

PROVINCE OF BRITISH COLUMBIA  
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES (EMPR)

**QUARRY PERMIT**

**APPROVING WORK SYSTEM AND RECLAMATION PROGRAM**  
(Issued pursuant to Section 10 of the *Mines Act* R.S.B.C. 1996, C.293)

**Permit: Q-8-121**

**Mine No.: 1610713**

Issued to: **O.K. Industries Ltd.**  
**6702 Rajpur (PO Box 1324)**  
**Victoria BC, V8W 2W3**

for work on the following Property:

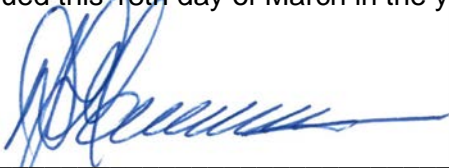
**Millstream Rd Quarry-OKI (District of Highlands)**

located on: **Lot 1, Section 5, Range 3, West Highlands District, Plan VIP 70242 (PID  
024-710-270)**

Reclamation security amount: **\$75,000**

This permit is subject to the appended conditions, referenced documents, and maps.

Issued this 18th day of March in the year 2020.



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**Don J. Harrison, P.Geo.**  
**Senior Inspector of Mines**

## **PREAMBLE**

A notice of intention to commence work on a quarry for construction aggregate, and plan of the proposed work system, and a program for the protection and reclamation of the surface of the land and watercourses affected by the work (a Notice of Work application, or NoW) were submitted on March 24, 2017. A Notice of such filing was published in the Goldstream News Gazette on June 21, 2017 and in the British Columbia Gazette on June 22th, 2017. A Notice of the application was posted on the Property along Millstream Road on June 15<sup>th</sup>, 2017. The NoW application was updated by the applicant over the course of the application review.

The Notice of Work and associated documents listed in this Permit shall form the Mine Plan and are an integral part of this permit. Where there may be a discrepancy or conflict between the submitted NoW and its associated documents, and conditions in this Permit, the conditions in this Permit shall prevail.

This Permit contains the requirements of the Ministry of Energy, Mines and Petroleum Resources (EMPRR) for mining operations and 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 in which this security may be applied, will also reflect the requirements of those ministries. Nothing in this Permit, however, limits the authority of other provincial ministries to set other conditions, or to act independently, under their respective permits and legislation.

The permit holder should be aware that while this permit is issued under the *Mines Act*, other laws and regulations may apply, including federal and provincial legislation and local government bylaws. It is the proponent's responsibility to ensure compliance with any other legal requirements that may apply.

Decisions made by staff of the Ministry of Energy, Mines and Petroleum Resources will be made in consultation with other ministries.

### **Documents Relevant to this Permit**

The NoW and originally submitted reports were updated and revised as part of the technical review process of this application. The NoW and updated documents as listed below collectively form the Mine Plan and are a part of this Permit.

- **Revised Phase Plan<sup>1</sup>**: as per MILLSTREAM ROAD - OK INDUSTRIES - PROJECTED VOLUME BASED ON 2.0m REMOVAL OF OVERBURDEN AND 95m FINISHED ELEVATION (1:2,000 scale), revised 2019-July-09, signed and sealed 2019-July-11 by N.Fischer, Westbrook Consulting Ltd., with revised mining Phases as follows:

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<sup>1</sup> The electronic (digital) version of this map is: **1610713-20190711\_Dwg\_190711 FIG 1\_Revised-Phased-Plan-Projected-Volume.pdf**

PHASE NUMBERS		VOLUME (m <sup>3</sup> )	AREA (ha)
Phase 1	(was Phase 3)	220,729.2	4.48
Phase 2	(was Phase 5)	84,880.2	1.88
Phase 3	(was Phase 4)	276,953	5.26
Phase 4	(was Phase 2)	106,561.6	3.35
Phase 5	(was Phase 1)	201,584.4	2.23

- **Site Drainage Plan<sup>2</sup>:** found in Appendix I of the Millstream Road Quarry - Environmental Effects and Mitigation Report (EEMR), prepared by Hemmera Envirochem Inc., (Project No. 989491-01) dated March 22, 2019, for O.K. Industries Ltd. (herein referred to as the **EEMR**). Note: mine phases in this report are revised and updated as per the **Revised Phase Plan**.
- **Quarry Site Plans and Cross-Section Drawings:** from in Appendix VII of the EEMR.
- **Nitrogen Management Plan:** from Appendix VIII of EEMR.
- **Mitigation Measures:** from **Section 6.0** of the Noise Assessment in Appendix IV of EEMR.
- **Hydrocarbon Transport, Storage, and Handling Plan:** from Appendix VIII of the EEMR.
- **Spill Response Plan:** from Appendix VIII of the EEMR.
- **Site Discharge and Groundwater Monitoring Plan** in Appendix VIII of EEMR

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<sup>2</sup> Includes the **Millstream Quarry Storm Water Management Report** (November 2018), and the **Storm Water Management Plan (SWMP) Figures 1 to 5** for each mining phase with all drawings signed and sealed 2019-03-20 by N. Fischer, Westbrook Consulting Ltd., noting that the mining Phases have been revised as per the Revised Phase Plan

## **CONDITIONS:**

### **General**

The Chief Inspector of Mines (Chief Inspector) hereby approves the Notice of Work and Reclamation Program, and related submitted documents (Application) subject to compliance with the following conditions:

1. Interpretation

Where more than one version of information exists in the application, the most recent version shall be considered the approved version unless otherwise determined by the Inspector. If there is a discrepancy or conflict between the NoW or associated documents or management plans, and a Condition in this Permit, the Condition in this Permit shall prevail.

2. Reclamation Security

(a) The owner, agent or manager (herein called the Permittee) must maintain with the Minister of Finance securities in the amount of seventy-five thousand dollars (\$75,000). 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.

3. End Land Use

The final surface of the land must be left in a manner that ensures long term physical and geochemical stability suitable for Commercial / Industrial use.

4. Revegetation

Land to be re-vegetated must be re-vegetated to a self-sustaining state where practicable, using appropriate plant species native to the bio-region of the site.

5. No Removal of Topsoil

Topsoil must not be removed from the Property without the specific written permission of an Inspector of Mines.

6. Buffer Zones

A minimum 5.0 metre wide undisturbed and vegetated buffer zone must be established and maintained between the property boundary and the mine disturbed area, unless exempted by the Chief Inspector. The buffer zone must be established prior to vegetation clearing for the mine and maintained for the life of the mine.

7. Treatment of Structures and Equipment

Prior to abandonment, and unless the Chief Inspector has made a ruling otherwise, such as heritage project consideration or industrial use,

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

8. Watercourses

- (a) Sediment laden water resulting from the mining activities must be controlled and managed on site prior to discharge to any creek or watercourse. A water management plan for the site, including management of storm event rainfall, must be prepared and implemented for the site and a copy must be submitted to an Inspector of Mines.

9. Roads

- (a) All roads must be reclaimed in accordance with land use objectives unless permanent access is required to be maintained.
- (b) Individual roads will be exempted from the requirement for total reclamation under condition 9(a) if either:
  - (1) 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,
  - (2) 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.

10. Disposal of Fuels and Toxic Chemicals

Fuels, chemicals or reagents which cannot be returned to the manufacturer/supplier are to be disposed of as directed by the Chief Inspector in compliance with municipal, regional, provincial and federal statutes.

11. Fuels and Lubricants (Hydrocarbons)

Fuels, lubricants and other hydrocarbons, if stored on the mine site, must conform to the latest version of the BC Fuel Guidelines.

The Permittee must develop and implement a hydrocarbon management plan that deals with fueling, operational servicing, spill prevention and clean-up for fuels and lubricants stored on the mine site. In addition to the plan:

- (a) Fuel and lubricants shall be delivered to site as needed to re-supply fuel and oil tanks on mobile and fixed equipment,
- (b) Impermeable, oil absorbent matting must be used when refueling and servicing equipment,
- (c) While refueling, the operator must always be in control of the refueling nozzle,
- (d) If any petroleum, hydrocarbon or other product (no matter how small) is spilled the contaminated soil/gravels must be forthwith collected and removed for appropriate disposal,
- (e) Fuel or oil leaks on equipment must be effectively repaired as soon as they are discovered, or the equipment must be removed from the site and not operated until repairs have been made,
- (f) An emergency spill containment and clean up kit must be kept at the site while it is in operation. The kit must have the capacity to contain and clean up 100% of a spill from a failure of the largest volume of a fuel or lubricant tank or system plus 10%.

12. Archaeological Find

An Archaeological Chance Find Procedure (ACFP) for the for the conservation of cultural heritage resources must be developed for the mine site prior to surface ground disturbance:

- (a) A copy of the procedure must be posted at the Mine Site, and all workers must be trained in the implementation of this procedure,
- (b) A copy of this procedure must be filed with an Inspector of Mines.

In the event an archaeological artifact or site is encountered during the course of the approved mining activities, the work program must be suspended or modified in such a manner so as to ensure that the artifact or site is not damaged, desecrated or otherwise altered. The archaeological occurrence must be reported immediately to the Archaeological Branch of the Ministry Forests, Lands, Natural Resource Operations and Rural Development and the Ministry of Energy, Mines and Petroleum Resources (Inspector of Mines). Work must not be resumed until authorized by the joint Ministries.

13. Site Access

The Mine Manager, or in their absence a Designate, must allow Employees of other Provincial Ministries holding authorizations related to Compliance and Enforcement duties onto the mine site subject to the following conditions:

- (a) The Provincial Employee must present the appropriate Ministry identification; and;
- (b) must clearly state that they are acting on behalf of an Inspector;
- (c) must be given a site orientation as required by the Health & Safety, and Reclamation Code;
- (d) must sign-in and sign-out as acknowledgement of being on site;
- (e) must be accompanied at all times by the Mine Manager, or qualified person appointed by the Manager, and must take all necessary measures to ensure the safety and well being of the individual(s); and this condition is not applicable to other Provincial Legislation.

14. Site Stability

- (a) An Inspector must be advised in writing at the earliest opportunity of any unforeseen conditions that could adversely affect the extraction of materials, site stability, erosion control or the reclamation of the site.
- (b) The stability of the excavated walls and all slopes must be maintained at all times and erosion must be controlled at all times.
- (c) The discovery of any significant subsurface flows of water, seeps, substantial amounts of fine textured, soils, silts and clays, as well as significant adverse geological conditions must be reported to the Inspector as soon as possible and work must cease until the Inspector advises otherwise.

15. Site Security

All vehicle access areas must be secured with locking gates and signage provided indicating the mine name, operator' s name and emergency contact number as well as all necessary safety advisories. Gates must be locked when the quarry is not in operation.

16. Temporary Shutdown

If this quarry ceases operation for a period longer than one year the Permittee must either continue to carry out the conditions of the permit or apply for an amendment setting out a revised program for approval by the Chief Inspector.

17. Monitoring

The Permittee must undertake monitoring programs, as required by the Inspector, to demonstrate that reclamation objectives are being achieved.

18. Alterations to the Program

Substantial changes to the program and Mine Plan must be submitted to the Inspector of Mines for written approval.

19. Notice of Closure

Pursuant to Part 10.6.1 of the Health, Safety and Reclamation Code for Mines in British Columbia, a Notice of Completion of Work must be filed with the Inspector not less than seven days prior to cessation of work.

20. Annual Report

An Annual Report must be submitted in a form and containing the information as required by the Inspector of Mines. The completed Annual Report must be received by the Inspector on or before March 31 of each year and must contain the required information from the previous calendar year (the Report Year).

The Permittee or Manager must forward to the Inspector each year a copy of the completed Health and Safety Assessment form.

21. Liability:

The government is not liable to the Permittee for injuries, losses, expenses, or costs incurred or suffered by the Permittee as a result, directly or indirectly, of an act or omission of a person who is not a party to this Mines Act Permit, including but not restricted to an act or omission of a person disrupting, stopping or otherwise interfering with the Permittee's operations under this *Mines Act* Permit by road blocks or other means.

22. Permit to be kept at mine site

While it remains valid and subsisting, a copy of this Permit and associated reports, plans, maps and cross-sections must be kept at the mine site and be available to authorized Inspectors and other authorized government officials.



## **Site Specific Conditions:**

### **1. Annual Production**

Annual production from the quarry must not exceed 150,000 tonnes per year.

### **2. Authorized Activities**

This permit authorizes drilling, blasting, excavation, hauling, crushing, screening, stockpiling, load-out and reclamation activities. This permit does not authorize the importation of surficial soil or used concrete or asphalt, other types of fill, or other foreign material unrelated to the quarry and mining activity; however, rock excavated on-site that has been moved off site for processing, may be introduced for the purposes of haul road construction.

### **3. Hours of Operations**

This permit authorizes year-round operation as required, from Monday to Friday, excluding statutory holidays, between the hours of 7 AM and 5 PM, subject to the following.

- (a) Light maintenance work is permitted on Saturdays between 9am and 4 pm. Light Maintenance is defined as work requiring the use of hand tools only. It does not include operation of any heavy equipment to perform the maintenance.
- (b) Blasting is only permitted between 8 AM and 5 PM.
- (c) Notwithstanding the hours of work provisions above, the Permittee is authorized to conduct work outside of this provision, if:
  - (1) An agency having jurisdiction declares an emergency and the product from this site is required to mitigate an emergency;
  - (2) A safety concern on site is such that a failure to complete necessary work can result in harm or risk to workers or members of the public;
  - (3) An environmental incident on site occurs and a failure to address or mitigate the incident may result in harm to the receiving environment;
  - (4) The Southwest Regional Mines office must be informed as soon as possible in any event where work may have to be performed outside of the hours noted above.

### **4. Access and Haul Road**

- (a) The access road must be constructed as shown on the Revised Phase Plan map with a curved radius at the entrance to the quarry.

- (b) The access road must be paved for at least the first 60m from the entrance off Millstream Road. The paved section of the access road must be maintained regularly to prevent the accumulation of rock, sediment and dust.
- (c) The road must be constructed with sufficient crown to shed water, and maintained as required to keep a clear and safe running surface with effective water management structures that prevent sediment laden waters from entering nearby water bodies.
- (d) The Property must be fenced and gated where necessary to restrict access to the site.

5. **Surface Water Management**

- (a) Site drainage shall be managed as described in Appendix I of the EEMR: **Site Drainage Plan**, which includes the **Millstream Quarry Storm Water Management Report** and **Storm Water Management Plan (SWMP)** drawings, Figures 1 to 5.
- (b) Management of surface and storm water site must effectively control the quantity and quality of surface and storm water from cleared areas as the site is mined.
- (c) Each mining phase must utilize water management structures and features including sloped surfaces, settling/detention pond, pump, and ditches where appropriate, to ensure there is no water runoff and sedimentation from the quarry area that negatively impacts adjacent water bodies.
- (d) Drainage features must be installed along the north perimeter of the quarry where there is potential to collect groundwater discharge,
- (e) Sediment ponds and other water and sediment collection structures must be maintained and cleaned of sediment routinely to ensure they operate effectively as and when required. Accumulated sediment must not be allowed to exceed 50% of the pond or structure volume.
- (f) The volume of the structures or features (i.e. ponds, pumps, ditches) must be sized appropriately to manage water and sediment volumes during the life of the quarry.
- (g) Silt fencing and other effective sediment control structures must be installed and utilized as necessary to prevent sediment laden water from entering any creek or off-site watercourse.
- (h) Operations must be suspended during extreme weather events (high intensity/duration precipitation) to minimize erosion and sediment generation, and to allow adequate time for drainage and infiltration of surface water.

- (i) Effective measures must be taken to prevent inadvertent access (by people, equipment and vehicles) into storm water management ponds, water retention ponds, settling ponds, ditches, and trenches.
- (j) A stock of oil absorbent pads must be kept near each sump/settling pond location.

## 6. **Groundwater Management**

- (a) The quarry must not result in capture of overburden-hosted groundwater,
- (b) Quarrying at the site shall not have a negative impact on the quality or quantity of neighbouring existing domestic potable groundwater users.
- (c) Temporary water management and drainage features (dewatering wells, drains, and ponds) must be installed to divert and control the movement of groundwater and groundwater discharge during quarrying activities.
- (d) Monitoring wells MW00-1A (shallow) and MW00-1B(deep) are within the western buffer zone (west of the ephemeral tributary to Millstream Creek) and must not be impacted by any mining activities including blasting.
- (e) Prior to decommissioning well MW00-3, a replacement well must be installed in one of the phases where quarry excavation has been completed.
- (f) Groundwater levels and water quality must be monitored in a new monitoring well in the potential flow path between the Millstream Meadows property and the Site.
- (g) Wells within the quarry area that are consumed by quarry excavations must be decommissioned to reduce the risk of contaminating local water-bearing zones and water wells in accordance with the Groundwater Protection Regulation.

## 7. **Quarry Excavation**

- (a) The excavation of the site shall follow the plans as shown in Appendix VII of EEMR (**Quarry Site Plan and Cross-Section Drawings**), with the exception of the mining phase numbers, which shall be as shown on the **Revised Phase Plan**, dated July 11, 2019 (N.Fischer, Westbrook Consulting Ltd.).
- (b) Quarrying shall be undertaken using a series of eight metre benches (excluding initial pioneering bench).
- (c) With the exception of access road construction, quarrying must start at Phase 1 in the southeast corner of the Property and progress northerly into Phases 2 and 3, before moving westward into Phases 4 then 5.

- (d) Tree clearing and overburden stripping must be carried out in the same sequential phases as mining to provide vegetated buffers between the quarry and adjacent residents for as long as possible.
- (e) The quarry floor must not be at an elevation below 95 metres above mean sea level.
- (f) The operational quarry floor must be left as rock and aggregate and be minimally sloped to allow for both shallow subsurface drainage and surface drainage towards constructed sediment structures/ponds as per the EEMR.
- (g) Blasting must be utilized to break rock for primary quarry excavation. Pneumatic/hydraulic rock breaking equipment must not be utilized for primary excavation purposes. Such use shall be restricted to the reduction of blast oversize for no more than 15 minutes at a time, followed by a hiatus of no less than 15 minutes.
- (h) The site must be monitored regularly for changes in geology, rock type or mineralogy. If any noticeable changes are observed, the Inspector must be notified as soon as possible of the observed changes.
- (i) The Permittee or its QP must collect one representative composite rock sample (5-10 kg) of quarry blast rock immediately following each production blast. The rock sample must be submitted to an accredited lab for analysis for acid rock drainage (ARD) characterization, including Acid-Base Accounting (ABA) to determine acid generating potential and the neutralization potential ratio (NPR). Chemical analyses must include, but not limited to:
  - (1) Total sulphur, sulphate-sulphur and sulphide-sulphur,
  - (2) Bulk neutralization potential
  - (3) Total carbonate content
  - (4) pH

Results of the above characterization and analytical testing must be forwarded to the Inspector upon receipt. This condition may be reconsidered based on a review of the on-going analytical results.

- (j) If potentially acid generating (PAG) rock is indicated from analyses, confirmation samples from the same area must be collected and analyzed as above. Pending results, the manager may be required to close that part of the quarry from further excavation until a plan for the prediction, prevention, mitigation and management of metal leaching and acid rock drainage, according to Part 10.1.16 of the Code has been developed and implemented for the quarry.
- (k) Blasted material from Phase 1 shall be hauled to OK Industries Ltd. site at 2121 Millstream Road for processing until sufficient area is established on the site for stockpiles, crusher and related work.

## **8. Drilling and Blasting**

- (a) Drilling and Blasting must not negatively impact the surrounding environment and properties in a significant way.
- (b) All blasting on site must be carried out by a blaster certified as required under the Health, Safety and Reclamation Code for Mines in BC (Code), and who has an urban blasting endorsement (a.k.a. close-proximity blasting endorsement).
- (c) The blaster must apply best industrial practices for each blast and promote safe and productive operations, to protect the safety and health of the public, workers and close proximity structures within the blast area of influence to mitigate the environmental effects of: noise, dust, blast vibration, air overpressure, flyrock, and surface water contamination.
- (d) Drills used on site must be maintained in accordance with the manufacturer's recommendations. The drills must use environmentally friendly hydraulic oils and be equipped with functioning and effective on-board dust collection systems.
- (e) Blasting is only permitted between 8 AM and 5:00 PM, Monday to Friday, but not on statutory holidays.
- (f) There must be no on-site storage of explosives.
- (g) Atmospheric and weather conditions must be considered in planning each blast, such that:
  - (1) blasting does not occur on days that happen to have temperature inversions, strong winds, low continuous overcast cloud or fog;
  - (2) post-blast air-borne dust is not carried by wind towards residential areas.
- (h) The time between loading a bore hole and detonation of the blast must be kept as short as possible, and loaded blast holes must not be left overnight without first notifying a Mines Health and Safety Inspector.
- (i) All blasts must be electronically monitored with appropriate equipment which may include seismographs and geophones, to measure the velocity (PPV) of the particle motions in mm/sec (or inches/sec) and air overpressure (dBL).
  - (1) The monitoring devices must be located at the closest residence, building, and structures in each direction (north, south, east, west) to maintain a permanent record of both blast vibrations and air overpressure and to confirm compliance.
- (j) Blast overpressure and vibration levels at the nearest residence or industrial building must not exceed 120 dBL and 50 mm/s peak particle velocity (PPV)

respectively (based on Fig. B-1 "Safe levels of blasting vibration for houses using a combination of velocity and displacement" USBM RI-8507).

- (k) Copies of all Blast Logs, plans, and electronic monitoring records must be kept by the manager for quality control purposes and made available to an Inspector on request.
- (l) Blast vibration levels must not exceed 25 mm/second PPV as measured:
  - (1) on the north Property boundary closest to the Highest Waste Management liner (currently managed by Coast Environmental), and,
  - (2) on the common Property boundary with the Capital Regional District's Millstream Meadows site.
- (m) All blasts must be monitored according to the "ISEE Field Practice Guidelines for Blasting Seismographs 2015" or as it may be updated.
- (n) All blasts at the quarry must be video recorded, and a copy of the video must be kept by the manager and/or kept at the mine office and made available to an Inspector on request.
- (o) The video file must include the following identification information as a word or text document;
  - (1) the quarry name, permit number, mine number,
  - (2) the bench/location identification of the blast site, including a map showing the blast area location on the mine footprint,
  - (3) the name of the blaster,
  - (4) the time and date of the blast.
- (p) Where the potential for flyrock beyond the Property boundary exists, the blaster must ensure blast mats or other suitable covering is used. Where mats are not used the blast must be controlled to ensure flyrock does not have a negative impact on adjacent property.
- (q) Blasts must be planned and designed such that they do not impact the integrity and performance of wells used for monitoring or water supply on neighbouring properties.
- (r) Controlled Blasting procedures must be applied along the final quarry perimeter face and boundary to ensure stability of the final quarry wall/face.
- (s) A procedure for public notification acceptable to the Inspector must be given for all blasts and shall include all residences and businesses within 1,000 metres of the centre of the blast area (including the CRD / Millstream Meadows, Highest Waste Management site, Millstream Industrial Park). The blast notification must be given at least 24 hours in advance of the scheduled blast.

- (t) Prior to blasting, the manager must place a sign at the entrance to the quarry indicating:
  - (1) that a blast is scheduled the follow day and that day,
  - (2) the blast warning signals to be used, and,
  - (3) a warning that all radios must turned off if electric detonators are used.
- (u) All potential surface access routes into the blast danger zone must be identified, posted with appropriate warning signs and sufficiently guarded and controlled to prevent human access into the blast danger zone prior to, during and following each blast, until the blaster of record deems the area safe to enter.
- (v) Prior to the first pioneering site blast and the first production blast, a pre-blast survey must be carried out by an independent qualified assessor to establish baseline observations, including defects and cracks at:
  - (1) all susceptible buildings and structures within 100 metres of the blast area, and,
  - (2) the closest residences to the blast area.
- (w) A Control Blasting Plan form and Control Blast Report form must be completed by the certified blaster in charge, and the completed forms must be retained by the manager and made available to an Inspector upon request.
- (x) If the manager receives any public complaint relating to a blast from the site, the manager must notify the Inspector without delay, and forward to the Inspector all records pertaining to the complaint.
- (y) The manager must keep a written log of public complaints related to blasting, noise, dust, and any other activities at the quarry, and make this log available to an Inspector upon request.

## 9. **Nitrogen Management**

- (a) Nitrogen from use of explosives must be managed according to the Millstream Quarry **Nitrogen Management Plan** in Appendix VIII of EEMR.
- (b) A safe work procedure must be developed for the clean-up of spilled ANFO explosives, and the procedure follow the manufacturer's recommendations.

## 10. **Noise Management**

- (a) Noise from the quarry site must be managed according direction provided in the Mitigation Measures outlined in **section 6.0 Mitigation Measures** of the **Noise Assessment** in Appendix IV of EEMR.

- (b) Effective measures must be taken regarding strategic placement and orientation of the working face and operating equipment (including conveyors, crusher, screener) to reduce noise impacts.
- (c) Non-audible back-up alarms must be used on loaders and excavators.
- (d) An 80m naturally vegetated buffer must be left between the quarry and the nearest residence.
- (e) The drop height (fall height) of overburden, rock and aggregate must be minimized when loading or stockpiling to minimize noise.
- (f) Rubber linings must be used where feasible at transfer points to reduce the noise of rock falling onto metal surfaces.
- (g) All equipment must be used within its design capacity, and properly maintained, repaired and lubricated. Noise-mitigation measures must be installed on heavy equipment and kept in top working condition.
- (h) Progressive reclamation must include planting of drought tolerant native vegetation and shrubs on catchment benches to aid in sound dampening and absorption, and to prevent sound reflection off quarry faces.

#### **11. Dust Management**

- (a) A site-specific Fugitive Dust Management Plan approved by a mines inspector must be developed by the permittee prior to ground disturbance and blasting, and be implemented throughout the duration of this permit.
- (b) The Fugitive Dust Management Plan (FDMP) referred to in 12(a) must be based on the document: "Developing a Fugitive Dust Management Plan for Industrial Projects" dated May 2018 or subsequent amendments to it, prepared by: BC Ministries of Energy, Mines and Petroleum Resources and Environment and Climate Change Strategy.

#### **12. Hydrocarbon Transport, Storage and Handling**

- (a) Fuel and other hydrocarbons, including spills, must be managed according to the **Hydrocarbon Transport, Storage, and Handling Plan** in Appendix VIII of the EEMR.
- (b) All personnel authorized to operate fuel dispensers must be aware of and trained in the Hydrocarbon Transport, Storage, and Handling Plan.
- (c) All used or contaminated spill pads must be disposed of properly and according to the appropriate regulations.



**13. Spill Response**

- (a) Those fuel and hydrocarbon spills not referred to in Condition 13. must be managed according to the **Spill Response Plan** in Appendix VIII of the EEMR.
- (b) All heavy equipment and fuel delivery trucks as described in the Spill Response Plan must be equipped with spill response kits as described in Table 1 (On-Site Spill Response Equipment) of the Spill Response Plan.
- (c) All workers, contractor and, subcontractors on site must be made aware of and be provided with a copy of the Spill Response Plan.

**14. Site Monitoring**

Surface Water Monitoring

- 1. Monitoring of select site parameters must be as described in the **Site Discharge and Groundwater Monitoring Plan** in Appendix VIII of EEMR.
- 2. The surface water sampling methods must follow the British Columbia Field Sampling Manual (Ministry of Environment, 2013) or its most current updated version.
- 3. Two surface water sampling locations, identified as SW-WEST-02 AND SW-SOUTH-02 as shown on Figure 1 of the Site Discharge and Groundwater Monitoring Plan must be monitored over the course of this permit at frequencies described in Table 1 below.

**Table 1. Surface Water Sampling Criteria**

Sample Location	Sampling Frequency	Analytical parameters	Exceedance Response**
<b>SW-WEST-02</b>	Pre-operations: quarterly	pH, EC, hardness, TSS*, ammonia, nitrite nitrate, total metals	Resample and analysis, Notify EMPR, System review, mitigation (Section 2.5 of Plan) Resample
	Operations: biannually		
<b>SW-SOUTH-02</b>	Pre-operations: quarterly	pH, EC, hardness, TSS*, ammonia, nitrite nitrate, total metals	
	Operations: monthly, <b>and</b> after >13mm precip/24 hrs		

\*TSS: Total Suspended Solids (turbidity) measured against the calibration curve created from on-site TSS measurements;

\*\* to comply with BC Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report by MoE, latest edition.

Groundwater Monitoring

- 4. Groundwater monitoring locations are shown on Figure 1 of the **Site**

**Discharge and Groundwater Monitoring Plan** and all must be monitored through phases 1-3, then as long as possible until excavation becomes too close to the wellhead.

5. Monitoring wells MW00-1A (shallow) and MW00-1B(deep) within the western buffer zone must not be impacted by mining activities and must be monitored while this permit is in effect.
6. Groundwater levels in at least one deep monitoring well must be monitored during all five phases of quarry operation.
7. Since monitoring wells MW00-2 and MW00-3 are planned to be impacted by quarry excavation, a replacement monitoring well must be installed at an as yet undetermined location.
8. Groundwater sampling and analyses must be carried out as per Table 2. below (*following page*):

**Table 2. Groundwater Sampling Criteria**

Sample Location	Sampling Frequency	Analytical parameters	Exceedance Response*
BH-5	Obtain data from CRD or request permission to sample annually	pH, EC, hardness, major and minor anions, dissolved metals and petroleum hydrocarbon parameters (BETX and EPH)	Follow-up Sampling and analysis; Notify EMPR Consult with MoE; Develop mitigation plan; Implement mitigation plan; Continue monitoring and sampling
MW00-1B (deep)	Pre-operations: quarterly (for one year)		
MW00-1A (shallow)			
MW00-2 (shallow)			
MW00-3 (deep)	Operations: biannually		

\* Exceedances are to be determined by comparing analyses of groundwater sampling to the BC Source Drinking Water Quality Guidelines (SDWQGs), and the BC Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report by MoE, latest edition.

**Monitoring Results and Reporting**

9. EMPR must be notified of any exceedances from the above sampling as soon as possible after receipt of results by the Permittee.
10. Surface and groundwater monitoring data must be compiled into a site-wide annual monitoring and sampling results report, which shall form part of the Annual Summary. The completed report must be received by the Inspector on or before March 31 of each year and shall contain the required information from the previous calendar year (Report Year).

### Invasive Plant Monitoring

11. Monitoring of invasive plants must take place in cleared areas, especially those areas adjacent to neighbouring lands where invasive plants may persist and where active control cannot be undertaken, and near any environmentally sensitive features and established buffers.

## **15. Ecological and Wildlife Management**

- (a) The minimum distances of vegetated buffers undisturbed by mining activities, must be maintained around the quarry as shown on the Revised Phase Plan and as described below:
- 5m along the south property line west of the large fir tree,
  - 56.7m along the south property line east of the large fir tree,
  - 30m around the large fir tree,
  - Minimum of 50m from Teanook Creek,
  - 20m from Thetis Lake Regional Park,
  - 5m along the property line adjacent to the CRD property,
  - 30m along ephemeral water course adjacent to Millstream Road
- (b) Vegetation clearing, grubbing and overburden stripping must be carried out consistent with the mining phases to maintain as large a buffer as possible between the quarry operations and local residents for as long as possible.
- (c) Vegetation clearing must be minimized to maintain as much existing vegetation as practicable and shall occur outside the nesting period from March 1 to August 31 to reduce impacts on bird species.
- (1) A search for and survey of bird nests (eagles, peregrine falcons, gyrfalcon, ospreys and herons) protected under Section 34(b) of the Wildlife Act must be conducted by a Qualified Environmental Professional (QEP) before the start of vegetation clearing.
- (2) Should the nest of a bird requiring protection under Section 34(b) of the Wildlife Act be located, the recommended buffer distances must be referred to in Table 4.1 (Section 4) of Develop with Care: Environmental Guidelines for Urban and Rural Land Development in BC (see MOE 2014) available at <http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/index.html>
- (d) All grubbing, stump grinding, and stripping will be completed during the months of October through to February.
- (e) Prior to logging and land clearing, a Qualified Environmental Professional (QEP) must design and direct species survey and salvage plans as per the Ecological Values and Management Plan in Appendix VI of EEMR.

- (1) The Permittee must, with the appropriate permits, salvage listed species and other species of concern where feasible;
  - (2) The species for salvage must include amphibians (Including red-legged frog), reptiles (including sharp-tailed snakes) and plants. Plant salvage must be based on a need for beneficial end-uses in offsite locations for specific plant stock;
  - (3) The dewatering of the wetlands prior to quarrying must not happen in the breeding and rearing period, but at proper times as determined by the QEP;
  - (4) Captured amphibians must be moved to appropriate relocation site(s) outside the mine permit area in compliance with a Wildlife Act permit and with the consent of the recipient landowner/land manager.
- (f) Best Management Practices for Raptor Conservation during Urban and Rural Land Development in BC must be followed.
- (g) Vegetated buffers as described in the EEMR and as shown in the Revised Phase Plan must be retained around the perimeter of the excavated area as shown on the Revised Phase Plan. Select vegetation within the buffer areas may be removed if it is determined to be a hazard to health and safety to workers or the public.
- (h) Invasive species must be removed and controlled as follows:
- (1) The permittee must restrict the extent of cleared areas to the footprint of the current mining phase and to no more than 20 percent of the next phase, to limit the spread of invasive species;
  - (2) Invasive plants must be removed by hand or using approved herbicides and disposed of through existing CRD programs.
- (i) The boundary between the buffer areas and the quarry area must be flagged or otherwise appropriately marked prior to cutting and clearing of each quarry phase to prevent entry into it by machinery or debris or other means of disturbance.

## **16. Fire**

- (a) All work must be suspended during any forest closures relating to fire hazard conditions as determined by the Ministry of Forests, Land and Natural Resource Operations.
- (b) The Permittee must maintain an adequate supply of freshwater and firefighting equipment on site for fire protection purposes during the fire season. Firefighting equipment must be maintained in good condition, in accordance with the Forest Fire Prevention and Suppression Regulation.

## **17. Reclamation and Use of Site**

- (a) Derelict or damaged equipment must not be stored or abandoned on the

site. The site must not be used for the disposal of items including but not restricted to, garbage, wood waste, toxic materials, and petroleum waste.

- (b) All waste and refuse must be controlled so as not to attract wildlife or other pests and must be removed from the site on a frequent and regular basis.
- (c) With the exception of the access road and Phase 2, excavation of a mining phase must not exceed more than 30% until reclamation has commenced in the previously excavated phase.
- (d) Topsoil and overburden must be stockpiled separately for future reclamation and effectively managed by whatever means (including use of a physical membrane or cover or use of weed-free native species ground cover vegetation).
- (e) Invasive plant species must be controlled on the reclaimed site to prevent their establishment and spread.
- (f) The quarry area must undergo progressive reclamation that includes the replacement of overburden and topsoil with vegetation over the life of the quarry with a focus on, 1) reclamation of catchment berms (horizontal benches) and, 2) peripheral areas of the final quarry floor, and, 3) those areas that are no longer required for mining or mining-related activities.