

PROVINCE OF BRITISH COLUMBIA  
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

**PERMIT**

**APPROVING WORK SYSTEM  
AND RECLAMATION PROGRAM**

(Issued pursuant to Section 10 of the *Mines Act* R.S.B.C. 1996, c. 293)


Permit: **G-225**

Issued to: **Orca Sand & Gravel Ltd.  
1780 - 999 West Hastings Street  
Vancouver, British Columbia  
V6C 2W2**

for work located at:

**Orca Sand and Gravel Project**

Issued at Victoria, British Columbia this 28th day of July in the year 2005.

---

F.W. Hermann, P.Eng.  
Chief Inspector of Mines

## **PREAMBLE**

An application to commence work including a report and plan of the work system entitled "Orca Sand & Gravel Project, Port McNeill, B.C., Application for a Mine Permit", dated January 2005, was submitted to the Chief Inspector of Mines on January 17, 2005, in accordance with Part 10, Section 10.1 of the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

Notice of such filing was published in the BC Gazette on January 27, 2005, in the North Island Gazette on January 26, 2005 and in the North Island Weekender on January 22, 2005 and again on January 27, 2005. An Environmental Certificate issued by the Environmental Assessment Office was signed on July 13, 2005.

This application was referred to other agencies in accordance with Part 10, section 10.3 of the Code. Open house events were held in Fort Rupert, Alert Bay, Port McNeill, Sointula and Port Hardy during the period February 7 - 11, 2005.

This permit contains the requirements of the Ministry of Energy, Mines and Petroleum Resources for reclamation. It is also compatible, to the extent possible, with the requirements of other Provincial ministries for reclamation issues. The amount of security required by this permit and the manner to which this security may be applied, will also reflect the requirements of those ministries. However, nothing in this permit limits the authority of other provincial ministries, to set other conditions, or to act independently, under their respective permits and legislation.

Decisions made pursuant to this permit by the staff or the Ministry of Energy, Mines and Petroleum Resources will be made in consultation with other provincial ministries and federal departments and agencies. Where these decisions directly affect the Ministry of Environment, or the Ministry of Agriculture and Lands., all decisions will be made in concurrence with the appropriate Regional Manager.

## **CONDITIONS**

The Chief Inspector of Mines (Chief Inspector) hereby approves the work system and the program for protection and reclamation of the land surface and watercourses subject to compliance with the following conditions:

### **General**

#### **1. Compliance with *Mines Act* and Code**

All work shall be in compliance with all sections and parts of the *Mines Act* and Code, and the owner, agent or manager (herein called the Permittee) shall obey all orders issued by the Chief Inspector or his delegate.

2. Departure from Approval

The Permittee shall notify the Chief Inspector in writing of any intention to depart from either the plan of the work system or the program for the protection and reclamation of the surface of the land and watercourses to any substantial degree, and shall not proceed to implement the proposed changes without the written authorization of the Chief Inspector.

3. Scope

- (a) Permitted activities include site development, stripping, gravel extraction, gravel screening, washing, crushing and stockpiling, load out for shipping and reclamation.
- (b) The site shall not be used for any purpose unrelated to the development and extraction of the aggregate resource. Industrial activities such as topsoil processing, sanitary land filling operations, asphalt recycling, batch plants, equipment storage, metal salvage etc. shall not be permitted with the mine site. Disused or damaged equipment shall not be stored on site and the pit shall not be used for the disposal of such items as garbage, wood waste, toxic materials and petroleum wastes.

**Health and Safety**

1. General

- (a) Blasting is not approved without the written authorization of the Chief Inspector.
- (b) No pit slopes shall be greater than 2:1.
- (c) The Permittee shall maintain a plan of the pit developments indicating surface roads, facilities, drainage structures, environmental buffers, limits of excavation in relation to the pit boundaries as designed, pit floor elevations, overburden and soil stockpiles and sediment stockpiles (if any), sampling and monitoring locations. The plan shall be updated on a semi-annual basis with a copy of the latest version to be maintained on site for reference purposes.

2. Noise Control

- (a) The Permittee shall control vehicle speeds and the use of engine brakes on haulage vehicles on the mine property, in order to minimize noise impacts.

- (b) The Permittee shall equip all mine equipment with high efficiency muffling systems which shall be maintained in good working condition.
- (c) The Permittee shall construct a suitable noise barrier to mitigate the mine traffic noise if the owners of the nearest residence or the Cluxewe Resort complain.

3. Noise Monitoring

- (a) The Permittee will engage a qualified acoustic consultant to complete a baseline noise assessment at the Cluxewe Resort and Pulteney Point prior to the commencement of construction. If the noise levels from the pit or ship loading operations are considered by MEM to exceed acceptable limits, the Permittee shall implement additional noise mitigation measures. The Chief Inspector may require additional noise monitoring if complaints are received.
- (b) The Permittee shall maintain a log of any noise complaints received, and shall reconcile the occurrences with the recorded data and site activities as part of the logbook entry.
- (c) An annual summary of sampling results and public complaints (if any) shall be provided in the Annual Reclamation Report following each year of operation.

4. Dust Control

The Permittee shall implement dust suppression measures such as water sprays and sprinklers wherever necessary to control dust generation and prevent migration of dust to neighbouring properties. Particular attention shall be given to dust control and "track out" along Highway 19.

5. Fuel Handling/Spill Containment

- (a) Fuel storage facilities must comply with the *Provincial Fire Services Act* and regulations, including the provision for secondary containment and security. A Summary of Environmental Standards and Guidelines for Fuel Handling, Transportation, and Storage is also available, which includes recommendations to ensure compliance with applicable legislation. This document can be obtained from the regional Environmental Protection office.
- (b) A permanent fuel storage facility shall be constructed and operated in accordance with appropriate federal and provincial regulations for fuel storage and shall be appropriately contained to avoid spills and contamination.
- (c) Refueling of mobile equipment shall be conducted at an approved location where any accidental spillage can be contained. The manager shall prepare and

maintain a refueling procedure prior to the start of site development and operations. The procedure shall be available to all supervisors and workers and personnel directly involved with refueling shall be properly instructed.

- (d) A spill contingency plan shall be developed in accordance with the BC Guidelines for Industrial Emergency Response Contingency Plans (1992) and shall be implemented prior to commencing mine operations. This plan shall be maintained at the mine and be available to all supervisors and workers. All supervisors and workers shall be instructed in the provisions of this plan prior to the commencement of site development and operations and as may be necessary there after.
- (e) An emergency spill containment kit of adequate capacity shall be maintained on site whenever the mine is in operation.
- (f) The Permittee shall immediately contain and implement remedial measures for any spill of hydrocarbon or other deleterious substance. Any such occurrence shall be reported to the Chief Inspector, and to the Provincial Emergency Program in accordance with the Spill Reporting Regulation of the *Environmental Management Act*. Contaminated materials shall be disposed of in a manner acceptable to the Regional Waste Manager. Any spill of hydrocarbon product or other deleterious material in quantities that require reporting under Federal or Provincial regulation or statute, shall be considered a dangerous occurrence pursuant to Part 1.7.1 of the Code.
- (g) Stationary engines, lubricated rollers on conveyor belts and related drive mechanisms shall be provided with drip pans that shall be cleaned on a regular basis.

## Geotechnical

### 1. Conceptual Designs

The conceptual designs for the pit, overburden stockpiles and sedimentation ponds are hereby approved.

### 2. Monitoring

- (a) The Permittee shall monitor the stability and condition of all ditches, culverts, settling pond structures and pit walls on a regular basis, and document observations. Any changes indicating instability or advanced erosion shall be immediately reported to the district Inspector of Mines.

- (b) The discovery of any significant subsurface flows of water, seeps, substantial amounts of fine textured soils, silts and clays shall be reported to the Inspector as soon as possible, and work shall cease until the Inspector advises otherwise.

### **Protection of the Land and Watercourses**

#### **1. Mine Site Preparation**

- (a) The Permittee shall remove all tree stumps, vegetation and topsoil from the working area no more than 24 months prior to excavation.
- (b) The Permittee shall retain all topsoil and overburden materials on site for use in final reclamation. Wood waste from site clearing activities shall be retained for use in reclamation. Such material shall be spread on the reclamation areas to encourage nutrient cycling and minimize erosion.
- (c) The Permittee shall not clear during bird nesting periods or in areas where there is a chance of harming nesting birds.
- (d) The Permittee shall ensure measures are in place to allow the movement of animals past the conveyor and ship loading systems.

#### **2. Buffer Zones**

- (a) No disturbance shall be conducted within 150 m of the Cluxewe River or any surface tributary of the Cluxewe River, except as necessary to create wind firm tree boundaries.
- (b) No disturbance shall be conducted within 50 m of Mills Creek or any surface tributary of Mills Creek.
- (c) Buffer zones shall be indicated by appropriate signage

#### **3. Drainage Monitoring**

- (a) The Permittee shall develop and implement a program to monitor turbidity, suspended solids and hydrocarbons from disturbed areas, waste materials, and in the receiving environment. This program shall be in place 30 days prior to the start of mine development.
- (b) A record of the water monitoring data shall be maintained on site. An annual summary of sampling results shall be provided to the Ministry of Environment and in the Annual Reclamation Report.

4. Drainage Management and Collection

- (a) There shall be no direct surface discharge of mine or access road drainage to the environment. Water shall be directed into the pit and treated in the sedimentation ponds to achieve acceptable water quality prior to recycling into the process plant.
- (b) Discharge of water from the pit directly to the receiving environment is not permitted.
- (c) In the event that the mine site drainage is not of acceptable discharge quality, the Permittee shall collect and treat, or otherwise mitigate drainage for as long as is necessary.
- (d) The Permittee shall obtain permits for discharge when required to do so by the Ministry of Environment.

5. Groundwater Protection

- (a) Excavations shall not extend below the groundwater table.
- (b) The Permittee shall monitor groundwater levels and groundwater quality in the project area. Groundwater levels in the existing wells shall be monitored on a monthly basis until removed by extraction. Groundwater samples for quality analysis shall be collected annually from all wells in the operational areas and from an up-gradient well. Test parameters shall include general chemistry, PAH and metals. Replacement monitoring locations may be required depending on results.
- (c) A record of the groundwater monitoring data shall be maintained on site. An annual summary of sampling results shall be provided to the Ministry of Environment and in the Annual Reclamation Report
- (d) In the event that test results indicate potentially harmful levels of groundwater contamination, mine operations shall be suspended immediately and the situation thoroughly investigated by a qualified hydrogeologist. Production must not resume until contamination problems are resolved.

## Reclamation Program

### 1. Reclamation Security

- (a) The Permittee shall cause to be deposited with the Minister of Finance, security in the amount of One Million dollars (\$1,000,000.00) following the schedule shown below. The security will be held by the Minister of Finance for the proper performance of the approved program and all the conditions of this permit in a manner satisfactory to the Chief Inspector.

	\$	<u>Cumulative \$</u>
Start of Preproduction stripping	500,000.00	500,000.00
12 months after the start of mining	500,000.00	1,000,000.00

- (b) The amount of security will be adjusted for inflation where required. The first adjustment will be made the year following placement of the total security in 1(a) above, when cumulative inflation from January 1, exceeds 10% based on each of the previous year's annual increase in the British Columbia Consumer Price Index (B.C. CPI).
- (c) The Permittee shall conform to all forest tenure requirements of the Ministry of Forests and Range. Should the Permittee not conform to these requirements then all or part of the security may be used to cover the costs of these requirements.
- (d) The Permittee shall conform to all Ministry of Environment approval, licence, and permit conditions, including the *Environmental Management Act*, Contaminated Sites and Special Waste regulations, as well as requirements under the *Wildlife Act*. Should the Permittee not conform to these conditions then all or part of the security may be used to fulfil these requirements.
- (e) The Permittee shall conform to all *Land Act* tenure (permit, licence of occupation, statutory right of way or lease) or *Water Act* licence terms and conditions. Should the Permittee not perform any of the required obligations under any *Land Act* tenure or *Water Act* licence, then all or part of the security may be used to cover any costs or expenses incurred by the Province of British Columbia to perform any of these obligations or otherwise satisfy any outstanding obligation under any such tenure or licence.

### 2. Annual Reclamation Report

By March 31st of each year, an Annual Reclamation Report shall be submitted in a form containing the information required by the Chief Inspector. The Annual Reclamation Report shall document the current status of the work system and reclamation obligations,



outstanding liability and associated costs, and all monitoring including water quality, and ongoing maintenance activities.

3. Land Use

- (a) The surface of the land and watercourses shall be reclaimed to commercial forest production and wildlife habitat related activities.
- (b) Permanent wetlands designated for the final pit shall be revegetated with an appropriate assemblage of riparian species native to the area.

4. Capability

- (a) Excluding lands that are not to be reclaimed, the average land capability to be achieved on the remaining lands shall not be less than the average that existed prior to mining.
- (b) A baseline assessment of the pre-development forest productivity shall be provided to the Chief Inspector 90 days prior to the start of construction.

5. Long-term Stability

Land and watercourses shall be left in a stable condition. To ensure long-term stability, engineered structures including internal drainage features and sediment impoundments shall be constructed and maintained in a safe and stable configuration.

6. Re-vegetation

- (a) Land shall be re-vegetated to a self sustaining state using appropriate plant species.
- (b) An appropriate vegetation cover capable of returning the land to productive forestry capability shall be established on all designated benches and mine floors. Details of the silvicultural prescriptions are to be included in the Annual Reclamation Report for each year of operation.
- (c) Areas designated for wildlife habitat and biodiversity purposes shall be revegetated in a manner that is appropriate to the intended use.
- (d) Weeds shall be managed so they do not affect the revegetation work or adjacent properties.

- (e) Stockpiles that are to remain throughout the life of the mine shall be revegetated following the silvicultural prescriptions developed by the holder of TFL 6 Block 2.

7. Growth Medium

- (a) On all lands to be re-vegetated, the growth medium shall satisfy land use, capability, productivity and water quality objectives.
- (b) All surficial soil material removed for mining purposes shall be saved for use in reclamation programs unless these objectives can be otherwise achieved. All suitable growth media shall be salvaged concurrent with expansion of overburden stockpile, pit and any other mine facilities. Testwork shall be undertaken to determine growth medium application depths required to meet end land use objectives with results provided in the Annual Reclamation Report.
- (c) All severely compacted areas shall be deeply ripped prior to placement of growth media and/or vegetation.
- (d) Reclamation areas shall be treated with sediment excavated from the sediment detention ponds. All sediment generated from gravel washing shall be used in this manner and none shall remain in the sediment ponds at the cessation of mining.
- (e) Overburden materials shall be applied to the substrate development areas in the proportions (thickness) they were removed from development areas
- (f) Topsoil salvaged from the development areas shall be applied to the reclamation areas in the proportion it was stripped from the development areas. All topsoil stripped from the mine development foot print shall be used in the reclamation of the mine and none shall be removed for use elsewhere without specific written permission of the Chief Inspector.
- (g) Substrate materials including topsoil and overburden shall be maintained in a loose and friable state and shall not be compacted or otherwise treated in a manner that would limit tree growth except where these materials form part of a structure that requires compaction.
- (h) All woody debris stripped from the development areas shall be applied in a uniform manner to the reclamation areas and none shall be chipped or burned except with the specific written permission of the Chief Inspector.

8. Landforms

Land and watercourses shall be reclaimed, where practical, in a manner that is consistent with the adjacent landforms.

9. Structures and Equipment

Prior to abandonment, and unless the Chief Inspector has made a ruling with respect to heritage project status or industrial use,

- (a) all machinery, equipment and building superstructures shall be removed,
- (b) concrete foundations shall be covered and re-vegetated unless, because of demonstrated impracticality, they have been exempted by an Inspector, and
- (c) all scrap material shall be disposed of in a manner acceptable to an Inspector.

10. Waste Dumps/Residual Stockpiles

- (a) Waste dumps and stockpiles shall be reclaimed to ensure,
  - (i) long-term stability
  - (ii) long-term erosion control, and
  - (iii) land use, productivity and capability objectives are achieved.

11. Erosion Control

- (a) Reduction of erosion shall be achieved through landform configuration, development of maintenance-free vegetation covers and the development of self sustaining, erosion resistant watercourses.
- (b) Overburden stockpiles shall be sloped at 3:1 and stabilized with an appropriate vegetation cover.
- (c) Sloped road fill and other exposed surfaces made up unconsolidated material shall, be sloped at 2:1 and stabilized with an appropriate vegetation cover.

12. Visual Planning

To prevent wind throw, the Permittee shall replant trees adjacent to Highway 19 in areas that have been cleared.

13. Watercourses

Watercourses shall be reclaimed to a condition that ensures,

- (a) long-term water quality is maintained to a standard acceptable to the Chief Inspector,
- (b) drainage is restored either to original watercourses or to new watercourses which will sustain themselves without maintenance, and
- (c) the level of productive capacity shall not be less than existed prior to mining unless the Permittee can provide evidence which demonstrates, to the satisfaction of the Chief Inspector, the impracticality of doing so.
- (d) appropriate vegetation and ecological attributes (e.g. large woody debris and large boulders) shall be established along new drainage courses to provide riparian structure and function.

14. Pits

- (a) Unconsolidated materials including soils, overburden, cut and fill slopes and sediment stockpiles shall be contoured at a 2 H:1V overall slope or flatter.
- (b) Prior to abandonment, any rock slopes that are to be exposed at the end of mining shall be scaled, bolted, screened and/or otherwise made safe as required.
- (c) Pit walls including benches constructed in rock, and/or steeply sloping footwalls greater than 2:1 are not required to be re-vegetated. Pit wall seepage may require treatment to ensure that water is of a quality acceptable to the Chief Inspector.
- (d) Where the pit floor is free from water, and safely accessible, vegetation shall be established.
- (e) Where the pit floor will impound water and it is not part of a permanent water treatment system, provision must be made to create a body of water where use and productivity objectives are achieved.

15. Impoundments

- (a) All sediment ponds and impoundment structures shall be reclaimed to the approved land use.

- (b) Impoundment facilities shall be inspected, monitored and maintained to ensure stability.
- (c) Prior to mine closure, a report shall be submitted to the Chief Inspector outlining the steps that will be taken to ensure structural stability and runoff control and detailing the post-operational state of the dams, dikes, related seepage control works, spillway works, mine water department and post-operational monitoring provisions.

16. Roads

- (a) All roads shall be reclaimed in accordance with land use objectives unless permanent access is required to be maintained.
- (b) All roads not being retained for the designated end land use shall be scarified, top dressed with the above outlined reclamation substrates and planted with an appropriate vegetation cover (in agreement with TFL 6 Licensee) .
- (c) All unessential confined drainage structures (culverts etc.) shall be removed and replaced with waterbars and/or other passive self-maintaining water control measures. Such alterations in and about a stream will require authorization under the *Water Act*.
- (d) Individual roads will be exempted from the requirement for total reclamation under condition 16(a) if either:
  - (i) the Permittee can demonstrate that an agency of the Crown has explicitly accepted responsibility for the operation, maintenance and ultimate deactivation and abandonment of the road, or
  - (ii) the Permittee can demonstrate that another private party has explicitly agreed to accept responsibility for the operation, maintenance and ultimate deactivation and abandonment of the road and has, in this regard, agreed to comply with all the terms and conditions, including bonding provisions, of this reclamation permit, and to comply with all other relevant provincial government (and federal government) regulatory requirements.
- (e) All access roads shall be effectively blocked to prevent inadvertent vehicular access to surface areas of the mine that may be dangerous.

17. Disposal of Chemicals and Reagents

Chemicals or reagents, which cannot be returned to the manufacturer, shall be disposed of in compliance with municipal, regional, provincial and federal statutes.

18. Monitoring

The Permittee shall undertake monitoring programs, as required by the Chief Inspector, to demonstrate that reclamation objectives including land use capability, water quality, and stability of structures are being achieved.

19. Temporary Shutdown

- (a) If the mine ceases operation, the Permittee shall,
  - (i) continue to carry out the conditions of the permit, and
  - (ii) carry out a program of site monitoring and maintenance.
- (b) If the mine ceases operation for a period longer than one year, the Permittee shall apply for an amendment setting out a revised program for approval by an Inspector.

20. Permit Review

On or before March 31, 2010, the Permittee shall submit a revised reclamation program that incorporates the current mine plan as well as the results of research conducted under this permit. This provision shall not be construed as limiting the power of the Chief Inspector to amend this permit at any time.