



Wright Water Engineers, Inc.

HAYES LENHART, P.E.
SENIOR ENGINEER / SCIENTIST

CURRENT	Provides support on surface water, stormwater, hydrology, hydrologic modeling and hydraulics projects. He manages WWE's Durango Office.
EDUCATION	M.S., Biological and Agricultural Engineering, North Carolina State University, 2008 B.S., Civil Engineering, Oregon State University, 2006
REGISTRATION	Registered Professional Engineer—Colorado #46527

REPRESENTATIVE PROJECTS

Water and Wastewater Planning and Design

Forest Lakes Metropolitan District Drinking Water Treatment Plant. Lead project engineer and engineer of record for the design and construction administration of a 1.5 million-gallon-per-day (MGD) full build out capacity surface water treatment plant and its associated raw water pump station, and raw water delivery pipeline.

Cutter 60 Percent Design Evaluation. Lead project engineer working for the United States Bureau of Reclamation (USBR) to develop an independent cost estimate report for the planned Cutter Lateral Reach 21 Water Treatment Plant in Navajo Gallup, New Mexico. Reviewed 60 percent design documents, specifications, and drawings and developed Opinions of Probable Cost for materials, labor, engineering services, and six months of operations and training.

Cornerstone Metropolitan District. Lead project engineer for the design of a chloramine booster and tank mixing system associated with the district's drinking water treatment system in Ouray County, Colorado. Services included developing and coordinating disinfection by product bench testing to inform disinfection process, and development of basis of design report, design drawings, and technical specifications for review and approval by regulatory agencies.

City of Ouray Capital Improvement Project Phase 1. Lead project engineer working to develop a Water and Wastewater capital improvement Project Plan for the City of Ouray, Colorado. Tasks include developing existing and full-buildout water demand estimates to inform the sizing of a new drinking water treatment plant. Developed a rate analysis tool to help the city inform its water and sewer rates.

Colorado Centre Metropolitan District. Lead project engineer for development of an engineering report in support of a motion to allow the district to use a new wastewater facility. Included a dry year analysis under various scenarios to evaluate potential impacts to senior rights along the affected stretch of creek.

Uncompahgre River Temperature and Flow Data Collection System Design. Lead project engineer for the installation of a temperature and flow monitoring system for the City of Montrose, Colorado, Wastewater Treatment Facility.

Irrigation Farm Pond Design. Lead project engineer for the design of a 3.5 acre-foot, above-ground irrigation pond in Weld County Colorado. Specific tasks included obtaining a flood hazard permit from Weld County and the development of the grading plan and design details associated with the pond.

Water Rights

Town of Bayfield Drought Management Plan. Lead project engineer to support development of the Town of Bayfield, Colorado drought management plan. Developed drought trigger indices based on three metrics, snowpack, administrative call depth, and spring inflow into Vallecito Reservoir.

Tri-County Water Conservancy District Water Efficiency Plan. Lead project engineer to support development of the Tri-County Water Conservancy District Water Efficiency Plan. Lead the development of historical and future water use demand calculations within the District and worked with the District staff to select appropriate water efficiency activities.

Town of Buena Vista, Colorado. Project engineer for various water rights related projects including water transfer plan, substitute water supply plans, well permits, and augmentation plan and exchange.

Bessemer Irrigating Ditch Company. Lead engineer for Bessemer Irrigating Ditch Company. Performed review of a combination ditch-wide, parcel-specific historical consumptive use analysis on behalf of the Ditch Company. Provided an engineering assessment of impacts to ditch operations as result of a potential change of water rights application.

Colorado Sweet Gold Water Accounting. Developed a water rights accounting form using data acquired from real time data loggers installed at various flumes and weirs located throughout the site.

Channel Design

Manitou Springs Flood Control Design. Lead project engineer for the design and construction administration of the emergency channel stabilization measures on the Williams Canyon Drainage for the City of Manitou Springs, CO following the 2012 Waldo Canyon Fire. Stabilization measures included the channelization of approximately 1,500 feet of existing channel, drop structures, debris nets, and a settling basin.

Wines Ditch Fish Passage. Working with Colorado Parks and Wildlife (CPW) and Gateway Resort, a series of fish passage structures were designed to replace an old diversion that was unsafe for boaters. The old diversion also limited fish passage by native species. The new fish passage design was developed to allow safe boat passage and to provide the ability to modify fish passage operations to limit passage of certain fish species during certain parts of the year.

Upper Uncompahgre Basin Water Supply Protection & Enhancement Project Phase II. Lead project engineer for Phase II of the Upper Uncompahgre Basin Water Supply Protection & Enhancement Project to assist in balancing water needs amongst various users and the development of additional sustainable multipurpose water supplies, including both consumptive and non-consumptive demands.

Hess Lateral Irrigation Water System. Project engineer and engineer of record for the design of a 4.5-mile-long irrigation water system to deliver 18 cubic-feet-per-second of pressurized irrigation water to lateral users on the Florida Mesa in La Plata County, Colorado.

Florida Canal Diversion Structure Rehabilitation. Working with CPW and the Florida Consolidated Ditch Company near Durango, Colorado, a series of alternatives were developed and prioritized utilizing different ramp styles and bypass channels to determine the most efficient fish passage design that would also not impact existing diverted water rights. The purpose of the project was to utilize a push up dam, stabilize a failing diversion structure, and remove the need for continued maintenance. Multiple stakeholders were included to evaluate and select the preferred alternative.

Florida Canal Company Canal Lining. Lead project engineer for the design of approximately 2 miles of canal lining in La Plata County, Colorado. The canal liner consisted of a 30-mil PVC geomembrane with a 3.5-inch-thick layer of protective shotcrete.

City of Durango, CO Stormwater Master Plan Phase I. Project Manager for the development of the City's stormwater master plan. Lead the development of a SWMM model to assess the hydraulic capacity of the City's stormwater infrastructure under existing and future buildout hydrologic conditions.

Irrigation Ditch Lateral Lining. Project engineer for the design of approximately 120 feet of a concrete irrigation ditch lining and a 30-inch Parshall flume in western Kansas.

Hydrology

Confidential Litigation Case Involving Surface Water and Groundwater. Lead engineer tasked with determining the feasibility of developing a model to understand the connection between the surface water and groundwater in eastern New York.

Watershed Modeling, Long Pine Creek, Nebraska. Project manager and lead engineer for the development of a water quality and quantity model for a 520-square-mile watershed in central Nebraska. The model was a spreadsheet-based, in-house watershed model developed to identify sources of and quantify the existing and annual pollutant loads to the watershed's primary receiving water.

Watershed Modeling, Clear Creek, Nebraska. Project manager and lead engineer for the development of an United States Environmental Protection Agency (USEPA) STEP-L model in conjunction with a lake model (BATHTUB) in order to reasonably estimate existing pollutant loads to Pibel Lake, the primary receiving waterbody in the watershed.

Deltic Timber Corporation and Lake Maumelle Watershed, Little Rock, Arkansas. Advised Deltic Timber regarding the practical implications of regulatory limitations related to proposed land development in the Lake Maumelle watershed. Specific tasks have included long term hydrograph analysis, HSPF model review and development, and research related to forest and urban runoff.

Wetland Delineation. Helped to perform a wetland delineation for a piece of private property near Gunnison, Colorado. Field identification of hydric soils and wetland vegetation was used to define the limits of the wetland area.

Chambers Reservoir. Responsible for monthly groundwater sampling and analysis of groundwater wells surrounding a 1,400-acre-foot-capacity reservoir in Colorado.

Stormwater

Stormwater Management Training for Confidential Client. Lead engineer for the development of two full-day training sessions for an international company on fundamental treatment practices for urban stormwater runoff.

Mile High Flood District (MHFD) Urban Storm Drainage Criteria Manual, Volume III. Project engineer for the development of design standards and drawings associated with construction stormwater best management practices (BMPs).

Colorado Stormwater Management. Project engineer for the development of multiple stormwater management plans (SWMPs) for oil and gas clients in Colorado.

Wyoming Stormwater Management. Project engineer for the development of multiple stormwater pollution prevention plans (SWPPPs) for oil and gas clients in Wyoming.

Allied Recycling. Lead project engineer for the development of an industrial stormwater management plan for a large-scale recycling facility in Colorado.

International BMP Database. Project engineer responsible for review and quality control of BMP monitoring data prior to entry into the database.

Bowie Coal Mine No. 2. Sediment transport analysis for approximately two miles of high mountain stream in Paonia, Colorado. Specific project tasks included stream sediment sampling and engineering calculations to evaluate the potential effects that subsidence, as a result of mining operations, may have had on the stream's sediment transport characteristics.

Flooding and Drainage Study in Crown Point, Indiana. Prepared a HEC-RAS analysis and associated report to determine flood elevations and culvert sizing for a small community that was experiencing flooding as a result of undersized culverts.

MHFD Impervious Reduction Factor (IRF) Spreadsheet. Lead project engineer for the development of an Excel spreadsheet tool to calculate an IRF for existing and proposed development projects in the City and County of Denver.

MHFD Waterways SWMP. Lead project engineer for the development of typical BMP installation drawings for use by MHFD to streamline the stormwater permitting process for small maintenance and construction projects in waterways.

PROFESSIONAL & HONORARY SOCIETIES

Member, Order of the Engineer (inducted 2012)

Associate Member, American Society of Civil Engineers (ASCE)

Peer Reviewer for ASCE, *Journal of Environmental Engineering*

PUBLICATIONS

Lenhart, H.A., W.F. Hunt, M.R. Burchell. 2012. Harvestable Nitrogen Accumulation for Five Storm Water Wetland Plant Species: Trigger for Storm Water Control Measure Maintenance? *Journal of Environmental Engineering*. Volume 138, No. 9. September: 972–978.

Lenhart, H. and W. F. Hunt III. 2011. Evaluating Four Storm-Water Performance Metrics with a North Carolina Coastal Plain Storm-Water Wetland. *Journal of Environmental Engineering*. Volume 137, No. 2. February: 155–162.