

PROVINCE OF BRITISH COLUMBIA  
MINISTRY OF ENERGY AND MINES

APPROVAL OF WORK SYSTEM  
AND  
PERMIT APPROVING RECLAMATION PROGRAM - PLACER OPERATIONS  
(Issued pursuant to Section 10 of the *Mines Act* R.S.B.C. 1996, c. 293)

Permit No.: **P-1-720** Mine No.: **0100197**

Issued to: **Otter Creek Mines**  
**11204 40th Avenue**  
**Edmonton AB T6J 0R2**

for placer work on the following claims and/or leases: : **PL 572210**

Map Reference: **NTS:** **Lat: 59.59667** **Long: -133.38360**  
**Trim: 104N054** **Northing: 6607605** **Easting: 591248**

Located at: **Wenzel/Otter** Authorization No. **15-0100197-0922**

**Approved Work:** (As per attached mine plan)

**Infrastructure:** Use of existing office infrastructure onsite (no camp is authorized).

**Exploration Activities:** Drilling in advance of pit development for mine planning purposes.

**Access:** Modification of 1.4km of existing trails. Construction of 0.75km of access.

**Mines Areas:** 6 consecutive pits (total size 65m x 600m)

**Stockpiles:** Overburden Stockpile (100m x 600m), temporary pay stockpile, and fine tailings stockpile are authorized.  
No waste rock or coarse tailings stockpiles are authorized, continuous backfilling to existing open pits is required.

**Processing Infrastructure:** Movement of existing wash plant to new location and construction of 2 settling ponds.

**Stream Diversion:** Temporary stream diversion structure is approved as per "Application for Approval of an Approximate 600m Temporary Diversion" dated June 18, 2015.

**All outstanding liabilities are maintained under this permit:** These include existing reclamation obligations from operations dating back to original approval of June 15, 2011 and are outlined in the "Reclamation Plan for Previous Disturbances".

**Total new disturbance: ~8 ha**

**Pay Dirt Production: ~19,500 m3/yr**

**The Approval of the work system is issued seasonally (during the snow-free months) for the period September 22, 2015 to March 31, 2021. The approval is issued conditionally and will be reviewed on March 31 of every calendar year as per the appended conditions specifically related to annual reclamation targets and operational mine plans.**

This Approval and Permit are issued pursuant to Section 10 of the *Mines Act*, and are subject to the appended conditions.


Issued the 15<sup>th</sup> day of June in the year 2011.

Amended June 17, 2013.

Amended February 25, 2015

Amended September 22, 2015

Issued this 11<sup>th</sup> day of April in the year 2017.

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

## PREAMBLE

### Whereas:

1. Notice of intention to commence work was given on **April 24, 2015** (final amendment dated **June 18, 2015**).
2. A report and plan of the work system for the proposed placer exploration and/or development and/or mining activities (hereinafter termed the "Operations"), was filed with the Inspector of Mines on **2015 April 24, 2015** (final amendment dated **June 18, 2015**).
3. A proposed program for the protection and reclamation of the surface of the land and watercourses affected by the Operations (hereinafter termed the "Program"), was filed with the Inspector of Mines on **2015 April 24, 2015** (final amendment dated **June 18, 2015**).

### APPROVAL OF THE WORK SYSTEM (the "Operations")

The Chief Inspector of Mines (Chief Inspector) hereby approves the report of the work system for the proposed Operations for the stated period, subject to compliance with the following conditions:

1. **Mine Plan Modifications:**

The owner, agent or manager (herein called the Permittee) shall not depart from the report and plan of the work system to any substantial degree without the written approval of the Inspector of Mines.

2. **Mines Act and Code:**

The Permittee shall comply with all of the provisions of the **Mines Act** and the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

3. **Termination of Work:**

Pursuant to Part 10.6.1 of the **Code**, notice of intention to stop work shall be filed with the Inspector of Mines not less than seven (7) days prior to cessation of work.

4. **Term of Approval:**

The Permittee shall not perform work on the subject placer mining property after the termination of the period for which implementation of the proposed Operations has been approved without first applying for, and receiving the approval of, the Inspector of Mines.

5. **Documentation:**

While it remains valid and subsisting, a copy of this Approval must be kept at the subject placer mining property, and must be available to authorized inspectors and other authorized government officials.

**PERMIT APPROVING RECLAMATION PROGRAM (the "Program")**

The Chief Inspector of Mines (Chief Inspector) hereby approves the proposed Program for protection and reclamation of the land and watercourses affected by the approved Operations, subject to compliance with the following conditions:

1. **Mines Act and Code:**

The permittee shall comply with all of the provisions of the **Mines Act** and the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

2. **Reclamation Security:**

- (a) The Permittee shall maintain with the Minister of Finance security in the amount of **one hundred thousand Dollars (\$100,000)**. The security will be held by the Minister of Finance and for the proper performance of the approved program and all the conditions of this permit in a manner satisfactory to the Chief Inspector.
- (b) The Permittee shall conform to all forest tenure requirements of the Ministry of Forests, Lands and Natural Resources Operations. 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.
- (c) The Permittee shall conform to all Ministry of Environment approvals, licenses and permit conditions, 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 fulfill these requirements.

3. **Obligation to Reclaim:**

During the entire period of the Operations, the Permittee shall:

- (a) continually and progressively reclaim the surface of the land affected by the Operations in accordance with the approved Program; and
- (b) Complete the targets outlined in the reclamation plan described as "Reclamation Plan for Previous Disturbance",

- (c) Submit an updated **operational reclamation plan** on **March 31** of every calendar year, describing reclamation targets for the upcoming season for review and acceptance by an Inspector of Mines, and
- (d) in each year of the Operations, where required by the Chief Inspector, deposit security in an amount and form satisfactory to the Chief Inspector, so that, together with the deposit made under Condition 2 (a) above, and calculated over the estimated life of the Operations, there will be money necessary to perform and carry out properly:
  - (i) all of the requirements of the approved Program at the proper time, and
  - (ii) all of the orders and directions of the Chief Inspector or an Inspector respecting the execution of the approved Program.

**4. Technical Conditions and Limitations on Operations - I:**

The Permittee shall conduct the Operations and carry out the Program in compliance with the following conditions and constraints, unless exempted by the Inspector of Mines after consultation with the appropriate staff in other government agencies and consideration of their concerns:

**(a) Topsoil and Overburden:**

Topsoil and overburden (to rooting depth) shall not be removed from the subject placer mining property, but shall be removed from operational areas first, and stockpiled separately in a manner which is adequate to prevent their entry into any watercourse, and which makes possible their re-use for reclamation purposes.

**(b) Location of Facilities:**

Access road construction shall be performed in compliance with Part 9.10.1, of the Code, as well as with the conditions of this Permit.

**(c) Protection of Watercourses, Fish and Wildlife:**

- (i) Forest cover and vegetation within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse shall not be disturbed or removed (unless described as part of the approved temporary stream diversion). (Streamside vegetation provides food and cover for fish, and wetlands also provide important wildlife habitat).
- (ii) Every effort shall be made to minimize the impacts of access development and mining operations on fisheries and wildlife habitats, and to maximize the opportunity to reclaim the minesite upon abandonment.



- (iii) Forest cover, topsoil and debris shall be disposed of in such a manner as to prevent their entry into any watercourse, defined as any stream, lake, pond, river, creek, spring, ravine or swamp.
- (iv) Gravel or other material shall not be displaced, or removed from, within a stream channel or within a minimum of ten (10) horizontal metres of the natural boundary\* of any regulated watercourse or any unregulated watercourse with intact riparian vegetation (unless described as part of the approved temporary stream diversion).
- (v) Machinery and equipment shall not be operated within the wetted perimeter of any regulated watercourse.
- (vi) Neither tailings nor any part of any tailings pond or settling pond shall be located within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse, and where water infiltrates to ground, this must not result in the entry of suspended solids into watercourses downstream of the Operations.
- (vii) All mined or otherwise disturbed ground surfaces, including cut banks, fill slopes and tailings piles, shall be stabilized annually by contouring and where necessary re-vegetating to prevent erosion and surface run-off from carrying sediment into adjacent watercourses.
- (viii) Locations for storage of fuel shall be sited and designed in a manner which will prevent any spillage entering any watercourse. Fuel storage in excess of 25 litres shall be located on an impermeable base within a berm of sufficient height to fully contain any spillage which may occur.

**\*Note to Condition 4(c):**

**Natural Boundary** means the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual and so long continued as to mark upon the soils of the bed of the lake, river, stream or other body of water a character distinct from that of the banks, thereof, both in respect to vegetation, and in respect to the nature of the soil itself. In addition, the best estimates of the edges of dormant or old side channels and marsh areas are considered to be natural boundaries for the purposes of **Condition 4(c)**.

**(d) Suction Dredging:**

Suction dredging is not approved under this Permit.

**(e) Condition of the Land:**

At the termination of the Operations each year, disturbed areas are to be left in a neat, clean, and safe condition. At the final completion of the Operations, all areas shall be

leveled to conform with the natural terrain, covered with topsoil or overburden, and conditions established for natural re-vegetation on lands previously vegetated. All disturbed areas shall be reclaimed to the satisfaction of the Chief Inspector.

**(f) Buildings:**

Buildings will only be permitted if they are required for the Operations, and can be constructed only following written approval of the Inspector of Mines. At the completion of the Operations, all buildings are to be completely removed from the site, and any foundations must be covered with overburden and revegetated.

**(g) Equipment:**

At the final completion of the Operations, all equipment is to be completely removed from the subject placer mining property.

**(h) Trees and Slash:**

At the completion of the Operations, all dead trees and slash must be scattered to facilitate natural revegetation.

**5. Technical Conditions and Limitations on Operations - II:**

The Permittee shall conduct the Operations and carry out the Program in compliance with the following conditions and constraints, unless exempted by means of either appropriate formal approvals from other government agencies (as identified), or, where appropriate, by consents from relevant private parties:

**(a) Protection of Watercourses and Fish:**

- (i)** Water intakes and those diversions authorized under Condition **5(e)** (see below) shall be screened, in accordance with the specifications of the Department of Fisheries and Oceans and the Ministry of Environment, to prevent the entry of fish.
- (ii)** Monitoring of suspended solids using an Imhoff Cone shall be conducted on a weekly basis at a set of locations upstream and downstream of the approved mine plan (the locations must be fixed, recorded and clearly marked in the field). Records of this monitoring data shall be kept onsite and be made available to an inspector of mines upon request.

**(b) Waste Management:**

The Permittee must adhere to the **Environmental Management Act**, unless exempted under the terms of the **Placer Mining Waste Control Regulation**, which allows certain placer mining activities without a permit in the following circumstances:

(i) Mining production is such that no chemicals or mercury are used to recover a mineral, and tailings are discharged to a tailings pond with a minimum of 0.5 metres of freeboard, and the water in the tailings pond:

- A. is pumped back to the Operations for reuse; or
- B. is left in the pond and allowed to seep into the ground in a manner which does not result in the entry of suspended solids into a body of water at any point downstream of the Operations; or
- C. is partly pumped back, as referred to in subparagraph (A), and is partly left, as referred to in subparagraph (B), or
- D. the mine is located, as shown on the National Topographic System of Mapping, on Birch Creek 104N/11W, Boulder Creek 104N/11W, Ruby Creek 104N/11W, Otter Creek and its tributaries 104N/11W, Wright Creek 104N/11W, Quartz Creek 104N/11E, Spruce Creek and its tributaries 104N/11W and 104N/12E, Pine Creek between Birch Creek and Atlin Lake 104N/11W and 104N/12E, McKee Creek 104N/5E and 104N/6W, Snowy Creek 104P/5E, or Dease Creek 104J/9E.

(iii) The person carrying out the Operations provides to the Regional Waste Manager, Ministry of Environment on his request, information which allows him to determine the existence and extent of the discharge of waste, and to determine that no permit or approval is required.

**(c) Beaver Dams:**

Disturbance or removal of beaver dams is not approved under this Permit.

**(d) Diversion of Watercourses:**

A temporary stream diversion is approved as per "Application for Approval of an Approximate 600m Temporary Diversion" dated **June 18, 2015**.

- (i) Construction of the stream diversion is to be under the supervision of a qualified professional.
- (ii) As-built drawings are to be submitted to the Ministry of Energy and Mines and Water Stewardship Branch of the Ministry of Forests, Lands and Natural

Resource Operations within 30 days of completion of construction. Written acceptance from an Inspector of Mines is required prior to Otter Creek being diverted into the constructed channel.

- (iii) A final reclamation plan outlining the location and design of Otter Creek's permanent channel must be submitted for review and acceptance by an Inspector of Mines prior to **March 31, 2020**.

(e) **Forest Resources:**

Cutting of trees is **not approved** under this Permit; however the required associated cutting of up to 50m<sup>3</sup> of trees is authorized under **FUP # P-1-720/2015-2021**.

(f) **Access from Public Highways:**

Development of road access from a public highway is not approved under this Permit.

(g) **Heritage Resources:**

Disturbance or salvage of heritage resources is not approved under this Permit. An Archaeological Chance Find procedure is required and must be implemented by all persons working on the placer property.

6. **Annual Reporting:**

- (a) Pursuant to **Part 10.1.4 (5)** of the Code, the Permittee shall submit an updated operational reclamation plan on **March 31** of every calendar year, describing reclamation targets for the upcoming season, and an annual report of reclamation in a summary form specified by the Chief Inspector (Annual Summary of Placer Activities, ASPA) or by conditions of the permit by **March 31** of the following year.
- (b) The reclamation targets as described in the previous year's operational reclamation plan will be reviewed in comparison to the ASPA. **If the approved reclamation targets have not been achieved, then the continuation of the approval for work under this permit will be reassessed by an Inspector of Mines.**

7. **Reclamation and Closure Plan:**

**One year prior to final closure or by March 31, 2020**, the Permittee shall submit a workplan to the Inspector for review and approval that describes all reclamation and closure prescriptions, including surface preparation, contouring, soil replacement, and revegetation, required to address all mine components in a manner that achieves long-term stability, water quality, and approved end land use objectives.

8. **Amendment of Permit:**

The Chief Inspector of Mines reserves the right to amend the conditions set forth in this Permit.

9. **Requisition of Security:**

Where the Permittee fails to perform and complete the Program and/or fails to comply with the conditions of this Permit in a manner satisfactory to the Chief Inspector of Mines, the Chief Inspector of Mines may apply all or part of the security alluded to in **Condition 2** towards payment of the cost of the work required to be performed and completed.

10. **Return of Security:**

On the final completion, discontinuance or abandonment of the Operations, and on the Chief Inspector of Mines being satisfied that the approved Program has been properly completed, the person who deposited the security under **Condition 2** is entitled to a refund of it, less any amount paid out under **Condition 9** (see above).

11. **Mineral Tenure:**

The Permittee may only exercise rights to undertake the Operations in accordance with all of the provisions of the **Mineral Tenure Act**, and the Operations may only be undertaken on placer mineral tenures which are in good standing, and for which the Permittee has the legal right to operate, either as tenure holder or by valid and subsisting authorization from the tenure holder. Notwithstanding any other statements and conditions in this Permit, this Permit does not approve the production of more than twenty thousand (20,000) cubic metres of pay dirt per legacy claim per year, or cell claim per year.

12. **Other Applicable Legislation:**

This Permit applies only to the requirements under the **Mines Act**, and other legislation and regulations may be applicable to the Operations.

13. **Variances:**

Where, during the course of Operations, the Permittee wishes to conduct work which does not comply with the terms and conditions of this Permit, the Permittee must apply to the Chief Inspector of Mines or the Inspector of Mines for an amendment to this Permit.

14. **Documentation:**

While they remain valid and subsisting, both this Permit and appropriate and up-to-date mineral tenure documentation (including maps of the subject placer mining property, showing both

placer claims and placer leases) must be kept at the subject placer mining property, and must be available to authorized inspectors and other authorized government officials.

15. **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.

16. **Geotechnical:**

- (a) As per Section 10.1.12 of the code, the **Chief Inspector requires** that Sections 10.1.2 through 10.1.10 of the code shall apply to this Mine. As per Section 6.1.1(3) of the code the **Chief Inspector requires** that the qualified person identified in 6.1.1(1) of the code be a qualified professional engineer.
- (b) An operational mine plan including detailed cross-sections of pit walls is required to be submitted on **March 31** of every calendar. This plan shall include all mine development for the upcoming mining season. Prior to commencement of seasonal operations written acceptance of the operational mine plan must be received from an inspector of mines. A copy of the operational mine plan must be kept onsite, and made available upon request of an inspector of mines.
- (c) The stability of the slopes shall be maintained at all times and erosion shall be controlled at all times.
- (d) The inspector shall 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.
- (e) 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 shall be reported to the inspector as soon as possible and work shall **cease until the inspector advises otherwise.**

17. **Miscellaneous:**

- (i) In order to decrease the spread of invasive plants, all equipment must be washed prior to transport to the mine site.
- (ii) Use of all terrain vehicles (ATV's) is restricted to business purposes only.
- (iii) In order to minimize sedimentation of aquatic environments you are required to install and maintain erosion control measures wherever possible.

- (iv) In order to aid reclamation of natural habitat you are requested to follow Section 8 of the BMP's where possible, in particular Sections 8.11 and 8.12.
- (v) Section 8.1 of the Atlin Placer Mining Best Management Practices Guidebook (BMP's) speaks to reclamation planning and considerations. A final reclamation plan that addresses the key objectives outlined within the BMP's shall be created by the Permittee in consultation with the Taku River Tlingit First Nation (TRTFN), and forwarded to MEM for review and approval.
- (vi) As per Parts 10.7.4 to 10.7.6 and 10.7.9 of the Code, upon completion of mining, disturbed areas shall be re-sloped consistent with surrounding topography, and reclaimed to ensure long-term stability and erosion control to match natural landforms. A final reclamation plan shall include details on how any stream diversions and final pit will be reclaimed.
- (vii) As per Sections 3 and 6 of this permit, an updated operational reclamation plan and report is due by **June 30, 2017**, and in subsequent years by **March 31**.





PROVINCE OF BRITISH COLUMBIA  
MINISTRY OF ENERGY AND MINES

APPROVAL OF WORK SYSTEM  
AND  
PERMIT APPROVING RECLAMATION PROGRAM - PLACER OPERATIONS  
(Issued pursuant to Section 10 of the **Mines Act** R.S.B.C. 1996, c. 293)

Permit No.: **P-4-178** Mine No.: **1640630**

Issued to: **Allgold BC Ltd.**  
**2772 - 1055 West Georgia st**  
**Vancouver BC V6E 3R5**

for placer work on the following claims and/or leases:

**PL 777122, PC 404897-900, 555736, 568597, 671624, 777122, 860667, 860947, 937831, 983402, 1015286, 1039618, 1039620, 1039622**

Map Reference: **NTS:** Lat: **52.74385** Long: **-122.13680**  
Trim: **093B080** Northing: **5844126** Easting: **558271**

Located at: **East side of Quesnel River – Access via 500 Road and J Road**

**The Approval of the work system is issued for the period Friday, April 1, 2016 to Monday, December 31, 2018.**

This Approval and Permit are issued pursuant to Section 10 of the **Mines Act**, and are subject to the appended conditions.

Issued this 30th day of March in the year 2016.



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**Grant Feldinger**  
**Inspector of Mines**



## PREAMBLE

Whereas:

1. Notice of intention to commence work was given on **Tuesday, January 19, 2016**
2. A report and plan of the work system for the proposed placer exploration and/or development and/or mining activities (hereinafter termed the "Operations"), dated **Wednesday, January 20, 2016**, was filed with the Inspector of Mines on **Tuesday, January 19, 2016**.
3. A proposed program for the protection and reclamation of the surface of the land and watercourses affected by the Operations (hereinafter termed the "Program"), dated **Wednesday, January 20, 2016**, was filed with the Inspector of Mines on **Tuesday, January 19, 2016**.

## APPROVAL OF THE WORK SYSTEM (the "Operations")

The Chief Inspector of Mines (Chief Inspector) hereby approves the report of the work system for the proposed Operations for the stated period, subject to compliance with the following conditions:

1. **Mine Plan Modifications:**

The owner, agent or manager (herein called the Permittee) shall not depart from the report and plan of the work system to any substantial degree without the written approval of the Inspector of Mines.

2. **Mines Act and Code:**

The Permittee shall comply with all of the provisions of the **Mines Act** and the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

3. **Termination of Work:**

Pursuant to Part 10.5.1 of the **Code**, notice of intention to stop work and a report of work done shall be filed with the Inspector of Mines not less than seven (7) days prior to cessation of work.

4. **Term of Approval:**

The Permittee shall not perform work on the subject placer mining property after the termination of the period for which implementation of the proposed Operations has been approved without first applying for, and receiving the approval of, the Inspector of Mines.

5. **Documentation:**

While it remains valid and subsisting, a copy of this Approval must be kept at the subject placer mining property, and must be available to authorized inspectors and other authorized government officials.

**PERMIT APPROVING RECLAMATION PROGRAM (the "Program")**

The Chief Inspector of Mines (Chief Inspector) hereby approves the proposed Program for protection and reclamation of the land and watercourses affected by the approved Operations, subject to compliance with the following conditions:

1. **Mines Act and Code:**

The permittee shall comply with all of the provisions of the **Mines Act** and the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

2. **Reclamation Security:**

- (a) The Permittee shall maintain with the Minister of Finance security in the amount of one hundred thousand dollars (\$100,000). The security will be held by the Minister of Finance and for the proper performance of the approved program and all the conditions of this permit in a manner satisfactory to the Chief Inspector.
- (b) The Permittee shall conform to all forest tenure requirements of the Ministry of Forests, Lands and Natural Resources Operations. 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.
- (c) The Permittee shall conform to all Ministry of Environment approvals, licenses and permit conditions, 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 fulfill these requirements.

**3. Obligation to Reclaim:**

During the entire period of the Operations, the Permittee shall:

- (a) continually and progressively reclaim the surface of the land affected by the Operations in accordance with the approved Program; and
- (b) in each year of the Operations, where required by the Chief Inspector, deposit security in an amount and form satisfactory to the Chief Inspector, so that, together with the deposit made under Condition 2 (a) above, and calculated over the estimated life of the Operations, there will be money necessary to perform and carry out properly:
  - (i) all of the requirements of the approved Program at the proper time, and
  - (ii) all of the orders and directions of the Chief Inspector or an Inspector respecting the execution of the approved Program.

**4. Technical Conditions and Limitations on Operations - I:**

The Permittee shall conduct the Operations and carry out the Program in compliance with the following conditions and constraints, unless exempted by the Inspector of Mines after consultation with the appropriate staff in other government agencies and consideration of their concerns:

**(a) Topsoil and Overburden:**

Topsoil and overburden (to rooting depth) shall not be removed from the subject placer mining property, but shall be removed from operational areas first, and stockpiled separately in a manner which is adequate to prevent their entry into any watercourse, and which makes possible their re-use for reclamation purposes.

**(b) Location of Facilities:**

Access road construction shall be performed in compliance with Part 9.10.1, of the Code, as well as with the conditions of this Permit.

**(c) Protection of Watercourses, Fish and Wildlife:**

For areas other than those described in Condition 14(k):

- (i) Forest cover and vegetation within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse shall not be disturbed or removed. (Streamside vegetation provides food and cover for fish, and wetlands also provide important wildlife habitat).

- (ii) Every effort shall be made to minimize the impacts of access development and mining operations on fisheries and wildlife habitats, and to maximize the opportunity to reclaim the minesite upon abandonment.
- (iii) Forest cover, topsoil and debris shall be disposed of in such a manner as to prevent their entry into any watercourse, defined as any stream, lake, pond, river, creek, spring, ravine or swamp.
- (iv) Gravel or other material shall not be displaced, or removed from, within a stream channel or within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse.
- (v) Machinery and equipment shall not be operated within the wetted perimeter of any regulated watercourse.
- (vi) Neither tailings nor any part of any tailings pond or settling pond shall be located within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse, and where water infiltrates to ground, this must not result in the entry of suspended solids into watercourses downstream of the Operations.
- (vii) All mined or otherwise disturbed ground surfaces, including cut banks, fill slopes and tailings piles, shall be stabilized annually by contouring and revegetating to prevent erosion and surface run-off from carrying sediment into adjacent watercourses.
- (viii) Locations for storage of fuel shall be sited and designed in a manner which will prevent any spillage entering any watercourse. Fuel storage in excess of 25 litres shall be located on an impermeable base within a berm of sufficient height to fully contain any spillage which may occur.

**\*Note to Condition 4(c):**

**Natural Boundary** means the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual and so long continued as to mark upon the soils of the bed of the lake, river, stream or other body of water a character distinct from that of the banks, thereof, both in respect to vegetation, and in respect to the nature of the soil itself. In addition, the best estimates of the edges of dormant or old side channels and marsh areas are considered to be natural boundaries for the purposes of Condition **4(c)**.

**(d) Suction Dredging:**

Suction dredging is not approved under this Permit.

**(e) Condition of the Land:**

At the termination of the Operations each year, disturbed areas are to be left in a neat, clean and safe condition. At the final completion of the Operations, all areas shall be leveled to conform with the natural terrain, covered with topsoil or overburden, and revegetated. All disturbed areas shall be reclaimed to the satisfaction of the Chief Inspector.

**(f) Buildings:**

Buildings will only be permitted if they are required for the Operations, and can be constructed only following written approval of the Inspector of Mines. At the completion of the Operations, all buildings are to be completely removed from the site, and any foundations must be covered with overburden and revegetated.

**(g) Equipment:**

At the final completion of the Operations, all equipment is to be completely removed from the subject placer mining property.

**(h) Trees and Slash:**

At the completion of the Operations, all dead trees and slash must be scattered to facilitate natural revegetation.

**5. Technical Conditions and Limitations on Operations - II:**

The Permittee shall conduct the Operations and carry out the Program in compliance with the following conditions and constraints, unless exempted by means of either appropriate formal approvals from other government agencies (as identified), or, where appropriate, by consents from relevant private parties:

**(a) Protection of Watercourses and Fish:**

**(i)** Water intakes and those diversions authorized under Condition **5(e)** (see below) shall be screened, in accordance with the specifications of the Department of Fisheries and Oceans and the Ministry of Environment, to prevent the entry of fish.

**(b) Agricultural Land Reserve:**

If the subject placer mining property is wholly or partially situated within an Agricultural Land Reserve (as denoted on the Agricultural Land Reserve maps, which may be viewed in both the local regional district office and the local B.C. Lands office), the following conditions apply:

- (i) The Operations cannot take place on, or create debilitation or disturbance of, cultivated agricultural lands.
- (ii) Access needed for the purpose of implementing the Operations and Program may be located through cultivated land, provided that the owner of the land gives written approval and further, provided that any land debilitated or disturbed by the access is repaired or rehabilitated to its prior state or condition or better on completion of the Operations.
- (iii) There shall be no disturbance of, or interference with, fences, gates, cattleguards and other farm-related developments and structures without the written approval of the owner of the land, lessee or an individual holding a water licence on the subject placer mining property.
- (iv) Any Agricultural Land Reserve lands which are not covered by Conditions **5 (b)(i), (ii) and (iii)**, and which are disturbed or debilitated by the Operations, shall be reclaimed in accordance with the requirements of the **Mines Act and Code** and of this Permit.
- (v) There must be compliance with all other legislation, including land use by-laws of a municipality or regional district, and also with decisions of any responsible authority which may be applicable.

**(c) Waste Management:**

The Permittee must adhere to the **Environmental Management Act**, unless exempted under the terms of the **Placer Mining Waste Control Regulation**, which allows certain placer mining activities without a permit in the following circumstances:

- (i) Mining production is such that no chemicals or mercury are used to recover a mineral, and tailings are discharged to a tailings pond with a minimum of 0.5 metres of freeboard, and the water in the tailings pond:
  - A. is pumped back to the Operations for reuse; or



- B.** is left in the pond and allowed to seep into the ground in a manner which does not result in the entry of suspended solids into a body of water at any point downstream of the Operations;  
or
  - C.** is partly pumped back, as referred to in subparagraph (A), and is partly left, as referred to in subparagraph (B), or
  - D.** the mine is located, as shown on the National Topographic System of Mapping, on Birch Creek 104N/11W, Boulder Creek 104N/11W, Ruby Creek 104N/11W, Otter Creek and its tributaries 104N/11W, Wright Creek 104N/11W, Quartz Creek 104N/11E, Spruce Creek and its tributaries 104N/11W and 104N/12E, Pine Creek between Birch Creek and Atlin Lake 104N/11W and 104N/12E, McKee Creek 104N/5E and 104N/6W, Snowy Creek 104P/5E, or Dease Creek 104J/9E.
- (ii) The person carrying out the Operations provides to the Regional Waste Manager, Ministry of Environment on his request, information which allows him to determine the existence and extent of the discharge of waste, and to determine that no permit or approval is required.

**(d) Beaver Dams:**

Disturbance or removal of beaver dams is not approved under this Permit.

**(e) Diversion of Watercourses:**

Diversion of watercourses and other changes in and about a stream are not approved under this Permit.

**(f) Forest Resources:**

Cutting of trees is not approved under this Permit.

**(g) Access from Public Highways:**

Development of road access from a public highway is not approved under this Permit.

**(h) Heritage Resources:**

Disturbance or salvage of heritage resources is not approved under this Permit. An Archaeological Chance Find procedure is required and must be implemented by all persons working on the placer property.

**6. Notice of Closure:**

A report of reclamation shall be filed with the Inspector of Mines not less than seven (7) days prior to cessation of work, and this report shall accompany the notice which is required upon cessation of work under Part 10.6.1 of the **Code**.

**7. Amendment of Permit:**

The Chief Inspector of Mines reserves the right to amend the conditions set forth in this Permit.

**8. Requisition of Security:**

Where the Permittee fails to perform and complete the Program and/or fails to comply with the conditions of this Permit in a manner satisfactory to the Chief Inspector of Mines, the Chief Inspector of Mines may apply all or part of the security alluded to in Condition **2** towards payment of the cost of the work required to be performed and completed.

**9. Return of Security:**

On the final completion, discontinuance or abandonment of the Operations, and on the Chief Inspector of Mines being satisfied that the approved Program has been properly completed, the person who deposited the security under Condition **2** is entitled to a refund of it, less any amount paid out under Condition **8** (see above).

**10. Mineral Tenure:**

The Permittee may only exercise rights to undertake the Operations in accordance with all of the provisions of the **Mineral Tenure Act**, and the Operations may only be undertaken on placer mineral tenures which are in good standing, and for which the Permittee has the legal right to operate, either as tenure holder or by valid and subsisting authorization from the tenure holder. Notwithstanding any other statements and conditions in this Permit, this Permit does not approve the production of more than twenty thousand (20,000) cubic metres of pay dirt per legacy claim per year, or cell claim per year.

**11. Other Applicable Legislation:**

This Permit applies only to the requirements under the **Mines Act**, and other legislation and regulations may be applicable to the Operations.

**12. Variations:**

Where, during the course of Operations, the Permittee wishes to conduct work which does not comply with the terms and conditions of this Permit, the Permittee must apply to the Chief Inspector of Mines or the Inspector of Mines for an amendment to this Permit.

**13. Documentation:**

While they remain valid and subsisting, both this Permit and appropriate and up-to-date mineral tenure documentation (including maps of the subject placer mining property, showing both placer claims and placer leases) must be kept at the subject placer mining property, and must be available to authorized inspectors and other authorized government officials.

**14. Other Conditions:**

- a) The operator shall comply with the conditions of the March 4, 2016 letter issued by the Agricultural Land Commission.
- b) All water from the wash plant or sluice shall be directed into a suitably sized settling pond and re-circulated and there shall be no discharge from the settling pond.
- c) Prior to the removal of equipment from the site, all disturbances shall be cleaned of debris, contoured and revegetated using a mixture appropriate for the area.
- d) Overburden and topsoil stockpiles shall be revegetated to mitigate the propagation of noxious weeds.
- e) Sediment laden water shall be suitably contained on site and not be allowed free access to any water body or creek.
- f) Liquid hydrocarbon products shall be stored within a containment that minimizes the possibility of accidental discharge to the environment.
- g) Unless authorized by an inspector, bulk liquid hydrocarbon products shall not be stored within 30 metres of a stream, lake or wetland.
- h) All equipment used shall be re-fuelled by means to ensure no fuel spillage. An emergency spill kit must be available on site.

- i) For every year the permit is in effect, an Annual Summary of Placer Activities (ASPA) is required for the calendar year in which activities are conducted. For MYAB permits a Placer MYAB Work Program Annual Update must be submitted with the ASPA, and both forms must be provided to this office by March 31 each year, and at least 30 days prior to the proposed re-commencement of activities. Work cannot commence until these forms have been accepted by the Inspector.
- j) The permittee is responsible for the existing reclamation liability under Permits P-4-178 and P-4-381.
- k) Exploration activities on this permit are within areas designated as Critical Fish Habitat under the Cariboo-Chilcotin Land Use Plan. These areas require additional riparian setbacks to adequately protect valuable fish habitat. Unless exempted by an inspector in writing, the following conditions shall apply:
  - Forest cover and vegetation within a minimum of thirty (30) horizontal metres of the natural boundary\* of the Quesnel River shall not be disturbed or removed. (Streamside vegetation provides food and cover for fish, and wetlands also provide important wildlife habitat).
  - Gravel or other material shall not be displaced, or removed from, within a stream channel or within a minimum of thirty (30) horizontal metres of the natural boundary\* of the Quesnel River.
  - Neither tailings nor any part of any tailings pond or settling pond shall be located within a minimum of thirty (30) horizontal metres of the natural boundary\* of the Quesnel River, and where water infiltrates to ground, this must not result in the entry of suspended solids into watercourses downstream of the Operations.

PROVINCE OF BRITISH COLUMBIA  
MINISTRY OF ENERGY AND MINES

APPROVAL OF WORK SYSTEM  
AND  
PERMIT APPROVING RECLAMATION PROGRAM - PLACER OPERATIONS  
(Issued pursuant to Section 10 of the Mines Act R.S.B.C. 1996, c. 293)

Permit No.: **P-4-324** Mine No.: **1621217**

Issued to: **Federation Mining Ltd.  
2677 Grant St.  
Vancouver, BC V5K 3G8**

for placer work on the following claims and/or leases: **PC 849397**

Map Reference: **NTS:** Lat: **52.94010** Long: **-122.05090**  
Trim: **093B100** Northing: **5866029** Easting: **563782**

Located at: **Swift River**

**The Approval of the work system is issued for the period April 1, 2015 to December 31, 2017.**

This Approval and Permit are issued pursuant to Section 10 of the **Mines Act**, and are subject to the appended conditions.

Issued this 22nd day of January in the year 2015.



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**Tom Charles**  
**Inspector of Mines**

## PREAMBLE

Whereas:

1. Notice of intention to commence work was given on **December 8, 2014**.
2. A report and plan of the work system for the proposed placer exploration and/or development and/or mining activities (hereinafter termed the "Operations"), dated **December 8, 2014**, was filed with the Inspector of Mines on **December 8, 2014**.
3. A proposed program for the protection and reclamation of the surface of the land and watercourses affected by the Operations (hereinafter termed the "Program"), dated **December 8, 2014**, was filed with the Inspector of Mines on **December 8, 2014**.

## APPROVAL OF THE WORK SYSTEM (the "Operations")

The Chief Inspector of Mines (Chief Inspector) hereby approves the report of the work system for the proposed Operations for the stated period, subject to compliance with the following conditions:

1. **Mine Plan Modifications:**

The owner, agent or manager (herein called the Permittee) shall not depart from the report and plan of the work system to any substantial degree without the written approval of the Inspector of Mines.

2. **Mines Act and Code:**

The Permittee shall comply with all of the provisions of the **Mines Act** and the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

3. **Termination of Work:**

Pursuant to Part 10.5.1 of the **Code**, notice of intention to stop work and a report of work done shall be filed with the Inspector of Mines not less than seven (7) days prior to cessation of work.

4. **Term of Approval:**

The Permittee shall not perform work on the subject placer mining property after the termination of the period for which implementation of the proposed Operations has been approved without first applying for, and receiving the approval of, the Inspector of Mines.

5. **Documentation:**

While it remains valid and subsisting, a copy of this Approval must be kept at the subject placer mining property, and must be available to authorized inspectors and other authorized government officials.

**PERMIT APPROVING RECLAMATION PROGRAM (the "Program")**

The Chief Inspector of Mines (Chief Inspector) hereby approves the proposed Program for protection and reclamation of the land and watercourses affected by the approved Operations, subject to compliance with the following conditions:

1. **Mines Act and Code:**

The permittee shall comply with all of the provisions of the **Mines Act** and the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

2. **Reclamation Security:**

(a) The Permittee shall maintain with the Minister of Finance security in the amount of eighty thousand dollars (\$80,000). The security will be held by the Minister of Finance and for the proper performance of the approved program and all the conditions of this permit in a manner satisfactory to the Chief Inspector.

(b) The Permittee shall conform to all forest tenure requirements of the Ministry of Forests, Lands and Natural Resources Operations. 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.

(c) The Permittee shall conform to all Ministry of Environment approvals, licences and permit conditions, 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 fulfill these requirements.

3. **Obligation to Reclaim:**

During the entire period of the Operations, the Permittee shall:

(a) continually and progressively reclaim the surface of the land affected by the Operations in accordance with the approved Program; and

- (b) in each year of the Operations, where required by the Chief Inspector, deposit security in an amount and form satisfactory to the Chief Inspector, so that, together with the deposit made under Condition 2 (a) above, and calculated over the estimated life of the Operations, there will be money necessary to perform and carry out properly:
  - (i) all of the requirements of the approved Program at the proper time, and
  - (ii) all of the orders and directions of the Chief Inspector or an Inspector respecting the execution of the approved Program.

4. **Technical Conditions and Limitations on Operations - I:**

The Permittee shall conduct the Operations and carry out the Program in compliance with the following conditions and constraints, unless exempted by the Inspector of Mines after consultation with the appropriate staff in other government agencies and consideration of their concerns:

(a) **Topsoil and Overburden:**

Topsoil and overburden (to rooting depth) shall not be removed from the subject placer mining property, but shall be removed from operational areas first, and stockpiled separately in a manner which is adequate to prevent their entry into any watercourse, and which makes possible their re-use for reclamation purposes.

(b) **Location of Facilities:**

Access road construction shall be performed in compliance with Part 9.10.1, of the Code, as well as with the conditions of this Permit.

(c) **Protection of Watercourses, Fish and Wildlife:**

- (i) Forest cover and vegetation within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse shall not be disturbed or removed. (Streamside vegetation provides food and cover for fish, and wetlands also provide important wildlife habitat).
- (ii) Every effort shall be made to minimize the impacts of access development and mining operations on fisheries and wildlife habitats, and to maximize the opportunity to reclaim the minesite upon abandonment.



- (iii) Forest cover, topsoil and debris shall be disposed of in such a manner as to prevent their entry into any watercourse, defined as any stream, lake, pond, river, creek, spring, ravine or swamp.
- (iv) Gravel or other material shall not be displaced, or removed from, within a stream channel or within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse.
- (v) Machinery and equipment shall not be operated within the wetted perimeter of any regulated watercourse.
- (vi) Neither tailings nor any part of any tailings pond or settling pond shall be located within a minimum of ten (10) horizontal metres of the natural boundary\* of any watercourse, and where water infiltrates to ground, this must not result in the entry of suspended solids into watercourses downstream of the Operations.
- (vii) All mined or otherwise disturbed ground surfaces, including cut banks, fill slopes and tailings piles, shall be stabilized annually by contouring and re-vegetating to prevent erosion and surface run-off from carrying sediment into adjacent watercourses.
- (viii) Locations for storage of fuel shall be sited and designed in a manner which will prevent any spillage entering any watercourse. Fuel storage in excess of 25 litres shall be located on an impermeable base within a berm of sufficient height to fully contain any spillage which may occur.

**\*Note to Condition 4(c):**

**Natural Boundary** means the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual and so long continued as to mark upon the soils of the bed of the lake, river, stream or other body of water a character distinct from that of the banks, thereof, both in respect to vegetation, and in respect to the nature of the soil itself. In addition, the best estimates of the edges of dormant or old side channels and marsh areas are considered to be natural boundaries for the purposes of Condition 4(c).

**(d) Suction Dredging:**

Suction dredging is not approved under this Permit.

**(e) Condition of the Land:**

At the termination of the Operations each year, disturbed areas are to be left in a neat, clean and safe condition. At the final completion of the Operations, all areas shall be levelled to conform with the natural terrain, covered with topsoil or overburden, and re-vegetated. All disturbed areas shall be reclaimed to the satisfaction of the Chief Inspector.

**(f) Buildings:**

Buildings will only be permitted if they are required for the Operations, and can be constructed only following written approval of the Inspector of Mines. At the completion of the Operations, all buildings are to be completely removed from the site, and any foundations must be covered with overburden and re-vegetated.

**(g) Equipment:**

At the final completion of the Operations, all equipment is to be completely removed from the subject placer mining property.

**(h) Trees and Slash:**

At the completion of the Operations, all dead trees and slash must be scattered to facilitate natural re-vegetation.

**5. Technical Conditions and Limitations on Operations - II:**

The Permittee shall conduct the Operations and carry out the Program in compliance with the following conditions and constraints, unless exempted by means of either appropriate formal approvals from other government agencies (as identified), or, where appropriate, by consents from relevant private parties:

**(a) Protection of Watercourses and Fish:**

**(i)** Water intakes and those diversions authorized under Condition **5(e)** (see below) shall be screened, in accordance with the specifications of the Department of Fisheries and Oceans and the Ministry of Environment, to prevent the entry of fish.

**(b) Agricultural Land Reserve:**

If the subject placer mining property is wholly or partially situated within an Agricultural Land Reserve (as denoted on the Agricultural Land Reserve maps, which may be viewed in both the local regional district office and the local B.C. Lands office), the following conditions apply:

- (i) The Operations cannot take place on, or create debilitation or disturbance of, cultivated agricultural lands.
- (ii) Access needed for the purpose of implementing the Operations and Program may be located through cultivated land, provided that the owner of the land gives written approval and further, provided that any land debilitated or disturbed by the access is repaired or rehabilitated to its prior state or condition or better on completion of the Operations.
- (iii) There shall be no disturbance of, or interference with, fences, gates, cattleguards and other farm-related developments and structures without the written approval of the owner of the land, lessee or an individual holding a water licence on the subject placer mining property.
- (iv) Any Agricultural Land Reserve lands which are not covered by Conditions 5 (b)(i), (ii) and (iii), and which are disturbed or debilitated by the Operations, shall be reclaimed in accordance with the requirements of the **Mines Act and Code** and of this Permit.
- (v) There must be compliance with all other legislation, including land use by-laws of a municipality or regional district, and also with decisions of any responsible authority which may be applicable.

**(c) Waste Management:**

The Permittee must adhere to the **Environmental Management Act**, unless exempted under the terms of the **Placer Mining Waste Control Regulation**, which allows certain placer mining activities without a permit in the following circumstances:

- (i) Mining production is such that no chemicals or mercury are used to recover a mineral, and tailings are discharged to a tailings pond with a minimum of 0.5 metres of freeboard, and the water in the tailings pond:
  - A. is pumped back to the Operations for reuse; or

- B. is left in the pond and allowed to seep into the ground in a manner which does not result in the entry of suspended solids into a body of water at any point downstream of the Operations; or
  - C. is partly pumped back, as referred to in subparagraph (A), and is partly left, as referred to in subparagraph (B), or
  - D. the mine is located, as shown on the National Topographic System of Mapping, on Birch Creek 104N/11W, Boulder Creek 104N/11W, Ruby Creek 104N/11W, Otter Creek and its tributaries 104N/11W, Wright Creek 104N/11W, Quartz Creek 104N/11E, Spruce Creek and its tributaries 104N/11W and 104N/12E, Pine Creek between Birch Creek and Atlin Lake 104N/11W and 104N/12E, McKee Creek 104N/5E and 104N/6W, Snowy Creek 104P/5E, or Dease Creek 104J/9E.
- (ii) The person carrying out the Operations provides to the Regional Waste Manager, Ministry of Environment on his request, information which allows him to determine the existence and extent of the discharge of waste, and to determine that no permit or approval is required.

**(d) Beaver Dams:**

Disturbance or removal of beaver dams is not approved under this Permit.

**(e) Diversion of Watercourses:**

Diversion of watercourses and other changes in and about a stream are not approved under this Permit.

**(f) Forest Resources:**

Cutting of trees is not approved under this Permit.

**(g) Access from Public Highways:**

Development of road access from a public highway is not approved under this Permit.

(h) **Heritage Resources:**

Disturbance or salvage of heritage resources is not approved under this Permit. An Archaeological Chance Find procedure is required and must be implemented by all persons working on the placer property.

6. **Notice of Closure:**

A report of reclamation shall be filed with the Inspector of Mines not less than seven (7) days prior to cessation of work, and this report shall accompany the notice which is required upon cessation of work under Part 10.6.1 of the **Code**.

7. **Amendment of Permit:**

The Chief Inspector of Mines reserves the right to amend the conditions set forth in this Permit.

8. **Requisition of Security:**

Where the Permittee fails to perform and complete the Program and/or fails to comply with the conditions of this Permit in a manner satisfactory to the Chief Inspector of Mines, the Chief Inspector of Mines may apply all or part of the security alluded to in Condition 2 towards payment of the cost of the work required to be performed and completed.

9. **Return of Security:**

On the final completion, discontinuance or abandonment of the Operations, and on the Chief Inspector of Mines being satisfied that the approved Program has been properly completed, the person who deposited the security under Condition 2 is entitled to a refund of it, less any amount paid out under Condition 8 (see above).

10. **Mineral Tenure:**

The Permittee may only exercise rights to undertake the Operations in accordance with all of the provisions of the **Mineral Tenure Act**, and the Operations may only be undertaken on placer mineral tenures which are in good standing, and for which the Permittee has the legal right to operate, either as tenure holder or by valid and subsisting authorization from the tenure holder. Notwithstanding any other statements and conditions in this Permit, this Permit does not approve the production of more than twenty thousand (20,000) cubic metres of pay dirt per legacy claim per year, or cell claim per year.

**11. Other Applicable Legislation:**

This Permit applies only to the requirements under the **Mines Act**, and other legislation and regulations may be applicable to the Operations.

**12. Variances:**

Where, during the course of Operations, the Permittee wishes to conduct work which does not comply with the terms and conditions of this Permit, the Permittee must apply to the Chief Inspector of Mines or the Inspector of Mines for an amendment to this Permit.

**13. Documentation:**

While they remain valid and subsisting, both this Permit and appropriate and up-to-date mineral tenure documentation (including maps of the subject placer mining property, showing both placer claims and placer leases) must be kept at the subject placer mining property, and must be available to authorized inspectors and other authorized government officials.

**14. Other Conditions:**

1. The application may be in a high archaeological potential area, so if an archaeological site is discovered, a **stop work order** applies and an AIA should be conducted immediately;
2. Progressive reclamation shall be conducted at all times;
3. Prior to removal of equipment from site, all disturbances shall be cleaned of debris, contoured and re-vegetated using a mixture appropriate for the area;
4. Overburden and topsoil stockpiles shall be re-vegetated to mitigate the propagation of noxious weeds;
5. Sediment-laden water shall be suitably contained on site and not allowed free access to any watercourse;
6. All equipment used shall be re-fuelled by means to ensure no fuel spillage and an emergency spill kit shall be available on site;
7. Riparian buffers a minimum of ten (10) horizontal metres from the natural high water mark of any watercourse shall be field-marked with ribbons, and there shall be no mechanical disturbance within the riparian buffers;
8. Fresh water pump intake (in fish-bearing streams or lakes) shall be screened to comply with Department of Fisheries and Oceans standards;
9. All equipment, camp and trailers shall be of a temporary nature and removed from the site on completion of the work exploration program;
10. Open trenches and pits shall be fenced or otherwise protected against inadvertent access by people or animals; and
11. If trees in a plantation or a reforested cut block are destroyed, restocking of the appropriate species shall be carried out as part of the reclamation plan.

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

**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-15-006**

Mine No.: **1500021**

Issued to: **Absorbent Products Ltd.**  
**724 Sarcee ST.**  
**Kamloops BC V2H 1E7**

for work located at the following property:

**Red Lake Quarry**

This approval and permit is subject to the appended conditions.

Issued this 23rd day of October in the year 2006.

*for*

*D. B. Hermann*

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

## PREAMBLE

Notice of intention to commence work on a quarry, including a 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 dated February 20, 2001, was filed with the District Inspector on February 21, 2001.

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 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.

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

## CONDITIONS

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

1. Reclamation Security
  - (a) The owner, agent or manager (herein called the Permittee) shall maintain with the Minister of Finance securities in the amount of **Seventy Thousand dollars (\$70,000)**. 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.
  - (b) The Permittee shall conform to all forest tenure requirements of the Ministry of Forests. 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.
  - (c) The Permittee shall conform to all Ministry of Water, Land & Air Protection approval, licence and permit conditions, 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 fulfill these requirements.



2. Land Use

The surface of the land and watercourses shall be reclaimed to the following land use: ***Return to Forest or Grazing Land.***

3. Productivity

The level of land productivity to be achieved on reclaimed areas shall not be less than existed prior to mining on an average property basis unless the Permittee can provide evidence which demonstrates, to the satisfaction of the Chief Inspector, the impracticality of doing so.

4. Revegetation

Land shall be re-vegetated to a self-sustaining state using appropriate plant species.

5. Use of Suitable Growth Medium

(a) On all lands to be revegetated, the growth medium shall satisfy land use, productivity, and water quality objectives. Topsoil and overburden (to rooting depth) shall be removed from operational areas prior to any disturbance of the land and stockpiled separately on the property for use in reclamation programs, unless the Permittee can provide evidence which demonstrates, to the satisfaction of the Chief Inspector, that reclamation objectives can otherwise be achieved.

(b) No topsoil shall be removed from the property without the specific written permission of the District Inspector.

6. Buffer Zones and Berms

Buffer zones and/or berms shall be established between the mine and the property boundary unless exempted in writing by the District Inspector.

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

8. Watercourses

- (a) Watercourses shall be reclaimed to a condition that ensures
  - (1) long-term water quality is maintained to a standard acceptable to the Chief Inspector,
  - (2) drainage is restored either to original watercourses or to new watercourses which will sustain themselves without maintenance, and
  - (3) use and productivity objectives are achieved and the level of productivity 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.
- (b) Water which flows from disturbed areas shall be collected and diverted into settling ponds.

9. Roads

- (a) All roads shall 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. Temporary Shutdown

If this quarry ceases operation for a period longer than one year the Permittee shall 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.

12. Safety Provisions

All safety and other provisions of the **Mines Act** shall be complied with to the satisfaction of the Chief Inspector.

13. Monitoring

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

14. Alterations to the Program

Substantial changes to the program must be submitted to the District Inspector for approval.

15. 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 shall be filed with the District Inspector not less than seven days prior to cessation of work.

16. Annual Report

Annual reports shall be submitted in a form and containing the information as and if required by the District Inspector.

17. Site Stability

- a) The inspector shall 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 slopes shall be maintained at all times and erosion shall 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 shall be reported to the inspector as soon as possible and work shall cease until the inspector advises otherwise.

**SPECIAL CONDITIONS:**

1. Progressive reclamation of the overall property shall continue and the total unreclaimed disturbance shall not exceed 70ha.
2. The permittee shall comply with the October 24, 2002 decisions by the Mediation and Arbitration Board and any further decisions imposed by the Supreme Court of British Columbia.

3. A Licence to Cut shall be obtained from the Kamloops Ministry of Forests District Office before any trees are removed.
4. Upon completion of mining, overburden and topsoil shall be spread and suitable seedlings planted.

**ANNUAL RECLAMATION REPORT  
FOR YEAR 2016**

**MINES ACT PERMIT NUMBER: Q-15-006**

**MINING LEASES 310888 & 376818**

**RED LAKE QUARRY**

**ABSORBENT PRODUCTS LTD.**

**Mine Manager and  
Person Responsible for  
Reclamation:**                   **Steve Gurney**  
  
**1(250) 372-1600 ext 111**

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**(604) 681-4643**

March 6, 2017

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## EXECUTIVE SUMMARY

Red Lake Quarry, situated 41 km northwest of Kamloops, is accessed by 8 km of paved road to the railway crossing near Tranquille and thereafter 33 km of publically maintained gravel road called the Criss Creek Forestry Access Road. Hauling of diatomaceous earth from the quarry to Absorbent Products Ltd plant at 724 East Sarcee Street, Kamloops is seasonal in nature avoiding road load restrictions. The quarry consists of four pits called Main, West, Northwest and Bepple pits yielding a combined total area of 60.8 hectares.

The diatomaceous earth (DE) comes from two layers, Upper and Basal, which are separated by a medial layer of carbonaceous shale called leonardite. On the eastern edge of Bepple Pit an erosional remnant of basalt flows tops the diatomaceous earth sequence. Here and there lenses of basal carbonaceous shale intervene between the Basal diatomaceous earth layer and the underlying andesite flows.

In 1982, the former DEM Company started quarrying the Upper diatomaceous earth layer in the Main Pit. Since then quarrying spread west to West Pit. With the exception one small area, the Upper and Basal layers of diatomaceous earth are exhausted. The Northwest and Bepple pits produce the present plant feed. Briefly summarized for the next five years the following activities are anticipated:

1. Main Pit: removal of DE in the northeast corner beside and under present stockpiles and removed of DE under present haul road between Main and Bepple pits. Reclamation of waste and carbonaceous shale stockpiles in southeast corner of pit and use of north edge of pit for topsoil and waste piles from northward mining in Bepple Pit.
2. West Pit: removal of small Basal DE area and reclamation
3. Northwest Pit: Taking southern portion of pit area down to basement, reclamation and placement of waste pile on small part reclaimed ground as quarrying progresses northward.
4. Bepple Pit: Quarrying the present leonardite floor down to basement and reclaiming ground prior to the northward progression of quarrying.

The past year's reclamation program concentrated again on the basement high which separates Northwest Pit from Bepple Pit and involves 0.97 hectares, in which the ground level was raised by backfilling with waste. Reconstruction of the southern haul road is complete and with the decommissioning of the Main Haul road will allow extraction of diatomaceous earth from beneath the old haul road. The drainage ditches shown in the Main and West pits were maintained. These ditches have water flow during spring runoff only. As the topsoil, waste and stockpiles of diatomaceous earth and leonardite contain no acid-generating materials; neither the piles nor drainage waters from the quarry are subject to any special treatment. Table 5 gives the pH results taken monthly for the past ten months and Table 2 gives the trace element analyses for the last four quarters all taken from the Red Lake Diatomaceous Earth products produced at Absorbent Products Ltd plant at Kamloops, B.C.

At the end of 2016, the amount of unreclaimed land stands at 11.59 ha with an estimated reclamation cost of \$69,540, which lies within the reclamation bond of \$70,000.

# ANNUAL RECLAMATION REPORT FOR 2016, RED LAKE QUARRY

Peter B. Read

March 6, 2017

## 1. INTRODUCTION

This report details mining and reclamation activities carried out at the Red Lake Quarry to October 31, 2016 and a five-year projection of anticipated mining and reclamation. The quarry is operated under Permit Q-15-006 issued to Western Industrial Clay Products Ltd., (WICPL) on November 30, 1992 with subsequent amendments in 1996, 2001 and 2003. On February 4, 2005, WICPL transferred ownership of the lease to Absorbent Products Ltd (APL). On November 30, 2012 this lease was extended an additional 10 years to November 30, 2022. With the payment of the annual lease fee, Mining Leases No. 310888 and No. 376818 are good until November 30, 2017 and September 12, 2017 respectively (Table 1).

**Table 1:** Mining Leases 310888 and 376818

| Mining Lease | Map #   | Issue Date | Good To Date | Area  |
|--------------|---------|------------|--------------|-------|
| 310888       | 0921096 | 30-Nov-92  | 30-Nov-17    | 45.32 |
| 376818       | 0921096 | 12-Sep-00  | 12-Sep-17    | 21.40 |

Mining Lease No. 310888 encompasses Main Pit, West Pit and Northwest Pit and No. 376818 covers the Bepple Pit with a combined total of 60.8 hectares (150 acres) divided into these four pit areas (Figure 3). In early 2006, APL purchased the 44.35 hectares of Crown land within Mining Lease 310888. Diatomaceous earth was extracted from the Northwest and Bepple pits during 2016. Reclamation work, consisting of backfilling from waste, medial leonardite and topsoil piles and recontouring of mined out areas and reseeding with an approved grass mixture, continued in 2016 in the West and Main pits

Prior to quarrying the area had been selectively logged and used for grazing amid debris left from logging. The aim of the reclamation project is to return the land to either hay production or a much higher grazing capacity than originally.

The quarry maps are presented in the following two formats: (a) shapefiles as required and (b) EXCEL spreadsheets which give the statistical basis for all numbers used in the text and tables of this report.

## 2. LOCATION

The Red Lake Quarry is 41 km northwest of Kamloops at an elevation of approximately 1,300 metres (Figure 1). The first eight kilometres of road from APL's plant in Kamloops is paved with the remaining 33 km a publically maintained gravel road called the Criss Creek Forestry Access Road. APL has its processing and bagging plant, distribution warehouse, research laboratory and offices at 724 East Sarcee Street in Kamloops. The quarrying and trucking of the raw diatomaceous earth to the Kamloop's plant is of a seasonal nature to avoid winter and load restriction conditions and usually operates seven to eight months of the year.

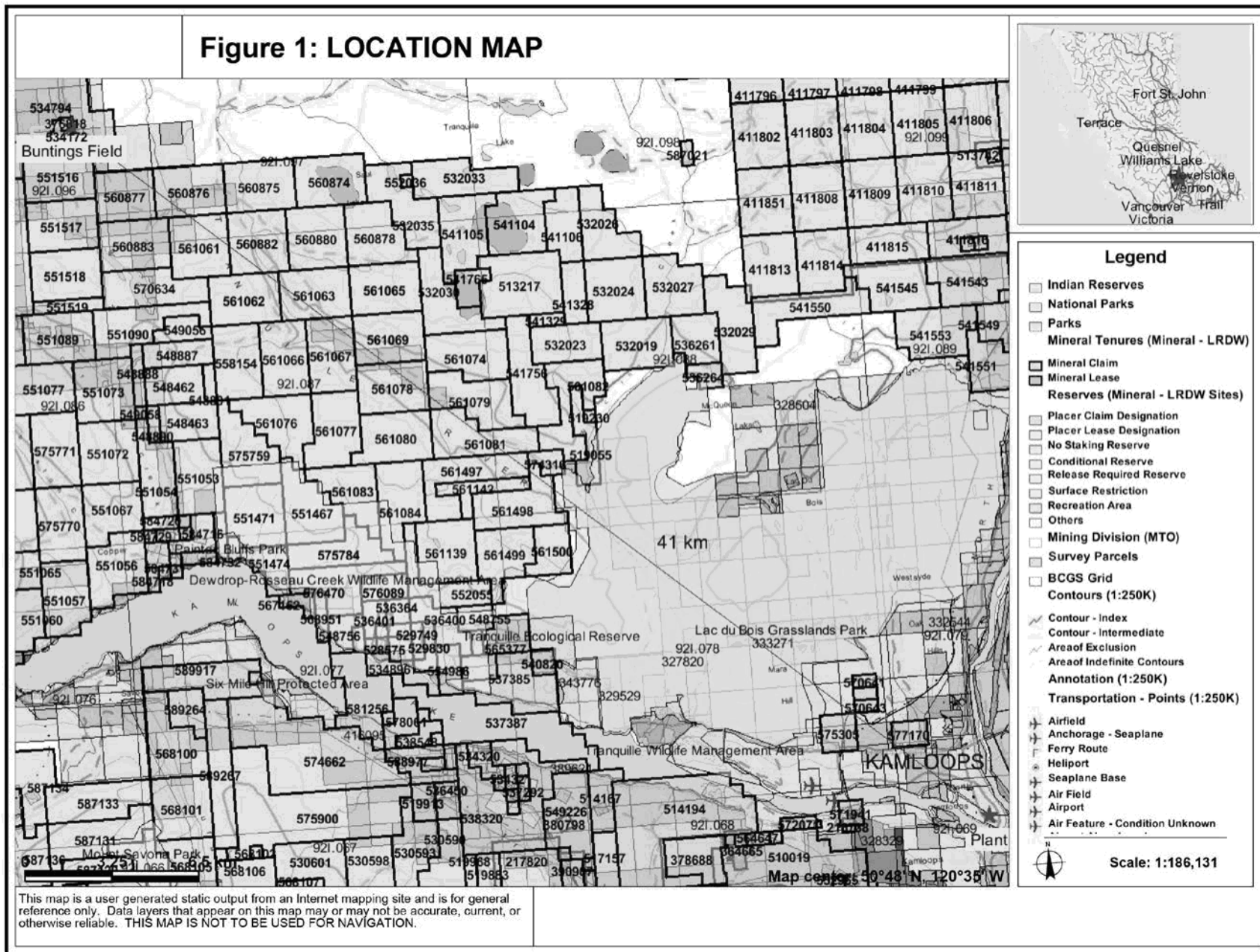


Figure 1: Location map showing the location of Mining Leases 310888 and 376818 relative to Kamloops

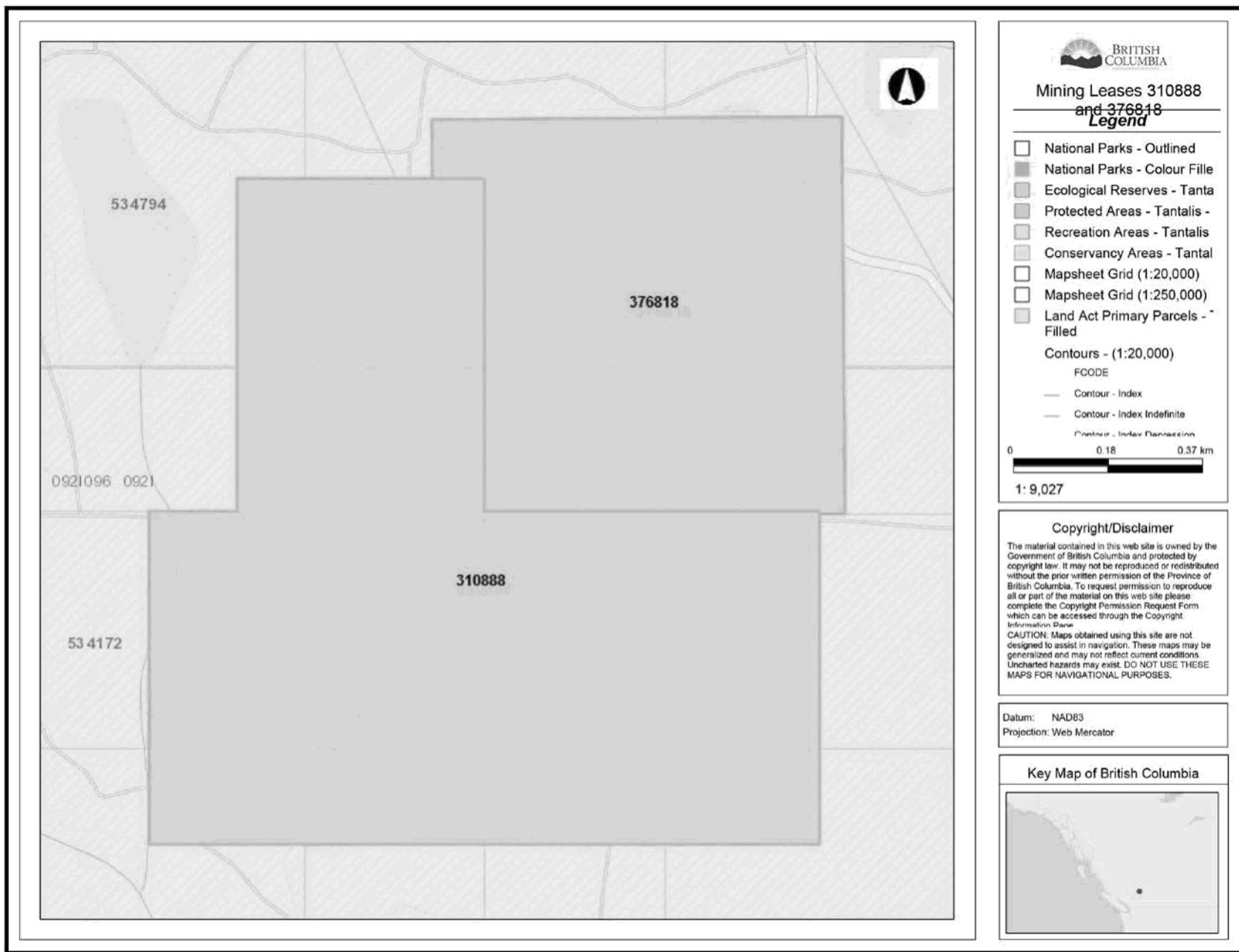


Figure 2: Map showing mining leases 376818 and 310888

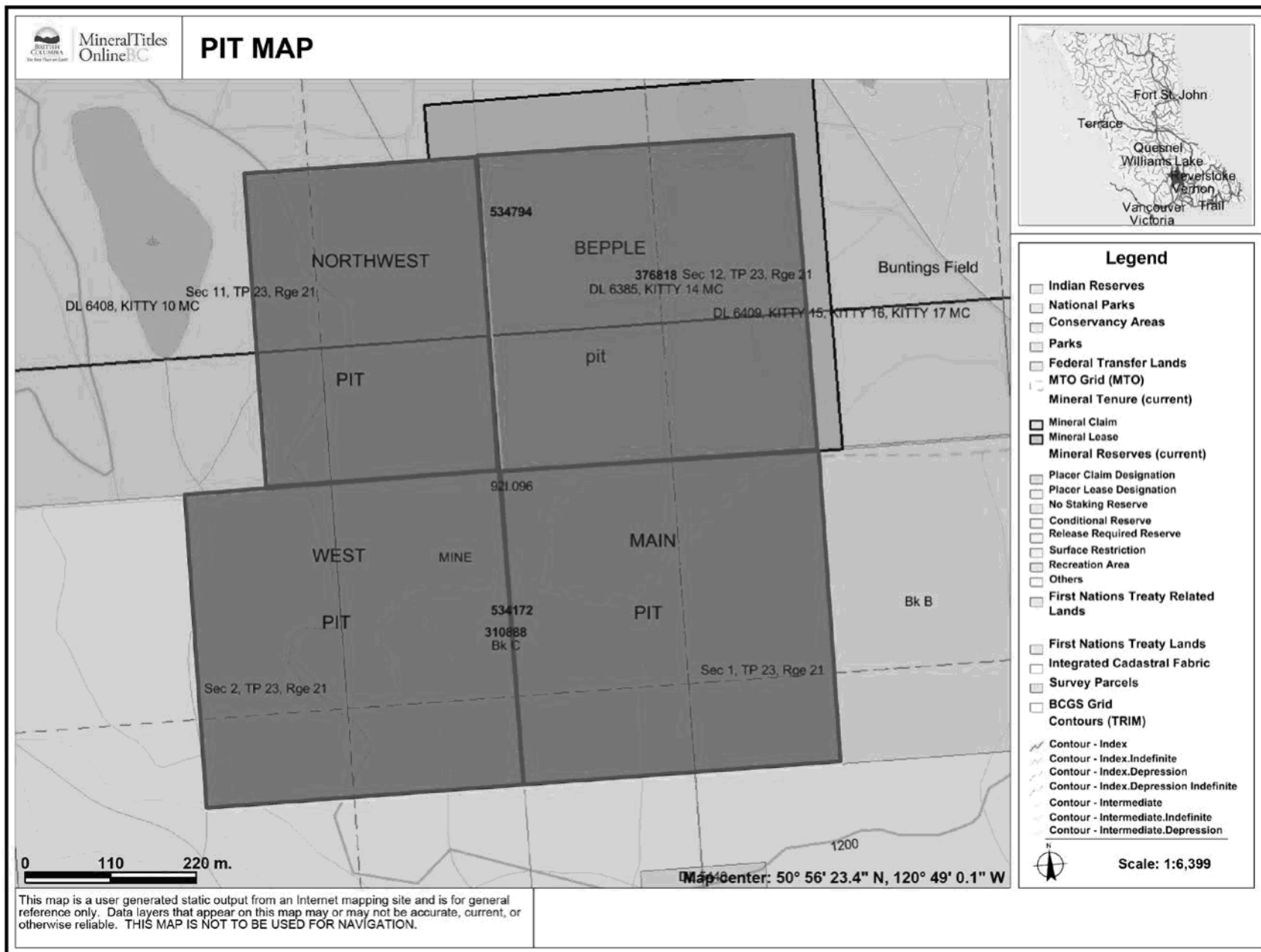


Figure 3: Map showing the location of Main, West, Northwest and Bepple pits in mining leases 376818 and 310888.

### 3. GEOLOGY OF THE RED LAKE QUARRY

At the Red Lake Quarry, the diatomaceous earth deposit consists of Upper and Basal layers of diatomaceous earth separated by a 1.0 to 1.5 m thick medial carbonaceous shale (leonardite) all locally overlying a lenticular basal carbonaceous shale (leonardite) up to 1.5 m thick. These sedimentary rocks comprise the Deadman River Formation of Miocene age, which unconformably overlies andesite to dacite flows of the Dewdrop Flats Formation of the Kamloops Group of mid-Eocene age. Here and there, such as on the eastern edge of the Bepple Pit, an erosional remnant of a once extensive sheet of Miocene basalt flows of the Chasm Formation overlies the Miocene sedimentary succession. These Miocene sedimentary and volcanic sequences comprise the southern edge of the Chilcotin Group, which is widespread in central British Columbia. Quaternary soil, till and locally sand, silt and gravel form a 1.5 to 3.0 m thick cover over bedrock.

The Upper Diatomaceous Earth layer is up to 8 m thick in the Bepple Pit and overlies the Basal Diatomaceous Earth layer which averages 2 to 6 m in thickness but locally can attain 15 m. Because the density of the Upper DE is higher than the Basal DE, the two DE layers are blended in the quarry before trucking. Although the medial carbonaceous shale is rich in fulvic and humic acids, it is not presently marketable and instead is used along with topsoil to provide an excellent growing medium to enhance reclamation.

### 4. MINING PROGRAM

In 1982, DEM started quarrying in the Main Pit area (Figure 4). Because litigation tied up the Bepple Pit area, quarrying proceeded westward into the West Pit area (Figure 5) and eventually into the Northwest Pit (Figure 6) before access became available to the Bepple Pit area (Figure 7). In the Main Pit area, an area of only 0.97 hectares of Basal Diatomaceous Earth resource and 0.05 hectares of Upper Diatomaceous Earth resource remain (Figure 4). In West Pit, an area of only 0.33 hectares of Basal Diatomaceous Earth resource exists (Figure 5). In the Northwest Pit, the cleared area of 7.47 hectares covers a potential resource of Basal and Upper diatomaceous earth spanning the length and breadth of the pit (Figure 6). An area of 1.15 hectares presently produces Upper Diatomaceous Earth and an area of 0.36 hectares is stripped and ready to produce Upper and Basal diatomaceous earth in 2016. In Bepple Pit, an area of 1.23 hectares (1.15 of Medial Leonhardite + 0.08 ha of Basal DE) has a resource potential for Basal Diatomaceous Earth and an area of 0.77 hectares is currently producing Upper Diatomaceous Earth (Figure 7). In the Bepple Pit, the combined cleared and stripped areas of 13.57 hectares have a resource potential for both Upper and Basal diatomaceous earth layers. All of this information is summarized in Table 3 (the required Table 1 BC Ministry Reclamation Table).

In 2016, the mining program concentrated on production from the Northwest and Bepple pits and reducing the stockpile crossing the boundary between the two pits.

Table 2: Details of Disturbed and Reclaimed Areas for the Four Pits as of October 31, 2016 (**black**)  
Compared to 2012 (blue), 2013 (green), 2014 (red) and 2105 (pink)

| DISTURBANCE                           | MINING AREA (hectares) |             |             |             |              | RECLAIMED AREA (hectares)              |             |             |              |              |
|---------------------------------------|------------------------|-------------|-------------|-------------|--------------|--|-------------|-------------|--------------|--------------|
|                                       | Main Pit               | West Pit    | NW Pit      | Bepple Pit  | TOTALS       | Main Pit                               | West Pit    | NW Pit      | Bepple Pit   | TOTALS       |
| Waste Pile (2016)                     | 1.23                   | 0.02        | 0.00        | 0.00        | 1.25         | <b>5.60</b>                            | <b>8.90</b> | <b>0.79</b> | <b>0.49</b>  | <b>15.78</b> |
| Topsoil Pile (2016)                   | 0.24                   | 0.00        | 0.01        | 0.06        | 0.31         | 5.59                                   | 8.68        | 0.74        | 0.48         | 15.49        |
| Tailings Ponds (2016)                 | 0.00                   | 0.00        | 0.00        | 0.00        | 0.00         | <b>5.37</b>                            | <b>9.31</b> | <b>0.80</b> | <b>0.44</b>  | <b>15.66</b> |
| Plant Site (2016)                     | 0.04                   | 0.00        | 0.01        | 0.01        | 0.06         | 4.70                                   | 9.06        | 0.78        | 0.67         | 15.21        |
| Roads (2016)                          | 0.97                   | 0.62        | 0.56        | 0.13        | 2.28         | 4.70                                   | 9.06        | 0.78        | 0.67         | 15.21        |
| <b>Totals (2016)</b>                  | <b>2.48</b>            | <b>0.64</b> | <b>0.58</b> | <b>0.20</b> | <b>3.90</b>  |  |             |             |              |              |
| Totals (2015)                         | 2.49                   | 0.64        | 0.58        | 0.20        | 3.91         |  |             |             |              |              |
| <b>Totals (2014)</b>                  | <b>3.27</b>            | <b>0.01</b> | <b>0.52</b> | <b>0.19</b> | <b>4.00</b>  |  |             |             |              |              |
| Totals (2013)                         | 3.43                   | 0.26        | 0.34        | 0.07        | 4.10         |  |             |             |              |              |
| Totals (2012)                         | 3.43                   | 0.26        | 0.34        | 0.07        | 4.09         |  |             |             |              |              |
| <b>Active Mining</b>                  |                        |             |             |             |              | <b>VEGETATED AREA CLEARED OF TREES</b> |             |             |              |              |
|                                       |                        |             |             |             |              | Main Pit                               | West Pit    | NW Pit      | Bepple Pit   | TOTALS       |
| <b>Stripped (2016)</b>                | <b>0.00</b>            | <b>0.00</b> | <b>0.38</b> | <b>0.41</b> | <b>0.79</b>  | <b>0.38</b>                            | <b>0.00</b> | <b>7.67</b> | <b>13.08</b> | <b>21.13</b> |
| Stripped (2015)                       | 0.00                   | 0.00        | 0.36        | 0.42        | 0.78         | 0.38                                   | 0.00        | 7.91        | 13.17        | 21.50        |
| Stripped (2014)                       | 0.00                   | 0.00        | 0.44        | 0.44        | 0.88         | 0.39                                   | 0.00        | 7.47        | 13.11        | 20.97        |
| Stripped (2013)                       | 0.00                   | 0.00        | 0.45        | 0.44        | 0.89         | 0.38                                   | 0.00        | 7.47        | 13.11        | 20.96        |
| Stripped (2012)                       | 0.00                   | 0.00        | 0.74        | 0.00        | 0.74         | 0.49                                   | 0.00        | 7.66        | 14.29        | 22.44        |
| <b>Upper DE (2016)</b>                | <b>0.05</b>            | <b>0.00</b> | <b>1.23</b> | <b>0.78</b> | <b>2.06</b>  |  |             |             |              |              |
| Upper DE (2015)                       | 0.05                   | 0.00        | 1.15        | 0.77        | 1.97         |  |             |             |              |              |
| Upper DE (2014)                       | 0.11                   | 0.00        | 1.87        | 0.97        | 2.95         |  |             |             |              |              |
| Upper DE (2013)                       | 0.12                   | 0.00        | 1.57        | 1.10        | 2.79         |  |             |             |              |              |
| Upper DE (2012)                       | 0.01                   | 0.00        | 1.38        | 0.42        | 1.81         |  |             |             |              |              |
| <b>Medial Leon (2016)</b>             | <b>0.66</b>            | <b>0.00</b> | <b>0.94</b> | <b>1.14</b> | <b>2.74</b>  |  |             |             |              |              |
| Medial Leon (2015)                    | 0.66                   | 0.00        | 0.69        | 1.15        | 2.50         |  |             |             |              |              |
| Medial Leon. (2014)                   | 0.59                   | 0.00        | 0.18        | 0.97        | 1.56         |  |             |             |              |              |
| Medial Leon. (2014)                   | 0.56                   | 0.00        | 0.18        | 0.84        | 1.58         |  |             |             |              |              |
| Medial Leon.(2012)                    | 0.56                   | 0.00        | 0.10        | 0.78        | 1.44         |  |             |             |              |              |
| <b>Basal DE (2016)</b>                | <b>0.31</b>            | <b>0.11</b> | <b>0.03</b> | <b>0.08</b> | <b>0.53</b>  |  |             |             |              |              |
| Basal DE (2015)                       | 0.31                   | 0.33        | 0.03        | 0.08        | 0.75         |  |             |             |              |              |
| Basal DE (2014)                       | 0.36                   | 0.30        | 0.03        | 0.08        | 0.73         |  |             |             |              |              |
| Basal DE (2013)                       | 0.36                   | 0.26        | 0.03        | 0.08        | 0.73         |  |             |             |              |              |
| Basal DE (2012)                       | 0.36                   | 0.26        | 0.03        | 0.09        | 0.74         |  |             |             |              |              |
| <b>Basal Leon (2016)</b>              | <b>0.00</b>            | <b>0.04</b> | <b>0.00</b> | <b>0.00</b> | <b>0.04</b>  |  |             |             |              |              |
| Basal Leon. (2015)                    | 0.00                   | 0.04        | 0.00        | 0.00        | 0.04         |  |             |             |              |              |
| Basal Leon. (2014)                    | 0.00                   | 0.04        | 0.00        | 0.00        | 0.04         |  |             |             |              |              |
| Basal Leon. (2013)                    | 0.00                   | 0.04        | 0.00        | 0.00        | 0.04         |  |             |             |              |              |
| Basal Leon. (2012)                    | 0.00                   | 0.04        | 0.00        | 0.00        | 0.04         |  |             |             |              |              |
| <b>Active Mining Totals (2016)</b>    | <b>1.02</b>            | <b>0.15</b> | <b>2.58</b> | <b>2.41</b> | <b>6.16</b>  |  |             |             |              |              |
| Active Mining Totals (2015)           | 1.02                   | 0.34        | 2.23        | 2.42        | 6.04         |  |             |             |              |              |
| Active Mining Totals (2014)           | 1.06                   | 0.34        | 2.34        | 2.46        | 6.20         |  |             |             |              |              |
| Active Mining Totals (2013)           | 1.04                   | 0.30        | 2.23        | 2.46        | 6.03         |  |             |             |              |              |
| Active Mining Totals (2012)           | 0.93                   | 0.30        | 2.25        | 1.29        | 4.77         |  |             |             |              |              |
|                                       |                        |             |             |             |              | <b>NATURAL STATE</b>                   |             |             |              |              |
|                                       |                        |             |             |             |              | Main Pit                               | West Pit    | NW Pit      | Bepple Pit   | TOTALS       |
|                                       |                        |             |             |             |              | <b>5.98</b>                            | <b>6.27</b> | <b>0.01</b> | <b>0.00</b>  | <b>12.26</b> |
|                                       |                        |             |             |             |              | 6.00                                   | 6.34        | 0.01        | 0.00         | 12.35        |
| <b>Upper DE (2016)</b>                | <b>0.22</b>            | <b>0.00</b> | <b>0.30</b> | <b>0.13</b> | <b>0.65</b>  | 5.98                                   | 6.27        | 0.01        | 0.00         | 12.26        |
| Medial Leonardite (2016)              | 0.51                   | 0.00        | 0.00        | 0.00        | 0.51         | 5.98                                   | 6.27        | 0.01        | 0.00         | 12.26        |
| Basal DE                              | 0.19                   | 0.00        | 0.00        | 0.00        | 0.19         | 5.98                                   | 6.27        | 0.01        | 0.00         | 12.26        |
| <b>Totals (2016)</b>                  | <b>0.92</b>            | <b>0.00</b> | <b>0.30</b> | <b>0.13</b> | <b>1.35</b>  |  |             |             |              |              |
| Totals (2015)                         | 0.92                   | 0.00        | 0.57        | 0.13        | 1.53         |  |             |             |              |              |
| Totals (2014)                         | 0.81                   | 0.03        | 0.96        | 0.10        | 1.51         |  |             |             |              |              |
| <b>TOTALS ALL DISTURBANCES (2016)</b> | <b>4.42</b>            | <b>0.97</b> | <b>3.46</b> | <b>2.74</b> | <b>11.59</b> |  |             |             |              |              |
| TOTALS ALL DISTURBANCES (2015)        | 4.43                   | 0.98        | 3.29        | 2.75        | 11.48        |  |             |             |              |              |
| <b>TOTALS ALL DISTURBANCES (2014)</b> | <b>5.14</b>            | <b>0.38</b> | <b>3.82</b> | <b>2.75</b> | <b>11.71</b> |  |             |             |              |              |
| TOTALS ALL DISTURBANCES (2013)        | 5.28                   | 0.63        | 3.53        | 2.63        | 12.07        |  |             |             |              |              |
| TOTALS ALL DISTRUBANCES (2012)        | 5.17                   | 0.63        | 3.55        | 1.44        | 10.78        |  |             |             |              |              |

**TABLE 3**  
**SUMMARY OF AREAS DISTURBED AND RECLAIMED TO DECEMBER 31, 2016**

**COMPANY: Absorbent Products Ltd**

**PERMIT NO.: Q-15-006**

| DISTURBANCE                 | MINING              |         | RECLAMATION           |          |                          |          |                      |          |                        |          | LAND USE OBJECTIVE** |         |
|-----------------------------|---------------------|---------|-----------------------|----------|--------------------------|----------|----------------------|----------|------------------------|----------|----------------------|---------|
|                             | AREA DISTURBED (ha) |         | AREA RECONTOURED (ha) |          | AREA SEEDED/PLANTED (ha) |          | AREA FERTILIZED (ha) |          | AREA REVEGETATED* (ha) |          |                      |         |
|                             | 2015                | TOTAL** | 2015                  | TOTAL*** | 2015                     | TOTAL*** | 2015                 | TOTAL*** | 2015                   | TOTAL*** |                      |         |
| WASTE DUMPS                 | 1.25                | 1.25    | 0.00                  | 0.00     | 0.00                     | 0.00     | 0.00                 | 0.00     | 0.00                   | 0.00     | 0.00                 | Grazing |
| TAILINGS STORAGE FACILITIES | 0.00                | 0.00    | 0.00                  | 0.00     | 0.00                     | 0.00     | 0.00                 | 0.00     | 0.00                   | 0.00     | 0.00                 | Grazing |
| PLANT SITE                  | 0.06                | 0.06    | 0.00                  | 0.00     | 0.00                     | 0.00     | 0.00                 | 0/00     | 0/00                   | 0.00     | 0.00                 | Grazing |
| ROADS                       | 2.28                | 2.28    | 0.00                  | 0.00     | 0.00                     | 0.00     | 0.00                 | 0.00     | 0.00                   | 0.00     | 0.00                 | Grazing |
| ADMINISTRATION              | 0.00                | 0.00    | 0.00                  | 0.00     | 0.00                     | 0.00     | 0.00                 | 0.00     | 0.00                   | 0.00     | 0.00                 | Grazing |
| PIT                         | 6.27                | 6.11    | 0.00                  | 0.00     | 0.00                     | 0.00     | 0.00                 | 0.00     | 15.49                  | 15.78    |                      | Grazing |



|            |       |       |      |      |      |      |      |      |       |       |         |
|------------|-------|-------|------|------|------|------|------|------|-------|-------|---------|
| STOCKPILES | 1.62  | 1.35  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | Grazing |
| LINEAR     | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | Grazing |
| OTHER      | 0.00  | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | Grazing |
| TOTAL      | 11.48 | 11.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.49 | 15.78 | Grazing |

|                                |      |    |   |
|--------------------------------|------|----|---|
| EXEMPT<br>e.g., pit high walls | 0.00 | ha | Please specify what the exempt areas are (with maps) in the body of the annual reclamation report including rationale as to why they are considered exempt. This number should already be included in the total disturbed ha. |
|--------------------------------|------|----|---|

\* In order for an area to be recorded as “revegetated”, it must have supported vegetation that will lead to the designated land use objective for at least one year. Please provide monitoring data in the Annual Reclamation Report to support the areas reported here.

\*\* Specify land use. Options include: forestry, grazing, wildlife habitat, recreation, agricultural, industrial, residential, and other.

\*\*\* Total up to December 31, 2016

**TABLE 4**  
**QUANTITIES OF WASTE ROCK, TAILINGS, LOW GRADE ORE, COARSE REJECT**  
**AND OTHER MINE WASTE AS OF DECEMBER 31, 2016**

**COMPANY: Absorbent Products Ltd.**

**PERMIT NO.: Q-15-006**

Use the space below to enter information for each waste dump, tailings pond or low grade ore pile. All quantities should be given in tonnes.

| Name of Waste Pile or Pond                   | Acid Generating Waste |       | Potentially Acid Generating Waste |       | Non-Acid Generating Waste |         |
|--|-----------------------|-------|-----------------------------------|-------|---------------------------|---------|
|  | 2015                  | Total | 2015                              | Total | 2015                      | Total   |
| Waste Dumps                                  |                       |       |                                   |       |                           |         |
| 1  | 0.00                  | 0.00  | 0.00                              | 0.00  | 135,000                   | 135,000 |
| 2  | 0.00                  | 0.00  | 0.00                              | 0.00  | 1,080                     | 1,080   |
| 3  |                       |       |                                   |       |                           |         |
| 4  |                       |       |                                   |       |                           |         |
| 5  |                       |       |                                   |       |                           |         |
| Total  |                       |       |                                   |       | 136,080                   | 136,080 |
| Tailings Ponds                               |                       |       |                                   |       |                           |         |
| 1  |                       |       |                                   |       |                           |         |
| 2  |                       |       |                                   |       |                           |         |
| 3  |                       |       |                                   |       |                           |         |
| 4  |                       |       |                                   |       |                           |         |
| 5  |                       |       |                                   |       |                           |         |
| Total  | 0.00                  | 0.00  | 0.00                              | 0.00  | 0.00                      | 0.00    |
| Low Grade Ore/Coarse Reject/Other Mine Waste |                       |       |                                   |       |                           |         |
| 1  |                       |       |                                   |       |                           |         |

|       |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|
| 2     |      |      |      |      |      |      |
| 3     |      |      |      |      |      |      |
| 4     |      |      |      |      |      |      |
| 5     |      |      |      |      |      |      |
| Total | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**TABLE 5**  
**MONTHLY MINING AND MILLING PRODUCTION AS OF DECEMBER 31, 2016**

**COMPANY:** Absorbent Products Ltd. **PERMIT NO.:** Q-15-006

Use the space below to enter information for mining and milling production rates for each month of the reporting year. All quantities should be given in tonnes.

|                             | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Total |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Mining Production (tonnes)  |      |      |      |      |      |      |      |      |      |      |      |      |       |
| NW & Bepple                 | 0.00 | 0.00 | 0.00 | 0.00 | 3870 | 4773 | 3547 | 3915 | 4852 | 4085 | 0.00 | 0.00 | 25042 |
| Pit 2                       | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Underground 1               | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Underground 2               | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Mining Total                |      |      |      |      |      |      |      |      |      |      |      |      |       |
| Milling Production (tonnes) |      |      |      |      |      |      |      |      |      |      |      |      |       |
| Mill 1                      | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Mill 2                      | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0/00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| Kamloops                    | 1246 | 1334 | 1491 | 1691 | 1183 | 1181 | 1135 | 1475 | 1703 | 1532 | 1515 | 1208 | 16695 |
| Off-site Mill 2             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |

|               |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Milling Total |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|

|                  |     |                |
|------------------|-----|----------------|
| Milling Capacity | 200 | tonnes per day |
|------------------|-----|----------------|

Include:

- All mining locations (both underground and surface, including borrow areas)
- All milling locations (both on-site and off-site)

In the next five years, in the Main Pit (Figure 4):

- Removal of the Basal Diatomaceous Earth resource from an area of 0.97 hectares in the northeast corner of the pit area.
- Use of the waste and medial leonardite stockpiles at the south edge of the pit area in the reclamation of the Main Pit.
- Mining and removal of the diatomaceous earth layers and carbonaceous shales down to the volcanic basement beneath the presently used haul road situated along the northern edge of the pit.
- Reactivation of the southern haul road passing through the middle of Main Pit.
- Mining of the Basal Diatomaceous Earth beneath the “emergency” stockpiles in the northeast corner of the pit.
- After mining of the diatomaceous earth from beneath the present haul road, this area on the north edge of the reclaimed area will be used for waste and topsoil piles from quarrying the southern portion of the Beppe Pit.

In the West Pit (Figure 5):

- In the southern part of the pit, removal of the Basal Diatomaceous Earth resource underlying an area of 0.11 hectares will be followed by reclamation.
- Complete reactivation of the southern haul through the northeast corner of the pit.

In the Northwest Pit (Figure 6):

- Development of the Basal and Upper Diatomaceous Earth resources in the south half of the pit area.
- Placement of waste and topsoil piles on the basement high which separates Northwest Pit from Beppe Pit.
- On the eastern side of the pit, the main Upper diatomaceous earth stockpile has been reduced by 0.12 hectares to 0.30 hectares. Any underlying diatomaceous earth will be removed.

In Beppe Pit (Figure 7):

- North to northeastward progress of the working face in Upper and Basal diatomaceous earth layers has increased exposure of the medial leonardite layer from 0.84 hectares to 1.15 hectares and reduced exposure of the Upper Diatomaceous Earth 0.77 ha.
- Definition drilling for the outline of the Miocene basalt cap erosional remnant has started, but a decision as to whether it is economic to remove requires more drilling to define both the areal extent and thickness of the cap.
- Use of the topsoil and waste piles from the northern part of the Main Pit for reclamation.

- Placement of topsoil and waste piles on the basement high which separates Northwest Pit from Bepple Pit.

## 5. RECLAMATION PROGRAM

The past year's reclamation program concentrated again on the basement high which separates Northwest Pit from Bepple Pit and involves 0.97 hectares, in which the ground level was raised by backfilling with waste. Reconstruction of the southern haul road is complete and with the future decommissioning of the Main Haul road on the boundary between Bepple and Main pits will allow extraction of diatomaceous earth from beneath it. The drainage ditches shown in the Main, West and Northwest pits were maintained. These ditches have water flow during spring runoff only. As the topsoil, waste and stockpiles of diatomaceous earth and leonardite contain no acid-generating materials; neither the piles nor drainage waters from the quarry are subject to any special treatment. Table 6 gives the pH results taken monthly for the past twelve months and Table 7 gives the trace element analyses for the last four quarters all taken from the Red Lake Diatomaceous Earth products produced at Absorbent Products Ltd plant at Kamloops, B.C.

Table 6: Monthly pH's of Red Lake Diatomaceous Earth (January 2016 to December 2016)

| Jan16<br>Reg DE | Feb16<br>Reg DE | Mar16<br>Reg DE | 1stQuart<br>2016.00 | Apr16<br>Reg DE | May16<br>Reg DE | Jun16<br>Reg DE | 2nd Quart<br>2016.00 | Jul16<br>Reg DE | Aug16<br>Reg DE | Sep15<br>Reg DE | 3rd Quart<br>2016.00 | Oct16<br>Reg DE | Nov16<br>Reg DE | Dec16<br>Reg DE | 4th Quart<br>2016.00 | Annual Average<br>2016.00 |
|-----------------|-----------------|-----------------|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------|-----------------|-----------------|----------------------|-----------------|-----------------|-----------------|----------------------|---------------------------|
| 4.77            | 4.61            | 4.67            | 4.68                | 4.87            | 4.88            | 4.69            | 4.81                 | 4.80            | 4.82            | 4.76            | 4.79                 | 4.78            | 4.87            | 4.73            | 4.79                 | 4.77                      |

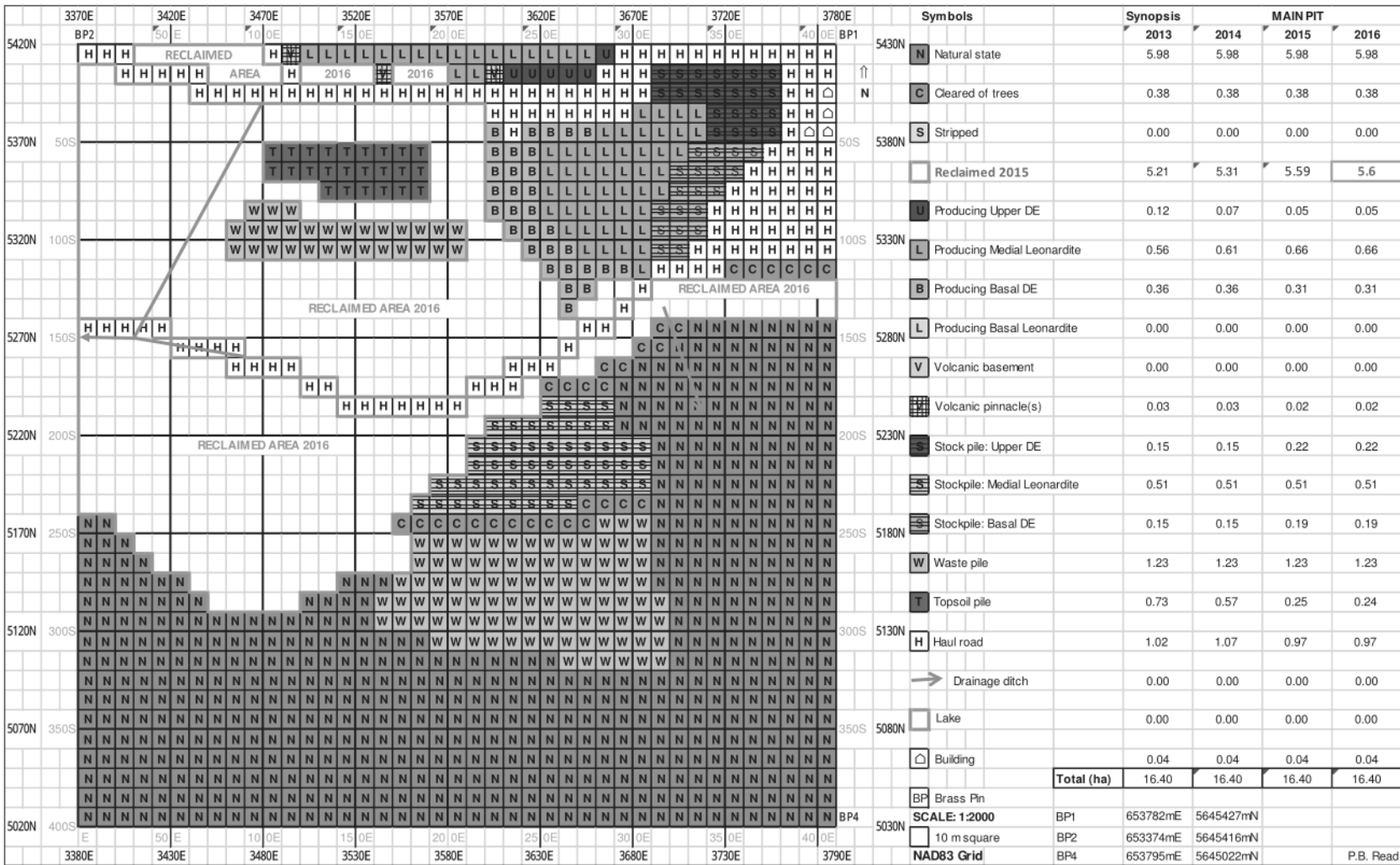


Figure 4: Main Pit showing the land classification for the pit and for comparison the areas for each class numerically from 2013 to 2016 (NAD83 grid at 1:2000-scale).



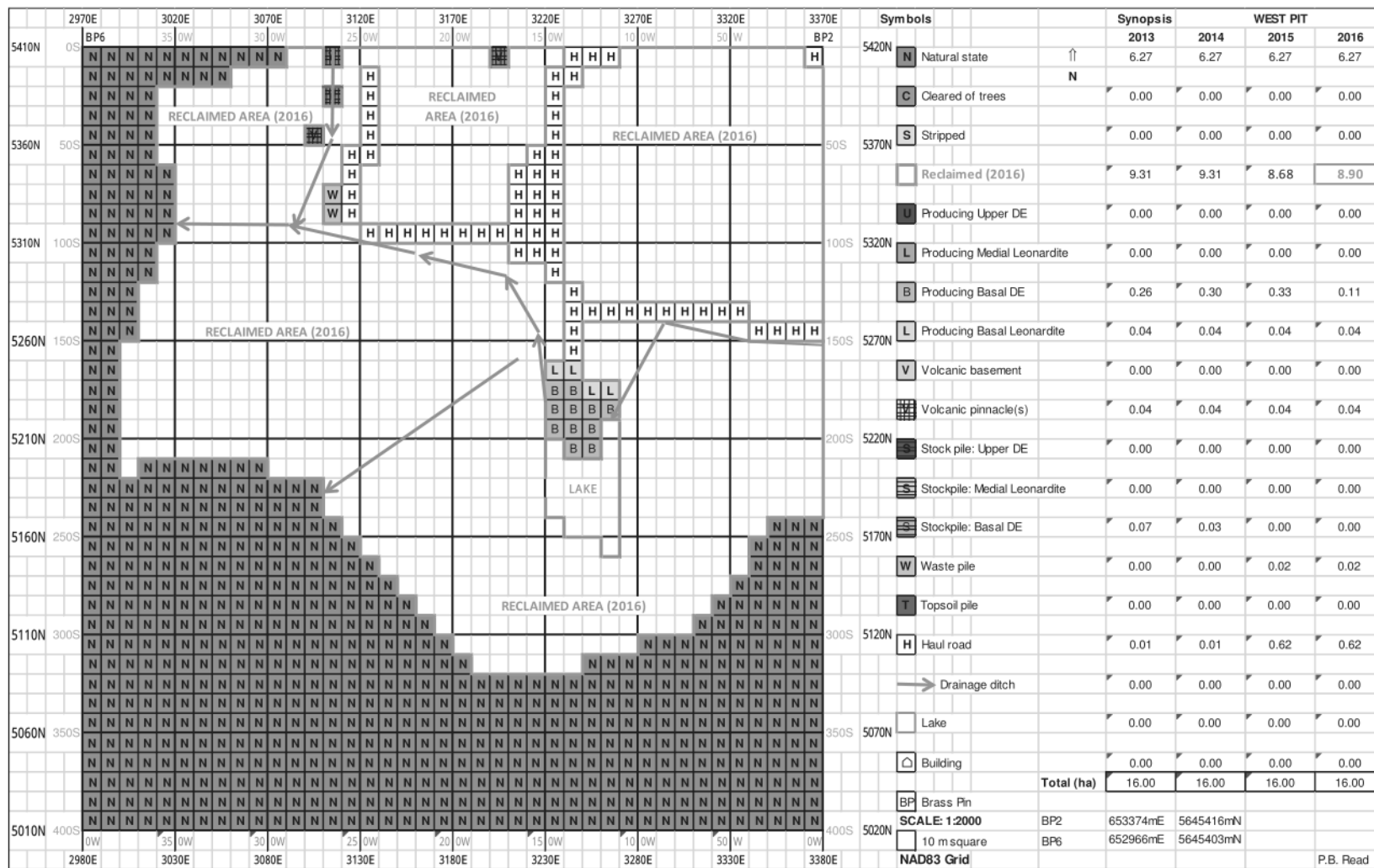


Figure 5: West Pit showing the land classification for the pit and for comparison the areas for each class numerically from 2013 to 2016 (NAD83 grid at 1:2000-scale).





Table 7: 2016 Quarterly Composites and Annual Average of Red Lake Trace Element Analyses

| <b>Element Reading</b> | <b>Jan-16<br/>Reg. DE</b> | <b>Apr-16<br/>Reg. DE</b> | <b>Jul-16<br/>Reg. DE</b> | <b>Oct-16<br/>Reg. DE</b> | <b>Yearly Average<br/>2016</b> |
|------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------------|
| Ag ppm                 | 0.14                      | 0.13                      | 0.15                      | 0.12                      | 0.14                           |
| Al %                   | 7.22                      | 6.51                      | 7.13                      | 6.97                      | 6.95                           |
| As ppm                 | 9.7                       | 7.5                       | 9.8                       | 7.9                       | 9.00                           |
| Ba ppm                 | 290                       | 240                       | 270                       | 270                       | 266.67                         |
| Be ppm                 | 1.49                      | 1.31                      | 1.35                      | 1.39                      | 1.38                           |
| Bi ppm                 | 0.21                      | 0.19                      | 0.27                      | 0.22                      | 0.22                           |
| Ca %                   | 0.67                      | 0.47                      | 0.68                      | 0.68                      | 0.61                           |
| Cd ppm                 | 0.19                      | 0.19                      | 0.15                      | 0.17                      | 0.18                           |
| Ce ppm                 | 42.6                      | 35.8                      | 38.1                      | 37.8                      | 38.83                          |
| Co ppm                 | 14.5                      | 12.4                      | 14.0                      | 13.9                      | 13.63                          |
| Cr ppm                 | 48                        | 42                        | 44                        | 43                        | 44.67                          |
| Cs ppm                 | 2.52                      | 2.20                      | 2.28                      | 2.44                      | 2.33                           |
| Cu ppm                 | 46.6                      | 42.8                      | 50.2                      | 40.8                      | 46.53                          |
| Fe %                   | 3.40                      | 3.01                      | 3.40                      | 3.27                      | 3.27                           |
| Ga ppm                 | 17.9                      | 16.2                      | 16.8                      | 16.8                      | 16.92                          |
| Ge ppm                 | <0.05                     | <0.05                     | 0.06                      | 0.06                      | 0.06                           |
| Hf ppm                 | 4.0                       | 3.5                       | 4.1                       | 4.2                       | 3.87                           |
| Hg ppm                 | 0.12                      | 0.14                      | 0.13                      | 0.13                      | 0.13                           |
| In ppm                 | 0.058                     | 0.053                     | 0.054                     | 0.058                     | 0.06                           |
| K %                    | 0.51                      | 0.41                      | 0.46                      | 0.49                      | 0.46                           |
| La ppm                 | 20.1                      | 16.8                      | 18.9                      | 18.8                      | 18.60                          |
| Li ppm                 | 23.7                      | 22.5                      | 22.8                      | 21.7                      | 23.00                          |
| Mg %                   | 0.49                      | 0.45                      | 0.49                      | 0.47                      | 0.48                           |
| Mn ppm                 | 123                       | 98                        | 112                       | 118                       | 111.00                         |
| Mo ppm                 | 12.20                     | 13.60                     | 15.85                     | 10.10                     | 13.88                          |
| Na %                   | 0.50                      | 0.38                      | 0.44                      | 0.46                      | 0.44                           |
| Nb ppm                 | 10.3                      | 9.3                       | 10.2                      | 10.5                      | 9.93                           |
| Ni ppm                 | 34.3                      | 29.3                      | 34.5                      | 27.3                      | 32.70                          |
| P ppm                  | 280                       | 240                       | 270                       | 280                       | 263.33                         |
| Pb ppm                 | 12.1                      | 8.9                       | 16.1                      | 10.1                      | 12.37                          |
| Rb ppm                 | 33.7                      | 28.9                      | 29.4                      | 32.4                      | 30.67                          |
| Re ppm                 | 0.004                     | 0.006                     | 0.005                     | 0.005                     | 0.01                           |
| S %                    | 0.25                      | 0.29                      | 0.25                      | 0.30                      | 0.26                           |
| Sb ppm                 | 0.74                      | 0.74                      | 0.82                      | 0.78                      | 0.77                           |
| Sc ppm                 | 14.7                      | 13.6                      | 13.7                      | 13.5                      | 14.00                          |
| Se ppm                 | 3                         | 3                         | 2                         | 3                         | 2.67                           |
| Sn ppm                 | 1.4                       | 1.3                       | 1.2                       | 1.3                       | 1.30                           |
| Sr ppm                 | 128.0                     | 99.1                      | 120.5                     | 123.5                     | 115.87                         |
| Ta ppm                 | 0.70                      | 0.59                      | 0.68                      | 0.72                      | 0.66                           |
| Te ppm                 | 0.05                      | <0.05                     | 0.07                      | 0.05                      | 0.06                           |
| Th ppm                 | 4.9                       | 4.4                       | 5.2                       | 5.4                       | 4.81                           |
| Ti %                   | 0.391                     | 0.350                     | 0.387                     | 0.375                     | 0.38                           |
| Tl ppm                 | 0.48                      | 0.43                      | 0.44                      | 0.43                      | 0.45                           |
| U ppm                  | 2.6                       | 2.0                       | 2.2                       | 2.3                       | 2.27                           |
| V ppm                  | 117                       | 107                       | 116                       | 108                       | 113.33                         |
| W ppm                  | 0.8                       | 0.7                       | 0.8                       | 0.8                       | 0.77                           |
| Y ppm                  | 19.5                      | 16.5                      | 18.6                      | 18.1                      | 18.20                          |
| Zn ppm                 | 91                        | 80                        | 85                        | 78                        | 85.33                          |
| Zr ppm                 | 147.0                     | 136.0                     | 137.5                     | 140.0                     | 140.17                         |

## 6. RECLAMATION LIABILITY COSTS

Sequenced mining and reclamation development plans were approved under Permit Q-15-006 in October 2000 and have been followed. Continuing reclamation has been carried out since commencement of backfill and grading in 2001. APL utilizes its own earth moving equipment to backfill and re-contour the mined out areas. The majority of the area requiring backfill and grading is included in the diatomaceous earth production costs if overburden is being moved as part of the mining process. When overburden is moved separately and piled or pushed onto the mined out areas from existing pile, then this cost is separated out as a direct reclamation cost. APL has allowed \$5,500 per hectare for the direct reclamation costs based on previous experience of actual costs at the quarry over the past 13 years. Based on the APL reclamation cost of \$5725/hectare, which includes grass seed (Table 8), and its distribution, and the amount of unreclaimed area of 11.59 hectares (Tables 1), the current reclamation security bonding of \$70,000.00 is sufficient to cover the estimated cost of \$69,540 for reclaiming the present 11.59 hectares of disturbed land (Table 9). The summary of material costs is given in Table 8.

**Table 8: Material Summary Report**

| Material Summary Report        | No. of Kg. or<br>No. of Plants | Unit Cost<br>\$/kg, \$/plant | Subtotal \$ |
|--------------------------------|--------------------------------|------------------------------|-------------|
| Seed mix                       | 1159                           | \$5.00                       | \$5,795     |
| Fertilizer                     | 0                              |                              | \$0         |
| Mulch                          | 0                              |                              | \$0         |
| Tackifier                      | 0                              |                              | \$0         |
| <i>Woody species</i>           |                                |                              |             |
| Seedlings (\$ per plant)       | 0                              |                              | \$0         |
| Fertilizer tablets (\$/tablet) | 0                              |                              | \$0         |
| Plant protectors (\$/unit)     | 0                              |                              | \$0         |
| optional - material 1          | 0                              |                              | \$0         |
| optional - material 2          | 0                              |                              | \$0         |
| optional - material 3          | 0                              |                              | \$0         |
| optional - material 4          | 0                              |                              | \$0         |
| maint.material 1               | 0                              |                              | \$0         |
| maint.material 2               | 0                              |                              | \$0         |
|                                |                                |                              | \$5,795     |



**Table 10: Summary**

| Version 3.5                |                 |                 |                   |                 | Date:                    |                |             |                 |
|----------------------------|-----------------|-----------------|-------------------|-----------------|--------------------------|----------------|-------------|-----------------|
| Project Name:              |                 | Red Lake Quarry |                   |                 |                          |                |             |                 |
| Permit #:                  |                 | Q-15-006        |                   |                 |                          |                |             |                 |
| Costing Year:              |                 | 2016            |                   |                 |                          |                |             |                 |
| Mine Activity Category     | AREA (ha)       |                 |                   |                 | RECLAMATION PRESCRIPTION |                |             | Total Cost      |
|                            | Total Disturbed | Perm. Disturb.  | Current Reclaimed | To be Reclaimed | Site Preparation         | Revegetation   | Maintenance |                 |
| <b>AREA DISTURBANCE</b>    |                 |                 |                   |                 |                          |                |             |                 |
| <b>Dump Face Resloping</b> |                 |                 |                   |                 |                          |                |             |                 |
| Resloped                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 1                   | 11.59           |                 |                   | 11.59           | \$63,745                 | \$5,795        | \$0         | \$69,540        |
| Master 2                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 3                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 4                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 5                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 6                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 7                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 8                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 9                   |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 10                  |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 11                  |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 12                  |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 13                  |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| Master 14                  |                 |                 |                   | 0               | \$0                      | \$0            | \$0         | \$0             |
| <b>TOTAL</b>               | <b>11.59</b>    | <b>0.00</b>     | <b>0.00</b>       | <b>11.59</b>    | <b>\$63,745</b>          | <b>\$5,795</b> | <b>\$0</b>  | <b>\$69,540</b> |
| <b>LUMP SUM ITEMS</b>      |                 |                 |                   |                 |                          |                |             |                 |
| ARD Capital Costs          |                 |                 |                   |                 |                          |                |             | \$0             |
| Mill Building              |                 |                 |                   |                 |                          |                |             | \$0             |
| Admin. Building            |                 |                 |                   |                 |                          |                |             | \$0             |
| Mill                       |                 |                 |                   |                 |                          |                |             | \$0             |
| Silos                      |                 |                 |                   |                 |                          |                |             | \$0             |
| Structures                 |                 |                 |                   |                 |                          |                |             | \$0             |
| Power line                 |                 |                 |                   |                 |                          |                |             | \$0             |
| Conveyor                   |                 |                 |                   |                 |                          |                |             | \$0             |
| Stockpiles                 |                 |                 |                   |                 |                          |                |             | \$0             |
| Sealing of Openings        |                 |                 |                   |                 |                          |                |             | \$0             |
| Hauling--Surface Materials |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 1            |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 2            |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 3            |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 4            |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 5            |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 6            |                 |                 |                   |                 |                          |                |             | \$0             |
| Optional Item 7            |                 |                 |                   |                 |                          |                |             | \$0             |
| <b>POST CLOSURE COSTS</b>  |                 |                 |                   |                 |                          |                |             |                 |
| Present Value              |                 |                 |                   |                 |                          |                |             | \$0             |
| <b>TOTAL</b>               |                 |                 |                   |                 |                          |                |             | <b>\$69,540</b> |

## 7. ACID ROCK DRAINAGE POTENTIAL

The diatomaceous earth quarried by APL is non-acid generating with a pH that lies close to 5 based on monthly results between January 2016 and December 2016 (Table 6). From the West Pit, the ephemeral spring runoff is directed toward a small pond slightly east of the centre of the Pit. From this pond a drainage ditch leads to the west where it is joined by a south-draining ditch from Northwest Pit and both drain to a naturally vegetated gully on the west side of West Pit (Figure 5).

## 8. REFERENCES

Read, P. B. (2012):

Annual Reclamation Report for the Year 2012, Mine Permit Q-15-006, Mining Leases 310888 and 376818, Red Lake Quarry; unpublished report, *Geotex Consultants Limited*, 14 p.

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Read, P.B. (2015):

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