

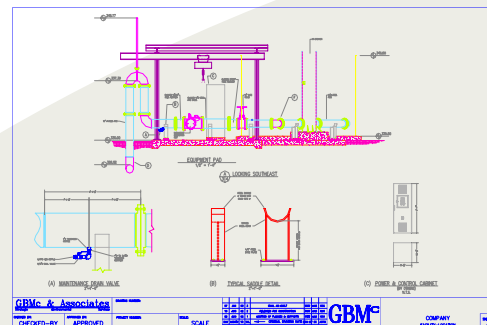
# ENGINEERING SERVICES

*GBM<sup>c</sup> & Associates has provided a broad range of engineering services to industrial facilities. This experience has included studies of manufacturing processes to eliminate waste and unit downtime, development of habitat restoration plans for closed facilities, preparation of engineering design plans and specifications, construction management and contract administration duties, preparation of Startup, Shutdown, and Malfunction (SSM) Plans, groundwater characterization studies, ASTM Phase I/II site assessments, preparation of oil Spill Prevention, Control and Countermeasures Plans, development of facility-wide Release Prevention, Control and Countermeasures (RPCC) Plans and design of site drainage modifications and containment structures.*

## Experience and Capabilities

- Developed **plans and specifications** for reconstruction of a **dam, spillway and outlet structure** of a City-owned water supply reservoir. Provided on-site construction management services.
- Developed the site **closure/restoration** plan for a kraft pulp/paper mill. Prepared engineering plans and specifications to convert abandoned waste treatment units to a diverse wetlands habitat. Overall **Project Management** including coordination between multiple State agencies and company resources.
- Prepared construction plans and specifications for fabrication and installation of a **high-rate effluent diffuser** installed in the Missouri River.
- Developed engineering design of **gravity sewers** for poultry processing and municipal waste collection systems.
- Provided on-site **construction management** and contract administration for brief and extended capital projects.
- Provided route selection, preliminary design and capital cost estimation for a **multi-user force main** pipeline network totaling 23+ miles.

- Prepared a **groundwater investigation** plan to evaluate the impact of earthen surface impoundments on the hydrology and quality of a nearby aquifer.
- Prepared oil **Spill Prevention, Control and Countermeasures Plans (SPCC)** for a wide range of effected industrial facilities.
- Prepared **Startup, Shutdown, and Malfunction (SSM) Plans** for bleached and unbleached kraft pulp/paper manufacturing operations to minimize excess emissions of hazardous air pollutants during those specified events.
- Conducted numerous **Environmental Site Assessments** using ASTM E1527 protocols.



# ENGINEERING SERVICES (cont.)

- Performed a **waste characterization** study at a chemical manufacturing facility to identify source reduction/waste minimization opportunities.
- Conducted **hydrological studies** of receiving streams to justify revised storm water discharge limitations for industrial facilities.
- Provided the Basis of Design for a subsurface high-rate diffuser for a chemical manufacturing facility using CORMIX.
- Demonstrated the acceptability of converting an active groundwater remediation project to monitored natural attenuation.
- Investigated and delineated the horizontal and vertical extent resulting from spilled industrial materials.
- Characterized storm water runoff quality/quantity to establish engineering design criteria at developed facilities.
- Provided technical and engineering support to Low Impact Development design and planning for a residential development in a sensitive watershed.
- Prepared comprehensive Release Prevention, Control and Countermeasures Plans for three aluminum product manufacturing operations. The “One Plan” addresses potential releases of regulated materials to all media.
- Developed **Best Management Practices (BMP)** Plans for pulp/paper manufacturing operations to prevent or minimize the effects of spills or leaks of high-strength waste streams on wastewater treatment systems.



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