



Project:

British Petroleum CASPER



North American Wetland Engineering

LOCATION

Casper, Wyoming

PROJECT TYPE

Industrial

WASTE TYPE

Industrial

COMPLETION DATE

2003

DESIGN FLOW

6,000,000

TREATMENT

Subsurface Flow Wetland
with Forced Bed Aeration

NEED

The former Casper, Wyoming refinery was one of the oldest refineries in the West. It operated from 1908 until 1991. As a result of common management practices during the 80 years of operation, much of the site is underlain with residual hydrocarbons. It has been estimated that 30 million gallons of hydrocarbons (oil) had leaked into the shallow alluvial aquifer adjacent to the North Platte River:

SOLUTION

BP and the City of Casper agreed to convert the former refinery site into a golf course and office park, with a trail system along the North Platte River. The presence of a large amount of contaminant's below the water table created a major challenge. The remediation treatment system needed to handle up to 3 million gallons per day of gasoline-contaminated groundwater; blend into the middle of a premier golf course and operate for more than 100 years. Knowing that petroleum hydrocarbons are biodegradable and keeping in mind the cost of pumping groundwater for decades, BP chose NAWE's wetland treatment technology as the most appropriate solution.

The full-scale wetland had to be capable of operating at 6,000 cubic meters per day and deal with potential fouling of the wetland media. A cascade aeration system for iron oxidation and a surface flow wetland for iron precipitation were added to the system. To address flow distribution, an innovative radial-flow wetland configuration was adopted. This innovative system is the largest remediation wetland in North America.

BENEFIT

By using new "green" technology, the old refinery site has been transformed from what once seemed destined to remain an unused brownfield to a community landmark. There is now beautiful green space adjacent to the City, with amenities including walking trails, a river park, a whitewater kayak course, and an 18-hole golf course. The wetlands are integrated into the golf course water features. When compared to a conventional mechanical plant, construction of an engineered wetland system saved BP \$12.5 million. Over the first 50 years of site remediation, the lower operating costs associated with constructed wetlands is anticipated to save an additional \$15.7 million.



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North American Wetland Engineering

4444 Centerville Road, Suite 140
White Bear Lake, MN 55127

Ph 651-255-5050

Fax 651-255-5060

www.nawe-pa.com