Licensing and Permitting Qualifications

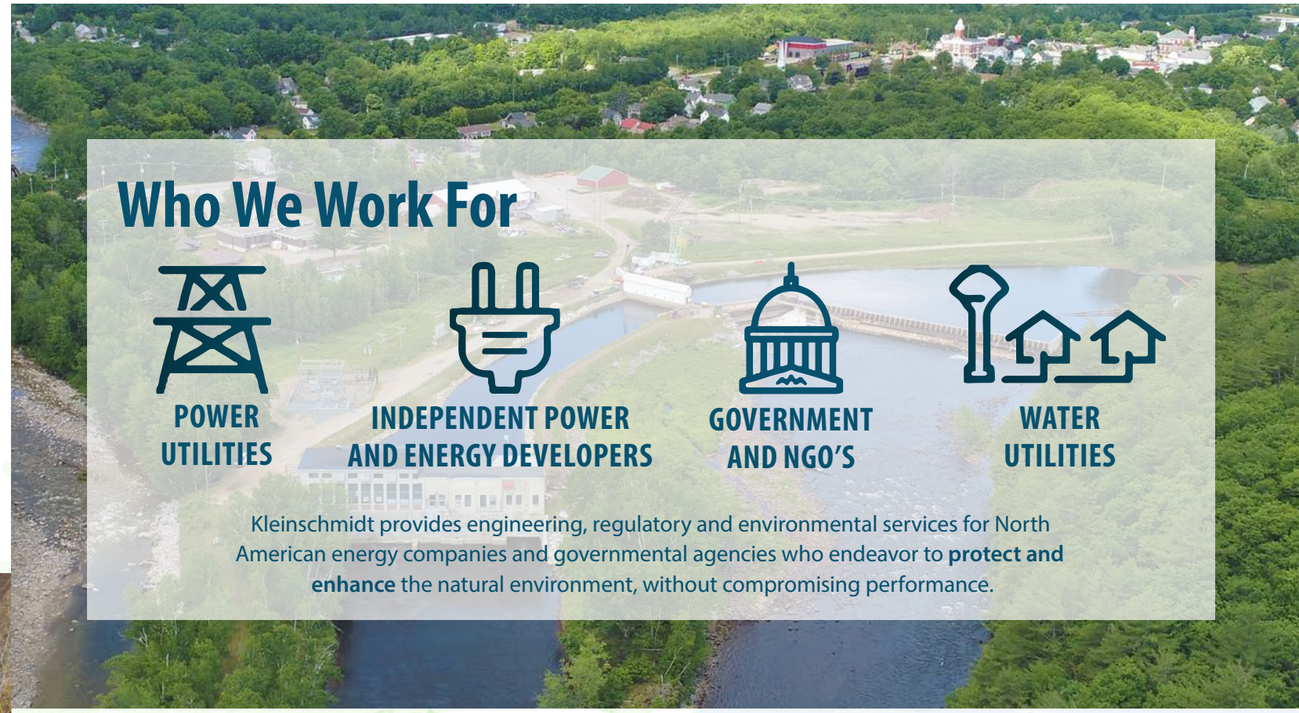
2023

Kleinschmidt

We provide practical **solutions** for complex renewable energy, water, and environmental projects.

For more than 55 years, Kleinschmidt has provided engineering, regulatory, and environmental consulting services to energy companies and government agencies across North America. We provide **practical solutions** for complex renewable energy, water, and environmental projects.

We are a mid-sized, employee-owned firm offering technical expertise and the skills required to work on **large, complex projects**. We have 11 offices strategically located throughout North America that enable us to provide personal attention and be **responsive** to our clients.



Who We Work For

- POWER UTILITIES
- INDEPENDENT POWER AND ENERGY DEVELOPERS
- GOVERNMENT AND NGO'S
- WATER UTILITIES

Kleinschmidt provides engineering, regulatory and environmental services for North American energy companies and governmental agencies who endeavor to **protect and enhance** the natural environment, without compromising performance.

What We Do

- HYDROPOWER ENGINEERING
- DAM SAFETY AND WATER INFRASTRUCTURE ENGINEERING
- LICENSING AND PERMITTING
- ENVIRONMENTAL SERVICES
- FISHERIES ENGINEERING
- WATER RESOURCE ENGINEERING AND HABITAT RESTORATION
- GIS, STATISTICS, AND MODELING

We excel in working at the intersection of regulatory requirements, environmental science, and engineering solutions. Kleinschmidt staffs each project with **experienced** and **knowledgeable** personnel to meet the challenges of each project. Our reputation for providing practical solutions to complex problems affecting energy, water and the environment is founded on **55+ years** of experience and our ability to analyze, prepare, and present project information in a logical, thorough, and technically sound manner.

Client Listening Program

Loyal relationships with our clients, teaming partners, and employees is one of our **Core Values** and has been part of our foundation since Steve Kleinschmidt founded us in 1966. Our success over the years has come from taking the time to listen intently and identify our client's underlying needs so we continue to provide value throughout the life cycle of your project.

"The team demonstrated creativity, and ingenuity in their approach to the project, and design deliverables. The team was very responsive to minor changes and owner comments."

— Confidential Client, Ontario, CN

"Just how to do this audit was an unknown. Very little guidance from FERC. But Kleinschmidt came through once again and provided a great product at a reasonable price. Good job!"

— Entergy Services, Inc.

"I appreciate knowing there is always someone to call when I am confused by FERC and/or their process. The resource specialists are also top-notch. I am so grateful to have access to the hydraulic and sediment modeling team that we do, but everyone we have worked with has been great."

—Confidential Client

"Always proactive! Keep things on track and on schedule. Very easy to work with. All of the Kleinschmidt team goes 100% to make sure we are getting things done."

— Columbia Basin Hydropower

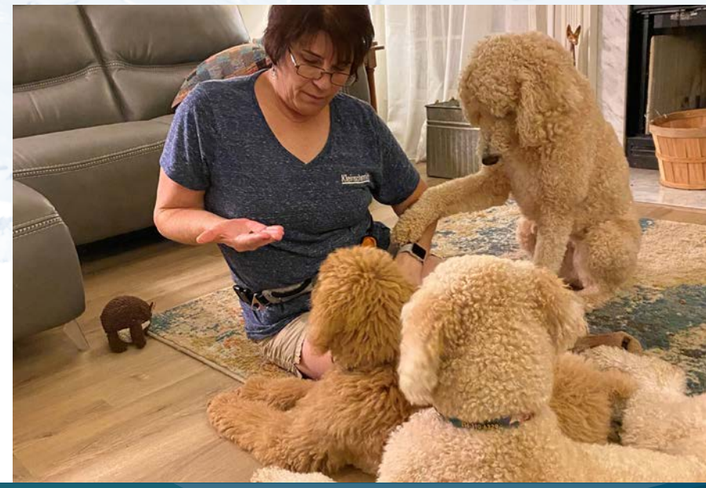
Philanthropy

Kleinschmidt sets aside a percentage of revenue each year for philanthropy with a focus on endowing our **Kleinschmidt Fund.** These funds support employee efforts to assist numerous organizations throughout North America. We promote STEM initiatives at junior high and high schools such as the Kleinschmidt Windstorm Challenge at the University of Maine, and several robotics and science programs. We also assist many other organizations in our communities through meaningful partnerships and employee volunteerism. We are thankful to our clients and partners, and to our socially conscious employees for enabling us to give back to the communities where we work, live and play.

Safety

Kleinschmidt has a formal safety program which includes a corporate safety officer, safety committee, and safety procedures to ensure safe and healthful conditions for all employees at the office and on the jobsite.

All members of the Kleinschmidt team are required to follow appropriate components of the program and receive annual job-specific training as part of Kleinschmidt's own Safety Week.



Licensing and Permitting

Many of our clients experience frustration due to the complicated, bureaucratic nature of government regulations. Trying to sort through regulatory agency jurisdictions and their requirements, regardless of the project size or complexity, is often characterized as a daunting task. We have been helping companies like yours **navigate** the regulatory process for more than 40+ years and this is an area where **experience matters!** Our experience has helped companies save millions of dollars and time associated with regulatory delays.

Federal/State/Provincial Permitting & Approvals

Our staff is well versed in the site plan and submittal requirements for all agencies, allowing us to provide "one-stop shopping" for most projects. Inherent in our permitting approach is our role as mediator and negotiator to ensure projects meet the client's purpose and need, while satisfying regulatory requirements. We advocate a proactive, cooperative approach to most permitting projects, involving jurisdictional agencies at the onset of the design and implementation stages. Using a practical, consensus based approach, our team of scientists and regulatory professionals efficiently navigate federal 401 and 404 as well as state environmental compliance process, with experience in SEPA, CEQA, and SEQR to name a few.

FERC Licensing

We have experience with all three of FERC's approved license processes (ALP, ILP, TLP), having successfully relicensed over 125 FERC projects. We know what is required by FERC and how to keep the licensing process moving – we served for 10 years as part of FERC's environmental contractor team. Our team identifies any potential resource issues and develops realistic studies based upon a nexus to the project as necessary to acquire data or to develop appropriate protection, mitigation and enhancement measures.

By integrating planning, facilitation, biological science, socioeconomic, and licensing skills, we provide a full suite of capabilities necessary for developing a workable relicensing strategy. This experience has proven successful in developing documents that meet FERC's requirements and expectations, resulting in lower costs for our clients.

NEPA

We have extensive experience in preparing environmental assessments and environmental impact statements under the requirements of the National Environmental Policy Act (NEPA) for various lead and cooperating federal agencies (e.g., U.S. Forest Service, Federal Energy Regulatory Commission, U.S. Department of Energy, National Telecommunication and Information Agency, Federal Highway Administration, and U.S. Army Corps of Engineers), private clients, and project types.

FERC Regulatory Compliance & Reporting

We have managed 125+ relicensing projects for hydropower owners throughout North America during the past 30 years and have the knowledge and expertise to assist licensees in meeting complex FERC compliance requirements. We provide different options for compliance management based on the level of assistance needed, the project specific complexities, the size of the project portfolio, and the kind of compliance requirements mandated by FERC and other agencies.

Full list of capabilities

- **Permitting & Approvals**
  - National Environmental Policy Act (NEPA)
  - State Environmental Compliance (SEQR, SEPA, CEQA, NRPA)
  - Stormwater Mgmt.
  - Shoreline Mgmt. Plans
  - FEMA Consultation
  - Land Use Regulatory Commission
  - Army Corps of Engineers
  - Stream Alteration Agreements
  - Clean Water Act Compliance (NPDES, 404, 401, etc.)
  - Section 7 ESA
  - Migratory Bird Treaty Act (MBTA)
  - Joint Permit Applications (JPAs)
- **FERC Licensing/Relicensing/Surrender**
  - Strategic Planning
  - FERC Licensing & Relicensing
  - License Exemptions
  - Preliminary Permits
  - License Amendments
  - Consultation/ Negotiation
  - Dam Removal & Decommissioning
  - Agency and Stakeholder Meeting Facilitation
  - Study/Process Implementation
  - Schedule Management
  - Permitting
  - Compliance
- **NEPA**
  - Issue Identification and Scoping
  - Alternatives Analysis
  - Environmental Impact Analysis
  - Study Planning & Implementation
  - Stakeholder Facilitation
  - Cumulative Effects Analysis
  - Mitigation & Enhancement Measures
  - Record of Decision Preparation
  - NEPA Training
  - Public Scoping Meeting Support and Coordination
  - Public Comment Mgmt.
  - Biological Assessments
  - Federal Agency Consultation (Section 7, 106)
  - Third-party Contracting
- **Regulatory Compliance & Reporting**
  - Gathering FERC Orders
  - Conducting Compliance Audits
  - Cataloging Historic Compliance Findings
  - Developing / Populating / Maintaining Management Tools
  - Developing Turnkey Solutions
  - Evaluation of Compliance Tracking Software

Minimizing Roadblocks and Providing *Solutions*

We have experience managing

125+ FERC Licensing/ Relicensing Projects

and served for more than

10 years as part of FERC's Environmental Contractor Team

"{The Kleinschmidt Team} is always proactive! They keep things on track and on schedule and are very easy to work with. All of the Kleinschmidt team goes 100% to make sure we are getting things done."

- Columbia Basin Hydropower

Our Licensing & Permitting Experts

Finlay Anderson
Principal Consultant

Kim Fitzgibbons
Principal Consultant

Steven Layman
Principal Consultant

Tim Oakes
Business Sector Leader
Power and Energy

Andy Qua
Principal Consultant

Kelly Schaeffer
Principal Consultant

Wendy Bley
Senior Regulatory
Advisor

Lesley Brotowski
Senior Licensing
Coordinator

Laura Cowan
Senior Licensing
Coordinator

Jeffrey Deason
Senior Licensing
Coordinator

Alison Jakupca
Senior Licensing
Coordinator

Kayla Hopkins
Licensing Coordinator

Catherine Shively
Senior Regulatory
Advisor

Kelly Kirven
Project Licensing
Coordinator

Karen Klosowski
Senior Licensing
Coordinator

Shannon Luoma
Project Licensing
Coordinator

Fatima Oswald
Licensing Coordinator

Stephanie Landers
Regulatory Coordinator

Our team has been helping companies like yours navigate the regulatory process for more than 4 decades

Elizabeth Krchnavek
Licensing Coordinator

Uriah Forest-Bulley
Licensing Coordinator

Angela Whelpley
Licensing Coordinator

Hannah Flanagan
Associate Licensing Coordinator

Jennifer Gut
Staff Licensing Coordinator

Sydney Robinson
Staff Licensing Coordinator

Sandra Wash
Staff Licensing Coordinator

Lauren Rosenkranz
Staff Licensing Coordinator

Jessica Antonez
Staff Licensing Coordinator

Sue Byrd
Project Licensing Coordinator

Representative Projects

Bishop Creek FERC Relicensing

Early stakeholder engagement to manage risk and uncertainty of relicensings

Client: Southern California Edison

Project Location: Bishop, CA

Project Size: 28.6 MW

Services Provided:

- FERC Licensing/Relicensing/Amendments
- Study Scoping & Plan Development
- Regulatory Strategic Planning
- Agency Consultation

Project Timeframe: 2018 - Present

Relationship with Client: Since 2018

Client Needs:

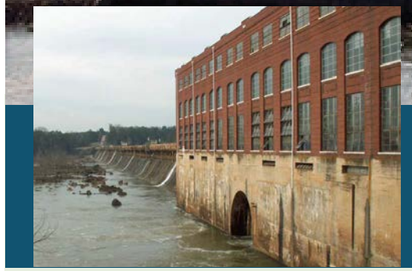
Southern California Edison (SCE) required regulatory and environmental support for the Federal Energy Regulatory Commission (FERC) relicensing for the Bishop Creek Hydroelectric Project. The Project is located in the Eastern Sierra's and consists of five powerhouses with a licensed capacity of 28.6 megawatts. SCE was interested in a relicensing approach that would address schedule constraints of a lengthy licensing process.

Kleinschmidt Solution:

Kleinschmidt is managing the modified Integrated Licensing Process with SCE, and has developed a draft PAD and study plans, in collaboration with technical work groups pre-filing of the NOI and PAD. The approach enabled SCE to identify issues early and reach agreement in the primary issues to be addressed in relicensing. This allows for additional time to conduct and conclude studies in support of a new license.

Client Benefit:

Early consultation and front-end work has engaged stakeholders and will result in agreement upon studies which will be implemented in support of the license application. This early engagement is expected to reduce project costs by minimizing rework and streamlining stakeholder approvals in the later stages of the project. Moreover, the early implementation of studies will provide for additional time in advance of the filing of the license application to consider appropriate protection, mitigation, and enhancement measures.



Parr Hydroelectric Project

Comprehensive FERC relicensing services

Client: South Carolina Electric & Gas Company

Project Location: Fairfield/Newberry Counties, SC

Project Size: 526 MW

Services Provided:

- FERC Relicensing Support
- Strategic Planning
- Agency Consultation
- Stakeholder Facilitation
- Study Scoping and Plan Development
- Water Quality
- IFIM
- Recreation Studies
- Threatened & Endangered Species
- American Eel Surveys
- Website Development and Support

Project Timeframe: 2012 - Present

Relationship with Client: Since 1988

Client Needs:

The Parr Hydroelectric Project consists of the Parr Shoals Development and the Fairfield Pumped Storage Development. South Carolina Electric & Gas Company (SCE&G), now Dominion Energy South Carolina (DESC), required a consultant to assist them with all aspects of relicensing the project and securing a new Federal Energy Regulatory Commission (FERC) license.

Kleinschmidt Solution:

Kleinschmidt worked closely with SCE&G to identify a client-preferred relicensing process and develop a relicensing strategy. To aid in Pre-Application Document (PAD) development, Kleinschmidt planned and held stakeholder issue identification workshops that served as initial scoping meetings. They met with relicensing stakeholder groups to develop a list of relicensing studies that would be performed during relicensing and were necessary to provide information that was not currently available. Kleinschmidt prepared and filed the PAD, Notice of Intent, and the request for using the Traditional Licensing Process that the stakeholders supported and FERC approved.

Kleinschmidt also developed and maintain a project relicensing website for SCE&G that is used to share information with stakeholders and the public. Study plans were developed with stakeholder consultation and studies were performed in 2015 and 2016 to address project recreational use, fish entrainment, instream flows, reservoir fluctuations, downstream fluctuations, threatened and endangered species, water quality, and project operations. As the studies are now complete, Kleinschmidt has developed and submitted the Draft and Final License Applications and assisting SCE&G in the development of a Comprehensive Relicensing Settlement Agreement (CRSA) with stakeholders. This involved numerous meetings with stakeholders to develop the appropriate language and proposals to include in a settlement agreement. Kleinschmidt assisted with the development and filing of the 401 Water Quality Certification which was recently issued in 2020.

Client Benefit:

Kleinschmidt is assisting SCE&G/DESC to strategically and efficiently navigate the licensing process and evaluating potential project effects, while preserving the operational flexibility and economic value of this regionally significant project.

Ludington Pumped Storage Project

FERC relicensing

Client: Consumers Energy

Project Location: Ludington, MI

Project Size: 1872 MW

Services Provided:

- FERC Relicensing
- Agency Consultation
- Stakeholder Facilitation
- Expertise on Resource Issues

Project Timeframe: 2012 - Present

Relationship with Client: Since 1994

Client Needs:

Consumers Energy (Consumers) required consulting support in the Federal Energy Regulatory Commission (FERC) relicensing of their Ludington Pumped Storage Project.

Kleinschmidt Solution:

Kleinschmidt, in association with TRC Engineers, LLC (TRC), is working with Consumers to manage the relicensing process. Critical to this relicensing was the integration of the previous settlement agreement and studies that supported the settlement's compliance activities.

Our background in developing internal relicensing strategies and training, developing recommendations for the licensing process, preparing for initial stakeholder meetings, and evaluating available data and recommending studies in advance of the Pre-Application Document were key to starting the process effectively. Our development of study plans and evaluation of results led directly to the proposed application in 2017.

Client Benefit:

Using experience on more than one hundred FERC relicensing projects that includes five pumped storage projects, Kleinschmidt and TRC are assisting Consumers to strategically and efficiently navigate the licensing process. The team carefully planned the relicensing to balance relicensing costs with future O&M while preserving the operational flexibility and economic value of the project.

R.L. Harris Project FERC Relicensing

First relicensing of Alabama Power's youngest hydro project

Client: Alabama Power Company

Project Location: Tallapoosa River, AL

Project Size: 135MW

Services Provided:

- FERC Licensing/Relicensing/Amendments
- Study Scoping & Plan Development
- Regulatory Strategic Planning
- Stakeholder Identification & Facilitation
- Agency Consultation
- Environmental and Recreations Studies and Study Management

Project Timeframe: 2016 - Present

Relationship with Client: Since 1999

Client Needs:

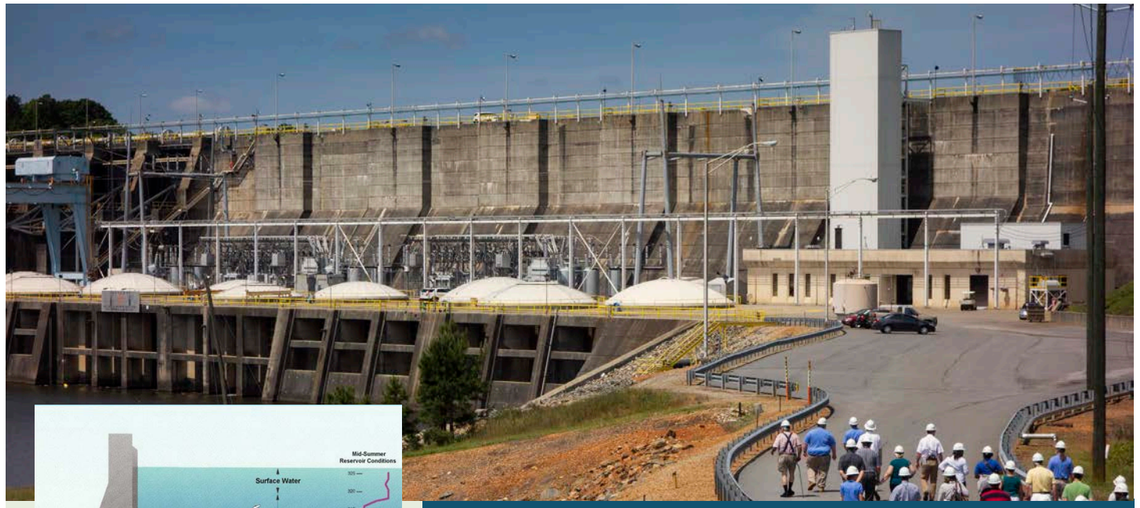
Alabama Power Company (Alabama Power) required general professional services related to the Federal Energy Regulatory Commission (FERC) relicensing of the R.L. Harris Hydroelectric Project. Issues include evaluating a 1-4 foot change in the winter pool elevation to support access to Lake Harris; modeling and evaluating alternative downstream releases. Each of these operational changes requires evaluating economic, environmental and recreational affects.

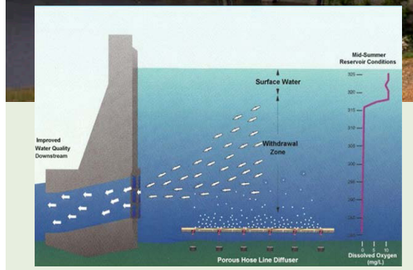
Kleinschmidt Solution:

Kleinschmidt is providing strategic services and project management, and information management including a relicensing website, stakeholder database, and administrative record database. We are also working with Alabama Power to scope issues, develop study plans and conduct relicensing studies. We are responsible for developing a stakeholder process (Harris Action Teams) that incorporates stakeholder input to the process. Kleinschmidt is conducting hydrologic and hydraulic modeling of the Tallapoosa River and managing subcontractors responsible for various FERC approved studies. We are also providing facilitation services for stakeholder meetings.

Client Benefit:

Early consultation and front-end work has engaged stakeholders and will result in agreement upon studies which will be implemented in support of the license application. This early engagement is expected to reduce project costs by minimizing rework and streamlining stakeholder approvals in the later stages of the project. Moreover, the early implementation of studies will provide for additional time in advance of the filing of the license application to consider appropriate protection, mitigation, and enhancement measures.





Wallace Dam Dissolved Oxygen Conceptual Design and Modeling

Assessment and oversight of DO modeling

Client: Georgia Power Company

Project Location: Eatonton, GA

Project Size: 321 MW

Services Provided:

- Water Quality
- Conceptual Design

Project Timeframe: 2018-2020

Relationship with Client: Since 1990s

Client Needs:

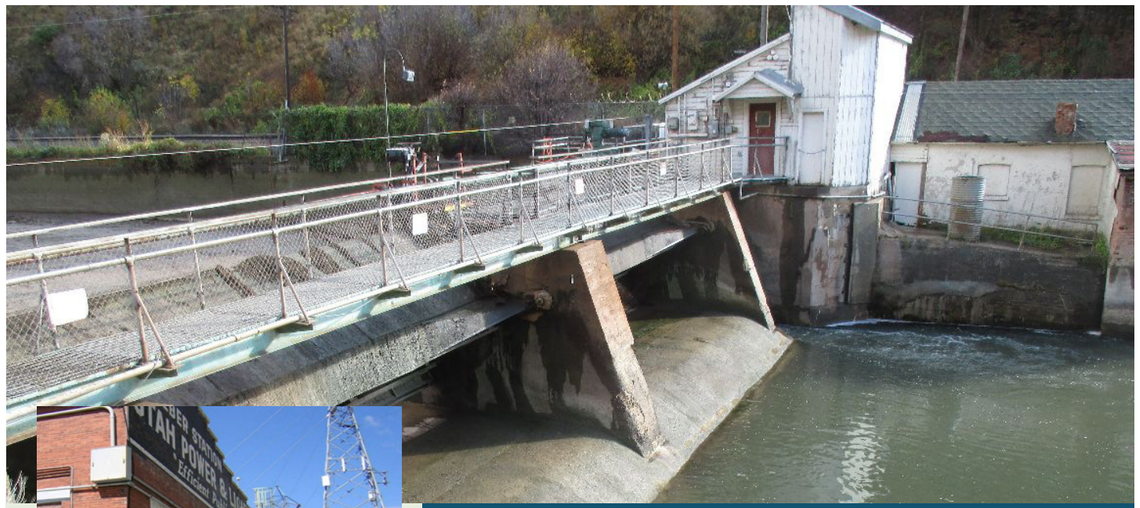
Georgia Power Company's (Georgia Power's) Wallace Dam Project is a pumped storage facility that uses 19,050-acre Lake Oconee as the upper reservoir and Lake Sinclair as the lower reservoir. As part of the Federal Energy Regulatory Commission (FERC) relicensing of the Wallace Dam Project, Georgia Power proposed to install a forebay diffuser system in Lake Oconee to enhance dissolved oxygen (DO) concentrations in project waters annually from May 1-October 31 to benefit water quality, fisheries, and recreation in the tailrace area and meet applicable water quality standards.

Kleinschmidt Solution:

Kleinschmidt managed the development of a conceptual design for the DO diffuser system which will use diffuser lines weighted to sink to depth to spread oxygen bubbles in the turbine withdrawal zone of Lake Oconee to meet a target DO concentration in the tailrace. The diffusers will be supplied with oxygen from an on-shore oxygen storage and supply facility consisting of liquid oxygen tanks, a liquid oxygen unloading zone, a vaporizer system, control building, oxygen flow control system, and piping leading to the reservoir. We worked closely with Reservoir Environmental Management, Inc. (REMI), to facilitate the collection of water quality data and velocity measurements in the forebay of Lake Oconee and the tailrace used in subsequent modeling for the design of the aeration system. We oversaw REMI's subsequent modeling of reservoir processes to ensure that the aeration system was designed to perform effectively over the range of operating conditions that occur at the Project.

Client Benefit:

Kleinschmidt's assessment of the environmental effects and benefits of constructing and operating the aeration system during the relicensing of the Project and management of REMI's modeling efforts for the engineering design has allowed Georgia Power to move forward with the final detailed design of the project.



Weber Hydroelectric Project

Strategic FERC relicensing services

Client: PacifiCorp

Project Location: Ogden, UT

Project Size: 3.85 MW

Services Provided:

- Regulatory Strategic Planning
- Study Scoping & Plan Development
- FERC Licensing
- 401 Water Quality Certification
- Agency Consultation

Project Timeframe: 2015 - Present

Relationship with Client: Since 2003

Client Needs:

PacifiCorp required Federal Energy Regulatory Commission (FERC) relicensing assistance for its Weber Hydroelectric project. The project consists of a concrete diversion dam, two miles of steel penstock, powerhouse and 3.85 mW of generation. PacifiCorp initially began development of the Pre-Application document (PAD) and Notice of Intent (NOI) and needed assistance completing these documents and understanding the pros and cons of the different FERC relicensing processes.

Kleinschmidt Solution:

Kleinschmidt finalized the NOI and PAD for submittal to FERC. Kleinschmidt provided strategic assistance by evaluating the risks and rewards of FERC's three licensing processes. PacifiCorp ultimately decided to request the Alternative Licensing Process (ALP) which FERC subsequently agreed upon. Kleinschmidt developed the project schedule for PacifiCorp in keeping with the timing requirements for the ALP.

Client Benefit:

Kleinschmidt was able to assist PacifiCorp in meeting its filing date for the PAD and NOI Kleinschmidt has helped keep the ALP on track and PacifiCorp in a position to file its licensing application on or ahead of schedule. Kleinschmidt continues to assist the client in navigating the licensing process and will work on resource related matters including fish passage as requested by PacifiCorp.

Paper Mill Stock Line Permitting

Federal and State Consultation and Permitting for International Crossing

Client: Twin Rivers Paper Company

Project Location: Edmundston, New Brunswick and Madawaska, Maine

Services Provided:
- Federal Agency Consultation & Permitting
- State Agency Consultation & Permitting

Project Timeframe: 2021-2023

Relationship with Client: Since 2021

Client Needs:

Twin Rivers Paper Company (Twin Rivers) required U.S. permitting assistance associated with the removal of the two existing stock lines from one bridge slated for removal and the installation of two new stock lines on another, existing bridge owned and operated by Twin Rivers that spans the international border. The existing stock line system linking the Twin River's paper mills in Edmundston, New Brunswick and Madawaska, Maine is integral to the operations of both mills.

Kleinschmidt Solution:

As a first phase of project work, Kleinschmidt consulted with relevant U.S. agencies and local entities to provide a high-level overview of the proposed project to familiarize them with the project and discuss anticipated permitting requirements. These entities included the U.S. Department of State (DOS), U.S. Army Corps of Engineers (USACE), U.S. Coast Guard, Maine Department of Environmental Protection (MDEP), Maine Department of Transportation, Maine State Historic Preservation Office (MSHP), First Nations, and the Town of Madawaska. Kleinschmidt subsequently prepared applications for a DOS Presidential Permit Application, a USACE Self Verification Application, and an MDEP Natural Resource Protection Act Permit-by-Rule Application. Kleinschmidt submitted the permit applications upon finalization on Twin Rivers' behalf.

Client Benefit:

Kleinschmidt reduced regulatory hurdles based on cross-border and State of Maine permitting experience. We drove the complicated presidential permitting process through the U.S. State Department and the permit-by-rule approach for the MDEP. Due to Kleinschmidt's ability to work with agencies efficiently and effectively, we completed the project within budget and in a compressed timeframe allowing Twin Rivers to move their stock lines in time for the bridge removal while keeping the mill running.

Cutler Hydro Electric Project

Strategic FERC relicensing services

Client: PacifiCorp

Project Location: Box Elder and Cache, UT

Services Provided:
- Regulatory Strategic Planning
- FERC Licensing
- Stakeholder Identification
- Workshop Presentation

Project Timeframe: 2018 to Present

Relationship with Client: Since 2005

Client Needs:

PacifiCorp required Federal Energy Regulatory Commission (FERC) relicensing assistance for its Cutler Hydroelectric Project.

Kleinschmidt Solution:

Kleinschmidt initially developed the Notice of Intent to relicense the Project and the Pre-Application document (PAD). An important aspect of the project has been managing the stakeholder outreach as the project lands are adjacent to hundreds of adjoining landowners who manage their properties for agricultural and ranching uses. Additionally, the project reservoir is located on a nationally recognized wildlife and migratory bird refuge. Kleinschmidt prepared the PAD, attended stakeholder workshops, and is currently scoping studies. Kleinschmidt will continue to manage the relicensing process including upcoming study planning, stakeholder engagement throughout the FERC public process, and filing of the Final License Application.

Client Benefit:

Kleinschmidt was able to assist the owner in submitting a robust PAD despite a short turnaround time and multiple stakeholder meetings with heavy agency and public involvement. Kleinschmidt has also provided strategic guidance on the upcoming early study season to better inform the future Final License Application.

Bad Creek Pumped Storage Non-Capacity License Amendment

Quality environmental analysis led to rapid FERC amendment approval allowing client to begin construction and increase generation within their preferred timeframe

Client: Duke Energy

Project Location: Oconee County, SC

Project Size: 1,400 MW

Services Provided:
- FERC Amendment Application Package
- Agency Consultation

Project Timeframe: 2016-2018

Relationship with Client: Since 2013

Client Needs:

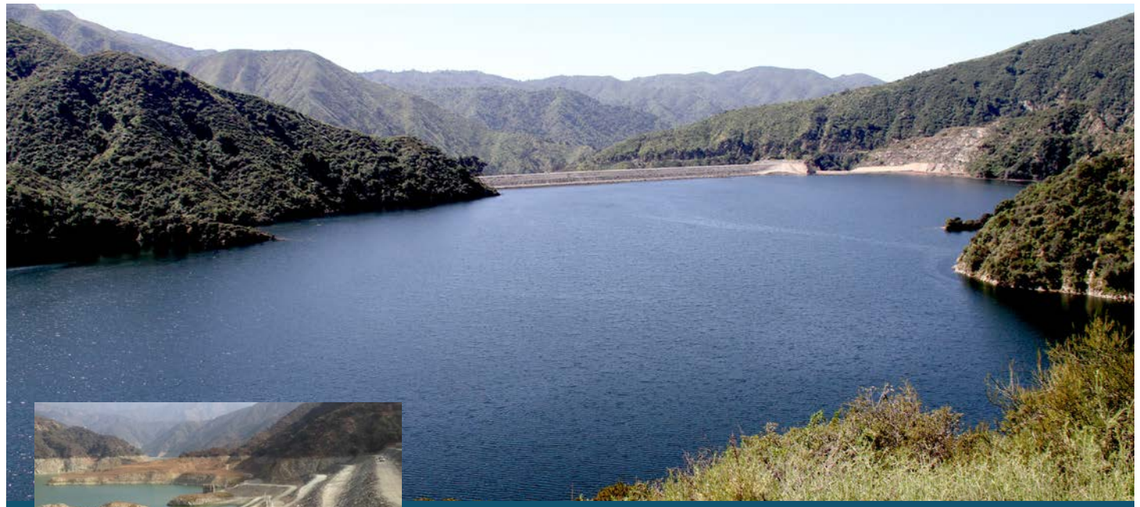
Duke Energy required environmental and regulatory support to develop a non-capacity Federal Energy Regulatory Commission (FERC) license amendment application for the Bad Creek Pumped Storage Project (Project). These service needs come as a result of planned and necessary upgrades to all four Project pump-turbines, resulting in an increase in the total authorized installed capacity of the Project. These upgrades are necessary to support the development and function of Duke Energy's renewable energy portfolio.

Kleinschmidt Solution:

Kleinschmidt reviewed engineering analyses and the portfolio of existing environmental data available at the Project. As the amendment was non-capacity, relevant license exhibits were updated to existing FERC standards to incorporate updated Project information. Kleinschmidt additionally performed an environmental analysis in the form of an Exhibit E. Kleinschmidt aided Duke Energy in the agency review process and the draft Application Package was vetted by South Carolina State Historic Preservation Officer, U.S. Fish and Wildlife Service, National Marine Fisheries Service, South Carolina Department of Parks Recreation and Tourism, South Carolina Department of Health and Environmental Control, and the South Carolina Department of Natural Resources.

Client Benefit:

Due to the clarity and soundness of Kleinschmidt's environmental review, analyses and presentation of findings demonstrating that the turbine and component upgrades would have negligible effects on aquatic resources and the surrounding environment, FERC and state and federal resource agencies provided approval of the amendment within about 3 months. This expedited schedule allowed Duke to initiate and complete modifications sooner and as a result increase generation more quickly.



Azusa Hydroelectric Project

Regulatory strategic planning leads City to purse exemption

Client: City of Pasadena, CA

Project Location: Los Angeles County, CA

Project Size: 3 MW

Services Provided:
- Regulatory Strategic Planning
- Agency Consultation
- Stakeholder Identification and Facilitation
- FERC Relicensing

Project Timeframe: 2013 - Present

Relationship with Client: Since 2013

Client Needs:

The City of Pasadena's Water and Power Department (PWP) owns and operates the 3 megawatt Azusa Hydroelectric Project (Project) whose Federal Energy Regulatory Commission (FERC) license is due to expire in 2018 thus necessitating PWP to begin the relicensing process in 2013. PWPs expressed goal is to cost effectively relicense the Project so it can continue to provide reliable, clean and renewable energy its customers.

Kleinschmidt Solution:

Kleinschmidt assisted PWP in exploring the options for the regulatory process, assisted in assessing the project from an economic and engineering perspective, established a working relationship with agencies and stakeholders, and developed a solid pre-application document (PAD).

As part of strategic planning early in the process, we assessed licensing options with PWP and FERC leading to FERC agreeing that the Traditional Licensing Process (TLP) is appropriate for this project given that the project might qualify for a FERC exemption. Midway through the licensing process, PWP informed FERC and stakeholders that it would be filing for a License Exemption following Kleinschmidt's assessment of the benefits of the License Exemption. As a result, we are currently preparing a License Exemption application on behalf of PWP.

Client Benefit:

Through Kleinschmidt's successful recommendations to FERC for proceeding using the TLP, PWP has been able to convert to a License Exemption process. If successful in obtaining a License Exemption, PWP will recognize considerable financial savings by eliminating certain studies during the application preparation phase and eliminate the need for future relicensing.

Blenheim Gilboa Pumped Storage Project

Lead consultant for FERC relicensing

Client: New York Power Authority

Project Location: North Blenheim, NY

Project Size: 1,160 MW

Services Provided:

- FERC Licensing
- Regulatory Strategic Planning
- Study Scoping and Plan Development
- Agency Consultation
- Stakeholder Identification and Facilitation

Project Timeframe: 2011-2018

Relationship with Client: Since 1994

Client Needs:

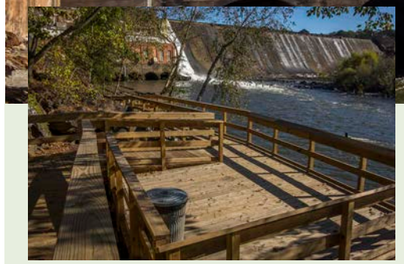
The New York Power Authority (NYPA) required consulting support for the preparation and execution of the FERC relicensing process for its 1,160 MW Blenheim Gilboa (B-G) Pump Storage Project (Project).

Kleinschmidt Solution:

Kleinschmidt is assisting NYPA in all aspects of the relicensing efforts for the Kleinschmidt assisted NYPA in all aspects of the relicensing efforts for the B-G Project. An initial task involved developing a strategic assessment of the preferred approach to licensing. The team developed a Project Information Document to facilitate informal consultation with stakeholders, a PAD, and Notice of Intent to Relicense. Early initiation of the PAD process allowed NYPA to identify information gaps and to conduct early field studies to fill these gaps prior to initiating the formal licensing process, which ultimately streamlined the formal study scoping process under the integrated licensing process. Kleinschmidt managed and conducted multiple environmental studies and supported consultation with a large group of local stakeholders concerned with the operation and economic impact of the Project. Final Project studies included a historic structures survey, Phase 1A Archaeological survey, fish entrainment assessment, recreation user/user contact study, effect of Project operations on downstream flooding, and socioeconomics. Kleinschmidt designed habitat improvement Projects and developed management plans for recreation, water, land, and historic properties in support of NYPA's settlement negotiations with stakeholders. The final license application was filed in early 2017 and a new 50-year license based on these settlements was issued in April 2019.

Client Benefit:

Kleinschmidt provided Project management expertise leading a relicensing team with multiple areas of expertise and talents to keep the Project within budget and on schedule. In addition, Kleinschmidt provided technical and strategic relicensing advice to NYPA, which in turn helped NYPA better plan and reduce their risk for issues that could have arisen during the subsequent phases of the relicensing process, including additional study requests.



Lloyd Shoals FERC Relicensing and Study Plan Implementation

Comprehensive relicensing and environmental

Client: Georgia Power Company

Project Location: Jackson, GA

Project Size: 18 MW

Services Provided:

- FERC Relicensing
- Study Scoping & Plan Development
- Regulatory Strategic Planning
- Stakeholder Facilitation
- Agency Consultation
- Shoreline Management Plans
- Shoreline/Riparian Studies
- Fish Population Assessments
- Aquatic Habitat Assessments
- Rare Threatened & Endangered Species Assessment
- Entrainment, Impingement, & Mortality
- Water Quality
- Terrestrial & Wetland Science
- Recreation & Land Use Planning
- Cultural Resource Studies & Assessments

Project Timeframe: 2018-2020

Relationship with Client: Since 1990's

Client Needs:

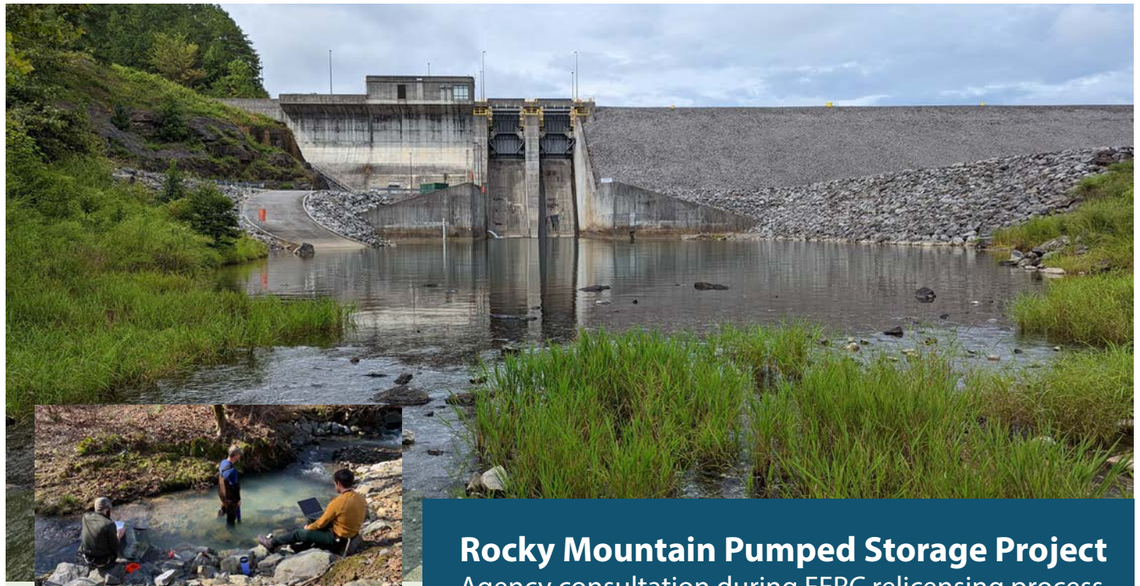
Georgia Power Company (Georgia Power) required support for the Federal Energy Regulatory Commission (FERC) relicensing of the Lloyd Shoals Hydroelectric Project (Lloyd Shoals Project). The project consists of Lloyd Shoals Dam, 4,750-acre Lake Jackson, a powerhouse with a total installed capacity of 18 megawatts, voltage transformation, and appurtenant facilities. The current license expires December 31, 2023.

Kleinschmidt Solution:

Kleinschmidt assisted Geosyntec Consultants in completing the first phase of pre-application activities for relicensing of the Lloyd Shoals Project, from completing the final Pre-Application Document (PAD) through formal study plan development. These activities followed FERC's applicable Integrated Licensing Process (ILP) regulations. Kleinschmidt is currently contracted directly with Georgia Power to implement eight resource studies in 2019 and 2020. The studies include shoreline reconnaissance survey; sediment deposition and shoreline temporal change analysis; water quality monitoring in the tailrace; shoreline habitat survey; freshwater mollusk survey; habitat for primary sport fish species; downstream riverine habitat; fish entrainment and turbine-induced mortality; American Eel abundance and upstream movements; terrestrial, wetland, and riparian resources; Rare, Threatened, and Endangered (RTE) species; recreation and land use; and a cultural resources study.

Client Benefit:

Kleinschmidt's applied understanding of the project-specific resource issues and knowledge of river basin information sources resulted in enhanced strategic decisions regarding environmental studies and allowed us to leverage existing information to reduce new data collection requirements. Our local project manager provides for quick responsive and availability of team resources. Kleinschmidt's positive agency relationships have added technical credibility to study proposals and study results, enhancing Georgia Power's ability to obtain reasonable agreements among key stakeholders.



Rocky Mountain Pumped Storage Project

Agency consultation during FERC relicensing process minimizes study costs

Client: Oglethorpe Power Corporation

Project Location: Rome, GA

Project Size: 904 MW

Services Provided:

- FERC Licensing / Relicensing / Amendments
- Stakeholder Identification & Facilitation
- Study Scoping & Plan Development
- Agency Consultation
- Cultural Resource Studies & Assessments
- Recreation & Aesthetics Planning
- Water Quality

Project Timeframe: 2020 - Present

Relationship with Client: 2020

Client Needs:

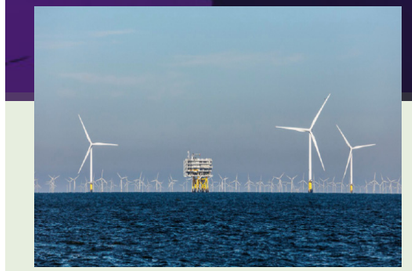
With an installed generating capacity of 904 MW, the Rocky Mountain Project provides peaking power and spinning and supplemental (non-spinning) reserves. As a pumped storage project, Rocky Mountain Project generates power during periods of peak electricity demand and uses off-peak power from the grid when in pumping mode. As co-licensee with Georgia Power Company and the 75-percent majority owner, Oglethorpe Power Corporation (OPC) has sole responsibility for the Federal Energy Regulatory Commission (FERC) licensing, operation, and maintenance of the Rocky Mountain Project and required FERC relicensing support.

Kleinschmidt Solution:

Kleinschmidt was chosen as the lead relicensing consultant and facilitated relicensing strategy meetings with OPC's relicensing team to jointly discuss, assess, and develop strategies, and organize the relicensing process. Kleinschmidt developed and submitted a Notice of Intent (NOI), Pre-Application Document (PAD) and study plans, and is currently conducting recommended studies including aquatics, cultural resources, recreation, terrestrial, and water quality. Kleinschmidt will be developing the Draft and Final License Applications and providing post-license application filing support.

Client Benefit:

Kleinschmidt successfully advocated that few studies were needed to support the FERC National Environmental Policy Act process due to the mostly closed-loop nature of the facility and relatively low environmental impact. Following agency consultation, some proposed studies required methodology modifications and two new studies were added (Water Quality Study and Trispot Darter Surveys). However, Kleinschmidt worked closely with the agencies and OPC to minimize field efforts, resulting in only one year of studies (May 2022 through May 2023). This is permitting a very aggressive project schedule and is reducing study costs for OPC.



Sunrise Offshore Wind Farm

Third Party NEPA EIS

Client: Bureau of Ocean Energy Management

Project Location: Offshore from Montauk, Long Island, NY

Project Size: 880 MW

Services Provided:

- NEPA - EAs & EISs
- Marine Regulatory (BOEM, FERC)
- Agency Consultation
- Federal Permitting
- Public / Stakeholder Involvement
- Study Scoping & Plan Development

Project Timeframe: 2021 - Present

Relationship with Client: 2021

Client Needs:

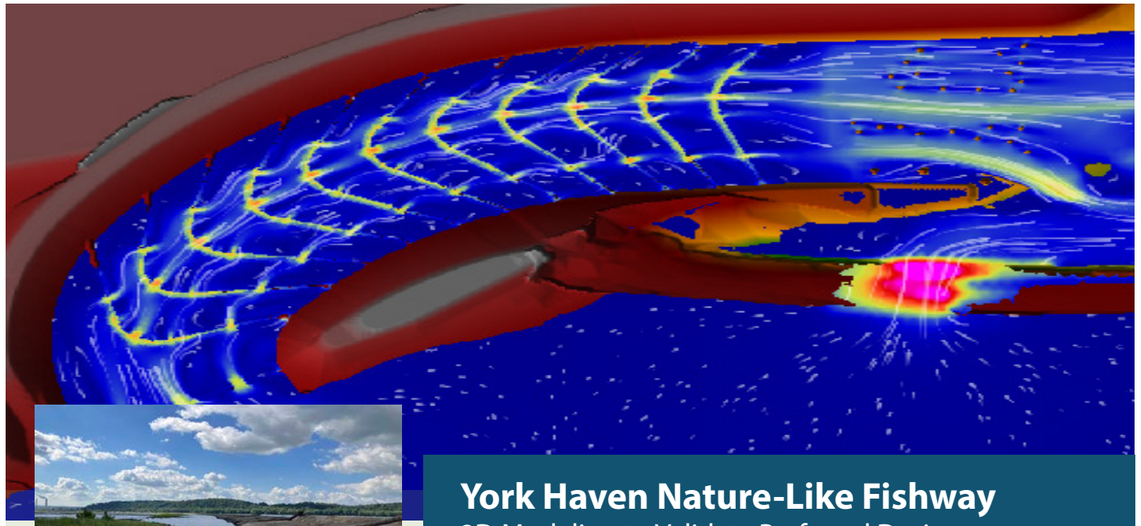
Consistent with the regulations implementing the National Environmental Policy Act (NEPA), the Bureau of Ocean Energy Management (BOEM) requires a Third-Party Contractor to prepare an Environmental Impact Statement (EIS) for the review of a Construction and Operations Plan (COP) submitted by Orsted and Eversource for the construction, and operation of a wind energy facility offshore Massachusetts, Rhode Island, and New York with a proposed interconnection location at the existing Holbrook Substation on Long Island, New York. BOEM has chosen to use the NEPA substitution process to fulfill its obligations under Section 106 of the NHPA and its implementing regulations.

Kleinschmidt Solution:

Kleinschmidt, supported by several specialty subcontractors is developing the EIS for the Sunrise Project. The Kleinschmidt Team is identifying and describing the potential effects of the proposed project that are reasonably foreseeable and have a reasonably close causal relationship to the proposed project. Our Team is providing subject matter experts to analyze potential impacts including air quality, water quality, bats, benthic habitat, essential fish habitat, invertebrates, finfish, birds, marine mammals, terrestrial and coastal habitats and fauna, sea turtles, wetlands and other waters of the United States, commercial fisheries and for-hire recreational fishing, cultural resources, demographics, employment, economics, environmental justice, land use and coastal infrastructure, navigation and vessel traffic, other marine uses, recreation and tourism, and visual resources.

Client Benefit:

As Project Lead, Kleinschmidt is supporting BOEM during public scoping meetings and by developing a draft EIS, responding to comments on the draft EIS, developing a final EIS, and preparing the Administrative Record for the project. Kleinschmidt has received positive feedback from BOEM on the rigor of the assessments in the draft EIS and quality of the reports and documents.



York Haven Nature-Like Fishway

2D Modeling to Validate Preferred Design

Client: York Haven Power Company, a subsidiary of Eagle Creek Renewable Energy

Project Location:
Susquehanna River, PA

Services Provided:
- FERC Compliance Implementation
- Hydraulic Modeling
- Agency Consultation
- Permitting
- Natural Fishway Design

Project Timeframe: 2018 -Present

Relationship with Client: Since 2003

Client Needs:

York Haven Power Company (YHPC) as part of the Federal Energy Regulatory Commission (FERC) license compliance for their York Haven Hydroelectric Project, requires design, construction, and operation of a new nature-like fishway passage (NLFP) at their Main Dam. YHPC sought an alternate design that meets the intent of the Settlement Agreement and the FERC License, but reduces substantial construction risks and costs, as well as long-term operation and maintenance risks of the original design prepared for the previous owner.

Kleinschmidt Solution:

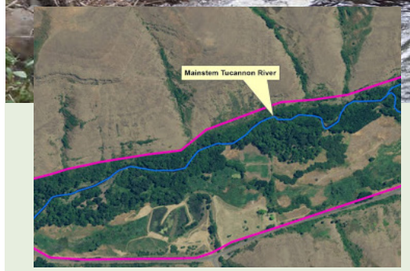
Kleinschmidt provided an assessment of the design as conceptualized in the Settlement Agreement and developed alternative NFLP concepts. Kleinschmidt also identified pros and cons of existing and alternative designs relative to effectiveness, risks, costs, schedule, and agency acceptance.

Kleinschmidt investigated an alternate in-river design as well as an inland bypass concept as part of our task to develop a cost-effective design that minimizes aquatic resource impacts, while meeting the FERC, U.S. Fish and Wildlife Service and Pennsylvania Department of Environmental Protection requirements to provide fish passage over 6 feet of head difference.

As part of the design efforts, Kleinschmidt created far-field and near-field2-D HEC-RAS model of the proposed NLFP starting with existing conditions along approximately 8 miles of the Susquehanna River that included two dams.

Client Benefit:

Kleinschmidt's experience provided YHPC a fresh approach to find an alternative design that satisfied the resource agencies' requirement for a NLFP at this site. The alternative design was developed and communicated in a collaborative approach that convinced the resource agencies that the alternate option was acceptable option that achieved desired long term outcomes while greatly reducing construction risks, costs & temporary environmental impacts.



Tucannon River Hartsock Reach

Instream Habitat/Floodplain Restoration

Client: Confederated Tribes of the Umatilla Indian Reservation

Project Location: Tucannon River, Washington

Services Provided:
- GIS/DEM Analysis
- Hydrologic Analysis
- Hydraulic Engineering & Modeling
- Geomorphic Assessment
- Infrastructure Impacts
- Stream Restoration and Design
- Log Structures, Helicopter Placement
- Floodplain Connectivity
- Riparian/Floodplain Forest Restoration
- Plans, Specifications and Estimates
- Permitting Assistance/BPA HIP III
- Construction Oversight

Project Timeframe: 2015 - 2022

Relationship with Client: Since 2013

Client Needs:

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) required consulting support to develop phased channel, floodplain, and riparian vegetation restoration designs for an approximately two-mile reach of the Tucannon River impacted by historic grazing and agriculture, tree harvest/clearing, and excavation and other bulk earthwork activities.

Kleinschmidt Solution:

In the first phase of the project, Kleinschmidt developed designs for an approximately one-mile long reach owned by Washington Department of Fish and Wildlife. We designed modular, cost efficient project elements including embedded logs, large wood accumulations, small-anchored log jams, boulder ballasted logs, and instream boulder clusters. As part of the design, we evaluated and considered geomorphic and riparian forest conditions as an important part of developing project elements that were consistent and compatible with natural channel and floodplain processes. Floodplain connectivity elements included excavating small pilot channels to increase the frequency of hydraulic connection between the river and selected floodplain channels. In addition, geomorphic processes influenced design considerations for protecting or accommodating infrastructure such as bridges, tributary sediment settling ponds, and irrigation facilities for wildlife habitat. We used HEC-RAS 2D modeling to design the dimensions of a channel conveying flood flows to a long, adjoining spring-fed channel. The goal was to increase the two-year spring channel discharge sufficiently to facilitate channel maintenance functions to support increased steelhead spawning and rearing habitat. The results of this first phase were used to engage private property landowners upstream and downstream of the project reach and initiate discussions of comparable restoration actions that could be implemented on their parcels.

Client Benefit:

The project reach has experienced several large floods since construction, and instream habitat complexity and floodplain connectivity have increased substantially within the project reach. We continue to support the CTUIR with expanding the project implementation area and developing designs that are acceptable to stakeholders.

DeepCWind Offshore Pilot Project

Permitting services for deployment of 1/8 scale test turbines

Client: University of Maine

Project Location: Off Castine, ME

Project Size: 20 kW

Services Provided:

- Marine Regulatory Permitting
- Army Corps of Engineers Section 10
- Maine Department of Environmental Protection

Project Timeframe: 2012-2014

Relationship with Client: Since 1989

Client Needs:

A University of Maine-led consortium was required to secure specific permits for the proposed project from applicable local, state, and federal permitting authorities for the installation of a temporary offshore wind demonstration project in the State of Maine waters.

Kleinschmidt Solution:

Kleinschmidt, serving on the Consortium's Permitting and Policy Team, is providing permitting services related to the deployment of a 1/8 scale test turbine in state waters. The Team submitted applications and received permits from the USACE under Section 10 of the Rivers and Harbors Act and Maine DEP under its General Permit program for marine renewable energy projects. The applications described existing commercial fishing and other uses in the project area, as well as the marine resources, a detailed monitoring plan of benthic invertebrates, fish, marine mammal, and avian wildlife, a monitoring plan of ambient noise levels possibly associated with project construction and, if needed, any subsequent operations and avoidance and mitigation measures, navigation public safety plans, and a project removal plan. Kleinschmidt worked in consultation with several federal, state, and local agencies.

Client Benefit:

The unit was deployed in Castine Harbor, Maine, in an existing cable right of way (ROW) approximately 800 feet offshore of the Dyce Head Lighthouse property. Deployment occurred in July 2013 and the unit remained at the location until June 2014. This represents the first grid-connected offshore wind project in North America. The pilot project will help clear hurdles to installing utility-scale turbines in U.S. waters, connecting to the power grid, and navigating new siting and permitting processes.

Hydropower Engineering

Hydropower is the oldest and largest source of renewable power generation. We have served this market for more than **55 years**, working on hundreds of hydropower facilities from existing hydropower **rehabilitations and modernizations**, to building new facilities. We build trust with our clients by working effectively to solve problems in a manner that **reduces costs and increases revenues**.

Our reputation for **quality** is founded on our ability to analyze, prepare, and present project information that is comprehensive and detailed, and concise to withstand the scrutiny of technical, regulatory, and legal review. We staff each project with experienced, knowledgeable professionals who average more than **22 years** of hydropower experience. The core project team remains assigned for the duration of the project.

Feasibility & Planning

Our experience includes performing hydropower feasibility assessments for the upgrade potential of existing sites, development potential of new greenfield sites, and performing due diligence assessments at existing hydropower facilities nationwide.

Asset Modernization & New Facility Engineering

Whether the project involves developing a new "greenfield" hydropower plant, adding generation to an existing non-powered dam, or rehabilitating an existing hydropower facility, hydropower engineers need a comprehensive understanding of the inter-relationship of all the project components. Our team has diverse backgrounds in civil, structural, hydraulic, mechanical, electrical, and geotechnical disciplines, which allow us to identify, evaluate, and develop comprehensive and integrated solutions.

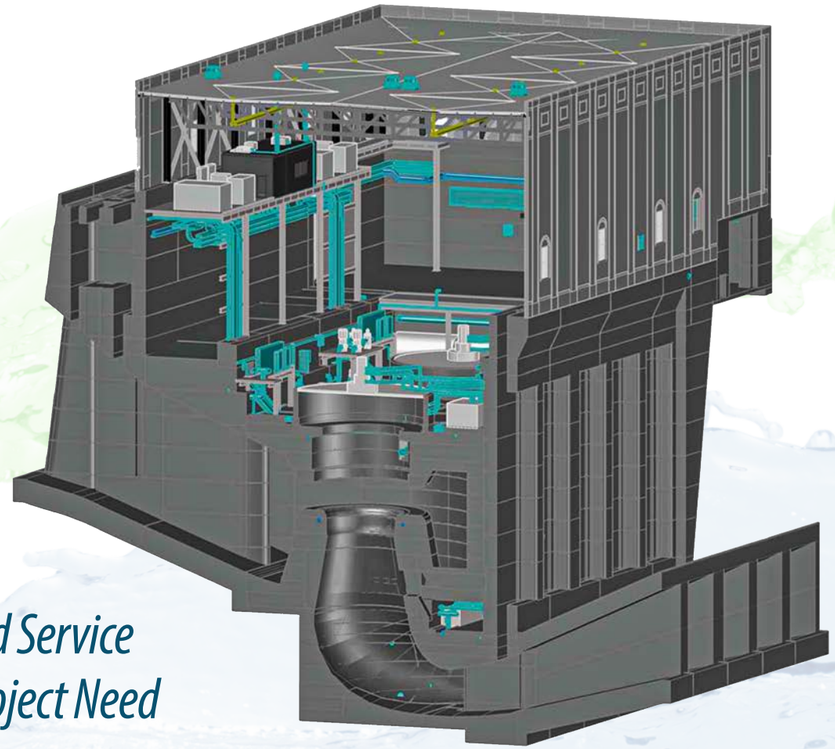
Penstock Inspections & Design

We routinely perform penstock inspections and evaluations to assess the condition of existing penstocks. Several staff members hold Level I certification with the Society of Professional Rope Access Technicians (SPRAT) and have the experience to perform penstock and hydraulic structure inspections using industrial rope access techniques. Our experienced inspection staff complete annual confined space training for entry into penstocks.

Valuations & Due Diligence

Technical consultants are often required to evaluate a project or an asset portfolio. Our team of experienced, senior personnel offer specialized technical services to our clients and the lenders involved in the financing, sale, acquisition and development of hydroelectric and other electric assets. In meeting this need, Kleinschmidt has served as independent reviewers for lending institutions, private developers, utilities, and law firms.

Hydropower Engineering



Personalized Service for Every Project Need

Pumped Storage

The need for large-scale energy storage is growing in response to the continued development of large-scale intermittent renewable energy sources (e.g., wind and solar power). We are an industry leader in managing the FERC regulatory processes and studies at pumped storage facilities.

We have managed or had significant involvement in the relicensing of eight pumped storage projects and are currently managing three other pumped storage relicensings. This experience has allowed us to develop a robust understanding of the unique operations of pumped storage, as well as a strong appreciation of the relatively low impacts associated with these projects.

Construction Services

To confirm that a construction project is built according to the design specifications and to mitigate future liability, most owners require construction monitoring or inspection services to be performed by an owner's engineer – someone whose primary responsibility is to consider the owner's interests.

These services may be limited to reviewing shop drawings, answering contractor questions during construction and occasional site visits; or for larger complex projects they may require full-time on-site engineering teams. We have experience with both scenarios and can provide the necessary hydro engineering construction services required to verify the quality, accuracy, and progress of the project.

Dam Safety & Infrastructure Engineering

We Know Dams

Our dam engineers provide studies, inspections, and designs to meet the needs of today's dam owners. We work with our clients to determine the most **cost-effective** means to help owners ensure the **safety** of their dams. Our **extensive experience** in identifying, studying, and preparing solutions to complex dam issues can provide you with peace of mind that your project is in the best hands.

Dam Safety Inspections & Monitoring

We routinely perform structural assessments and dam safety inspections to meet the owners' internal audit requirements and federal, state, and provincial regulations. Our independent consultants have conducted hundreds of the highly regulated Federal Energy Regulatory Commission (FERC) Part 12 inspections, which require periodic evaluation of all water-retaining project facilities in the United States that may affect public safety if they were to fail (such as spillways, gates and foundations). For Canadian owners, we have conducted dam safety reviews in accordance with the Canadian Dam Association guidelines.

Dam & Spillway Engineering

Our dam engineers provide inspections, studies, and designs to meet the needs of today's dam owners. Over the lifecycle of a project, solutions can involve determining the reasons for equipment inefficiency or failure, addressing safety issues, optimizing water usage for increased generation, modernization of existing civil structures, and meeting regulatory requirements such as permitting and Part 12 dam safety obligations, including delivery of emergency action plans and functional exercise services.

Spillway/Gate Inspection & Design

Safety concerns and economic risks of aging water control gates are common problems for many older dams. While the rehabilitation of existing gates share many technical aspects with new gate construction, it also presents special considerations and unique challenges. We provide our clients with comprehensive inspections, analysis, and design to assist with any gate/intake issues.

Hydrologic & Hydraulic (H&H) Modeling

Our hydrologic engineering experience includes developing new site-specific probable maximum flood (PMF) values and analyzing existing PMF conditions for dozens of projects throughout North America. We routinely revise flood frequency estimates for sites and apply hypothetical rainfall distributions in our hydrologic models. Our hydraulic engineers regularly perform hydraulic modeling and dam breach analyses to determine Inflow Design Flood (IDF) levels and hazard classifications. Our staff has completed hundreds of emergency action plans, dam breach studies, and inundation mapping projects.

By combining hydrologic models and hydraulic modeling, we help clients understand how the amount of runoff that enters rivers impacts their specific site locations. The results of the combined hydrologic and hydraulic models allow engineers to relay how the changes could impact operating procedures, generation capacity, or compliance adherence.

Our Hydrologic Engineering Center (HEC) utilizes software programs such as HEC-HMS, HEC-RAS, HEC-ResSim, HECSSP, HEC-DSSVue, and our proprietary software **McBreach**.

McBreach© by Kleinschmidt

Dam Safety & Infrastructure Engineering

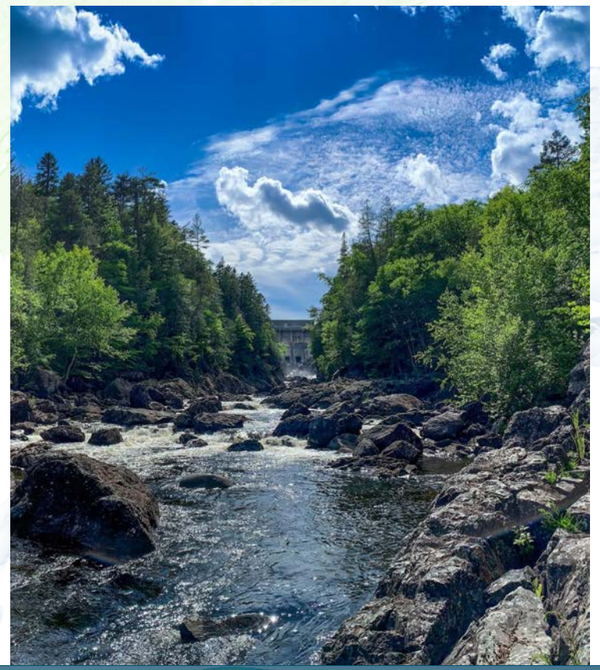
Emergency Action Plans & Dam Breach Analysis

Extreme weather conditions and rain events can wreak havoc on dams and be a major cause of concern for local communities. Let us help you prepare. Our highly trained team of hydraulic engineers are well versed in understanding the nature of dams, especially during flood conditions. We have completed hundreds of emergency action plans (EAP), dam breach studies, and inundation mapping projects.

Our engineers embrace the risk-informed decision-making process, using a suite of deterministic and probabilistic tools to inform clients of the risks associated with dam failures. We combine geographic information system (GIS) mapping with breach modeling to provide a consistent platform that unifies planning (e.g., building restrictions) and preparing EAP's.guidelines.

Environmental Services

Integrating Science, Planning, and Engineering to Provide Solutions to Complex Land and Water Resource Issues



Environmental Services

Kleinschmidt has 40+ years of experience helping clients create **sustainable solutions** to complex land and water resource issues. We have become highly regarded for ecosystem assessments, individual habitat and river restoration projects, watershed management, water supply reservoir management, dam removal, fish passage, and impact studies for wetlands.

Our success lies in our commitment to **integrating** science, planning, and engineering disciplines. By offering the biologist, the engineer, and the planner as part of one **integrated team**, we save clients time and money, and we create **lasting solutions** that benefit the environment.

Wetland & Habitat Investigations

Wetlands provide a variety of functional benefits to society, such as clean drinking water and flood attenuation, in addition to important biological functions such as fish and wildlife habitat. Federal and state agencies regulate impacts to wetlands with the goal of maintaining wetlands as an important resource to people and the environment.

Our scientists work with clients and regulators to avoid and minimize wetland impacts, which typically reduce project costs and streamline permitting efforts. In cases where mitigation is needed, we provide multidisciplinary design and monitoring services.

Stream Flow Regulation Studies

Our experts lead the way in Instream Flow Incremental Methodology (IFIM) studies that include collaborating with interagency study teams to identify all flow related issues, focusing the study scope on applicable parameters, defining evaluation criteria, locating study sites and transects, gathering survey and hydraulic data, developing hydraulic and habitat models, analyzing model output, and preparing written reports and analyses.

Fisheries & Aquatic Organism Assessments

We perform and manage studies and analyses, and works with and/or for agencies, conservationists, and developers to mitigate or enhance diverse impacts on freshwater and estuarine and marine fisheries resources. Our expertise includes assessing the health of warm water, coldwater, anadromous and catadromous fish resources and endangered species, in riverine, lacustrine, and tidal environments.

Steam Electric 316(a) and (b) Compliance

Our biological and engineering staff have over 3 decades of experience in dealing with 316(a) and (b) issues. By integrating biological science, engineering, socioeconomics and regulatory skills, we provide ample technical expertise to meet the needs of the project.

We seek to define both resource issues and project constraints, helping to identify appropriate options for mitigating environmental impacts with the overall goal of developing project alternatives acceptable to both project proponents and regulatory authorities. We conduct the required studies as well as serve as peer reviewers.

Rare, Threatened, and Endangered Species Assessments

We provide rare, threatened, and endangered (RTE) species assessments for hydroelectric and other energy relicensing, decommissioning, and compliance projects. In recent years, we have completed RTE species studies and consultation for numerous projects over a wide geographic range for wildlife, fish, and plant species. We have extensive experience with impact analyses.

For energy developers, we have developed avian protection plans for birds and bats for issues related to new development (e.g., tree clearing) and operations (e.g., effect on raptors of perching on transmission lines).

Fisheries Engineering

Kleinschmidt has provided biological and engineering fisheries engineering consulting services for more than **250** projects located throughout the United States and Canada. We are widely respected for conceptual and final design work of fish passage facilities and hatcheries, as well as biological assessments relating to fish passage and entrainment at hydropower facilities. Our **integration** of fisheries biologists, regulatory specialists, and engineers provides an exceptional capability for **solving problems** involving the **mitigation** of **fisheries impacts** and enhancement of fisheries resources.

Species Restoration & Restoration Planning

Our multidisciplinary team of biologists, engineers, and regulatory specialists have outstanding knowledge and experience in the process of evaluating and developing fisheries protection and restoration plans in the context of fish passage requirements. We work with stakeholders and clients to facilitate and streamline a planning process to develop a plan that uses a sound science approach with objectives, priorities, and action items designed to optimize the benefit to the species while balancing our clients' needs and providing cost-saving ideas along the way.

Feasibility Studies & Alternative Analysis

Our dedicated fish passage team has conducted feasibility studies for more than 100 projects in North America. The process begins by consulting with the client regarding goals, objectives, and key elements of station operation that must be considered to develop an effective conceptual solution. With agency prescriptions or recommendations as a guide, we work with clients to develop a solution that addresses safety, compliance, revenue, and maintenance concerns.

Agency Consultation & Conceptual Layout

As a highly competent fish passage consultant, we advocate for our clients and facilitates productive and efficient dialogue with agencies, non-governmental organizations, and stakeholders. Our experience and ability to advocate for our clients with the agency personnel who will be involved in their projects often leads to reduced project costs because we understand the agencies' expectations and how to negotiate more practical approaches that are more constructible and acceptable to the owner and do not impact fishway effectiveness.

Engineering Design

While designing fish and eel passage facilities of all types over the past 30 years, we developed a library of design components that we easily customize for each of our client's projects to reduce design costs. Our library includes designs for eel passage, elevators/lifts, Denil ladders, Alaskan Steeppass, vertical slot, pool and weir, nature-like, sorting facilities, and downstream passage. We have designed more than a dozen fish lifts as well as the largest nature-like fish passage project in the Eastern United States.

Effectiveness Studies

We have conducted more than 40 effectiveness studies using an approach of consulting with our clients to identify and screen techniques for testing that are practical and cost-effective for the project.

We have developed innovative statistical analyses techniques to automate fish tracking data reduction using algorithms that reduce processing times and costs and enhance data credibility with resource agencies. Our assessments are routinely accepted by resource agency personnel without the need for extensive additional data gathering or analysis resulting in cost savings for our clients.

*We **ARE** the Fisheries **Experts***

Fish Hatcheries

Kleinschmidt specializes in hatchery planning and engineering, fisheries biology, fish passage, water resources, and hydraulic engineering. Our experienced scientists and engineers have been involved in a wide variety of projects preserving, protecting, and restoring fish populations, with an emphasis on salmon, trout, and other native fish species. Kleinschmidt's engineers are experienced in all aspects of planning, design, and construction of fish hatcheries including bio-programming, fish ladders, adult holding, sorting and spawning, incubation, early rearing, intakes, water supply treatment, effluent treatment, feed storage, incubation buildings, office buildings, residences, and other elements of a fish hatchery.

250+

Fisheries Engineering Projects

*Kleinschmidt has provided **biological** and **engineering fish passage** consulting services for more than 250 projects located through the United States and Canada.*

Water Resource Engineering & Habitat Restoration

Providing Integrated Solutions to Meet Your Project Needs

Our water resource engineering team is composed of **technical experts** in hydrology, hydraulics and civil engineering who interact with our fisheries, aquatic and terrestrial scientists to provide ecosystem-based solutions. We offer a full spectrum of services beginning with detailed analyses and conceptual studies through design, project management, regulatory approvals and construction services.

We design environmental enhancements to **mitigate impacts** and recreational facilities to promote the public access to natural areas. Our scientists and engineers use field data, modeling and planning tools to **efficiently design** projects that meet the needs of varied stakeholders including public, private, and regulatory interests.

Restoration & Protection Design

We offer wetland and stream restoration, as well as targeted designs to protect and enhance conditions for sensitive species that efficiently meet ecological needs and local, state, and federal agency requirements. Our services include design implementation, procurement support, construction management and post-construction monitoring; ensuring the future success of the individual projects according to project-specific federal monitoring requirements.

We adopt an efficient, multidisciplinary approach to solving restoration needs by focusing on options that are low-risk, low-cost, durable, and designed to achieve regulatory approval.

Water Resource Engineering & Habitat Restoration

Dam Decommissioning and Removal

We have conducted more than 30 dam removal projects in nine states and one province for clients that include owners as well as public and private organizations. A complete alternatives analysis and cost-sensitive design requires access to a strong interdisciplinary mix of engineering, biology, and permitting expertise. Our engineering expertise includes civil, geotechnical, and structural disciplines (dam stability and fish passage design); our biologists have nationally recognized expertise in fish migration and passage, fluvial geomorphology, aquatic habitat, water quality, wetlands and wildlife; and our permitting staff is experienced with NEPA, FERC, state and federal permitting requirements, has strong public outreach and stakeholder management skills, and possess excellent working relationships with regulatory and natural resource agencies, conservation groups, and other stakeholders.

Whether the decommissioning of your dam is primarily to restore fish passage or remove a structure that is no longer necessary, our team of experts has the experience and passion to work with you to make your project a success.

Recreation Facilities Design

Our recreational design experience includes assisting federal licensees of hydropower projects to meet requirements for providing reasonable public access to project lands and waters for recreation. We assist these and other clients by assessing use and facilities and developing designs to support outdoor recreation management plans.

Our familiarity with regulatory requirements, recreational planning, and permitting allows us to assist our clients in developing new project designs in a timely, efficient manner that meet their needs and those of recreationalists.

Bridge and Culvert Hydraulic Design

Our hydraulic engineers provide the full range of hydraulic design services for bridges and culverts. Bridges and culverts are common road features that must be designed to withstand the hydraulic forces from a flood so they won't cause a flood risk to the surrounding areas. But that's not their only purpose – they must be designed to work in concert with the aquatic environment, allowing safe migration for resident species and complimenting habitats rather than detracting from them.

We have decades of experience with the hydraulic design for bridges and culverts using Federal Highways and State DOT standards to protect surrounding areas from flooding but also to prevent erosion and scour. Our hydraulic design engineers work in concert with our fish passage and stream restoration specialists to produce environmentally friendly designs that last. In addition, our restoration engineers and scientists can work to incorporate additional habitat features to improve the aquatic environment. We use the latest technologies to predict flood frequencies and we simulate flood conditions using one and two-dimensional hydraulic models. Kleinschmidt prides itself on being on the cutting edge in bridge and culvert hydraulic analysis and design and actively collaborates with the top researchers in the field to produce modern, accurate, and practical approaches.

Watershed Planning

In recent years, there has been a renewed focus on watershed planning in water resource management. State and federal regulators, as well as many non-governmental organizations, are actively promoting comprehensive planning and local community stewardship as alternatives to regulatory approaches.

We provide planning, engineering, and environmental services to solve land and water resource concerns within a watershed or river basin. These services include smaller assessments that focus on a particular concern, as well as larger, more comprehensive evaluations that seek to balance multiple uses such as flood control, water supply, water quality, species and habitat protection, recreation, and energy production.

Green Stormwater Design

Improved stormwater management is an important component of strategic initiatives for many municipalities, and many have developed Sustainable Stormwater Management Plans to counter deteriorating ecosystems. Kleinschmidt has developed green stormwater infrastructure (GSI), or source controls, which is a set of techniques that detain or retain stormwater runoff through capture and controlled release, infiltration into the ground, vegetative uptake and evapotranspiration thereby reducing the need for end-of-pipe stormwater storage and treatment systems.

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