

**Philip A. Spadaro, LG**  
Vice President and  
Principal Scientist

Licensed Geologist, WA  
Licensed Geologist, OR



- 
- Expertise
- Contaminated Sediment Investigation and Remediation
  - Environmental Chemistry Forensics Analysis
  - Technical Support for Allocation, Litigation, and Construction Claims
  - Source Identification and Control
  - Environmental Effects of Dredging and Capping
  - Gas Works Investigation and Remediation
  - Confined Disposal Facility Siting and Design
  - Design Coordination and Management
  - Community Outreach and Communication
  - Waterfront Property Redevelopment

---

Summary

Mr. Spadaro is a leading international expert in urban and industrial waterfront redevelopment, sediment cleanup, and environmental effects of dredging. Technically based in environmental chemistry with strong proficiency in hydrogeology, geology, regulatory affairs, and remediation technology, Mr. Spadaro has over 35 years of experience applying his expertise and management skills to projects where sediment quality is a prominent issue. As a senior technical advisor, Mr. Spadaro provides technical support for litigation, allocation, construction claims, cost-recovery actions and other matters related to sediment remediation. In addition, Mr. Spadaro has extensive expertise in the siting, design, permitting, and construction of confined disposal facilities and in the fate and transport of contaminants in estuarine, riverine, and marine aquatic environments. He is an expert advisor to clients for international sediment management and remediation projects in Europe, the Middle East, and Asia.

Through years of work focused entirely on the remediation of contaminated sediment and land on the urban and industrial waterfront, Mr. Spadaro has developed expertise in application of the available technologies including dredging, capping, monitored natural attenuation, and source control. The successful execution of these highly complex sediment remediation projects demands meticulous planning, strong, scientifically sound technical approaches, and credibility with regulatory authorities. Mr. Spadaro's international reputation for designing and implementing inventive, appropriate, and cost-effective waterfront solutions is anchored in these qualities and in his commitment to seek out and respect the unique needs of every project, client, and cultural setting.

---

Professional Experience

**Expert Consultation for Sediment Remediation Projects in Flanders (2016–Ongoing)**  
Flemish Government and AnteaGroup, Antwerp, Belgium

In Flanders, the management of contaminated upland sites and the management of water are the responsibility of two separate governmental authorities. Sediments are a shared responsibility. The Public Waste Agency of Flanders (OVAM) is responsible for upland cleanup and soil. Sediments fall under the Soil Decree. The Flanders Environment Agency (VMM) is responsible for water management. Sediments are considered part of the aquatic system. Historically, each agency has adopted a different approach to sediment pollution. Increasing demand for use of the historically industrialized waterfront throughout Flanders was looking for a more coordinated approach in which investigation of contaminated upland sites would involve a collateral evaluation of the likelihood of potential sediment contamination. The Flemish Government requested assistance in harmonizing the regulations and addressing several specific sites in Ghent and Antwerp.

---

### **Technical Support of Cost Allocation and Source Control (2014–Ongoing)**

Confidential Client, Seattle, Washington

TIG Environmental is assisting the owner of a recreational marina in Washington State, a participant in a Superfund site allocation and a potential responsible party for a state-led upland remedial action. The Superfund sediment site consists of five miles of an urban and industrial estuarine waterway. TIG Environmental has evaluated potential sources of polychlorinated biphenyls (PCB) contamination in sediments adjacent to the marina and developed an allocation strategy based on forensic chemistry and sediment transport modeling. The soil and groundwater of the marina uplands are contaminated with PCBs, petroleum hydrocarbons, volatile organic compounds, pesticides, and metals that will require cleanup under the Washington State Model Toxics Control Act (MTCA). TIG Environmental's work has identified additional potentially liable persons for release of hazardous materials. These potentially liable persons are now involved in the uplands site investigation and cleanup process. TIG Environmental has completed several source control, remedial investigation, feasibility study, and engineering design tasks that will be further developed under a future Washington State Department of Ecology-administered Agreed Order.

Mr. Spadaro is retained to assist in the development of an allocation strategy in reference to the Superfund site. TIG was asked to evaluate the potential relationship, if any, between the marina, a small recreational boatyard, and sediment contamination that may have been caused by the discharge of hazardous substances, potentially resulting in the need for remedial action and associated response costs. TIG Environmental collected upland and in-water samples and evaluated PCB sources. Several major off-site sources were identified. Two additional potentially responsible parties (PRPs) were identified for the upland site contamination. A separate order will be formulated with the Washington State Department of Ecology (Ecology) for an upland source control study and remediation.

### **Design for Sediment Removal, Capping, and Natural Attenuation (2015–Ongoing)**

Yosemite Slough Cooperating Parties Group, San Francisco, California

TIG Environmental and a co-consultant are conducting pre-remedial design studies aimed at refining the EPA-proposed multi-technology removal action in a contaminated intertidal channel in a highly urbanized area within San Francisco Bay. Studies include specialized evaluations of sedimentation rates; depth of the biologically active zone; bulk sediment and pore water chemistry; erosion and particle transport; and geotechnical parameters. Overall, the studies will support the design for dredging, capping, and natural recovery of the contaminated sediments.

Mr. Spadaro is the director of the design team of engineers and scientists from multiple specialist firms. The design will include multiple proof-of-concept studies and the development of plans and specifications for construction.

### **Technical Consultation and Allocation/Litigation Support (2012–Ongoing)**

Confidential Client, Seattle, Washington

TIG Environmental is providing litigation support to a Washington State agency participating in a Superfund site allocation. The Superfund sediment site consists of five miles of urban and industrial estuarine waterway. The key issues revolve around potential stormwater loads from state-maintained roads, bridges, and properties. TIG Environmental has prepared expert reports that evaluate whether there is a potential relationship between the Superfund site sediment contamination and the discharge of hazardous substances from the state-owned facilities, potentially resulting in the need for remedial action and associated response costs. TIG Environmental is developing an allocation strategy based on sampling and statistical analysis of stormwater, historical and scientific research, drainage pathway delineation, and sediment transport modeling. TIG Environmental is also assisting the state agency with the development of source control plans in accordance with Washington State Department of Ecology's source control strategy.

The Superfund site is the subject of an ongoing cost allocation process. As part of this process, PRPs have agreed to supply an allocator with specific information on historical and current discharges. Mr. Spadaro led a team of scientists developing such information for one of the participants. The work involved historical research, interviews, and development of a conceptual site model of the relationship between the facility and

---

the river. Extensive sampling and research on historical sources of PCBs led to the conclusion that the area adjacent to the subject participant was not the principal source, and that nearby industrial facilities were.

**Expert Consultation for Sediment and Uplands Cleanup Cost Allocation (2015–Ongoing)**

Confidential Client, Bellingham, Washington

TIG Environmental is providing technical support to a former operator of a rock crushing facility that operated on uplands adjacent to an industrial waterway in Bellingham, Washington. The 51-acre site has been occupied by numerous industrial operations, including saw and lumber mills, fish processing, municipal landfilling, bulk fuel storage, coal storage and shipping, and boat maintenance. Sediments within the waterway and soil and groundwater within the uplands require cleanup under Washington State’s Model Toxics Control Act (MTCA). The waterway and uplands are administered as separate cleanup sites by Washington State Department of Ecology (Ecology) under Agreed Orders. Environmental testing confirmed elevated concentrations of mercury, nickel, phthalates, polycyclic aromatic hydrocarbons (PAHs), and dioxin/furans in sediment, and lead, arsenic, mercury, nickel, PAHs, and petroleum hydrocarbons in uplands soil. The client’s former rock crushing operation is identified as the source of nickel. Improper screening levels for nickel were selected and interpreted as enforceable cleanup levels by Ecology during the remedial investigation and feasibility study (RI/FS) phase of both sites. TIG Environmental conducted several technical analyses to evaluate the role of nickel as a contaminant requiring cleanup in sediments and soil. As a result of TIG Environmental’s work, Ecology recognized the improperly selected screening levels and requested that the performing party modify the nickel cleanup levels. Less stringent cleanup levels were developed for use during the cleanup action and used as the basis for allocating a lower percentage share of cleanup costs to the client.

Mr. Spadaro is providing technical support for the case regarding the sources of the subject contaminants, particularly nickel, and the lack of a causal effect in site bioassay tests.

**Expert Review of Remediation of Wood Waste in Sediment (2013)**

Confidential Client/Location

Wood waste is an important issue at many sites. Aside from the potential for related chemical contamination, the physical effects on benthic community structure can be significant. Remediation is not straight forward since these sediments are difficult to dredge or cap due to their very low strength and high water content. This work entailed compiling approaches taken at various sites around the world and assessing capping and dredging at a site in a fjord setting.

**Expert Review of Deep Water Dredging and Capping Technologies (2013)**

Confidential Client/Location

Mr. Spadaro assisted a team of experts in review of currently available and possible future technologies for dredging and capping in approximately 200 meters of water as part of the considerations surrounding the long-term management and eventual decommissioning of offshore oil production assets.

**Technical Consultation and Litigation Support (2013–2017)**

Confidential Client, California

TIG Environmental provided technical support for investigative identification of PRPs associated with an intertidal channel with contaminated sediments. Historical research consisted of identification and review of property records and aerial photographs. Several other PRPs were identified and successfully brought into the case. TIG Environmental used multiple lines of technical evidence and analysis to underpin a cost allocation concept. TIG Environmental also helped its client achieve agreement with EPA on the application of risk-based multi-technology approach to the removal action, which will result in significant reduction in removal volume and cost.

Mr. Spadaro served as senior technical advisor in negotiations with EPA to improve removal action design and address community concerns regarding quality of life issues. He also provided technical support for allocation of cleanup costs to multiple parties.

---

**Technical Consultation and Allocation/Litigation Support (2012–Ongoing)**

Confidential Client, Multnomah County, Oregon

TIG Environmental is providing technical expert support for environmental liability assessment and cost allocation for the remediation of sediments at the Portland Harbor Superfund Site and for the associated Natural Resource Damages claims. The harbor has been the site of numerous manufacturing, shipbuilding, petroleum storage and distribution, metal salvaging, and electrical power generation operations for more than a century. Development of expert reports has included research and forensic analysis to determine the specific contaminant nexus to the sediments for each upland PRP. Specific forensic analysis has included evaluation of potential historical contaminant sources, chemical fingerprinting of PAHs and PCBs, and contaminant fate and transport. Key issues revolve around potential contributions from state-maintained roads, bridges, and other facilities. TIG Environmental is also responsible for evaluating the potential relationship between activities on state-owned submerged lands and the contamination in the river. This effort has included collection and evaluation of sediment, stormwater, and bridge paint samples.

Mr. Spadaro is currently providing expert analysis, advice, reporting, and testimony related to the site. He also supervises a large team of scientists and engineers developing the technical work needed to support the client's position in the case.

**Rehabilitation of Evaporation Ponds (2012)**

Haifa Chemicals Corporation, LTD, Haifa, Israel

Mr. Spadaro served as part of an expert team to evaluate alternatives for rehabilitation of four evaporation ponds associated with fertilizer manufacturing in the Negev Desert in southern Israel. The work involved on-site assessment of conditions, including specialized odor assessment followed by development of rehabilitation alternatives. The selected alternative included dredging of two ponds and capping of a third with the dredged material. Interactions with the Ministry of Environment were crucial in securing permission to accomplish the work.

**Removal Action Studies, Design, and Construction Management, Passaic River Superfund Site (2008–2012)**

Confidential Client, Passaic River, Newark, New Jersey

The Passaic River is one of the most highly contaminated urban and industrial waterways in the world. Mr. Spadaro has maintained a long-term strategic consulting role with one of the involved parties. He provided technical advice on and oversight of numerous technical studies and conceptual design efforts leading ultimately to a plan for sediment removal and off-site disposal. Work included evaluation of stormwater and combined sewer overflow inputs, review of EPA and consultant work products, and preparation of design documents for Phase I and Phase II non-time-critical removal actions of 200,000 cubic yards of highly contaminated sediment. Mr. Spadaro served as technical advisor for a multi-disciplinary team performing studies of sediment quality, dredging, sediment processing, transport and disposal, water quality, hydrodynamics, community health and safety, and confined disposal facility siting and design. He provided review and quality assurance for extensive design deliverable development as well as support and troubleshooting during the construction phase.

**Strategic Consultation and Technical Support for Litigation, Passaic River Superfund Site (2008–2012)**

Confidential Client, Passaic River, Newark, New Jersey

Multiple sources of contamination have contaminated the Passaic River, which passes through one of the most heavily industrialized regions in the world, over a period of approximately 200 years. Mr. Spadaro assisted one of the responsible parties in sediment characterization, source identification and sediment geochronology. Work included development of sampling designs for surface water, sediments, sewers and storm drains. In close coordination with the client's legal counsel, Mr. Spadaro developed white papers and technical reports to catalog sources and provide advice for allocation and cost recovery actions.

---

**Waterfront Facility Redevelopment Plan (2011–2012)**

Southern Wood Piedmont Corporation, Wilmington, North Carolina

Southern Wood Piedmont, the former owner of a wood treatment facility on the Cape Fear River, hired Mr. Spadaro to assist them, their attorneys, and the North Carolina Port Authority (the current site owner) in the development of a comprehensive plan for reuse of the property. The work was performed based on remedial action plans developed by others and included evaluation of container, liquid bulk, and solid bulk facilities.

**Xiawangang Canal Remedial Action Conceptual Design (2011–2012)**

OTEK Pty. Ltd. Of Australia and the Zhuzhou Municipal Economic Authority  
Zhuzhou City, Hunan Province, China

The redevelopment and public safety plans of the city included removal of heavy contaminated sediments from a 4-kilometer canal in an industrial zone. The work, which was conducted on a highly accelerated schedule, included site reconnaissance and preparation of a basis of design report and conceptual design for removal and treatment of 30,000 cubic meters of sediment. Mr. Spadaro supervised a team of engineers and scientists, working around the clock and in two languages, to produce the needed documentation for final designers and contractors locally.

**Department of Sediment Investigation and Remediation Guidance Documents (2011)**

Energy Institute, United Kingdom

The Energy Institute (a consortium of energy companies) retained Mr. Spadaro and others to develop guidance on the rapidly developing regulatory climate related to contaminated sediments in the European Union and the United Kingdom. Using existing knowledge, focused research, and interviews, the guidance was developed at a practical, working level for technical personnel within the member companies.

**Expert Report on Remediation and Cost Effectiveness (2010–2011)**

DLA Piper and BAE Systems, Inc., San Diego, California

The BAE Systems shipyard in San Diego, California was facing litigation related to proposed sediment remediation. Their attorneys retained Mr. Spadaro and other experts to prepare an expert report that evaluates the cost effectiveness of the proposed remedy relative to more extensive, but not necessarily more effective, proposals. The expert work included toxicological and economic evaluations (performed by others) as well as an overall synthesis that was presented to hearing examiners for the California Water Quality Control Board. The examiners found the work definitive and adopted the original remediation plan.

**Control of NAPL Seeps, Pine Street Canal Superfund Site (2006–2011)**

Green Mountain Power, Burlington, Vermont

An existing sand cap that was designed by others to physically isolate chemical contaminants from the overlying water failed, and nonaqueous-phase liquid (NAPL) was seeping through the cap and entering the water column. Mr. Spadaro was retained to evaluate NAPL controls to eliminate seepage into the canal and was readily and economically implemented as partial replacement for the existing sand cap. Serving as principal-in-charge for this evaluation, design, and construction effort, with responsibility for ensuring that activities were consistent with project goals and that technical work products met quality assurance standards. The work included field studies, bench and pilot tests, and, ultimately, design of a light-weight reactive core mattress cap using organoclay to sorb NAPL leaking through the original sand cap. The new cap was successfully installed in 2010 and 2011.

**Emergency Removal of Contaminated Sediments (2010)**

Confidential Client, Wiesbaden, Germany

An accidental release of a dense non-aqueous phase liquid heat transfer fluid required the removal of free product and contaminated sediments from the River Rhine. The work included expedited site testing and field design with contractor assistance for removal and processing of the sediments as well as treatment of dewatered fluids. Mr. Spadaro served as senior advisor for an international team of scientists, engineers, and

---

contractors. The free product and involved sediments were effectively removed and deposited at an offsite disposal facility. Processing included in-barge dewatering with geotubes. Complicating factors included the presence of unexploded ordinance in the sediments and sensitive nearby structures.

**Design of Engineered Containment Facility for Contaminated Sediments (2004–2011)**

Hamilton Port Authority, Hamilton, Ontario

The Hamilton Port Authority, Environment Canada, and the Ontario Ministry of the Environment began constructing an engineered containment facility in the Randle Reef area of Hamilton Harbour, where sediments are contaminated as the result of a coal-tar spill in the 1980s. Mr. Spadaro served as the environmental studies task manager and overall technical advisor for this multidisciplinary project. Critical factors for design included contaminant transport and fate, short-term and long-term water quality, and effluent treatment. The basis of design report and final design are complete and have been accepted by the multi-agency consortium sponsoring the project.

**Development of Conceptual Dredged Material Management Plan (2011)**

Louisiana Office of Coastal Protection and Research, Baton Rouge, Louisiana

The office of Coastal Protection has the responsibility for rehabilitating salt marshes along the coast of Louisiana. Mr. Spadaro reviewed existing dredging and restoration activities with respect to cost and technology. Using historical data and interviews with dredging contractors, he provided a comprehensive evaluation of past practices and recommendations for future dredging and restoration.

**Peer Review of Proposed Remediation Plans (2009–2010)**

Haifa Chemicals Corporation, LTD, Haifa, Israel

The Kishon River Authority proposed a removal action based on historical effluent discharges. Mr. Spadaro reviewed existing information and proposed alternative remediation plans. He also prepared a critical review of site characterization and remedial action plans. Additional work included providing strategic advice on sediment remediation plans and cost allocation.

**Sediment and Water Quality Data Review (2011)**

Confidential Client and Offshore Location, Southeast Asia

Mr. Spadaro was asked to review 10 years of sediment and water quality data related to offshore oil and gas production to evaluate possible environmental impacts of production activity. He provided recommendations for program improvement and additional field studies.

**Review of Corporate Contaminated Sediment Issues (2008)**

Akzo Nobel, Arnhem, the Netherlands

Mr. Spadaro provided training to high level corporate environmental staff in a two-day workshop dealing exclusively with contaminated sediment management. He reviewed contaminated sediment management policies and practices at numerous sites and provided suggestions for technical studies and negotiation strategies to improve outcomes.

**Peer Review of Confined Disposal Facility Design and Management (2009)**

US Army Corps of Engineers, New Orleans, Louisiana

As part of restoration efforts following damage caused by Hurricane Katrina, Mr. Spadaro was retained by the US Army Corps of Engineers (USACE) to evaluate the disposal of contaminated dredge material from the Industrial Harbor Navigation Canal in a nearby confined disposal facility (CDF). He served as overall technical advisor to the project team conducting peer review of CDF design, community safety, and long-term maintenance and monitoring. He also assisted USACE in addressing community concerns about short- and long-term risks of CDF operation as well as the potential for catastrophic failure.

---

**Evaluation of CDF Feasibility (2009–2010)**

Retia (Arkema), Portland, Oregon

Mr. Spadaro served as technical advisor to multi-disciplinary team performing engineering evaluation of the feasibility of a CDF for dichlorodiphenyltrichloroethane- (DDT-)contaminated sediments. Work included negotiation with EPA and conceptual design of sediment removal and a unique cellular cofferdam wall confined disposal facility.

**Sediment Removal Action Evaluation and Design (2007–2009)**

3M Corporation, East Cove, Cottage Grove, Minnesota

Mr. Spadaro provided strategic advice for negotiation of removal action with Minnesota Pollution Control Agency. He evaluated conceptual removal action design, and provided technical oversight for a proposed design-build approach to remove sediments contaminated with fluorinated compounds in a cove adjacent to the Mississippi River.

**Sediment Removal Action (2008)**

3M Corporation, Sayreville, New Jersey

Mr. Spadaro assisted the client with review of proposed removal action at Horseshoe Road Superfund Site on Raritan River. He evaluated capping, removal, and natural recovery.

**Evaluation of Proposed Removal Action (2008)**

Ford Motor Company, River Raisin, Michigan

Mr. Spadaro evaluated the EPA-proposed removal action for contaminated sediments in this highly industrialized river drainage. He advised the client on removal action costs and benefits and evaluated the potential for additional PRP involvement. Mr. Spadaro performed limited sampling to refine agency proposed removal action design.

**Contaminated Sediment Management and Remedial Design (2005–2009)**

Sediment Investigation and Remediation Strategic Consulting, Rada di Augusta, Priolo Site of National Interest  
Confidential Client, Priolo, Sicily, Italy

Mr. Spadaro, defined an overall strategy regarding 9,000,000 cubic yards of contaminated sediments in Rada di Augusta, a 25-square-kilometer bay. The initial review of the Italian government's investigation results and cleanup plan revealed extensive enrichment in mercury from a local chloralkali plant and petroleum hydrocarbon contamination. The government's plan called for large-scale dredging and construction of a confined disposal facility. Since performing the initial data review, focused sampling has been conducted to evaluate conditions in the bay. An engineering evaluation was performed to assess remediation alternatives based on a multi-technology approach appropriate to this enormous and complex site.

**Contaminated Sediment Management and Remedial Design (2006–2007)**

Confidential Client, Navassa, North Carolina

Prior investigation results indicated the presence of lead and other metals in the nearshore sediments adjacent to this former fertilizer plant on the Cape Fear River. Initially asked to review the existing engineering evaluation/cost analysis (EE/CA) as an expert on the remediation of contaminated sediments, Mr. Spadaro conducted pre-design sampling of sediment and wetlands soils needed to support the design of a remedy.

**Litigation Support for a Construction Claim (2006–2007)**

Confidential PRP Group Client, Tacoma, Washington

Mr. Spadaro led a team that provided expert support regarding the validity of a contractor's claim that its own failure to perform construction on schedule resulted from a purportedly inadequate dredging design. He was

---

responsible for supervising engineers who reviewed the design, plans, and specifications and assisting the client's attorneys in developing their litigation strategy.

**Litigation Support, Gashouse Cove Marina (2004–2006)**

Pacific Gas and Electric Company (PG&E), San Francisco, California

Gashouse Cove Marina is located at the site of a former manufactured gas plant (MGP) once operated by PG&E. Sediments in the vicinity were contaminated with (PAHs) from multiple sources, including the MGP. Mr. Spadaro worked with PG&E's legal department to evaluate the City of San Francisco's proposed plan for redevelopment of the marina—the plan calls for dredging, which has the potential to expose contaminated sediments—and the City's claim against PG&E for partial cost of the redevelopment. In addition to litigation support, the team conducted source evaluation and engineering analysis to help ensure that PG&E's level of responsibility was accurately assessed.

**Due Diligence Investigation (2006–2007)**

Port of Tacoma, Tacoma, Washington

Mr. Spadaro served as a consultant to the Port's environmental, real estate, and legal departments as they worked to evaluate the Port's responsibilities and liabilities should it have decided to purchase a large, contaminated property. The effort involved evaluating extensive environmental documentation from a 1970s-era cleanup, the site's 100-year industrial history, its multi-agency regulatory history, and large-scale soil, groundwater, and sediment contamination with chlorinated solvents and caustics.

**Litigation Support for Insurance Cost Recovery (2005)**

Nadler Law Group and Confidential Puget Sound Port Authority

Mr. Spadaro was retained to serve as an expert for a complex insurance cost recovery matter involving numerous waterfront properties. The key element of this case involved cost-recovery claims for construction of a confined disposal facility to contain contaminated sediments.

**Upland Source Control Investigation and Remediation (2004–2005)**

Port of Portland, Portland, Oregon

Mr. Spadaro served as the principal in charge on this 5-year contract to evaluate and clean up multiple Port terminals and other properties along the Willamette River. The work involved review of historical and current site information and ongoing investigation consistent with agreements between the Port and the Oregon Department of Environmental Quality.

**EE/CA for Non-Time-Critical Removal Action (2003–2005)**

Port of Portland, Portland, Oregon

Mr. Spadaro served as the project manager for a 3-year contract to provide technical assistance for the removal of contaminated sediments adjacent to Terminal 4 of the Port. Mr. Spadaro's responsibilities included managing characterization of contaminated Willamette River sediments, preparation of an engineering evaluation/cost analysis (EE/CA) in accordance with the Administrative Order by Consent between the Port and U.S. Environmental Protection Agency (EPA) Region 10, and preparing associated work plans and technical reports. He coordinated with the Port to integrate data and decision making for Terminal 4 with work at the larger Portland Harbor Superfund Site, and incorporated developing upland source control strategies now under development into removal alternatives for Terminal 4. The EE/CA was reviewed by the EPA and accepted without comment.

**Elliott Bay Water Quality Monitoring and Sediment Sampling (2003–2004)**

US Army Corps of Engineers, Seattle, Washington

The Pacific Sound Resources Superfund Site, located on Elliott Bay, has long been a source of hazardous substances associated with former wood-treating operations. Cleanup actions included removing about 700 treated wood pilings, dredging 10,000 cubic yards of contaminated nearshore sediments, and placing a clean



---

sediment cap over about 58 acres of contaminated sediments. Mr. Spadaro supported the construction effort by monitoring water quality during dredging and cap placement and by conducting verification sampling to confirm the integrity and thickness of the engineered cap. He served as the officer in charge for several work elements, including writing the sampling, monitoring, and quality assurance plans, mobilizing in the field to collect water quality and vibracore sediment samples, and coordinating laboratory analysis and data validation. Prior to cap placement, Mr. Spadaro also coordinated physical and chemical testing of the import material to ensure it was suitable for use.

**Sediment Sampling Program at Marine Transfer Stations (2003–2004)**

New York City Department of Sanitation, New York Harbor, New York

Working on behalf of the prime contractor, Mr. Spadaro executed an initial sediment sampling program related to the conversion of eight former marine transfer stations operated in New York Harbor by the New York City Department of Sanitation. Conversion of the solid waste facilities involved demolishing several structures, removing old piles, repairing bulkheads, and dredging to increase navigational depths. Mr. Spadaro served as technical specialist for the sediment sampling program. This was designed to provide preliminary sediment and water quality data to aid in determining the engineering controls needed to limit contaminant releases to surface water during construction, and identify handling, transportation, and disposal options for the dredged sediment.

**Litigation Support for Insurance Cost Recovery (2002)**

Short, Cressman, and Burgess and Confidential Puget Sound Port Authority, Washington

Mr. Spadaro was retained as an expert to review extensive documentation and current site conditions at multiple facilities owned by a mid-sized port authority. The sites included a shipyard, boatyard, landfill, and other types of active and unused facilities. Activities included extensive interaction with the port's attorneys, a review of reports, site visits and interviews, preparation of expert opinions, and depositions. The port prevailed in its complaint and received a settlement in keeping with its expectations.

**North Channel Confined Disposal Facility (2001–2002)**

Port Authority of Venice, Venice, Italy

The Port of Venice was contemplating construction of a large confined disposal facility for containment of contaminated dredge materials. Mr. Spadaro was retained by the Port as a special consultant to address contaminant mobility issues associated with facility construction.

**Sediment Treatment Technology Evaluation (2001)**

State of Washington

Mr. Spadaro served as project manager and senior scientist to evaluate several contaminated sediment treatment technologies for their effectiveness, implementability, and cost under three Washington State Department of Natural Resources-specified scenarios. Two were particular to Bellingham Bay, where a multiagency group is working to establish a model process for selecting disposal sites; the third was more widely applicable to contaminated sediments from throughout Puget Sound. Together, the three scenarios form a natural progression for the development of sediment treatment technology in the region.

**Removal Action at the Olympic View Resource Area (2001–2002)**

City of Tacoma, Tacoma, Washington

The EPA approved a removal action at the Olympic View Resource Area (OVRA) to address approximately 2.2 acres of contaminated marine sediments within the 12.4-acre OVRA site. Mr. Spadaro helped design the removal action—including the development of design and construction documents, design methods, assumptions, and evaluations—and documented quality assurance methods in a construction quality assurance plan. In addition, he was involved in the performance of an engineering evaluation and cost analysis for the removal action that summarized investigation results and evaluated remedial alternatives in accordance with the National Contingency Plan. Following public comment and EPA review, a preferred remedial alternative was selected. The design team's analysis report presented design criteria and regulatory

---

requirements for the preferred alternative, rationales for design decisions, and a detailed construction cost estimate. Mr. Spadaro served as senior technical review scientist for the project.

**Metal Bank Superfund Site Remediation (1998–2001)**

PRP Group, Philadelphia, Pennsylvania

River sediments and upland areas were contaminated with polychlorinated biphenyls from the recycling of 1970s-era transformers and transformer oils at this former metals recycling facility located on the banks of the Delaware River; the design team was responsible for remediation of the river sediments. Mr. Spadaro provided senior technical review during development of the preliminary design submittal to EPA Region III.

**Design of Hylebos Waterway, Phase I Dredging, Slip 1 Disposal (1999–2002)**

Port of Tacoma, Tacoma, Washington

Cleanup of the outer Hylebos Waterway was the third major cleanup in the Commencement Bay Nearshore Tideflats since the bay was declared a Superfund site. Mr. Spadaro served as project manager for all three design projects. In this cleanup, contaminated sediments at the mouth of the waterway were dredged and deposited in a confined disposal facility constructed in Slip 1 at the Blair Waterway. While serving as project manager, responsibilities included senior technical review and oversight of all project elements, including design of both the dredging plan and the containment facility.

**Hylebos Waterway, Area 5106 Dredging and Disposal Project (1999–2002)**

Port of Tacoma, Tacoma, Washington

Mr. Spadaro provided the port with technical oversight as it developed plans for the dredging, treatment, and disposal of approximately 50,000 cubic yards of sediments heavily contaminated with volatile organic compounds. Plans called for hydraulic dredging followed by thermal treatment of the sediments at an upland treatment plant and disposal of the treated sediments in a confined disposal facility to be constructed in Slip 1 of the Blair Waterway. Mr. Spadaro was responsible for reviewing all technical documents on behalf of the Port, including studies of fate and transport and the engineering evaluation/cost analysis.

**Ross Island CAD Cells Assessment (1998–2000)**

Port of Portland, Portland, Oregon

From 1992 to 1998, sediments dredged by the Port of Portland were disposed of under permit at five capped aquatic disposal (CAD) cells in Ross Island Lagoon (Willamette River), where sand and gravel mining was ongoing. In 1999, the port asked the design team to initiate a comprehensive site investigation to evaluate regulatory and environmental issues associated with use of the CAD cells, including such components as contaminant fate and transport, geotechnical stability, and ecological and human health risks. Mr. Spadaro served as program manager and provided senior technical review for the investigation, which incorporated extensive sampling of soil, sediments, and groundwater; a thorough review of the mining and disposal history, including a detailed permit review; biological surveys; risk assessments; and an analysis of lagoon bathymetry and groundwater flow and gradient. Evaluation of the investigation results will be used by the Oregon Department of Environmental Quality to determine whether this type of confined disposal will continue in Oregon. The investigation results demonstrated conclusively that capped aquatic disposal can be accomplished in an environmentally safe manner and that these CAD cells are functioning as intended to isolate Port dredged material from the environment.

**Thea Foss and Wheeler-Osgood Waterways Pre-Remedial Design (1994–2003)**

City of Tacoma, Tacoma, Washington

Mr. Spadaro served as project manager for the sediment remedial design component of this large-scale waterway redevelopment. The 8,000-foot-long waterway receives considerable storm drainage and direct discharges from adjacent industries. The variety of inputs, including effects from operation of a former manufactured gas plant, had caused several inorganic and organic constituents of interest in the sediments, such as oils, tars, polycyclic aromatic hydrocarbons, phthalates, and PCBs. Technical elements of the remedial design included an evaluation of source control measures, a natural recovery analysis, an evaluation of

---

potential disposal sites, a hydrographic survey, and the development of habitat mitigation plans. The remedial design included natural recovery in the mouth of the waterway, enhanced natural recovery in its middle section, and more active remediation at the head of the waterway. Several alternatives were considered for the active remediation, including capping the contaminated sediments in place or removing them to a confined aquatic, nearshore, or upland disposal site. The pre-remedial design process concluded in 2000, and the remediation plan received EPA approval. The remedy incorporated dredging approximately 700,000 cubic yards of sediments and capping 36 acres, including thin-layer and thick-layer caps, and an innovative hybrid sorbent cap that will combine the traditional function of isolation with a treatment component for oily seeps. In addition, Mr. Spadaro managed the design of a confined disposal facility in the adjacent St. Paul Waterway, where the dredged sediments will be placed. He also assisted the city in a related effort to proportionately allocate cleanup costs among numerous non-city potentially responsible parties and to recover the city's costs from its insurers.

#### **Contaminant Mobility Investigation and Dredging Feasibility Study (1998–2000)**

Confidential Client, Massachusetts

Mr. Spadaro served as technical specialist for issues of contaminant mobility and remedial alternatives in the evaluation of an historical manufactured gas plant. The site is regulated under the Massachusetts state cleanup program. He assisted the owners and prime consultants in their assessment of oil-releasing sediments; key to investigation was an evaluation of nonaqueous phase transport from upland areas to sediments, from sediments to the water column, and through the water column offsite to nearby estuaries. He accomplished this analysis through evaluation of existing data, proposing additional data gathering to close gaps, and assisting in the development of a focused feasibility study for remedial action at site. Mr. Spadaro evaluated several technologies, including dredging to remove oil-containing sediments, capping, natural recovery, and controlling nonaqueous phases, both to determine the best available technical approach and to control potential costs. Ultimately, he provided the PRP client with the information necessary to negotiate a financial settlement, relieving it of future liability for the site.

#### **Grand Calumet River/Indiana Harbor Ship Canal Remedial Options Assessment (1997–1999)**

PRP Group, East Chicago/Gary/Hammond, Indiana

On behalf of the PRPs, Mr. Spadaro assessed remedial options for sediments in this system under a Natural Resource Damage Assessment action brought by the Natural Resource Trustees, which included the EPA, the U.S. Fish and Wildlife Service, and the Indiana Department of Natural Resources. He acted as technical specialist for the evaluation of remedial alternatives, and assisted the project team by identifying gaps in the existing data set; defining the need for further technical studies; interpreting existing chemical and physical testing data; establishing the history of dredging and sediment deposition in the waterways; and providing strategic guidance to the PRP group. On the basis of this evaluation, the PRPs made a settlement offer to the regulatory agencies on the basis of this evaluation.

#### **Island End River MGP Site Evaluation (1998–2001)**

Eastern Enterprises, Weston, Massachusetts

Mr. Spadaro was retained by the PRPs to evaluate the feasibility of reconfiguring a confined disposal facility (CDF) proposed to contain sediments contaminated with PAHs at this Boston Harbor site of a former manufactured gas plant. In addition, he assessed methods for managing sheen-producing sediments that will remain outside the CDF's boundaries. He provided senior technical review for these evaluations, with particular emphasis on oil seepage and innovative approaches to the management of oily sediments.

#### **Brooklyn Navy Yard Confined Disposal Area Feasibility Study (1998–2000)**

Brooklyn Navy Yard Development Corporation, Brooklyn, New York

Faced with the necessity of dredging to accommodate ongoing vessel maintenance, Mr. Spadaro evaluated the feasibility of constructing a bermed, nearshore CDF at the head of the Wallabout Channel to contain up to 450,000 cubic yards of dredged material. In addition, the feasibility study examined other disposal alternatives, such as constructing an upland CDF, using the dredged material as landfill cover, or removing the material for offsite disposal under a mine reclamation program. In support of the feasibility study and other

---

efforts, he provided senior technical review, with particular emphasis on the assessment of chemical fate and transport and contaminant mobility. Other elements of the project included development of a conceptual design for the CDF and an evaluation of the regulatory structure and key permitting requirements.

**Fox River Dredging (1998–2000)**

Fort James Corporation, Green Bay, Wisconsin

As a result of historical discharges to the river system, bottom sediments in the lower Fox River are impacted by PCBs. As one PRP, Fort James Corporation had a keen interest in the selection of appropriate, technically sound, and cost-effective remediation and restoration actions. During early planning for a possible remedial action, Mr. Spadaro assisted Fort James in assessing issues broadly associated with its liability. After a demonstration dredging project undertaken by the state and the Fox River Group, a PRP organization, failed to meet expectations and attain cleanup goals, Fort James elected to independently redesign and complete the project as a full-scale removal. For that more recent work, Mr. Spadaro managed technical oversight of the dredging design. Careful engineering of the dredge prism was a key issue; because capacity at the disposal site was limited, cleanup goals had to be achieved while limiting the removal to 50,000 cubic yards. Following the removal action, verification sampling showed that the design team's engineering had successfully met both objectives, resolving Fort James' obligations at the site.

**Claremont Channel Deepening (1997–2002)**

Hugo Neu Schnitzer East (HNSE), Jersey City, New Jersey

This project, a public-private partnership among the State of New Jersey, the City of Jersey City, HNSE (a major metal recycling firm), and Liberty National Development Corporation, incorporated several phases, all associated with improvements in the Claremont Channel. Key elements of the proposed effort included dredging 1.25 million cubic yards of contaminated sediments and beneficially using the dredged material to create five acres of intertidal habitat, as well as to cap two former upland industrial properties and grade a new golf course. Dredged material employed at the upland sites and in the golf course were amended with PROPAT®, a product manufactured by HNSE from auto shredder residue, a recycled material. Mr. Spadaro served as technical specialist regarding matters of dredging design, CDF design, bench-scale and pilot-scale mixing studies, permitting, and project funding, which will include state bond funds and funds designated for demonstrating the efficacy of new remediation technologies.

**Nearshore Confined Disposal Facility (1996–1999)**

River Terminal Development Corporation, New Jersey

Mr. Spadaro served as technical specialist for permitting and conceptual design of the first nearshore confined disposal facility in the New York-New Jersey area proposed for construction specifically to contain contaminated sediments. In the early project stages, responsibilities included negotiating with the Corps of Engineers and regional regulators (including the New Jersey Department of Environmental Protection) to secure the necessary permits. He also led discussions with local environmental groups to develop support for the remediation of severely contaminated sediments, which would lead to some habitat destruction, as well as to redevelop an important waterfront facility. Participation included assessments of contaminant mobility and habitat mitigation requirements.

**Remedial Investigation and Feasibility Study (RI/FS) of Shipyard Sediment Operable Unit (1994–2000)**

Lockheed Martin Corporation, Seattle, Washington

Mr. Spadaro served as project manager for work undertaken on behalf of a PRP. He reviewed the EPA's RI/FS study documents, developed supplemental remedial investigation strategies, and negotiated the statement of work and Administrative Order on Consent with the EPA. Technical aspects of the pre-remedial design studies included surface and subsurface sediment sampling, biological evaluations, and natural recovery analysis. Involvement continued through design analysis and development of a preliminary remedy design that included limited dredging and capping. The design team was successful in demonstrating to the EPA that large-scale active remediation was unnecessary, thus reducing the projected costs of remedial action by more than a factor of 10.

---

### **Litigation Support for Blair, Sitcum, and Milwaukee Waterways Cost-Recovery Action (1995–1997)**

Attorneys for the Port of Tacoma, Tacoma, Washington

Mr. Spadaro supported litigation and cost-recovery actions through investigation of the origins of sediment contamination in the waterways and adjacent upland properties and development of dredging and sediment contamination chronologies. To this end, he implemented a methodology structured to capture all available literature and documentation, including Port contract records, Corps of Engineers files, previous investigations, aerial photographs, and personal interviews. The historical information was then correlated with sediment contamination profiles to provide technical grounds for legal action against insurers and other PRPs. The work culminated with testimony as an expert technical witness.

### **Sitcum Waterway Remediation (1991–1995)**

Port of Tacoma, Tacoma, Washington

Mr. Spadaro served as project manager for this complex, long-term remediation, the largest sediment remediation ever undertaken by EPA mandate. One purpose of the project was to increase container terminal space by filling approximately 70 percent of the Milwaukee Waterway with 1.6 million cubic yards of fill sediments taken from the Blair Waterway (where redevelopment plans called for removing sediments to expand Port facilities) and the Sitcum Waterway (where sediment removal was a component of the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] cleanup). The project began with a conceptual design in the early 1980s and progressed to encompass sediment quality testing, geotechnical engineering, hydrogeologic evaluations, and pre-remedial design and remedial design phases. Conceptualized specialty services executed by the design team included elutriate, leaching, and settling tests; natural recovery modeling; and dredge and disposal water quality modeling. In addition, Mr. Spadaro managed environmental permitting issues and ensured compliance with CERCLA and Clean Water Act mandates.

### **Mercury Contamination Source Evaluation Middle Waterway (1990–1993)**

Foss Maritime, Tacoma, Washington

Mr. Spadaro served as project manager for this investigation of the source of mercury contamination in sediments. He conceptualized and oversaw focused sampling of seeps, upland soils, and sediments to assess ongoing source control measures. This project required a comprehensive review of historical sources of mercury deposits in the waterway, which in turn led to subsequent development of an expanded PRP list. Components of the pre-remedial design included natural recovery modeling and an assessment of the feasibility of various alternatives for confined disposal.

### **Sediment Assessment of Blair Waterway, Slip 2 Nearshore Fill (1987–1990)**

Port of Tacoma, Tacoma, Washington

This logistically complex project called for expanding the land area of Terminal 3 and constructing Terminal 4 at the port by dredging adjacent offshore sediments and using the dredged material to fill Slip 2. As project manager, Mr. Spadaro oversaw the collection of sediment samples using hollow-stem augers, impact coring, and vibracoring through 40–60 feet of water and to 20–40 feet below the mud line. The team was able to significantly reduce the sampling and analysis requirements through negotiation with regulatory agencies. In addition, and of considerable benefit to the client, initial assessment of sediment chemistry was so thorough that when the Port altered its original plan, it was not necessary to negotiate the chemistry requirements.

### **Open-Water Disposal Permit for Sitcum Waterway Maintenance Dredging (1987–2000)**

Port of Tacoma, Tacoma, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. This effort successfully obtained PSDDA-related permits.

---

**Open-Water Disposal Permit for Everett Marina Project (1989)**

Port of Everett, Everett, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. This effort successfully obtained PSDDA-related permits.

**Open-Water Disposal Permit for Hylebos Facility Project (1990)**

Lone Star NW, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. This effort successfully obtained PSDDA-related permits.

**Open-Water Disposal Permit for West Blair Terminal Project (1995)**

Port of Tacoma, Tacoma, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. This effort Successfully obtained PSDDA-related permit.

**Open-Water Disposal Permit for SeaLand Pier Extension Project (1989)**

Port of Tacoma, Tacoma, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. This effort successfully obtained PSDDA-related permits.

**Open-Water Disposal Permit for Pier 7D (1988)**

Port of Tacoma, Tacoma, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. Successful obtained PSDDA-related permits.

**Open-Water Disposal Permit for Terminal 3 (1987)**

Port of Tacoma, Tacoma, Washington

As project manager for Puget Sound Dredge Disposal Analysis (PSDDA) compliance, Mr. Spadaro negotiated with regulatory agencies to develop technically sound and cost-effective sampling plans, oversaw and managed sampling and chemical analyses, and provided senior review of technical studies. This effort Successfully obtained PSDDA-related permits.

**Queen City Farms Superfund Site Waste Pond Closure (1984–1987)**

Rabanco Disposal Company, Washington

Mr. Spadaro served as the owner's representative during construction and provided daily field reports and briefings. Activities at this major Superfund site included extensive geologic exploration and mapping in support of remedial design for closure of four industrial waste lagoons. Exploration techniques included hollow-stem auger, air rotary, and impact hammer drilling as well as test pits and trenching. Mapping of subsurface waste deposits and underlying glacially overridden advance, outwash, and till deposits was critical

---

for successful design of waste excavation, groundwater interceptor trench, impermeable cap, and slurry cutoff wall.

---

- Professional Affiliations
- American Chemical Society
  - Central Dredging Association
  - Western Dredging Association
  - Society of Environmental Toxicology and Chemistry
  - Permanent International Association of Navigational Congresses
  - Society of Industrial Archeology
- 

- Academic Qualifications
- MSc/Geochemistry, University of Chicago, 1983
  - BSc/Chemistry, Cook College at Rutgers University, 1981
- 

Publications and Presentations

Glenn J., A Hackett, P. Spadaro. "Best Practices and Lessons Learned for an Efficient and Equitable Allocation." Poster, Battelle – Tenth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, LA, February 2019.

Spadaro, P., J. Winter-Stoltzman. "Use of a Fiber Optic Temperature Sensor System to Evaluate EMNR/MNR at a Sediment Remediation Site." Presentation, Battelle – Tenth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, LA, February 2019.

Dittman, J. and P. Spadaro. 2017. Who Should Pay for Sediment Cleanup? Paper/presentation, Eighth International Smart Rivers Conference, Pittsburgh, Pennsylvania, September 18–21, 2017.

Spadaro, P., J. Gabster, S. Biondi, F. Sambo, and B. Kellems. 2017. Stormwater Management at Facilities Draining to Sediment Superfund Sites. Paper/presentation, 16<sup>th</sup> Annual Stormwater Conference (StormCon), Bellevue, Washington, August 27–31, 2017.

Spadaro, P.A. 2017. Who Should Pay for Sediment Cleanup? 2017. Paper/presentation, Tenth International SedNet Conference, Genoa, Italy, June 14–17, 2017.

Vanacker, G., P. Spadaro, N. Van den Heuvel, and B. Caussyn. 2017. Remediation of Urban Waterways in Flanders – The Bluegreen Network and Eeklo Example. Paper/presentation, Tenth International SedNet Conference, Genoa, Italy, June 14–17, 2017.

Dittman, J., M. Hayes, D. Profusek, B. Romagnoli, and P. Spadaro. 2017. CERCLA Sediment Remediation – Managing Cost Risk and Uncertainty. Paper/presentation, Ninth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 9–12, 2017.

Glenn, J., P. Spadaro, C. Moody, and R. Reed. 2017. Who Owns the Riverbed? Paper/Presentation, Ninth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 9–12, 2017.

Sittoni, L., K. Cronin, B. van Maren, J. Rego, R. Schueder, P. Spadaro, J. Dittman, C. Moody, and D. Profusek. 2017. A Robust and Effective Approach to Evaluate Impact of Stormwater Discharge to Sediment Concentration. Paper/Presentation, Ninth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 9–12, 2017.

Spadaro, P., G. Vanacker, G. Kayens, W. De Cooman, J. Teuchies, K. Van Nieuwenhove, K. Laurysen, and A. Boden. 2017. Sediment Remediation in Flanders – A New Model for Intragovernmental Coordination. Poster/Presentation, Ninth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 9–12, 2017.

---

Dittman, J.A., Hayes, M.K., Profusek, D.M., Romagnoli, R., and Spadaro, P.A., CERCLA Sediment Remediation – Analysis of Project Cost from Completed and Planned Projects. Presentation and Technical Paper, WODCON 2016, Miami, Florida, June 13–16, 2016.

Spadaro, P. 2015. National Trends and Important Considerations in Sediment Cleanup. Keynote Address at the Oregon Environmental Cleanup Conference, Portland, Oregon, September 18, 2015.

Spadaro, P., J. Beaver, and C. Brown. 2015. Commencement Bay Superfund Multiple CDFs: Designs and Long-Term Performance Evaluations. Presentation, Dredging 2015 Conference, Savannah, Georgia, October 19–22, 2015.

Romagnoli, B., P. Spadaro, C. Moody, P. Bluestein, and P. Brzozowski. 2015. Dredging Operations and the Potential Impacts of Underwater Sound. Presentation, Dredging 2015 Conference, Savannah, Georgia, October 19–22, 2015.

Spadaro, P., M. Henley, J. O’Loughlin, and M.P. Slevin III. 2015. The Role of the Municipality in Cleanup of Contaminated Sediments: Lessons from the Thea Foss Waterway in Tacoma, Washington. Presentation, Ninth International SedNet Conference, Kraków, Poland, September 23–26, 2015.

Spadaro, P., S. Bowerman, J. Dittman, D. Profusek, C. Moody, and K. Maitland. 2015. Evaluation of the Effect of Bridge Coatings on Sediment Quality. Poster/Presentation, International Conference on Contaminated Sediments (ContaSed 2015), Ascona, Switzerland, March 8–13, 2015.

Bowerman, S., P. Spadaro, J. Dittman, D. Profusek, C. Moody, and K. Maitland. 2015. Evaluation of the Effect of Bridge Coatings on Sediment Quality. Poster/Presentation, Eighth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 12–15, 2015.

DeShields, B., M. Pattanayek, P. Spadaro, and N. van Aelstyn. 2015. The Perfect Is the Enemy of the Good: A Rational Approach to PCB Cleanup Goals and Source Control for San Francisco Bay. Presentation, Eighth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 12–15, 2015.

Spadaro, P., M. Henley, J. O’Loughlin, and M.P. Slevin III. 2015. The Role of the Municipality in Cleanup of Contaminated Sediments: Lessons from the Thea Foss Waterway in Tacoma, Washington. Presentation, Eighth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 12–15, 2015.

Dittman, J., C. Moody, P. Spadaro, and D. Profusek. 2015. Methods for Evaluating the Impact of Urban Stormwater on Sediment Quality. Short Course Presented at the Eighth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, Louisiana, January 12–15, 2015.

Romagnoli, B., Spadaro, P.A., Reed, R., Bowman, M., Kellems, B., Bluestein, P., Brzozowski, P., Orchard, B., McIntyre, K., 2013. Construction of Phase I of the EPA Non-Time Critical Removal Action in the Lower Passaic River. WEDA Journal of Dredging Engineering, Vol. 13, No. 1, pp. 16–33.

Romagnoli, B., Spadaro, P.A., Bowman, M., Kellems, B., Bluestein, P., Brzozowski, P., Reed, R., Orchard, B., McIntyre, K., 2013. Design of Phase I of the EPA Non-Time Critical Removal Action in the Lower Passaic. WEDA Journal of Dredging Engineering, Vol. 13, No. 1, pp. 1–15.

Kellems, B., Fabian, K., Orchard, B., Parmelee, R., Bonkoski, B., Spadaro, P.A., Beaver, J., Fitzgerald, W., Santiago, R., Rozenberg, W., 2013. Randle Reef Sediment Remediation Project. Technical Paper/Presentation, Copri Ports 2013, Seattle, WA, August 2013.

Thomsen, F., Spadaro, P.A., Clarke, D., DeJong, C.A.F., DeWit, P., Borsani, F., Goethals, F., Holtkamp, M.J., van Raalte, G.H., San Martin, E., 2013. WODA Technical Guidance on: Underwater Sound in Relation to Dredging. Technical Paper/Presentation, WODCON XX Global Dredging Conference, Brussels, Belgium, June, 2013.



- 
- Baker, K., Spadaro, P.A., Hay, S., MacLeod, C., 2013. Guidance on characterising, assessing and managing risks associated with potentially contaminated sediments. Publication, Energy Institute in cooperation with CONCAWE, London, England, May, 2013.
- Baker, K., Spadaro, P.A., Hay, S., MacLeod, C., 2012. Guidance on characterising, assessing and managing risks associated with potentially contaminated sediments. Poster/Presentation, 2012 Sediment Management Seminar, Ft. Lauderdale, Florida, February 2012.
- Orchard, B., Spadaro, P.A., Gabriel, J., Barry, J., Schifano, V., 2012. Xiawangang Canal Sediment Remediation Project. Poster/Presentation, 2012 Sediment Management Seminar, Ft. Lauderdale, Florida, February 2012.
- Spadaro, P.A., et al., 2011. Underwater Sound in Relation to Dredging. Publication, Dredging and Port Construction. Position Paper, CEDA. Publication, Dredging and Port Design, London, United Kingdom, December 2011.
- Spadaro, P.A. 2011. Remediation of Contaminated Sediment: A Worldwide Status Survey of Regulation and Technology. Publication, Terra et Aqua. The Hague, Netherlands, June 2011.
- Loveland, G., Kellems, B.L., Spadaro, P.A., Bowman, M., Taplin, S., Anson, R. 2011. Rehabilitation an Existing Sand Cap – Construction Challenges. Abstract, 7th WEDA XXXI Technical Conference & TAMU 42 Dredging Seminar, Nashville, TN, June, 2011.
- Cohen, B., Collins, G., Excude, D., Garbaciak, S., Hassan, K., Lawton, D., Perk, L., Simoneaux, R., Spadaro, P.A., Newman, M., 2011. Evaluating Alternatives to Improve Dredging Efficiency and Cost-Effectiveness for Inland Marsh Restoration Projects. Abstract, 7th WEDA XXXI Technical Conference & TAMU 42 Dredging Seminar, Nashville, TN, June, 2011.
- Spadaro, P.A. 2011. A Survey of the Current Approaches to Contaminated Sediment Remediation in Various Countries. Presentation, 7th International SedNet Event. Venice, Italy, April, 2011.
- Spadaro, P.A. 2011. A Survey of the Current Approaches to Contaminated Sediment Remediation in Various Countries. Abstract, Battelle Conference. New Orleans, Louisiana, February 2011.
- Spadaro, P.A. 2010. A Survey of the Current Approaches to Contaminated Sediment Remediation in Various Countries. In proceedings of WODCON XIX. Beijing, China, September 2010.
- PIANC Environmental Commission. 2009. Dredging Management Practices for the Environment: A Structured Selection Approach. PIANC WG 100 (ex EnviCom 13. 2009). Member of the International Working Group 100.
- Dunn, S.M., B.L. Kellems, and P.A. Spadaro. 2009. Long-Term Recontamination Modeling at a Sediment Remediation Site. In Proceedings of the 5th International Conference on Remediation of Contaminated Sediments. Jacksonville, Florida, February 2–5, 2009.
- Parmelee, R., B.L. Kellems, S.M. Dunn, P.A. Spadaro. 2009. Evaluation of NAPL migration mechanisms at the Pine Street Canal Superfund Site. In Proceedings of the 5th International Conference on Remediation of Contaminated Sediments. Jacksonville, Florida, February 2–5, 2009.
- Dunn, S.M., B.L. Kellems, and P.A. Spadaro. 2008. Recontamination Analysis at a Sediment Remediation Site. In Proceedings of the Western Dredging Association, Twenty-Eighth Technical Conference and Thirty-ninth Texas A&M Dredging Seminar. June 8–11, 2008, St. Louis, Missouri.
- Spadaro, P.A., et al. 2007. International group participant to review “Best Management Practices Applied to Dredging and Dredged Material Disposal Projects for Protection of the Environment.” PIANC WG 13. 2007.
- Spadaro, P.A. 2007. Sediment remediation technologies presented at the Environmental Law Education Conference, Washington Environmental Cleanup Conference, Seattle, Washington, June.

---

Spadaro, P.A., and C. Vogt. 2007. Innovation in Dredging through Collaboration – A Worldwide Connection, chaired the WEDA Environmental Commission Panel at WODCON XXVIII Global Dredging Congress, Lake Buena Vista, Florida. May/June.

Spadaro, P.A. 2006. Preparing infrastructure for cargo: Outside the gates. Panel participant, American Association of Port Authorities Conference on Harbors, Navigation, and Environment, Vancouver, British Columbia, June.

Spadaro, P.A. 2006. Program summary of Day 1 and introduction of Day 2, The Harbors and Sediments Conference of the International Society of Environmental Forensics, Honolulu, Hawaii, April.

Fabian, K., and P.A. Spadaro. 2006. The role of confined disposal facilities in contaminated sediment remediation, given at the Third European Conference on Contaminated Sediments, Budapest, Hungary, March.

Spadaro, P.A. 2006. The construction phase of the project, presented at the Environmental Law Education Center Advanced Sediment Conference, Seattle, Washington, September.

Spadaro, P.A. et al. 2003. Hydrogeologic assessment of the north channel CDF, Porto Marghera, Venice, Italy. Proceedings, International Conference on Remediation of Contaminated Sediments, Venice, Italy, September.

Spadaro, P.A., and L. Rosenthal. 2003. The concept of adversarial legalism as applied to waterfront cleanup. Proceedings, International Conference on Remediation of Contaminated Sediments, Venice, Italy, September.

Spadaro, P.A., and M.L. Henley. 2003. Thea Foss Waterway remedial design-Observations for future projects. Poster presentation, International Conference on Remediation of Contaminated Sediments, Venice, Italy, September.

Spadaro, P.A. 2003. Analysis of technical considerations for nearshore CDF design. Poster presentation, International Conference on Remediation of Contaminated Sediments, Venice, Italy, September.

Spadaro, P.A. 2003. Capping of NAPL-containing sediments, presented at the Environmental Law Education Center Seminar on Contaminated Sediments, Portland, Oregon, September.

Mohan, R., and P.A. Spadaro. 2003. State-of-the-art design for capping NAPL-containing sediments. Presentation, Western Dredging Association Twenty-Third Annual Meeting, Chicago, Illinois, June.

Mohan, R., P.A. Spadaro, and D. Ludwig. 2003. Habitat design considerations for in situ caps. Presentation, Electric Power Research Institute workshop on in situ capping of contaminated sediments, Cincinnati, Ohio,

Spadaro, P.A. 2003. Guest instructor, environmental dredging short course, Texas A&M University, College Station, Texas, January.

Spadaro, P.A. 2002. Guest lecturer, theory of adversarial legalism relative to dredging and waterfront redevelopment projects, Goldman School of Public Policy, University of California Berkeley, Berkeley, California, November.

Kellems, B.L., and P.A. Spadaro, R. McGinnis, J. Morrice, and M. Lear. 2002. Design of sorbent cap for control of seepage and sequestration of coal-tar NAPL and PAHs. Presentation, Third Specialty Conference on Dredging and Dredged Material Disposal, COPRI/ASCE, Orlando, Florida.

Moore, R.F., and P.A. Spadaro, and S. Degens. 2002. Ross Island Lagoon - A case study for confined disposal of contaminated dredged material, Portland, Oregon. Presentation, Third Specialty Conference on Dredging and Dredged Material Disposal, COPRI/ASCE, Orlando, Florida.

---

Graalum, S.J., P.A. Spadaro, and M.L. Henley. 2002. Thea Foss Waterway remediation and St. Paul Waterway nearshore fill design. Presentation, Third Specialty Conference on Dredging and Dredged Material Disposal, COPRI/ASCE, Orlando, Florida.

Spadaro, P.A. 2001. Sequential risk mitigation in contaminated sediment management at the Thea Foss Waterway Superfund site, Tacoma Washington, USA. Presentation, International Conference on Remediation of Contaminated Sediments, Venice, Italy.

Spadaro, P.A., R. Moore, and S. Degens. 2001. Confined dredged material disposal investigation, Ross Island Lagoon, Portland, Oregon. Presentation, Twenty-First Western Dredging Association Annual Meeting and Conference and the Thirty-Third Texas A&M University Dredging Seminar, Houston, Texas.

Spadaro, P.A. 2000. Evaluation of five capped aquatic disposal cells in Portland, Oregon. Presentation, Conference on Dredged Material Management: Options and Environmental Considerations, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Graalum, S.J., P.A. Spadaro, and M.L. Henley. 2000. Thea Foss Waterway remediation: Design status report. Presentation, Western Dredging Association XX and Texas A&M Thirty-Second Annual Dredging Seminar, Providence, Rhode Island.

Spadaro, P.A., S. Garbaciak, R.G. Fox, D.W. Matthews, and R.M. Weaver. 1999. Site characterization and remedial design issues for contaminated sediments associated with historical manufactured gas plants. Presentation, Characterization and Treatment of Sediments (CATS 4) Conference, Antwerp, Belgium.

Garbaciak, S., P.A. Spadaro, T.M. Thornburg, and R.G. Fox. 1997. Sequential risk mitigation and the role of natural recovery in contaminated sediment projects (preprint), given at the International Conference on Contaminated Sediments, Rotterdam, The Netherlands.

Spadaro, P.A., M.L. Henley, and J.R. Verduin. 1997. Interim status report: Thea Foss and Wheeler-Osgood Waterways cleanup. Presentation, Western Dredging Association, Eighteenth Annual Meeting.

Verduin, J.R., P.A. Spadaro, and T. Wang. 1996. A general framework for consideration of a nearshore CDF: Contaminated sediment confinement and upland creation. Presentation, Western Dredging Association, Seventeenth Annual Meeting.

Templeton, D.W., and P.A. Spadaro. 1996. The role of natural recovery in contaminated sediment. Presentation, Western Dredging Association, Seventeenth Annual Meeting.

Spadaro, P.A. 1995. Sediment remediation: Puget Sound case studies. Presentation, Law Seminars International's West Coast Conference on Contaminated Sediments.

Spadaro, P.A., D.W. Templeton, G. L. Hartman, and T.S. Wang. 1993. Predicting water quality during dredging and disposal of contaminated sediments from the Sitcum Waterway in Commencement Bay, Washington. *Water Science Technology*, Vol. 28, No. 8-9, pp. 237–254.

Templeton, D.W., P.A. Spadaro, and R. Gilmur. 1993. The role of natural recovery in sediment remediation projects. Proceedings, the International Conference on Contaminated Sediment Remediation, Milwaukee, Wisconsin.