

Thinking like a Watershed



■ Michael M. WENIG

Alberta's fresh water supply has long posed a management challenge. Eighty percent of demand for the province's fresh water is in the southern region, which accounts for only twenty percent of the province's supply. However, ecological concerns, costs, and increasing industrial water demands in the north, have precluded the wholesale use of north-south intra-provincial water transfers to solve this paradox.

Beyond this geographic imbalance of supply and demand, Alberta's overall water resources are under increasing stress. The general sources of this stress are population growth and increasing water consumption and pollution from urban, agricultural, and industrial users.

Climatic forces — droughts and shrinking mountain glaciers — have exacerbated this stress and are likely to be of even greater concern in the near future (See Dr. David Schindler, Keynote Speech at *Watershed: Research Informing Public Policy*, www.albertaingenuity.ca/conference/2003/). While water stresses have been particularly acute in the province's southern regions (see "Water Scarcity and

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Bursting out of the Box”), they are also increasingly apparent in the province’s central region. Even Alberta’s northern regions are subject to increasing stress from a myriad of sources, including dams, pulp mill pollution, acid rain (from industrial air emissions of sulfur dioxide and nitrogen oxides), stream crossings and, most recently, rapidly expanding surface and in situ oilsands production. Although water supplies are generally much more plentiful in Alberta’s northern regions than in the south, even those northern supplies appear to be shrinking substantially. According to a 2002 *National Post* article, the average summer flow in Alberta’s northern rivers dropped 35-40% in the preceding ninety-year period (Andrew Nikiforuk, “Water Fight” *National Post Business Magazine* (1 July 2002)).

Alberta water law has evolved considerably in the face of these management challenges. Before water legislation was enacted, the common law focused, albeit ambiguously, on rights of riparian users and land owners’ rights to *capture* groundwater. Several iterations of legislation expanded the common law’s ambit of preferential uses and established allocation systems for other kinds of uses, while grandfathering pre-existing allocations and entrenching a *first in time, first in right* principle for distributing scarce supplies among preferential users and licence holders. Thus, rather than creating new management frameworks from scratch, these legislative initiatives reflected a building block approach that appears to have resulted in more of a patchwork framework than a coherent, well organized and designed allocation structure.

In 1996, the Alberta legislature adopted still another legislative iteration – the *Water Act* (proclaimed in 1999) that repeated its historical pattern in many respects, while also placing more of an emphasis on aquatic ecosystem protection as an overarching water management goal. This emphasis is reflected in the Act’s opening statement of purpose as well as in provisions authorizing Alberta Environment to use specific management tools, including granting new allocations with more restrictive conditions than previous allocations, allowing rights holders to transfer rights in over-allocated basins, establishing water conservation objectives, and adopting province-wide and basin-specific frameworks and plans for achieving those objectives.

There are thus two faces of the *Water Act* – on the one hand, the continuation of prior allocation systems, and on the other, the promotion of new tools for ecosystem protection. The latter of these two approaches has not been vigorously

promoted, but may have gotten a recent boost. Prompted by recent droughts and other signs of water stress, and by growing conflicts over water uses, the government commenced an extensive public consultation process in late 2001 leading to its production of a draft Water for Life strategy in March 2003 and, following additional consultation, the final strategy in November 2003.

The province describes its strategy as the “most comprehensive of its kind in Canada.” This claim is difficult to verify, however, because the strategy document is long on broad vision statements and short on actual design details or even clear instrument choices. One of the strategy’s broad visions is to re-model the province’s water management framework on a watershed-by-watershed basis or, in other words, to adopt a watershed management approach. A variant of the increasingly popular *ecosystem based management*, watershed management generally involves a comprehensive or holistic planning effort that links management decisions with respect to both quality and quantity. As to quality, watershed management addresses pollution from both “point sources” (e.g. industrial discharge pipes) and runoff. Watershed management decisions also consider all three hydrological linkages in watershed ecosystems: up-stream/down-stream; in-stream/upland; and surface water/groundwater. From an organizational standpoint, watershed management stresses integrated government decision-making and multi-level governance, and especially promotes local initiative, input, and decision-making.

This description of watershed management is more of a utopian vision or best-case scenario than an accurate depiction of current practice. Few, if any, watershed-like programs, or even actual self-proclaimed watershed management models, have achieved this level of holism or comprehensiveness. There are several reasons for the gap between the practice and theory of watershed management. Chief among these reasons are practical, relating to what US law professor Robert Adler has described as the *paradox* of watershed management (Robert W. Adler, “Addressing Barriers to Watershed Protection” (1995) 25 Environmental Law). This paradox results from the fact that the same physical, biological, social, and institutional linkages that necessitate a holistic approach also make the approach difficult to define and implement.

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These difficulties include determining the appropriate scale. A *watershed* is commonly defined as the geographic area of land drained by a particular body or segment of flowing water. Under this definition, defining watershed scales involves somewhat arbitrary choices of the length of relevant

river segments. Even the basin concept provides an unclear determinant of scale, because a basin — commonly defined as the land mass drained by an entire river system — can itself be defined at varying scales. Additional difficulties arise from the scientific complexities inherent in modeling physical and biological linkages in and between watersheds and other ecosystems, and determining the effects of various in-stream and upland activities on these linkages. There are also legal and organizational complexities in developing watershed-based management frameworks for watersheds that cross political boundaries and that have multiple human uses and corresponding environmental threats. Watershed management efforts are also frustrated by long-range pollution that results from human activities occurring outside a given watershed.

Despite the difficulties of designing and implementing a truly holistic watershed management model, the model remains a worthy target because the alternative approach — managing individual water uses and threats without regard to their cumulative effects on all physical and biological linkages within and among watersheds — is logically flawed. Thus, it is no surprise that watershed management is widely supported by professionals, academics, and interest groups and has appeared as a major theme in the province's *Water for Life* strategy.

In fact, the calls for watershed management in Alberta are over fifty years old, going back, at least to 1947, to the province's agreement with Ottawa to protect the quality and quantity of watersheds on the eastern slope of the Rockies. These calls have been renewed more recently in the recommendations of several studies of northern rivers. For a discussion of these historic programs, see, Pierre Walther, *Against Idealistic Beliefs in the Problem-Solving Capacities of Integrated Resource Management* (1987) 11 *Environmental Management* and Steven A. Kennett, "Integrated Watershed Planning for the Northern River Basins: Thirty Years and Counting" (2001) 26 *Canadian Water Resources Journal*. A landmark 1985 report of a three-member inquiry called for considerable federal involvement in watershed management (P.H. Pearse, F. Bertrand, & J.W. MacLaren, *Currents of Change – Final Report, Inquiry on Federal Water Policy* (Ottawa: Environment Canada, 1985).

Unfortunately, neither Ottawa nor Alberta has vigorously heeded these historical calls for watershed management, in that neither government has reformed its regulatory programs on a watershed basis. At the federal level, Ottawa has virtually ignored provisions in the *Canada Water Act* that come the closest of federal statutes to calling for watershed management. Nor has Ottawa used its broad discretion, in the *Fisheries Act* and *Canadian Environmental Protection Act* to adopt a watershed management model for its regulation of water pollution and other harms to fish habitat.

Before adopting the *Water Act*, Alberta had also declined to reform its regulatory framework along watershed management lines. The *Water Act*

changed this picture somewhat, by providing enhanced legal authority, but still not a legislative obligation, for watershed-based regulatory reform. Not surprisingly, however, the discretionary nature of this legislative *mandate* has engendered foot-dragging. While the province has adopted management plans for a few specific watersheds, the plans arguably take only baby steps toward implementing a holistic management framework for those watersheds. There is no province-wide, watershed-based blueprint for reforming regulatory programs for water allocations and water pollution. In addition, there is no provincial approach to integrating those functions with land use planning and other tools for managing residential developments, transportation, agriculture, forestry, and the myriad of other upland activities that cumulatively affect aquatic ecosystems.

The province has also put little flesh on the bones of the watershed management model called for in the *Water for Life* strategy. Thus, much work remains to operationalize the watershed management concept and, in particular, to rationalize it with the *Water Act's* affirmation of water rights granted under historic allocation systems. Given the history of unheeded calls for watershed management, and the *Water Act's* reaffirmation of historic water allocations, it would be reasonable to be skeptical about the *Water for Life* strategy's calls for watershed management. On the other hand, the growing stresses on Alberta's water supplies and aquatic ecosystems, and the increasing friction among competing sectors of water users, may provide sufficient cause for the province to take the watershed approach seriously this time.

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