

Gravel Pit Operations

5.17 Gravel Pit Operations

Gravel pits provide sources of aggregate materials such as rock, stone, gravel, and sand used in many construction or maintenance activities. Pit operations include activities such as mechanical excavating, sorting, crushing, screening and washing of materials. Heavy equipment and vehicles are used to transport materials around the site and from the pit to construction and maintenance sites. Gravel pits typically follow a lifespan from initial site clearing and vegetation removal to pit reclamation and abandonment. Pit operations may extend over several years or decades. Care should be exercised to avoid the potential environmental concerns that arise during these operational periods.



Environmental Issues

Primary environmental issues relating to gravel pit operations associated with routine highway maintenance activities are summarized in the following table. It should be noted that site-specific conditions might present additional issues you will need to address in planning and undertaking your works.

Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
Gravel Excavation and Processing	May release deleterious substances (sediment, sediment-laden waters) to a watercourse	No release of any substance that could be deleterious (toxic) to fish or fish habitat (<i>Fisheries Act</i> , Sections 34(1) and 36(3)). Deleterious substances include sediment.
	May release fine sediment and particulate matter to air	Control of fugitive dust to avoid air quality impacts in accordance with local bylaws. Provincial environmental objectives include air quality criteria for the 10 micrometer particulate fraction (PM10) generated by aggregate dust – a 24-hour average PM10 less than 50 µg/m ³ (BC Ambient Air Quality Objectives).

Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
Noxious Weed / Invasive Plant Control <i>(See Section 5.10)</i>	Gravel pits may become a source of invasive plants and the transport of aggregate material may contribute to the spread of noxious weeds	Control of invasive plants and no dispersal of noxious weeds or their seeds (<i>Weed Control Act, Weed Control Regulation</i>).
	May introduce sediment or other deleterious substances to a watercourse when chemicals, mechanical, or biocontrol management methods are implemented	No harmful alteration, disruption or destruction of fish habitat without authorization (<i>Fisheries Act, Section 35(1)</i>). No alteration of a stream unless authorized by a <i>Water Act</i> approval, licence, or order (<i>Water Act, Section 9</i>), or through a Notification (<i>Water Act Regulation, Part 7</i>). No use, handling, release, transport, storage, or disposal of a pesticide in a manner that causes or is likely to cause an unreasonable adverse effect (<i>Integrated Pest Management Act and Regulations</i>).
	May disturb riparian vegetation	No harmful alteration, disruption or destruction of fish habitat without authorization (<i>Fisheries Act, Section 35(1)</i>).
Carcass Disposal in Gravel Pits	May cause a threat to both wildlife and public safety through the attraction of wildlife to highway rights-of-way and storage locations	Disposal and storage of carcasses in a manner that will not attract dangerous wildlife (<i>Wildlife Act, local bylaws</i>)
	May pose a threat of disease through improper storage or disposal of roadkill	Disposal and storage of carcasses in accordance with local public health regulations and bylaws.
	May contaminate surface waters, groundwater, and soils through improper storage or disposal of materials	Disposal of all waste materials in accordance with the <i>Act</i> and reporting of any hazardous materials spills (<i>Waste Management Act, Special Wastes Regulation</i>).



Environmental Best Practices

The following BPs are provided as guidelines to help you ensure your routine works are completed in compliance with the performance standards and environmental legislation. Please note that the general BPs provided apply for most work activities within this category; if BPs specific to the activity are available they are also noted below.

Regulatory Agency Contact

- Work with your local regulatory agencies to establish a protocol for the disposal of noxious weeds/invasive plants in your area.

Site Management

- Gravel pit excavation and operation create areas of exposed soils where there is the potential for sediment to be transported to a watercourse. Care is needed to design and install appropriate erosion and sediment controls that provide adequate settling times when fine sediment is a component of the gravel deposit.

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- Temporarily inactive areas of exposed soils susceptible to erosion should be stabilized through the use of short-term (e.g., polyethylene sheeting) or longer-term (e.g., establishment of vegetation) cover. Soil amendments (e.g., compost) can be used to support plant covers.
- Gravel pit operations typically leave large disturbed areas that lack natural cover and medium for plant growth. Native plants face challenges to growth in these areas and many noxious weeds and invasive plants which have broader habitat tolerances are able to colonize and persist.

Noxious Weed/Invasive Plant Control

- Regularly inspect the gravel pit area for noxious weed/invasive plant material. Noxious weeds/invasive plants may establish from adjacent areas or may spread from onsite dumping of materials that contain invasive plants or their seeds.
- Where noxious weeds/invasive plants are identified, avoid transporting gravel or soil as seeds are likely present. Equipment entering the area can also contribute to dispersal of invasive plant material.
- Record and report infestations to MoT Gravel Managers so that appropriate controls can be implemented.
- Select appropriate plant removal methods specific to the noxious weed/invasive plant species (see the T.I.P.S. publications created by the Invasive Plant Council of British Columbia).
- Ensure all noxious weed/invasive plant materials are disposed of in accordance with the *Integrated Pest Management Act* and its Regulations, *Weed Control Act* Regulations and any local area protocols. For example, use a covered container to transport noxious weeds/invasive plants and take care to clean any vehicle or equipment used in the removal of noxious weed/invasive plants when it leaves the work area.
- When using chemical or biological controls to treat noxious weeds/invasive plants within the gravel pit, confirm the control agent's safety for aquatic species where runoff may enter a stream or wetland. Use safe materials handling measures as directed by the product manufacturer.

Erosion and sediment control

- Gravel pit operation requires that soils be exposed and excavated. Without the protective cover of vegetation, sediment will be eroded by wind, rain, or surface runoff from snowmelt. The management of erosion and sediment within a gravel pit becomes a particular concern near watercourses, in small pits without adequate space for settling ponds, and in windy areas where sediments are fine enough to become airborne.

- Within the gravel pit, minimize excavation or storage of erodible materials near watercourses. Store piles on flat areas and collect local drainage in settling ponds. Use control measures (i.e., temporary covers, grading and seeding, installation of silt fence around stock piles) to contain sediment safely within the gravel pit.
- Ensure that all sediment control structures are installed, maintained and monitored regularly until they are no longer needed.
- Following completion of the gravel pit or cessation of its use, reclaim the site by redistributing stockpiled topsoil and re-establishing vegetative cover using native species. A stable drainage network must also be constructed.



Key Information Sources

The documents and websites listed below are recommended resources for roadside vegetation management. They can provide examples of existing protocols and management strategies, as well as additional information on specific operational BPs (e.g., erosion and sediment control techniques).

MoT Technical Circulars:

Removal of Gravel from MoT Pits by Third Parties – MoT Technical Circular T-1/91

Use of Explosives in or near Fish and fish Habitat – MoT Technical Circular T-03/00

ARD Testing at Quarry and Rock Cut Sites – MoT Technical Circular T-10/04

These and all other MoT Technical Circulars available at:
http://www.th.gov.bc.ca/Publications/Circulars/Current_technical.asp

Locally Developed BPs

(Provide any locally-developed BPs):

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Other Resources:

Aggregate Operators Best Management Practices Handbook for British Columbia

<http://www.empr.gov.bc.ca/Mining/MineralStatistics/MineralSectors/ConstructionAggregates/ReportsandPublications/Pages/AggregateOperators.aspx>

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Gravel License – Schedule 13 – Current Maintenance Agreement Schedules – Highway Maintenance Contracts. 2008. BC Ministry of Transportation and Infrastructure.

http://www.th.gov.bc.ca/BCHighways/contracts/maintenance/Maintenance_Agreements/SCHEDULE-13_10-Jan-06.pdf

Reclamation & Environmental Protection Handbook for Sand, Gravel & Quarry Operations in BC. 1995. Ministry of Energy, Mines and Petroleum Resources; Ministry of Transportation and Highways; and Natural Resources Canada.

Disturbed Ecosystems Quarries, Gravel Pits, Barren Land Fact Sheet #11. Biodiversity Conservation Strategy for the Greater Vancouver Region.
<http://public.metrovancouver.org/about/publications/Publications/BiodiversityFactSheetEstuary.pdf>

T.I.P.S.: Targeted Invasive Plant Solutions. 2007. Invasive Plant Council of British Columbia.

<http://www.invasiveplantcouncilbc.ca/resources/targeted-invasive-plant-solutions-tips>

BC Weed Control Act: Noxious Weeds in BC Website. Pest Management, Ministry of Agriculture and Lands.

<http://www.agf.gov.bc.ca/cropprot/noxious.htm>

“Dangerous Travelers” Invasive Plant Control Video

<http://www.fs.fed.us/invasivespecies/prevention/dangeroustravelers.shtml>



Checklist for Environmental Protection Requirements

- Is your proposed work considered a “routine” maintenance activity? If not, approvals or permits may be required. Contact your local municipal, provincial, or federal regulatory agency staff.
- Has this project been discussed with local environmental regulatory staff? In addition to the BP information presented, other site-specific conditions may apply.
- Have site-specific environmental protection requirements been identified? List below:
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