

Capturing and Integrating Cumulative Effects into Assessment

By Cole Atlin

Introduction

If industrial development proposals of any nature are to receive more positive reception in host communities and regions, they will need to be planned, reviewed and approved in ways that ensure they contribute to more sustainable regional futures. That transition will require improvements in individual project assessment practice – especially a shift from a focus on mitigating “significant adverse effects” to requiring “positive contributions to sustainability” as well as avoidance of adverse effects. It will also demand more effective regional planning and other strategic level efforts to provide attention to the cumulative regional effects of multiple projects (e.g., mines, hydrocarbon exploration and extraction, hydropower dams), associated infrastructure and other past, current and anticipated activities. Such broader work would provide a better examined context and more authoritative guidance for individual project planning and development. Regional scale planning and assessment are largely a responsibility of governments, not something that individual mine proponents can reasonably be expected to deliver adequately in project-based assessment and approval processes.

This submission will overview the concept of cumulative effects, clarify specific characteristics required for assessment to capture cumulative effects concerns, and explore strategic assessment and sustainability assessment as means of integrating those characteristics and address the broad alternatives for response. Additionally, this paper will explore governance structures for tiering and the potential opportunities that scenario-backcasting can provide as an assessment tool. Major portions of this submission are excerpts from a forthcoming paper, “Lasting regional gains from non-renewable resource extraction: the role of sustainability-based cumulative effects assessment and regional planning for mining development in Canada” by Cole Atlin and Robert Gibson for the *Journal of Extractive Industries and Society* (2017).

Cumulative Effects

Cumulative effects and assessment processes to address these effects have some common characteristics. The actual effects of any undertaking are always cumulative; they result from new stresses that build upon existing natural and anthropogenic stresses and their interactions. Actual cumulative effects include socio-economic and cultural as well as ecological aspects, which always interact and are not often separable (Weber, Krogman, and Antoniuk

2012). Also, cumulative effects can be (usually are) positive and adverse, with the positive effects including opportunities and the adverse ones including risks. The effects occur in dynamic complex social and/or ecological systems and may be direct or indirect, immediate or delayed, simple and linear or interactive and non-linear (MacDonald 2000). Cumulative effects, therefore, involve combinations and interactions among factors that influence existing social and/or ecological systems or their components. The effects may be additive, synergistic, magnified (e.g., biomagnification of toxic contaminants up a food chain), compounding, or compensating across multiple scales.ⁱ

The diverse characteristics of cumulative effects can be re-categorized as four types of impacts:

- i) coincident effects (independently initiated activities in the same system);
- ii) induced effects (where one effect or set of effects leads to others; e.g., where one project and its infrastructure in an area facilitate additional projects and associated effects);
- iii) lifecycle effects (through product chain, cradle to grave, cradle to cradle);
- iv) legacy effects (effects that follow and may extend far beyond the active life of the focal undertakings, such as decommissioned mines with tailings facilities that may entail monitoring and management in perpetuity).

Most importantly, all these effects interact and need to be considered together.

These complexities of cumulative effects entail uncertainty and imperfect predictability even with good information (which is not always available). In order to identify and evaluate cumulative effects, the assessment process must rely on expertise, including both specialized conventional scientific expertise and traditional knowledge based on local experience.ⁱⁱ At the same time, however, assessment of cumulative effects necessarily involves choices for which expert understanding is helpful but insufficient and credible public process is crucial.ⁱⁱⁱ

Capturing Cumulative Effects in Assessment- Utilizing Scenario Back-casting

Cumulative effects are complex. As a result, assessment has to become more complex. A focus must fall upon capturing cumulative effects in assessment, meaning identifying them, and then ensuring that the negative effects are avoided or mitigated, and the positive effects are maximized. A method for identifying cumulative effects that can be easily assessed and presented to the public for dialogue and consultation are scenarios.

The use of scenarios as a tool for visioning and planning is an often recommended best practice.^{iv} Future scenarios provide a basis for choosing among possible futures and tracing various possible trajectories of development. They give people who might be affected a more

informed basis for anticipating and responding to opportunities to push change towards desirable options and to avoid undesirable ones. This focus on positive futures is consistent with the agenda of sustainability-based assessment and the objective of enhancing prospects for lasting wellbeing.^v

Project level assessments typically offer one puzzle piece, without a full conception of how it might fit in and contribute to the larger vision. Regional scale scenarios provide a more fulsome picture of possibilities, risks and objectives. Additionally, backcasting (working back from the characteristics of a preferred future scenario, in contrast to forecasting that presents that future that present trends will deliver) can be effective for planning and policy generation where we wish exercise some influence over the pathways to be chosen and the future that will result.

Scenarios can be defined as “conjectures about what might happen in the future.”^{vi} A vision, conversely, is the desirable future state. Neither is a forecast. Scenario building is a useful tool for strategizing to determine how to get to a scenario closest to one’s vision. Beyond clearer thinking about what future we want, scenario-building can help participants to anticipate future opportunities, risks, barriers and uncertainties.^{vii} In particular, scenarios play two important roles in planning and policy making: “one is risk management, where scenarios enable strategies and decisions to be tested against possible futures, while the other is creativity and sparking new ideas.”^{viii}

Effective scenario design includes creating forecasts of current trends and looming possibilities that represent plausible prospects that the participants may wish to avoid but may also need to be ready to address (combat, soften, accommodate, etc.). Identification of trends including projected developments and land uses can be supplemented by anticipation of changes resulting from climate change, industrial development in other sectors, and other context dependent issues . While the specifics of such impacts cannot be predicted with confidence, they can be broadly identified for anticipatory encouragement, resistance or preparation for adaptation. The use of multiple scenarios helps to ensure that a reasonably full range of future possibilities is taken into account in regional planning and policy making. In areas that face the cumulative effects of multiple individual projects and other activities, regional planning informed by scenario work is a potentially powerful tool for considering alternative response options for maximizing positive effects while minimizing risks and maintaining flexibility in an uncertain world. Supportive policy making can provide more targeted attention to big issues. Together, they can provide valuable anticipatory guidance for project level assessments, which rarely have the scope or capacity to cover the main regional cumulative effects, much less identify and compare future scenarios and response options.^{ix}

Regional plans that have been informed by scenario analysis and that aim to enhance prospects for desirable futures can aid project-level planning and decision making through guidance for “better siting and phasing of development, demand reduction and other behavioural changes, and particularly through setting development consent rules for projects.”^x This approach for identifying regional cumulative effects concerns and response options has been used in a modest way in some regionally significant project assessments in Canada, generating significant impacts on recommended conditions for project approval. The Joint Review Panel in the case of the Voisey’s Bay nickel mine recommended reducing the capacity of the mine concentrator to extend the life and potential regional contributions of the project.^{xi} The Joint Review Panel in the Mackenzie Gas Project case recommended careful control of the pace and scale of gas development in the region to keep project related activities from exceeding the capacities of authorities and communities to monitor and mitigate adverse effects and to take advantage of positive opportunities.^{xii}

There are many formal methods for scenario-building^{xiii}, but very generally, two to five scenarios are usually created. Reliance on only three scenarios generally shifts the focus to the middle or most moderate one. Using more scenarios has the benefit of creating a larger “possibility space” in which the future is likely to unfold... “[*the suggested scenarios are*] a menu of five, with generic themes: (a) a surprise-free or continuation scenario; (b) a pessimistic scenario; (c) a disastrous scenario; (d) an optimistic scenario; and (e) a transformation (or miracle) scenario”.^{xiv} The scenario types are generic and can then be framed by context dependent drivers, meaning “influential forces of change”, including society’s value for a given commodity, environmental change, adaptive capabilities, etc.^{xv} Scenarios as a product can provide “mental maps of the future,” elucidating key assumptions, forcing the design of alternatives, testing for alternatives and options, identifying uncertainty and “provid(ing) a vehicle for communication.” Scenario planning as a process fosters shared learning and systems thinking, provides an arena for dialogue across silos, inspires innovation and creativity, and encourages adaptation and learning.

Scenario-based approaches fit well with the core agenda of environmental assessment. They are centred on anticipation of future effects and provide a “more robust way of assessing the potential future consequences of proposed developments” than conventional forecasting.^{xvi} Scenario building also has the advantage of enabling people to escape from the entrenched positional boundaries and conflicts that typify immediate controversies and move into discussions about future options where they may find common ground.^{xvii} Also, future scenario discussions can often begin with efforts to depict ways of accommodating all key objectives in a manner more consistent with the interdependent requirements for progress towards sustainability, unlike conventional discussions about immediate effects, which often start with clashes over potential trade-offs (e.g., between jobs and environmental stewardship).^{xviii}

Duinker and Greig (2007) argue that scenario building is a suitable tool for the assessment of large regional industrial developments where significant cumulative effects of multiple undertakings are likely, “Scenarios and scenario learning are highly applicable to mid- and long- range futures studies where there are considerable levels of both predictability and uncertainty. Scenario planning attempts to compensate for two common errors in decision-making – under- prediction and over-prediction of change – allowing a middle ground between the two to be charted.”^{xix}

Assessing Cumulative Effects: The Five Factors Required

Ideally, assessments should be examined through a predictive, transparent process that considers all elements of cumulative effects and response options, and seeks as the best option is the one that has the strongest prospects for positive contributions to sustainability while avoiding serious adverse effects and risks. Effective assessment of cumulative effects thus has core characteristics that it must fulfill. These factors are addressed in a process that is:

- (i) Multi-dimensional: covers the full suite of cumulative effects of multiple undertakings, past, present and reasonably foreseeable in the relevant regional future (well beyond the individual project level), in light of contribution to sustainability objectives;
- (ii) Long term: uses scenarios or some equivalent to explore and illuminate the nature and potential implications of plausible and desirable futures, to identify alternative pathways and plan options to examine;
- (iii) Credible in process and justification: establishes explicit open processes for elaborating and evaluating regional alternatives in light of context-specified sustainability-based criteria and trade-off rules;
- (iv) Authoritative: integrates regional assessment conclusions as decisions in legislatively authoritative regional plans or the equivalent with provisions for ensuring compliance in project level planning and assessment; and
- (v) Accountable: ensures clear and accountable assignment of cumulative effects management responsibilities and expectations, including provisions for engaged monitoring, effective responses and public reporting.

Taken together, all of these characteristics and requirements mean that cumulative effects assessment presents technical and procedural challenges. To address the predictive uncertainties and value-laden choices^{xx}, cumulative effects assessment processes must apply foresight in identifying and pursuing desirable futures but also adopt precautionary approaches

that favour lower risk options and adaptive design with careful monitoring, adaptive management and continuous learning.^{xxi}

The Need for Sustainability Based Assessment

Most environmental assessment practice under federal authority has focused on the “mitigation of significant adverse effects.” Thus mitigation focus is especially problematic where adverse effects may already be unsustainable (as they are globally in many key parameters). Moreover, it does not provide the information required to make decisions in wicked problem areas featuring complex and dynamic interactions among multiple factors, or cover the range of considerations involved in meeting expectations for social licence or social “acceptability”. Much more promising is planning and assessment centred on, the more comprehensive and positive “contribution to sustainability” objective. In order to determine if a regional plan (or an individual project) can contribute to lasting sustainability gains, alternatives must be compared to see which scenario generates the maximum long term, fairly distributed benefits and minimizes tradeoffs. Sustainability-based assessment covers the full suite of socio-economic, cultural and biophysical factors, and their interactions in its evaluation and determines what supporting programs, policies and initiatives must be in place for the proposed undertaking to succeed.^{xxii}

Sustainability-based cumulative effects planning and assessment is not about balancing economic needs against ecological ones, but rather aims to identify and facilitate achievement of desirable futures in which social, economic and ecological (and cultural, etc.) objectives can be served in mutually supporting ways. Such work needs explicit criteria for effective evaluation and decision making. These criteria need to be specified for the particular context of each application and applied in ways that recognize the interactions among effects and criteria categories. For a strong example of sustainability based criteria in the Canadian context, please see the report of the Joint Review Panel in the Mackenzie Gas Project case.

Context-specified criteria are especially valuable for comparative evaluation of alternative regional options. As opposed to the limitations of determining whether a proposed undertaking should go forward as proposed or be stopped, the comparison of alternatives using credibly developed, context-sensitive criteria opens assessment processes to broader, potentially more positive opportunities. At the project level, alternatives may involve the pace and scale of an operation, the nature and placement of infrastructure, means of revenue sharing and other benefit enhancement for local communities, and approaches to using non-renewable resource royalties and other opportunities to build more sustainable livelihood foundations. In regional level planning and assessment where cumulative effects are a major

concern, alternatives should be based on different scenarios and different packages of options to avoid adverse cumulative effects, enhance prospects for positive effects and minimize trade-off risks. The selection of the best option is guided by application of the context-specified sustainability-based criteria.

In the following sections, I will overview two specific recommendations for the panel, in order for federal assessment processes to achieve the aforementioned characteristics: strategic assessment and sustainability based assessment.

The Need for Authoritative Strategic Assessment

Proper attention to the cumulative interactions among the effects of multiple undertakings and stressors – past, present and in the reasonably foreseeable future – requires a larger scale than is available at the project level and more authority than can be expected from individual project proponents or from informal planning and policy development exercises. There is a specific need for a regional level examination of cumulative effects, related future considerations, and appropriate action in anticipation of them. Where multiple past, present and reasonably foreseeable undertakings will affect a region, an anticipatory regional response is needed. Regional level strategic assessments (R-SEAs), often involving multiple jurisdictions, need sufficient scope, authority, access to information and arrangements for meaningful public engagement to ensure credible analysis covering wide-ranging cumulative effects, examining broad implications, comparing future scenarios, and considering multiple alternatives. Virtually all R-SEA in provinces will have to be at least bi-jurisdictional and many will involve the federal government, the province and at least one Indigenous authority. The best option would be for all of the participating authorities to have legislated SEA (including R-SEA) processes, and for them to establish joint processes through formal agreements that deal with context specific considerations.^{xxiii}

The understanding of current and potential cumulative effects and possible options for responding to them can be enhanced through regional studies. Authoritative guidance for individual project planning and assessment, however, typically depends on integration of these studies into the development and approval of legislatively mandated broader undertakings, such as formal regional plans. Broader undertakings may be regional plans developed through processes equivalent to rigorous and participative assessments or policies developed through credible strategic level environmental assessment (SEA) processes. Such regional or strategic initiatives can address many well-recognized project level assessment insufficiencies. SEAs “systematically assess the potential environmental effects, including cumulative effects, of alternative strategic initiatives, policies, plans, or programs for a particular region”.^{xxiv} Because

of overlapping mandates under the Constitution of Canada, strategic (and project) level undertakings, particularly those involving resource extraction, often involve multiple senior jurisdictions – federal, provincial/territorial and Indigenous – as well as municipal and sectoral authorities.

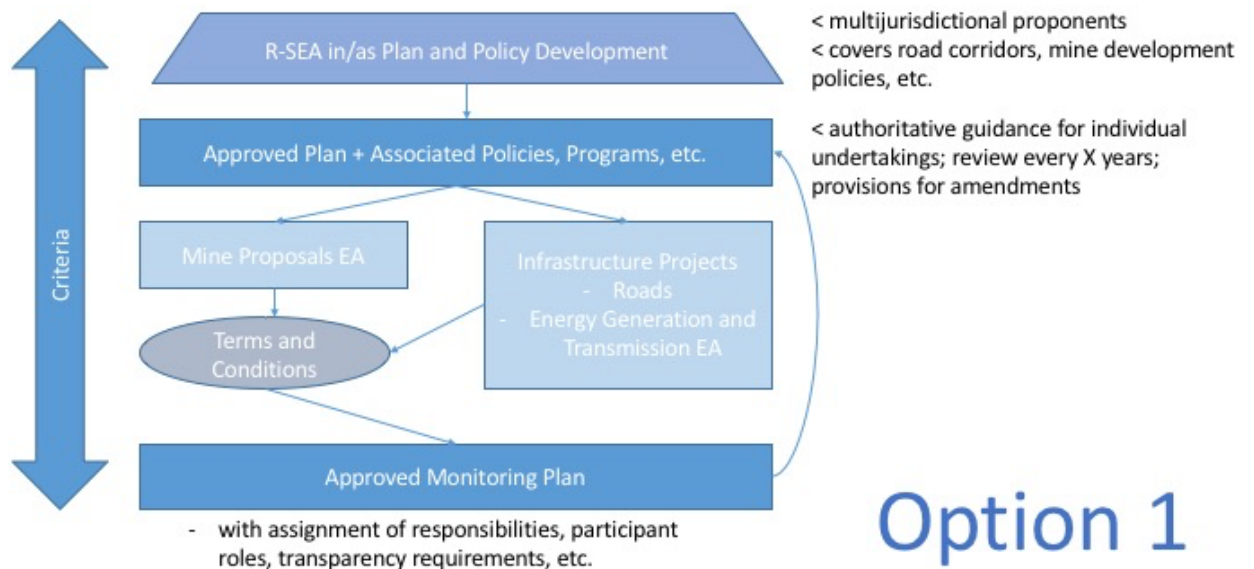
One of the largest problems in project level cumulative effects assessment is that the responsibility for assessing cumulative effects is placed on individual project proponents. Such proponents, especially those in the private sector, rarely have the motivation (beyond legislated obligation), authority, capacity, potential credibility, or information base (at least about other anticipated projects) to do good cumulative effects assessment in a way that addresses the core needs and rising expectations by the public, First Nations and proponents for better decision making. Project-level proponents may be able identify the likely range and potential importance of cumulative effects, but it is unreasonable to expect them to examine their implications in light of desirable and undesirable future scenarios, consider and assess broad alternatives, and point to the best options for action.^{xxv}

Project proponents would benefit from capable cumulative effects assessments and associated regional plans or the equivalent that address these overarching issues and provide credibly developed and authoritative guidance for project planning. The immediate and long term concerns and aspirations surrounding project proposals now often extend well beyond the individual project – especially where there have been and/or will be multiple undertakings with uncertain overall future effects. Where the projects involved include mines, with their limited life expectancies, uneasy combination of opportunities and risks, and often unfortunate legacies, proponents have much to gain from good cumulative effects assessments to clarify and smooth the path for project planning and approval.^{xxvi} Such assessments and associated benefits would seem much more likely to be delivered by careful attention to cumulative effects in sustainability-oriented anticipatory regional planning and associated policy and program initiatives than by project level cumulative effects efforts.

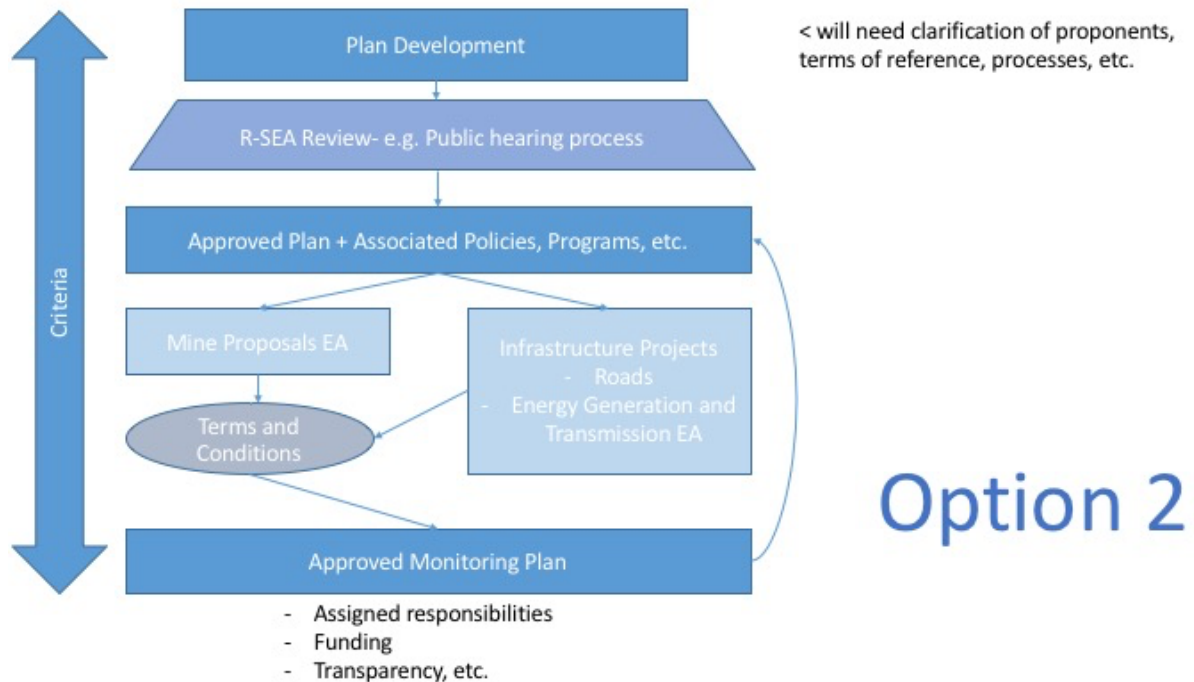
Effective tiering must be law-based to be authoritative and have public credibility (produced in a properly open, comprehensive, participative and accountable process, and regularly reviewed to keep up to date). Otherwise the guidance from SEAs and/or regional planning is unlikely to be accepted as a legitimate base for project assessment and approval. If authoritative and credible, the plan would provide reasonable clarity and certainty of expectations for proponents of individual undertakings and remove much of the burden these proponents carry under Canadian environmental assessment law to do the cumulative effects assessment themselves. Under a tiered structure, proponents participating in a project level assessment would address most cumulative effects by ensuring the character and potential

effects of their proposed undertakings would not conflict with the plan. Therefore, for cumulative effects considerations, a primary objective of the project assessment process would be to ensure its compliance with the larger scale plan.

The figures below present two possible governance models for strategic level assessment. These models are peppered with incomplete information because each assessment of this nature would be context dependent and would likely emerge as a result of 'decision windows'.^{xxvii} However, the standard assumption would be that a regional strategic assessment would act as a method of developing a regional plan, or that a proposed plan (or policy statement, etc.) would be evaluated by a regional strategic assessment, which could lead to modifying the conditions for the plan.



Option 1



The approved plan would direct the development of a region or a sector for a limited term. It would, for example, designate the number or extent of licences or permits that could be distributed, the accompanying social programming required, provide guidance for management of induced development, estimate infrastructure needs, maximize potential for fair distribution of opportunities, and determine standards for remediation. An important overall goal of such a development plan would be to control the pace and scale of development to maximize long term benefit for a community, and also to provide significant guidance to project level EAs for proponents and reduce levels of social conflict relating to specific projects.

The monitoring plan and accompanying monitoring body would gather data, evaluate the findings based on set criteria and act as a place to discuss on-going development concerns, lodge complaints and recommend plan modifications. Bodies like this should be linked to the independent panel or R-SEA body. Monitoring is an extremely important factor for R-SEA, particularly in non-renewable resource extraction cases where oil and gas or mining legacies can fundamentally alter the long term prospects for the sustainability of a community. Bodies of this nature would need to be adequately funded, have clearly designated authority and responsibility, and be transparent.

The monitoring needs of various industries will be different across sectors and regions. For example, the legacy concerns for consideration in the non-renewable resource extraction

sector is vastly different than in other sectors. The major mining legacy factors may be summarized in five interconnected categories.^{xxviii}

- (i) *Depletion of a non-renewable resource* is inherent in mining, which develops but also extracts and removes a valuable resource that will longer be available for future generations. That reality inevitably raises questions about whether what is gained in the long run compensates for what is lost.
- (ii) *Boom/bust effects* are commonly associated with economic activities that have highly intensive phases and/or limited overall duration, especially when they are significant relative to the level of pre-existing economic activity in the surrounding communities and region. Mining often involves all of these factors. The best recognized problems are those of the economic bust at mine closure, especially for communities that have become highly dependent on mining related incomes and other opportunities. However, boom effects too can have adverse socio-economic effects. For example, sudden influxes of money, a transient male dominated work force and a lack of strong social programs brings multiple problems for nearby communities, including drugs and alcoholism, increases in violent crime, prostitution and other serious issues.^{xxix}
- (iii) *Residual adverse effects on or risks to the land, waters and wildlife*, are well known in the record of mining in Canada and elsewhere. Public authorities now face a huge and costly backlog of responsibilities for remediating abandoned and orphan mines. While regulatory obligations and corporate practices have improved, some mines still leave negative biophysical and associated economic legacies. Many mines generate tailings and other residuals that can have highly detrimental ecosystem effects and require careful treatment, storage maintenance and monitoring, sometimes in perpetuity. If heavy metals or other potentially toxic substances enter the ecosystem, they can cause adverse effects for hundreds, if not thousands, of years.^{xxx} Unfortunately, current monitoring and enforcement efforts are generally unsatisfactory^{xxxi} and changeovers in mine ownership from initial exploration to closing often leave declining mines in the hands of poorly resourced small operators unable to meet remediation obligations.^{xxxii}
- (iv) *Inappropriate residual infrastructure* results if the extensive development of transportation networks, power generation, waste storage and human settlement that accompanies mining development is not designed with other purposes and post-mining realities in mind. In some cases, the infrastructure can be built to serve lasting needs of regional communities and other livelihood

options. Otherwise, once mines close, the infrastructure may be insufficient for continuing purposes, maintainable only at undue expense, and/or represent another remediation problem for regional communities and the public purse.^{xxxiii}

- (v) *Effects on local, especially Indigenous communities* include the cumulative community results of all the above categories of concerns. Colonialization, poverty and the dependence that Indigenous communities have on the land, economically, culturally and spiritually, means that Indigenous communities are particularly vulnerable to the negative legacies of mining developments.^{xxxiv}

With those legacy factors in mind, monitoring and re-evaluating the plan are crucial for the long term success of a region. The plan would have to be re-evaluated based on time or other imposed limits. The information from the monitoring board is integral to re-evaluating the development plan, integrating ecological and socio-economic data and encouraging adaptive design and management.

Tiered governance regimes of this nature are expensive and have significant risk associated with them, particularly as the use of R-SEA processes remains woefully undertested in Canada. One important method of strengthening processes such as these is to utilize explicit sustainability-based criteria for planning and evaluation.

In order to achieve sustainability-enhancing outcomes, regional level planning and assessments that incorporate sustainability-based objectives are most likely to align well with the public interest concerns presented in recent development controversies and meet best practice expectations recognized by independent EA professionals and scholars.^{xxxv} These regional and strategic initiatives must go well beyond the standard environmental assessment practices that are focused narrowly on mitigating significant adverse biophysical effects.

In EA practice, we have tended to focus on the proponent, since they are the ones proposing an undertaking, and implementing it if approved, though the responsible authority has the final say on approval. In a strategic assessment, particularly those where there are multiple corporate entities involved, as well as public monies for infrastructure, the undertaking may have no single suitable proponent. Especially where two or more jurisdictions are involved, the relevant agencies and authorities will need to develop the undertaking cooperatively.

In many RSEAs, the practical question of who leads and who funds the regional planning or other strategic regional undertaking will be answered according to context, convenience and mutual agreement recognizing the need for sufficient mandate and capacity to address the key

issues and the scope of sustainability-related considerations. In multijurisdictional cases, RSEAs should have arm-length review panels or the equivalent with appointments by the parties (e.g., the federal government, the provincial/territorial government(s) and relevant Indigenous government(s)). These review panels would have to be quasi-judicial, with independent authority and significant responsibility. For Indigenous interests, there are more complexities to the appointments given that often each community has its own national identity and multiple communities are likely affected regionally. The parties at the table are a matter of negotiation, but whatever the makeup, the goal is for power to be equally distributed.

The funding of the initial SEA should be from federal and provincial/territorial bodies. However, proponents could benefit significantly from the results of this structure from reduced social costs, less litigation, improved working relationships, etc. Due to the nature of regional strategic undertakings, monitoring and re-evaluating will require continual funding that should be treated as part of doing business in the region. Consequently, private and public sector actors that are contributing to regional cumulative effects ought to be helping to cover the costs of the R-SEA work, including monitoring.

Triggering a strategic environmental assessment is a challenging matter. Standard triggering methods centred on project level assessment would not be sufficient. Key requirements include legislated provisions for:

- (i) federal strategic level assessments and for federal participation in multi-jurisdictional strategic assessments, including at the regional scale, with associated provisions for federal initiation of SEAs and R-SEAs;
- (ii) provincial, territorial and Indigenous authorities to request a federal or multijurisdictional SEA or R-SEA, with suitable requirements for federal response and justification in light of the purposes of the enabling legislation;
- (iii) establishment of an arms-length federal body to receive and evaluate other requests for federal or multijurisdictional SEAs or R-SEAs from civil society organizations or members of the public; and
- (iv) regulation making authority to set out specific triggers for undertakings that respond to strategic regional/sectoral cumulative effects in areas of federal or joint responsibility for (e.g., for climate change mitigation).

The Yukon used land and resource management plans, as they applied to watersheds, to delineate boundaries. Terms of reference for these assessments would have some consistency across Canada, given the timing and structure, but would be specified for regional concerns.

As the strategic assessment bodies would be quasi-judicial, it would be imperative that their processes (data, deliberations, decision making, etc.) be transparent. Open access databases, public consultation, the use of alternatives and their comparison, and the justification of decisions made would be crucial to the success of an endeavour, as would an appellate body.

Conclusion

The purpose of this submission has to been to consider how cumulative effects can be integrated in assessment to address some of the on-going inadequacies of current project-centred assessment regimes. At present, cumulative effects are poorly considered in Canadian resource development. The limited scope and motives of project proponents and the narrow focus on “significant adverse effects” leave project level assessments with little potential for integrating serious attention to cumulative effects. I recommend that the primary foci of future policy building for assessing cumulative effects and appropriate response options, especially at the regional scale, include emphasis on:

- designing and delivering tiered regional assessment regimes, where credible and authoritative public processes for assessing cumulative environmental effects and broad alternatives are used to address regional concerns and opportunities and to guide the planning and assessment of individual projects; and
- requiring the adoption and use of explicit sustainability-based criteria for assessment evaluations and decision-making, duly specified for particular applications; the criteria must be applied to and incorporated into regional strategic and project assessments with particular attention to legacy concerns and the use of all projects as bridges to more sustainable futures.

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