LANGAN

Environmental Regulatory Compliance

Qualifications and Experience

Technical Excellence · Practical Experience · Client Responsiveness



SUSTAINABLE DESIGN

Langan professionals design solutions that maintain the inherent connections between structures and their natural surroundings. The result – sustainable communities for future generations to live, work and play.

HEALTH & SAFETY

Langan is committed to providing a healthy and safe working environment. Langan's goal is to be SAFE (Stay Accident Free Everyday).


Corporate Summary

Integrated Solutions. Measurable Value.

Langan provides an integrated mix of engineering and environmental consulting services in support of land development projects, corporate real estate portfolios, and the oil and gas industry. Our clients include developers, property owners, public agencies, corporations, institutions, and energy companies around the world.

Founded in 1970, Langan employs more than 1,000 professionals in its Parsippany, NJ headquarters and among regional offices in:

- Doylestown, PA
- Bethlehem, PA
- Philadelphia, PA
- Pittsburgh, PA
- New Haven, CT
- Arlington, VA
- New York City, NY
- White Plains, NY
- Trenton, NJ
- San Francisco, CA
- Oakland, CA
- Sacramento, CA
- San Jose, CA
- Irvine, CA
- Bismarck, ND
- Cleveland, OH
- Houston, TX
- Miami, FL
- Fort Lauderdale, FL

Langan International, the firm's wholly owned subsidiary headquartered in New York City, provides all firm services for projects in the Middle East, Eastern Europe, Latin America, and the Caribbean. Langan International regional locations are in:

- Abu Dhabi
- Athens
- Doha
- Dubai
- Istanbul
- London
- Panama

SUSTAINABLE DESIGN:

As the recognized industry leader, Langan's team of over 125 LEED Accredited Professionals provides sustainable solutions for every aspect of your project.

LANGAN

Nationwide Footprint. International Reach.

Headquarters: Parsippany, NJ

Doylestown, PA
Philadelphia, PA
Pittsburgh, PA
Bethlehem, PA
Cleveland, OH

Houston, TX
Bismarck, ND
Washington, DC
Arlington, VA
Miami, FL

Fort Lauderdale, FL
New York, NY
White Plains, NY
New Haven, CT
Lawrenceville, NJ

San Francisco, CA
Oakland, CA
San Jose, CA
Sacramento, CA
Irvine, CA

Abu Dhabi, UAE
Athens, Greece
Dubai, UAE
Doha, Qatar
Istanbul, Turkey
London, United Kingdom
Panama City, Panama

Environmental

Technical and Regulatory Knowledge

Langan works with project teams to provide leading-edge, focused, streamlined investigations and risk-based remediation. We excel in promoting and gaining regulatory acceptance of risk based strategies to obtain cost effective site closures. Langan possesses expertise in a wide variety of projects including state Voluntary Programs, Brownfields, RCRA, State and Federal Superfund, Manufactured Gas Plants (MGP) and Storage Tank programs.

Langan Environmental Services:

- Risk-Based Corrective Action
- Brownfields
- Storage Tank Management
- Due Diligence Support
- Environmental Assessments
- Site Characterization
- Permitting/Regulatory Approvals
- Remediation Design/ Oversight
- Water Resources/Supply
- Hydrological Investigations
- Wastewater and Stormwater Permitting
- Air Modeling
- GIS/Database Management
- Environmental Impact Statements (EIS)
- Manufactured Gas Plant Remediation Services
- Asbestos/Lead-Based Paint Abatement
- Management of PCB-Containing Materials
- Indoor Air Quality/Mold
- Demolition
- Waste Management
- Compliance Auditing
- Ecological Risk Assessment
- Human Health Risk Assessment
  Site Feasibility Studies
- Remediation by Natural Attenuation
- Expert Witness
- Exposure Assessments
- Free Product Volume and Mobility Modeling

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Environmental Services

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Environmental Compliance

Seamless Strategies

Langan's environmental compliance team focuses on the unique needs of our clients to help them understand and fulfill their regulatory obligations on local, state and federal levels while maintaining the design intent of their projects. We develop seamless strategies to streamline environmental management activities in a way that is least burdensome for facility managers and corporate environmental health and safety directors. To maximize our clients' resources and improve overall efficiency, we assist with the implementation of facility or corporate-wide procedures and best management practices, which lead to state-of-the-art environmental compliance programs and management systems.

Our environmental compliance experts have a strong understanding of federal environmental regulatory programs and the state-specific interpretations and implementation plans. We are well-versed in the regulations, and we routinely help our clients understand their applicability for permits and other regulatory requirements, and make important business decisions accordingly. We prepare technically sound permit applications that promote quick approvals from the regulatory agencies. When permits are issued, we advocate on behalf of our clients by negotiating for optimal permit conditions. Our GIS/data management capabilities provide cutting-edge data visualization with figures and flow diagrams to support permit applications, contingency plans, and regulatory submittals. Our extensive practical experience, as listed below, gives us the tools necessary to help you ensure compliance at your facilities.

Langan Environmental Compliance Services:

- Multi-media Regulatory Compliance Audits
- Environmental Management Systems (ISO 14001)
- Compliance Training and Regulatory Guidance
- Applicability Determinations
- Air Quality Permit Applications and Renewals (Title V and Minor Sources)
- Air Quality Compliance Reporting (Emissions Inventories, GHG reporting, compliance certifications)
- Storage Tank Management and Compliance Services
- Contingency Plan Preparation and Compliance Evaluations (SPCC/SPPP/PPC/DPCC)
- RCRA Part A and Part B Permitting
- EPCRA TRI and Tier II Reporting
- Hazardous and Residual Waste Management and Reporting
- Waste Analysis and Characterizatio
- POTW Discharge Permitting
- NPDES Evaluations and Permitting
- Sustainability Reporting

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Air Quality Permitting and Compliance

Focused Facility Evaluations

As regulatory agencies continue to revise their regulations for air-pollution control, ensuring that your facility is in compliance can be an arduous process. Langan's goal is to provide you with a breakdown of the complex regulations and identify the specific requirements applicable to your facility. Our approach is to evaluate facilities for permit applicability and help you make strategic decisions to either qualify for exemptions or minimize the burdensome requirements on your air permits.

We regularly work with clients to prepare applications for installation permits for individual air-emission sources and facility-wide operating permits. Our applications are well-organized and thorough to ensure that the regulatory agencies issue the permit without delay. Knowing that each facility is different, we keep in close contact with regulators while we advocate for the most practical permit requirements to meet the unique needs of our clients. Once a permit is issued, we can help maintain records, calculate emissions, and submit compliance monitoring reports to regulatory agencies.

Langan Air Quality Compliance and Permitting Services

- Applicability determinations
- Regulatory compliance audits
- Title V and minor source permitting
- General permits
- Permit exemption requests
- Ongoing compliance reports
- Emissions recordkeeping
- Environmental Management Systems databases
- Greenhouse gas reporting
- Air permit compliance training
- MACT / BACT reviews
- New Source Review (NSR) permitting
- Prevention of Signification Deterioration (PSD) permitting
- Compliance-management guides
- Visible-emission/opacity evaluations
- PADEP GreenPort Annual Emission Statements (AES)
- NJDEP RADIUS applications
- State-of-the-Art (SOTA) reviews
- Philadelphia source registrations and permitting
- Ozone-season NOx emissions evaluations
- Prescreen modeling
- Stack-testing support

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Contingency Planning

Making Sure You Are Prepared

Petroleum, chemical and waste storage all require contingency plans to keep pollutants out of our waterways and minimize the impact of an accidental discharge. Langan works with facility managers and operators of commercial and industrial facilities to prepare contingency plans that meet their specific federal, state, and local regulatory obligations. We review current preventive measures, such as engineered containment structures and facility drainage design. We evaluate employee best management procedures, including those followed during material transfers and equipment inspections. Our contingency plans provide facilities with detailed spill response procedures including immediate countermeasures, internal and external notification requirements, and cleanup procedures to guide facilities during spill scenarios. Finally, Langan assists facilities with employee training on the elements of the contingency plans to meet regulatory requirements for spill prevention and spill response.

While Langan has prepared numerous contingency plans that satisfy a single regulatory requirement, such as SPCC, we also have significant experience integrating multiple facility contingency plans into a single document. This has allowed facilities to streamline their federal, state, and local contingency plan obligations by combining them into one user-friendly plan with cross-references to indicate the regulations that are covered by each section. Our GIS/Data Management services help to provide top-of-the-line figures to clearly identify storage locations, drainage features, and spill control equipment to allow for a quick and effective response to spills. Our goal is to make sure you are prepared and your employees have the tools and knowledge necessary to prevent spills and respond to them in an efficient manner during an emergency situation.

Langan Contingency Plan Services:

- Spill Prevention, Control, & Countermeasures (SPCC) Plans
- Facility Response Plans (FRP)
- Integrated Contingency Plans (ICP)
- Preparedness, Prevention & Contingency (PPC) Plans
- Spill Prevention & Response (SPR) Plans
- Discharge Prevention, Containment & Countermeasure (DPCC) Plans
- Discharge Cleanup & Removal (DCR) Plans
- Stormwater Pollution Prevention Plans (SWPPP)

Multi-Media Compliance Auditing

Covering Your Bases

When it can be exceedingly burdensome to navigate through regulations and make interpretations on applicability within regulatory programs, a multi-media compliance audit can help you cover your bases and ensure compliance for your facility. Langan has developed environmental compliance auditing programs to identify regulated activities at facilities, make determinations on applicability within environmental regulatory programs, identify compliance gaps, and propose corrective actions where necessary to achieve compliance.

Langan's compliance auditing program includes visiting the site to conduct a detailed review of facility operations, preparation of process flow diagrams, regulatory compliance reviews for equipment and operations at the facility, and preparation of an audit report describing the audit procedures, findings, and proposal for corrective actions for any violations discovered. Ongoing compliance recommendations are also included to assist the facility with maintaining compliance at the conclusion of the audit.

Langan has prepared compliance audit reports to evaluate facilities for compliance with the following federal regulatory programs: Clean Air Act, Clean Water Act, Safe Drinking Water Act, RCRA, CERCLA, EPCRA, TSCA, and FIFRA. State-specific regulatory programs are also reviewed in addition to the federal requirements.

Langan Compliance Auditing Services:

- Environmental Compliance Audit Reports
- Applicability Determinations and Compliance Evaluations
- Corrective Action Follow-Up Activities
- Environmental Compliance Management Systems
- Regulatory Program Training

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Storage Tank Compliance

Keeping Your Assets Secure

When storing petroleum products, hazardous chemicals or other regulated substances at your facility, maintaining compliance with applicable federal, state and local regulations for proper storage is of the utmost importance. Keeping your storage tanks in compliance will not only help you prevent costly violations and penalties, but it will also help you keep your assets secure, minimize the chances of a release, and ensure that procedures are in place to respond to releases.

Langan is experienced in providing a full range of regulatory compliance assistance from the initial planning phases of tank installations to tank removal and replacement. We routinely conduct environmental compliance audits to evaluate storage tanks and recommend corrective actions. Our environmental compliance team helps our clients obtain required permits and registrations for tanks and develop contingency plans for spill prevention. Our engineers design new tank systems and prepare specifications for removing and replacing tanks. Langan's field staff assists in overseeing the work of tank contractors to confirm that it is completed according to specifications, as well as identifying reportable releases during tank removal, and conducting site assessments to confirm clean closure.

Langan Storage Tank Compliance Services:

- Storage tank compliance audits
- Engineering design, oversight and facilitation of tank design, upgrade and closure/replacement projects
- Site assessment and reporting requirements for tank closure
- Tank permitting and registration
- Pennsylvania Site Specific Installation Permits (SSIP)
- Preparation of Spill Prevention, Control and Countermeasure (SPCC) Plans and Preparedness, Prevention and Contingency (PPC) Plans
- Geotechnical engineering evaluations for proposed tank installations
- Remediation and closure for contaminated sites

Environmental Compliance for the Oil and Gas Industry

Streamlined Compliance Management

Taking the necessary steps to ensure compliance with environmental regulations can be a burdensome and time consuming task for active players in the oil and gas industry, especially when there are significant opportunities for fast paced growth. Regulatory agencies are constantly trying to keep pace by introducing new industry-specific standards and permit requirements. Having a thorough understanding of both existing and anticipated regulations is vital toward making sustainable decisions for the future.

Langan's environmental compliance team has significant experience providing the oil and gas industry with a full scale of services to streamline compliance, data management, and reporting to keep pace with evolving regulations. For example in the Appalachian Basin, as active participants on the Marcellus Shale Coalition midstream, regulatory and air quality committees, we are among the first to learn about regulatory developments and potential changes that may impact facilities. As strong industry advocates, our team is committed to helping our clients achieve compliance with current regulations, prepare for what is to come, and make important business decisions accordingly.

Langan Oil and Gas Compliance Services:

- Multi-media regulatory compliance audits
- Air quality permits – experience in multiple states and basins
- Title V facility permitting
- Compliance data management systems
- NPDES evaluations and permitting including hydrostatic testing of tanks and pipelines
- Storage tank management and compliance
- Contingency plan preparation and compliance evaluations (SPCC, FRP, PPC, SPR, SWPPP)
- Hazardous and residual waste management (26R) and reporting
- Air emissions calculations and reporting
- EPCRA TRI and Tier II reporting
- Waste analysis and characterization
- Compliance training and regulatory guidance
- Applicability determinations

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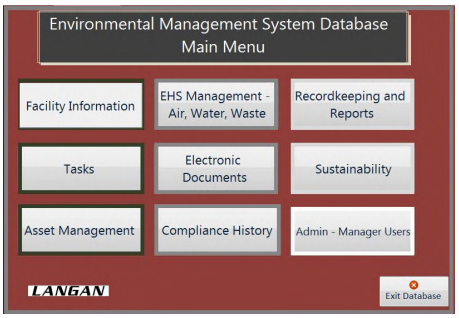
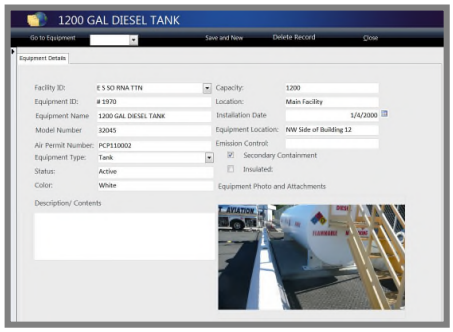
Environmental Management Systems





Custom Database Development Services

Langan designs and programs custom environmental management system databases to assist our clients in managing environmental and operational data to meet a myriad of regulatory, permit, and operational requirements.

Environmental Compliance and Data Management:

Our custom database systems are designed and programmed to emulate your current process workflows and operational practices. This helps to integrate the system into your business practices in the most efficient and seamless manner. Example databases include ISO 14001 Environmental Management System; Safety Data Sheets; Preventative Maintenance; Air and GHG Emissions Calculations and Tracking; and Oil & Gas Environmental and Operational Data Management.

Web-Based, Mobile Application and GIS Component:

The databases are web accessible and can be hosted on either your server or Langan's. Data is encrypted and login is by user name and password. Database features are available based on login privileges. Langan provides these high performance and user friendly applications including web and mobile platforms such as Android, iOS and Windows that allows data entry on a tablet, mobile device, or desktop computer.

Langan's Geographical Information System (GIS) staff are fluent in integrating environmental and operational data with the graphical elements of your facility, equipment, structures and/or assets.

Benefits of Environmental Management Systems:

- Reduced risk of non-compliance
- Functionality to import data automatically
- Support compliance standards across multiple sites
- Fill out inspection forms electronically, instant data upload
- Accessibility of data, documents, manuals and procedures stored electronically with web based access
- Send email reminders and alerts
- Improved productivity and efficiency

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Ecological Risk Assessment

Experts in Ecosystems

Langan's ecological risk assessment staff is experienced with properly identifying ecologically relevant contaminants, environmentally sensitive natural resources, and impacts to ecological receptors. Our scientifically-designed ecological field studies use assessment and measurement tools that effectively evaluate the bioavailability of contaminants due to ecological exposures. Pairing these skills with our expertise in environmental engineering and remediation, sustainable habitat restoration, natural resource permitting, and site development has allowed Langan to provide cutting edge sustainable solutions that help protect ecosystems as well as human health.

Langan Ecological Risk Assessment Services:

- Screening Level Ecological Risk Assessments
- Ecological Risk Assessment
- Wildlife Exposure Modeling
- Sediment Characterization
- Biomonitoring
- Bioavailability Assessments
- Wildlife Habitat Assessments
- Threatened and Endangered Species Surveys
- Natural Resource Damage Assessment
- Habitat Restoration and Sustainable Design
- GIS/Database Management
- Wetland Delineation
- Environmental Impact Statements
- Streambank Restoration
- Remediation Design/ Oversight
- Environmental Assessments
- Site Characterization
- Management of PCB-Containing Materials
- Human Health Risk Assessment
- Site Feasibility Studies
- Remediation by Natural Attenuation

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Natural Resources/ Permitting

Navigating Policy and Nature

Langan has developed strong relationships with federal, state and local regulators through our experience in more than 1,000 wetland and permitting projects. Our Natural Resource staff consists of certified professional wetland scientists, ecologists and wildlife biologists with extensive experience throughout the United States. Our federal and state permitting specialists work closely with our engineers to design a "permittable" project while providing the most economic return to our clients. Our ability to identify critical natural resource issues early in the design process and our in-depth understanding of regulatory programs and policies result in an expedited application and approval process.

Langan Natural Resources/Permitting Services:

- Wetland Delineation
- Army Corps of Engineers Section 10/404 Permit Applications
- State Permit Applications to Agencies, including SEQR
- Environmental Assessments / Environmental Impact Statements (EIS)
- NEPA Environmental Review Documents
- Alternatives Analysis
- Wetland Mitigation Design (Creation, Restoration, Enhancement)
- Wetland Mitigation Banking
- Coastal/Waterfront Development Permitting and Planning
- Dredge – Cut / Fill Analysis
- Wildlife Surveys and Habitat Assessments
- Threatened and Endangered Species Surveys and Habitat Assessments
- Essential Fish Habitat Assessments
- Baseline Ecological Evaluations (BEE)
- Natural Resource Damages Assessments
- Ecological Risk Assessment
- Wetland Functional Assessments
- Streambank Restoration / Bioengineering

Hazardous Materials

Safety First

Asbestos

Langan routinely performs buildings investigations for city, state and federal agencies for asbestos-containing materials (ACM). Our ACM surveys typically include review of original design documents, construction records, review of environmental reports for the property, site assessment, and the collection and analysis of bulk samples. In occupied buildings, the survey typically will not include intrusive means of access such as puncturing the walls, ceilings, or core sampling of roofing materials. Samples are typically collected following the AHERA regulations and are analyzed using Polarized Light Microscopy (PLM). Intrusive investigation of concealed spaces is performed only upon receiving written authorization.

Non-friable organically bonded (NOB) materials, such as roofing, Vinyl tiles, etc., which may present difficulty in identifying asbestos by PLM, are re-analyzed using Transmission Electron Microscopy (TEM), in accordance with the State requirements. All sampling is performed by Langan asbestos professionals, who are certified Asbestos Hazard Emergency Response Act (AHERA) inspectors under USEPA and licensed to practice in individual state.

Lead-Based Paint

Lead-based paint surveys are also routinely performed when directed by our clients. Langan utilizes a Niton fluorescence (XRF) Spectrum Analyzer to inspect the buildings for the presence of lead-based paint. The results of the inspection are compared to the federal HUD Guidelines governing lead in paint. The inspections are usually performed to address worker exposure to lead under 29 CFR 1926, and the disposal of demolition/ construction debris under the Federal Resource Conservation and Recovery Act (RCRA).

In addition to LBP screening inspection, we also perform waste characterization study for classification of the demolition debris. The recommended sampling protocols developed by the United States Environmental Protection Agency (USEPA) and those established by the United States Department of the Army's Environmental Hygiene Agency are primarily followed during the characterization study.

Industrial Stormwater

Experts in the flow of NPDES Permitting

Langan's environmental staff are experienced with evalauting stormwater flows and determining National Pollutant Discharge Elimination System (NPDES) permitting and on-going complaince requirements. Stormwater is regulated on both the federal and state levels during periods of construction and after industrial operations have begun. We can evaluate the areas of your facility where pollutant sources may contribute to stormwater pollution, offer solutions to reduce or eliminate exposure of pollutants to stormwater with engineering and non-engineering Best Management Practices (BMPs), and potentially avoid the need for permitting altogether when possible.

If potential pollutant exposure exisits at your site, Langan experts will evaluate conditions and receiving waterbodies to determine if coverage under an existing General Permit is the proper path forward or if an indivdual permit is required. We work with the regulatory agencies as your advocate during the entire permitting process, from pre-application meeting through technical reviews, commenting on draft permit conditions untill your final permit is issued.

Langan's Industrial Stormwater Services Include:

- Source evaluations
- Regulatory applicability determinations
- Engineering and non-engineering BMP recommendations
- Certifications of no-exposure
- General NPDES Permits for construction activities
- General NPDES Permits for industrial stormwater discharges
- High Quality or Exceptional Value receiving water identification
- Individual NPDES Permits for industrial stormwater discharges
- Periodic sampling and reporting services

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Indoor Air Quality

Indoor Air Quality

Most people are aware that outdoor air pollution can damage their health, but many do not know that indoor air pollution can also have significant health effects. USEPA studies of human exposure to indoor air pollutants may be 2 to 5 times, and occasionally more than 100 times, higher than outdoor levels. These levels of indoor air pollutants may be of particular concern because most people spend 90% of their time indoors.

Energy conservation measures for office buildings instituted during the early 1970s have minimized the infiltration of outdoor air and have subsequently contributed to the build-up of indoor air contaminants. Additionally, concern about indoor exposure to mold has been increasing as the public becomes aware that exposure to mold can cause a variety of health effects and symptoms.

Langan provides an experienced team of qualified professionals committed to the highest level of technical excellence and client responsiveness. Our approach is to provide cost-effective practical engineering and environmental services to guide projects to successful completion.

Langan currently provides a variety of services relating to indoor air quality concerns. Examples of these include indoor air quality profiles, microbial contamination assessments, construction and/or renovation inspection and oversight, health and safety monitoring, environmental compliance, preparation of remedial plans/specifications/contract documents, project management, indoor air quality testing and industrial hygiene studies. We also provide indoor air quality training programs to public and private clients.

Vapor Intrusion Evaluation and Mitigation

Experts in Vapor Intrusion

Langan's environmental staff are experienced with evalauting and mitigating vapor intrusion, the migration of volatile chemicals from the subsurface into overlying buildings. In the mid-1990's vapor intrusion became more widely recognized by the environmental regulatory community as warranting specific attention. Since that time, Lanagan has been active in both state and federal regualtory programs in helping develop guidance for the various stages of vapor intrusion including receptor evaluation, investigation, remediation, monitroing, and closure. Our environmental technical staff are familiar with established protocols for investigating the vapor intrusion pathway including the recommeded number of sub-slab soil gas and and indoor air samples based on the size of the building footprint and numerous other building and site-specific technical factors.

Langan has developed an in-house vapor intrusion training program focusing on the following aspects of vapor intrusion:

- General vapor intrusion concepts
- Field sampling demonstrations
- Field methods and analyses
- Data evaluation (including modeling)
- Remedial methods

Langan's Vapor Intrusion Services Include:

- Screening for property transactions (ASTM E2600-10)
- Receptor evaluations
- Soil gas sampling (sub slab and near slab)
- Indoor air sampling
- Background/ambient sampling
- Off-site residential sampling and mitigation programs
- Community interaction for VI evaluation programs
- VI modeling
- Industrial, commercial, and residential mitigation systems
  - Barriers
  - passive ventilation
  - active depressurization
- Operation and maintenance monitoring

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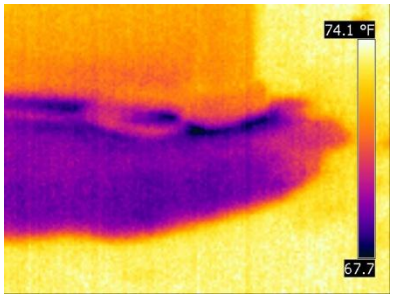
Industrial Hygiene



Environmental Health and Safety

People are exposed to various hazards every day whether they are at work or play. Most people don't think about their exposures, however, until a health issue arises — at which time the damage has already been done. Langan's Industrial Hygiene Department helps clients monitor worker and community exposures of various hazards so the proper corrective actions can be implemented to protect against overexposure.

Our industrial hygienists can monitor and help determine the proper engineering and administrative controls, as well as the personnel protective equipment, to reduce or eliminate exposure to chemical, noise, heat, biological, and physical hazards. These hazards may include asbestos, lead-based paint, bacteria, mold, vapor intrusion, particulate matter, and volatile organic and inorganic compounds.

Langan provides an experienced team of qualified professionals who assist in managing or instituting OSHA-required health and safety programs such as respiratory protection, lockout/tagout, and hazard communication.

Langan has provided a variety of industrial hygiene services to a wide range of clients including government agencies, hospitals, manufacturers, general contractors, hotels, condominium associations, radio and television companies, retail businesses, and private homeowners.

Langan and the ITRC

An Advocate for Progress

Langan is an active member of the Interstate Technology and Regulatory Council (ITRC). Established in 1995, the ITRC is a state-led, national coalition of representatives from the environmental regulatory agencies of all 50 states and the District of Columbia, the Department of Defense, the Department of Energy, and the Environmental Protection Agency as well as consulting firms, technology vendors, academia, and tribal and public stakeholders.

Langan maintains a strong partnership with ITRC and participates on the Board of Advisors and many ITRC technical teams. Langan was recommended for a leadership position on the ITRC Board of Advisors by members of the ITRC Industry Affiliates Program, which is the private sector component of the ITRC. Langan represents private sector interests on the ITRC Board and participates in guiding the mission and long term growth of the organization. These efforts help ITRC advance the development and acceptance of innovative environmental technologies throughout the United States and in the international market.

> "Langan has been recognized in 2007 and 2008 as "Outstanding Team Contributors" for work in developing Technical and Regulatory Guidance documents published by the Enhanced Attenuation and Chlorinated Organics Team and the Bioremediation."-DNAPL Team

Langan personnel share their expertise and experience as active members of the ITRC Teams listed below:

- Attenuation Process for Metals and Radionuclides
- Bioremediation-DNAPL
- Brownfields
- Contaminated Sediments
- Enhanced Attenuation of Chlorinated Organics
- Integrated DNAPL source Strategy
- Mining Waste
- Remediation Risk Management Sampling and Characterization

RCRA Services

Taking the Lead

The process of investigating and closing Resource Conservation and Recovery Act (RCRA) sites has evolved to the point that all sites should have a clearly defined exit strategy to address and close out all responsible party remedial obligations. Langan is at the forefront of applying existing tools in innovative ways to streamline effective closure at RCRA sites. Such tools include: EPA's Environmental Indicators, Memoranda of Agreement between EPA and state voluntary cleanup programs, brownfield redevelopment initiatives, and sustainable or green remedial design elements. Langan offers practical experience integrating these tools into creative and effective exit strategies.

Langan provides the technical services to develop, negotiate, and implement RCRA Facility Assessments (RFAs), RCRA Facility Investigation/Corrective Measures Studies (RFI/CMS) work plans, remediation focused investigations, risk assessments, corrective measures studies (CMS), corrective action remedial designs and remedy implementation.

Langan takes great pride in completing the first RCRA project that achieved Final Agency Determination under the One Cleanup Program. Currently, over 30 states have entered into Memoranda of Agreement (MOA) with the EPA through its One Cleanup Program initiative. The MOA dictates the process for sites to be remediated by following the state's Brownfield program while concurrently satisfying RCRA corrective action obligations. These MOAs, in conjunction with other state and EPA initiatives, help facilitate the closure, redevelopment and productive re-use of numerous RCRA sites nationwide.

CERCLA Services

Risk-Reducing Remedies

Langan provides comprehensive technical services to support negotiations, technical/regulatory strategy, and remedial implementation of projects governed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Langan's staff has successfully negotiated Record of Decision (ROD) changes and Explanations of Significant Differences (ESD) to obtain more cost-effective risk-based solutions or to align a site toward becoming de-listed.

The firm has engineered conceptual and detailed designs of full-scale soil, groundwater, surface water, and sediment remediation systems that integrate conventional and innovative solutions to achieve practical remedial action objectives. Our services to support CERCLA projects include remedial strategy, investigation, risk assessment, remedial design, and oversight and management of remedy construction and post-construction monitoring.

Langan has valuable experience working with multiple PRPs and PRP groups. Serving as the group technical coordinator and also as the prime consultant for one of the PRPs, Langan has effectively balanced the individual needs of the PRPs while affecting solutions that benefit specific interests with the needs of the group, and are acceptable to all agencies. Langan's technical expertise and focus on client responsiveness results in significant savings by influencing post-ROD changes to remedies that are technically sound, practical, and cost effective.

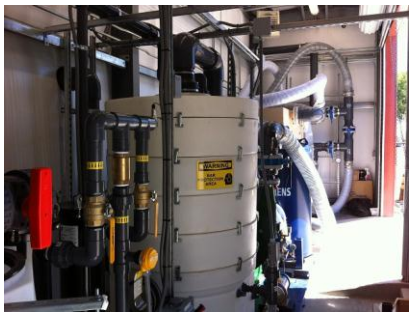
Probabilistic Cost Estimating and Decision Analysis

Langan provides an extensive range of services in project risk management. Our capabilities include probabilistic cost estimating, performance assessment, and decision analysis. These services have assisted our clients in assessing alternative site remediation approaches, implementing effective negotiation and litigation strategies, and making difficult business decisions. These projects require special expertise in risk analysis methods and project risk management principles which draw on our technical capabilities in engineering and earth sciences. Langan provides added value to clients by combining our extensive technical experience in environmental and geotechnical engineering with risk analysis. The services we provide include:

- Probabilistic cost estimates for soil gas, soil and groundwater remediation for use in cost negotiations among multiple parties involved in property transactions, coverage negotiations with insurance carriers, and long-term budget allocation
- Probabilistic performance assessments of remediation systems to predict the likelihood of meeting discharge criteria, cleanup levels and O&M budgets
- Decision analyses to evaluate site remediation alternatives and identify preferred alternatives, to prioritize cleanups, or to identify best land uses for redevelopment
- Probabilistic cost estimates combined with decision analyses to support settlement negotiations with multiple potentially responsible parties (PRPs) and negotiations with regulatory agencies

The benefit of using probabilistic methods is that they provide for a systematic and quantitative assessment of uncertainties in areas such as subsurface conditions, the nature and extent of environmental impacts, remedy implementation time, quantities and unit costs, technology or remedy performance, capital costs, and operation and maintenance requirements and costs.

Remediation Technology



Langan is experienced with process and system engineering.

Langan has designed, installed and operated air sparging systems.

Langan is a leader in the use of innovative *in-situ* remediation technologies. Our "hands-on" approach and practical experience extend to all phases of a remedial program, including technology selection, treatability and pilot studies, remedial design, and remedy implementation.

Technology Selection

Langan strongly focuses on the strengths and weaknesses of specific remedial technologies, as well as costs and effectiveness. We recognize that remedial technology selection has significant short and long term cost implications, as well as implications on future site use. Not only is the performance of a technology considered, but also the implementability, including the steps and costs of any up-front laboratory or pilot studies required and complexity of installation.

Technology Experience

Langan has direct, hands-on experience with the following remedial technologies:

Chemical Oxidation
- Persulfate
- Permanganate
- Ozone
- Peroxide
- In-Situ / Ex-Situ

Soil Vapor Extraction
- Conventional SVE
- Air sparging
- Dual-phase Extraction

Chemical Delivery
- Pneumatic Fracturing
- Blast Fracturing
- Direct Injection

Bioremediation
- Enhanced Reductive Dechlorination
- Oxygen Releasing Compounds
- Gas Infusion
- Biosparging
- Monitored Natural Attenuation

Chemical Reduction and Stabilization
- Zero-valent Iron
- Chemical and Biological Reduction of Chromium
- Solidification and Stabilization

Process Engineering
- Pump and Treat Systems
- Design, Installation and O&M
- Water Treatment
- Industrial Water Systems

Treatability Testing at NJIT

Treatability Studies

Langan performs most laboratory-scale treatability studies "in-house" through a unique and innovative partnership with the New Jersey Institute of Technology (NJIT) Center for Natural Resources Development and Protection. Langan professionals perform testing programs at NJIT's facilities and work closely with NJIT faculty and students. In turn, these studies are performed with a high degree of technical quality and cost-effectiveness. Because Langan takes the lead in the laboratory work, our treatability studies strongly focus on identifying and solving the key technical obstacles to implementation. We are capable of performing chemical oxidation, bioremediation, soil stabilization/solidification, and complex soil/groundwater column testing.

Langan's Portable Pilot Injection System Being Used at a Chemical Oxidation Project

Pilot Studies

Langan's remediation technology professionals are adept at performing field pilot studies for soil vapor extraction, dual-phase extraction, air sparging, chemical oxidation, and bioremediation. Langan owns pilot-sized skid-mounted units for performing pilot studies of these technologies.

Depth of Knowledge

Langan staff has extensive experience in the development and design of remediation technologies. Our staff has participated in groundbreaking innovations, including the commercialization of bioaugmentation, persulfate-oxidation, and the use of numerical models to predict the performance of air sparging and SVE systems. Members of our staff have Ph.D.'s in environmental engineering and science. In addition, Langan publishes extensively at national conferences, notably the Battelle Remediation Conferences. We also participate in the Interstate Technology Regulatory Council (ITRC), winning awards for our extensive involvement.

Sediment Characterization and Remediation

Dredging through Complexities

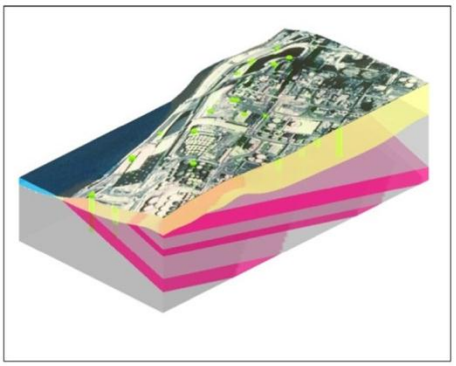
Langan maximizes our service capabilities to provid multi-disciplined approaches toward sediment charactorization and remediation. Our engineers and scientists have extensive knowledge of the biological, chemical, and physical mobility of contaminants in sediment and the effect of other mechanistic influences on sediment mobility. Langan's understanding of these sediment functions is a critical element to our ability to successfully design and implement complex and innovative sediment investigations and remediation projects in various types of waterways and wetland settings. Our intergrated team approach toward sediment remediation has allowed us to restore the health of sediments based on sustainable risk management strategies, yielding immediate and long-term benefits.

Langan Sediment Characterization and Remediation Services:

- Sediment Investigations
- Sediment Remediation
- Environmental Engineering
- Hydrological Testing
- Fate and Transport Modeling
- Structural Design
- Permitting/Regulatory Approvals
- Low Impact Stormwater Design
- Streambank Restoration
- Environmental Assessment
- Remediation Design/Oversight
- Green Remediation
- Bioengineering Design
- Feasibility Analysis
- Soil Erosion and Sediment Control Planning
- Habitat Restoration and Sustainable Design
- GIS/Database Management
- Wetland Delineation

LANGAN

Specialty Chemical/ Petroleum Services



Two Decades Tackling Challenges

Due to the high demand for petroleum products and strict regulation of the petroleum industry, it is a challenge for environmental managers to achieve their remedial objectives while complying with ever-changing regulations. Langan has a proven history of helping petroleum managers achieve their objectives at complex sites by developing remedial programs that focus on compliance and risk-based remedial decisions.

Our team of petroleum specialists includes professional geologists, hydrogeologists, engineers and compliance specialists that have been serving the specialty chemical and petroleum industries for two decades. This core team is complemented by an array of in-house services that include site/civil, geotechnical, and natural resource engineering. These broad capabilities allow us to maintain the creativity and technical knowledge required to solve environmental and engineering problems at challenging petroleum sites.

Our Petroleum Services include:

- Site Investigation & Characterization
    - Geologic and Hydrogeologic Characterization
    - Expedited Site Characterization
    - Groundwater and Soil Sampling
    - Comprehensive Database and GIS Development & Management
    - Groundwater, LNAPL, and Surface Water Modeling
    - Detailed Site Conceptual Model Development
- Remediation Engineering
    - Remedial Cost & Feasibility Analysis
    - Bench and Pilot-Scale Remedial System Evaluations
    - NAPL Recoverability Testing
    - Groundwater/NAPL Recovery System Selection, Design and Optimization
    - Remedial System Performance Evaluations
    - Lagoon Investigation and Closure
- Regulatory Compliance
    - RCRA Corrective Action and Environmental Indicators
    - Clean Air Act Compliance (Title V, MACT, RACT, NESHAPs)
    - Toxic Release Inventory Reporting (Form R & A)
    - Groundwater Protection Program Plans
    - Soil Reuse Plan Development

Brownfield Redevelopment

Urban Core Revitalization

Since the 1970s, decades before the advent of the "Brownfield" initiative, Langan has provided comprehensive services for the reuse of urban sites, the decommissioning and subsequent redevelopment of large industrial facilities, and the investigation and remediation of hazardous waste sites.

Langan's value engineering and cost-saving solutions in Brownfield Redevelopment have led to an unparalleled track record of award-winning reuse projects. We have negotiated precedent-setting regulatory agreements, utilized risk-based site closure strategies, provided technical assistance during grant application submission, and served as Technical Program Manager for National Brownfield Pilot programs. Langan has also played a key role in the success of numerous public/private reuse partnerships that facilitated fast-track, large-scale redevelopment projects. Furthermore, we were actively involved with the ASTM E-50.03 Task Group that developed the Standard Guide to the Process of Sustainable Brownfield Redevelopment.

Demolition Engineering

Razed Expectations

Many of our projects involve some level of demolition and site clearing and preparation. Since Langan's earliest days, we recognized that demolition is an important component in the overall site design process. Accordingly, we embrace a comprehensive design approach that integrates opportunities for cost and schedule savings during the demolition to avoid duplicating activities during the construction phases. For example, reusing concrete/masonry material as backfill and selective foundation removal to accommodate new foundations and utilities saves on material disposal costs and avoids unnecessary excavation – each also resulting in time savings.

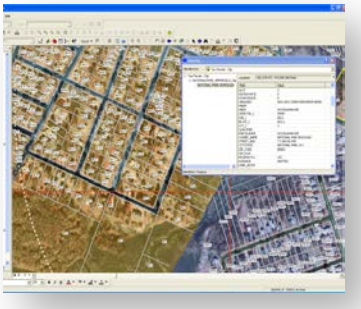
The firm's long list of engineering excellence awards indicates our unique expertise in this area. We have worked on projects from razing single-family homes to complex hundred-plus acre sites with millions of square feet of building demolition and salvage operations.

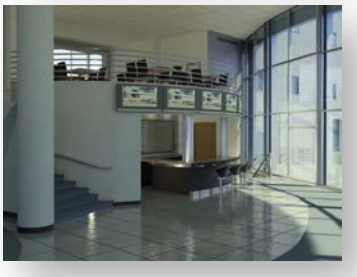
Langan Demolition Engineering Services:

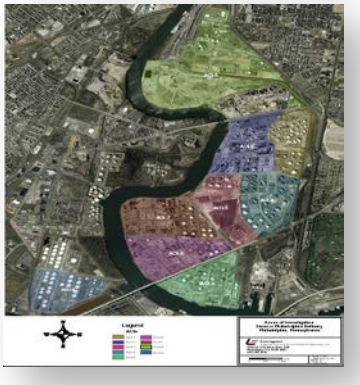
- Demolition Design and Permitting
- Materials Re-Use Design and Waste Flow Management
- Shoring and Bracing Design
- Solid and Hazardous Waste Management
- Integrated Site Preparation Planning
- Hazardous Building Materials Survey and Abatement Design
- Air Monitoring During Abatement Activities
- Demolition Inspection and Project Management

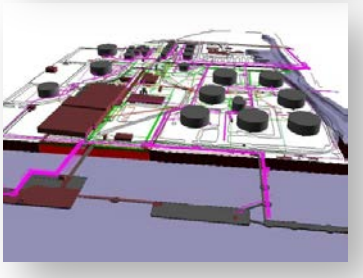
LANGAN

GIS/CAD/ Data Management









Cutting-Edge Data Management and Visualization

Langan utilizes the latest GIS, CAD and Data Management solutions to achieve our client's objectives. Our technical staff is experienced in ArcGIS and manages vast amounts of data for visualization purposes through the program. This includes, but is not limited to, the development and management of large utility databases for infrastructure cataloging and project planning at large oil refineries and major universities. Our staff is skilled in the use of ESRI's ArcGIS suite of applications including ArcInfo, ArcEditor, and ArcMap along with their assorted extensions. This expertise starts outside of the office, where Langan's field staff collects and reduces data in real-time using handheld ArcPAD data collectors, GPS units, and TabletPC's. In managing large environmental and geotechnical data sets, Langan utilizes Earthsoft's EQuIS Chemistry and Geology products in conjunction with ArcGIS. EQuIS, as well as Rockworks, GMS and EVS are fully integrated with ArcGIS and are utilized to provide specialized analysis for visualizing data collected.

For our Site/Civil/Transportation clients, our staff uses Autodesk's Civil 3D and Land Development Desktop to model large commercial, residential and retail projects. We also provide our architect clients with BIM models using Revit Architecture and MEP. These models are created using the point clouds generated by our surveyors who provide 3D laser scanning services.

We provide our client's with easy access to their project data by developing Extranet and Sharepoint data portals for seamless data exchanges between all project team members. Langan has developed custom web-based applications using ESRI's ArcIMS and ArcGIS Server technologies to publish data, maps and metadata so that our clients can access their project information effortlessly.

Langan's GIS/CAD and Data Management group is comprised of professional engineers and software programmers that understand our client's needs, and are able to provide the best technical solutions to meet and exceed expectations.

Langan GIS/Data Management Services:

- GIS Mapping
- Database Management
- Software Training
- Web Design
- Cadd Conversion
- Custom Programming
- 3D Animations
- Software Technical Support
- Software Integration
- Client Data Portals

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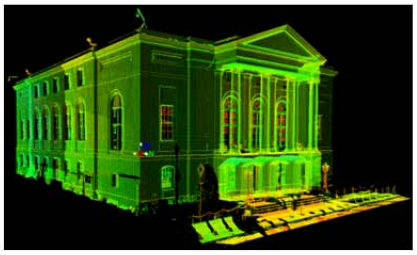
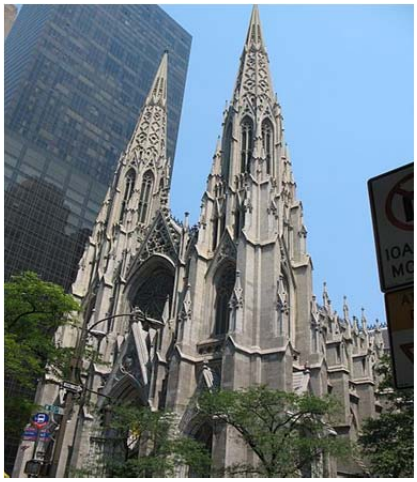
Surveying/Mapping





Accuracy and Efficiency

Langan's survey group provides rapid response times and flexible schedules to meet client needs and maintain schedules for fast-track projects. Our field crews utilize state-of-the-art surveying equipment including electronic data collectors, global positioning systems (GPS), robotic and prismless total stations, and BIM-compatible 3D Laser Scanning.

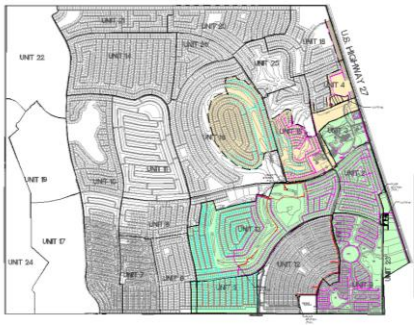
Equipped with Internet-enabled laptops, field crews accommodate design changes in real time and download data into Langan's network where it is edited, adjusted, analyzed and plotted. This allows for mapping that accurately reflects existing site conditions and boundary/legal issues, which could reveal potential problems early in a project's development.

Such technology, coupled with the seamless integration with other firm technical disciplines, enables Langan's survey group to save time and money for our clients.

Langan Survey/Mapping Services:

- Boundary Surveys
- ALTA/ACSM Land Title Surveys
- Topographic Surveys
- GPS
- GIS/LIS Data Acquisition
- Deformation/Monitoring Surveys
- Wetlands Location Surveys
- Utility Surveys
- Subdivisions
- 3D Laser Scanning
- Construction Stakeout
- Hydrographic/Bathymetric Surveys
- Environmental Surveys
- As-Built Surveys
- Photogrammetric Control
- Riparian Surveys
- Highway/Route Surveys
- Geographical Information Systems

Wastewater Infrastructure



Innovation in Wastewater

Langan has extensive experience in a variety of infrastructure projects that include wastewater conveyance facilities. We have successfully designed, permitted and provided construction observation and reporting services for several wastewater conveyance projects in urban areas including pump stations and gravity lines that have resulted in cost savings for our clients once the replacement or rehabilitation work was complete.

Langan approaches design problems with a combination of knowledge, experience, and innovation that renders the most efficient and sustainable engineering solution while maintaining cost effectiveness. Our staff of professionals and scientific specialists combine their knowledge and experience to provide comprehensive engineering services to our clients. They are supported by field personnel who possess an understanding of both the technical aspects of design and construction.

Our available wastewater services are:

- Wastewater Master Planning
- Wastewater Treatment Facility design
- Pump Station and Force Main design
- Gravity Pipe design
- Septic System design
- Low Head Pressure design
- Construction observation

LANGAN

Selected Compliance Project Experience

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VARIOUS ASSESSMENTS THROUGHOUT NEW YORK CITY

SERVICES:

- *Phase I Environmental Site Assessments (ESA)*
- *Petroleum Storage Tank Closure Plan*
- *Operational Assessment*
- *Construction and Site Logistics*
- *Health and Safety Plan*
- *NYSDEC Liaison*

LOCATION:

New York County, New York
Bronx County, New York
Queens County, New York
Richmond County, New York

CLIENT:

Department of General Services

Langan provided design and construction management services for the replacement of underground tanks and the installation of vapor recovery systems at multiple sites located throughout the five boroughs. Langan visited 23 Departments of Sanitation sites to evaluate the number of existing underground storage tanks (active and inactive), fuel consumption and throughput, regulatory compliance issues and additional environmental concerns such as asbestos, oil/water separators, and potable wells. Based on the assessment, Langan and York Hunter recommended preliminary design options, construction and site logistics plans, tank closure plans, and health and safety plans. Langan prepared engineers reports and schedules to the Department of General Services throughout the project.

LANGAN

VARIOUS ASSESSMENTS THROUGHOUT NEW YORK CITY

SERVICES:

- *Environmental Site Assessments*
- *Regulatory Compliance Assessments*
- *Remedial Investigation*
- *NYSDEC Liaison*

LOCATION:

New York State Department of Environmental Conservations (NYSDEC) Regions 2, 3, 5, 6, 7 and 8, New York

CLIENT:

Beattie Padovano, Counsellors at Law
Caspi Development Corporation
Windsor Development Group, Inc.
Industrial Ceramics, Inc.
AT&T
Lehman Brothers

Langan has been retained to provide Environmental Site Assessment and Regulatory Compliance Assessments for a varied clientele, including legal, financial, developers, and industrial. Langan's Environmental Assessment/ Regulatory Compliance expertise has consisted of property inspections, review of environmental and historical information and evaluation of operations relative to hazardous substances, hazardous wastes, liquid and solid waste discharge, state and federal permitting issues, and surrounding property searches. Some of the evaluated properties have included a college campus in Nyack; industrial facility in Lima; 100-year-old typewriter factory in Upstate New York; pulp and paper company in Mechanicville; automotive dealership in White Plains; industrial property in Harrison; undeveloped lands in Clifton Park; Department of Sanitation facilities in New York City, Bronx, Queens, Richmond and Kings Counties and office buildings in New York City.

LANGAN

BLACKHAWK WAREHOUSE FACILITY

SERVICES:

- *Site/Civil Engineering*
- *Geotechnical Engineering*
- *Landscape Architecture*
- *Environmental Engineering*
- *Survey*
- *Permitting*
- *Construction Services*

LOCATION:

Town of Hamptonburgh, NY

CLIENTS:

Blackhawk Development, LLC

Blackhawk Development, LLC proposed to subdivide and develop 37-acres of an 82-acre lot and construct a 1-story, 340,782 SF warehouse facility within the Hudson Crossing Complex. The warehouse facility includes approximately 23,126 SF administrative office, 45,320 SF loading area with office, and the remainder is warehouse space. The facility will be gated and enclosed with a 7-foot high security fence. The site was designed to allow for future expansion of the warehouse. The expansion area is approximately 99,696 SF and at full build-out the building footprint would be approximately 440,478 SF.

Langan was retained to provide site/civil engineering, geotechnical engineering, landscape architecture, environmental, surveying, permitting, and construction administration services. We prepared the topographic and boundary map, subdivision plat, site design, landscape and lighting design, and permitting of the warehouse facility. Langan worked closely with the Town of Hamptonburgh to complete the Generic State Environmental Quality Review Act (SEQRA) Findings Statement consistency compliance review process.

LANGAN

COMPLIANCE ASSESSMENT/REDIAL INVESTIGATION

SERVICES:

- *Environmental Compliance Assessment*
- *Soil and Groundwater Investigation*
- *Remedial Investigation*
- *NYSDEC Liaison*

LOCATION:

New York State Department of Environmental Conservation (NYSDEC) Region 5
Glen Falls, Warren County, New York

CLIENT:

Windsor Development Group, Inc.

Langan was retained by a Real Estate Developer to initially perform an Environmental Compliance Assessment of an abandoned, 100 year-old Auto Supply business and salvage yard. The results of Langan's investigation identified several areas of environmental concern. A soil and groundwater investigation was subsequently performed to evaluate any impact and potential regulatory issues that have a bearing on the project. The results of the investigation and review of applicable regulatory requirements indicated that several remedial measures were necessary to bring the property into compliance.

Langan performed a complete remedial action of the property consisting of underground storage tank removal, characterization, delineation and disposal of petroleum contaminated soils, RCRA hazardous soils, asbestos abatement, and approval from NYSDEC. The property has been completely renovated and serves as a retail shopping mall.

LANGAN

SPCC AND SPILL CONTAINMENT COMPLIANCE EVALUATION

SERVICES:

- *Spill Prevention, Control and Countermeasure (SPCC) Plan Compliance Evaluations*
- *Containment System Compliance Evaluations*

LOCATION:

Various Locations in New York

CLIENT:

Consolidated Edison Company of New York, Inc.

Langan was retained by Con Edison to evaluate SPCC Plans and spill containment systems at 13 waterfront substation facilities for compliance with federal oil pollution prevention requirements for secondary containment of oil-filled operational equipment.

To form the basis of our evaluation, Langan reviewed SPCC Plans, oil spill contingency plans, containment system design basis reports, geotechnical borings, waterfront inspection reports, site drainage plans, and other available drawings provided by Con Edison. Langan personnel visited each site and prepared reports identifying potential spill pathways, recommendations for follow-up investigations, and suggested improvements to each facility's SPCC Plan and overall site containment systems.

LANGAN

SPCC PLANS AND PBS REGISTRATION

SERVICES:

- *Environmental Compliance*
- *Spill Prevention, Control and Countermeasure (SPCC) Plans*
- *Petroleum Bulk Storage (PBS) Registration*

LOCATION:

New York, New York

CLIENT:

The Durst Organization

Langan was retained by the Durst Organization to prepare SPCC Plans for five high-rise commercial office buildings, each of which having diesel fuel storage tanks associated with emergency generators. We conducted site visits to gather information on each tank, secondary containment systems, predicted spill flow directions, and spill control devices used by each facility to prevent potential spills from reaching navigable waters. Each SPCC Plan was reviewed and certified by a Langan professional engineer licensed in the State of New York.

Langan also reviewed petroleum bulk storage (PBS) registration information and prepared applications for information corrections, where necessary, to ensure that each tank was properly registered.

LANGAN

GOETHALS BRIDGE REPLACEMENT

SERVICES:

- *Site/Civil Engineering*
- *Geotechnical Engineering*
- *Environmental Permitting*
- *Natural Resources*

LOCATION:

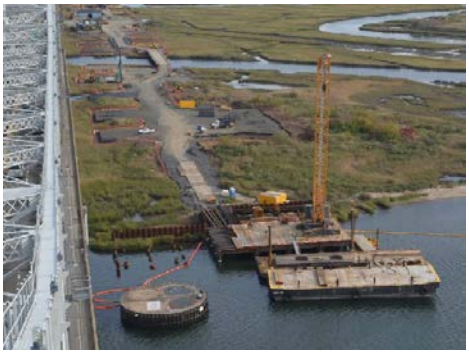
Elizabeth, New Jersey and Staten Island, New York

CLIENT:

Parsons Transportation Group Kiewit-Weeks-Massman, AJV

SPONSOR:

Port Authority of New York and New Jersey



Courtesy of "NYNJ Link Partnership"

Langan performed under a public–private partnership between the NYNJ Link Partnership and the Port Authority of New York and New Jersey for the Goethals Bridge Replacement Project. NYNJ Link will design-build-finance-maintain the new bridge, which will replace the existing Goethals Bridge, for a period of 40 years.

Langan was the lead designer of a temporary access road that was required to provide a stable working platform to construct the new bridge. The road will also serve as a future maintenance road. The access road extends into an existing tidal wetlands complex in Staten Island. Project design plans included nearly one mile of roadway with crane platforms. Challenges related to the filling of the existing wetlands included significant settlements, slope stability, rapid construction, design/build coordination, enormous crane pick loads, bridging over waterways and high pressure product pipes buried in soft ground, and a pre-set fill impact limit of 5.4 acres of wetlands.

As the "Permitting Specialist" for the design phase of the project, Langan addressed a wide range of environmental management and permitting requirements. Engineering and environmental responsibilities included preparation of a draft Environmental Management Plan, wetland impact analysis for concept road plans, draft permit condition compliance reporting submissions, prepared permit modification packages for wetland permitting, and prepared new permit applications required for construction dewatering activities for New Jersey and New York. We prepared Stormwater Pollution Prevention Plans for construction activities and Soil Erosion and Sediment Control Plans for the project footprint along the entire alignment in New Jersey and New York.

LANGAN

HURRICANE SANDY MICROBIAL CLEANING AND REMEDIATION PROGRAM

SERVICES:

- *Environmental Mold and Remediation Consulting and Oversight*

LOCATION:

Queens, New York

CLIENT:

FriendsOfRockaway.org

When Hurricane Sandy landed on New York's shores in October of 2012, it left thousands of residents homeless and millions more without power. Total damages are expected to be in the billions of dollars.

Langan was retained to provide environmental consulting services and oversight during microbial cleaning and remediation efforts in the coastal area of Rockaway, Borough of Queens. Langan observed and verified the effectiveness of work activities associated with a cleanup program that was successfully carried out in a previous effort.

Under the supervision of a Langan Certified Industrial Hygienist, we observed the contractor work and ensured compliance with accepted industry practices. Field personnel completed daily site inspection logs for each of the assigned residences and–following the completion of activities–conducted a post-remediation visual assessment. Langan issued a Final Inspection Verification Form including daily site inspection logs to the client.

LANGAN

FORMER MAYFLOWER HOTEL – PHASE I ESA/LEAD AND ASBESTOS SURVEY

SERVICES:

- *Phase I Environmental Site Assessment (ESA)*
- *Asbestos and Lead-Based Paint*
- *Abatement Design*
- *SEQRA Compliance*

LOCATION:

New York, New York

CLIENT:

Jeffries Avlon, Inc.

Located just east of Central Park in the heart of Manhattan, the former 18-story Mayflower Hotel and the adjacent vacant lot were scheduled for major redevelopment as a multi-story residential building. As part of the development, the 18-story building on site was slated for demolition.

Langan was retained to perform an extensive Phase I Environmental Site Assessment (ESA) in accordance with ASTM Standard Practice for ESA (E 1527-97) and inspection for suspect asbestos and lead-containing building materials. Asbestos and lead were the primary environmental concerns identified during the initial walk-through assessment. A full-scope intrusive asbestos and lead survey was implemented. A total of 173 samples of observed suspect material were collected and analyzed.

The survey also included LBP screening using state of the art X-ray fluorescence spectrum analyzers, confirmatory bulk sampling, and laboratory analysis via Atomic Absorption Spectrometry (AAS).

A final report including the survey findings, recommendation for abatement programs, and cost estimate was produced.

LANGAN

NEW YORK AQUARIUM POST-SANDY REHABILITATION

SERVICES:

- *Geotechnical Engineering*
- *Site/Civil Engineering*

LOCATION:

Brooklyn, New York

CLIENT:

Wildlife Conservation Society

ARCHITECT:

di Domenico + Partners

Outline of New York Aquarium at Coney Island

Having completed a damage assessment in an earlier Federal Emergency Management Agency (FEMA) report, Langan was retained to complete permitting and construction documentation phase services for New York Aquarium's (NYA) restoration efforts. Design services included repair and replacement of damaged site and building features and improvements to bring the NYA infrastructure up to current code. We also provided mitigation services to prevent similar flood-related damages in the future.

Langan's scope included coordination with the architect and design team to document the FEMA-approved scope of work throughout the 14-acre site. Our work included the design of drainage structures and sewers, site features (including hydrants, fencing, and directional signage), site grading, and pavement restoration.

Langan's involvement with site mitigation focused on coordinating designs for an emergency-power facility. We completed sub-surface investigations and coordinated designs for a multi-generator facility, which included the generator housing, switchgear housing, above-grade fuel storage, and load bank. Langan also coordinated with the design team (MEP and structural engineers, architect, and Owner) to avoid existing underground utilities, provide proper interfacing with existing electrical utilities, and prevent undo disturbance to NYA operations.

For the construction of a hybrid flood-defense perimeter, Langan provided site/civil and geotechnical design. This defense system included temporary site flood barriers, which were integrated with flood-hardening of existing buildings to form an overall flood-defense perimeter.

To accommodate temporary flood barriers within the public right-of-way (Surf Avenue), Langan also prepared a revocable consent application for the NYC Department of Transportation. This application included documentation and permitting of temporary flood prevention measures within NYC right-of-ways and included approvals from both NYC Department of Buildings (for emergency egress compliance) and FDNY (for emergency response compliance).

LANGAN

FACILITY RESPONSE PLANS AND SPILL PREVENTION REPORTS

SERVICES:

- *Environmental Compliance*
- *Spill Contingency Plan Compliance Evaluations*
- *Facility Response Plans (FRP)*
- *Spill Prevention, Control and Countermeasure (SPCC) Plans*
- *Spill Prevention Report (SPR)*
- *Chemical Bulk Storage (CBS)*

LOCATION:

East Setauket and Holtsville, New York

CLIENT:

Northville Industries

Langan conducted site inspections and compliance evaluations of Northville Industries' combined FRP and SPCC Plans for their East Setauket and Holtsville oil storage terminal facilities in Long Island, New York. Langan also conducted a compliance review of the Holtsville terminal's SPR for CBS at the facility. Based on our site visits and the results of our compliance evaluations, Langan provided Northville with a summary of recommended upgrades to each plan to ensure they would be consistent with site conditions and in compliance with regulatory requirements.

We prepared plan amendments, including revisions to the text and facility diagrams, in order to address facility changes or inconsistencies observed during site inspections. Our survey team prepared piping schematic diagrams detailing the complex piping systems at both terminal facilities. Plan amendments were certified by a Langan professional engineer licensed in the State of New York.

LANGAN

NYDCEP MONITOR – ENVIRONMENTAL COMPLIANCE TECHNICAL SUPPORT

SERVICES:

- *Environmental Compliance Audits*
- *HazMat Inspections*
- *Facility Remediation Review*
- *Regulatory Negotiations with NYCDEP, NYSDOH, NYSDEC, and USEPA*
- *Traffic Safety Inspections*

LOCATION:

NYCDEP Facilities Throughout Upstate New York Watersheds and the Five Boroughs

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CLIENT:

NYCDEP

Langan was retained by a "DEP Monitor" who was appointed by the federal government to conduct a review of NYCDEP's health & safety and environmental compliance programs. Langan supported the DEP Monitor for approximately eight years, spanning from 2001 to 2009.

Langan provided technical support to the DEP Monitor. The work performed by Langan included inspections and review of environmental-related activities performed by NYCDEP at their facilities located in the upstate watersheds as well as throughout the five boroughs.

Environmental audits were performed by Langan on a routine basis at upstate Bureau of Water Supply (BWS) facilities where NYCDEP was performing significant renovations and improvements to water supply flow control structures (primarily sluice gates and sluice gate operators). Inspections were performed by Langan at Bureau of Water and Sewer Operations (BWSO) facilities to supplement NYCDEP initiated "legacy"-related audits aimed primarily at identifying and mitigating asbestos, mercury, PCBs, and lead within the building facilities.

Technical support for the DEP Monitor concluded with a review of Bureau of Wastewater Treatment (BWT) facilities located throughout the five boroughs. Our supporting role was diverse and ranged from NYCDEP work crew traffic safety audits to NYPDES monitoring compliance review.

LANGAN

NYCDEP WATER SUPPLY TECHNICAL REVIEW

SERVICES:

- *Site Assessment*
- *Permit Overview*
- *Technical Reviews*
- *CERCLA Documentation*
- *Field Audits and Data Review*

LOCATION:

New York, New York

CLIENT:

New York City Department of Environmental Protection (NYCDEP)

Langan is providing technical support to a Federal Monitor appointed to oversee New York City Department of Environmental Protection's (NYCDEP) environmental and health and safety compliance programs. Langan's role has been mostly technical document reviews, meeting support, field activities, permit review, and Administrative Order compliance review. The court- appointed Federal Monitor oversees NYCDEP's environmental and health and safety regulatory obligations in connection with New York City's public water supply, sewer systems, and waste water treatment facilities. Oversight included NYCDEP remediation or permit compliance projects aimed toward rehabilitation of water supply flow and monitoring equipment. Compliance programs were tracked on a regular basis and progress is reported to the Federal Monitor, who reports to the Federal Court. Approximately 300 sites and facilities were tracked. More recently, Langan has reviewed NYCDEP's wastewater treatment plant permits. As part of the remediation/compliance oversight, Langan participated in technical advisory group meetings with United States Environmental Protection Agency (USEPA), New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH) and NYCDEP to review the remediation and regulatory compliance progress being made by NYCDEP.

LANGAN

PETROLEUM BULK STORAGE COMPLIANCE AUDIT

SERVICES:

- *Petroleum Bulk Storage (PBS) Compliance Audit*
- *PBS Facility Registration with NYSDEC*
- *Spill Prevention, Control and Countermeasure (SPCC) Plan Preparation*
- *Environmental Management Systems (EMS)*

LOCATION:

New York and Brooklyn, New York

CLIENT:

New York University

Langan was retained by New York University (NYU) to conduct a petroleum bulk storage (PBS) compliance audit and prepare Spill Prevention, Control and Countermeasure (SPCC) Plans for their storage of oil in 45 campus buildings, including a cogeneration plant. Our auditing team visited each site to evaluate aboveground and underground storage tanks for compliance and gather information needed to prepare SPCC Plans. Storage tanks were audited against the recently updated PBS regulations in 6 NYCRR Part 613. PBS facility registrations were reviewed and compared to onsite observations to identify any inconsistencies with the tank system details and secondary containment features.

After completing the audit and preparing SPCC Plans, Langan developed an environmental management system for NYU's Environmental Health & Safety team. The EMS provides a mechanism for NYU to track the completion of corrective actions, maintain ongoing compliance records, and keep a calendar with important due dates for tank inspections and registration renewals.

LANGAN

PHASE I/PHASE II ESA AND COMPLIANCE EVALUATION

SERVICES:

- *Environmental Due Diligence*
- *Limited Environmental Compliance Evaluation*
- *Industrial Wastewater Discharge*
- *Petroleum Bulk Storage (PBS)*
- *Title V Air Permit*
- *National Emission Standards for Hazardous Air Pollutants (NESHAP)*
- *Hazardous Waste Generator Standards*
- *EPCRA Tier II and TRI Reporting*

LOCATION:

Jamaica, New York

CLIENT:

Puracap Pharmaceuticals, LLC

Langan completed a Phase I Environmental Site Assessment and Limited Environmental Compliance Evaluation for Puracap Pharmaceuticals, LLC on a fast-track due diligence time period in response to a real estate transaction. The site consisted of a 180,000 square feet pharmaceutical manufacturing facility located in Jamaica, New York.

Three recognized environmental conditions (RECs) were identified by Langan during the Phase I ESA and further investigated during expedited Phase II ESA activities which included a geophysical survey and soil, soil vapor, and groundwater sampling.

The Limited Environmental Compliance Evaluation included a review of applicable permit requirements and the facility's compliance status to support negotiations during the real estate transaction. During the Phase I ESA site reconnaissance, Langan also gathered information about site operations and environmentally regulated activities conducted at the facility. The final report included a summary of the environmental compliance requirements that would be assumed upon acquisition of the property and recommendations for additional information to request from the property owner.

LANGAN

AIR PERMITTING FOR COMBINED HEAT AND POWER

SERVICES:

- *Environmental Compliance*
- *Air Permitting*
- *NYSDEC Air Facility Registration*

LOCATION:

New York, New York

CLIENT:

The Related Companies

STRATEGIC PARTNER:

ENER-G Rudox Inc.

Langan was retained by Related to determine air permit applicability and prepare the required applications for three luxury apartment buildings in Manhattan prior to installing new combined heat and power (CHP) units at each facility. To determine the appropriate air permit requirement, Langan calculated potential emissions from the CHP units based on the anticipated operating schedule, equipment specifications, and engine performance data provided by ENER-G Rudox, Inc. We then combined the CHP emission calculations with potential emissions from other fuel combustion sources at the facility (e.g. emergency generators and boilers) to determine the facility-wide potential to emit.

In order for a facility to obtain an air facility registration in lieu of the state facility or Title V permit, the actual emissions must be capped to less than 50% of the major source threshold. Based on the expected operating schedules for the CHP units and other fuel combustion sources, Langan determined that all three facilities would be able cap emissions as required and apply for the air facility registration. We then assisted Related by preparing the required air facility registration forms for each facility and submitting them to the NYSDEC.

LANGAN

CITY OF NEW YORK DEPARTMENT OF CORRECTION – RIKERS ISLAND SPCC UPGRADE PROGRAM

SERVICES:

- *Site Inspection*
- *SPCC Plan Preparation*
- *Detailed Site Plans and Specifications*
- *On-Site Construction Management*
- *Regulatory Permitting*

LOCATION:

Rikers Island, New York

CLIENT:

New York City Department of Design and Construction (NYCDDC)

Langan prepared a Spill Prevention, Control, and Countermeasure (SPCC) Plan for this 440-acre prison facility located in the East River. We also designed required upgrades that included removal of non-compliant aboveground storage tanks (ASTs), installation of new ASTs, and installation of containment structures and curbing. The project encompassed 116 active ASTs and drum storage areas with a total capacity of 185,000 gallons. The work included inspection of the site, development of upgrade options, selection and design of upgrades, preparation of engineering drawings and specifications, and inspection of the work.

As part of the project, Langan inspected each of the island's facilities, developed detailed design drawings and specifications, assisted with New York State Department of Environmental Conservation and New York City Department of Buildings permitting and compliance issues.

LANGAN

1752 SHORE PARKWAY

SERVICES:

- *Geotechnical Engineering*
- *Site/Civil Engineering*
- *Environmental Engineering*
- *CEQR Services*
- *Wetland Permitting*
- *Beneficial Use Determination (BUD)*
- *Petroleum Bulk Storage Compliance and Assessment*
- *Coastal Erosion Hazard Assessment*
- *Environmental Remediation*

LOCATION:

Brooklyn, New York

CLIENT:

Thor Shore Parkway Developers, LLC

ARCHITECT:

Greenberg-Farrow Architects

The 10-acre parcel is a peninsula that extends into the Gravesend Bay near Coney Island, Brooklyn. Langan's geotechnical, environmental, site/civil engineers, environmental planners and wetland specialists played a key role in transforming this site from its historic use as a solid waste transfer station, to a 200,000 SF retail center. The development will also feature a parking garage and 1,400-foot long publicly-accessible waterfront park along the edge of the entire peninsula.

Site planning and design required coordinating the requirements and approvals of many agencies, the largest being New York City Department of City Planning (DCP), US Army Corps of Engineers (USACE), and the New York State Department of Environmental Conservation (NYSDEC) Divisions of Solid Waste, Marine Resources, Water, and Coastal Erosion Hazard.

Langan's integrated services guided the owner through many interconnected components such as soil testing and remediation, earthwork modeling and costing of soil export and re-use, shoreline rip-rap stabilization and design, stormwater management and sustainability, zoning requirements (open space, planting, and circulation), impervious coverage, tidal wetland consistency, and site grading and layout. Langan prepared the NYSDEC and USACE Joint Permit Application, the natural resources chapter for the project Environmental Impact Statement and assisted the owner in submissions to the City Department of City Planning.

LANGAN

THE ABRAHAM JOSHUA HESCHEL LOWER/ MIDDLE SCHOOL

SERVICES:

- *Due Diligence – Phase I and Phase II Site Investigations*
- *Remedial Action Work Plan and Site-Specific Health and Safety Plan*
- *Coordination with NYC Board of Standards and Appeals and NYC Office of Environmental Remediation*
- *Coordination with NYSDEC Spills Program*
- *Remedial Excavation Oversight*
- *UST/AST Removal and Closure*
- *Community Air Monitoring*
- *CEQR Environmental Review*
- *Environmental Assessment Statement*
- *Environmental Specifications and Bid Support*
- *Environmental Engineering*

LOCATION:

New York, New York

CLIENT:

Gruzen Samton Architects
Levien & Company

ARCHITECT:

Gruzen Samton Architects

AWARD:

2014 SARA, NY Chapter, Bronze Honor Award
2014 Learning by Design Magazine, Citation of Excellence
2014 School Planning & Management Magazine, Judge's Choice Award
2013 American School and University Magazine, Combined-Level School Citation Award

Langan conducted due diligence investigations, prepared and implemented a remediation work plan, and conducted a petroleum spill cleanup and community air monitoring for the construction of the Abraham Joshua Heschel Lower/Middle School in Manhattan's "Hell's Kitchen" neighborhood. The services were performed in accordance with New York City Environmental Quality Review (CEQR) as part of an application to the New York City Board of Standard and Appeals (BSA) for a variance from bulk and height zoning requirements and are subject to review by the NYC Office of Environmental Remediation (OER).

The project involved the construction of a 9-story, 150,000 SF Lower/Middle School for approximately 745 students and 185 staff and faculty. The 17,600 SF project site formerly contained an automobile storage facility and an automotive repair shop. Several underground and aboveground petroleum storage tanks were located at the facilities. The proposed facility will include an Early Childhood Center, an elementary school ("Lower School") and a Middle School.

In addition to NYCBSA and NYCOER compliance, the project is being conducted under the oversight of the NYSDEC, following discovery of a petroleum spill during the Phase II ESA. Langan obtained a Notice to Proceed from the NYCOER and is currently overseeing the remedial excavation, community air monitoring, and construction of the vapor mitigation system.

For the CEQR environmental review, Langan prepared an Environmental Assessment Statement (EAS) and supplemental report which evaluated the environmental impacts of the project with and without the variances requested from the BSA. The EAS analysis focused on evaluating stationary source noise impacts and impacts involving potential hazardous materials.

LANGAN

MORRIS PAD WATER-TREATMENT PERMITS AND TRAINING

SERVICES:

- *Compliance Plan*
- *Stormwater Compliance Training*
- *Stormwater Sampling and Reporting*

LOCATION:

Harrison County, West Virginia

CLIENT:

Antero Resources

Langan provided environmental services at the Morris Pad Water Treatment Facility which included developing a facility-wide compliance plan, preparing customized stormwater and groundwater-protection training, collecting stormwater samples, and preparing discharge monitoring reports.

Langan reviewed the facility's General National Pollutant Discharge Elimination System (NPDES) Permit and Stormwater Pollution Prevention Plan and extracted the requirements for a compliance checklist that included due dates and recordkeeping requirements. In addition, Langan developed site-specific recordkeeping forms.

Langan also prepared a site-specific training program, which included a summary of the facility requirements and instructions on how to effectively use the compliance plan. We also trained employees and subcontractors at the well pad site.

Additional services included ongoing semi-annual sampling of stormwater discharge for the facility's general NPDES permit. Samples were collected and sent to a certified laboratory for analysis, and the results were submitted using the West Virginia Electronic Discharge Monitoring Reporting (eDMR) system.

LANGAN

RYDER SYSTEM DUE DILIGENCE SERVICES

SERVICES:

- *Phase I Environmental Site Assessment (ESA)*
- *Phase II Environmental Site Assessment (ESA)*
- *Regulatory Compliance Audit*

LOCATION:

Miami, Riviera Beach, and Orlando, Florida

CLIENT:

Ryder System, Inc.

Ryder System contracted Langan to provide confidential due diligence services during negotiations for a property transaction involving four truck rental and maintenance facilities.

Services included preparing Phase I Environmental Site Assessments (ESAs) according to ASTM Standard Practice E-1527-05, implementing Phase II ESAs, and reviewing each facility's regulatory compliance with regard to storage tanks, industrial waste discharge, and other environmental compliance concerns. During the Phase II ESA, Langan supervised a direct-push subcontractor and collected soil, groundwater, and sediment samples. Ryder handled analytical services directly with its contract laboratory.

Langan completed the investigations concurrently and on time and within budget.

Because of the confidential nature of the negotiations, Langan personnel signed non-disclosure agreements and interacted only with the property owners while on site.

This was a challenging project in part because the property owner was not forthcoming regarding historical documentation of environmental conditions. The project scope had to be adjusted as Langan and Ryder uncovered new information.

LANGAN

FORMER KOPPERS SUPERFUND SITE

SERVICES:

- *Remedial Design Investigations*
- *Innovative DNAPL Characterization Techniques*
- *Natural and Cultural Resources*
- *Stream Hydraulics Engineering*
- *Stream and Ecological Restoration*
- *Comprehensive Remedial Design Engineering*

LOCATION:

Newport, New Castle County, Delaware

CLIENT:

Beazer East, Inc.

Langan has been retained by Beazer East, Inc. and approved by EPA as the remedial design consultant to implement pre-design investigations and lead remedial design efforts at one of Beazer's highest priority sites: the Former Kopper's Wood Treating Superfund Site in Newport, New Castle, Delaware. The Site is situated on 317 acres including approximately 136 acres of wetlands, three ponds, and surrounded on three sides by surface water. Soil, sediment, and groundwater at the site are impacted with creosote constituents, primarily polycyclic aromatic hydrocarbons (PAHs) and dense non-aqueous phase liquids (DNAPL).

Under a Unilateral Order, Langan, on Beazer's behalf, prepared a comprehensive Remedial Design Work Plan (RDWP) for a projected $52 million remedial action that was selected by EPA. As required by the Order, the RDWP was submitted to EPA within 60 days after the effective date of the Order and was approved by EPA within four months and with only five minor comments. Certain time critical pre-design investigation tasks were immediately initiated to collect important data to resolve uncertainty and establish preliminary design criteria.

Langan prepared a Preliminary Design Report for the containment and cap remedial elements which was submitted to EPA within 60 days after approval of the RDWP. Key pre-design investigation tasks are ongoing and we will collect all necessary data that will enable complete design of all remedial elements to satisfy remedial action objectives for the selected remedy.

Langan is providing integrated environmental, natural resources assessment and permitting, geotechnical engineering and land development services to Beazer in support of this important and challenging project. Our integrated services are a key and needed asset to overcome the technical and regulatory challenges that are inherent to a project of this complexity and importance.

Langan is preparing all design documents (Preliminary Design, Pre-final Design and Final Design) for the integrated remedial components that include: soil and sediment excavation, NAPL recovery, groundwater hydraulic control and treatment, stream hydraulics and restoration, containment area, groundwater barrier wall, modified RCRA cap and wetlands mitigation design. Costs to date for pre-design investigations and remedial design are in excess of $2.5M.

LANGAN

CASCADES PARK REMEDIATION PROJECT

SERVICES:

- *Remediation Services*

LOCATION:

Tallahassee, Florida

CLIENT:

WRS Infrastructure & Environmental, Inc.

It's one of the most historically significant locations in Tallahassee, not to mention the entire state of Florida and the process to return it to its citizens as a beautiful urban recreation site is now underway. The City of Tallahassee's Cascades Park Cleanup project has been completed. This is a critically important step that will help transition the site into a multi-use downtown park.

Langan was a sub-contractor to WRS Infrastructure & Environment, Inc. for design consulting and engineering oversight services for the ongoing $8M Cascades Park Remediation Project, a coal gasification plant and landfill Superfund site has been remediated by the City of Tallahassee under an Administration Order of Consent with USEPA.

Langan prepared the Removal Action Work Plan which received USEPA approval in a one month time period. Design specifications and drawings were developed for the removal of in access of 47,000 cubic yards of contaminated soil, and the construction of a low permeability liner within the excavated area for future use as a stormwater management facility at the former plant site.

At the landfill site, Langan conducted geotechnical investigations and is currently developing engineering specifications and drawings for the removal action which involves sediment removal from the creek; installation of a 400 linear foot box culvert within the creek; and installation of a geosynthetic clay liner (GCL) cap on the landfill surface, and installation of a GCL along the landfill embankment, totaling 5,720 square yards.

Langan also provided engineering oversight during the earthwork and liner installation at the former plant site, and provided oversight during the box culvert and GCL installation at the landfill site.

LANGAN

ABANDONED OIL AND GAS PRODUCTION AND EXPLORATION RESERVE PITS REGULATORY COMPLIANCE AND CLOSURE ASSESSMENT SERVICES

SERVICES:

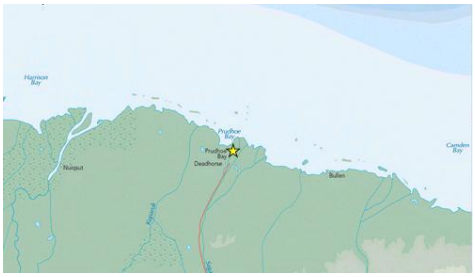
- *Oil and Gas Extraction*
- *Federal and State Regulatory Compliance*
- *Site Assessment*
- *Site Closure and Restoration*
- *RCRA/State Lead Program*

LOCATION:

Prudhoe Bay Area, Alaska

CLIENT:

BP Exploration (Alaska), Inc.



Following the signing of the Charter for Development of the Alaskan North Slope in 1999, an agreement between state of Alaska, BP Exploration (Alaska), Inc. and ARCO Alaska, Inc., Langan assisted BP with assessing and cleaning up abandoned production and exploration reserve pits located throughout the Greater Prudhoe Bay area of Alaska. The charter set forth an aggressive schedule that required BP to complete the site cleanups by 2007.

The Alaska Department of Environmental Conservation (ADEC) set forth requirements for the closure of inactive reserve pits as part of its Solid Waste Management regulations. Langan was integral in developing a regulatory approach for BP that complied with ADEC regulatory requirements while satisfying its RCRA obligations for these sites.

Langan assisted BP with the preparation of work plans for specific abandoned reserve pit sites. The work plans set forth sampling strategies and data quality objectives to evaluate the need for remedial action or additional monitoring ahead of closure.