

THE SUCCESSFUL REHABILITATION OF ABANDONED AGGREGATE SITES ACROSS ONTARIO

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The Ontario Aggregate Resources Corporation (TOARC), through the Management of Abandoned Aggregate Properties Program (MAAP) delivers a program for rehabilitating former aggregate properties (deemed to be abandoned; herein referred to as 'legacy') across Ontario. Legacy sites qualify for the MAAP program if they have never been licenced following the establishment of the Aggregate Resources Act (ARA) in 1990 and are within designated ARA areas. Most often the legacy sites are relatively small by nature and were created as the result of small-scale operations (municipal wayside pits, private use pits or intermittent commercial operations) and were generally unregulated.

The legacy sites (files) come from an original inventory completed by the Ministry of Natural Resources and Forestry (MNRF) in the early 1990s, which equated to 6,600 qualifying legacy sites. Furthermore, as more areas of the Province are designated under the ARA the number of qualifying sites has grown to 7,900 and expected to grow in the future. The MAAP program is funded by a portion (1/2 cent per tonne) of the annual 11.5-cent/tonne licence fee paid by aggregate producers in Ontario.

Since 1997, all of the legacy sites (all 7,900) have been assessed and it has been determined that 3,200 will require some sort of assistance by the MAAP program. The reality is many of the 7,900 sites have been reverted to other uses since often it has been 40 or more years since these sites have experienced disturbances. Based on the inventories many of the legacy sites files have been 'closed' for multiple reasons such as: obtaining re-licence status for aggregate extraction; disappearing under urban expansion (Figure 1); being rehabilitated by the property owner; and/or have naturalized on their own (Figure 2).



In order to successfully tackle the volume of sites MAAP created a systematic priority ranking system to evaluate the legacy sites across Ontario. The inventories provide a clear record of the current conditions by documenting three key parameters: safety, environmental and aesthetics factors to provide a composite overall ranking of 'high', 'medium' or 'low' priority. As shown in Figure 3, the legacy site demonstrates unstable slopes, deep water, vertical cliffs with easy public access and high visibility, which triggers a 'high' priority status. Figure 4 demonstrates a site that lacks vegetation, susceptibility to erosion and inconsistency with the surrounding agricultural area, but not easily accessible to the public or having safety concerns therefore triggering a 'medium' priority. The sites with higher priorities are approached first when organizing the annual work schedule. In general many of these properties exhibit severely degraded soils, steep and eroding slopes, difficult microclimates, unique species and are at various stages of naturalization.



Figure 3: High priority ranking



Figure 4: Medium priority ranking

In the simplest of terms, the MAAP program aims to rehabilitate sites solely using workable material on site to provide a higher level of function (usefulness) over the prevailing condition of the site. Rehabilitation may include grading and stabilizing slopes for safety, grading and seeding sites for agriculture or recreation, and creating and enhancing wildlife habitat by planting native trees, shrubs, wildflowers, and grasses. The appropriate course of rehabilitation is determined following consultation and consent with the landowner and conservation authorities.

Based on recent levels of extraction in Ontario the average amount available for rehabilitation projects ranges from \$400,000 to \$600,000 each year. This means the MAAP program is capable of rehabilitating 30-40 sites each year. The average cost to rehabilitate a legacy site has been just over \$11,500 per hectare. This results in an average cost per site of just under \$20,000 with an average site size of 1.58 hectares. To date, approximately \$8,000,000 has been spent to reclaim/rehabilitate over 681 hectares of land, on over 435 individual sites.

The rehabilitation construction schedule is divided into a spring and fall work program. To achieve better productivity, the spring and fall sites are targeted within as small a geographical area as possible (usually within a county or regional jurisdiction). By concentrating projects into two annual groupings for work purposes, travel time for staff and contractors is minimized and opportunities are created for tendering a number of small sites together. Counties and regions targeted for work are rotated on a semi-annual basis to ensure that all sectors of the Province are considered for rehabilitation work on as equitable a basis as possible.

Historically, many legacy pits have been returned to agriculture and project site 14-03 located in the Township of Elderslie, Bruce County is an example of the typical conditions and obstacles of rehabilitation. Figures 5 a,b,c show an expansive 10 hectare legacy pit and highly visible to anyone travelling down County Road 19. The landowner was currently using the pit as pastureland but a 10-acre portion was prone to seasonal flooding and multiple pit faces made much of the pasture impractical. Over 40,000m³ of earth was moved to rehabilitate this site. While it will be awhile before the site will be able to support livestock grazing, it is now well on the way to being able to do so from a relatively barren, unused part of the farm.



Landowner desires for a site are not always accommodated if they are unrealistic or unreasonable. For example, returning a site to agricultural use may not be practical if there is no topsoil or organic materials remaining on site that could be utilized for such purposes. The importation of large quantities of topsoil to achieve such ends may not be practical, possible or economically feasible in certain circumstances. The MAAP program will then try to solve and find other solutions.

The existence of abandoned pits and quarries provides opportunities to re-establish landscapes and ecosystems lost to settlement and urbanization. In addition to the monies being allocated to legacy pit rehabilitation, monies from the fund support research into pit and quarry rehabilitation techniques. As the MAAP program has found in many instances, these sites have reverted to naturally functioning habitat spaces on their own. In others, minimal help from the MAAP program can launch the progress of a site on a trajectory to arrive at a naturalized area in a shorter time frame than if left on its own. Continual research paired with these rehabilitation techniques will lead to the expansion of agriculture and habitat, the enhancement of biodiversity, an overall increase in ecological function and act as demonstration sites for others to replicate in the industry.

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