

QUALIFICATIONS

- Strong background in surface water and municipal drainage
- Design of numerous fishery-related structures
- Municipal engineering of water systems

RESPONSIBILITY

Project management and detailed engineering evaluations of stormwater and municipal facilities

YEARS OF EXPERIENCE: 22

EDUCATION

B.S., Civil Engineering, West Virginia University, 1977, Cum Laude

AFFILIATIONS

American Society of Civil Engineers
Association of Conservation Engineers

REGISTRATION

Professional Engineer, WA (1982),
and AK (1984)

PRESENTATIONS AND PAPERS

Fleming, A.J., 1990. *Cost Effective Solution to a Water Hammer Problem*, for Anchorage, Alaska. Public Works, July 1990.

Fleming, A.J., *Blackbird Mine Site Remediation & Biological Restoration*, for ACE National Conference, Seattle, Washington. 1995.

Brown, M.L. and Fleming, A.J. *Progress of early action activities at the Blackbird Mine Site*, Tailings and Mine Waste '96, A.A. Balkema/Rotterdam/Brookfield, 1996.

Fleming, A.J., *Case Study: Large Diameter Manifolds for Stripping Head*, for ASCE National Water Resources Conference, Seattle, Washington, August 1999.

Dunster, D.G. and Fleming, A.J. *Blackbird Mine Site Remediation & Biological Restoration*, for ASCE National Water Resources Conference, Seattle, Washington, August 1999.

Mr. Fleming is an Associate Engineer and has more than 20 years of experience designing civil and mechanical engineering projects. As a project manager, he has been responsible for planning, predesign, final design, and construction management on various water supply systems, water and wastewater treatment plants, pumping stations, shoreline protection, and pipeline projects. Mr. Fleming also has extensive experience in hydraulic analysis of open and closed systems including hydraulic transient analysis of pressure systems. Also responsible for project management and design of civil and hydraulic phases of mining, stormwater, stream bank erosion/stabilization, environmental and roadway projects. Responsibilities include client development, project management, hydraulic analysis of spillways, outlet works, channels, and pipelines, final design of roads, utilities and earthworks for major civil and mining projects.

RELEVANT PROJECT EXPERIENCE

Ice Harbor Dam Juvenile Fish Passage Snake River, Washington

Project Manager for development and design of a system to transfer up to 400 cfs of excess flow from the juvenile dewatering screens to the much lower adult water supply system. The selected plan utilized an existing ice-trash sluiceway with the installation of a diversion weir, 78-inch transfer pipe, and an isolation bulkhead. Additional pipelines were designed and built inside the sluiceway in order to isolate stormwater and pumped sump water from the excess water.

Little Goose Dam Modifications Snake River, Washington

Project Manager responsible for developing conceptual and detailed design for transferring 250 cfs of high-head, excesses juvenile water to a nearby adult fishwater discharge chamber. This project required extensive hydraulic analyses to develop a system to efficiently remove the excess. A 48" diameter manifold with 36 - 6"x12" orifices was selected to discharge the excess water into the pump chamber. The excess water is mixed with pumped water to provide adult attraction and collection flows.

Lower Granite Dam, Adult Fish Trap Modifications Snake River, Washington

Project Manager for design of modifications to an existing trap located one-third of the way up the fish ladder at the Lower Granite Dam. A new work deck was designed to provide a larger workspace to handle up to 500 anadromous fish per day. Two existing 6 cfs false weirs were replaced, and new facilities were built to vertically crowd fish out of a hopper pool and into an anesthesia tank. Additional support facilities include: two recovery tanks, two 250 cf holding tanks, and several flumes for transferring fish to the return pool, or to transport trucks. Vertical crowdors were also designed for the two holding tanks.

Lower Granite Dam, Prototype Lift Tank Snake River, Washington

Project Manager for the development and design of temporary facilities to allow the Government to draw down the reservoir 44 feet below the normal operating pool elevation. Project included design and field testing of a prototype gate well lift bucket sized to lift 3,150 gallons of water and juvenile fish. After prototype testing, 18 buckets will be constructed over each gate well. The project included the design of support facilities for field testing with marked juvenile fish and the design of a simulated gate well orifice and a flume channel that could be built on the deck of the dam.