

SAROS Predicts the Past:

Gravel Watch's Critique of MNR's Consolidated Report for SAROS

(State of Aggregate Resources, Ontario Study)

Gravel Watch Ontario

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Executive Summary

Ontario's Ministry of Natural Resource carried out a set of studies called SAROS (State of the Aggregate Resource, Ontario Study). MNR commissioned a set of six papers about the State of Aggregate Resources in Ontario. MNR summarized the results of this work in a publication called the Consolidated Report, which presents 26 key findings about aggregates in Ontario. The critique given here concludes that MNR's summary needs a broader perspective and too often takes an industrial point of view.

This critique is available from <http://gravelwatch.org/saros.htm>

Introduction

Ontario's Ministry of Natural Resources is responsible for the management of aggregates (principally sand, stone and gravel) in Ontario. Aimed toward helping "plan and manage aggregate resources", MNR launched the SAROS (State of the Aggregate Resource, Ontario Study) project which began by studying aspects of the resource and its industry. Six papers were contracted to be written by 6 consultancies, based on terms of reference prepared by MNR.

As of this writing MNR has not released the 6 reports, which were completed in December 2009. In their stead, on February 19, 2010, MNR published a Consolidated Report for SAROS, summarizing these 6 papers. The Consolidated Report is available from MNR:

<http://www.mnr.gov.on.ca/en/Business/Aggregates/2ColumnSubPage/286708.html>

Our analysis gives a review of the key findings presented in the Consolidated Report.

MNR/Industry Interaction

MNR has many interactions with OSSGA (Ontario Sand Stone and Gravel Association), which is the aggregate producers' association for the Ontario aggregate industry. Five of the six consultancies contracted to write the SAROS reports are associate members of OSSGA. Two of the six have or had members as special advisors to the OSSGA board. One of the six has a member serving as an associate director of OSSGA. No ENGOs (environmental non-governmental organizations) were authors of or contributors to the SAROS papers.

Commenting on SAROS

Other organizations have previously commented on the SAROS Consolidated Report. The staff report of April 7, 2010 from the Niagara Escarpment Commission states, *"Overall, SAROS portrays a very positive image of and economic benefit from the aggregate sector while downplaying the controversial issues such as environmental costs and impacts, poor track record on progressive rehabilitation and the nature of promised rehabilitation over time."* See http://www.gravelwatch.org/orig-gw/misc/NEC/NEC_SAROS_Status_Report_April_7_2010.pdf The staff report on SAROS of April 21, 2010 from Halton Region states that the *"issues in the report appear to favour the perspectives of the aggregate industry, and a balanced and objective presentation on the state of the aggregate resource in Ontario is required."* See <http://www.gravelwatch.org/orig-gw/misc/halton/Halton-Consolidated-SAROS-Report-Review.pdf>

The SAROS Consolidated Report states (February 19, 2010), *"This consolidated report is a summary of information from a series of six papers that make up the State of the Aggregate Resource in Ontario Study."* It goes on to say, *"For more detailed information, explanation and analysis refer to the relevant paper."* In order to comment on the Consolidated Report, the report you are now reading makes occasional reference to the contents of the six papers.

Organization of MNR's Consolidated Report and of Comments on Key Findings.

MNR's key findings for SAROS in its Consolidated Report are presented in the order of their related SAROS paper. MNR organized the Consolidated Report presentation in the following non-numeric order.

Paper 3: **The Value of Aggregates** by *AECOM Ltd.*

Paper 1: **Aggregate Consumption and Demand** by *Altus Group Ltd.*

Paper 5: **Aggregate Reserves in Existing Operations** by *Golder Associates Ltd.*

Paper 4: **Reuse and Recycling** by *LVM-JEGEL*

Paper 2: **Future Aggregate Availability and Alternatives Analysis** by *MHBC Planning*

Paper 6: **Rehabilitation** by *Skelton Brumwell & Associates Inc.*

Gravel Watch Ontario Comments

The remainder of this paper is organized as follows. Each of MNR's 26 key findings is quoted, in the above non-numeric order of their related SAROS paper. Each of these 26 findings is accompanied by our comments on them.

PAPER 3: THE VALUE OF AGGREGATES by AECOM Canada Ltd.

MNR's Consolidated Report summarizes the "value" of aggregates, as analyzed in Paper 3, in five key findings.

MNR Key Finding #1: Upstream value of aggregates:

- \$2.9 billion of gross output • \$827 million of labour income
- \$1.6 billion of GDP • 16,600 full time jobs

MNR Key Finding #2: Downstream value of aggregates:

- \$3.2 billion of gross output • \$940 million of labour income
- \$1.6 billion of GDP • 18,300 full time jobs

Gravel Watch comments

Paper 3 concentrates on value such as GDP, but does not reasonably consider the corresponding cost and negative impact of the aggregate industry.

- Aggregates have very low value, only about \$8 per tonne according to Paper 3 which translates to less than a cent per kilogram. Consequently a large amount of earth must be disturbed and exploited to produce a modest amount of value.
- The size of the Ontario aggregate industry as measured by its GDP of \$1.6 billion makes it a modest to small industry, constituting only 0.3% (3 thousandths) of the GDP of Ontario which is \$493 billion [2007, http://www.omafra.gov.on.ca/english/stats/food/gdp_select.htm].
- In 1968, Robert F. Kennedy stated that GNP, which is essentially GDP not counting services, "counts air pollution and cigarette advertising and ambulances to clear our highways of carnage. It counts special locks for our doors and the jails for those who break them. It counts the destruction of our redwoods and the loss of our natural wonder in chaotic sprawl." Wikipedia's entry for GDP states, "*if the aim of economic activity is to produce ecologically sustainable increases in the overall human standard of living, GDP is a perverse measurement; it treats loss of ecosystem services as a benefit instead of a cost.*" These indicate that GDP as a measure of value is unsuited to SAROS studies.
- Paper 3 states that the annual economic value of aggregate production in Ontario is approximately \$1.3 billion, which is a more direct measure of value than GDP which includes indirect and induced effects. In round numbers, this \$1.3 billion is \$8 (roughly the average value of a tonne) for each of the 184 million tonnes predicted to be consumed annually.

- None of the 6 SAROS papers considers the huge emissions of greenhouse gas from the cement manufacturing component of the industry. Apparently this produces millions of tonnes of greenhouse gas annually; the precise figure is not known.
- Paper 3 does not account for environmental and social costs, such as energy consumed, danger to water wells, pollution to water, injuries and deaths due to heavy equipment, loss in property values near aggregate operations, etc.

In brief, MNR’s statement of the value of aggregates is unrealistic in that it gives value without corresponding cost while using an inappropriate measure (GDP).

MNR Key Finding #3: The public is concerned about social and environmental costs of extraction and transportation, but they also appreciate the positive effects of infrastructure development.

Gravel Watch comments

MNR’s key finding #3 is written such that it appears that the public is happy to trade off social and environmental costs to gain infrastructure development. This conclusion does not follow from Paper 3 (or from the other SAROS papers). Paper 3 states that, *“This leads us to conclude that respondents did not seem willing to trade the most important things that they value about their community for development and infrastructure projects.”* MNR’s finding #3 does not agree with this statement.

MNR Key Finding #4: Existing legislation is working to protect natural environment features.

Gravel Watch comments

The public is concerned about the costs of extraction and transportation (as per finding #3). The public is also concerned about what appears to be lack of rehabilitation and lack of enforcement of site plans. These concerns suggest that existing legislation is not working well.

MNR Key Finding #5: There is concern for loss of agricultural lands that are being replaced by natural features.

Gravel Watch comments

MNR finding #5 does not say who is concerned about loss of agricultural lands. It implies that the public is concerned that farms are being turned into natural features such as forests or wetlands, but this position is not supported by paper 3.

What is true is that the public and farmers are concerned that aggregate pits/quarries are increasingly destroying farmland or taking it out of usage for decades. Paper 3 documents this ongoing loss in farmland.

PAPER 1: AGGREGATE CONSUMPTION AND DEMAND *by Altus Group Ltd.*

MNR Key Finding #6: Ontario is expected to continue to experience strong growth over the next 20 years.

Gravel Watch comments

Paper 1 states that the province can be expected to record “moderate” average real GDP growth of about 2.5%. This is not “strong” growth. Historically, the annual Ontario consumption of aggregates rises and falls, but in the long term has not experienced “strong growth.”

MNR Key Finding #7: There will be a substantial need for aggregate, estimated at an average of 186 million tonnes per year for the next 20 years.

Gravel Watch comments

This prediction is equivalent to the “business as usual” approach of guessing that each year for the next 20 years will be the same as recent years. This is like looking in the rear view mirror to guess where you are going. Similar prediction methods applied to the amount of garbage produced or the amount of tobacco smoked in Ontario would have been grossly wrong.

Paper 1 which made this prediction did not consider that:

- Conservation efforts may drive down the rate of consumption.
- Rising prices due to exhaustion of close-to-market sources may drive the price up and hence drive consumption down.
- Requirements to decrease greenhouse gas emissions may decrease demand by forcing a decrease in the rate of cement production and heavy truck travel, as these are significant sources of GHG emissions.
- Changes in Ontario Provincial Policy for aggregates may change from encouraging consumption of aggregates to discouraging consumption.

Paper 5 (Reuse and Recycling) states that the push for sustainable development and the need to preserve non-renewable aggregate resources, along with rising costs of energy, have increased the amount of recycling. It seems likely that these same forces will decrease the demand for virgin aggregate. Paper 1, in making this prediction looks at past patterns of consumption, but does not consider that the market demand can be expected to be sensitive to pressures such as public sentiment for conservation and sustainability.

MNR Key Finding #8: Expect demand to continue for primary aggregate.

Gravel Watch comments

Is this MNR finding saying that “primary” gravel (perhaps meaning virgin gravel) will continue to be useful? The answer is, Yes, but that seems obvious. Paper 1 and the other SAROS papers do almost no analysis of “demand” (what the market is willing to pay) versus consumption (what was actually used). This finding #8 adds little to our understanding of the future demand for aggregate.

PAPER 4: REUSE AND RECYCLING by LVM-JEGEL

MNR Key Finding #9: The use of recycled material has increased to 13 million tonnes per year.

Gravel Watch comments

This finding #9 is encouraging. What fraction is this 13 million tonnes of the total?

MNR Key Finding #10: Used asphalt and concrete are the largest sources of recycled aggregate.

Gravel Watch comments

This finding is potentially important, but it should be stated quantitatively:

- How many tonnes were and were not recycled?
- How does this compare to other jurisdictions?
- Concrete and asphalt require high quality crushed stone (Paper 5). How many tonnes were recycled for high quality use versus other uses?

MNR Key Finding #11: Improved recycling technology enables almost complete use of available recyclable material.

Gravel Watch comments

This finding #11 is from SAROS Paper 4. However, it is not clear that it is true. It implies that since there is complete use of this material, no more recycling should be expected. It is not clear that there are no more materials that should be and will be recycled in replacing virgin aggregates.

The same consultancy JEGEL that wrote SAROS Paper 4 also wrote “Mineral Aggregate Conservation: Reuse and Recycling” for MNR in 1990. In that earlier paper, JEGEL stated:

“It is projected that wastes and byproducts reuse and recycling will continue to make only a modest contribution to aggregates conservation (some 3 to 5 percent of total aggregates consumption).”

In their 2010 SAROS Paper 4, JEGEL now states:

“The use of recycled material in road building grew substantially between 1991 and 2006 from approximately 6 million tonnes per annum to approximately 13 million tonnes.”

It appears that the 1990 prediction was considerably lower than what was actually observed by 2010. It may also be that the 2010 prediction will be considerably high or low.

MNR Key Finding #12: There is a lack of municipal awareness and acceptance of recycling technologies.

Gravel Watch comments

This is in essence a recommendation to improve the awareness of recycling and its benefits to municipalities, which is excellent idea.

MNR Key Finding #13: There is a movement towards the use of high-performance materials, which generally precludes the use of recycled material.

Gravel Watch comments

This movement is not well documented in paper 4. This finding deserves careful study.

PAPER 5: AGGREGATE RESERVES IN EXISTING OPERATIONS *by Golder Associates Ltd.*

MNR Key Finding #14: Current licensed reserves total 3.44 billion tonnes of limestone/dolostone within selected quarries in the study area. This is a total of all material not taking into consideration quality, distance to market, and applicability of the resource in high-specification applications such as high rises, condominiums, overpasses and major highways.

Gravel Watch comments

This estimated figure, 3.44 billion tonnes of licensed reserve, is huge. Recall that annual production across the entire province of all kinds of aggregate is only about 184 million tonnes. And yet, finding #14 covers only part of Ontario, and considers only bedrock limestone/dolostone (quarries) and not surface licensed sand and gravel pits (unaggregated resources). In fact, gravel pits account for more than half of the predicted annual exploited 184 million tonnes of aggregates.

The “study area” in Ontario is not defined in this finding, but it is apparently “all quarries within Areas 2, 3, 4 and a portion of Area 5 that have a licensed area of 20 hectares or greater” where the “Areas” are defined by Canadian Portland Cement Association --- so apparently the “study area” is roughly speaking Southern Ontario minus Area 1 (west from Brantford and Kitchener to Windsor and Sarnia).

If major quarries of Area 1 such as those in St Marys and Woodstock area with high quality stone and being of a similar distance as to market as Area 4 and 5 were included, the licensed reserves would be much greater than the quoted 3.44 billion tonnes.

MNR Key Finding #15: There are approximately 317 million tonnes of high quality limestone/dolostone reserves close to the GTA market.

Gravel Watch comments

The figure from Paper 5 is 476 million tonnes, not 317 million tonnes. The figure 317 million tonnes assumes (without specified evidence) only two thirds of the 476 can be used. This finding #15 is confusing and cannot be understood without clarification.

From Paper 5, “high quality” aggregate is apparently that which “is required for concrete and asphalt” (not further defined and not considering the amount of recycled asphalt). “Close to the GTA [Greater Toronto Area] market” is assumed to be within 75 km of Vaughn (why 75 km?). Based on these assumptions, Paper 5 makes these downward adjustments and estimations:

- It starts with the figure 3.44 billion tonnes of limestone/dolostone (see finding #14)
- It then decreases it down to 902 million tonnes (to be within 75 km of Vaughn)
- It further decreases it down to 476 million tonnes (to be “high quality”)
- Finally it decreases it by a factor of 2/3 down to 317 tonnes. This final decrease comes from the consultancy’s estimate that “about two thirds of the total high quality reserves is achievable for production of concrete/asphalt grade stone and manufactured sand”. No explanation is given of how the figure 2/3 was derived.

Even with all of these assumptions, the estimates in Paper 5 and findings #14 and #15 do not answer the essential question: *Is there a shortage or is there an abundance of aggregates in Ontario or near GTA?* They do not give figures for how much aggregate is needed, of what quality, how close to GTA, so the essential question remains unanswered. Notably, they do not provide evidence that there is a shortage of aggregates near GTA.

The tonnage of actual high quality aggregate required by the GTA market remains unreported.

MNR Key Finding #16: The majority of reserves are located at greater distances from the market areas as close to market sources continue to be depleted.

Gravel Watch comments

This finding #16 is difficult to follow. Are these “reserves” limited to bedrock? Does the term “market areas” mean within 75 km of Vaughn as in Finding #15? How far is a “greater distance”?

This finding indicates that the “close to market” principle is self-defeating in that aggregates close to markets continue to be depleted, forcing the distance to market to be farther and farther.

MNR Key Finding #17: Relatively few existing aggregate operations contain reserves that are considered to be abundant.

Gravel Watch comments

To understand this finding #17, we need to know that Paper 5 defines “abundant” as licensed properties with greater than 55 million tonnes of reserves (why 55 million tonnes?). This finding #17 leaves ambiguous whether these reserves are limestone/dolostone or all kinds of aggregates.

The essential question, which remains unanswered, is this: *Is there a shortage of aggregates, perhaps of particular quality?* A lack of “abundance” is not of itself evidence of shortage.

MNR Key Finding #18: Techniques to maximize aggregate reserves will provide some increases in existing supply.

Gravel Watch comments

Finding #18 states without elaboration that techniques will maximize reserves. This simplifies the results of Paper 2, which determined that certain actions, such as removing setbacks, can allow more aggregates to be extracted.

The essential question is: *Are these techniques justified considering their social and environmental impacts?* For example, if a setback is determined by an OMB hearing, with consideration of various planning and environmental considerations, then probably it is not reasonable to remove the setback. Finding #18 is essentially a recommendation to use certain techniques but in practice these may be inappropriate.

PAPER 2: FUTURE AGGREGATE AVAILABILITY AND ALTERNATIVES ANALYSIS
by MHBC Planning

MNR Key Finding #19: Ontario has abundant and high quality aggregate deposits close to high demand areas. However, ninety-three per cent of unlicensed bedrock resources have overlapping environmental, planning and agricultural constraints.

Gravel Watch comments

The term “abundant” used here is not defined. Perhaps its definition comes from a paper other than Paper 2. The statement about ninety-three per cent as written seems to apply to all of Ontario, but probably this is intended to apply to only the southern part of Ontario.. If it applies only to “high demand areas”, this term needs to be defined. As it stands, finding #19 is ambiguous. As used in this finding #19, “high quality” is a technical term, which needs to be defined.

The view of finding #19 seems be that bedrock resources are threatened by “constraints” such as the environment, whereas it seems more reasonable to say that aggregate operations threaten the environment. .

MNR Key Finding #20: Mega-quarries and underground mining are the most feasible alternative sources of aggregate.

Gravel Watch comments

This finding should clarify the term “mega-quarry”. It needs to provide a statement of the meaning of “alternative sources”.

MNR Key Finding #21: There are significant economic, environmental, and social implications from shifting away from the “close to market” policy.

Gravel Watch comments

The word “implications” seems loaded to imply negative impacts. This finding #19 should be written in a non-biased way to include implications that are positive or negative.

It seems to imply that the GTA is the only market and that it is a geographically static market without considering that GTA market as defined, consumes much less than half of Ontario’s production. Like its aggregate resources, Ontario markets are spread across Southern Ontario and thus “close to market” policy needs definition.

MNR Key Finding #22: Shifting away from close to market policy would require significant government intervention, including market interventions, capital investment, new infrastructure, and overriding municipal land use controls.

Gravel Watch comments

This finding #22, arising from Paper 2, indicates that significant intervention and costly actions would be required by the government of Ontario if the “close to market” section of the Provincial Policy Statement PPS were repealed. This PPS section, number 2.5.2.1, states “*As much of the mineral aggregate resources as is realistically possible shall be made available as close to markets as possible.*” .

The study in Paper 2 considered 15 jurisdictions, namely, Australia, Cayman Islands, 7 European countries (including UK) and 6 states from the USA. Considering these, the results show that Ontario is unique in that it explicitly demands extraction of as much aggregate possible as near to market as possible. Most of these 15 jurisdictions had no explicit “close to market” policy but rather they leave aggregate operations to be driven by market forces. Two of these jurisdictions, Cayman Islands and New Zealand favour “far to market”, i.e., the opposite of “close to market”, to protect their environment. The only jurisdiction that even approximated Ontario’s “close to market” policy is UK, but it is much weaker than Ontario’s policy in stating that “where feasible, new sites should be guided to locations close to markets”.

From the evidence in paper 2, it seems reasonable to conclude that if Ontario repealed its “close to market” policy, the industry would simply fall back to dealing with market forces as is the case in other jurisdictions. There is no reason to expect a need for “significant government intervention”, as finding #22 claims. The alarmist nature of finding #22 seems biased toward supporting the current PPS “close to market” position without considering the evidence in Paper 2. Finding #22 misleads the reader by implicitly equating (1) Ontario’s particular PPS “close to market” requirement with (2) the obvious fact that aggregate producers naturally tend to serve close markets because this saves them fuel and money.

PAPER 6: REHABILITATION by Skelton Brumwell & Associates Inc.

Gravel Watch comments

Findings #23 - #26 (below) are based on SAROS Paper 6. Paper 6 records public expectations and disappointments regarding rehabilitation. For example:

“The public’s expectations are not being met, particularly relative to rehabilitation to natural heritage features. The public sees licenses as a total loss of natural heritage features for all time, and this causes hostility.”

The paper lists a number of reasons for lack of rehabilitation, such as “*Requirements on site plans for rehabilitation for the old licenses are not as high as the sites being licensed today. As a result, some sites only require rehabilitation to a ‘dry bowl’*”.

MNR's key findings should address these un-met expectations by the public, but this is not the case.

MNR Key Finding #23: Rehabilitation, both progressive and final, is occurring on the majority of sites in Ontario. However, progressive rehabilitation can be slow to occur.

Gravel Watch comments

The reported finding in Paper 6 is that 58% of studied aggregate operations had done progressive rehabilitation and 40% had not, whereas the Aggregate Resources Act intends all sites to carry out progressive rehabilitation. Rather than stating that the majority of sites have rehabilitation, it seems more appropriate to state that 40% of the sites are not carrying out required progressive rehabilitation

The sites chosen for study of final rehabilitation were (approximately) the operations with the 50 most recently surrendered licenses. These were surrendered between December 1, 2005 and June 3, 2009. It not clear if 50 is a sufficiently large number of sites for reliable results. Considering that there are over 3,000 existing licenses, it may be that the most recent 50 surrenders are not a representative sample. If the lifetime of a typical operation is long, say lasting 30 years or more, as seems to be the case, then the ones surrendered between December 1, 2005 and June 3, 2009 may not be representative of the whole set of operations.

MNR Key Finding #24: Final rehabilitation on sites includes a wide range of land uses (i.e. agriculture, open space, natural heritage).

Gravel Watch comments

Finding #24 seems to be a statement rather than a key finding. It does not seem to clarify, or to inform the discussion of how to improve rehabilitation in Ontario. It does not clarify to what extent final rehabilitation is actually happening.

MNR Key Finding #25: Excellent examples of rehabilitation can be attained by partnerships between industry, NGOs, and research institutions

Gravel Watch comments

Finding #25 suggests that such partnerships are common and highly successful, but Paper 6 does not provide convincing evidence of this.

MNR Key Finding #26: Existing policies and legislation, including the Aggregate Resources Act, are generally well suited to guiding the rehabilitation of pits and quarries in Ontario.

Gravel Watch comments

Finding #26 seems to suggest that current policies and legislation produce good quality, prompt and appreciated rehabilitation results. Many citizen coalitions across Ontario and many individuals feel that this is not the case. There is considerable public concern about aggregates pits and quarries and their rehabilitation, as indicated by interest in this issue by the Environmental Commissioner of Ontario. It seems reasonable to review existing policies and legislation to see if their effect can be improved.

Conclusion

MNR states that their primary purpose for the SAROS study is to:

“Gain a better understanding of aggregate resources by gathering the most up to date information and current science on the consumption, demand, availability, analysis of alternatives, current reserves, rehabilitation, transportation, recycling/reuse and the value of aggregates to the province of Ontario; and obtain new information to help plan and manage aggregate resources in the province.”

[<http://www.mnr.gov.on.ca/en/Business/Aggregates/2ColumnSubPage/286708.html>]

The six SAROS papers provide a considerable amount of useful data, but the consolidated report does not accurately or adequately capture that information.

The key findings that MNR states for the SAROS papers have a tendency to assume or support business-as-usual and to promote increasing consumption of a non-renewable resource. That approach does not seem to be sustainable. In essence, they use the past to predict the past.

The comments and analysis given here lead to the conclusion that: **MNR’s key findings can be confusing and incomplete, and they look to the past instead of the future.**

MNR’s publication of the Consolidated Report is unfortunate in that it detracts attention from the more serious, long term goals of reviewing and improving the management of aggregates in Ontario. While we should review and discuss the Consolidated Report, we should not lose sight of long term goals because they hold the promise of better protecting the environment and better safeguarding our social values as the years and decades roll by.