



JOHN P. CHRISTENSEN P.E.

Principal Hydropower/Water Resources Engineer

Mr. Christensen is a water resources engineer with over 40 years of experience in development and operation of major water resource and hydropower projects including dams, reservoirs, tunnels, penstocks, and hydroelectric power plants.

His expertise spans the project development cycle through planning, site investigations, permitting, licensing, engineering, equipment procurement, bidding, construction management, claim resolution, asset management, plant operation, upgrading and life-extension of wet infrastructure.

He assists water agencies and electric utility companies with FERC licensing, regulatory compliance, asset management, operation, life extension, upgrading and dam safety issues.

Professional Experience

Over 40 years of experience in project management, planning, engineering, construction and operation of major water resources and hydropower projects

Expertise

- Project management
- Water resources engineering
- Hydropower development
- FERC licensing & relicensing
- Hydrology & hydraulics
- Economics & project finance
- Construction management
- Dam safety
- Hydropower upgrades
- Asset management and operation

Education

Graduate Studies, Water Resources Engineering, UBC, Canada.

B Eng, Civil Engineering, University of Auckland, New Zealand.

Professional Registration

*California Civil 36271
Washington Civil 49067*

Professional Affiliations

*US. Society on Dams
American Society of Civil Engineers
Northwest Hydroelectric Association*

Awards

2008 – Narrows 2 Flow Bypass Project - NHA Outstanding Steward of American Waters Award.

REPRESENTATIVE PROJECT EXPERIENCE

New Bullards Bar Dam, Foundation Remediation, CA

Grout curtain remediation for foundation of a 645 feet high concrete arch dam.

Enloe Hydroelectric Project, WA

Engineering design and FERC Licensing of a 9-MW hydroelectric project at an existing concrete arch dam.

WTP2 Conduit Hydropower Turbine Upgrade, CA

Upgrading of a 1.25-MW small hydro plant at Alameda County Water District's Water Treatment Plant No 2.

Middle Fork American River Project, CA

Upgrading of water and hydropower facilities for relicensing of a 220-MW hydroelectric project.

Wheatland Canal Project, CA

Construction management of a new irrigation system comprised of 11 miles of canals, pipelines, laterals and three pump stations.

Colgate Penstock Valve Retrofit, CA

Retrofit of a 168 inch diameter penstock shutoff valve for the 340-MW Colgate Hydroelectric Project.

Narrows 2 Power Plant Flow Bypass, CA

Engineering design and construction management of a 3000 cfs flow bypass at YCWA's 55-MW Narrows 2 hydroelectric plant.

New Bullards Bar Spillway Gate Seismic Retrofit, CA

Design and construction of seismic retrofit of three 55 foot high radial spillway gates at New Bullards Bar Dam. (Largest radial spillway gates in California)

Pardee Reservoir Enlargement, CA

Preliminary engineering of a \$250 million raise or replacement of existing dam and hydroelectric power plant upgrade for EBMUD.

Panama Canal, Panama

Investigation of existing spillway capacity and planned spillway upgrade at Lake Gatun Dam.

SCE Hydro Relicensing, CA - *Engineering support services for FERC relicensing of 10 Southern California Edison hydro projects.*

Puueo Hydro Project, HI - *Repowering of a 3-MW small hydroelectric project in Hilo for Hawaii Electric Light Company.*

PROFESSIONAL EXPERIENCE

1989-Present Christensen Associates Inc. *Founder and President of Christensen Associates Inc. – a specialty water resources and hydropower engineering firm headquartered in San Rafael, near San Francisco, California.*
As a Principal of the firm he works with our clients to assemble and manage multidisciplinary project teams. He also provides specialist planning, engineering, licensing, economics and litigation support services for water resource and hydropower projects.

New Bullards Bar Dam, Grout Curtain Remediation, Dobbins, CA

Yuba County Water Agency, Marysville, CA

Project Manager for investigation of increased seepage through foundation of the dam and evaluation of performance of grout curtain.

Enloe Hydroelectric Project, Oroville, WA

Okanogan Public Utility District No.1

Conceptual design, site investigation, engineering and preparation of a FERC license application for redevelopment of 9-MW hydropower plant at an existing 57 feet high concrete arch dam on the Similkameen River near Oroville, WA,

Water Treatment Plant No. 2 – Hydro Turbine Upgrade, Fremont, CA.

Alameda County Water District

Hydro plant testing, and upgrade evaluation for six turbine-generator units at the 1.25-MW small hydropower facility at the intake to Water Treatment Plant No 2.

Middle Fork American River Project Relicensing, Foresthill, CA

Placer County Water Agency, Auburn, CA

Provided engineering support services to Placer County Water Agency for relicensing of the 220-MW Middle Fork American River Project. This work included evaluation of upgrades and betterments to stream diversions, storage reservoirs and power generating facilities. The work also included evaluation of improvements in reservoir outlet works to address future instream flow release requirements for the project.

Yuba- Wheatland Canal Project, Wheatland, CA

Yuba County Water Agency, Marysville, CA

Construction management of development of a 10 mile long system of irrigation canals, underground pipelines, three pumping stations, canal laterals and 26 canal turnouts to bring water from the Yuba Main Canal to agricultural; lands in southern Yuba County.

New Bullards Bar Spillway Gate Remediation, Dobbins, CA

Yuba County Water Agency, Marysville, CA

Project Manager for seismic rehabilitation of three 55 foot high radial gates at the spillway of New Bullards Bar Dam. These are the largest radial gates in California.

Narrows 2 Flow Bypass Project, Marysville, CA

Yuba County Water Agency, Marysville, CA

Design of a new fisheries mitigation facility for the 55-MW Narrows hydroelectric powerhouse at Englebright Dam on the Yuba River. The purpose of the project is to protect fish habitat on the lower Yuba River by allowing the Agency to bypass flows during an unscheduled or scheduled outage of the turbine unit. The \$12M project includes a new tunnel, turbine shutoff valve, guard valve and energy dissipating valve and ancillary facilities.

Colgate Penstock Shutoff Valve Retrofit

Yuba County Water Agency, Marysville, CA

Preparation of bid documents and construction management of retrofit of a 168 inch diameter butterfly valve in the penstock of a 330-MW hydroelectric plant.

Panama Canal Expansion - Raise Gatun Lake, Panama

Panama Canal Authority, Panama

Investigation of the feasibility of increasing the capacity of the Panama Canal by raising the operating level of Gatun Lake. The lake forms the central part of the canal waterway across the isthmus of Panama.

Developed alternatives for reducing Probable Maximum Flood surcharge by increasing the capacity of Gatun Spillway- the main flood control outlet works for Gatun Lake which forms the central trans-isthmus reach of the Canal.

Puueo Hydro Rehabilitation, Hilo, HI.

Hawaii Electric Light Company Hilo HI.

Resource utilization study for Puueo and Waiau hydro plants on the Wailuku River in Hawaii. Evaluation of rehabilitation options for Puueo Unit No. 2 which failed while in service. Supported the client in an insurance claim and application to the Hawaii Public Utilities Commission to Repower the plant with a 3-MW unit.

Prepared bid documents for a water-to-wire equipment package and design-build documents for removal of the old equipment, installation, start-up and commissioning.

Lyons Reservoir Enlargement Project, Pinecrest, CA.

Tuolumne Utilities District, Sonora, CA.

Project manager for updating engineering studies, hydrology, reservoir operation studies and cost estimates of enlarging Lyons Reservoir to serve the future water needs of Tuolumne County and other water agencies.

The \$80M project involves an enlarged reservoir, 300 foot high concrete-faced rockfill dam, diversion tunnel, concrete chute spillway, outlet works, provision for a hydroelectric powerhouse and a six-mile long water delivery pipeline from Lyons to Twain Harte.

Part of this work involved reviewing over 20 years of previous engineering studies of water resources development of the South Fork of the Stanislaus River and recommending a definite project concept for seeking Federal and State funding.

Adobe Creek Conjunctive Use Project, Big Valley, CA.

Lake County Flood Control & Water Management District, Lakeport CA.

Project Manager for feasibility study and CEQA Initial Study for a conjunctive use water supply project near Clear Lake, California. Today, conjunctive use of surface and groundwater storage is one of the most promising environmentally acceptable options for improving the reliability and yield of water supply in California.

The Adobe project involves modifying the outlet works and seasonal operation of an existing flood control reservoir to provide water to recharge the Big Valley Groundwater Basin.

In addition to water supply benefits the project will improve groundwater quality, reduce subsidence, improve wildlife habitat and improve recreation opportunities. The work included supporting the client in preparing a detailed application for construction funding from the State of California Proposition 13 water bonds.

Sunset Reservoir Condition Assessment, San Francisco, CA

City of San Francisco Water Department, San Francisco, CA.

As part of the City of San Francisco’s planned \$3-Billion seismic retrofit program for its water system inspected over 25,000 reinforced concrete structural elements that make up the roof of the North Basin of Sunset Reservoir.

Developed a unique system for gathering and recording structural element condition data. Prepared a report that presented an analysis of concrete deterioration in the structure including detailed maps showing spatial trends of structural deterioration.

Off-Stream Water Supply Storage, Tuolumne River Basin, CA

Turlock Irrigation District

Project manager for a strategic assessment of off-stream storage reservoir sites in the lower Tuolumne and San Joaquin River Basins in California. Off-stream storage of surface water is one of the few potentially feasible ways for increasing the water supply available to meet California’s growing human and ecosystem needs.

The project involved performing reconnaissance level studies of several reservoir sites including development of conceptual layouts, cost estimates and preliminary inventories of environmental issues.

Pardee Reservoir Enlargement Project, Jackson, CA.

East Bay Municipal Utility District, Jackson, CA

Project Manager for preliminary engineering and geotechnical services for enlargement of Pardee Reservoir. The project entails almost doubling the capacity of the reservoir to improve the reliability and yield of EBMUD’s primary water supply from the Mokelumne River.

Previous concepts had involved raising the existing dam. After a full evaluation of engineering, geotechnical, constructability, dam safety, environmental and operational issues it was determined that constructing a new dam about one mile downstream was the most feasible and cost-effective plan.

The project involves a 350 feet high RCC gravity dam and spillway, four embankment saddle dams, relocating a 30-MW hydroelectric powerhouse, constructing a new outlet tower and tunnel, relocating roads, highway bridges and utilities and relocating an existing lakeside recreation facility. The project involved extensive coordination between engineering and environmental consultants and District Staff to successfully reach consensus regarding the overall design concept.

PG&E Hydro Divestiture, CA.

Placer County, Auburn, CA

Working as part of Lamont Financial Services team, developed Placer County’s official response to PG&E’s divestiture of hydro projects, including potential impacts on county land use planning, agriculture, water supply, tax revenues. Coalition of opposing parties succeeded in achieving a moratorium on divestiture until 2006.

EPRI Hydro Modernization Guide

Electric Power Research Institute (EPRI) Palo Alto, CA

Collaborated on preparing a new guide to modernizing and upgrading hydro plants. The guide presents the state-of-the-art in technologies for improving and extending the life of existing hydropower infrastructure. Under contract to BC Hydro International, Mr.

Christensen prepared the portion related to Federal and State licensing of hydro facilities.

SCE Hydro Relicensing Support, CA.

Southern California Edison, Rosemead, CA.

Assessed potential economic impact of increases in instream flow for fisheries, recreation and maintenance of water quality on ten existing small hydroelectric projects in the Southern California Edison Hydropower system. Reduction of generation is a significant risk facing hydro project owners in FERC relicensing proceedings.

The process of environmental problem-solving and negotiating with resource agencies/stakeholders is important in minimizing these losses. On this project CAI developed hydrologic, operations and economic models to estimate impact of potential changes in instream flow and water levels on Edison ratepayers. We developed data used by Edison staff in negotiating instream flows and licensing conditions.

Clavey River Project, Sonora, CA

Tuolumne County and Turlock Irrigation District, Sonora, CA

Project manager for planning and licensing of the Clavey River Project near Sonora, California. This visionary project was planned in the 1980's to provide additional water storage and 150-MW of peaking hydroelectric power starting in 2001.

The project was placed on indefinite hold due to strong opposition by environmental groups who insisted that California did not need more hydroelectric power. The energy crisis of 2000/2001 proved otherwise. The Project comprised a 114,000 acre-ft. reservoir, 400 foot high Roller Compacted Concrete Dam, three stream diversions, eleven mile long power tunnel, underground powerhouse containing two 75-MW Pelton turbines operating under a hydraulic head of almost 3000 feet, and a reregulating reservoir.

Complex resource issues on this project required extensive environmental studies, mitigation planning and agency consultation. Mr. Christensen managed a multidisciplinary team of engineers, environmental scientists conducting a 5 year program of investigations and licensing activities. The project required extensive consultation with Federal and State Resource Agencies and community outreach programs.

Market Value Appraisal of Buckeye and Tunnel Hill Hydro Projects, Georgetown, CA

Western Energy Associates, Tiburon, CA.

Carried out an appraisal of the fair market value of two small hydro projects (650-kW and 400-kW) on Georgetown Divide Public Utility District's water supply system. The purpose of the work was to determine the fair market value of the projects for transfer of ownership.

The work entailed inspecting the projects, reviewing development agreements and historical cost data, developing estimates of revenues and costs, developing an appraisal of market value and preparing an appraisal report. Subsequently prepared expert testimony for legal proceedings.

SCE Hydro Business Alternatives Evaluation, CA

Southern California Edison, Rosemead, CA

Developed a program for Southern California Edison Company staff to use in evaluating existing hydro assets and maximizing the value of each asset.

Project involved development of a financial model to evaluate asset management options. The program was applied to a test project and a training course was developed for Edison hydro staff.

PacifiCorp Hydro Asset Evaluation, Medford OR & Yreka CA.

PacifiCorp, Portland, OR.

Inspected and evaluated the Eagle Point and Fall Creek hydro projects for PacifiCorp and recommended options for maximizing asset value in the face of restructuring of the utility industry.

Hawaii Pumped-Storage Hydroelectric Study, Hawaii, Maui, Molokai and Lanai, HI

Hawaii Electric Company, Honolulu, HI

Project Manager for evaluation of feasibility of pumped-storage hydroelectric development to serve peak electrical loads on the islands of Hawaii, Maui, Molokai, and Lanai. Developed resource and cost data for use in Hawaii's Integrated Resource Planning (IRP) process.

The work included map studies to prepare an inventory of over eighty potential sites, screening them according to technical and environmental criteria, inspecting the most promising sites and then preparing project layouts and cost estimates.

An assessment of environmental constraints was also prepared and the most promising projects were ranked on a technical, cost and environmental basis.

Sand Bar Project Settlement & Refinancing, Cold Springs, CA

Tri-Dam Power Authority, Strawberry, CA.

Assisted Tri-Dam to successfully negotiate resolution of issues related to compensation for firm capacity and energy for their 16.2-MW Sand Bar Project under their Standard Offer No. 4 power sales agreement with PG&E. Work involved interpretation of licensing, contractual and environmental constraints and computer modeling of operations of Donnell's, Beardley Spring Gap, Sandbar and Stanislaus power plants on the Middle and South Forks of the Stanislaus River. Subsequently prepared a successful FERC license amendment for an increase in licensed capacity. Prepared Independent Engineers Report to support a successful \$62-million bond refunding and project refinancing.

EBMUDSIM Operations Model, Oakland, CA

East Bay Municipal Utility District, Oakland, CA

Project management of review, evaluation and preparation of documentation for the existing EBMUD District system operations model. The model simulates operation of Pardee and Camanche Reservoirs on the Mokelumne River, operation of two hydroelectric projects and water transfer through a 90 mile long aqueduct system to treatment and distribution facilities that serve a 325 square mile urban area on the East side of San Francisco Bay.

Stanislaus River Headwater Benefits Settlement, CA.

Tri-Dam Power Authority, Strawberry, CA

Provided expert support to Tri-Dam Power Authority in settling issues related to FERC's Headwater Benefits Determination for the Stanislaus River Basin. Work entailed reviewing FERC estimates of headwater charges for Tulloch power plant, advising Tri-Dam regarding the validity of the estimates and supporting the settlement process. This matter has been swiftly resolved to the satisfaction of both parties.

El Dorado and Upper American River Project, Placerville, CA

El Dorado Water Agency, Placerville, CA

Provided technical and economics support to El Dorado County Water Agency in negotiating contracts for supply of water from the El Dorado Hydro Project and Upper

American River Hydro Project.

Assisted EDCWA in negotiating a participation agreement for the SMUD/EL Dorado Multi-Purpose Water and Power Project (285-MW).

Santa Ana River 1 & 2, Mill Creek 2 & 3 and Lytle Creek Projects, San Bernadino, CA

Southern California Edison, Rosemead, CA

Economic evaluation of instream flow release options for three existing small hydro projects: Lytle Creek (500-kW), Mill Creek 2/3 (3.25-MW), Santa Ana 1 & 2 (4-MW). Assisted Southern California Edison Company with preparation of applications for relicensing projects.

Puueo & Waiiau Projects, Hilo, HI

Hawaii Electric Company, Honolulu, HI

Assessed rehabilitation alternatives for the Waiiau (1100-kW) and Puueo (2250-kW) hydro plants on the Wailuku River near Hilo. Work includes inspection of penstocks and turbines, assessment of plant life and planning of upgrading measures.

Oakdale Canal Emergency Repairs, Oakdale, CA

Oakdale Irrigation District, Oakdale, CA

Supervised emergency repairs to the Oakdale South Canal which was washed out in peak irrigation season due to vandalism at the headworks. Worked with the client and contractor to design and construct a \$300,000 repair in eight days from start to finish.

Banks Pumped-Storage Project, Payette, ID.

Consolidated Pumped Storage Inc., Stamford, CT

Developed unique design concept for a 500-MW hybrid conventional hydroelectric and pumped-storage project on the North Fork Payette River in Idaho. Project comprises a 80-MW pumping plant, 12 miles of tunnels, 4 miles of channels and new wetland areas and a 500-MW underground power plant.

Ralston & Oxbow Projects, Foresthill, CA

Placer County Water Agency, Auburn, CA

Investigated loss of generation due to sedimentation and high tailwater at the 80-MW Ralston and 7-MW Oxbow power plant on the Middle Fork of the American River. Developed solutions and carried out an economic analysis of operational and capital improvement options. Work carried out for Placer County Water Agency & EA Engineering Science and Technology.

Melones Condemnation Litigation, Sonora, CA.

Pacific Gas & Electric Company, San Francisco, CA.

Expert witness retained by Pacific Gas and Electric Company to provide supporting engineering analysis and cost estimates for valuation of PG&E's 26-MW Melones Hydroelectric Project on the Stanislaus River in California. The project is the subject of a civil suit regarding just compensation for condemnation by the Federal Government in 1976.

Goodwin Project, Oakdale, CA

Tri-Dam Power Authority, Strawberry, CA

Prepared preliminary permit application and in process of preparing a FERC License Application for the proposed 5-MW Goodwin Hydroelectric Project on the Stanislaus River.

1982-1989 Morrison Knudsen Engineers) Joined MKE in 1982 as Senior Engineer in the project planning section of the Water Resources Division in San Francisco, CA Worked on planning, Federal Energy Regulatory Commission (FERC) licensing and preliminary design of hydroelectric projects.

Formerly International Engineering Company (IECO) In 1983 he was promoted to the position of Principal Engineer responsible for project management of hydropower and water supply projects. Projects included, feasibility studies, preparation of FERC License Applications, and evaluation of hydro projects for financing institutions.

In 1988 became Director of Water Resources Project Operations in the responsible for overall management of MKE water resources projects in the Western U.S. including coordinating project operations, project development activities and contract administration.

Clavey River Project, Sonora, CA.

Turlock Irrigation District, Turlock, CA.

Feasibility studies and FERC licensing of this 150-MW Project near Sonora, California. Unique project involving development of a 3,000-foot hydraulic head peaking hydroelectric project on a tributary to the Tuolumne River.

North Fork Tolt Water Supply Project, Seattle, WA.

City of Seattle, Seattle, WA.

Preliminary investigations of development of a 60-Mgd Municipal and Industrial Water Supply project on the North Fork Tolt River for the City of Seattle, Washington.

SOFAR Project, Placerville, CA.

Swiss Bank Corporation, New York, New York

Pre-financing evaluation for Swiss Bank Corporation of the 126-MW SOFAR Project near Placerville, California.

Owyhee Project, Nyssa, OR.

Gem Irrigation District, Homedale, ID.

Feasibility studies of 8-MW Owyhee Tunnel No. 1 underground hydroelectric power plant at Owyhee Reservoir near Nyssa, Oregon. Developed a unique design concept for an underground powerhouse adjacent to an existing underground reservoir outlet structure.

Big Creek Project , Hyampom, CA.

Investment Bank, Providence, Rhode Island

Pre-financing evaluation for an investment bank of the 5-MW Big Creek Hydroelectric project near Hyampom, Northern California.

Newcastle Project , Newcastle, CA

Pacific Gas and Electric Company, San Francisco, CA

Licensing support for Pacific Gas & Electric Company on this 12-MW Project on the American River, California.

Salt Lake City Small Hydro Project, Salt Lake City, UT.

Energy National Inc. Salt Lake City, UT.

Feasibility studies of nine 250-kW to 3-MW hydroelectric projects in the Salt Lake City water supply system. Involved energy recovery from existing pressure reducing stations as well as conventional projects on streams and canals.

Tulloch & Goodwin Projects , Sonora, CA

Tri-Dam Project, Strawberry, CA

Feasibility study, preliminary design and Federal Energy Regulatory Commission licensing of an additional 7-MW unit at Tulloch Dam, and new 5-MW unit at Goodwin Dam on the Stanislaus River, California.

Department of Energy Small Hydro Program, United States

Department of Energy, Idaho Falls, ID.

Evaluated National Small Hydropower Program and prepared a comprehensive manual for hydro project developers entitled "Small Hydro Development - The Process Pitfalls & Experience". The manual is the first to address complex legal, environmental, and institutional issues facing U.S. hydropower development today.

Azure Pumped Storage Project, Yampa River, Colorado.

Northern Colorado Water Conservancy District, Grand Lake, CO

Economics, operation analysis, and assisted with preparation of a FERC License Application for an 800-MW Pumped-Storage Project on the Yampa River in Colorado.

Low Line Project, Twin Falls ID.

Idaho Power Company, Boise ID

Powerhouse layouts for development of an 8.4-MW Hydroelectric Project, Twin Falls, Idaho.

**1981-1982
Canadian
Energy
Development
Systems
International**

Project Manager for investigation of small hydroelectric projects in Jamaica. Managed a multinational team of Canadian and Jamaican engineers.

Assisted with establishing and supervising similar programs in Dominica and the Dominican Republic.

Jamaica Small Hydro Feasibility Studies

Canadian International Development Agency (CIDA)

Investigations of the Laughlands Great River (6.5-MW), Negro River (1-MW), Cave River (660-kW) and Morant River (220-kW) hydropower projects in Jamaica.

Dominica Small Hydro Feasibility studies, Rouseau, Dominica

Canadian International Development Agency (CIDA)

Reconnaissance Studies of three micro-hydro projects at Delice, Castle Bruce, and Rosalie, Commonwealth of Dominica.

Dominican Republic Small Hydro Feasibility Studies

Canadian International Development Agency (CIDA)

Investigations of the 1700-kW Cocuyu, 440-kW El-Limon and 70-kW Rio Casui projects, Dominican Republic.

**1980-1981
Acres
Consulting
Services**

Employed as Project Engineer in the Vancouver Office working on evaluation of an aging hydro electric plant on the British Columbia coast. Subsequently managed water resources and civil works projects.

Ocean Falls Hydroelectric Project

Crown Zellerbach Paper Company

Evaluated safety and condition of penstocks, turbines, the dam and hydraulic structures at the 70-year-old 14-MW Ocean Falls Hydroelectric Project, British Columbia.

Valley Copper Mine, Gambia Island, British Columbia

Mining Corporation – Confidential.

Conceptual Design of an aerated lagoon sanitary wastewater treatment facility for the Valley Copper Mine, British Columbia.

Burrard Dry Dock Infrastructure Improvements

Burrard-Yarrows Corporation

Prepared contract documents for demolition of four buildings and construction of a new reinforced concrete retaining wall at Burrard Dry Dock, Vancouver, British Columbia.

1975-1980
Monenco
Consultants
Formerly
Montreal
Engineering
Company

Mr. Christensen joined the Water Resources Division as a Hydraulic Engineer.

Initially he worked in the headquarters office in Montreal on international projects and then relocated to Vancouver to work on water resources and hydropower projects in British Columbia, Alberta and the Yukon Territory.

Yukon Mining Energy Study, Yukon Territory, Canada

Northern Canada Power Commission, Edmonton, Alberta, Canada

Investigated potential sources of hydroelectric power for future mining in the Yukon Territory. Projects included the 60-MW Frances River, 30-MW Ross River, 30-MW Hoole Canyon and 15-MW Little Salmon River Projects.

Mid-Yukon Project, Carmacks, Yukon Territory, Canada

Northern Canada Power Commission, Edmonton, Alberta, Canada

Supervised site investigation work for the 500-MW Mid Yukon Hydroelectric Project on the Yukon River near Carmacks, Yukon Territory.

Alberta Pumped-Storage Study , Alberta, Canada

Calgary Power Limited, Calgary, Alberta, Canada

Supervised reconnaissance studies of twelve 100-MW to 700-MW high-head pumped-storage hydropower sites in the Rocky Mountains, Alberta.

Hat Creek Thermal Plant, Ashcroft, British Columbia, Canada

British Columbia Hydro & Power Authority, Vancouver, Canada

Designed stream diversion facilities, mine drainage systems and leachate collection systems for British Columbia Hydro and Power Authority's proposed Hat Creek Coal Mine and 2000-MW Thermal Power-plant near Ashcroft, British Columbia. Carried out preliminary design of water supply system for coal processing facilities.

Peace and North Saskatchewan River Ice Studies

TransAlta Utilities, Edmonton, Alberta, Canada

Investigated ice-jamming and flooding process downstream of the Peace River, Bighorn and Brazeau hydroelectric developments on the Peace and North Saskatchewan Rivers, Alberta, Canada.

Whitehorse Powerhouse Expansion, Whitehorse, Yukon Territory, Canada

Northern Canada Power Commission, Edmonton, Alberta, Canada

Power System Studies of the Whitehorse hydro-diesel electricity generating system, Whitehorse, Yukon Territory.

Atlin Lake Storage , British Columbia, Canada

Northern Canada Power Commission, Edmonton, Alberta, Canada

Carried out site investigations, hydrologic studies, operation studies, and preliminary design of Atlin Lake Storage Dam to provide flow regulation for the fourth unit at the 40-MW Whitehorse Rapids Hydroelectric Power plant.

Aishihik Project , Yukon Territory, Canada

Northern Canada Power Commission, Edmonton, Alberta, Canada

Carried out feasibility studies of headwaters diversions into Aishihik Reservoir, Yukon Territory, Canada.

Otter Falls Pumping, Yukon Territory, Canada

Northern Canada Power Commission, Edmonton, Alberta, Canada

Feasibility Study of Otter Falls Pumping Project for environmental mitigation for the Aishihik Project, Yukon Territory, Canada.

Ghost Spillway Evaluation Alberta, Canada

Transalta Utilities, Calgary, Alberta

Assessed extreme flood discharge capacity of three spillway structures at Ghost Reservoir, Alberta, Canada.

El Santo Project , Nicaragua

Mining Corporation –Name Withheld.

Conceptual design of river diversion works, penstock and surge tank for the 20-W high-head El Santo hydroelectric project, Nicaragua.

Jebba Project Nigeria

Power Holding Company of Nigeria, Lagos, Nigeria

Carried out preliminary design studies of the powerhouse structures for the 550-MW Jebba Hydroelectric Project, Nigeria.

1974-1975
Beca Carter
Hollings and
Ferner

Project Engineer for major consulting engineering firm headquartered in Auckland New Zealand.

Worked on planning, engineering design and construction oversight of municipal water resource and transportation projects.

North Auckland Sewage Treatment Plant , Whangaparoa, N.Z.

Auckland Regional Authority, Auckland, New Zealand

Prepared feasibility studies of a trunk sewer system and wastewater treatment plant to serve 150,000 people, Hibiscus Coast, Auckland.

Golf, Royal and Glenvar Road Upgrades, Auckland, N.Z.

Waitemata City and North Shore City, Auckland, New Zealand

Prepared final design drawings, specifications and contract documents for upgrading of Golf Road, Royal Road and Glenvar Road in Auckland City.

1971-1974 *Served as Resident Engineer on design-construct and construction-only infrastructure, marine and water resources projects at the Ministry of Works, Northern Residency in Auckland, New Zealand.*
Ministry of Works and Development

Kauri Point Wharf Upgrades, Auckland, N.Z.

Royal New Zealand Navy, Auckland, N.Z.

Supervised construction of four reinforced concrete ship mooring dolphins, steel cantilever fender pile system and erection of a wharf crane, Kauri Point Naval Armament Facility, Auckland Harbor.

Calliope Wharf Expansion, Auckland Harbor, N.Z.

Royal New Zealand Navy, Auckland, N.Z.

Supervised marine drilling for site investigation of a 2000-foot wharf extension, Royal New Zealand Naval Base, Auckland Harbor.

Coastal Marine Beacon Upgrades, Hauraki Gulf, N.Z.

Maritime New Zealand, Wellington, N.Z.

Supervised prototype development and installation of a unique fiberglass marine beacon structure, D'Urville Rock, Hauraki Gulf.

Kawau Island Sewage Treatment Facility , Kawau, N.Z.

N.Z, Department of Lands

Supervised construction of a sanitary sewer system, pumping plant, oxidation pond wastewater treatment plant and ocean outfall for a resort hotel complex, on Kawau Island.

Military Base Infrastructure Upgrades, Auckland, N.Z.

Royal New Zealand Navy, Auckland, N.Z.

Supervised construction of roading, highway culverts, stormwater and sanitary sewers, helicopter pads and land reclamation works.

PUBLICATIONS AND SEMINARS

Electric Power Research Institute "*Hydro Life Extension Modernization Guide - Volume 1 Overall Process*" December 1999 - Authored chapter on institutional and regulatory issues including FERC licensing and relicensing.

Christensen, John P.; "*Buying and Selling Hydro Assets*". Chaired session at *HydroVision 98* regarding the process of acquiring existing hydro assets.

Christensen, John P.; Bodington, Jeffrey C. "*Maximizing the Value of Hydro Assets*". *Hydro Review* December 1995.

Christensen, John P.; "*The Unwanted Project*". Presentation given at Northwest Hydro Association conference, 1995 in Portland Oregon.

Christensen, John P.; "*What is Hydro Worth*". Seminar given in association with Saint Anthony Falls Hydraulic Laboratory and Hydro Review at Waterpower 93 in Nashville, Tennessee.

Christensen, John P.; "*Hydro Economics*" Seminar given in association with Saint Anthony Falls

Hydraulic Laboratory and Hydro Review at Waterpower 91 in Denver, Colorado.

Christensen, John P.; "Power Economics". Presentation given at Water Works, National Hydropower Association's 1990 annual conference in Washington DC

Christensen, John P.; "Overview of U.S. Hydro Experience". Presentation given at the Canadian Small Hydro Developers Conference in Halifax, Nova Scotia in June 1990.

Christensen, John P. and Greely, Gail A.; "Meeting the Needs of the U.S. Hydro Industry". In-house seminar prepared for Voith Corporation, York, Pennsylvania, January 1990.

Christensen, John P.; "Overview of the U.S. Hydro Industry". Presentation given at the International Renewable Energy Conference, Honolulu, Hawaii, 1988.

Christensen, John P.; "The Next Generation of Hydro Advances". Hydro Review, December 1987.

Christensen, John P., "Future Hydropower Development". Waterpower '87 Conference, Portland, Oregon.

Christensen, John P.; "Cost Estimates - What a Hydro Developer Should Know". Hydro Review Spring Issue, 1986.

Christensen, John P.; "Transfer of Small Hydro Technology". Proceedings of First International Conference on Small Hydro, Singapore, 1984.

Christensen, John P.; "Performance of Small Hydro Projects". Presentation at the American Power Conference, Chicago, Illinois, 1984.

Christensen, John P.; "Costs of Small Hydro Projects". Proceedings of Waterpower '83 Conference, Washington, DC

Christensen, John P.; Cunningham, C. H.; Engebretsen, A. R.; and Sommers, G. L., "Small Hydro Technology Transfer Project". Proceedings of Waterpower '83 Conference, Washington, DC

Christensen, John P.; "Operation and Maintenance Costs of Small Hydro Equipment". Presentation at the Northwest Small Hydroelectric Association Conference, Portland, Oregon, 1983.

Electric Power Research Institute, "Small Hydro Development- The Process, Pitfalls and Experience". Volumes I-IV, 1984-1986, Editor and joint author.