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SUMMARY

In the conterminous USA only about half of the original 89.5 million hectares of wetlands existing at the time of European settlement remain today. Because of these substantial wetland losses and growing public awareness of wetland values, state and federal governments in the early 1990s adopted a “no net loss” of wetlands policy. The state of Minnesota enacted its own Wetland Conservation Act in 1991 to address this issue. This policy requires compensation or mitigation for unavoidable wetland impacts such as peat mining. As a result increasingly strict regulations have made it much more difficult to acquire the permits required to mine peat. In the past decade several new horticultural peat operations and expansions of existing operations have occurred in the state of Minnesota. These operations are subject to new state and federal permit requirements for various aspects of peat mining. Environmental review is also required for some peat mining developments depending on the size of the operation and the potential for adverse environmental effects. As regulations continue to evolve some of the new and emerging issues include water quality, in-kind restoration, temporal mitigation, financial assurance, and hydrologic monitoring. The trend is towards more peat mining regulations in the future.

KEYWORDS: horticultural peat, permitting, regulations, water quality, restoration

INTRODUCTION

In the past several decades wetland losses in the USA have become an issue of concern. Society has come to look at wetlands as something of value rather than just something to be drained, filled, and exploited. Since the time of European settlement the original 89.5 million hectares of wetlands in the conterminous USA have been reduced by more than half to 42.7 million hectares by 1997 (Dahl 2000). The estimated rate of wetland loss has steadily decreased from 185,400 hectares/year in the mid-1950s to mid-1970s (Frayner, *et al.* 1983), to 117,400 hectares/year in the mid-1970s to mid 1980s (Dahl and Johnson 1991), to 23,700 hectares/year in the mid-1980s to mid-1990s (Dahl 2000). The most dramatic decrease in the rate of loss seen in the mid-1980s to mid-1990s is due primarily to “no-net-loss” of wetlands policies instituted by federal and state governments. The state of Minnesota enacted its own Wetland Conservation Act in 1991 to address the no-net-loss issue. This policy requires compensation or mitigation for unavoidable wetland impacts such as peat mining. As a result, increasingly strict regulations have made it much more difficult to acquire the permits required to mine peat.

REGULATORY AGENCIES AND PERMITTING

Horticultural peat operations in Minnesota are regulated by a number of state and federal agencies (Malterer, *et al.* 2000). Peat mining operations that drain or fill wetlands must comply with the provisions of Minnesota's Wetland Conservation Act (WCA) administered by the Minnesota Board of Water and Soil Resources (BWSR) and the Federal Section 404 Permit administered by the U.S. Army Corps of Engineers (Army Corps) under the direction of the U.S. Environmental Protection Agency (EPA). Both of these programs require no-net-loss of wetlands. The Section 404 permit requires compensation or “mitigation”, usually through restoration, for the unavoidable loss of wetland functions and values as a result of peat mining.

Peat mining operations greater than 40 acres in size are also regulated under Minnesota's Permit to Mine program, administered by the Minnesota Department of Natural Resources (MDNR). The focus of this program is the reclamation of mined peatlands (MDNR 1985). The MDNR is also responsible for conducting environmental review for proposed peat operations. The environmental review procedure is conducted for projects that “may have the potential for significant environmental effects” (Minnesota Environmental Quality Board 1998). The main purpose of the process is to provide information to regulatory agencies to allow them to make better informed permit decisions.

Water quality issues associated with peat mining activities are regulated by the Minnesota Pollution Control Agency (MPCA) through their National Pollutant Discharge Elimination System (NPDES) permit. The permit requires regular sampling and analysis of discharge water from peat operations to ensure that receiving waters are not impacted.

NEW AND EMERGING ISSUES

Several new and emerging issues have recently resulted in increased scrutiny of Minnesota's horticultural peat operations resulting in more strict regulations. Some of these issues include water quality, in-kind restoration, temporal mitigation, financial assurance, and hydrologic monitoring.

Water Quality

Any water discharged from a peat mining operation is classified as industrial process wastewater by the MPCA. The conventional pollutants of concern in discharge from peat mining operations are typically suspended solids, phosphorus, and acidic pH. Discharge water that is outside the limits for any of these pollutants can be detrimental to fish and other aquatic organisms. Another pollutant of concern is mercury. Mercury accumulates in Minnesota peatlands as a result of atmospheric deposition. Elemental mercury can be converted to methyl mercury, a toxic form, by aquatic bacteria in lake sediments and wetlands. Methyl mercury is concentrated as it moves up the aquatic food chain with large game fish such as walleye and northern pike having the highest concentrations. When these concentrations become too high, fish consumption advisories are posted to protect human health. “Impaired waters” are classified as water bodies where the fish consumption advisory is more restrictive than one meal per week (MPCA 2005).

To protect receiving waters from these potential pollutants, the MPCA is now requiring additional water sampling to detect phosphorus and mercury for any new or existing operations. Discharge waters must meet strict limits to insure that receiving waters are not further degraded. The current limit for phosphorus is 1.0 mg/L. The non-Lake Superior Basin water-column standard for mercury is 6.9 ng/L. Within the Lake Superior Basin the standard is 1.3 ng/L (MPCA 2006).

In-kind Restoration

To insure no-net-loss of functions and values for any particular wetland type the U.S. Army Corps of Engineers is now requiring that impacted wetlands be replaced or restored to the same type of wetland that existed prior to disturbance whenever possible providing “in-kind restoration” (Malterer *et al.* 2000). In the case of most Minnesota horticultural peat operations this means restoring the mined sites to *Sphagnum* dominated bogs. While this is now possible with the recently developed “Canadian Approach” (Quinty and Rochefort 2003) it precludes the use of cutover sites for other purposes such as forestry or agriculture.

Temporal Mitigation

When peat mining sites are restored in-kind to *Sphagnum* dominated bogs in their entirety there is no-net-loss of wetland functions and values on a spatial scale. However, the Army Corps maintains there are losses in wetland functions and values on a temporal scale (U.S. Army Corps of Engineers 2007). Therefore, additional compensation or mitigation is required for the time period that the mine site is not providing wetland functions and values, which is the life of the operation from initial drainage to restoration (20-40 years). This is above and beyond the restoration that is currently required on the mine site. As a general rule the Army Corps requires approximately 10% replacement on an area basis. Because it can be difficult to find other opportunities for wetland replacement in certain wetland-rich parts of the State, the Army Corps has also allowed wetland enhancement projects to meet this requirement.

Financial Assurance

Historically, financial assurance for restoration has been required by the MDNR's Permit to Mine. This was to insure that funds would be available to restore the mine site should a peat company go out of business. This was usually in the form of a letter of credit from a bank. The Army Corps has taken a new approach to this and now requires restoration funds be put in an escrow account for each acre under production. This may be more costly up front, but the peat companies will have their money refunded once restoration is accomplished, unlike a letter of credit. Because the Army Corps requirements are more restrictive, they now supersede the Permit to Mine financial assurance requirements. Estimated financial assurance costs to restore a *Sphagnum* dominated bog using the Canadian Approach (in 2004 U.S. dollars) are \$200/acre to do the actual restoration work, plus an additional 7% for administrative, 15% for contingency, and 10% for monitoring costs for a total of \$264/acre.

Hydrologic Monitoring

Another issue of concern is the effect of drainage ditches on the hydrology surrounding horticultural peat operations. The Army Corps is now requiring peat companies to install monitoring wells to determine the lateral effect of perimeter ditches on adjacent areas. If lateral effects are significant, remedial action may be required.

CONCLUSIONS

Regulations pertaining to horticultural peat operations in Minnesota continue to evolve as new and emerging issues come to light. These issues include water quality, in-kind restoration, temporal mitigation, financial assurance, and hydrologic monitoring. Even as these issues are addressed, the trend is towards increased peat mining regulations in the future.

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