala Wai Small Boat Harbor 600 Row Finger Pier Repairs, Honolulu, Hawai'i — Provided environmental planning, design and engineering, bid advertisement, and construction management for this project. The project included a total of six new aluminum fixed piers for vessel berthing. Additional improvements included raising landside abutments to match the new pier elevations (which have been elevated for future sea level rise) and repairs to the adjacent mooring piles. This project required approvals from USACE and a blanket 401 water quality certification from the Department of Health Clean Water Branch. In addition, provided a marine biological survey for the project.

SITE INVESTIGATION AND SOIL REMEDIATION

Kekaha Multimaterial Recycling Facility Soil Sampling and Analysis, Kekaha, Hawai'i — Led the development and implementation of a SAP for site soils characterization in support of the proposed multimaterial recycling facility located in Kekaha on Kauai. The purpose of the SAP was to present an approach for site soil investigations to document existing (background) conditions at the site with respect to any legacy contamination that may be present. The SAP presented the proposed methods for carrying out the sample collections, laboratory testing and analysis, quality assurance and quality control, and reporting requirements. With the SAP approved, led field sampling activities, coordinated laboratory analyses, and provided final reporting of results to regulatory agencies.

Publications

Walker, R., B. Bendell, and L. Wallendorf. 2011. Defining engineering guidance for living shoreline projects. *Coastal Engineering Practice* 2011:1064–1077.

Walker, R., G. Rudolph, and S. Rogers. 2011/2010. Fort Macon terminal groin, Beaufort Inlet, North Carolina. In *Coastal Structures: A Dedicated Double Issue, Shore & Beach* 78/79(4/1).

Blake, S., R. Walker, and R. Walker. 2011. Potable water issues during disaster response and recovery: Lessons learned from recent coastal disasters. pp. 779–794 In *Solutions to Coastal Disasters 2011*. Anchorage, AK.

Walker R.A. and D. Basco. 2011. Application of the coastal storm impulse (COSI) parameter to predict coastal erosion. *Coastal Engineering Proceedings 32:23–33.*

Walker, R., N. Price, and J. Yoon. 2010. Probabilistic analysis of dispersive estuarine *F. enterococcus* transport and fate along banks channel in Wrightsville Beach, NC. *Proceedings of the 2010 Virginia Lakes & Watershed Association Annual Conference*. Richmond, VA.

Presentations / Posters

Walker, R. 2022. Evaluating nature-based shoreline stabilization in Saipan Lagoon, Northern Mariana Islands. Presentation. American Shore & Beach Preservation Association (ASBPA) 2022 National Coastal Conference, Long Beach, CA.

Walker, R. 2021. New climate change and health hazard assessment tool for island communities. Presentation. American Shore & Beach Preservation Association (ASBPA) 2021 National Coastal Conference, New Orleans, LA.

Walker, R. 2018. Paradise in crisis: The need for nature-based solutions on Oahu's north shore. Presentation. American Shore & Beach Preservation Association (ASBPA) 2018 National Coastal Conference, Galveston, TX.

Barry, J.H., and R. Walker. 2017. Coastal processes, coastal morphology, and coastal engineering practice on two Hawai'i shorelines: The north shore of Oahu and west shore of Maui. Presentation. GSA Cordilleran 2017 Section Meeting, Honolulu, HI.

Walker, R. 2016. Living shorelines in tropical island environments. Presentation. International Union for the Conservation of Nature (IUCN) 2016 World Conservation Congress, Workshop hosted by the Hawai'i Shore & Beach Preservation Association, Honolulu, HI.

Walker, R. 2016. Sunset Beach coastal erosion: Beach monitoring and recent observations. Presentation. Annual Meeting of the Hawai'i Shore & Beach Preservation Association, Honolulu, HI.

Walker, R. 2015. Evaluating the feasibility of nature-based infrastructure for shoreline management in Hawai'i. Presentation. National Association of Environmental Professionals 40th Annual Conference, Honolulu, HI.

Walker, R. 2015. Natural habitats reduce waves and storm surge; what does it mean for my community? Presentation. Coastal Structures and Solutions to Coastal Disasters Joint Conference, Boston, MA.

Walker, R. 2015. Habitat Restoration in Urban Settings. Presentation. National Association of Environmental Professionals 40th Annual Conference, Honolulu, HI.

Walker, R. 2015. Sustainability in coastal engineering. Invited lecturer. GG 420 Course "Beaches, Reefs, and Climate Change," Prof. Chip Fletcher. University of Hawai'i at Manoa, Department of Geology and Geophysics, Honolulu, HI.

Walker, R. 2015. Coastal data collection in the Sunset Beach, Oahu region. Presentation. USACE Regional Sediment Management (RSM) Workshop, Haleiwa, HI.

Walker, R. 2015. Climate vulnerability, impacts, and adaptation along Oahu's North Shore, case study: Sunset Beach. Invited lecturer. CEE 491 Special Topics Course, Prof. Oceana Francis. University of Hawai'i at Manoa, Department of Civil and Environmental Engineering, Honolulu, HI.

Walker, R., 2014. The COPRI living shorelines database. Presentation. Restore America's Estuaries 7th National Summit on Coastal and Estuarine Restoration and 24th Biennial Meeting of The Coastal Society, National Harbor, MA.

Attachment 3

Integral Promotional Literature

Environment

Integral offers diverse expertise in multimedia environmental investigations and forensic analyses.

We approach our clients' environmental challenges with the endgame in sight—whether it's cleaning up legacy pollution, complying with environmental protection standards, or ensuring that restored environments are safe. We combine our multidisciplinary and collaborative approach with technical expertise and practical perspectives to achieve permanent solutions that work.

- SITE INVESTIGATION
- REGULATORY COMPLIANCE
- EMERGING CONTAMINANTS
- CONTAMINANTED SEDIMENT
- FATE AND TRANSPORT
- MONITORING TECHNOLOGIES

integral consulting inc.

Selected Projects

Our integration of the remedial investigation results, modeling, and risk assessments is supporting an adaptive management approach to remediation.

Lower Passaic River RI/FS

New Jersey

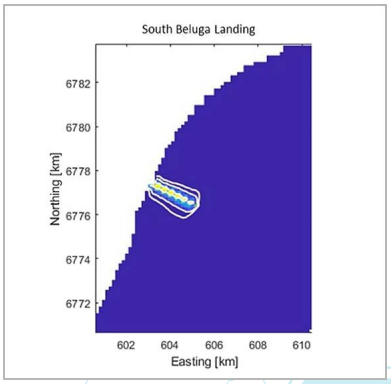
The Lower Passaic River has a long history of industrialization, leading to elevated levels of dioxin and other contaminants. We are leading the feasibility study, which is focused on a source control interim remedy in the upper 9 miles of the 17-mile study area. Involving more than 60 cooperating parties, the project requires strong technical coordination and effective collaboration.

Our risk assessments support health-protective and cost-effective remedies.

Environmental and Litigation Support Services

Rhode Island

At the Centredale Manor Restoration Project Superfund site, Integral provided regulatory consultation services and expert witness testimony on issues related to CERCLA liability and divisibility. Our scientists refined the conceptual site model and reassessed the human health and ecological risks based on plausible exposure scenarios. We are currently performing critical studies as part of the pre-design investigation.



We set up multiple hydrodynamic and sediment transport models to predict erosion and deposition.

Sediment Modeling

Alaska

Alaska LNG has proposed constructing a pipeline from the North Slope to Cook Inlet that would deliver natural gas for commercialization and in-state distribution. As a member of the Draft Environmental Impact Statement (DEIS) team, our role was to evaluate turbidity impacts resulting from the proposed pipeline construction. Our focused and streamlined modeling approach allowed us to present comprehensive and compelling analyses, supporting the DEIS.

SITE INVESTIGATION

Our team designs and delivers efficient, science-based, multimedia environmental investigations that provide the data needed to answer the important questions and develop the right solutions. We are targeted, on point, and strategic. The result is remedial strategies that are protective, sustainable, and cost-effective.

CONTAMINATED SEDIMENT

We offer comprehensive sediment management services to help our clients evaluate and remediate contaminated sediment sites; plan navigation dredging projects; and manage sediments in lakes, rivers, estuaries, and impoundments. Our services are fully integrated with our risk assessment, engineering, remediation, modeling, restoration, and natural resources capabilities. The result is sustainable, environmentally sound, and cost-effective solutions.

KEY CONTACTS

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Patrick Gwinn
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Engineering

Integral develops permanent solutions that achieve risk-based goals, minimize future liability, and maximize project value.

We apply our breadth of engineering expertise to remediation, stormwater, water supply, and development projects. From legal support to project planning through construction, our engineering teams develop practical solutions to solve our clients' challenges. We prepare engineering plans and specifications, obtain permits, provide construction management, and optimize existing treatment systems. To address risks related to sea level rise, we work collaboratively to develop resilient infrastructure and protect coastlines.

- REMEDIATION
- STORMWATER
- CONSTRUCTION MANAGEMENT
- CONTROL SYSTEMS
- WATER SUPPLY
- RESILIENCY

integral consulting inc.

Selected Projects

To expedite the investigation of PCE in groundwater, we used innovative tools including a cone penetrometer and a hydraulic profiling tool.

In Situ Groundwater Remediation

California

PCE from a former industrial laundry had contaminated the groundwater beneath a commercial building and nearby properties, causing neighborhood and regulator concern. To expedite the investigation, we used innovative tools, developed a robust conceptual site model and 3-D groundwater plume depiction, and finalized an *in situ* bioremediation remedial design. The overall progress restored good relations with stakeholders, mitigating potential third-party litigation.

When contaminants were discovered during a ferry terminal project, Integral's engineering team provided a timely, cost-effective solution.

Sediment Cap Evaluation, Design, and Permitting

California

During construction of a new ferry terminal for the Port of San Francisco, contaminated sediments were discovered—requiring a rapid response. We served as Engineer of Record for design of the engineered cap required to manage contaminated sediments. The multilayered cap design included an erosion protection layer to safeguard the underlying isolation sand cap from hydrodynamic forces caused by vessel traffic, tidal currents, and storms.

We vetted and tested technologies and oversaw design of a system that is now providing clean drinking water.

PFAS in Drinking Water

New Jersey

When per- and polyfluoroalkyl substances (PFAS) were detected in a potable water supply well, prompt treatment was essential. Integral vetted PFAS drinking water treatment technologies and successfully completed testing of granular activated carbon (GAC). We designed and oversaw construction of the GAC system, while meeting an accelerated schedule. The system has been reliably providing clean drinking water since 2017.

REMEDIATION

Our clients rely on our expertise in remediation of contaminated soil, sediment, and groundwater. We conduct thorough engineering evaluations and design and implement remedial actions. Applying our robust understanding of the conceptual site model and our in-depth knowledge of and experience with remedial technologies and their application, we implement remediation programs that work.

STORMWATER

We offer a comprehensive approach to stormwater management. From simple, facility-level stormwater sampling for permit compliance, to more complex sampling for basin-wide source control evaluation, we devise practical stormwater monitoring programs. We integrate these data, supplementing with treatability studies and modeling as needed, to design and implement effective stormwater treatment systems.

KEY CONTACTS

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Solving Complex Problems in the Coastal Environment

KEY CONTACT

Robert Walker
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About Integral

Integral Consulting Inc. is an environmental consulting firm that focuses on solving complex problems in the coastal environment. Our multidisciplinary team of professionals specializes in developing sustainable alternatives to challenges impacting coastal ecosystems and the built environment along our shorelines. We provide integrated services through all phases of coastal and waterfront projects, from initial planning and permitting to full design, bid support, construction, and legislative issues that impact our clients' operations, as well as crafting tailored strategies to navigate these challenges successfully.

HARBORS, MARINAS, AND WATERFRONT FACILITIES

Integral is an expert in the planning, design, and regulatory permitting of small-craft harbors and waterfront facilities. Project experience includes floating docks, fixed piers, boat launch ramps, and site layout design. We have experience with new facilities as well as the maintenance and repair of existing infrastructure.

DREDGING

Integral has completed navigation dredging for ports and harbors, maintenance dredging of marinas and small-craft harbors, and dredging for beneficial reuse for shore protection projects. Our staff has experience in contaminated sediment management and dredged material disposal design, sediment investigations, and water quality monitoring for dredging and waterfront construction projects.

COASTAL ENGINEERING

With advanced degrees in coastal engineering, coastal geology, natural resources management, marine science, and coastal management, the team at Integral has trained at top universities across the nation. Our experience ranges from shore protection projects including beach nourishment and coastal structure design, coastal hazard evaluations and coastal resiliency planning, sediment investigations, and coastal processes studies.

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Permitting, Planning, and Compliance Services

Integral Consulting Inc. is a national science and engineering firm delivering technical solutions to complex environmental, health, economic, and natural resource challenges faced by our clients. We employ an unrelenting commitment to technical excellence, innovation, and collaboration to help our clients minimize yesterday's impacts, comply with today's demands, and plan for tomorrow's needs.

Our multidisciplinary team of scientists, engineers, economists, toxicologists, chemists, data scientists, marine scientists, biologists, and geoscientists are committed to protecting the integrity of natural systems while meeting the needs of an ever-evolving society.

Permitting, Planning, and Compliance

Integral Consulting's Planning and Permitting services take a strategic approach to environmental consulting, emphasizing client objectives and comprehensive project development. By integrating deeply within client teams and leveraging expertise, we facilitate the identification of biological constraints, regulatory compliance, project authorization, and tailored mitigation strategies, and prepare comprehensive permitting and environmental documents. Beyond obtaining necessary permits from relevant agencies and producing well written environmental documents that comply with CEQA/NEPA requirements, we ensure compliance through construction monitoring, criteria monitoring, and compliance reporting. Integral's holistic approach, enriched by our experience with large-scale projects, ensures streamlined regulatory navigation, fostering sustainable and environmentally conscious project outcomes.

Service Areas

- Delineation of waters of the U.S/state
- Special status species surveys
- Biological resource analysis
- Biological assessment
- Natural resource permitting
- Clean water act permitting
- Project planning & mitigation solutions
- Natural resource management
- Field compliance support
- Environmental planning
- California environmental quality act compliance
- National environmental policy act complinace
- Water quality permitting
- Water quality monitoring
- Stormwater planning

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CEQA and NEPA, Planning, and Related Services

- Initial Studies, Mitigated Negative Declarations and EIRs
- Environmental Assessments/Environmental Impact Statements
- Community Engagement
- Biological Resource Impact Assessments
- Hazards and Hazardous Materials Evaluations
- Climate Change/Sea-Level Rise/Coastal Hazards
- Stormwater Management
- Water Quality Assessments and NPDES Permitting
- Biological Resources and Permitting
- 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
- Compliance Monitoring and Regulatory Compliance

Key Personnel

Bridgette R. DeShields
Technical Director of Permitting and Planning
bdeshields@integral-corp.com

Ms. Bridgette DeShields has over 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. 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 as well as preparing environmental documents under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Paula C. Gill, PWS
Principal, Permitting and Planning
pgill@integral-corp.com

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.

Cameron Johnson
Principal, Permitting and Planning
cjohnson@integral-corp.com

Mr. Cameron Johnson is a wildlife biologist and permitting specialist with 24 years of experience in the field. He has experience with projects throughout the western United States, including post-graduate fieldwork in Arizona, California, and Nevada. During the past 18 years, Mr. Johnson has worked on the permitting of large- and small-scale utility and development projects for both private and public applicants.

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Engineering, Design, and Permitting

Our clients rely on us to help them navigate complex and unique permitting processes for their energy projects. We understand, before construction begins, a team must build and deliver the requirements needed for approval. These must be delivered through cost-effective and timely practices.

Integral's scientists and engineers have extensive experience in developing, permitting, implementing, and monitoring a wide array of onshore and offshore energy projects. Our approach is science-based within an adaptive management framework to provide the necessary depth and flexibility within a regulatory context. The internationally recognized experts at Integral also support clients in positive and productive negotiations with regulators and natural resource trustees.

Service Areas

- Civil, Environmental, and Coastal Engineering
- Planning
- Environmental Permitting
- Economics

Permitting and Compliance

- U.S. Army Corps of Engineers Permitting
- Environmental Impact Statements (EIS HRS 343)
- Coastal Zone Management Determinations
- Conservation District Use Permits
- Environmental Monitoring (biological & chemical)
- Litigation support

Environmental Impact Assessment

- Engineering Drawings for In-Water Construction (piers, shorelines, docks, etc.)
- Dredged Material Management & Design
- Shoreline Reinforcement
- Coastal Climate Risk and Resilience
- Climate Impact Assessment
- Natural Resource Damage Assessment
- Natural Resource Economics

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Highlighted Projects

Private Residence, Waterfront Improvements, *Kaneohe, Oahu, Hawai‘i*

Integral scientists are technical leads for the new marine energy environmental toolkit for permitting and licensing. Aimed at reducing the amount of time and cost to permit and license marine energy projects, the easily accessible, online toolkit is being developed through the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy.

Department of Land and Natural Resources, Maunalua Boat Ramp Maintenance Dredging and Facility Improvements, *Hawaii Kai, Oahu, Hawai‘i*

Provided engineering, design, and permitting to support dredging of 70,000 square feet from the navigation channel and boat ramp to restore safe vessel navigation and replace broken channel markers. Project also involved several facility improvements including repairing damaged shoreline structures, erosion mitigation efforts, and beach nourishment.

Department of Land and Natural Resources, Ala Wai Small Boat Harbor Pier Repairs, *Waikiki, Oahu, Hawai‘i*

Engineering, design, and permitting to repair and replace 13 fixed piers and associated gangways within the Ala Wai Small Boat Harbor. Prepared biological assessment to document regulated and sensitive species. Responsible for obtaining permit from U. S. Army Corps of Engineers under the nationwide permitting process. Anticipate award of construction oversight and environmental monitoring.

Office of Planning and State Development, Analysis of Sea Level Response Strategies, *Hawai'i, Hawai‘i*

Provided a comprehensive report on the feasibility and implications of managed retreat strategies for vulnerable coastal areas in Hawai‘i. Synthesized information gathered during the project and made findings and recommendations to develop a viable, comprehensive managed retreat strategy including coordination, legal requirements, land use, funding, stakeholder involvement and support, and leadership.

Key Contacts

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Learn more at **integral-corp.com**

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Site Investigation & Remediation

Our engineers and scientists lead remediation projects from investigation through remedy implementation and long-term monitoring. We have designed remedies focused on removal, *in situ* treatment and capping for contaminants including PCBs, organochlorine pesticides, metals, and volatile organic compounds.

We provide multidisciplinary scientific and engineering expertise in all phases of contaminated soil and groundwater remediation and have managed large- and small-scale projects in Hawai'i for 15 years. Integral has successfully implemented the Hawaii Department of Health, Hazard Evaluation and Emergency Response Office Technical Guidance Manual and facilitated a No Further Action Determination for more than 25 sites across the Hawaiian Islands.

Service Areas

- Civil Engineering
- Environmental Engineering
- Planning
- Environmental Consulting

Highlights

- Site Investigation
- Remediation
- Feasibility Study
- Remedial Alternatives Analysis
- Remedial Design and Engineering
- Remedy Implementation
- Construction Oversight
- Risk Assessment
- Conceptual Site Models
- Site Closure: No Further Action Determinations
- Water, Soil, Sediment, Stormwater, Air
- Fate and Transport
- Modeling
- Data Quality Objectives
- Land Transaction Support
- Hazardous Materials Handling
- Litigation Support

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Highlighted Projects

Soil Investigation, Remedy Selection and Design, Select Public Schools, *Hawai'i*

Conducted various investigation projects for the State of Hawai'i Department of Education, Facilities Division. The projects consist of building-exterior soil studies at more than 150 school campuses in Hawai'i, including development of sampling strategies, field implementation, and determining mitigation actions. Field activities include use of both x-ray fluorescence (XRF) and incremental soil sampling.

Investigation, Remedy Design, Remedy Implementation Oversight, and Site Closure at a Lead-Impacted Site, *Kona, Hawai'i*

Investigation and remediation project at a former scrap metal recycling facility with lead-contaminated soil and debris. Conducted multiple site investigations to evaluate removal action alternatives. Quantified lead concentration in more than 100 discrete soil samples via innovative use of XRF technology.

Phase I and II Environmental Site Assessments of Agricultural Lands, *Hawai'i*

Conducted site assessments of former pineapple and sugarcane fields acquired by agricultural businesses for growing seed crops. Conducted site assessment of properties used for seed crop production. Main contaminants were residual pesticides (arsenic, dioxins, organochlorine and organophosphate pesticides, and total petroleum hydrocarbons). Analyzed arsenic concentrations using XRF.

Subsurface PCB Investigation, *Kahului, Maui, Hawai'i*

Conducted extensive historical records review including review of third-party due diligence work for private shopping center with detectable levels of polychlorinated biphenyls (PCBs). Designed and implemented subsurface soil investigation to assess possible PCB impacts from historical site uses to support property ownership transfer.

Key Contacts

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X-ray Fluorescence Analyzers

Integral scientists have a deep understanding and 15 years of experience using portable x-ray fluorescence (XRF) analyzers, which allow real-time analyses to be conducted in the field.

Hand-held analyzers provide a rapid and cost-effective field screening method for metals—significantly reducing the scope and cost of investigations. Using XRF, Integral scientists perform non-destructive analyses of major and trace elements in soil, sediment, and solid waste samples. Applications include both screening-level and quantitative analysis for a wide array of elements of environmental interest such as arsenic, cadmium, copper, lead, mercury, and zinc. Our scientists have successfully incorporated XRF into many sampling programs where arsenic, lead, or both are chemicals of potential concern. Accurate elemental analyses are performed with custom corrections for site-specific matrix and moisture content.

- SITE CHARACTERIZATION AND REMEDIATION
- WASTE AND DEBRIS CHARACTERIZATION
- AGRICULTURAL APPLICATIONS FOR ELEMENTAL NUTRIENTS & DETRIMENTAL METALS

integral consulting inc.

Selected Projects

Using XRF, an Integral scientist tests soil in a garden area at a public school.

Soil Assessment at More Than 130 Public Schools

Oahu and Big Island, Hawaii

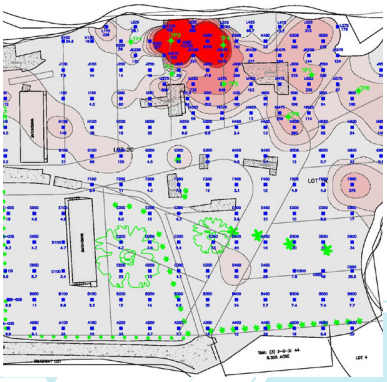
We designed and performed a study to assess potential human health hazards in building exterior soil at schools. The use of a portable XRF analyzer enabled rapid results by providing preliminary indications of elevated arsenic and lead in school soils. XRF was incorporated into the sampling design for decision making, aiding in the identification of areas for soil sampling and reducing the total number of samples collected for conventional laboratory analyses.

We provided our client with a cost-effective way to test for lead in approximately 44,100 cubic yards of soil and debris.

Former Metal Scrap Yard

Big Island, Hawaii

At a metal scrapyard, Integral conducted multiple site investigations to evaluate soil/debris removal action alternatives. Using a portable XRF analyzer, we quantified lead concentrations in mixed soil and debris samples. XRF was also used during the subsequent removal action before confirmation soil samples were collected—saving the client time and reducing cost.



Data from a portable XRF analyzer allow efficient mapping of element concentrations across a site.

Arsenic Contamination in Soil

Big Island, Hawaii

Integral staff have used a portable XRF analyzer to map the extent of arsenic contamination in soil on former sugar cane plantation lands on the Island of Hawaii. Using a combination of field screening with XRF followed by conventional laboratory analyses, we determined the extent of arsenic contamination requiring cleanup.

INTEGRAL USES OLYMPUS VANTA™ SERIES XRF ANALYZERS.

What is XRF?
XRF is an established method for analyzing element concentrations in various media.

How does it work?
X-rays excite the sample resulting in characteristic x-ray fluorescence, captured by the detector as photon counts for a series of energy-level bins. The software transforms photon counts into concentrations.

What are its features?
Portable: Hand-held XRF analyzers are battery-powered and can be used in office, laboratory, or field settings.
Easy to use: XRF analyzers are easy to operate and provide immediate element concentration readings in milligrams per kilogram.
Safe: Olympus XRF analyzers use an x-ray tube (not a radioactive isotope source), eliminating regulatory and operational concerns. The XRF is readily transported as checked or carry-on luggage.
Precise: Accurate elemental analyses include custom corrections for site-specific matrix and moisture content.

KEY CONTACT

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Attachment 4

DPW Form 120, Insurance Certificate, Projects and Clients in Hawaii, Copy of P.E. License

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

QUESTIONNAIRE FOR ARCHITECTS, ENGINEERS AND OTHER PROFESSIONAL SERVICES

QUESTIONNAIRE FOR: (LIST DISCIPLINE)	OTHER QUESTIONNAIRES SUBMITTED: (LIST DISCIPLINES)	DATE
2) Civil Engineering 7) Environmental Engineering 8) Coastal Engineering 12) Planning 15) Environmental Consulting/planning 16) Environmental Permitting 24) Economist	N/A	30 June 2024

FIRM NAME	ESTABLISHED YEAR	ESTABLISHED STATE	TYPE OF ORGANIZATION (Underline)
Integral Consulting Inc.	2002	WA	INDIVIDUAL PARTNERSHIP **CORPORATION** JOINT VENTURE OTHER

BUSINESS ADDRESS, TELEPHONE & FAX NO. OF HAWAII OFFICE	AGE OF FIRM	FEDERAL ID NO.	YEARS ESTABLISHED IN HAWAII
98-820 Moanalua Road, Space 5, #706 Aiea, HI 96701 Tel: 808.374.4437	22 years	48-1266683	16

PRINCIPALS OF FIRM: (NAMES)	ASSOCIATE MEMBERS OF FIRM: (NAMES)
William Locke, P.E. William Cutler, PH.D., P.G. Avram Frankel, P.E. Bridgette DeShields Robert Walker, P.E.	Silvia Barber Erin Petrosian Taylor Caster Zoe Curley

PRESENT BRANCH OFFICE(s): (ADDRESS, TELEPHONE & FAX NO.)	PERSON IN CHARGE: (NAMES)
719 2nd Avenue, Suite 1450 Seattle, WA 98104 Tel: 206.230.9600 Fax: 206.230.9601	William Cutler, Hawaii Principal-in-Charge

NUMBER OF PERSONNEL IN YOUR PRESENT ORGANIZATION

LOCATED AT	PRINCIPALS & KEY PERSONNEL			OTHER PERSONNEL											TOTAL
					Engineers										
	Architect	Engineer	Others	Architect	Mech.	Electri	Civil	Others	Draftsmen	Spec. Writer/ Writer	Estimator	Inspector	Surveyor	Balance	
HOME OFFICE Boulder, CO	0	5	23				3	2							28
BRANCH IN Hawaii	0	2	6				2	1							8
BRANCH IN California		2	26				1	1							28
OTHER BRANCHES IN U.S.		18	137				5	13							156
TOTAL	0	27	190				3	14							217
TECHNICAL PERSONNEL: 134				NUMBER OF PERSONNEL WITH HAWAII LICENSES					2	NUMBER OF PERSONNEL WITHOUT HAWAII LICENSES					218

PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES WITHIN YOUR FIRM

PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES WITHIN YOUR FIRM

NAME	RESIDENT OF
William Locke, P.E.	CO

TITLE: President

YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
34	21	0	13

EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)

Stanford University, M.S., 1989, Civil Engineering (emphasis in Water Resources)

Stanford University, B.S., 1987, Geology, with distinction, Phi Beta Kappa

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Society of Environmental Toxicology and Chemistry

REGISTRATION (TYPE, YEAR, STATE)

Registered Professional Civil Engineer, 2000, CO

NAME	RESIDENT OF
William Cutler, Ph.D., P.G.	CO

TITLE: Principal Scientist

YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
37	14	0	23

EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)

University of Hawaii at Manoa, Ph.D., 2011, Geology and Geophysics

University of Calgary, M.S., 1982, Geology and Geophysics

University of Michigan, B.S., 1980, Geological Sciences

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Geological Society of America

REGISTRATION (TYPE, YEAR, STATE)

Professional Geologist, 1987, CA

NAME	RESIDENT OF
Avram Frankel, P.E.	CA

TITLE: Business Director/Principal

YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
34	10	10	14

NAME	RESIDENT OF
Robert Walker, P.E.	HI

TITLE: Principal

YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
19	1	5	13

DPW FORM 120 (Rev. 6/99)

EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)	EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)
Northwestern University, M.S., 1995, Environmental Engineering John Hopkins University, B.A., 1989, History (with honors)	University of Hawai‘i at Manoa, M.S., Geoscience, Coastal Geology, 2017 Old Dominion University, M.S., Civil (Coastal) Engineering, 2010 North Carolina State University, B.A., Spanish, 2004 North Carolina State University, B.S., Environmental Engineering, 2003
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	**MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**
Member of National Ground Water Association Member of American Water Works Association Member of Groundwater Resources Association of California	LEED Accredited Professional (LEED AP) (2008) American Shore & Beach Preservation Association Coasts, Oceans, Ports and Rivers Institute (COPRI) American Society of Civil Engineers
REGISTRATION (TYPE, YEAR, STATE)	**REGISTRATION (TYPE, YEAR, STATE)**
Professional Engineer, PE-19758-C, expires 04/30/2026, HI	Professional Engineer (Civil), Hawai‘i, 2010, expires 04/30/2026 (License No.14549) Professional Engineer (Civil), California,2010 (License No. 79483) Professional Engineer (Civil), North Carolina, 2008 (License No. 36186)

PERSONAL HISTORY STATEMENT OF TECHNICAL PERSONNEL WITHIN YOUR FIRM

NAME	STATUS (Underline)	Name	STATUS (Underline)
Silvia Barber	**Full-Time** Part-Time	Erin Petrosian	**Full-Time** Part-Time
TITLE OR POSITION	**YEARS OF EXPERIENCE**	**TITLE OR POSITION**	**YEARS OF EXPERIENCE**
Senior Consultant	15	Consultant	16
WITH THIS FIRM	**WITH LAST FIRM (NAME & NO. OF YEARS)** / **WITH OTHER FIRMS**	**WITH THIS FIRM**	**WITH LAST FIRM (NAME & NO. OF YEARS)** / **WITH OTHER FIRMS**
15	University of Hawaii, 2 / 2	1	W. M. Keck Observatory, 6 / 16
EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)		**EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)**	
University of Hawaii, M.S., 2008, Natural Resources and Environmental Management Università degli Studi di Milano, Italy, Bachelor of Arts and Master of Arts, 2000, Philosophy of Science		University of San Diego, B.A., 2006, Marine Chemistry	
REGISTRATION (TYPE, YEAR, STATE)		**REGISTRATION (TYPE, YEAR, STATE)**	
Certified Lead-Based Paint Activities Risk Assessor: Hawaii (Certification No. PB-0957)			

NAME	STATUS (Underline)	NAME	STATUS (Underline)
Zoe Curley	**Full-Time** Part-Time	Taylor Caster. E.I.T	**Full-Time** Part-Time
TITLE OR POSITION	**YEARS OF EXPERIENCE**	**TITLE OR POSITION**	**YEARS OF EXPERIENCE**
Assistant Scientist	3	Project Engineer	8
WITH THIS FIRM	**WITH LAST FIRM (NAME & NO. OF YEARS)** / **WITH OTHER FIRMS**	**WITH THIS FIRM**	**WITH LAST FIRM (NAME & NO. OF YEARS)** / **WITH OTHER FIRMS**
3	0 / 0	1	7 / 0

EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)	**EDUCATION (COLLEGE, DEGREE, YEAR, SPECIALIZATION)**
University of Hawaii, B.S., 2020, Global Environmental Science	B.S., Civil and Environmental Engineering, University of Hawai‘i at Manoa, Honolulu, Hawai‘i, 2014 Engineer in Training (Environmental), Hawai‘i, 2021
REGISTRATION (TYPE, YEAR, STATE)	**REGISTRATION (TYPE, YEAR, STATE)**
	Part-107 Unmanned Aircraft Systems (Drone) Remote Pilot Certified, 2021 Certified Erosion and Sediment Control Plan Coordinator, 2024

OUTSIDE ASSOCIATES AND CONSULTANTS USUALLY EMPLOYED

DISCIPLINE	NAME OF FIRM OR INDIVIDUAL		DISCIPLINE	NAME OF FIRM OR INDIVIDUAL
N/A				

ERRORS AND OMISSIONS INSURANCE

DOES YOUR FIRM HAVE ERRORS & OMISSION (E&O) INSURANCE? (Underline)			AMOUNT OF COVERAGE PER CLAIM	AMOUNT OF DEDUCTIBLE
YES	NO	PROJECT INSURANCE	$1,000,000*	$15,000

* The E&O policy has a $2,000,000 aggregate, and Integral has an excess liability policy of $10,000,000 in addition to the E&O. Please see insurance certificate, Attachment 4, See Professional Liability Coverage.
Submit proof of insurance or insurability from your insurance carrier with this form. See Attachment 4.

SUMMARY OF YOUR FIRM'S COMPLETED AND PRESENT PROJECTS DURING THE LAST 10 YEARS AS A PRIME A/E CONSULTANT

TOTAL NUMBER OF COMPLETED PROJECTS	472
TOTAL ESTIMATED CONSTRUCTION COST OF COMPLETED PROJECTS	$72,765,000
TOTAL NUMBER OF PRESENT PROJECTS	485
TOTAL ESTIMATED CONSTRUCTION COST OF PRESENT PROJECTS	$121,275,800

AS AN ASSOCIATE WITH OTHER A/E CONSULTANTS

TOTAL NUMBER OF COMPLETED PROJECTS	30
TOTAL ESTIMATED CONSTRUCTION COST OF COMPLETED PROJECTS (ONLY THE PORTION OF WORK FOR WHICH YOUR FIRM WAS RESPONSIBLE)	**$3,150,000**
TOTAL NUMBER OF PRESENT PROJECTS	36
TOTAL ESTIMATED CONSTRUCTION COST OF PRESENT PROJECTS (ONLY THE PORTION OF WORK FOR WHICH YOUR FIRM IS RESPONSIBLE)	**$1,050,000**

CLASS OF WORK AND PROJECT TYPE SPECIALIZATION

TYPE OF PROJECT	TOTAL NO. OF COMPLETED PROJECTS	TOTAL ESTIMATED CONSTRUCTION COST	TOTAL ESTIMATED PROJECT SIZE (G.S.F.)
Industrial	242	2,100,000	20,947,500
Ports/Harbors/Piers	36	525,000	771,750
Municipal/Local Gov’t/Public Agency	30	525,000	7,717,500
Litigation Support	162	NA	NA
Planning & Permitting	75	1,400,000	830,000,000

Categorize your firm’s class for work during the last 10 years by project type. Examples of project types include Educational, Commercial, Industrial, Residential, Health Care, Correctional and Judicial Facilities. Work may also be categorized as planning, civil site work, renovation/alteration, architectural barrier removal, fire alarm system, etc.

PRESENT/COMPLETED PROJECTS IN WHICH YOUR FIRM IS/WAS DESIGNATED THE PRIME CONSULTANT (BY TYPE)

(LIST A MAXIMUM OF 10 PROJECTS FOR EACH DISCIPLINE/TYPE OF WORK BEING APPLIED FOR. LIST PROJECTS THAT REFLECT YOUR ABILITY TO PROVIDE QUALITY WORK FOR YOUR REQUESTED PROJECTS.) **TYPE:**

YEAR	NAME AND LOCATION OF THE PROJECT	NAME OF LEAD DESIGNER	NAME, ADDRESS, PHONE & FAX NO. OF THE OWNER	ESTIMATED CONST. COST ($)	DURATION FOR DESIGN (MONTHS)	% COMPLETED	
						DESIGN	CONST.
	See Attachment 3 of the Submission Package						

DPW FORM 120 (Rev. 6/99)

PRESENT/COMPLETED PROJECTS THAT YOUR FIRM IS/WAS ASSOCIATED WITH OTHERS (BY TYPE)

(LIST A MAXIMUM OF 10 PROJECTS FOR EACH DISCIPLINE/TYPE OF WORK BEING APPLIED FOR. LIST PROJECTS THAT REFLECT YOUR ABILITY TO PROVIDE QUALITY WORK FOR YOUR REQUESTED PROJECTS.)

TYPE:

YEAR	NAME AND LOCATION OF THE PROJECT	NAME, ADDRESS, PHONE & FAX NO. OF THE OWNER	ESTIMATED CONSTRUCTION COST		DURATION FOR DESIGN (MONTHS)	PRIME FIRM ASSOCIATED WITH	% COMPLETED	
			ENTIRE PROJECT	YOUR FIRM'S WORK			DESIGN	CONST.
	See Attachment 3 of the Submission Package							

Explain firm's individual project assignment, project management structure, project execution (work flow and responsibilities) and quality control process. In the event the spaces provided on this form are not sufficient for entries, or if you wish to furnish additional information, it may be inserted here or on separate sheets, with appropriate references.

Individual Project Assignment: Silvia Barber (under the direction of William Cutler) will act as Project Managers depending on the type of project awarded. They will gather a team with the appropriate experience and qualifications and will commit to keeping those individuals on the project, unless exceptional circumstances are encountered. We carefully select key staff to provide the best value to the client. We are confident that the staff identified will carry out tasks in a timely and cost-effective manner. In the event that a change in a key staff member is required, we will recommend a replacement with at least equal qualifications, and await client approval before making the change.

Project Management Structure: Integral has a large team of scientists, engineers, project managers, technicians and administrative support staff. The project team will be assigned in a manner that aligns their experience and qualifications with the type of project awarded. Project teams include the Principal in Charge/Professional Engineer (oversees the technical scope of work), Senior Technical Reviewer (reviews technical work for accuracy), Project Manager (oversees budget, schedule, client communications and contract terms), Project Coordinator (responsible for drafting invoices), Consultants/Scientists/Engineers (responsible for drafting, technical reporting, data processing, etc.), technicians (perform field work, AutoCAD drafting, GIS figures, etc.) and a broad range of administrators including, but not limited to, accounting, publications, contracts/insurance, legal, quality assurance, etc.

Project Execution (work flow and responsibilities): When a contract delivery order is received, Silvia Barber will assign a Principal in Charge, Sr. Technical Reviewer, Project Manager and Project Coordinator based on task order technical content. Each Principal in Charge will then assemble and coordinate the efforts of a customized technical task team to accomplish the task order. The Project Managers responsibilities will include coordination with the Project Manager and client representative to develop and execute the best technical and most cost-effective approach for the requested task.

Quality Control Process: Integral has established a formal QA/QC program that is documented in the Quality Management Plan and followed by all project managers and technical staff. Feedback and verification of the quality of work we provide to our clients are key components of the QA process and is generally executed by the Senior Technical Reviewer. QC is achieved through independent peer reviews, spreadsheet calculation checks, and document editing by technical experts on our deliverables (proposals, reports, project briefings). Principal in Charge will be responsible for ensuring full implementation of our QA/QC procedures, and will be ultimately responsible for the quality of all deliverables.

As of this date June 30, 2024 the foregoing is a true statement of facts.

NAME OF FIRM OR INDIVIDUAL SUBMITTING QUESTIONNAIRE	TYPE NAME AND TITLE OF PERSON SIGNING	SIGNATURE
Integral Consulting Inc.	Robert Walker	

NOTE: It is to a firm's advantage to maintain its experience record on a current basis. This may be accomplished by periodically forwarding current data to County of Hawaii.

PRINCIPALS ONLY - ADDITIONAL INFORMATION

NAME	TITLE AND POSITION	YEARS WITH FIRM
William Locke, P.E.	President & Chief Operating Officer	22

MAJOR RESPONSIBILITIES WITH THIS FIRM

Mr. William Locke is a hydrologist and registered civil engineer with more than 30 years of experience in environmental investigation, fate and transport assessments, remedy analysis and selection, and regulatory affairs. He specializes in designing physical and chemical investigations of complex environmental systems, including soil, groundwater, sediments, surface water, and biota. He advises a broad range of clients on scientific and engineering issues, regulatory strategy, and management of environmental assets and liabilities. Mr. Locke has overseen and contributed to numerous remedial investigations, risk assessments, engineering feasibility studies, and fate and transport evaluations conducted under the Comprehensive Environmental Response, Compensation and Liability Act (Superfund); Resource Conservation and Recovery Act (RCRA); and state-led environmental cleanup programs. He has also provided expert support for environmental litigation matters and natural resource damage assessments.

Mr. Locke is well versed in the environmental behavior of a wide array of organic chemicals (e.g., dioxins and furans, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, and chlorinated solvents) and inorganic chemicals (e.g., cyanide, arsenic, cadmium, lead, and other metals). He has designed and executed technical studies to differentiate site-related releases from natural and anthropogenic background chemical concentrations in soil, water, and sediments. Mr. Locke has evaluated groundwater-sediment-surface water interactions at several sites across the U.S., where he has developed and successfully implemented a multiple-lines-of-evidence approach for differentiating impacts of historical releases to sediments from those caused by migration of upland groundwater plumes. Mr. Locke has also developed analytical and numerical models to assess chemical fate and transport in groundwater and surface water systems, predict the effects of mining on water quality and quantity, analyze the feasibility of environmental remediation projects, and address questions related to water resources quantity and quality.

PRIOR EMPLOYMENT

(START WITH LATEST EMPLOYMENT PRIOR TO JOINING THIS FIRM AND PROVIDE SIMILAR INFORMATION FOR EACH SEPARATE EMPLOYMENT OR MAJOR CHANGES IN DUTIES WITH THE SAME EMPLOYER.)

FIRM:	DATE FROM:	DATE TO:	FIRM:	DATE FROM:	DATE TO:
Exponent	1995	2002	PTI Environmental Services	1992	1995
ADDRESS: 4940 Pearl East Circle #300 Boulder, CO 80301			**ADDRESS:** 4940 Pearl East Circle #300 Boulder, CO 80301		
JOB TITLE: Managing Scientist			**JOB TITLE:** Project Manager		

SUPERVISOR'S NAME AND TITLE:	**SUPERVISOR'S NAME AND TITLE:**
Walt Shields, Ph.D., Principal	Andy Davis, Ph.D.
MAJOR DUTIES:	**MAJOR DUTIES:**
Project management; sediment and groundwater modeling.	Project management; sediment and groundwater modeling.

NAME	TITLE AND POSITION	YEARS WITH FIRM
William Cutler, Ph.D., P.G.	Principal Geologist	15

MAJOR RESPONSIBILITIES WITH THIS FIRM

Dr. William Cutler is a professional geologist with more than 30 years of experience in geosciences primarily focused on environmental site assessment and remediation. He is well-versed in managing all aspects of environmental projects, including strategy development, study design, technology assessments, senior management and agency communications, consulting and contracting services, field implementation, community relations, government affairs, and financial assessment and control. He has managed complex remediation projects in excess of $50 million. In addition to the management of individual projects, he has managed strategies and financial reserves for environmental liability site portfolios.

Dr. Cutler's areas of expertise include site assessments and investigations, sampling plan development, geophysical surveys, remedial technology assessments, and application of risk-based approaches. He has designed and managed site remediation projects under federal Superfund, RCRA corrective action, and state programs. Remedies employed range from simple soil removals to complex treatment systems for soil, groundwater, free product, and waste materials. Dr. Cutler is very experienced at communicating with the community and regulators, and he often functions as the link between the scientific/technical team and nontechnical stakeholders. One of his great strengths is financial evaluation of potential environmental liabilities, including individual sites and portfolios.

PRIOR EMPLOYMENT

(START WITH LATEST EMPLOYMENT PRIOR TO JOINING THIS FIRM AND PROVIDE SIMILAR INFORMATION FOR EACH SEPARATE EMPLOYMENT OR MAJOR CHANGES IN DUTIES WITH THE SAME EMPLOYER.)

FIRM:			FIRM:		
ERM	10/2004	10/2008	FMC Corporation	10/1993	08/2004
ADDRESS: Honolulu, HI			**ADDRESS:** 1735 Market Street, Philadelphia, PA 19103		
JOB TITLE: Environmental Consultant			**JOB TITLE:** Remediation Project Manager and Associate Director		
SUPERVISOR'S NAME AND TITLE: John Cavanaugh, Principal			**SUPERVISOR'S NAME AND TITLE:** Robert Forbes, Director EHS		
MAJOR DUTIES: Environmental Remediation			**MAJOR DUTIES:** Environmental Remediation		

FIRM:			FIRM:		
The Dow Chemical Company	09/1988	08/1993	UNOCAL Corporation	09/1983	08/1988

ADDRESS: Midland, MI	**ADDRESS:** Los Angeles, CA
JOB TITLE: Environmental Engineer	**JOB TITLE:** Exploration Geologist
SUPERVISOR'S NAME AND TITLE: Steve Curry	**SUPERVISOR'S NAME AND TITLE:** Terry McCauliff
MAJOR DUTIES: Environmental Remediation	**MAJOR DUTIES:** Oil and Gas Exploration

NAME	TITLE AND POSITION	YEARS WITH FIRM
Avram Frankel, P.E.	Principal	11

MAJOR RESPONSIBILITIES WITH THIS FIRM

Mr. Avram Frankel is a professional engineer, technical expert, and program manager with more than 30 years of experience on a wide range of commercial/industrial, municipal, state, and federal sites regulated under numerous state and federal programs. A civil and environmental engineer licensed in California, Oregon, Washington, Colorado, Georgia, and Hawaii, Mr. Frankel provides his clients with strategic risk management and technical analysis in support of due diligence, redevelopment, technology evaluation, site investigation, water treatment, remediation, and legal/litigation matters. With a focus on enhancing health and safety, restoration of drinking water aquifers, and delivery of potable water, he has overseen the design, costing, installation, and optimization of groundwater remediation and water treatment systems across the U.S. over a wide range of site scales, geologies, and technical complexities. As a program manager and technical strategist, Mr. Frankel's experience on large, complex, and performance-based projects is extensive, including the successful application of combined remedies and remediation of plumes measured in miles. These projects often included the remediation of large commingled and multi-contaminant groundwater plumes in challenging stakeholder environments and under litigation or settlement conditions. He has also served as a consulting and testifying expert on numerous litigation matters, including pre-trial and trial testimony.

PRIOR EMPLOYMENT

(START WITH LATEST EMPLOYMENT PRIOR TO JOINING THIS FIRM AND PROVIDE SIMILAR INFORMATION FOR EACH SEPARATE EMPLOYMENT OR MAJOR CHANGES IN DUTIES WITH THE SAME EMPLOYER.)

FIRM:	DATE FROM:	DATE TO:	FIRM:	DATE FROM:	DATE TO:
Arcadis	12/2003	08/2013	URS Corporation	02/1997	11/2003
ADDRESS: 100 Montgomery St. #300 San Francisco, CA 94104			**ADDRESS:** 1 Montgomery St. #900 San Francisco, CA 94104		
JOB TITLE: Vice President			**JOB TITLE:** Engineering Manager		
SUPERVISOR'S NAME AND TITLE: Janet Peters, SVP			**SUPERVISOR'S NAME AND TITLE:** Des Garner, Manager		

MAJOR DUTIES:	MAJOR DUTIES:
Engineering, management, business development.	Engineering, management, business development.

FIRM:	DATE FROM:	DATE TO:	FIRM:	DATE FROM:	DATE TO:
Outboard Marine Corporation (OMC)	06/1995	08/1996	E&E	10/1989	06/1994
ADDRESS: Waukegan, IL			**ADDRESS:** San Francisco, CA		
JOB TITLE: Engineer			**JOB TITLE:** Project Manager		
SUPERVISOR'S NAME AND TITLE: Larry Keller, Manager			**SUPERVISOR'S NAME AND TITLE:** Thompson Chambers, Manager		
MAJOR DUTIES: Engineering, compliance evaluations, permitting.			**MAJOR DUTIES:** Emergency response, environmental cleanup.		

NAME	TITLE AND POSITION	YEARS WITH FIRM
Bridgette DeShields	Principal	10

MAJOR RESPONSIBILITIES WITH THIS FIRM

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, and environmental toxicology. 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 technical expertise in the area of bioaccumulation and bioavailability.

Ms. DeShields has developed excellent working relationships with regulatory agency staff, including the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, California State Water Resources Control Board and regional boards, California Environmental Protection Agency, California Department of Toxic Substances Control, and numerous other state agencies. She has extensive experience in navigating California regulatory and permitting programs.

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. Her responsibilities include technical review of RMP documents and attending technical meetings. She also has led the dioxin strategy for San Francisco Bay.

PRIOR EMPLOYMENT

(START WITH LATEST EMPLOYMENT PRIOR TO JOINING THIS FIRM AND PROVIDE SIMILAR INFORMATION FOR EACH SEPARATE EMPLOYMENT OR MAJOR CHANGES IN DUTIES WITH THE SAME EMPLOYER.)

FIRM:	DATE FROM:	DATE TO:	FIRM:	DATE FROM:	DATE TO:
Arcadis	09/2005	03/2013	Arcadis (formerly Blasland, Bouck & Lee)	03/2002	09/2005
ADDRESS: Petaluma, CA			**ADDRESS:** Petaluma, CA		
JOB TITLE: Vice President			**JOB TITLE:** Vice President		
SUPERVISOR'S NAME AND TITLE: Pat Keaney, Vice President			**SUPERVISOR'S NAME AND TITLE:** Tyler Gass, Vice President		

MAJOR DUTIES: California Practice Leader, Sediment and Waterfront Group	**MAJOR DUTIES:** Senior Risk Assessor and Project Manager

FIRM: Harding Lawson Associates (now AMEC/MACTEC)	**DATE FROM:** 06/1994	**TO:** 02/2002	**FIRM:** SR Hansen and Associates	**DATE FROM:** 11/1991	**TO:** 06/1994
ADDRESS: Novato, CA			**ADDRESS:** CA		
JOB TITLE: Project Manager			**JOB TITLE:** Project Manager		
SUPERVISOR'S NAME AND TITLE: Liz Hawkins, Director			**SUPERVISOR'S NAME AND TITLE:** Steve Hansen, Owner		
MAJOR DUTIES: Risk Assessment Team Leader and Project Manager			**MAJOR DUTIES:** Toxicology Studies		

NAME	TITLE AND POSITION	YEARS WITH FIRM
Robert Walker, P.E.	Principal	1

MAJOR RESPONSIBILITIES WITH THIS FIRM

Mr. Robert Walker is a highly experienced coastal engineer with 19 years of expertise in coastal and marine projects. He specializes in dredging and dredged material management, coastal analyses and studies, shoreline protection, the design of waterfront facilities, and nature-based coastal hazard mitigation. Mr. Walker's proficiency goes beyond planning, design, and field investigations—he also excels in guiding clients through the complex regulatory permitting process, successfully securing local, state, and federal permits for numerous complex coastal projects. In addition, Mr. Walker brings valuable expertise in hydrographic surveying, sediment sampling and analysis, construction management, and environmental compliance services for dredging and coastal and waterfront construction projects.

PRIOR EMPLOYMENT

(START WITH LATEST EMPLOYMENT PRIOR TO JOINING THIS FIRM AND PROVIDE SIMILAR INFORMATION FOR EACH SEPARATE EMPLOYMENT OR MAJOR CHANGES IN DUTIES WITH THE SAME EMPLOYER.)

FIRM:	DATE FROM:	DATE TO:	FIRM:	DATE FROM:	DATE TO:
Shoreline Science and Engineering, LLC.	2/2014	12/2023	Moffatt & Nichol	8/2012	2/2014
ADDRESS: Haleiwa, HI			**ADDRESS:** Honolulu, HI		
JOB TITLE: President and Principal Engineer			**JOB TITLE:** Senior Coastal Engineer		
SUPERVISOR'S NAME AND TITLE: Self-employed			**SUPERVISOR'S NAME AND TITLE:** Russ Boudreau, Vice President and Principal Coastal Engineer		
MAJOR DUTIES: Focused primarily on projects in Hawaii, Robert Walker provided coastal engineering for dredging and navigation projects, harbor/marina planning and design, beach and nearshore surveying, shoreline restoration, coastal hazard evaluations, regulatory permitting and construction management. Also provided civil and environmental engineering services.			**MAJOR DUTIES:** Managed multiple projects and performed engineering analysis and design for projects in coastal areas. Project types included beach nourishment, dredging, design for waterfront infrastructure, living shorelines, coastal structures. Provided engineering design and regulatory permitting for various waterfront improvement projects.		

Projects and Clients in Hawaii

Client Name/Project	Start Date	Completion Date	Services Performed	Professional Fees	Service Area
Private Land Owner, Waterfront Improvements, Kaneohe, Oahu, HI	Jan-24	Ongoing	Engineering, design and permitting to construct a new, recreational dock and gangway for a private residence in Kaneohe Bay	$92,000	Engineering, Design, Permitting
Department of Land and Natural Resources, Ala Wai Small Boat Harbor Slips 641 - 666 Pier Repairs, Waikiki, Oahu, HI	Jan-24	Ongoing	Engineering, design and permitting to repair and replace thirteen fixed piers and associated piers and gangways within the Ala Wai Small Boat Harbor.	$31,000	Engineering, Design, Permitting
Department of Land and Natural Resources, Maunalua Boat Ramp Maintenance Dredging and Facility Improvements, Hawaii Kai, Oahu, HI	Jan-24	Ongoing	Engineering, design and permitting to support dredging of 70,000 square feet from the navigation channel and boat ramp to restore safe vessel navigation and replace broken channel markers. Project also involved several facility improvements including repairing damaged shoreline structures, erosion mitigation efforts and beach nourishment.	$145,000	Engineering, Design, Permitting
Office of Planning and State Development/An Analysis of Managed Retreat Strategies in Hawai'i: Policy and Funding Opportunities and Challenges	May-23	Ongoing	Analysis of the funding and financing arrangements necessary for implementation of managed retreat in the State of Hawai'i, with case studies on the north shore of Oahu and the Kahana Sunset condominium complex on Maui.	$152,500	Analysis and Reg Review
County of Maui Department of Park and Recreation/ Ho'aloha Park Adaptation Plan	May-23	Ongoing	Development of park user profiles and adaptation pathway planning for Ho'aloha Park. The scope of services includes development and administration of a travel cost survey, coastal wave run-up hazard modeling, vulnerability analysis, and identification and prioritization of adaptation options and pathways to implementation.	$105,000	Analysis and Reg Review
Bayer Crop Science/Facilities Demolition Support, Multiple locations	Jun-22	Ongoing	Providing environmental support for the demolition of various agricultural facilities.	$36,800	Engineering, Design, Permitting
Kazmarek Mowrey Cloud Laseter LLP/Subsurface PCB Investigation/Kahului, Maui	Jun-22	Apr-23	Conducted extensive historical records review including review of third party due diligence work. Designed and implemented subsurface soil investigation to assess possible PCB impacts from historical site uses.	$106,600	Site Analysis, Action Plans, and Reg Review
Bayer Crop Science/Environmental Site Assessment and Property Redevelopment Support	Sep-20	Ongoing	Performed Phase I and Phase II site investigation of agricultural land in support of property acquisitions. Providing environmental support for property redevelopment.	$199,600	Site Investigation
Hawaii Department of Education/XRF Assessment of Building Perimeter Metals, Various Schools, Oahu, HI	May-19	Dec-22	Assist the Facilities Division on building-exterior soil studies at various elementary school campuses on the Island of Oahu.	$775,000	Site Investigation
Hawaii Department of Education/Hazardous Material Assessments, Various Locations, HI	May-16	Ongoing	Assist the Facilities Division on building-exterior soil studies at various school campuses in Hawaii. Developed recommendations and a soil management plan for any soil impacted by metals or pesticide compounds.	$1,266,235	Site Investigation
County of Hawaii Department of Environmental Management/Kealakehe Scrap Metal Facility Soil Investigation, Kailua-Kona, HI	May-11	Feb-22	Characterized lead in stockpiled soils at a solid waste transfer station and former scrap yard site. Evaluated potential worker exposure hazards. Developed soil disposition plan for presentation to Hawaii Department of Health. Developed engineering design for site remediation and provided construction contractor procurement support. Prepared Environmental Assessment (EA) for the remediation and closure project (final EA and Finding of No Significant Impact published in June 2016). Provided contractor oversight of remedy implementation.	$843,200	Site Investigation
Hawaiian Electric Company/Environmental Studies and Engineering, Oahu, HI	Sep-14	Ongoing	Assist client on multiple soil and sediment studies, including both on-land and in-water sample collection. Provide engineering design services of improvements and remedies under TSCA EPA Region IX oversight.	$5,039,838	Site Investigation
Hawaii Island Community Development Corporation/Removal Action Planning and Implementation, North Kohala, HI	Dec-14	Oct-16	Developed removal action plans for the remediation of a former pesticide mixing facility in support of its redevelopment as residential housing. Provided oversight of arsenic and dioxin impacted soil removal action, and final closeout documentation. Provided contractor procurement support. Site cleaned up and approved for "No Further Action" by Hawaii Department of Health in 2016.	$144,000	Site Analysis, Action Plans, and Reg Review
Various clients/Environmental Site Assessments, Multiple Islands, HI	Jan-11	Dec-14	Performed Phase I and Phase II site investigations of former sugar cane lands, in support of property acquisitions, long-term leases, and divestitures. Phase II investigations included soil sampling and laboratory analysis.	$85,000	Site Investigation
Monsanto Company/Irrigation Studies, Multiple Islands, HI	May-11	Oct-13	Evaluated groundwater resources supporting irrigation water use. Performed hydrogeological and water quality assessments of water resources in basal aquifer systems on Oahu and Maui.	$66,000	Site Investigation

Client Contacts:

State of Hawaii Department of Education - Gary Bignami, Environmental Services Division, (808) 784-5067

Hawaiian Electric Company - Donielle Comeau, Environmental Manager, (808) 543-4509

County of Hawaii - Greg Goodale, Division Chief, (808) 961-8515

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/31/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Alliant Insurance Services, Inc. 353 North Clark Chicago IL 60654	**CONTACT NAME:** Sara Arnold **PHONE (A/C, No, Ext):** 725-245-1061 **FAX (A/C, No):** **E-MAIL ADDRESS:** Sara.Arnold@alliant.com
INSURED INTECON-42 Integral Consulting Inc. 1701 Pearl Street, Suite 200 Boulder, CO 80302	**INSURER(S) AFFORDING COVERAGE** / **NAIC #** **INSURER A :** Crum & Forster Specialty Insur / 44520 **INSURER B :** Continental Insurance Company / 35289 **INSURER C :** Transportation Insurance Compa / 20494 **INSURER D :** Arch Insurance Company / 11150 **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 2005652193 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** [ ] CLAIMS-MADE [X] OCCUR X Contractual Incl X for Railroads GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC X OTHER: XCU			EPK-145660	11/1/2023	11/1/2024	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG 	$ 1,000,000 $ 300,000 $ 25,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
B	**AUTOMOBILE LIABILITY** [ ] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY			BAU 7036127003	11/1/2023	11/1/2024	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) 	$ 1,000,000 $ $ $ $
A	[ ] **UMBRELLA LIAB** [X] OCCUR X **EXCESS LIAB** [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			EFX-123962	11/1/2023	11/1/2024	EACH OCCURRENCE AGGREGATE 	$ 10,000,000 $ 10,000,000 $
C B	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WC 7 36126997 WC 7 36126983	11/1/2023 11/1/2023	11/1/2024 11/1/2024	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
A A D	Pollution Liability Professional Liability Managment Liability			EPK-145660 EPK-145660 PCD1004368-00	11/1/2023 11/1/2023 9/26/2022	11/1/2024 11/1/2024 9/26/2028	See Additional See Additional See Additional	Remarks Schedule Remarks Schedule Remarks Schedule

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

See Attached...

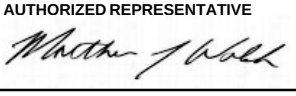
CERTIFICATE HOLDER

Evidence of Insurance

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE



ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
Alliant Insurance Services, Inc.	Integral Consulting Inc. 1701 Pearl Street, Suite 200 Boulder, CO 80302
POLICY NUMBER	
CARRIER / NAIC CODE	EFFECTIVE DATE:

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 25 **FORM TITLE:** CERTIFICATE OF LIABILITY INSURANCE

WC coverage includes USL&H
Stop Gap coverage is included for OH, ND, WA, WY, Insurer A - Policy #EPK-145660
EL $1,000,000 limit; $1,000 deductible

Excess Liability coverage policy #EFX-123962 Effective: 11/1/23 - 11/1/24
Insurer: Crum & Forster Specialty Insurance Company, follows form over General Liability, Employer's Liability, Contractors Pollution, and Professional Liability coverages. Auto Liability is capped at $5,000,000.

Workers Compensation and Employers Liability - All Other States Policy #736126983
Effective: 11/1/23 - 11/1/24, Insurer: Continental Insurance Company
Statutory limits and $1M for EL coverage. Coverage for the following states: CO,CT,FL,HI,ID,IL,IN,LA,MA,MD,ME,MT,NC,NJ,NV,NY,OR,PA,RI,TN,TX,UT,VA

Workers Compensation and Employers Liability – CA Only Policy #736126997 Effective: 11/1/23 - 11/1/24, Insurer: Transportation Insurance Company,
Statutory limits and $1M for EL coverage. Coverage for the following state: CA

Management Liability Coverage: Policy #PCD1004368-00 Effective: 9/26/2022-9/26/2028
Insurer: Arch Insurance Company, D&O $2,000,000 limit, $25,000 deductible, continuity date 7/25/07 EPL $2,000,000 limit, $25,000 deductible, continuity date 7/25/07 Fiduciary $3,000,000 limit, $0 deductible, continuity date 7/25/07 Crime (employee theft)/ERISA Fidelity $2,000,000 limit $10,000 ded (ded $0-ERISA Fidelity), Kidnap & Ransom $2,000,000 limit each insured event, no deductible

Professional Liability Coverage: Policy #EPK-145660 Effective: 11/1/23 - 11/1/24
Insurer: Crum & Forster Specialty Insurance Company
$1,000,000 each act limit: $2,000,000 aggregate limit; $15,000 deductible

Pollution Liability Coverage: Policy #EPK-145660 Effective: 11/1/23 - 11/1/24
Insurer: Crum & Forster Specialty Insurance Company
$1,000,000 per occurrence, $2,000,000 aggregate limit; $15,000 deductible

Maritime General Liability and Employers Liability Coverage: Policy B0507RL2200158, Effective dates: 11/1/23 - 11/1/24
Insurer: Lloyd's Syndicate, $1,000,000 any one accident or occurrence; $10,000 any one accident or occurrence deductible

Marine Equipment Floater Coverage: Policy# MSS003623, Effective dates: 11/1/23 - 11/1/24, $1,000,000
Insurer: Lloyd's Syndicate; 5% each item subject to a min of $10,000 deductible

Cyber Liability Coverage: Policy # C-4LPY-030018-CYBER-2023 Effective: 11/1/23 - 11/1/24
Insurer: Arch Specialty Insurance Company; $2,000,000 limit; $25,000 deductible

Foreign Policy Coverage: Policy # 83HIPBA4640 Effective: 11/1/23 - 11/1/24
Insurer: Hartford Fire Insurance Company; International Commercial General Liability ($1M/occurrence, $2M aggregate, $25K medical expense) International Business Auto (hired and non-owned auto for $1M limit) Employee Foreign Protection ($1M limit each for accident, disease (employee and policy)

Unmanned Aircraft Systems Physical Damage Coverage: Policy #9014191 Effective: 11/1/23 - 11/1/24
Insurer: Global Aerospace, Inc., Insured Value per Schedule
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STATE OF HAWAII

DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS

BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS

This is to Certify that
Avram J Frankel
was duly licensed as a

PROFESSIONAL ENGINEER

In the State of Hawaii.

and is therefore authorized to practice this Profession within the State of Hawaii. In witness whereof, this License has been issued and the Seal of the Board affixed hereto, this 14th Day of March, A.D 2022

No. 19758

Chairperson

STATE OF HAWAII

DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS

BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS

This is to Certify that
ROBERT A WALKER
was duly licensed as a

PROFESSIONAL ENGINEER

In the State of Hawaii.

and is therefore authorized to practice this Profession within the State of Hawaii. In witness whereof, this License has been issued and the Seal of the Board affixed hereto, this 27th Day of June, A.D 2011

No. *14549*

Chairperson