

# THE QUANDARY OF CUMULATIVE EFFECTS — FITTING A SCIENCE PEG IN A LAW HOLE

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A Symposium on  
Environment in the Courtroom: Key Environmental Concepts and  
the Unique Nature of Environmental Damage

March 23-24, 2012  
University of Calgary



This project was undertaken with the financial support of:



Ce projet a été réalisé avec l'appui financier de :



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Institut canadien du droit des ressources  
Faculty of Law  
University of Calgary

Printed in Canada

## INTRODUCTION

This paper addresses the concept of cumulative effects in the Canadian environmental regulatory context. It will provide an overview of the concept and discuss how it has been used in environmental regulation to date. It will then address the current shift to cumulative effects management, using a developing regulatory system as a case study.

## WHAT ARE CUMULATIVE EFFECTS?

Cumulative effects is a concept used in environmental law that seeks to address changes caused by human actions from a holistic, primarily preventative perspective. This concept is strongly anchored in science and Canadian environmental regulatory systems have struggled to effectively implement the concept as a part of environmental protection through law and policy. To date, cumulative effects have been used in Canadian environmental regulation more as a tool for prediction and prevention and less as a means of damage assessment.

Broadly speaking, in environmental law “cumulative effects” seek to address changes or effects that may occur from combined past, present and future human actions or activities.<sup>1</sup> Legislation and policy varies in relation to whether the concept should include only environmental effects or also encompass social, economic and cultural effects, although more recent legislative and policy developments tend to favor the wider approach.<sup>2</sup> The concept has proven extremely challenging for governments to effectively implement in traditional regulatory models and is not particularly amenable to historical court treatment of environmental issues.

There are various elements that are relevant to cumulative effects and should be kept in mind when dealing with this concept:

- Management of cumulative effects is a value laden proposition. In assessment literature this is often reflected in the identification of “valued ecosystem components”. This is the “what” of cumulative effects, in terms of determining what it is that society values that should be monitored for the impact(s) of cumulative effects and consequently protected through preventative or mitigative

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<sup>1</sup> From the federal perspective, see G Hegmann et al, *Cumulative Effects Assessment Practitioners Guide* (Hull: Canadian Environmental Assessment Agency, 1999) at 3; online: Canadian Environmental Assessment Agency <[http://www.ceaa-acee.gc.ca/43952694-0363-4B1E-B2B3-47365FAF1ED7/Cumulative\\_Effects\\_Assessment\\_Practitioners\\_Guide.pdf](http://www.ceaa-acee.gc.ca/43952694-0363-4B1E-B2B3-47365FAF1ED7/Cumulative_Effects_Assessment_Practitioners_Guide.pdf)>. From the Alberta perspective, see Alberta Environment and Water, “Cumulative Effects”, online: Alberta Environment and Water <<http://environment.alberta.ca/0890.html>>.

<sup>2</sup> See *Canadian Environmental Assessment Act*, SC 1992, c 37, s 2(1), definition of “environmental effect” and *Environmental Protection and Enhancement Act*, RSA 2000, c E-13, s 49(d).

action. These valued components may be chosen as a proxy for the environment as a whole.

- Incrementalism, as cumulative effects are intended to address multiple actions and their interactions:<sup>3</sup>

“Cumulative effects occur as interactions between actions, between actions and the environment, and between components of the environment. These “pathways” between a cause (or source) and an effect are often the focus of an assessment of cumulative effects. The magnitude of the combined effects along a pathway can be equal to the sum of the individual effects (additive effect) or can be an increased effect (synergistic effect).”

- Consideration of cumulative effects is scalable in relation to geographical area and time frame to be considered. From a regulatory perspective, scope can also relate to types of activities (e.g. regulated vs. non-regulated activities).
- Limits, as it is an implicit part of cumulative effects that biological and ecological systems have limits (sometimes referred to as “carrying capacity”) and are not capable of supporting unlimited growth.
- Integration, which is generally most relevant in the environmental regulatory context with respect to decision-making structures and jurisdiction. The extent of desirable integration in any given circumstance will depend on the scoping of the cumulative effects considerations.

In many ways, the watchword of cumulative effects is complexity, both from legal and scientific perspectives. There is an assumption underlying management of cumulative effects that our scientific knowledge is sufficient to justify regulatory and planning actions.

## **HOW HAS THE CONCEPT BEEN USED IN THE REGULATORY CONTEXT?**

To date, the concept of cumulative effects has been most commonly used in Canadian environmental regulation in relation to environmental assessment and, to a lesser extent, statutory authorizations.

### **Environmental Assessment**

Environmental assessment is a well-established tool in Canada, having been legislated federally and in most provinces since the early 1990s. It is used to assess likely effects of proposed activities and projects before their development to integrate environmental

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<sup>3</sup> *Cumulative Effects Assessment Practitioners Guide*, *supra* note 1 at 6.

concerns into planning and decision-making. Generally, environmental assessment legislation does not require assessment of all activities that may take place in a jurisdiction; more commonly, some form of sliding scale or set of lists is applied to match the extent of assessment (if required at all) with the anticipated environmental effects of a proposed activity.<sup>4</sup> Environmental assessment most commonly takes place on a project-specific basis, although federal legislation in particular provides for broader forms of assessment, such as regional studies or class reviews.<sup>5</sup>

While assessment of cumulative effects is an accepted part of environmental assessment practice from a scientific perspective, there are limited legislative provisions requiring it to be part of the environmental assessment process in Canada. Consideration of cumulative effects is mandatory federally, in the Yukon and Alberta, and is a consideration that may be imposed by government officials on a discretionary basis in British Columbia.<sup>6</sup> Practically speaking, cumulative effects matters are brought forward for consideration as part of an environmental impact assessment report or other document prepared by a project proponent to report to government officials on the anticipated effects of a proposed project or activity.

### Statutory Authorizations

In environmental regulation, statutory authorizations are forms of permission given by government allowing individuals or corporations to carry on activities that may have an effect on the environment. These authorizations may be referred to by any of a range of terms, such as approvals, licences, permits, certificates or others, depending on the legislation by which they have been created. Cumulative effects can be relevant to statutory authorizations either as a matter to be considered by government officials when deciding whether to issue an authorization or a matter to be addressed by specific terms or conditions imposed in an authorization. For example, Alberta's *Water Act* provides that the Director may consider cumulative effects by the proposed activity on specific

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<sup>4</sup> For example, in Alberta, some projects are exempted from any type of environmental assessment, while others are sent directly to a full environmental assessment; *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta Reg 111/1993. Activities that are not caught by either of these requirements but may otherwise be subject to environmental assessment are screened by provincial officials to determine the level of assessment required (if any); *Environmental Protection and Enhancement Act*, *supra* note 2, s 44.

<sup>5</sup> *Canadian Environmental Assessment Act*, *supra* note 2, ss 16.2 and 19.

<sup>6</sup> *Canadian Environmental Assessment Act*, *ibid*; *Yukon Environmental and Socio-economic Assessment Act*, SC 2003, c 7; *Environmental Protection and Enhancement Act*, *supra* note 2; *Environmental Assessment Act*, SBC 2002, c 43. See also Mark Haddock, *Environmental Assessment in British Columbia* (Victoria: University of Victoria Environmental Law Centre, 2010) at 31-33, online: University of Victoria Environmental Law Centre <[http://www.elc.uvic.ca/publications/documents/ELC\\_EA-IN-BC\\_Nov2010.pdf](http://www.elc.uvic.ca/publications/documents/ELC_EA-IN-BC_Nov2010.pdf)>.

water parameters when deciding whether to issue various authorizations under that Act.<sup>7</sup> Through the assessment of cumulative effects, measures to monitor and mitigate those effects may make their way into statutory authorizations as terms and conditions.

## **Jurisprudential Treatment**

Most Canadian jurisprudence focusing on cumulative effects has arisen in pursuit of administrative remedies sought in relation to decisions made under the *Canadian Environmental Assessment Act*, commonly on matters where a joint environmental assessment/statutory review has been held between the federal government and a province. While judicial deference to the statutory decision-makers has been explicitly recognized in relation to the substantive elements of the environmental assessment process,<sup>8</sup> the courts have expanded upon decision-makers' views of their own discretion:

- Once application of the *Canadian Environmental Assessment Act* is triggered, the federal authorities are not limited to addressing only matters of federal jurisdiction in considering cumulative effects and must also consider relevant matters beyond the scope of the specific project under review.<sup>9</sup>
- A finding by the federal authority that a project will have insignificant environmental effects does not preclude the consideration of possible cumulative effects, as an accumulation of insignificant effects may result in significant effects.<sup>10</sup> However, only likely cumulative effects must be considered; hypothetical projects or activities need not be included.<sup>11</sup>
- A review panel under the *Canadian Environmental Assessment Act* has the duty to ensure that it obtains all information needed to carry out an assessment, with a corresponding duty to use its evidentiary powers under the Act to meet the information gathering duty. While this duty can be delegated to the project proponent, where there are gaps in the information related to cumulative effects, the review panel still retains the ultimate duty to obtain and consider available relevant information.<sup>12</sup>

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<sup>7</sup> *Water Act*, RSA 2000, c W-3, ss 38(2)(b), 51(4)(b), 66(3)(b) and 82(5)(b).

<sup>8</sup> *Bow Valley Naturalists Society v Canada (Minister of Canadian Heritage)*, 2001 CanLII 22029 (FCA), [2001] 2 FC 461, online: CanLII <<http://canlii.ca/t/4jm3>> [*Bow Valley Naturalists*].

<sup>9</sup> *Friends of the West Country Assn v Canada (Minister of Fisheries and Oceans)*, 1999 CanLII 9379 (FCA), [2000] 2 FC 263, online: CanLII <<http://canlii.ca/t/4llf>> at [34].

<sup>10</sup> *Ibid* at [39].

<sup>11</sup> *Bow Valley Naturalists*, *supra* note 8 at [41].

<sup>12</sup> *Alberta Wilderness Assn v Cardinal River Coals Ltd*, 1999 CanLII 7908 (FC), [1999] 3 FC 425, online: CanLII <<http://canlii.ca/t/47rs>>.

There has been limited jurisprudence on cumulative effects in relation to statutory authorizations. The Alberta Environmental Appeals Board has upheld the broad discretion of the Director under the *Environmental Protection and Enhancement Act* to impose a general prohibition against harmful air emissions as a condition in an industrial approval to deal with cumulative effects concerns.<sup>13</sup>

## WHERE IS THE CONCEPT GOING?

In recent years, use of the cumulative effects concept has been expanding from the environmental assessment arena to that of practical implementation as a planning and management tool through cumulative effects management.

Cumulative effects management looks to move from assessing cumulative effects of development to setting limits on those anticipated effects and managing activities to avoid reaching those limits and prevent adverse cumulative effects. Broadly, this system involves:<sup>14</sup>

- identifying societal values related to the environment and land use in particular;
- setting specific measurable objectives for those values;
- managing and regulating activities to ensure those objectives are met;
- monitoring activities and their effects; and
- modifying the system as appropriate based on the monitoring results.

Often this system is linked with land use management systems and is intended to provide broad guidance and direction for decisions on specific developments and activities.

## A Case Study: Alberta's Lower Athabasca Regional Plan (LARP)

Implementation of cumulative effects management systems is a relatively new development in Canadian environmental regulation. Alberta is in the process of instituting cumulative effects management as part of its new regional land use planning system, which has been under development since 2006 and is embodied legally in the *Alberta Land Stewardship Act*.<sup>15</sup> The cornerstone of this new system is the land use plans

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<sup>13</sup> *McCain Foods (Canada) v Director, Prairie Region, Alberta Environment*, Appeal No 99-138 (Alberta EAB), online: Alberta Environmental Appeals Board <<http://www.eab.gov.ab.ca/dec/99-138.html>>.

<sup>14</sup> Forest Practices Board, *Cumulative Effects: From Assessment Towards Management* (Victoria: Forest Practices Board, 2011) at 13, online: Forest Practices Board <[http://www.fpb.gov.bc.ca/SR39\\_Cumulative\\_Effects\\_From\\_Assessment\\_Towards\\_Management.pdf](http://www.fpb.gov.bc.ca/SR39_Cumulative_Effects_From_Assessment_Towards_Management.pdf)>.

<sup>15</sup> SA 2009, c A-26.8.

that will be developed for each of the seven land use regions established by the Alberta government. These plans will identify desired environmental, social and economic outcomes for the region, set thresholds to manage cumulative effects of development, and seek to balance regional and provincial concerns. The plans will be developed by the provincial Land Use Secretariat and ultimately given legal effect through Cabinet approval.

To both avoid future conflicts with existing laws and systems affecting land use and underscore the significance of the new planning system, the *Land Stewardship Act* has been given precedence over all other provincial legislation and the regional plans, when developed, will prevail over other provincial regulations.<sup>16</sup> The regional plans will be binding on the provincial government, agencies such as the Energy Resources Conservation Board, and municipalities, and decisions of those bodies must be consistent with the applicable regional plan(s).<sup>17</sup> Municipalities and decision-making bodies will be required to ensure that their bylaws, policies and other regulatory instruments are in compliance with regional plans.<sup>18</sup>

#### *Lower Athabasca Regional Plan — An Overview*

The Lower Athabasca land use planning region covers Alberta's northeastern corner and encompasses much of the province's oil sands reserves. The region is the first to undertake development of a regional land use plan under Alberta's new planning system; a draft plan (LARP) is currently in public circulation and gives some indication of the intended direction for land use planning and management in region, including cumulative effects management.<sup>19</sup>

The draft LARP sets out a vision for the region, together with seven strategic directions. The plan's clear priority is development of oil sands resources. Cumulative effects management is intended to be implemented under the strategic direction to manage air, water and biodiversity and minimize land disturbance. More specifically, the draft LARP currently proposes to provide a legal structure for cumulative effects management in relation to air quality, surface water quality and groundwater quality and quantity.<sup>20</sup>

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<sup>16</sup> *Ibid*, s 17.

<sup>17</sup> *Ibid*, s 15(1).

<sup>18</sup> *Ibid*, ss 20-21.

<sup>19</sup> Government of Alberta, *Draft Lower Athabasca Regional Plan 2011-2021* (Edmonton: Government of Alberta, 2011), online: Land-use Framework <[https://www.landuse.alberta.ca/Documents/LARP\\_Draft\\_Lower\\_Athabasca\\_Regional\\_Plan-2011-08.pdf](https://www.landuse.alberta.ca/Documents/LARP_Draft_Lower_Athabasca_Regional_Plan-2011-08.pdf)>.

<sup>20</sup> *Ibid* at 48-50, 52-54, 57.

### *Cumulative Effects Management under the LARP*

The draft LARP sets out objectives for each of the environmental media subject to cumulative effects management and identifies specific indicators for management. For each of the indicators, limit and trigger levels are established. A limit is a value intended to be an environmental threshold, the exceedance of which will initiate management actions, while triggers are lesser values whose exceedances are intended to initiate preventative response action. “At triggers, the emphasis is on reversing trends and avoiding reaching limits. If a limit is reached, there is a commitment that steps will be taken to return to conditions below the limit.”<sup>21</sup> The indicators, limits and triggers are all set by policy.

The proposed LARP regulation provides that the responsible Minister makes final and binding determinations of whether a limit or trigger has been exceeded and the duration of any such exceedance. Where the Minister makes such a determination, she must then issue a notice to affected decision-makers (such as government departments and regulatory tribunals) and municipal governments regarding the exceedance, its scope, industries and activities that may have contributed to the exceedance and actions that the decision-makers and municipal governments must take. The notice will also include a prohibition against issuing a statutory authorization to any proposed activity identified in the notice.

In addition, where the Minister has determined a trigger or limit has been exceeded, officials in the Minister’s department are required to initiate a management response consistent with the relevant framework.<sup>22</sup> The frameworks are policy documents, though the intent seems to be to give them legal enforceability through reference in the regulation. For example, the draft *Lower Athabasca Region Air Quality Management Framework* sets one limit and two triggers for each of the two indicators, sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>).<sup>23</sup> The framework sets out a scale of four levels of potential management actions and tools that may be pursued in response to the particular levels of the indicators as shown by regional monitoring.<sup>24</sup> These actions are arranged to increase in severity and legal significance as the levels of the indicators increase and

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<sup>21</sup> *Lower Athabasca Region Air Quality Management Framework* (Edmonton: Alberta Environment, 2011) at 17, online: Alberta Environment and Water <[http://environment.alberta.ca/documents/LARP\\_AQMF\\_March\\_31\\_Final.pdf](http://environment.alberta.ca/documents/LARP_AQMF_March_31_Final.pdf)>.

<sup>22</sup> Draft frameworks currently available for the Lower Athabasca region are: *Lower Athabasca Region Air Quality Management Framework*, *ibid*; *Lower Athabasca Region Surface Water Quality Management Framework* (Edmonton: Alberta Environment, 2011), online: Alberta Environment and Water <[http://environment.alberta.ca/documents/LAR\\_SWMF\\_Mar\\_31\\_Final\\_Draft.pdf](http://environment.alberta.ca/documents/LAR_SWMF_Mar_31_Final_Draft.pdf)>; and *Lower Athabasca Region Groundwater Management Framework* (Edmonton: Alberta Environment, 2011), online: Alberta Environment and Water <[http://environment.alberta.ca/documents/Groundwater\\_Management\\_Framework\\_April\\_1\\_-Final.pdf](http://environment.alberta.ca/documents/Groundwater_Management_Framework_April_1_-Final.pdf)>.

<sup>23</sup> *Lower Athabasca Region Air Quality Management Framework*, *supra* note 21 at 20.

<sup>24</sup> *Ibid* at 24-25.

range from education and awareness initiatives to imposition of new approval conditions, revision of policies, and issuance of enforcement or protection orders. Prosecutions do not appear to be an intended option where triggers or limits are exceeded.

It should be noted that the Lower Athabasca regional plan and related frameworks remain as draft documents as of the date of writing this paper.

## **Challenges and Concerns Regarding Cumulative Effects Management**

Initial steps to implement cumulative effects management highlight the challenge of shifting a predominantly science-based concept to a regulatory and legal platform. Two significant concerns, discussed further below, are the fit between cumulative effects management and the current Canadian environmental quasi-criminal regulatory system and the burden of proof and process it entails, and ensuring enforceability and accountability in relation to cumulative effects management.

### *Can Cumulative Effects Management Fit with Environmental Regulation and Judicial Systems?*

As discussed above, cumulative effects management is extensively rooted in science. It seeks to address multiple effects of varying individual significance across ranges of geographical area and time. However, the holistic, ecosystem basis of its approach comes up against challenges in meshing with the focused, generally site or project specific orientation of current environmental regulatory systems. Canadian environmental legislation is strongly directed at regulating the environmental effects of designated activities on a case by case basis and responding punitively when limits and prohibitions have been broken. Our environmental legislation and regulatory systems have been less successful at identification of root causes and prevention and avoidance of environmental harm, which is a key aspect of cumulative effects management.

Similarly, the Canadian judicial system is one that predominantly focuses on specific incidents and disputes between specific parties, both from a regulatory and common law perspective. Where environmental regulatory matters make their way into our courts, it is generally to deal either with the quasi-criminal aspect of prosecution and punishment or the administrative law aspect of reviewing government action and decision-making. In both arenas, the rules and proceedings are not well-suited to dealing with preventing and repairing harm to the environment itself and addressing the broad scope and extent of cumulative effects management.

Another challenge of bringing cumulative effects management into the Canadian environmental regulatory system is trying to reconcile the fractured nature of that system

with the inherent need for integration that cumulative effects management demands. Our current system spreads regulatory responsibilities across federal, provincial and municipal levels of government due to the divided constitutional jurisdiction over environment, as interpreted by the courts, and also across several government departments and agencies within any given level of government. For example, in 2008, Alberta's *Land-use Framework* identified 12 different provincial government departments and tribunals that dealt with land use matters.<sup>25</sup> For cumulative effects management to succeed, these varied authorities must align their focus and regulatory requirements to work to achieve the common ends identified as part of the management system.

### *Can Enforceability and Accountability be Assured for Cumulative Effects Management?*

As discussed in the previous section, the focus on specific incidents and persons in enforcement proceedings before the courts does not mesh well with the broad scope and extent of cumulative effects management. Where triggers or limits are exceeded under cumulative effects management, it will likely be next to impossible to identify one particular action or activity and one particular actor that caused the exceedance. Similarly, the role that non-regulated activities (such as non-point source pollution or transportation) will play in contributing to exceedances is not a matter easily amenable to enforcement through our existing judicial and environmental regulatory systems, in large part due to the difficulties in identifying a particular offender against whom to enforce.

Cumulative effects management systems contemplate the involvement of a broad range of interests and participants beyond government regulators. A concern is where ultimate responsibility for the operation and success of such systems should lie, given their extensive scope. In part, this can be remedied by clearly indicating the responsibility of government in legislation and policy creating and supporting these systems. However, the wide swath of discretion that can be given to government officials in these systems, such as that proposed in the draft LARP, may limit success in holding those officials accountable through the courts due to the levels of deference often given to administrative decision-makers.

## **CONCLUSION**

The concept of cumulative effects has been and continues to be used in Canada as a means to predict, prevent and manage the impacts of multiple activities and events on our environment. Various challenges have been encountered in taking this broad, science-

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<sup>25</sup> Government of Alberta, *Land-use Framework* (Edmonton: Government of Alberta, 2008) at 11, online: Land-use Framework <[https://www.landuse.alberta.ca/Documents/LUF\\_Land-use\\_Framework\\_Report-2008-12.pdf](https://www.landuse.alberta.ca/Documents/LUF_Land-use_Framework_Report-2008-12.pdf)>.

based approach that is intended to be proactive and making it work within a focused, reactive and rather fractured environmental regulatory system. That the challenges exist do not mean, however, that regulators, lawyers and judges should walk away from this concept and the possibilities it offers for enhanced environmental protection. Instead, this author suggests that all involved consider new tools and approaches that may improve the fit between the science peg and the law hole of cumulative effects.