

Comments on ERO number 019-4801

Proposed regulatory changes for the beneficial reuse of excess soil at pits and quarries in Ontario

The Ontario Soil Regulation Task Force (OSRTF) is a volunteer group that has been pushing federal, provincial, and municipal levels of government for better regulation of excess soil since 2015. Its impetus was a pit that had been beautifully rehabilitated with wetlands and rolling hills but was bought to fill with soil ostensibly to build an aerodrome. The cyanide in the soil made its way into the groundwater. The aerodrome was never built. OSRTF members pushed for an amendment to the federal Aeronautics Act; solicited many municipalities to improve their soil by-laws; initiated a review that led to the provincial soil policy, and participated in MECP's ESEG¹ meetings as the government developed O.Reg.406/19.

In essence, the regulatory changes proposed in this ERO item 019-4801 (Proposal) are to rescind the current policy [A.R. 6.00.03, Importation of Inert Fill for the Purpose of Rehabilitation](#), and in its place use the [Rules for Soil Management and Excess Soil Quality Standards](#) under O.Reg. 406/19 under the EPA - with some exceptions. The main exceptions limit the quality of the imported soil in certain circumstances.

The Ontario Soil Regulation Task Force:

- questions if fill-to-grade qualifies as a beneficial reuse;
- asks for municipal compensation for the wear and tear of roads;
- suggests that site alteration by-laws be applied to soil importation to pits and quarries; and
- disputes the assertion that placing soil into groundwater is acceptable.

Background on O. Reg. 406/19 and its Rules

O.Reg.406/19 seeks to manage the movement and disposition of excess soil. The Rules provide the details for what is set in the regulation. Excess soil is the soil that is removed from a property during a development project such as excavating a foundation or boring a subway tunnel. It also includes contaminated soil removed from a property to clean up that site. The basic premise of O.Reg.406/19 is that excess soil is a waste, and therefore subject to the strict waste management rules under OR347, unless certain conditions are met. There are to be investigations, which may include taking samples, to ascertain the quality of the excess soil as determined by the past history of the site and/or the concentration of certain specified chemicals. The soil is classified by Soil Tables defined by the amount of contamination, the expected land use (agricultural, residential, industrial, etc.), and the ultimate placement (above potable aquifer, near water, buried, etc.). There are many Soil Tables for all the permutations and combinations but for most purposes Tables 1, 2 and 3 would apply. Table 1 is meant to represent clean natural soil, Table 2 has some contamination but is suitable for most rural uses, and Table 3 has more contamination making it unsuitable for depositing where it could contaminate drinking water wells. If any contamination is higher than the Table 3 limits the soil is a waste and must be disposed of as such through treatment or disposal at a municipal landfill. The source site of the excess soil and the study reports must be registered in a government run database. If the site where the soil is going will be accepting more than 10,000 m³ of soil it must be registered as a reuse site. A professional Qualified Person is to oversee the excess soil activities at the source site and the reuse site. All loads of soil are to be tracked (GPS phone apps are available) from source site to reuse site. The reuse of the soil must be for a beneficial use. O.Reg.406/19 states "The primary use of the reuse site must not be the deposit of excess soil²".

While a soil may be neatly labeled as Table 1 or Table 3, in reality it is not that precise. A review of previous property use may not know of that time when a barrel of pesticide leaked out. Only a few soil samples are taken from a site. Of 50 truckloads taken to a reuse site only a thimbleful of soil may be tested. Allowable contamination limits change with new science. In 2004 the Table 2 limit for fluoranthene was 40. In 2009 it was revised to 0.69! Prior to the Soil Tables the words used in soil guidelines were "clean soil", which, as lawyers would tell you, meant nothing or "inert soil", which was almost as meaningless.

¹ Ministry of the Environment, Conservation, and Parks (MECP) - Excess Soil Engagement Group

² Section 5 (1) 2.

O.Reg.406/19 and its Rules define the soil quality and quantity conditions³ for the soil to be placed at the reuse sites. There are two main categories. 1) The reuse site is governed by an instrument which could be a municipal by-law, a building permit, a permit or license under the ARA, or a similar government permit that regulates the incoming soil. 2) If there is no such instrument, or the instrument does not cover the quality or quantity of soil, the quality, quantity, placement, etc. of the soil is set out in the Rules. Sadly, the regulation allows the instrument (such as the municipal by-law or ARA permit) to set less stringent quality and quantity standards than in O.Reg.406/19. The soil quality standards in the Rules are set, and revised as new science emerges, by the scientists in the Standards group of the Ministry of the *Environment*, Conservation and Parks for the protection of the environment and human health. The various factors that went into the development of the Soil Tables were calculated, with certain assumptions, in a spreadsheet known as the Beneficial Reuse Assessment Tool (BRAT). The BRAT can be used by QP's in place of the Tables if the assumptions that went into the calculation of the Tables may not apply to a certain site. A Rationale Document⁴ of 107 pages describes the science that went into the development of the Soil Tables.

However, a municipality or a regulation under the ARA is free to disregard all that science and set their own limits – higher or lower. MECP officials thought that anyone changing the limits would do the right thing because they would have to answer to their constituents. For a municipal council the connection between constituents and decision makers is short and immediate. For ARA regulations that link is long, convoluted, and slow except for this opportunity to comment on the Proposal.

Beneficial Use

MECP consulted widely and often during the development of O.Reg.406/19. During those meetings there were frequent comments from the soil movement industry suggesting that exhausted pits and quarries were an obvious place for the excess soil. The Proposal acknowledges this.

- *For applications proposing to fill-to-grade....*

The Proposal leans heavily on a Best Management Practises⁵ (BMP) document for pit and quarry rehabilitation that was produced by the Ontario Society of Professional Engineers (OSPE), an organization to which many of the Qualified Persons belong. The BMP deals exclusively with the importation of soil for the purposes of rehabilitation.

The industry, in the form of the Ontario Stone, Sand & Gravel Association (OSSGA) defines rehabilitation in a 2018 document⁶ as:

Rehabilitation of a pit or quarry is the process of restoring the land from which aggregate has been extracted to either its former use or to a new use or condition compatible with the surrounding landscape. Aggregate extraction is an interim land use. Once aggregate is extracted from a pit or quarry, the site is rehabilitated into productive wildlife habitat, wetlands, golf courses, recreational parks, urban uses, conservation lands, forestry or agriculture.

It also discusses the types of rehabilitation. “Rehabilitated slopes must be no steeper than 3:1 for pits or 2:1 for quarries.” “Pits and quarries below the water table will be rehabilitated differently than pits and quarries above the water table. The former will be predominantly converted to aquatic end uses (unless fill is imported), whereas the latter will have more rehabilitation opportunities for agriculture or upland forest habitat.” There is no discussion of returning the site to the original grade.

In the past, rehabilitation has generally been described as making the exhausted pit safe and green and in practise importing a little soil as possible. In fact, the goal has been to rehabilitate with the overburden that had been scraped to the side.

It could be argued that the beneficial use of soil into a pit or quarry is for its rehabilitation to another land use. Fill-to-grade could be considered as an amount exceeding that. O.Reg.406/19 limits the amount of soil to what would fulfil the beneficial use.

“The quantity of excess soil deposited or to be deposited at the reuse site must not exceed the quantity necessary for the beneficial purpose identified”

³ Consult O.Reg.406/19 for the full complexity of the Regulation and the Rules including liquid soil, temporary storage sites, sampling procedures, etc.

⁴ Rationale Document for Development of Excess Soil Quality Standards; MECP, November 19, 2019

⁵ Best Management Practices for Aggregate Pit and Quarry Rehabilitation in Ontario; Ontario Society of Professional Engineers; March 2021

⁶ Rehabilitation of Pits & Quarries, OSSGA, February 2018

The SAROS Paper 6⁷ on Rehabilitation mentions a general goal expressed by many for “higher quality and more timely rehabilitation”. Fill-to-grade delays the final rehabilitation. For example, an application to fill a pit in Whitchurch-Stouffville to original grade indicated a 25 year timeline for the project while NDMNRF indicated the pit could be rehabilitated to their satisfaction within a year.

Fees to municipalities

When pits and quarries under the ARA are in operation some money comes back to the local municipality, ostensibly for the wear and tear of the roads by the trucks. Under this proposal in ERO 019-4801 there is no compensation to the municipalities for all the trucks bringing soil in. The Ontario Aggregate Resources Corporation⁸ (TOARC) collects fees from the operators of the pits and quarries at a rate of a less than a dollar per tonne and then disburses it (after costs) to the provincial government, municipalities, and for a program to rehabilitate abandoned pits. In 2020 \$25,000,000 (76%) went back to municipalities. Most municipal site-alteration by-laws that issue permits for reuse sites collect a tipping fee of \$1 or more per tonne. While some of that fee is for the costs of the municipality’s oversight, some could be for road maintenance. Our experiences with reuse site is when they are busy a site may take in hundreds of trucks a day for weeks at a time. The businesses that excavated the excess soil do pay \$5 to \$10 per tonne to the reuse site for the privilege of dumping it there. It would not be a hardship to compensate municipalities for wear and tear on their roads for the trucks coming into the reuse site.

Municipal by-laws

The Proposal mentions community impacts.

- *For applications proposing to fill-to-grade, potential impacts to the community from the fill operation and prolonged life of the site will be considered.*

The OSPE BMP covers consultation and engagement in its Section 6 which consider impacts to the community. In some localities, the municipal site alteration by-law or commercial fill operation by-law has prescribed procedures for managing the importation of large amounts of excess soil. They would cover public consultation, haul routes, dust and noise, operating hours, etc. and may include detailed soil management plans. Consideration should be given to manage the soil importation for pit rehabilitation under the municipal by-laws rather than the ARA. For the community, oversight and enforcement from local by-law officers would be preferred over enforcement and oversight by a distant and overworked officer from NDMNRF. We do have examples of this type of mixed jurisdiction. The construction of an aerodrome is under federal jurisdiction but municipalities can now apply site alteration by-laws to the importation of excess soil to aerodromes. In the past municipal site alteration by-laws were excluded from a Conservation Authority’s regulated areas but a change in the Municipal Act now allows them to be used in those regulated areas.

Deposition into the Water Table

The proposed ARA amendment proposes;

- 1.a. Excess soil placed below the water table must follow the soil management rules for environmentally sensitive areas under O.Reg. 406/19, which means these areas would be limited to the most stringent (table 1 under the EPA) quality standards.”*

This cannot stand.

Table 1 may be the most stringent quality standard in O.Reg.406/19 but the Tables were never intended to be used to place soil into the water table. The regulation says so itself.

Section 2 (1) This Regulation does not apply in respect of the following:

- 5. The final placement of excess soil on the bed of a surface water body. O. Reg. 406/19, s. 2.*

⁷ State of the Aggregate Resource in Ontario Study; to MNR from Skelton Brumwell and Associates and Savanta Inc; 2009.

⁸ <https://toarc.com>

Water body is defined in the regulation as “a permanent stream, river or similar watercourse or a pond or lake, but does not include a pond constructed on the property for the purpose of controlling surface water drainage”. The intersection of the water table with an excavation below the water table would form a pond, and thus the Rules can't be used.

A soil specialist in the Standards Branch of the Ministry of Environment, Conservation and Parks stated that the Soil Tables are intended for soils being placed above the water table. The impact of direct contact with groundwater was not considered. This is reinforced by the many references in the Rules to the water table and groundwater.

- The Tables are classified as either above potable groundwater or non-potable groundwater.
- Section A Rules 1. (1) 6. Near a water body tables means Tables 8, 9, 8.1, and 9.1.
- Rules 3. (1) 6. Approximate depth to water table, including whether the depths of excavation for each area where soil excavation is planned are below the water table;
- Rules Section A “...if the site is within thirty metres of a water body, and whether the reuse site is in an area serviced by a municipal drinking water system...” “...and proximity to a nearby water body.”
- Rules Section A 1. (3) 7. If the final placement of the excess soil is to be within 30 metres of a waterbody, depending on the groundwater conditions (potable versus non-potable) Tables 8 or 8.1, Tables 9 or 9.1 must be used.
- Rules Section A 1. (3) 8.ii. “...if the depth to the water table is less than 3 metres...”
- Rules Section D 1. (2) 2. “...shall be finally placed at a reuse site in a location that is at least 30 metres away from a water body.”
- Rules Section D 2 (4) 1. “...the following requirements must be satisfied.
 - ii. The reuse site is not an agricultural or other property use, is not a shallow soil property, and the final placement is not within 30 metres of a water body;

The concern of MECP to keep soil away from water is very evident. The Rationale document lists what was considered in the development of the soil standards. Three of them are “for protection of movement to ground water”.

2.1. Components Considered for the Development of Excess Soil Quality Standards

The component values considered for the development of excess soil quality standards are:

7) S-GW1 - Soil for protection of movement to ground water used for drinking water purposes;

8) S-GW2 - Soil for protection of movement to ground water and then vapour migration from ground water to indoor air;

9) S-GW3 - Soil for protection of movement to ground water and then migration to surface water (aquatic life);

10) Plants and Soil Organisms - Soil for protection against adverse effects to plants and soil dwelling organisms; and,

The Proposal for ERO 019-4801 attempts to justify placing soil into the water table with;

1. a. Excess soil placed below the water table must follow the soil management rules for environmentally sensitive areas under O.Reg. 406/19, which means these areas would be limited to the most stringent (table 1 under the EPA) quality standards.

The definition of “environmentally sensitive areas” in the Rules lists 10 categories and none of them would include a pit or quarry or placing soil into water. They don't meet the definition of “environmentally sensitive areas”.

The Table 1 standards for environmentally sensitive areas also include leachate tests. The Soil Tables for Leachate can be compared to the Ontario Drinking Water Standards. The table below compares the drinking water standard with Table 6.1: Leachate Screening Levels for Full Depth Excess Soil in Shallow Soils in a Potable Ground Water Condition. There are only a few contaminants that are in both tables for comparison. The leachate test does not include many contaminants listed in the drinking water standards and for a few contaminants the leachate limit is the same as the drinking water limit. It is conceivable to think that if a large mass of soil passed by the Table 6.1 Leachate test (remembering that the soil is not homogeneous and the amount tested is very small) were placed into the groundwater the concentrations in the leachate, i.e. the groundwater, could be similar to, and possibly exceeding, the drinking water standard limits. The effect of the heterogeneous soil and limited testing was demonstrated in a closely monitored commercial fill operation. While the soil tests from the source site showed the soil within limits, in-situ sampling testing at the reuse site found almost half the samples to exceed the limits for the contaminants.

While a minor exceedance of the Drinking Water standards may not have a significant effect on physical health, it could have an impact on mental health and the value of the property.

Contaminant	ug/L in Table 6.1 Leachate (Residential)	ug/L in Drinking Water Standard
Benzene		1
Ethylbenzene		140
Arsenic		10
Pentachlorophenol		60
Cadmium		5
Toluene		60
Lead		10
Vinyl Chloride		1
Polychlorinated Biphenyls		3
Mercury		1
Trichloroethylene	0.5	5
Carbon Tetrachloride	0.2	2
Selenium	10	50
Uranium	20	20
Barium	1000	1000
Antimony	6	6

The Best Management Practices guide written by OSPE references a Scientific Report: Beneficial Reuse of Excess Soil at Aggregate Pits and Quarries (Scientific Report) also by OSPE. It acknowledges that the Rules don't consider soil into groundwater.

3.4 Fill Quality for Backfilling Below the Water Table "In the MECP Soil Rules (MECP 2019a), there is no explicit mention of the acceptable criteria for situations in which deposited fill is in direct contact with the groundwater."

That report also refers to a Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario⁹ for justification of placing soil into water. The impact of soils on lake water was considered in the development of those lake filling standards for 1) confined soils unlikely to be eroded away (Table C-1) and 2) unconfined fill (Table C-2) going into the water of the lake. The guidance and Table C-2 numerical guidelines are intended to protect the general lake water quality and the aquatic ecosystems. Human health was not considered when developing these guidelines. Table C-2 was developed from Soil Table 2 but since then some the limits in Soil Table 2 were revised to be more stringent.

The OSPE report acknowledges that adding soil to the groundwater could increase the turbidity in the potable groundwater especially if "The pit or quarry is located in a highly permeable material that cannot attenuate the turbidity (e.g., karst, fractured rock, gravel with high permeability, or other preferential pathways)."¹⁰

It also acknowledges the possibility of biological contaminants getting into the groundwater.

*Microbiological contaminants can travel through groundwater; therefore, these types of contaminants should not be overlooked when rehabilitating pits and quarries. Biological contaminants of concern may include E. coli and other forms of coliform bacteria. Given that below water table pits and quarries may include a large area of exposed groundwater, there is a risk of accidental or intentional releases of such contaminants to the water.*¹¹

Testing for E. coli and other pathogens is not a component of the standard soil tests.

The impact of soil on groundwater is not just an environmental issue. It can have impacts on human health and economy. All the homes and businesses in the neighbourhood of a pit or quarry rely on groundwater wells, either their personal wells or the community wells. If the groundwater aquifer under them becomes contaminated and their tap water becomes unfit to drink their drinking water must be bought by the tanker or as crates of plastic bottles. Property values drop.

OSPE's BMP says "According to the NDMNRF (2020) statistics, there are 967 active pits and quarries that extract material from below the water table, which constitutes approximately 19% of all active sites in Ontario." Many amendments were made to the ARA recently (April 1, 2021) that appear to make it easier for pit operators "...to lower the depth of extraction from above the water table to below the water table..."¹² Proposals to place soil into groundwater may not be infrequent nor limited.

⁹ by M. Gordon and T. Fletcher; Standards Development Branch; Ontario Ministry of the Environment; revised 2011

¹⁰ Page 31

¹¹ Page 29

¹² ARA 0.3 (1) 3.

Conclusions

There is no justification for placing soil into groundwater. It is expressly excluded from O.Reg.406/19. It was never considered in developing the Soil Tables. The lake filling standards did not look at human health. The Best Management Practices (BMP) guide and Scientific Report produced by the Ontario Society for Professional Engineers did not make a valid case for it. The BMP warns of increased turbidity and biological contamination. Placing soil into groundwater has the potential for disastrous impacts on the drinking water for the surrounding community.

Recommendation: Placing soil into groundwater must be prohibited.

Some pit and quarry rehabilitation in the past had been the absolute minimum (3:1 slopes, a few inches of top soil, and grass seed). Some rehabilitations have built a natural landscape with landforms, wetlands, and vegetation in keeping with the adjoining lands. In most cases a minimum amount of soil was imported to meet the objective of a rehabilitation to make it suitable for another use. That would be the “beneficial use” required by O.Reg.406/19. Unless fill-to-grade is the only way to effect rehabilitation, the superfluous soil should be prohibited by O.Reg.406/19 because “The primary use of the reuse site must not be the deposit of excess soil.” Is fill-to-grade being considered just because it can add significantly to the profits of the owner? Fill-to-grade can delay for many years the return of the site to another productive use, and during that time continue to disrupt the neighbours.

Recommendation: Limit the soil importation for rehabilitation to the minimum required for a rehabilitation. Fill-to-grade to be limited to very special cases.

As stone, sand, and gravel came out of the pits and quarries to be trucked to construction projects, fees were collected to provide funds to municipalities to maintain the roads the trucks travelled on. The Proposal does not indicate compensation to municipalities to maintain the roads that incoming soil is trucked on.

Municipal oversight of the importation of soil for rehabilitation through site alteration and/or commercial fill by-laws provides for consideration of local impacts. There should not be two different regimes for reuse sites in a municipality. Why have one reuse site operating under an ARA regulation monitored by a NDMNRF inspector in a distant town who has 300 other pits to monitor and next door have a reuse site operating under a municipal permit monitored by a local by-law inspector? The municipality can consider all the impacts for the local situation thinking of haul routes, noise and dust, ultimate land use, zoning, protection of source water, etc. The municipality has the mechanisms in place for public consultations, applying for permits, collecting fees, etc.

The province has retained special powers over aggregate extraction because of the importance of aggregate to the provincial economy. However, at the point of rehabilitation, the extraction of aggregate has been completed and the provincial interest can diminish.

Recommendation: The Proposal presented in ERO 019-4801 be withdrawn and replaced with an amendment to the ARA regulations (and to O.Reg.406/19¹³) such that the importation of soil into a licenced pit within a municipality be covered by O.Reg.406/19 and municipal permits be sought.

¹³Remove 3.(2) 4. iii from O.Reg. 406/19