



Program Management Solutions

Proven capabilities to drive community success and resiliency.



BLACK & VEATCH



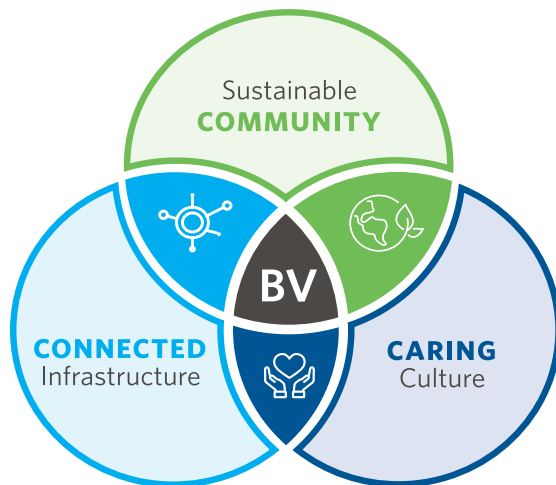
Seasoned Experts and Vast Resources to Deliver Any Program

Black & Veatch's proven program management model fosters timely deliverables and supports the entire program life cycle, from concept through commissioning.

Black & Veatch is committed to help you deliver sustainable, resilient and reliable infrastructure that benefits the diverse communities and customers you serve. Our professionals partner with you and your staff to forge an integrated team that defines and then manages the process to ensure successful completion of water, power and communications programs. We focus on managing risks and minimizing the economic, financial and community impacts to deliver quality solutions that connect infrastructure, sustainability and communities.

Ensuring Sustainable Solutions

Sustainability is ingrained into our company's strategy, purpose and the services we provide. As a signatory of the United Nations Global Compact, CEO Water Mandate and Caring for



the Climate pledges, Black & Veatch's innovative solutions integrate the social, environmental and governance (or triple bottom line) to maximize the value to you, your communities and your customers.



OVER
40 YEARS
OF GLOBAL
**PROGRAM
MANAGEMENT**

SECURED
\$1.6B+
in federal & state
**GRANT
FUNDING**

64%
REDUCTION in
SSOs/CSOs
for Programs
Managed

\$30B+
in
PROGRAM DELIVERY
for **WATER and**
WASTEWATER
INFRASTRUCTURE

Caring for Your Communities

As an employee owned company, one of Black & Veatch's core values is stewardship. We understand that we will impact the communities where our work will be built. Our team works with your staff to develop engagement strategies and plans with the affected community's needs in mind. Our company also focuses on tangible social and environmental solutions to enhance the benefits to your communities. Enhancements include community benefits that range from street beautifications to workforce and economic development programs.

In addition, for every assignment, Black & Veatch incorporates our zero-incident safety culture that puts people first – yours, ours and the public.

Connecting Infrastructure

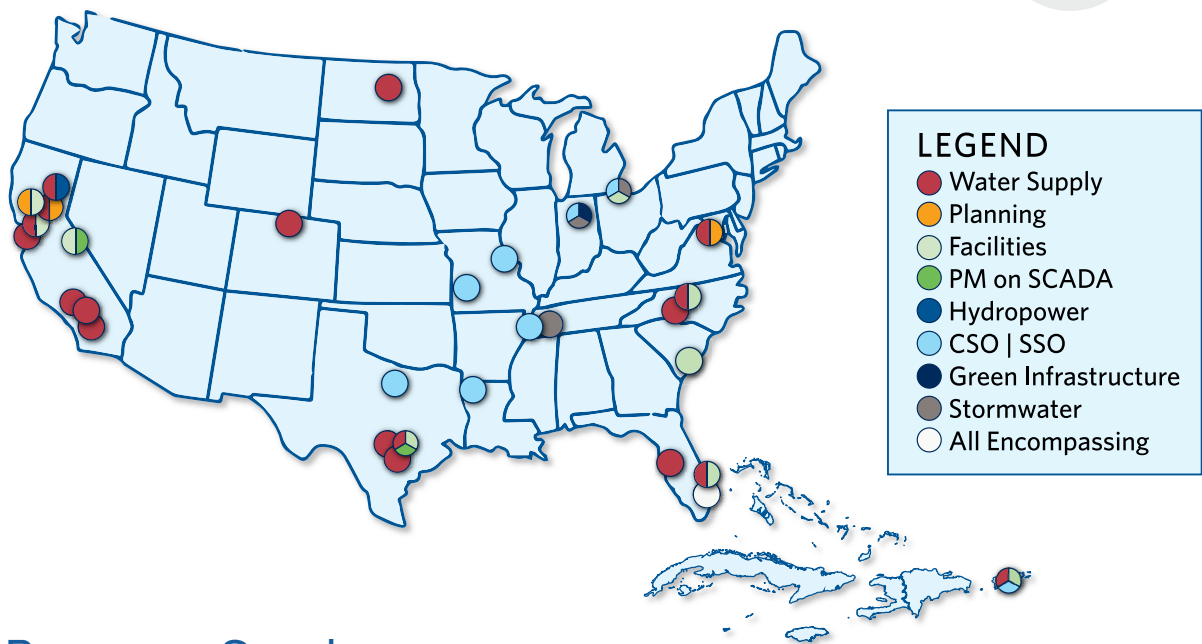
Our professionals understand that your needs are unique. We can provide a range of proven options to allow you to customize the approach that will best meet your goals, schedule, budget and other requirements. Then, our seasoned team will manage the tasks, risks and details to deliver results as part of an integrated team with you staff.

A Trusted Partner

Our professionals are with you every step of the way as trusted partners. Our team genuinely cares about you and your needs as well as the needs of the community. Our focus on caring and understanding, combined with our services and capabilities, enable a streamlined and cost-effective path to your success.

Program Solutions

The map below highlights the type of programs Black & Veatch has overseen in the United States.



Program Services

Black & Veatch services cover the full life cycle of a program. The following provides an overview of services we provide for the duration of a program.

1. CORE FOCUS



- Integration management
- Internal and external stakeholder engagement
- Safety, risk and quality management
- Alignment with Sustainable Development Goals (SDGs)

2. INITIATE



- Capital improvement plan optimization
- Benchmarking and key performance indicator development
- Delivery method and packaging assessments
- Governance and decision-making support
- Chartering and brand development support

3. PLAN



- Feasibility analyses
- Economic and benefit cost analysis
- Funding studies and grant writing
- Concept level engineering
- Environmental and regulatory compliance

4. EXECUTE



- Scope management
- Engineering design and management
- Risk- and schedule-based estimating
- Permit support and mitigation management
- Real estate support
- Procurement management and shop inspections
- Construction management and administration

5. CONTROL



- Real-time reporting
- Change management
- Resource-driven schedules
- Budget and cost management
- Trend, variance and earned value analyses
- Third-party audits
- Document and information management
- Administrative record preparation and support

6. CLOSEOUT



- Commissioning and startup management and support
- Operator training
- Warranty management
- Asset management
- As-builts and contract closeout

Program Experience Highlights

Memphis Sanitary Sewer Overflow Reduction Program

MEMPHIS, TN

The city of Memphis undertook the colossal Sewer Assessment and Rehabilitation Program—known as SARP10—and selected Black & Veatch to provide comprehensive program management services. SARP10 is slated to last more than a decade and includes numerous infrastructure improvement projects across the entire sanitary sewer system.

Key Accomplishments to Date

- Completed 900,000 work hours with no lost time incidents.
- Reduced the number of SSOs by 65 percent at the one-third mark of the construction portion of the program.
- Self-performance of engineering and construction eliminating schedule extension in city procurement and establishing a single point of responsibility on program outcomes.
- Workforce development that included mentoring and training for professional services and craft. More than 30 new careers created by the program.



CAPITAL SPEND: \$350 million
PERFORMANCE PERIOD:
2013–2025 (est.)

SERVICES:

- Program management
- Construction management
- Public relations
- Stakeholder management
- Workforce development

Gross Reservoir Expansion

BOULDER COUNTY, CO

Denver Water is focused on improving water supply dependability and reliability for the 1.4 million people the organization serves in the Denver metro area. As part of this effort, Denver Water selected Black & Veatch to provide owner’s representative and construction management services on the Gross Reservoir Expansion, the keystone for improving the northern supply system. The program will raise the height of the existing 340-foot curved, gravity dam by 131 feet, increasing reservoir capacity from 42,000 acre-feet of water to 119,000 acre-feet. The completed arched dam will be the largest raise of a concrete dam using roller-compacted concrete in the world and the only such project in the United States.

Key Accomplishments to Date

- Prepared an innovative, cost-effective final design for raising Gross Dam that modifies the concrete gravity dam into an arch dam to create a structure that will last 2,000 years with the proper care and maintenance.
- Program delivered using a construction manager and a general contractor. The developed approach is aligned with receiving the contractor’s innovation during design and developing the construction-agreed price—the best cost-estimate for the work with transparent accounting for project cost-risk.



CAPITAL SPEND: \$450 million
PERFORMANCE PERIOD:
2017–2027

SERVICES:

- Program management
- Public relations/community engagement
- Planning and risk management
- Procurement
- Infrastructure planning



CAPITAL SPEND: \$1.04 billion

PERFORMANCE PERIOD

2008–2032

SERVICES

- Program management
- Construction management
- Permitting and licensing
- Geographic information systems
- Geotechnical consulting

Red River Valley Water Supply Program

CARRINGTON, ND

Black & Veatch is providing program management and design services for this 160-mile, 72-inch-diameter pipeline to provide reliable sources of water in the Red Valley of North Dakota. This work is being performed under the direction of the Bureau of Reclamation and the Garrison Diversion Conservancy District.

Key Accomplishments to Date

- Led the design effort of the entire water transmission pipeline.
- Set site-specific standards for the restoration of high-yield agricultural lands following pipeline construction that will result in no crop loss.
- Established communication lines and feedback loops to inform communities in four counties and coordinate federal, state and county agencies.
- Developed and maintained schedules, coordinated QA/QC reviews and prepared all permit applications.
- Worked with budget and financing from stakeholders to help fund the program.



CAPITAL SPEND \$521 million

PERFORMANCE PERIOD

2002–2020

SERVICES

- Contract administration
- Project controls and master critical path method schedule
- Resident engineering and inspection
- Coordination and procurement of funding
- Public outreach and stakeholder interface

Waterways Initiative – Consent Order Program Management

TOLEDO, OH

The Toledo Waterways Initiative was driven by a 2002 consent decree that the city of Toledo signed with the U.S. EPA. Due to the sensitive nature of this program, the city selected Black & Veatch to manage all aspects of its wastewater program to comply with the federal consent decree for controlling combined sewer overflow (CSO) discharges and Ohio EPA findings and orders to eliminate sanitary sewer overflows (SSO).

Key Accomplishments

- Completed on schedule. Met every consent decree milestone and tracked more than nine percent below budget during the program.
- Prepared consent decree-required plans, studies and reports, and developed an accepted CSO long-term control plan.
- Provided sewer improvements and planning studies, design and construction management services to end bypassing at Bay View WWTP and eliminate all known SSOs.
- Established a project website for team information dissemination and coordination and to make program and design standards available for all firms involved in the program.

Anderson Dam Seismic Retrofit Program

SANTA CLARA, CA

This 1950s dam was built on Coyote Creek to impound up to 98,000 acre-feet of runoff from 195 square miles of the 320-square-mile watershed. It creates the Valley Water's largest surface storage reservoir, which supplies water to a large portion of Silicon Valley. To comply with current requirements, the embankment dam is being rebuilt to accommodate four feet of potential fault rupture below the dam's foundation; the spillway is being upgraded to pass the updated probable maximum flood; and the outlet works are being replaced to meet the state's drawdown criteria.

Key Accomplishments to Date

- The initial risk assessment identified the original dam retrofit approach was overly optimistic.
- A probabilistic evaluation identified the amount of earthwork needed to rebuild the dam would require two more years to complete.
- Worked with Valley Water to develop the current phased implementation, which consists of a new tunnel and completing downstream channel improvements before starting to rebuild the dam.



CAPITAL SPEND \$650 million

PERFORMANCE PERIOD

2011–2031

SERVICES

- Program management support
- Owner's engineer
- Federal and state dam safety compliance
- Risk and quality management
- Construction management support

Metropolitan St. Louis Sewer District (MSD) Tunnel Program

ST LOUIS, MO

The MSD embarked on a \$4.7 billion wet-weather program to address CSO and SSOs under a consent decree. Black & Veatch is providing third-party construction management services for a series of CSO/SSO storage and wastewater conveyance tunnel projects, which will be constructed over the course of the 20-year program.

Key Accomplishments to Date

- Executing work on seven projects involving 17 miles of deep rock tunnels ranging from 8 to 28 feet in diameter.
- Scope includes pre-construction services to review design documents for constructability and bid-ability as well as pre-qualifying tunneling contractors.
- Implementation of a program-wide construction management/document management software system.
- Services during construction include resident engineering/inspection and overall construction management, including cost and schedule control analysis and document control.



CAPITAL SPEND \$4.7 billion

PERFORMANCE PERIOD

2014–2034

SERVICES

- Program management
- Construction management
- Consent decree-based cost control
- Schedule control

Water

For more information, visit us at
bv.com/water

