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REPORT

ON

SIEVE FRACTION ANALYSIS & ROCK PROPERTIES

(March 2003)

Otto Property

Otto Tp.
Larder Lake Mining Division
North-eastern Ontario

For

Grant Forest Products Corp.

Map Sheet
42A/01
Nad 83
0572000 mE – 53210009 mN

2.27149

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1.0 SUMMARY

Mineral exploration work was conducted on the Otto Property to establish the existence, location, quantity and quality of a mineral resource suitable for producing bonded aggregate and to develop processes to evaluate that resource. The property consists of pink syenite; much of which has excellent potential to form a high quality pink coloured aggregate resource. The tonnage is very large. Consistency of product and product suitability remains to be verified.

The Blanche River divides the property into the West Claim and East Claims; both of which have excellent potential for aggregate products.

2.0 LOCATION AND ACCESS

UTM Nad 83 coordinates are used in this report.

The claims can be accessed by taking Highway 11 north from New Liskeard to Highway 112 (which leads to Kirkland Lake). From the intersection at Highway 11, proceed north on Highway 112 for approximately 6.5 km to the Round Lake cottage road which follows the north shore of the lake. Turn left onto this gravel access road and proceed 1 km west to the eastern claim line which crosses the road at a rock cut located at 0572817mE-5320364mN.

The West Claim is best accessed by proceeding approximately 5 km west from Highway 112. Turn right onto a gravel road leading north to the property. This intersection is approximately 400 metres west of the bridge over the Blanche River. Proceed north approximately 2 km to the southwest corner of the property (0568370mE 5321640mN). Park in a gravel pit located approximately 50 m north of the #3 post of the Western Claim.

3.0 THE PROPERTY

The property consists of 35 claim units within five contiguous claims as follows:

Claim 1199812	6 units	West claim
Claim 1199814	4 units	Blanche River claim
Claim 1199810	8 units	North central claim
Claim 1199813	15 units	East claim
Claim 1199815	2 units	Southeast claim
Total	35 units	All contiguous

Claim 1199812 is located to the west of the Blanche River and the remainder of the property is located to the east of the river.

4.0 PHYSIOGRAPHY AND VEGITATION

The Otto claims are covered by mixed spruce, balsam and poplar bush. Large outcrop areas have jack pine cover. Much of the area south of the claims is private land that appears to have been forested in the last 1 to 15 years. Outcrop areas are common.

5.0 REGIONAL AND PROPERTY GEOLOGY

The entire property is within the Otto Stock. The stock is approximately 12 kilometres in diameter and intrudes into Archean volcanics and sediments. It also intrudes the Round Lake Batholith located south of the stock.

Lovell reports the Otto Stock consists of medium to coarse grained pink syenite, quartz syenite and feldspar porphyry. Pink feldspar consists of euhedral to subhedral microperthite which is microcline feldspar ($KalSi_3O_8$) with a fine intergrowth of albite feldspar ($NaAlSi_3O_8$). The major accessory minerals include dark coloured aegirine-augite and amphibole and clear quartz as grains interstitial between the feldspar grains. Apatite and sphene form about 0.5% of the rock.

In the area sampled in this program, the feldspar is coarse grained to 5 mm and large phenocrysts are absent. To the north, tabular phenocrysts to 2 cm are common.

1 to 3 cm round black biotite-amphibole-pyroxene inclusions are present and locally form up to several percent of the rock.

Thin, fine grained bands of greyish syenite and syenite porphyry were encountered in the sample area.

6.0 EXPLORATION RATIONAL

Field and laboratory work was designed to locate a bedrock resource of pink syenite suitable for the bonded aggregate production. A combination of visual evaluation of hand and 10 kilogram composite samples, major oxide analysis and colour analysis where established as an orientation survey to develop evaluation procedures for a rigorous property evaluation which would include bulk sampling.

Sample preparation was designed:

- To produce samples within the sieve ranges used in commercial production.
    - To give a visual accounting of the appearance of expected products.
    - To determine if mineral fractionation is likely to occur during commercial crushing.
- To relate potential products to
    - Hand specimen logging and outcrop mapping.
    - Major oxide-whole rock analysis.
    - Colour analysis.

7.0 EXPLORATION PROGRAM

Priority was given to traversing and sampling the "West Claim". A cursory sampling traverse was also performed on the south-eastern part of the "East Claims". The locations of the outcrops examined and sampled are plotted on 1:5000 scale maps included in this report.

Nineteen hand samples numbered 29-48 were collected from outcrops on the property. These samples were logged with the aid of a Bausch and Lomb 10-30 power binocular microscope.

Five rock samples averaging approximately 10 kg each, were collected from outcrop locations #41, 43, 45, 47 and 48. These were cobbed into ~5 cm chunks and sent to "Accurassay Laboratories" at Kirkland Lake for crushing and major oxide-whole rock analysis. Each sample was crushed by a jaw crusher, then further reduced by a roles crusher. A sample was split from the crushed product before sieving and analyzed by major oxide-whole rock analysis.

Accurassay Laboratories forwarded the remainder of the crushed product to "Acculab Engineering and Testing Limited" at Schumacher, Ontario. Acculab conducted a dry sieve analysis of samples #41, 45, 47 and 48. Sample #43 was sieved but the fractions were not weighted. The sieve fractions were returned to Accurassay where major oxide analysis of the minus 0.045 mm sieve fraction (-45 microns) was performed. These fines were analyzed to determine if the mineral fractionation might occur due to crushing the rock. The major oxide analysis were used to calculate estimated percentages of quartz and feldspar in the original whole rock samples and in the –0.045 mm sieve fraction.

Grant Forest Products received the sieved fractions and provided these to Doug Robinson Consulting for logging. The author logged the sieved samples using Bausch and Lomb binocular microscope.

The author plotted the sieve analysis on cumulative percent frequency graphs to demonstrate a natural spectrum of sieve fractions expected from crushing operations.

Samples #41, 43 and 48 were photographed with a Nikon Coolpix 4500 digital camera using the incandescent colour balance setting. Tungsten lighting was used as a light source. These pictures; which are included in the appendixes, have not been digitally altered except to decrease the picture sieve to fit the page and to brighten the image. This image was digitally brightened to compensate for underexposure that resulted from the automatic exposure which recorded the image luminosity equivalent to 18% grey which is the photo industry standard. The rock is significantly brighter that the 18% grey standard.

Preliminary colour analysis of the hand specimen #48 and the analytical pulps #41, 43, 45, 47 and 48 were performed to establish potential logging procedures for exploration and eventually production sampling. Photo image evaluation was performed using the digital image processing program "Adobe Photoshop Elements (2)". The pictures were taken by various camera settings of the Nikon Coolpix 4500 camera. The properties measured included luminosity of the sample and the intensity of the Red, Green and Blue hues (RGB) that compose the luminosity.

Luminosity and intensities reported from the image processing program appear to be similar to percent reflectance; however, the units reported appear to be relative measurements, not absolute values. It may be possible and useful to relate these arbitrary units to percent reflectance, possibly by graphing luminosity and hue intensities relative to the percent reflectance of standardised grey cards.

8.0 DISCUSSION OF OBSERVATION & RESULTS

8.1 Access

The Blanche River effectively divides the property into the West Claim and the Eastern Claims. The west section consists of claim 1199812 and part of 1199814. The remainder of the property is located east of the river. The river that crosses the property is slow moving and moderately wide, similar to the bridge crossing

1.7 km to the south. At the south claim line of 1199814 the river bed drops to greater than 1.5 m deep within a few meters from shore.

The land south, west and east of the claims is private property. Much of the north boundary is Crown land; however, access from the north is probably less practical than from the south.

The West Claim is best accessed from a short gravel road that leads approximately 100 metres from the township road to a gravel pit located on the southwest corner of the west claim (1199812). The private property to the west and south of claim 1199812 is mature forest and the property boundary is marked by survey lines that are now overgrown by underbrush.

The main east claim; claim 1199813, is bounded to the south by recently clear-cut private land. Several seasonal private logging roads approach the south edge of this claim. Claim 1199815 gives direct access to claim 1199813. A natural gas pipeline is located north of the Round Lake access road and must be crossed to access the East Claims. An abandoned but drivable section of the Round Lake access road crosses claim 1199815 between the pipeline and the active road. The author used this abandoned road to drive onto the property. Both claims 1199813 and 1199815 are forested land.

8.2 Major Syenite Types

A quick walkabout of the property revealed three pink coloured units within the syenite:

1. West of the Blanche River, the "West Claim" (1199812) is a medium grained (2-5 mm) pink **quartz syenite** with prominent quartz grains.
2. The south part of the East Claims has a similar appearance. It is medium grained (2-5 mm) pink **feldspar syenite** with little or no visible quartz. This unit is called feldspar syenite to distinguish it from quartz syenite. Estimated mineral calculations; however, indicate quartz may be present.
3. The north part of the East Claims is coarse grained, pink **feldspar porphyry** with feldspar phenocrysts to 2 cm.

The contacts of these units were not mapped; however, the approximate contact of the porphyry is marked on a 1:25000 scale map included in this report.

8.2.1 West Claim (Quartz Syenite)

The topography of the West Claim is dominated by a high outcrop ridge. This ridge has excellent potential to produce a moderately hard and attractive pink-red aggregate product. This stone appears to be composed of fresh, hard and

competent feldspar grains with significant amounts of clear quartz and green ferromagnesian minerals (including aegirine-augite, hornblende and chlorite). The best potential appears to be located between UTM coordinates 05684000-0569000mE and 53218000-5322600mN. Any reserve potentials would have to allow for property setbacks along the west property line. Setback requirements along the north and south claim boundaries would probably be outside the prime resource area. The Blanche River is located approximately 250 meters to the east of the favourable ridge area.

In the southern portion of this area, several thin feldspar porphyry and fine grained syenite units cut the favourable quartz syenite. See sample #30 reported in the included sample log. These units are medium grey and could be detrimental to the colour of aggregate products. These do not appear to be associated with the much coarser, major porphyry unit identified on the north part of the property east of the river.

8.2.2 East Claims (Syenite)

A small area of the East Claims has had a cursory examination. Claim 1199815 is covered by scrubby spruce and balsam fir. The outcrops examined were generally small and poorly exposed. At the southeast part of claim 1199813 the author traversed to the south edge of an approximately 350 by 600 meter outcrop area marked on MNDM Map 2239. A single sample, sample #45 was collected at this location, along the south edge of a high outcrop.

Claim 1199814 immediately east of the river was not traversed; however MNDM Map 2239 reports a 350 by 250 metre outcrop area may be similar to the favourable feldspar syenite at the sample #45 collection site.

8.2.3 East Claims (Feldspar porphyry)

A quick walkabout of the property indicates most of claim 1199810 and the north part of 1199813 is coarse feldspar porphyry consisting of tabular grey-pink feldspar phenocrysts to 2 cm in a medium grained syenite matrix. This stone appears to have a significant planar fabric caused by a preferred orientation of the feldspar phenocrysts. This preferred orientation could be used to advantage if this stone were used as dimension stone. By changing the orientation of a cut or break of the stone, the appearance can be changed from a coarse equigranular product to a product having a strong linear texture.

If used as an aggregate product, this stone would probably appear similar to the medium grained feldspar syenite to the south. If this area is investigated, the colour of this stone should be carefully mapped with attention given to the

relationship of the pink and grey colours of the feldspar. Attention should also be given to the grain size and any possible alteration of ferromagnesian minerals that might adversely impact hardness or appearance of the large grains. The coarse grain sieve of the minerals could emphasise the colour variation in either aggregate or dimension stone products.

8.3 Rock and Mineral Descriptions

The feldspar and coarse quartz are easily identified on the fresh broken surface. The feldspar is recognized by prominent cleavages and translucent to opaque pink to off white colour. This is in contrast to the clear glassy quartz grains. Ferromagnesian minerals are recognized by their medium to dark green colour. Samples #29 to 48 are located on the attached 1:5000 scale maps and described in the attached rock sample logs.

Based on mineral calculations from major oxide analysis, the percentage feldspar appears to be consistently lower than logged in the hand samples. Inversely; the percentage of ferromagnesian minerals appears to be systematically higher than logged. Mineral calculations also indicate the percentage quartz may also be consistently underestimated in the logs.

Syenite is rock having low quartz contents, typically less than 10% and commonly without quartz. Quartz was logged only in those hand samples from the West Claim (#29-43). No quartz was logged in the samples from the East Claims (#44-48).

The rocks from both the west and east claims tend to be medium pink with little to distinguish differences in colour or reflectance-luminescence. The rocks from the East Claims may be marginally darker and greyer than on the West Claim. If these rocks are truly darker and greyer; the colour difference is probably caused by darker coloured feldspar and/or a higher percentage of the dark coloured ferromagnesian minerals.

Commercial descriptions such as "rose" are useful marketing tools; however rock descriptions require the use of a colour index and reflectance-luminescence index or other quantitative measurements to monitor colour quality. These could be measured optically or visually logged from direct comparison with a prepared library of colour patches.

8.3.1 West Claim: Samples #41 & 43

The feldspar and quartz were coarse grained and easily identified on the freshly broken surface. The ferromagnesian minerals tended to be discrete fresh mineral grains.

Feldspar is the dominant mineral of this syenite. Hand specimen logging suggests this rock is approximately 90% feldspar and 5% quartz and 5% combined ferromagnesian minerals including aegirine-augite, hornblende and/or chlorite. However, the whole rock analyses indicate the rock is approximately 71-74% feldspar, 15-17% quartz and 9% ferromagnesian minerals. The photographs indicate the 9% ferromagnesian minerals as calculated from the whole rock analysis is most reasonable. It is not possible to identify the quartz in the photographs to verify the quartz-feldspar ratio. Although not confirmed, 10% quartz appears to be a reasonable estimate of the quartz content. This is midway between the logged and the calculated estimates. Actual grain counts of sieved products could help resolve conflicting quartz estimates.

8.3.2 East Claims: Samples #45, 47 and 48

This feldspar is also coarse grained and easily identified on the freshly broken surface. No quartz was logged in the hand specimens.

Feldspar is the dominant mineral of this syenite. Hand specimen logging suggests this rock is approximately 93-95% feldspar and 5% combined ferromagnesian minerals including aegirine-augite, hornblende and/or chlorite. However, the whole rock analyses indicate the rock is approximately 71-74% feldspar, 7-10% quartz and 15% ferromagnesian minerals. The photographs indicate the 9% ferromagnesian minerals as calculated from the whole rock analysis is most reasonable. It is not possible to identify the quartz in the photographs to verify the quartz-feldspar ratio. Samples #45 and 47 are not available to confirm the quartz content. Sample #48 was re-examined and quartz is present, although it is difficult to see because the rock breaks around the quartz grains. 5% quartz in sample #48 is plausible; however the mineral calculations are believed to be imprecise and the calculated 9% quartz is doubtful. The best mineral estimate could be performed on a coarsest sieved fraction in which the minerals are in large part liberated and identifiable.

8.4 Sieve Fraction Analysis

Samples #41, 45, 47 and 48 were sieved and sieve fractions weighed to demonstrate typical sieve spectrum that can be expected from a simple crushing and single sieving process. As expected; no single sieve fraction within any 2:1

sieve fraction exceeded 40%. For example; the 2.26 to 1.18 mm sieve fraction of sample #41 is 28.5% of all the crushed product from that sample. These charts can be used to estimate the bulk sample size required to produce representative samples for physical testing. Any arbitrary sieve fraction can be measured from the graph without performing a new sieve analysis.

These sieved fractions could be logged specifically to determine the percentage of each mineral that is liberated at each fraction. This information would be useful if colour, hardness or other properties of the proposed products are to be controlled by beneficiation processes such as magnetic separation, screening, cycloning, floatation or other processes. The appearance of the product can be impacted by the grains being composite grains or liberated grains.

In the 2.36 to 4.75 mm sieve fraction of sample #43, it appears the coarse quartz is 50% liberated and has an effective liberation size of approximately 1 mm. The ferromagnesian minerals on the other hand appear to have an effective liberation sieve of approximately 0.2 mm. The dark green ferromagnesian minerals are probably the dominant impact on the grey colour and reflectance-luminescence of the crushed products. Removing the ferromagnesian minerals would eliminate much of the grey from the sample and increase the apparent brightness of the sample by increasing reflectance-luminescence. This effect can only be accomplished if a significant portion of the dark mineral is liberated and removed.

Natural processes in material handing could effectively concentrate liberated minerals causing product variation. In typical rocks, these minerals could include magnetite, mica or any other mineral having distinctive physical or electrical properties. Mineral fractionation is not expected to be a major problem with products from the syenites of the Otto Stock.

The general appearance of the crushed samples appears to change around 0.3 mm. The smaller sieve fractions appear more uniform and brighter than the coarse fractions. To produce an aggregate product with a distinctive pattern in the smaller sieve fractions, products with strongly divergent colour properties should probably be added. The increased brightness of the fine fractions may be apparent and disappear if these products are bonded into an aggregate, particularly if the bonding agent is transparent.

The estimated reflectance was established by using standardized reflectance patches contained in the referenced text "Kodak Professional Photoguide" in combination with a reflected light meter used for photography. The reflected light meter measured reflectance in a sequence of F-stop increments equivalent to reflectance intervals of ¼, ½, 1, 2, 4 etc.

The 2.36 to 5.75 mm sieved fractions of samples #41, 43, 45 and 47 were re-examined during March 2003. Samples #41 and 45 were then confirmed to have a distinctly more intense pinkish hue than samples #43 and 47. The author does not have an adequate explanation to explain this pinkish hue, however the observation appears to be valid. The photo images of the analytical pulps verify this apparent trend. The pinkest samples are also the northern most samples #41 and 45. This trend should be verified because the five samples studied are not statistically valid.

8.5 Appearance and Photo Analysis of Analytical Pulps

The analytical pulps of samples #41, 43, 45, 47 and 48 were digitally photographed by placing all the samples together as a single image showing all five samples on one page. Various camera settings and light sources were used. The most reliable colour was produced by using two tungsten bulbs as a light source and a standard Kodak (18%) Grey Card to preset the camera. This image is included in the report. The areas of the pulp samples were cropped and copied into a new image to show only rectangular colour patches of the pulps. This image is also included in the report.

Adobe Photoshop Elements (2) was used to evaluate digital images for luminescence and intensity of the Red, Green and Blue hues (RGB). For tungsten light, these values for the grey card were very close to equal, meaning the grey card image was close to perfect grey. It is assumed the pulps will be near to true colour as well.

Also included in this report is a similar image of the colour patches produced using a Nikon ring light. The hue intensities from the grey card had marked variance indicating a colour shift in this image. In theory, if the colour of the grey card were digitally altered to true grey (equal RGB values), the image of the pulps would also be changed to true colour by using the same changes.

The Photoshop program groups the pixels of the photo image into 156 intensity groups for each hue (RGB) and total luminosity. It plots a histogram and records the calculated mean value and standard deviation of each histogram. In this report the author reports intensity values as the mean value of the histogram.

The author is not familiar with the mathematical basis used to group the data. The sampling interval used to group intensity might be linear, logarithmic or other grouping.

Large colour corrections should be avoided if possible. Also grey reference cards with luminosity near the average luminosity value of the samples would be preferable to the 18% grey card.

Below is a more detailed accounting of the procedure followed and the observations made. The samples were prepared for photo imaging by:

- Placing each sample in a separate labelled glass Crown sealer lid.
- Spreading each sample approximately flat.
- Placing a mylar drafting film over each sample.
- Gently compacting each sample by light pressure applied across the mylar. A flat, nearly shadowless surface resulted over the samples.
- A Kodak Grey Card was placed in an open box lined by black fabric.
- The five samples were labelled and placed on the grey card.
- $1/6^{th}$ of the grey card was left uncovered to act as an 18% grey standard to monitor the colour fidelity of the image.
- Digital images were taken using various camera settings. The following two settings were deemed to have the best colour fidelity (This conclusion is based on the luminosity and the intensity of the Red, Green and Blue hues having similar values):
    - The camera was preset by taking an image of only the grey card exposed by using two 100 watt bare tungsten bulbs as a light source. The bulbs were placed to the left and right of the image at approximately 60° from the horizontal. The pulp samples were then placed on the grey card and the image retaken using the preset defaults.

      The tungsten image is included in this report
    - The camera was preset to grey card image using a Nikon ring light as the light source. This light is a 5 cm ring that threaded into the lens of the camera.
- The images were opened into Adobe Photoshop Elements (2).
- The largest possible rectangular area of each pulp sample and the grey card standard were individually blocked out and digitally sampled for total luminosity and intensity of the standard Red, Green and Blue hues.
- As each block was digitally sampled, the same blocked image was copied to a new composite image. The luminosity and intensity value of each hue was typed above or below the sampled block copied into the new image.
    - The resulting composite tungsten image and ring light image are included in this report.

- The author recognizes the image produced using tungsten light is probably closer to true colour than the image produced using the ring light. This conclusion is based on the fact that the luminosity and intensities of RGB hues of the grey card were nearly identical. This conclusion applies to the reliability of the colour fidelity, not the reflectance-luminosity level.
- The program produced statistical histograms along with the intensity values. The histograms measured from the tungsten image were copied onto a single 11x17 inch page which is included in this report.

- The author tried to numerically reconcile the luminosity and hue intensity values of the ring light image to the tungsten image. This was unsuccessful; which suggests the digital sampling was not a linear mathematical relationship. In the future; this problem could be reduced by using a fully manual camera and by using grey scale reference cards with luminosity nearer to the average luminosity of the samples.

8.6 Digital processing of Sample #48

The pulp and rock of sample #48 was digitally imaged using two tungsten bulbs as the light source and the camera preset to a standard 18% grey card. This setting was previously determined to give the best colour balance. This image and the colour patches evaluated from this image were copied to a single image included in this report. The image visually appears to be reliable. The histograms and the associated luminosity and RGB intensity values were copied to an appendix included in this report.

It is apparent the rock is significantly brighter than the grey reference card and the pulp is much brighter than both the grey card and the rock. Also the standard deviation of the pulp is very narrow compared to the rock.

The rock and the pulp are mineralogically and chemically identical; thus differences in mean values, colour intensity and luminosity must have an alternate explanation.

The narrow standard deviation of the pulp relative to the rock appears to be a factor of the grain sieve:

- The largest grains in the pulp appear to be approximately 1 pixel wide. This causes the pixels to sample multiple grains and the resulting values are an average colour shifted towards the mean value.
- Fine dust probably coats the larger grains thus causing a more uniform apparent colour which also reduces the standard deviation by shifting the apparent colour towards the mean value.

- Other factors which the author is not familiar with, possibly related to the wave length of light relative to the small particle sieve.

In the image of the hand sample, individual mineral grains are apparent. These grains appear to range from 1 to 10 pixels wide. A large percentage of the pixels fell totally within individual grains. Pixels free from dilution effects from overlapping grains allows for real statistical variance causing broad histograms with large standard deviations. The histograms and standard deviation would be even wider if the smaller pixels could be measured to reduce the percentage of pixels sampling multiple grains.

The apparent colour shift caused by grain reduction into the smaller sieves must be dealt with. It is real or apparent? The best test of this question is mounting sieved particles in various bonding mediums, particularly transparent mediums that cause an apparent wetting of the sample similar to immersing the sample in water. Opaque bonding mediums including black mediums and white mediums could be revealing as well.

The minerals in the rock range from opaque to transparent. The apparent colour and luminosity of transparent and semitransparent minerals may respond differently in transparent and opaque bonding mediums. It is the quality of the response of the mineral within bonding medium that will control the worth of the mineral. The bonding medium without mineral inclusions should be evaluated under similar conditions. The bonding medium would be a useful control sample to determine the impact of the bonding agent relative to the minerals.

The greater the transparency of the mineral grains, the more their colour is impacted by the colour of the mounting medium and the coloured mineral grains beside and behind the transparent grains. Also, transparent grains may darken the apparent colour of polished grains by transmitting light into the product. Transparent grains may also act as lenses creating attractive gemmy internal reflections and possibly coloured refractions when viewed under point source lighting.

The digital processing of the images in this report was performed with the intent to investigate the difficulties expected in reporting the rock properties of luminescence and colour. The images taken by tungsten light using a Kodak Grey card appear acceptable; however diligence is required to improve on the image quality and consistency in follow-up work recommended on this property.

It may be difficult to generate absolute values of reflectance-luminosity and colour. For this reason, the author recommends reflectance and hue intensity be expressed as index numbers. The luminosity could be expressed as a decimal

fraction relative to the Kodak Grey Card scales. The Red, Green and Blue hues could be expressed as a decimal fraction of the luminescence of the rock (see chart in 9.2 Colour Evaluation & Recording Images). Using these index values could increase reliability and reproducibility of results in field or non laboratory conditions.

8.7 Major Oxide Analysis

Major oxide analysis of both the whole rock and the –0.045 mm sieve fraction are comparable indicating serious fractionation caused by grinding are not expected. Weakly elevated LOI, Fe_2O_3, MgO, CaO and TiO_2 in the –0.045 mm sieve fraction indicates the green ferromagnesian minerals might be weakly concentrated in the fines.

Crude mineral calculations were performed from the major oxide data. It is difficult to establish meaningful mineral ratios from the chemical data because the relative abundances of aegirine-augite, hornblende and chlorite are unknown and their chemical compositions are also unknown. It is particularly difficult to attribute Al_2O_3 and Na_2O to the formulas of these ferromagnesian minerals. A more accurate allocation of the Al_2O_3 and Na_2O values to the ferromagnesian minerals values would result in a significant change to the calculated mineral ratios, making the calculation ratios more valid.

At this time the calculations should only be used to indicate possible trends in the quartz and ferromagnesian minerals. By calculation the feldspar is probably about 65% albite and 35% orthoclase by weight. The calculated quartz contents appears higher than the quartz logged in the hand samples. The actual quartz contents appear to greater than logged and less than calculated.

9.0 RECOMMENDATIONS

The systematic preliminary traverse should be extended to several major outcrop areas that were not examined. This traverse should focus on the large outcrop areas of feldspar syenite on claims 1199813-14. A cursory examination is warranted over the feldspar porphyry located on claim 1199810 and the north part of claim 1199813. The examination of the feldspar syenite and feldspar porphyry should focus on the colour of both the rock and the feldspar and estimate the percentage of quartz and ferromagnesian minerals. If the ferromagnesian minerals are coarse, they could impact the appearance of aggregate products.

9.1 Detailed Mapping & Sample Collection

Two to four priority 32-48 ha. areas having the best rocks should be mapped at scale 1 cm = 10 meters. Mapping should determine:

- The extent and location of rock favourable for aggregate production.
- The consistency and variance of the potential product.
- The feldspar, quartz and ferromagnesian mineral content of the rocks.
- The colour and reflectance of the rock, possibly as percent reflectance (or luminescence) and the intensities of the Red, Green and Blue hues. These could be expressed in absolute units or as index values.
- The location of any detrimental units within the favourable rock.

The mapping should be conducted using a 100 m square cut grid or a 50 metre grid line spacing. The first mentioned grid with lines spaced at 100 metre intervals cut in both directions is more precise and gives an excellent coverage. Representative rock samples should be collected during detailed mapping. Numerous 250-500 gram samples are ideal for mineralogical observation and photographic records.

From each grid area, ten repetitive 3 kg samples should be collected and crushed to minus 5 mm. From the crushed sample, the following hand or machine sieved fractions should be logged and photographed:

- 1 to 2 mm
- 0.2 to 0.3 mm
- -045 mm (45 microns)

A single major oxide, whole rock analysis should be performed on each of the large representative samples. Mineral grain counts of a sieved fraction should also be performed to calculate the percentages of quartz, feldspar and ferromagnesian minerals in the rocks. Several thin sections would be useful to understanding the mineralogy of the rock that could impact rock quality. The estimated liberation sieve could also be established from the logging the crushed samples and thin sections.

Care should be taken to identify and map low quality units including fine grained greyish syenite and porphyry units and dark green lamprophyre dikes. These rocks are all known to occur in the Otto Stock. Round, dark green to black inclusions to 3 cm are locally common in the Otto Stock. These should be mapped as well.

The 5 samples examined in detail by this report, indicate a trend of more intense pink colour to the north. Mapping should attempt to determine if this observation is real of coincidental.

All rock samples should:

- Be representative of the outcrop area and include both favourable rocks and any rock expected to cause a problem.
- Be free from dirt or any other colour contamination.
- Have at least one prominent, preferably flat, freshly broken surface free from weathering affects and joint faces.
- Be bagged to protect the fresh surface from scratching which can cause an apparent colour-brightness shift caused by the streak of scratched minerals.

Some rock samples should be cut and polished on one side while preserving a flat freshly broken face. The luminosity and colour of both the polished and broken face should be compared. This comparison is required to determine if the fresh face is a valid representation of the rock. The polished face is expected to more closely represent the colour quality of processed aggregate.

Bulk sample sites should be picked based on an evaluation of detailed mapping and sample logging. The significant proportion of outcrop exposure may accommodate bulk sampling involving little or no outcrop stripping. Any bulk sample should be at least twice as large as the total weight of the sieve fractions that may be required for testing. This will allow for waste that is outside the sieve fractions required. The sieve analysis graph included in this report may be useful to estimate wastage during crushing.

9.2 Colour Evaluation & Recording Images

A systematic process is required to measure the rock properties of colour and reflectance-luminescence. This could be difficult to accomplish for field measurements; however it may be viable to do this in lab conditions involving a standard light source within a neutral grey, black or white light box. A white interior to a light box will tend to decrease the intensity of any shadows that could impact the image of any product that is not a polished surface.

It may be possible to measure reflectance-luminosity and intensity of the Red, Green and Blue hues by spectrometer. Reflected light meters may exit that can measure percent reflectance or luminosity. The total reflectance and intensity of the RGB hues should be verified by a standard such as a Kodak Grey card. The author is not familiar with spectrometers or their use.

The alternative to using a spectrometer is to use a digital camera and process the image to measure luminosity and intensity of RGB hues. In preparing this port the author has developed and performed a preliminary evaluation of colour using digital images.

It appears the digital imaging program used by the author measures colour properties in relative intensities, not in recognized units. If possible, it might be better to measure the colour and reflected light properties of rock in absolute units.

For any instrument selected for colour measurement, it is critical to understand how the data is collected and what factors impact these measurements. For example; Is the data collected from a single small point source (not useful), many data points (similar to digital image) or a wide area (similar to a light meter used in photography)? It is important that an instrument measure a wide area covering many mineral grains without extending the measured area beyond the specimen.

A digital image from a camera is easy to use because the exact area to be sampled can be blocked out with the computer mouse. Considerable information is contained in the histogram of the data and the image can be magnified to examine the actual pixels used as data points.

The data collected from the images contained in this report is grouped by relative measurements, not absolute units. This disadvantage is in part compensated for by the ability to generate a coloured image of the exact sampled area of the rock. This image can be archived with the measurements. The disadvantage of not having recognized units could be compensated for by using standard grey cards for quality control. For best results, the reference grey card should be in the midrange of the reflectance of the samples to be tested. The values of reflectance-luminosity could be reported as a decimal fraction of the standard grey card. The intensities of the hues could be reported as a decimal fraction of the total luminosity of the sample.

The following table references the colour properties of rock sample #48. The two right hand columns illustrates two potential methods to report the colour values of rocks and rock products (See appendix "Histograms: Grey card and Sample #48 Analytical pulps and Rock").

Rock Sample #48.

Potential Colour Correction Referenced to18% Kodak Grey Card. and Hue Index Relative to Luminescence.

	Grey Card: Measured Mean Values	Correction Factor to Grey	Rock's Measured Mean Values	Correction Factor from Grey Card	Corrected Value	Index: Ratio to Grey
Luminosity	132.32	1	143.88	1	**143.88**	**1.0874**
Red Hue Intensity	130.93	1.0106	153.18	1.0106	**154.81**	**1.0759**
Green Hue Intensity	132.60	0.9979	140.87	0.9979	**140.57**	**0.9770**
Blue Hue Intensity	134.56	0.9834	134.96	0.9834	**132.71**	**0.9224**

The rock's luminosity and colour could be indexed by the following sequence of numbers:
143.8, 154.8, 140.6, 132.7 ***or***
1.087, 1.076, 0.977, 0.922.

The above corrections assume the measurements were taken from nearly equal sampling intervals (near linear) in the x-axis of the histogram. This correction formula would probably be invalid for correcting the image of the pulp taken from the same image because of the much larger x-axis separation between the luminosity of the reference card and the pulp.

Many automatic digital cameras are unlikely to take useful images because the camera adjusts the shooting parameters to produce an image with a colour and reflectance shifted towards the industry norm of 18% grey. If a camera and digital processing are used in the laboratory, the following items should be considered:

- A camera with fully manual exposure control could be used to maintain exposure relative to standard lighting conditions.
- Some cameras can adjust the first image to neutral grey and preserve the exposure setting until the settings are cancelled (see tungsten light photo images of pulps and sample #48). If the first image is a standard grey card, that image is produced as true grey and all subsequent images should have true hues that produce accurate colours relative to the reference grey card.
- Any images should include part of a reference grey card to verify the colour quality is maintained throughout the sequence of pictures:
    - If the RGB intensities and luminescence of the included grey card are nearly equal, the image can be used to determine the values of RGB hues relative to total luminosity. Each hue could be

expressed as a decimal fraction of luminosity. If the sample is grey, all values would be 1.00 (see chart above).

- Also luminosity of the rock could be expressed as an index relative to the measured luminosity of the grey card (see chart above).
- If small scale colour adjustments are used to correct colour shift in the grey card, the same adjustment would probably produce a satisfactory correction the colour of the sample. These adjustments would be made prior to calculating the individual hues as decimal fractions of total luminosity or printing colour images of the samples.

  Even if the intensity levels are measured on a logarithmic scale, small corrections of sampling intensity are likely to be nearly linear. Large corrections however are probably not valid.
- Any rock faces measured should be free from weathering, joint faces, dirt or any other colour contamination.
- Cut and polished samples may give the best colour data to representation commercially cut and polished products. In contrast, freshly broken samples are cheaper and easier to produce and measurements can be made quickly. A correlation between cut-polished samples and broken rock surfaces should be performed.

It would be advantageous to record reliable RGB images in the field to collect a larger and more representative colour database. In reality a collection of colour tabs may be more practical.

The following field conditions cause special problems in recording accurate colour: colour shifts (colour temperature) of the light relative to the time of day, coloured light reflected from nearby objects such as trees, and clouds or haze subtracting and reflecting light. Solutions could include:

- Using a camera that can adjust the first image to neutral grey when that image is a grey card, and then preserve the exposure settings until the settings are cancelled.
  - A grey card should also be included in each picture to verify the colour integrity of the image.
  - Pictures should be taken in rapid succession using similar lighting conditions (possibly direct sunlight filtered through a translucent mylar sheet).
  - Care should be taken to avoid taking and comparing images taken in both direct sunlight and diffuse light.

- Using two high intensity flash units at 45-60 degree to the line of sight. The added flash would have to be much more intense than the ambient light.

The rock properties of colour and luminescence-reflectance should be dealt with. Procedures to measure these properties are required to adequately describe aggregate products. Problems related to the reproducible measurement are dealt with in this report. The use of digital image processing is discussed in this report, both as a possible method to make the required measurement and as an illustration of the problems expected from any other measurement procedure. If an alternative measurement procedure such as spectrometer are used, similar problems are expected.

10.0 SUMMARY

The Otto property is potentially a very large source of a moderately hard pinkish aggregate that has excellent consistency. The following three distinct units: quartz syenite, feldspar syenite, and feldspar porphyry are potentially desirable aggregate products:

- The **quartz syenite** from the West Claim appears to have the best colour potential.
- The **feldspar syenite** from the Eastern Claims might be a better product where a significant very hard quartz content is detrimental. Although feldspar is significantly softer than quartz, it is moderately hard and should hold a polish well. During crushing and grinding, the lower hardness of feldspar could result in a substantial cost saving relative to quartz rich products. The low quartz content of this rock requires verification.
- The feldspar porphyry is not sufficiently documented for comment, except to note: it would probably look somewhat like feldspar syenite when crushed and polished. The strong coarse linear crystal fabric might make an attractive dimension stone. This syenite unit is located on the northern part of the property remote from road access.

The systematic preliminary traverse should be extended to several major outcrop areas that were not examined. Two to four priority areas ranging from 32 to 48 ha should be mapped at scale 1 cm = 10 meters. Mapping should determine:

- The extent and location of rock favourable for aggregate production.
- The consistency and variance of the potential product.
- The feldspar, quartz and ferromagnesian mineral content of the rocks.

- The colour and reflectance of the rock, possibly as percent reflectance (or luminescence) and intensities of the Red Green and Blue hues. These values could be expressed in absolute units or as index values.
- The location of any detrimental units within the favourable rock.

The bulk sample should be taken from the best sites confirmed by preliminary traverses and mapping of priority areas. The bulk sample should be at least twice as large as the total of any sieved product required.

A systematic procedure is required to properly describe and document the consistency and quality of the reflectance and colour of the aggregate resource on the property. The process developed would be a valuable asset to monitor quality control during production and to archive the rock quality of shipments. Precise documentation will enhance the ability to vary the product to client needs and reproduce previously supplied products.

11.0 REFERENCES

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MERQ-OGS

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Ontario Geological Survey 1991. Bedrock geology of Ontario, east-central sheet; Ontario Geological Survey, Map 2543, scale 1:1 000 000.

Ontario Geological Survey 1991. Bedrock geology of Ontario, explanatory notes and legend; Ontario Geological Survey, Map 2545.

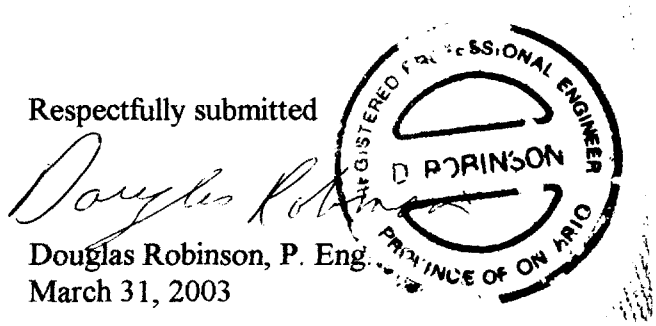
Kodak Professional Photoguide: 1st Edition, First Printing p.6-7.

CERTIFICATE OF QUALIFICATIONS

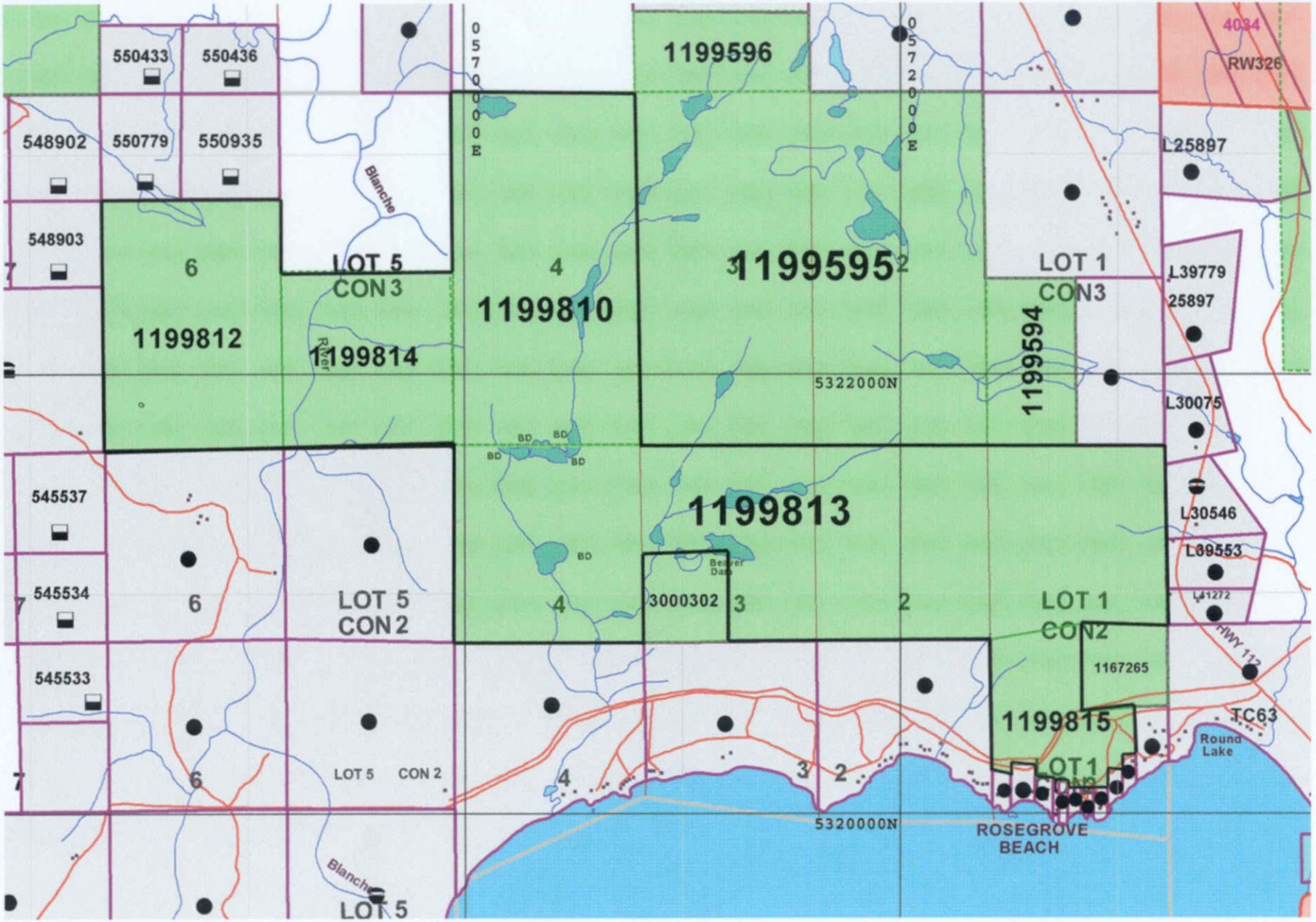
I, Douglas Robinson, of 24 Victoria Avenue, Swastika, Ontario hereby certify that:

1. I am a registered professional Engineer of the province of Ontario, No. 39322011.
2. I am a graduate of Queen's University in Kingston Ontario with an Honours Bachelor of Science, Geological Engineering 1975, and Northern College, School of Mines in Haileybury, Ontario, 1970.
3. I have been practising my profession since graduation.
4. The information contained in this report is the result of work done by myself and the references cited.

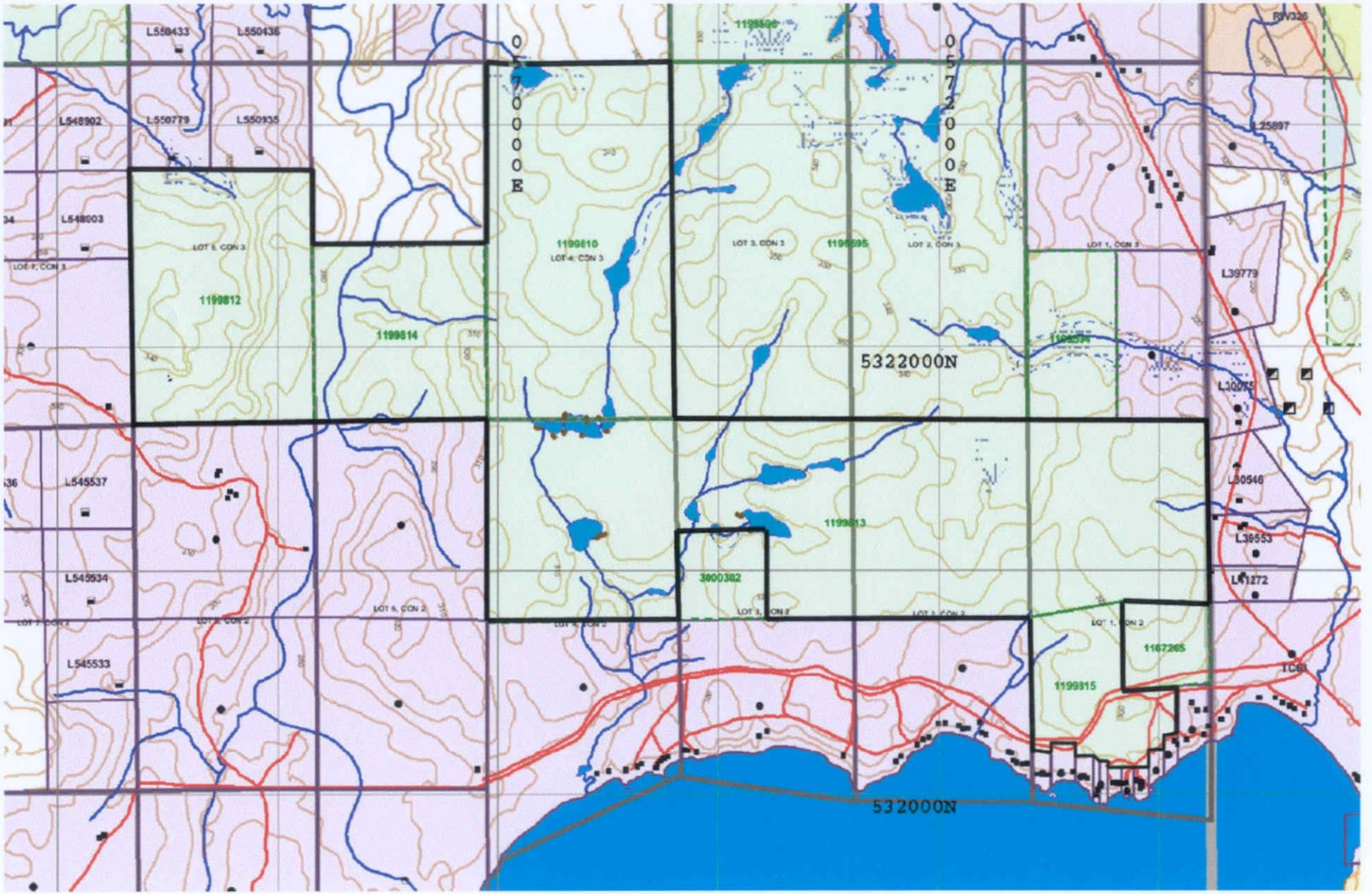
Respectfully submitted



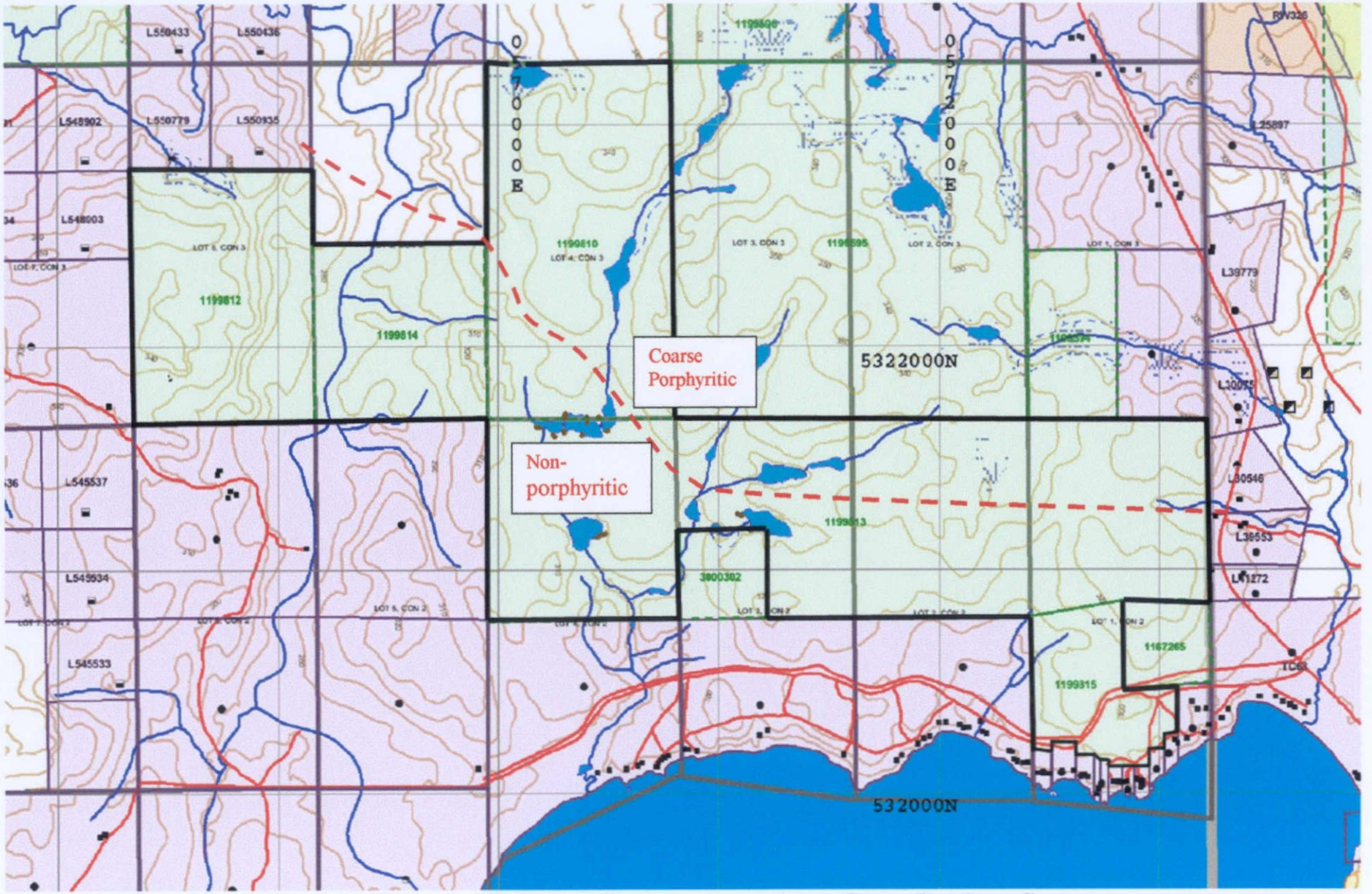
Douglas Robinson, P. Eng.
March 31, 2003



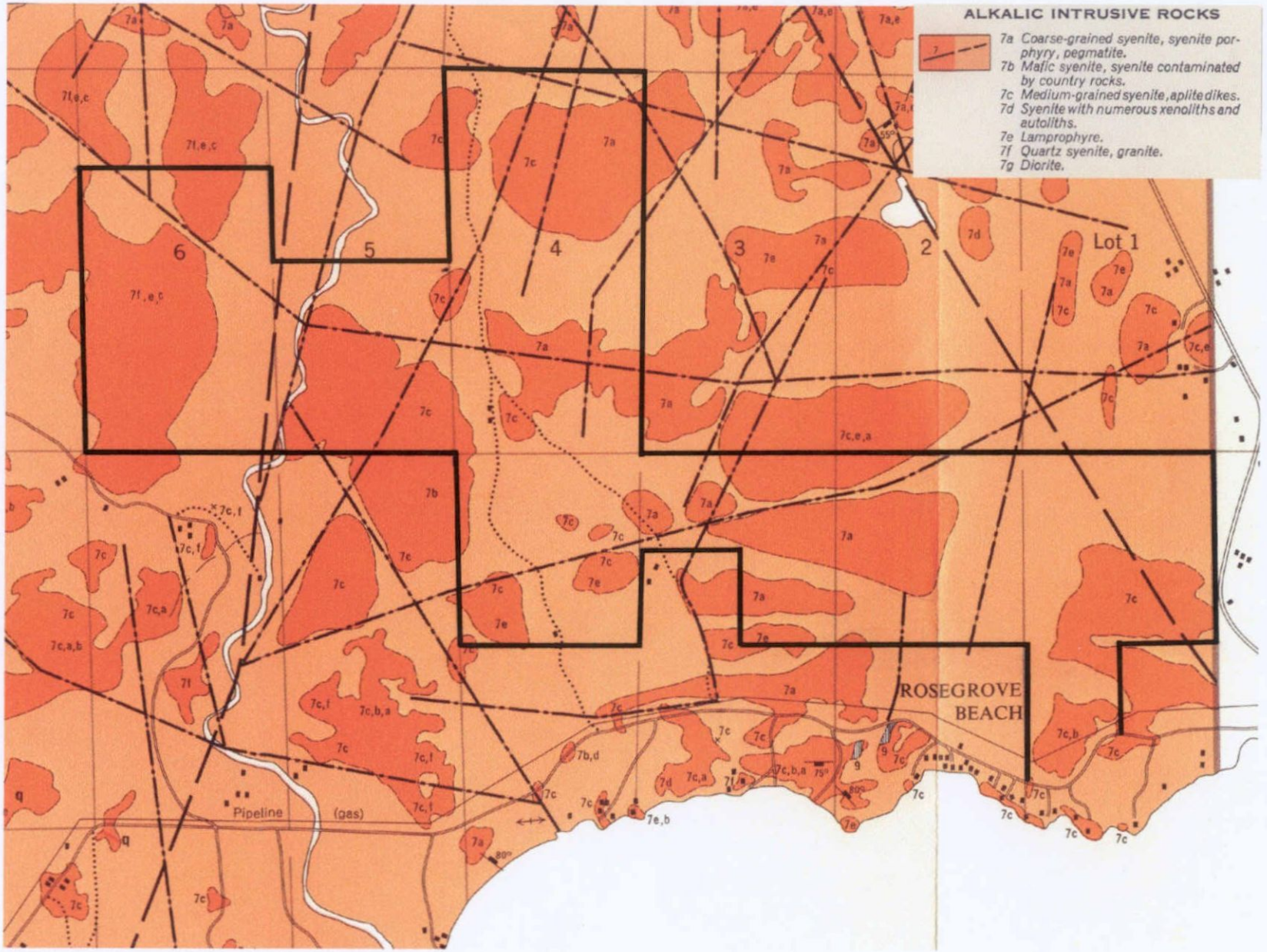
Otto Tp. Property Claim Map: 1 cm = 250 m



Otto Tp. Property Claim Map: Nad 83, 1 cm = 250 m, 10 m Contours.



Otto Tp. Property Claim Map: Nad 83, 1 cm = 250 m, 10 m Contours, Approximate Coarse Porphyry Contact.



Map 2239: Eby-Otto Area Geology, Scale 1 cm = 250 m

550779

550935

Nad83
532
3000

⊕ Sample Collected
⊕ Sample Tested

1199812

⊕39
⊕40
⊕38
⊕41
⊕37
⊕36
⊕35
⊕34
⊕33
⊕32
⊕43
⊕31
⊕30
⊕29

Limits Major Outcrop

Flat
Low Outcrop Areas

Flat
Low Outcrop Areas
Areas

532
2500

532
2000

Blanche

LOT
CON

1199814

River

Road

#3 Post - 1199812

0568500
Nad83

0569000

0569500

Otto Tp
West Claim 1199812
1 cm = 50 m

1199813

3000

2000

Nad 83

⊕ Sample Collected

⊕ Sample Tested

25897

L30075

L305

L395

L412

532/500

1199813

532/000

#4
1199815

1199815

45

44

46

47

48

Pipe Line

Road

N2

1167265

057 2500

057 3000

Otto Tp.
East Claim 1199813
+ 1199815
1 cm = 50 m.

Sample	Area	Nad 834 Easting	Nad 83 Northing	Rock Type	Rock Description	Grain Description	Product Expectation
29	Otto W 1199812	0568450	5321797	Quartz Syenite	Light pink, uniform and massive	90% 2-3 mm feldspar 6% 2-3 mm quartz 4% augite-hornblende	**This stone has potential to make a pale pink to near white crushed product. The low augite-hornblende content and pale colour of the feldspar and moderate quartz content may cause a lighter than normal colour.**
30	Otto W 1199812	0568515	5321852	Feldspar Porphyry	Medium pinkish green	30% 1 by 3 mm feldspar phenocrysts in medium greenish 0.2-0.5 mm crystalline groundmass	This unit should be avoided to preserve a high quality product. **This unit should be tested by same process as the superior product to determine how serious a threat it posses to quarrying.** Dikes of this type could be several meters thick.
31	Otto W 1199812	0568542	5321910	Quartz Syenite	Light pink, uniform and massive	90% 2-4 mm feldspar (weakly bladed) 7% quartz 3% fresh black augite-hornblende	**This stone has potential to make a near white crushed product. The low augite-hornblende content and pale colour of the feldspar may cause a lighter than normal colour.**
32	Otto W 1199812	0568686	5322005	Syenite	Medium pink, uniform and massive	93% 2 mm feldspar grains 3% quartz 4% fresh black augite(?) & dark green hornblende(?)	This rock might produce a good pale pink crushed product.
33	Otto W 1199812	0568815	5322122	Syenite	Medium pink, uniform and massive	95% 2-4 mm feldspar (weakly bladed) 1% quartz 4% augite-hornblende	This rock might produce a good pale pink crushed product.
34	Otto W 1199812	0568903	5322156	Quartz Syenite	Medium pink and massive with chloritic fracturing	91% 2-5 mm feldspar (weakly bladed) 5% 1-2 mm quartz 4% augite-hornblende	This is a dirty appearing rock. As a minor constituent of a large volume it would be tolerable but probably not desirable.

35	Otto W 1199812	0568872	5322211	Quartz Syenite	Medium pink, uniform and massive	92% 2-3 mm feldspar (a few coarser crystals) 5% 2 mm quartz 3% fresh augite-hornblende	**This stone has potential to make a pale powder. The low augite-hornblende content and pale colour of the feldspar may cause a lighter than normal colour.**
36	Otto W 1199812	0568816	5322312	Quartz Syenite	Medium pink, massive	75% 2-3 mm feldspar (weakly bladed) with rare 8 mm phenocrysts feldspars 20% 2 mm quartz (transparent) 2-3% augite-hornblende	**This stone has potential to make a near white powder. The low augite-hornblende content and high quartz content may cause a lighter than normal colour.**
37	Otto W 1199812	0568819	5322385	Syenite dike	Medium green, variable colour and grain size.	Mineral ratio? Generally 0.1-0.4 mm feldspar and augite-hornblende and several % coarser biotite or chlorite flakes.	**This is a waste product that must be dealt with if the syenite is quarried as a coloured or white aggregate source or is used as dimension stone.**
38	Otto W 1199812	0568832	5322470	Syenite	Dark pink, uniform and massive. No preferred orientation of feldspar laths observed.	90% feldspar moderately bladed) 3% quartz 7% augite-hornblende	
39	Otto W 1199812	0568813	5322586	Syenite	Dark pink, uniform and massive. No preferred orientation of feldspar laths observed.	92% feldspar (moderately bladed) 3% quartz 5% augite-hornblende	
40	Otto W 1199812	0568639	5322533	Syenite	Dark pink, uniform and massive	92% feldspar (weakly bladed) 2% quartz 6% augite-hornblende	
41	**Otto W 1199812**	**0568572**	**5322429**	**Quartz Syenite**	**Medium pink, uniform and massive**	**91% 1-3 mm feldspar 5% transparent to translucent quartz 4% augite-hornblende.**	**This stone has potential to make a light coloured crushed product.**
42	No sample	0568521	5322207		No sample		

43	**Otto W 1199812**	**0568408**	**5321953**	**Quartz Syenite**	**Pale pink, uniform and massive. Weathers in high relief outcrops.**	**87% 2-4 mm white feldspar (weakly bladed) 10% 1-2 mm transparent quartz 3% black augite-hornblende**	**This stone has potential to make a near white powder. The low augite-hornblende content and pale colour of the feldspar may cause a lighter than normal colour.**
44	Otto E 1199813	0572613	5320811	**Syenite**	Dark pink	95% 1-2 mm feldspar (a few 4 mm blades). 5% augite-hornblende	Crushed products may be darker than normal for this syenite.
45	**Otto E 1199813**	**0572654**	**5320844**	**Syenite**	Dark pink, uniform and massive	93% 1-4 mm feldspar (equant to weakly bladed) 7% augite-hornblende	This stone is potential aggregate or dimension stone. Crushed product could have a pink colour.
46	Otto E 1199815	0572690	5320573	**Syenite**	Light pink	95% 1-3 mm feldspar (equant) 5% augite-hornblende	
47	**Otto E 1199815**	**0572734**	**5320471**	**Syenite**	**Medium pink. Sample may be bleached by weathering.**		
48	**Otto E 1199815**	**0572817**	**5320364**	**Syenite**	**Medium pink, uniform and massive. 1% black xenoliths noted**	**95% 1-3 mm feldspar (equant) 5% augite-hornblende**	**This stone is potential aggregate or dimension stone. Crushed product should have a pale pink colour.**

Powder Description

Sample #: 41
Location: Otto Tp.
Description: Quartz Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0568572 E
UTM Northing: 5322429 N
Dry Weight: 608.5 gm

Sample # 41

Mesh Size		Size in mm					Estimated	
Passing	Retained	Passing	Retained		Uniformity	Colour	Reflectance	Comments
-'3/8"	+4	-9.50	**+4.75**	1.3%	Distinct black flecks.	Medium pink	35	
-4	+8	-4.75	**+2.36**	5.1%	Same.	Medium pink	37	
-8	+16	-2.36	**+1.18**	28.5%	Same.	Medium pink	39	
-16	+20	-1.18	**+0.850**	12.9%	Same.	Medium pink	41	
-20	+30	-0.850	**+0.600**	9.9%	Same.	Medium pink	43	
-30	+40	-0.600	**+0.425**	8.7%	Same.	Mid range	45	
-40	+50	-0.425	**+0.300**	6.9%	Uniform in appearance lacking black flecks.	Mid range	50	
-50	+60	-0.300	**+0.250**	2.4%	Same.	Mid range	51	
-60	+70	-0.250	**+0.212**	3.0%	Same.	Mid range	53	
-70	+80	-0.212	**+0.180**	2.3%	Same.	Mid range	55	
-80	+100	-0.180	**+0.150**	3.4%	Same.	Mid range	56	
-100	+200	-0.150	**+0.075**	7.3%	Same.	Light pink	58	
-200	+325	-0.075	**+0.045**	3.5%	Same.	Pale pink	60	
-325	Pan	-0.045	**+0**	4.7%				

Doug Robinson November 2002

-4 +8 mesh (-4.75 +2.36 mm) fraction:
5-10% distinct 0.5-1.0 mm green ferromagnesian minerals (0.2 mm appears to be liberation size).
Majority of ferromagnesian minerals are not liberated.
+5% quartz. 50% of quartz is liberated (1 mm appears to be liberation size).
Sample 41 has more intense pink colour than sample 43 but is equivalent to sample 45.
Feldspar has minor dark red discolouration.

Powder Description

Sample #: 43
Location: Otto TP.
Description: QuartzSyenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0568408
UTM Northing: 5321953
Dry Weight: ?

Sample # 43 (Labelled "A" on Analysis Certificates)

Mesh Size		Size in mm						
Passing	Retained	Passing	Retained		Uniformity	Color	Estimated Reflectance	Comments
-'3/8"	+4	-9.50	**+4.75**	?	Black fleck evident.	Light pink.	35	This rock is brighter than other samples from Otto Tp.
-4	+8	-4.75	**+2.36**	?	Same.	Same.	40	
-8	+16	-2.36	**+1.18**	?	Same.	Same.	42	
-16	+20	-1.18	**+0.850**	?	Same.	Same.	44	
-20	+30	-0.850	**+0.600**	?	Same.	Same.	46	
-30	+40	-0.600	**+0.425**	?	Same.	Transition	48	
-40	+50	-0.425	**+0.300**	?	Transition.	Light pink.	Transition. 50	
-50	+60	-0.300	**+0.250**	?	Uniform in appearance.	Same.	54	
-60	+70	-0.250	**+0.212**	?	Same.	Same.	56	
-70	+80	-0.212	**+0.180**	?	Same.	Same.	58	
-80	+100	-0.180	**+0.150**	?	Same.	Pale pink.	59	
-100	+200	-0.150	**+0.075**	?	Same.	Near white.	61	
-200	+325	-0.075	**+0.045**	?	Same.	Same.	65	
-325	Pan	-0.045	**+0**	?	-	-	-	-

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-4 +8 mesh (-4.75 +2.36 mm) fraction:
'2% distinct 0.5 mm green ferromagnesian minerals with distinct cleavage (0.2 mm appears to be liberation size).
Majority of ferromagnesian minerals are not liberated.
+5% quartz. 50% of quartz is liberated (1 mm appears to be liberation size).
Sample 41 has more intense pink colour than sample 43. Sample 41 is the lightest coloured sample.

Powder Description
Sample #: 45
Location: Otto Tp.
Description: Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0572654 E
UTM Northing: 5320844 N
Dry Weight: 530.9 gm

Sample # 45

Mesh Size		Size in mm					Estimated	
Passing	Retained	Passing	Retained		Uniformity	Colour	Reflectance	Comments
-3/8"	+4	-9.50	**+4.75**	1.8%	Black Fleck evident.	Medium pink.	35	
-4	+8	-4.75	**+2.36**	11.7%	Same.	Same.	37	
-8	+16	-2.36	**+1.18**	29.7%	Same.	Same.	37	
-16	+20	-1.18	**+0.850**	9.3%	Same.	Same.	40	
-20	+30	-0.850	**+0.600**	8.1%	Same.	Same.	43	
-30	+40	-0.600	**+0.425**	6.8%	Same.	Transition.	47	
-40	+50	-0.425	**+0.300**	5.6%	Same.	Transition.	50	
-50	+60	-0.300	**+0.250**	2.3%	Same.	Light pink.	53	
-60	+70	-0.250	**+0.212**	2.6%	Same.	Same.	57	
-70	+80	-0.212	**+0.180**	2.0%	Same.	Same.	61	
-80	+100	-0.180	**+0.150**	2.8%	No black fleck.	Same.	62	
-100	+200	-0.150	**+0.075**	7.8%	Same.	Same.	63	
-200	+325	-0.075	**+0.045**	4.0%	Same.	Pale pink.	60	
-325	Pan	-0.045	**+0**	5.5%				

Doug Robinson November 2002

-4 +8 mesh (-4.75 +2.36 mm) fraction:
10% distinct 0.3-1.0 mm indistinct grains of green ferromagnesian minerals (0.2 mm appears to be liberation size).
Majority of ferromagnesian minerals are not liberated.
No quartz.
Sample 45 has more intense pink colour than samples 47; but is equivalent colour to sample 41.
A few feldspar grains have dark red discolouration.

Powder Description
Sample #: 47
Location: Otto Tp.
Description: Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0572734 E
UTM Northing: 5320471 N
Dry Weight: 604.1 gm

Sample # 47

Mesh Size		Size in mm					Estimated	
Passing	Retained	Passing	Retained		Uniformity	Color	Reflectance	Comments
-3/8"	+4	-9.50	**+4.75**	1.1%	Black fleck evident.	Medium pink.	35	
-4	+8	-4.75	**+2.36**	6.5%	Same.	Same.	35	
-8	+16	-2.36	**+1.18**	27.2%	Same.	Same.	35	
-16	-20	-1.18	**+0.850**	No #20 Sieve		-	-	No # 20 sieve
-20	+30	-0.850	**+0.600**	19.1%	Same.	Same.	42	
-30	+40	-0.600	**+0.425**	No #40 Sieve		-	-	No # 40 sieve
-40	+50	-0.425	**+0.300**	13.4%	Same.	Transition	48	
-50	+60	-0.300	**+0.250**	6.2%	Transition	Light grayish pink	Transition 50	
-60	+70	-0.250	**+0.212**	3.3%	Uniform in appearance.	Same.	52	
-70	+80	-0.212	**+0.180**	2.6%	Same.	Pale gray	54	
-80	+100	-0.180	**+0.150**	3.9%	Same.	Same.	56	
-100	+200	-0.150	**+0.075**	6.4%	Same.	Same.	58	
-200	+325	-0.075	**+0.045**	4.4%	Same.	Light gray	60	
-325	Pan	-0.045	**+0**	5.9%				

Doug Robinson November 2002

-4 +8 mesh (-4.75 +2.36 mm) fraction:
10% distinct 0.5 mm distinct grains of green ferromagnesian minerals.
Majority of ferromagnesian minerals are not liberated.
No quartz.
Sample 45 has more intense pink colour than samples 47.
Feldspar grains have no dark red discolouration discolouration.

Powder Description
Sample #: 48
Location: Otto Tp.
Description: Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0572817 E
UTM Northing: 5320364 N
Dry Weight: 682.8 gm

Sample # 48

Mesh Size		Size in mm					Estimated	
Passing	Retained	Passing	Retained		Uniformity	Color	Reflectance	Comments
-'3/8"	+4	-9.50	**+4.75**	1.2%	Blake flecks evident.	Medium pink.	35	
-4	+8	-4.75	**+2.36**	7.4%	Same.	Same.	35	
-8	+16	-2.36	**+1.18**	29.7%	Same.	Same.	35	
-16	+20	-1.18	**+0.850**	11.4%	Same.	Same.	39	
-20	+30	-0.850	**+0.600**	8.7%	Same.	Same.	42	
-30	+40	-0.600	**+0.425**	7.3%	Same.	Transition.	44	
-40	+50	-0.425	**+0.300**	6.0%	Same.	Same.	46	
-50	+60	-0.300	**+0.250**	2.7%	Same.	Light pink.	48	
-60	+70	-0.250	**+0.212**	2.8%	Same.	Starts to show gray tint.	50	
-70	+80	-0.212	**+0.180**	2.1%	Transition.	Light gray with pink tint.	52	
-80	+100	-0.180	**+0.150**	3.2%	Uniform in appearance.	Same.	54	
-100	+200	-0.150	**+0.075**	8.3%	Same.	Light gray.	56	
-200	+325	-0.075	**+0.045**	4.2%	Same.	Same.	60	
-325	Pan	-0.045	**+0**	5.0%				

Doug Robinson November 2002

Log of Analytical Pulps From Major Oxide Analysis.

Sample #:	**41**	**Nad 83**	
Location:	**Otto Tp.**	**UTM Easting:**	**0568572 E**
Description:	**Quartz Syenite**	**UTM Northing:**	**5322429 N**
Colour:	**Pale pink**		

Sample #:	**43**	**Nad 83**	
Location:	**Otto Tp.**	**UTM Easting:**	**0568408 E**
Description:	**Quartz Syenite**	**UTM Northing:**	**5321953 N**
Colour:	**Pale pinkish green-grey**		

Sample #:	**45**	**Nad 83**	
Location:	**Otto Tp.**	**UTM Easting:**	**0572654 E**
Description:	**Syenite**	**UTM Northing:**	**5320844 N**
Colour:	**Pale pink with very weak grey tint.**		

Sample #:	**47**	**Nad 83**	
Location:	**Otto Tp.**	**UTM Easting:**	**0572734 E**
Description:	**Syenite**	**UTM Northing:**	**5320471 N**
Colour:	**Pale pinkish green-grey**		

Sample #:	**48**	**Nad 83**	
Location:	**Otto Tp.**	**UTM Easting:**	**0572817 E**
Description:	**Syenite**	**UTM Northing:**	**5320364 N**
Colour:	**Pale pinkish green-grey**		

Samples 41 and 45 have equivalent colour and reflectance
Sample 45 has a very slightly grey tint relative to 41 when viewed side by side.
Samples 43, 47 and 48 are indistinguishable when side by side.
The colour and reflectance appear to be independent of the quartz content.
The green hue and grey colour appear to be dependent on the ferromagnesian minerals: hornblende, augite (aegirine) and chlorite.
When present, ferromagnesian xenoliths will likely cause green-grey colouration of the powder.

Size Fractions

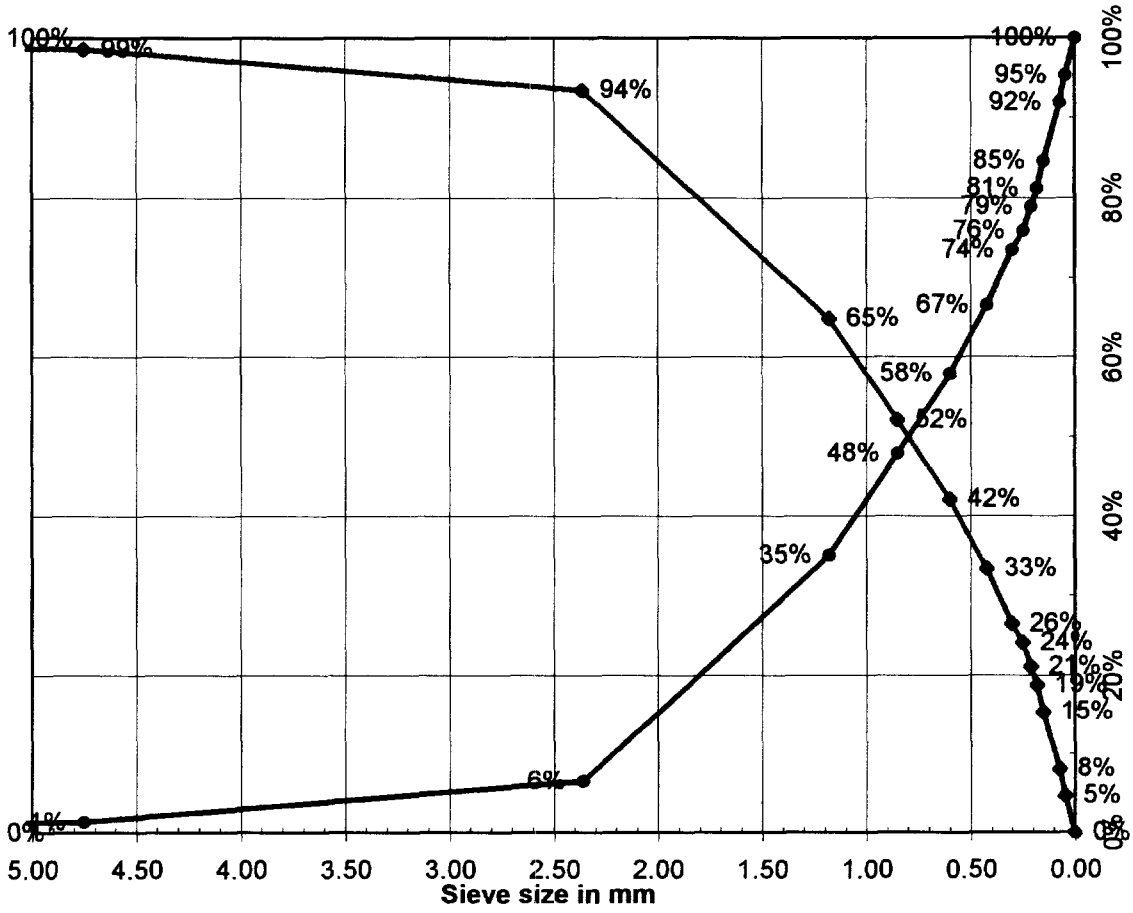
Sample #: 41 | **Nad 83**

Location: Otto Tp. | **UTM Easting:** 0568572 E

Description: Quartz Syenite | **UTM Northing:** 5322429 N

Crusher Setting: ~ 5 mm | **Dry Weight:** 608.5 gm

Passing Sieve #	Retained on Sieve #		Passing (mm) Sieve	Retained on (mm) Sieve	Weight retained Grams	Fraction retained	% retained	Cumulative Weight % retained	% Passing Xmm
	1 1/2"			37.50	0	0.000	0.0%	0%	100%
1 1/2"	3/4"		37.50	19.00	0	0.000	0.0%	0%	100%
3/4"	5/8"		19.00	16.00	0	0.000	0.0%	0%	100%
5/8"	0.53		16.00	13.20	0	0.000	0.0%	0%	100%
0.53	3/8"		13.20	9.50	0	0.000	0.0%	0%	100%
3/8"	#4		9.50	4.75	8.1	0.013	1.3%	1%	99%
#4	#8		4.75	2.36	31.3	0.051	5.1%	6%	94%
#8	#16		2.36	1.18	173.7	0.285	28.5%	35%	65%
#16	#20		1.18	0.850	78.6	0.129	12.9%	48%	52%
#20	#30		0.850	0.600	60.5	0.099	9.9%	58%	42%
#30	#40		0.600	0.425	53	0.087	8.7%	67%	33%
#40	#50		0.425	0.300	42.1	0.069	6.9%	74%	26%
#50	#60		0.300	0.250	14.6	0.024	2.4%	76%	24%
#60	#70		0.250	0.212	18.2	0.030	3.0%	79%	21%
#70	#80		0.212	0.180	14.2	0.023	2.3%	81%	19%
#80	#100		0.180	0.150	20.7	0.034	3.4%	85%	15%
#100	#200		0.150	0.075	44.2	0.073	7.3%	92%	8%
#200	#325		0.075	0.045	21	0.035	3.5%	95%	5%
#325	Pan		0.045	0.000	28.3	0.047	4.7%	100%	0%
					608.5	1.000	100.0%		

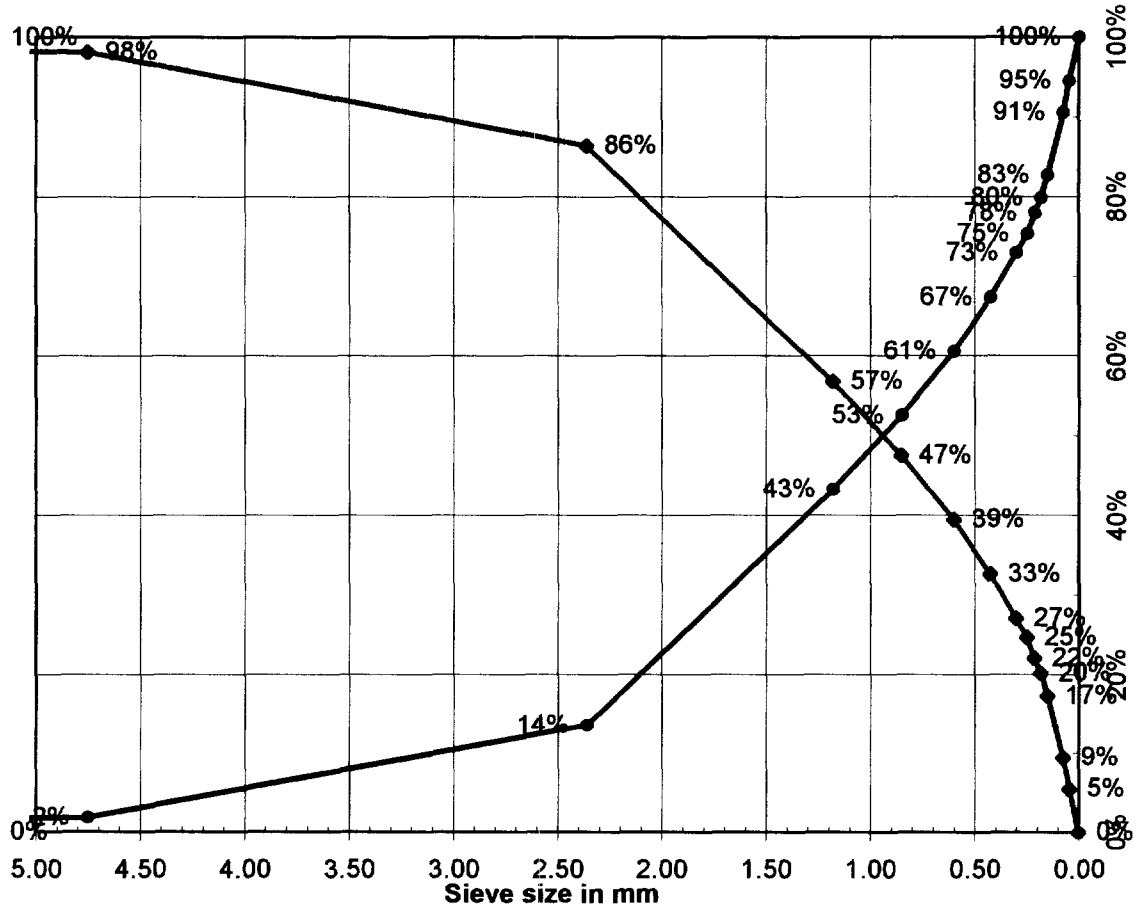


Size Fractions

Sample #: 45
Location: Otto Tp.
Description: Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0572654 E
UTM Northing: 5320844 N
Dry Weight: 530.9 gm

Passing Sieve #	Retained on Sieve #		Passing (mm) Sieve	Retained on (mm) Sieve	Weight retained Grams	Fraction retained	% retained	Cumulative Weight % retained	% Passing Xmm
	1 1/2"			37.50	0	0.000	0.0%	0%	100%
1 1/2"	3/4"		37.50	19.00	0	0.000	0.0%	0%	100%
3/4"	5/8"		19.00	16.00	0	0.000	0.0%	0%	100%
5/8"	0.53		16.00	13.20	0	0.000	0.0%	0%	100%
0.53	3/8"		13.20	9.50	0	0.000	0.0%	0%	100%
3/8"	#4		9.50	4.75	9.7	0.018	1.8%	2%	98%
#4	#8		4.75	2.36	62.2	0.117	11.7%	14%	86%
#8	#16		2.36	1.18	157.4	0.297	29.7%	43%	57%
#16	#20		1.18	0.850	49.3	0.093	9.3%	53%	47%
#20	#30		0.850	0.600	42.7	0.081	8.1%	61%	39%
#30	#40		0.600	0.425	36.1	0.068	6.8%	67%	33%
#40	#50		0.425	0.300	29.7	0.056	5.6%	73%	27%
#50	#60		0.300	0.250	12.4	0.023	2.3%	75%	25%
#60	#70		0.250	0.212	13.7	0.026	2.6%	78%	22%
#70	#80		0.212	0.180	10.4	0.020	2.0%	80%	20%
#80	#100		0.180	0.150	15.1	0.028	2.8%	83%	17%
#100	#200		0.150	0.075	41.5	0.078	7.8%	91%	9%
#200	#325		0.075	0.045	21	0.040	4.0%	95%	5%
#325	Pan		0.045	0.000	29.1	0.055	5.5%	100%	0%
					530.3	1.000	100.0%		

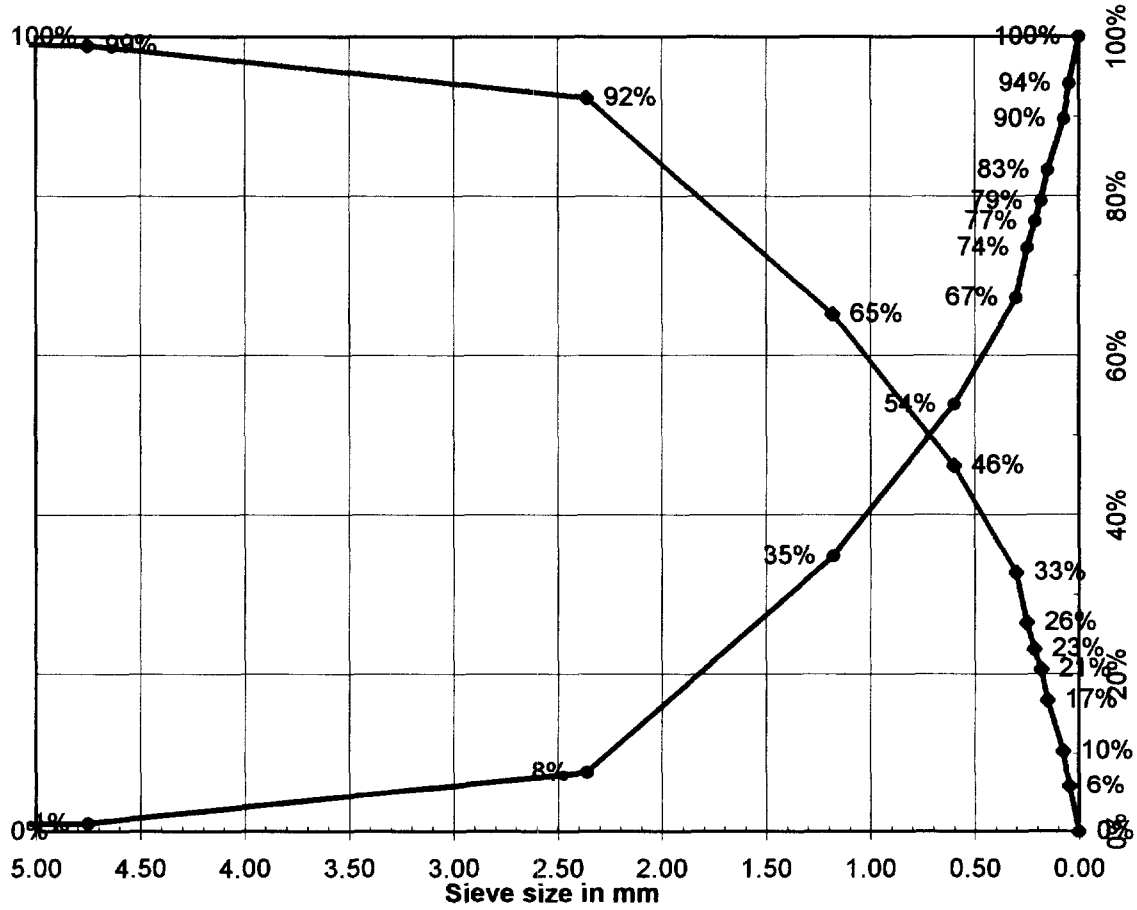


Size Fractions

Sample #: 47
Location: Otto Tp.
Description: Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0572734 E
UTM Northing: 5320471 N
Dry Weight: 604.1 gm

Passing Sieve #	Retained on Sieve #		Passing (mm) Sieve	Retained on (mm) Sieve	Weight retained Grams	Fraction retained	% retained	Cumulative Weight % retained	% Passing Xmm
	1 1/2"			37.50	0	0.000	0.0%	0%	100%
1 1/2"	3/4"		37.50	19.00	0	0.000	0.0%	0%	100%
3/4"	5/8"		19.00	16.00	0	0.000	0.0%	0%	100%
5/8"	0.53		16.00	13.20	0	0.000	0.0%	0%	100%
0.53	3/8"		13.20	9.50	0	0.000	0.0%	0%	100%
3/8"	#4		9.50	4.75	6.4	0.011	1.1%	1%	99%
#4	#8		4.75	2.36	39.3	0.065	6.5%	8%	92%
#8	#16		2.36	1.18	164	0.272	27.2%	35%	65%
#16	#30		1.18	0.600	114.8	0.191	19.1%	54%	46%
#40	#50		0.600	0.300	80.9	0.134	13.4%	67%	33%
#50	#60		0.300	0.250	37.6	0.062	6.2%	74%	26%
#60	#70		0.250	0.212	19.8	0.033	3.3%	77%	23%
#70	#80		0.212	0.180	15.6	0.026	2.6%	79%	21%
#80	#100		0.180	0.150	23.2	0.039	3.9%	83%	17%
#100	#200		0.150	0.075	38.8	0.064	6.4%	90%	10%
#200	#325		0.075	0.045	26.7	0.044	4.4%	94%	6%
#325	Pan		0.045	0.000	35.4	0.059	5.9%	100%	0%
					602.5	1.000	100.0%		

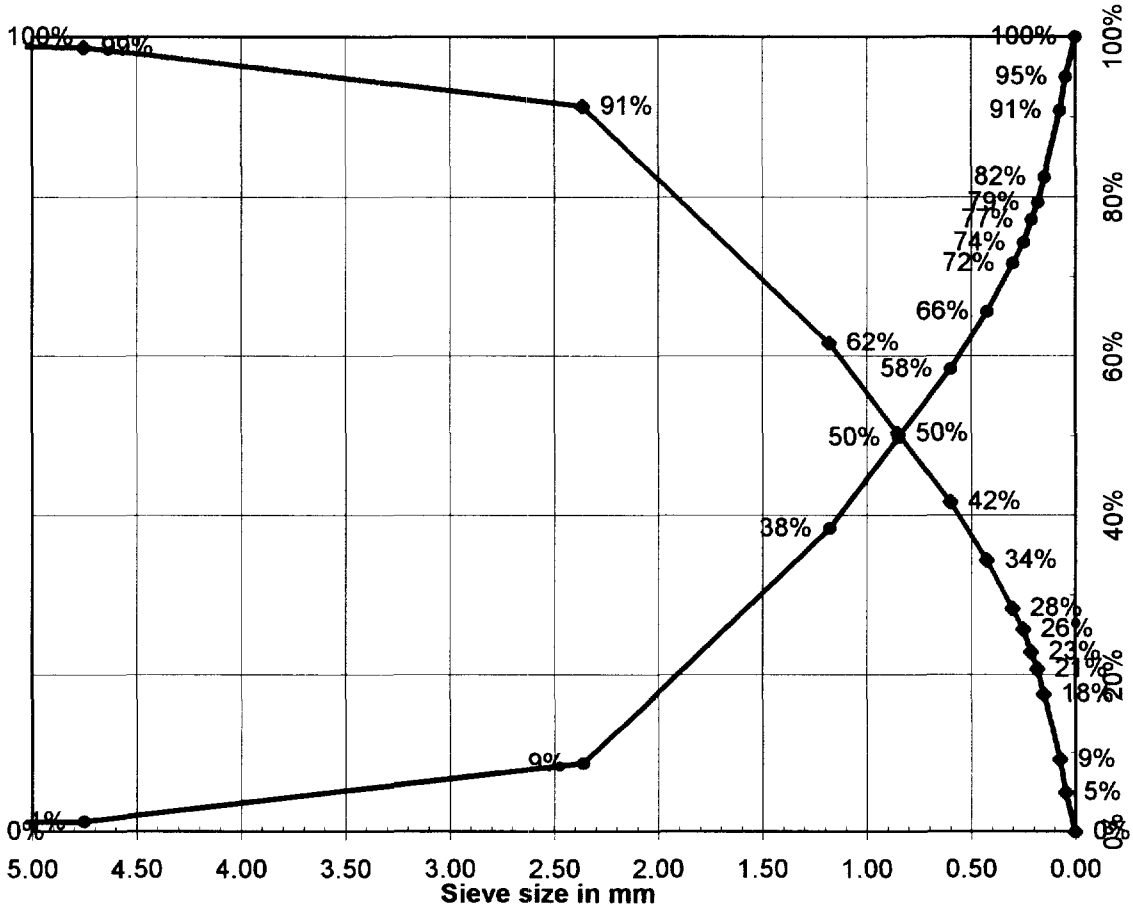


Size Fractions

Sample #: 48
Location: Otto Tp.
Description: Syenite
Crusher Setting: ~ 5 mm

Nad 83
UTM Easting: 0572817 E
UTM Northing: 5320364 N
Dry Weight: 682.8 gm

Passing Sieve #	Retained on Sieve #		Passing (mm) Sieve	Retained on (mm) Sieve	Weight retained Grams	Fraction retained	% retained	Cumulative Weight % retained	% Passing X mm
	1 1/2"			37.50	0.0	0.000	0.0%	0%	100%
1 1/2"	3/4"		37.50	19.00	0.0	0.000	0.0%	0%	100%
3/4"	5/8"		19.00	16.00	0.0	0.000	0.0%	0%	100%
5/8"	0.53		16.00	13.20	0.0	0.000	0.0%	0%	100%
0.53	3/8"		13.20	9.50	0.0	0.000	0.0%	0%	100%
3/8"	#4		9.50	4.75	8.4	0.012	1.2%	1%	99%
#4	#8		4.75	2.36	50.4	0.074	7.4%	9%	91%
#8	#16		2.36	1.18	201.2	0.297	29.7%	38%	62%
#16	#20		1.18	0.850	77.1	0.114	11.4%	50%	50%
#20	#30		0.850	0.600	59.0	0.087	8.7%	58%	42%
#30	#40		0.600	0.425	49.2	0.073	7.3%	66%	34%
#40	#50		0.450	0.300	40.7	0.060	6.0%	72%	28%
#50	#60		0.300	0.250	18.2	0.027	2.7%	74%	26%
#60	#70		0.250	0.212	19.3	0.028	2.8%	77%	23%
#70	#80		0.212	0.180	14.3	0.021	2.1%	79%	21%
#80	#100		0.180	0.150	21.4	0.032	3.2%	82%	18%
#100	#200		0.150	0.075	56.5	0.083	8.3%	91%	9%
#200	#325		0.075	0.045	28.5	0.042	4.2%	95%	5%
#325	Pan		0.045	0.000	34.0	0.050	5.0%	100%	0%
					678.2	1.000	100.0%		



ACCURASSAY LABORATORIES

3 Industrial Drive, P.O. Box 426, KIRKLAND LAKE, ON P2N 3J1
Tel: (705) 567-3361 Fax: (705) 568-8368 email: accuracy@onlink.net
Visit our website at www.accurassay.com

Certificate of Analysis

Grant Forest Products Inc.
P.O. Box 460
EARLTON ON P0J 1E0

September 30, 2002

Work Order : E222917
Date Received: August 30, 2002
Sample Date: None

Rock Samples

Whole Rock Analysis

	SAMPLE I.D.				
ICAP	43 Sample A	41	45	47	48
SiO_2	68.74	68.75	64.89	65.42	65.99
Al_2O_3	15.65	15.50	16.62	16.92	16.32
Fe_2O_3	1.59	1.57	2.66	2.31	2.22
MnO	0.033	0.031	0.055	0.049	0.047
MgO	0.60	0.63	1.36	1.14	1.18
CaO	0.91	0.88	2.21	1.99	2.14
Na_2O	6.76	6.58	7.23	7.34	7.05
K_2O	4.65	4.51	4.25	4.52	4.23
TiO_2	0.136	0.125	0.227	0.211	0.204
P_2O_5	0.05	0.05	0.09	0.08	0.07
LOI	0.32	0.34	0.45	0.25	0.39
Total	99.43	99.97	100.04	100.23	99.83

Note: All results expressed as percent (%)

Ba	1111	1330	1765	1982	1830
Sr	346	210	657	739	1044
Y	7	7	8	11	11
Sc	2	2	4	3	4
Zr	116	93	154	147	172
Be	3	3	3	3	3
V	24	24	44	32	38

Note: All results expressed as ppm unless otherwise stated.

< denotes less than method detection limit (MDL)

Certified by:

Gordon Collings

Gordon Collings, Laboratory Manager

ACCURASSAY LABORATORIES

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Certificate of Analysis

Grant Forest Products Inc.
P.O. Box 460
EARLTON ON P0J 1E0

Page 1
October 24, 2002

Work Order : E222915C
Date Received: August 30, 2002
Sample Date: None

Rock Samples

Whole Rock Analysis on < 46um Fraction

ICAP	43 Unknown	41	45	47	48
	SAMPLE I.D.				
SiO_2	68.33	68.19	64.70	64.20	65.15
Al_2O_3	16.13	15.82	16.62	16.29	16.19
Fe_2O_3	1.61	1.74	2.40	2.61	2.25
MnO	0.042	0.039	0.058	0.063	0.051
MgO	0.68	0.78	1.26	1.42	1.27
CaO	1.10	1.11	2.15	2.48	2.40
Na_2O	7.26	7.01	7.17	6.99	6.91
K_2O	4.17	4.43	4.58	4.64	4.60
TiO_2	0.196	0.195	0.354	0.378	0.328
P_2O_5	0.08	0.08	0.14	0.14	0.12
LOI	0.47	0.49	0.61	0.71	0.66
Total	100.07	99.88	100.04	99.90	99.92

Note: All results expressed as percent.

Ba	1865	1742	1919	2618	2348
Sr	414	220	675	767	1293
Y	8	9	11	14	12
Sc	2	2	4	4	3
Zr	99	93	212	220	201
Be	3	4	3	3	3
V	26	28	45	46	38

Note: All results expressed as ppm.

Certified by:

Gordon Collings

Gordon Collings, Laboratory Manager

Doug,
Following is the Whole Rock procedure,
Regards
Gerda

Code 4B

Samples are prepared and analyzed in a batch system. Each batch contains a method reagent blank, certified reference material and 17% replicates. Samples are mixed with a flux of lithium metaborate and lithium tetraborate and fused in an induction furnace. The molten melt is immediately poured into a solution of 5% nitric acid containing an internal standard, and mixed continuously until completely dissolved (~30 minutes). The samples are run for major oxides and selected trace elements (Code 4B) on a combination simultaneous/sequential Thermo Jarrell-Ash ENVIRO II ICP. Calibration is performed using 7 prepared USGS and CANMET certified reference materials. One of the 7 standards is used during the analysis for every group of ten samples.

Totals should be between 98.5% and 101%. If results come out lower, samples are scanned for base metals. Low reported totals may indicate sulphate being present or other elements like Li which won't normally be scanned for. Samples with low totals however are automatically refused and reanalyzed.

For accurate levels of base metals (Cu, Pb, Zn, Ni and Ag), option 4B1 (see below) is recommended. Option 4B-INAA (see below) is recommended for As, Sb, high W >100 ppm and Cr > 1,000 ppm.

Fusion ICP

Oxide	Detection Limit (%)
SiO_2	0.01
Al_2O_3	0.01
Fe_2O_3	0.01
MgO	0.01
MnO	0.001
CaO	0.01
TiO_2	0.001
Na_2O	0.01
K_2O	0.01
P_2O_5	0.01
Loss on Ignition	0.01

Trace Elements

Element	Detection Limit (ppm)
Ba	3
Sr	2
Y	2
Zr	4
Sc	1
Be	1
V	5

Typical ICP Standards Analysis (Oxides - %, Trace - ppm)

	SiO_2	Al_2O_3	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	Ba	Sr	Y	Sc	Zr	Be	V
SY3	59.51	11.62	6.47	0.32	2.54	8.25	4.17	4.23	0.14	0.52	435	306	718	8	327	22	44
Cert	59.68	11.76	6.49	0.32	2.67	8.25	4.12	4.23	0.15	0.54	450	302	718	6.8	320	20	50
DNC1	46.91	18.46	9.76	0.15	10.05	11.27	1.99	0.24	0.47	0.07	102	141	16	34	32	-1	141
Cert	470.4	18.30	9.93	0.15	10.05	11.27	1.87	0.23	0.48	0.08	114	145	18	31	41	1	148
W2	52.58	15.35	10.72	0.16	6.37	10.98	2.31	0.64	1.05	0.12	170	194	21	35	86	1	262
Cert	52.44	15.35	10.74	0.16	6.37	10.87	2.14	0.63	1.06	0.13	182	194	24	35	94	1.3	262
STM1	59.64	18.07	5.24	0.22	0.07	1.09	8.87	4.24	0.13	0.16	583	700	44	-1	1210	9	-5
Cert	59.64	18.39	5.22	0.22	0.1	1.09	8.94	4.28	0.14	0.16	560	700	46	0.61	1210	9.6	8.7
MRG1	39.43	8.59	17.93	0.17	13.74	14.77	0.73	0.18	3.78	0.07	48	272	13	55	96	1	528
Cert	39.12	8.47	17.94	0.17	13.55	14.7	0.74	0.18	3.77	0.08	61	266	14	55	108	0.62	526
BIR1	47.78	15.43	11.52	0.17	9.7	13.75	1.86	0.02	0.95	0.02	7	107	16	44	15	-1	320
Cert	47.77	15.35	11.26	0.17	9.68	13.24	1.75	0.02	0.96	0.05	7	108	16	44	15.5	0.58	313
G2	68.72	14.95	2.65	0.03	0.71	1.87	4.08	4.48	0.48	0.13	1882	471	9	3	318	2	36
Cert	69.14	15.39	2.66	0.03	0.75	1.96	4.08	4.48	0.48	0.14	1882	478	11	3.5	309	2.5	36

GRAIN SIZE ANALYSIS
MECHANICAL METHOD

ACCULAB ENGINEERING AND TESTING LIMITED AET
CONSULTING ENGINEERS & MATERIALS TESTING SERVICES
81 FIRST AVENUE, P.O. BOX 124
SCHUMACHER, ON P0N 1G0

Telephone No. (705)360-5252 Fax No. (705)267-5341 Email acculab@onlink.net

CLIENT: Accurassay Laboratories
PROJECT:
LOCATION of PROJECT
DESCRIPTION OF SOIL
TESTED BY: M Radey

JOB No. A1484-214
BORING No.
SAMPLED BY: Client
SAMPLE No. AET-468
Client Sample # 41

Soil Sample Size *(ASTM D1140-54)*
DATE of TEST: October 2, 2002

WEIGHT of WET SAMPLE + CONTAINER	grams
WEIGHT of DRY SAMPLE + CONTAINER	815.9 grams
WT of DRY WASHED SAMPLE + CONTAINER	grams
WEIGHT of CONTAINER	207.4 grams
WEIGHT of DRY SAMPLE	608.5 grams
WEIGHT of WATER	grams

Sieve Analysis and Grain Shape

Sieve No	Diameter (mm)	Weight Retained Grams	Cumulated WEIGHT	% Retained	% Passing
1½"	37.5	0.0	0.0	0.0%	100.0%
3/4"	19.0	0.0	0.0	0.0%	100.0%
5/8"	16.0	0.0	0.0	0.0%	100.0%
.53"	13.2	0.0	0.0	0.0%	100.0%
3/8"	9.5	0.0	0.0	0.0%	100.0%
#4	4.75	8.1	8.1	1.3%	98.7%
#8	2.36	31.3	39.4	6.5%	93.5%
#16	1.18	173.7	213.1	35.0%	65.0%
#20	850 µm	78.6	291.7	47.9%	52.1%
#30	600 µm	60.5	352.2	57.9%	42.1%
#40	425 µm	53.0	405.2	66.6%	33.4%
#50	300 µm	42.1	447.3	73.5%	26.5%
#60	250 µm	14.6	461.9	75.9%	24.1%
#70	212 µm	18.2	480.1	78.9%	21.1%
#80	180 µm	14.2	494.3	81.2%	18.8%
#100	150 µm	20.7	515.0	84.6%	15.4%
#200	75 µm	44.2	559.2	91.9%	8.1%
#325	45 µm	21.0	580.2	95.3%	4.7%
PAN		28.3	608.5	100.0%	0.0%

% Passing = 100 - Σ% Retained

GRAIN SIZE ANALYSIS
MECHANICAL METHOD

ACCULAB ENGINEERING AND TESTING LIMITED AET
CONSULTING ENGINEERS & MATERIALS TESTING SERVICES
61 FIRST AVENUE, P.O. BOX 124
SOMUMACHER, ON P0N 1G0

Telephone No. (705)360-5252 Fax No. (705)267-5341 Email acculab@onlink.net

CLIENT: Accurassay Laboratories
PROJECT:
LOCATION of PROJECT
DESCRIPTION OF SOIL
TESTED BY: M Radey

JOB No. A1484-214
BORING No.
SAMPLED BY: Client
SAMPLE No. AET-467
Client Sample # 45

Soil Sample Size *(ASTM D1140-54)*

DATE of TEST: October 2, 2002

WEIGHT of WET SAMPLE + CONTAINER	grams
WEIGHT of DRY SAMPLE + CONTAINER	735.2 grams
WT of DRY WASHED SAMPLE + CONTAINER	grams
WEIGHT of CONTAINER	204.3 grams
WEIGHT of DRY SAMPLE	530.9 grams
WEIGHT of WATER	grams

Sieve Analysis and Grain Shape

Sieve No	Diameter (mm)	Weight Retained Grams	Cumulated WEIGHT	% Retained	% Passing
1½"	37.5	0.0	0.0	0.0%	100.0%
3/4"	19.0	0.0	0.0	0.0%	100.0%
5/8"	16.0	0.0	0.0	0.0%	100.0%
.53"	13.2	0.0	0.0	0.0%	100.0%
3/8"	9.5	0.0	0.0	0.0%	100.0%
#4	4.75	9.7	9.7	1.8%	98.2%
#8	2.36	62.2	71.9	13.5%	86.5%
#16	1.18	157.4	229.3	43.2%	56.8%
#20	850 µm	49.3	278.6	52.5%	47.5%
#30	600 µm	42.7	321.3	60.5%	39.5%
#40	425 µm	36.1	357.4	67.3%	32.7%
#50	300 µm	29.7	387.1	72.9%	27.1%
#60	250 µm	12.4	399.5	75.2%	24.8%
#70	212 µm	13.7	413.2	77.8%	22.2%
#80	180 µm	10.4	423.6	79.8%	20.2%
#100	150 µm	15.1	438.7	82.6%	17.4%
#200	75 µm	41.5	480.2	90.5%	9.5%
#325	45 µm	21.0	501.2	94.4%	5.6%
PAN		29.1	530.3	99.9%	0.1%

% Passing = 100 - Σ% Retained

GRAIN SIZE ANALYSIS
MECHANICAL METHOD

ACCULAB ENGINEERING AND TESTING LIMITED AET
CONSULTING ENGINEERS & MATERIALS TESTING SERVICES
81 FIRST AVENUE, P.O. BOX 134
SCHUMACHER, ON P0N 1G0

Telephone No. (705)360-5252 Fax No. (705)267-5341 Email acculab@onlink.net

CLIENT: Accurassay Laboratories
PROJECT:
LOCATION of PROJECT
DESCRIPTION OF SOIL
TESTED BY: M Radey

JOB No. A1484-214
BORING No.
SAMPLED BY: Client
SAMPLE No. AET-465
Client Sample # 47

Soil Sample Size *(ASTM D1140-54)*

DATE of TEST: October 1, 2002

WEIGHT of WET SAMPLE + CONTAINER	grams
WEIGHT of DRY SAMPLE + CONTAINER	936.9 grams
WT of DRY WASHED SAMPLE + CONTAINER	grams
WEIGHT of CONTAINER	332.8 grams
WEIGHT of DRY SAMPLE	604.1 grams
WEIGHT of WATER	grams

Sieve Analysis and Grain Shape

Sieve No	Diameter (mm)	Weight Retained Grams	Cumulated WEIGHT	% Retained	% Passing
1½"	37.5	0.0	0.0	0.0%	100.0%
3/4"	19.0	0.0	0.0	0.0%	100.0%
5/8"	16.0	0.0	0.0	0.0%	100.0%
.53"	13.2	0.0	0.0	0.0%	100.0%
3/8"	9.5	0.0	0.0	0.0%	100.0%
#4	4.75	6.4	6.4	1.1%	98.9%
#8	2.36	39.3	45.7	7.6%	92.4%
#16	1.18	164.0	209.7	34.7%	65.3%
#20	850 µm		209.7	34.7%	65.3%
#30	600 µm	114.8	324.5	53.7%	46.3%
#40	425 µm		324.5	53.7%	46.3%
#50	300 µm	80.9	405.4	67.1%	32.9%
#60	250 µm	37.6	443.0	73.3%	26.7%
#70	212 µm	19.8	462.8	76.6%	23.4%
#80	180 µm	15.6	478.4	79.2%	20.8%
#100	150 µm	23.2	501.6	83.0%	17.0%
#200	75 µm	38.8	540.4	89.5%	10.5%
#325	45 µm	26.7	567.1	93.9%	6.1%
PAN		35.4	602.5	99.7%	0.3%

% Passing = 100 - Σ% Retained

GRAIN SIZE ANALYSIS
MECHANICAL METHOD

ACCULAB ENGINEERING AND TESTING LIMITED AET
CONSULTING ENGINEERS & MATERIALS TESTING SERVICES
81 FIRST AVENUE, P.O. BOX 134
SCHUMACHER, ON P0N 1G0

Telephone No. (705)360-5252 Fax No. (705)267-5341 Email acculab@onlink.net

CLIENT: Accurassay Laboratories
PROJECT:
LOCATION of PROJECT
DESCRIPTION OF SOIL
TESTED BY: M Radey

JOB No. A1484-214
BORING No.
SAMPLED BY: Client
SAMPLE No. AET-466
Client Sample # 48

Soil Sample Size *(ASTM D1140-54)*

DATE of TEST: October 1, 2002

WEIGHT of WET SAMPLE + CONTAINER	grams
WEIGHT of DRY SAMPLE + CONTAINER	1015.4 grams
WT of DRY WASHED SAMPLE + CONTAINER	grams
WEIGHT of CONTAINER	332.6 grams
WEIGHT of DRY SAMPLE	682.8 grams
WEIGHT of WATER	grams

Sieve Analysis and Grain Shape

Sieve No	Diameter (mm)	Weight Retained Grams	Cumulated WEIGHT	% Retained	% Passing
1½"	37.5	0.0	0.0	0.0%	100.0%
3/4"	19.0	0.0	0.0	0.0%	100.0%
5/8"	16.0	0.0	0.0	0.0%	100.0%
.53"	13.2	0.0	0.0	0.0%	100.0%
3/8"	9.5	0.0	0.0	0.0%	100.0%
#4	4.75	8.4	8.4	1.2%	98.8%
#8	2.36	50.4	58.8	8.6%	91.4%
#16	1.18	201.2	260.0	38.1%	61.9%
#20	850 µm	77.1	337.1	49.4%	50.6%
#30	600 µm	59.0	396.1	58.0%	42.0%
#40	425 µm	49.2	445.3	65.2%	34.8%
#50	300 µm	40.5	485.8	71.1%	28.9%
#60	250 µm	18.2	504.0	73.8%	26.2%
#70	212 µm	19.3	523.3	76.6%	23.4%
#80	180 µm	14.3	537.6	78.7%	21.3%
#100	150 µm	21.4	559.0	81.9%	18.1%
#200	75 µm	56.5	615.5	90.1%	9.9%
#325	45 µm	28.5	644.0	94.3%	5.7%
PAN		34.0	678.0	99.3%	0.7%

% Passing = 100 - Σ% Retained



Otto Tp. Sample # 41



Otto Tp. Sample # 41

Photo Images: Otto Tp. Rock Samples



Otto Tp. Sample # 43



Otto Tp. Sample # 48

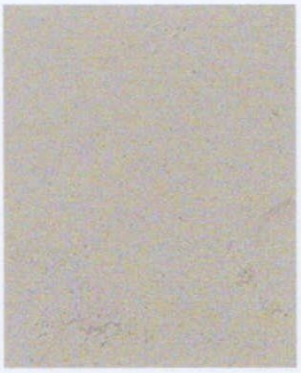
Photo Images: Otto Tp. Rock Samples



Otto Tp. Analytical Pulps on Grey Card (100 Watt Tungsten Light)



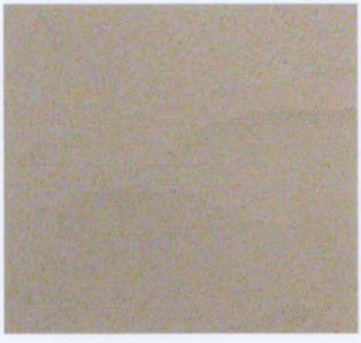
#41
171.1
179.7
168.7
161.6



#43
186.8
191.2
186.0
180.0



Grey Card
94.5
97.0
94.6
87.6



#45
157.9
165.8
154.8
144.0



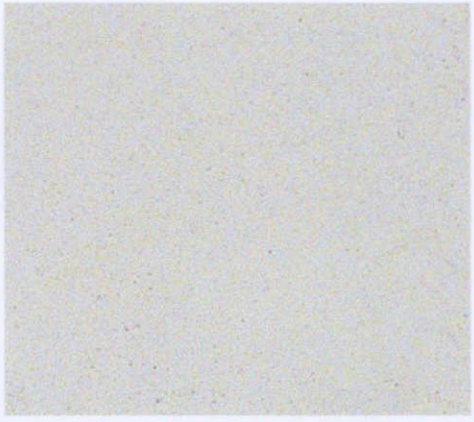
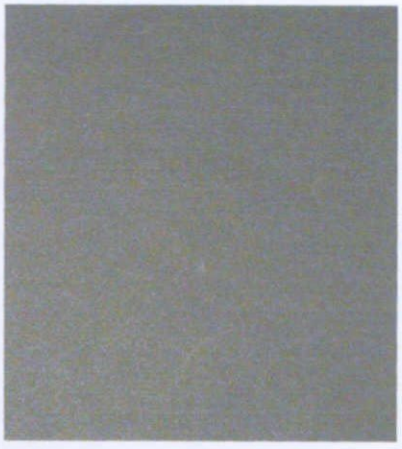
#47
166.1
170.6
165.6
156.8

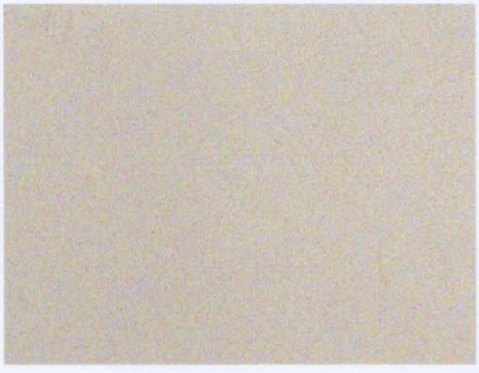


#48
153.7 Luminosity
158.3 Red
153.5 Green
142.5 Blue

Otto Tp.: Luminosity of Analytical Pulps
Nikon RIng Light Colour Balanced to Grey Card

203.9 Luminosity	216.5	126.7
210.0 Red	217.2	126.4
202.4 Green	217.1	127.0
195.9 Blue	211.5	126.0
Sample #41	Sample #43	Grey Card

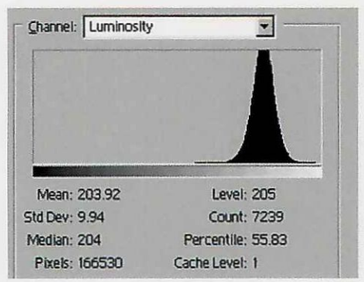


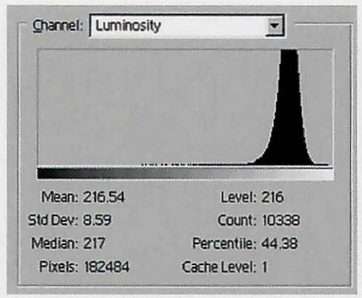


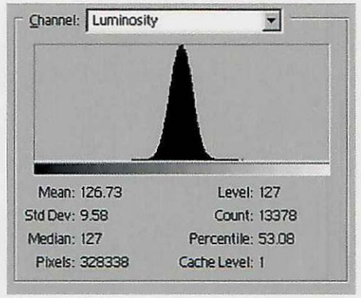
195.8	208.8	200.0
202.7	210.8	202.3
194.4	209.2	200.7
185.1	200.7	190.7
Sample #45	Sample #47	Sample #48

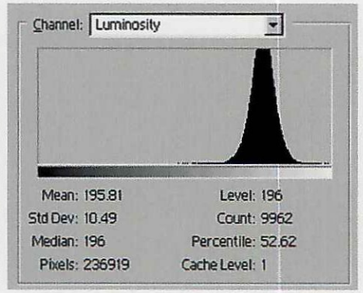
Otto Tp.Luminosity of Analytical Pulps

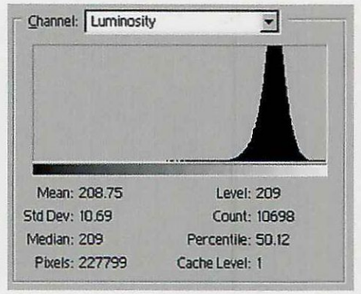
Colour Balanced to Grey Card (two Tungstem Bulbs)

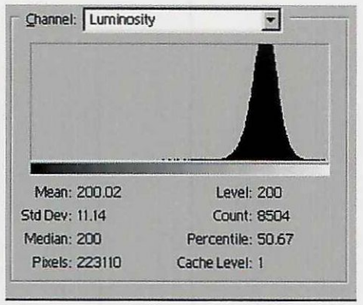


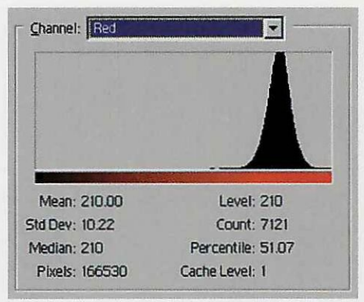


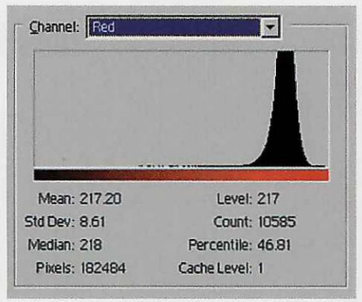


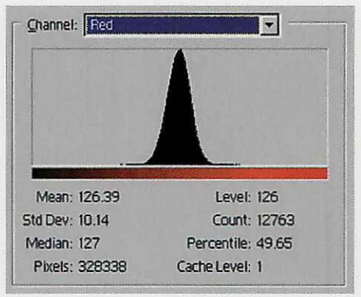


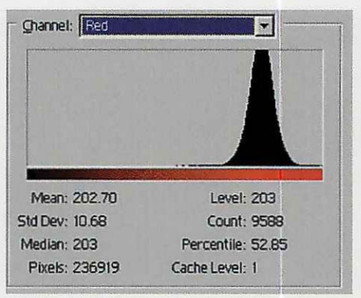


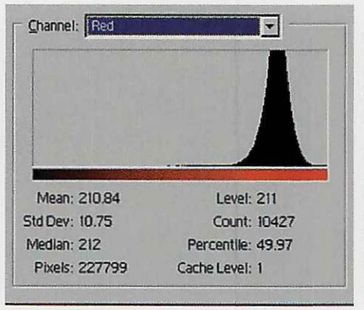


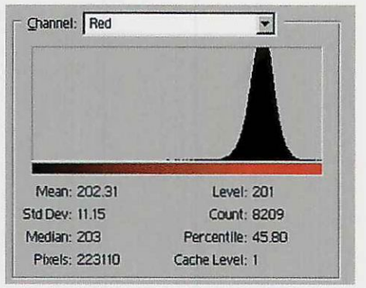


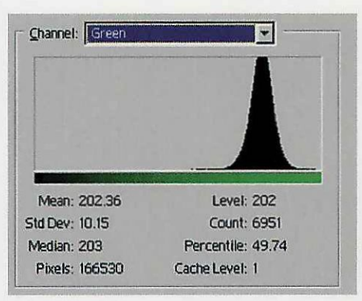


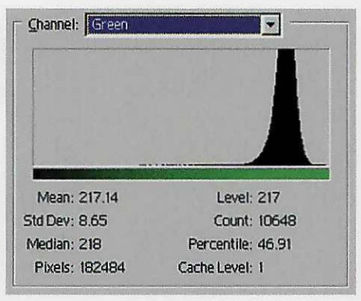


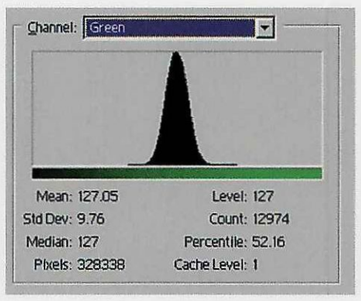


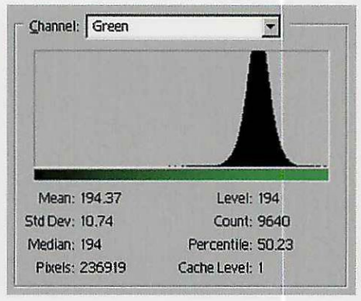


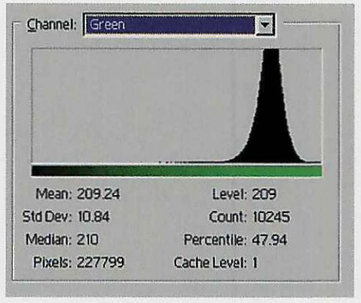


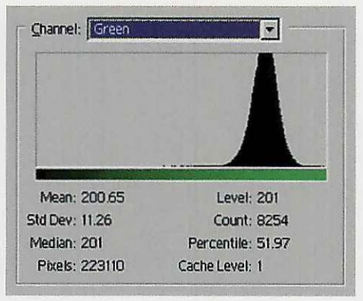


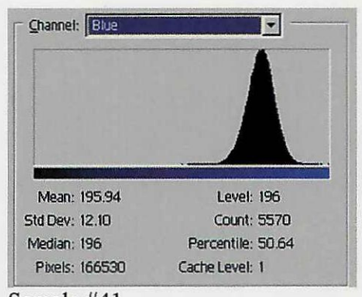


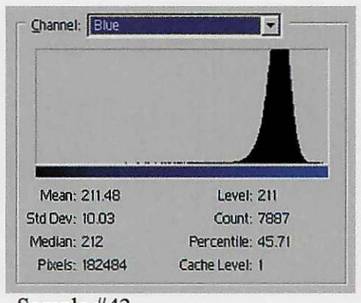


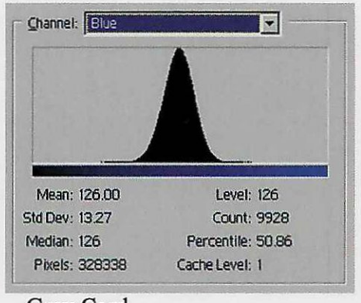


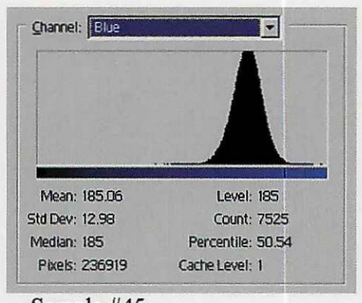


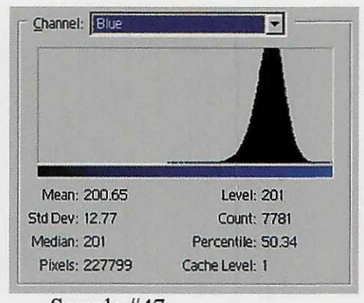


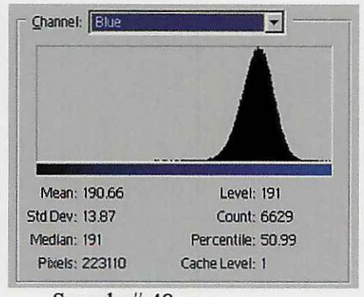








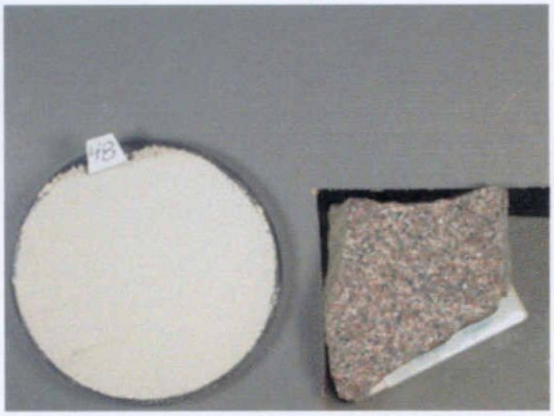




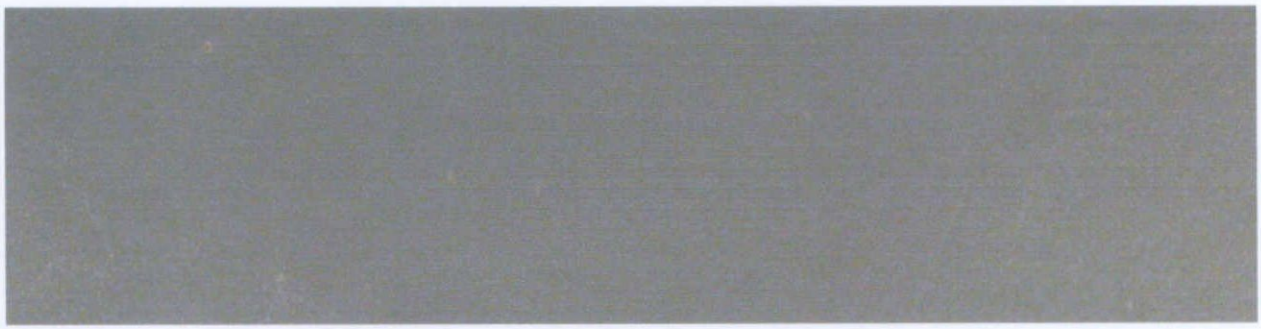
Sample #41 Sample #43 Grey Card Sample #45 Sample #47 Sample # 48

Otto Tp. Analytical Pulps Histograms: Images Balanced to Grey Card: Images Using Two 100 Watt Tungsten Bulb Light Source.

Otto Tp. Sample #48 Images (Tungsten Light)



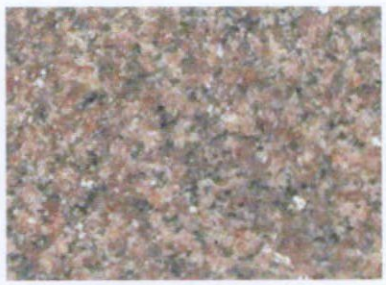
Master Image: Pulp and Rock on Grey Card



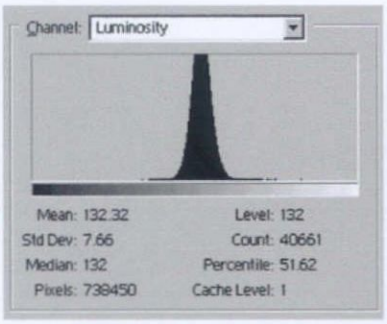
Kodak Grey Card

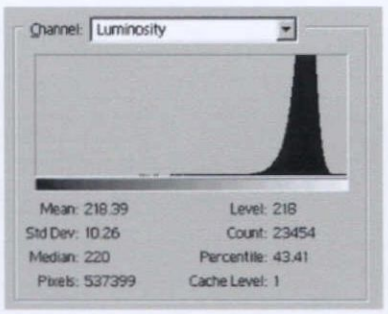


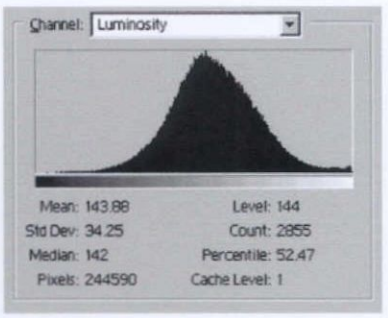
Analytical Pulp
Sample #48

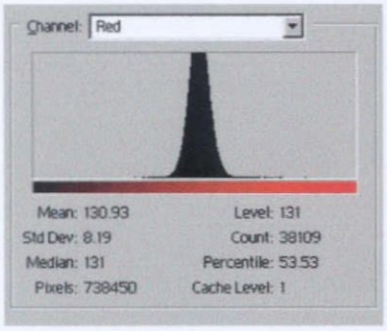


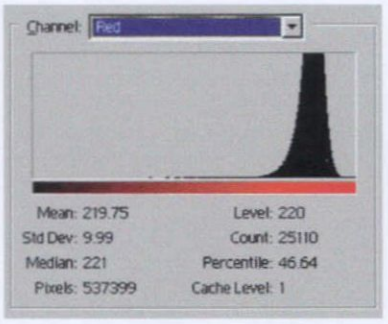
Sample #48 Rock

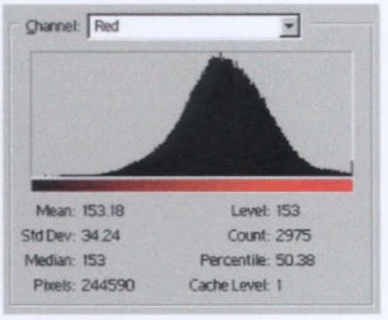


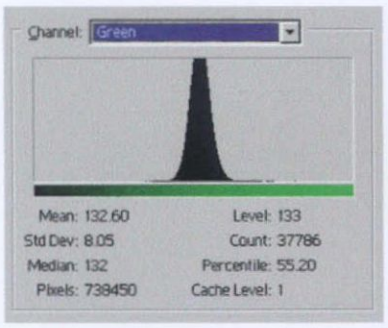


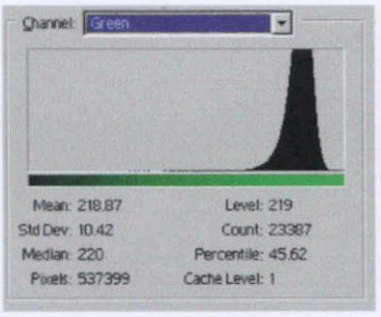


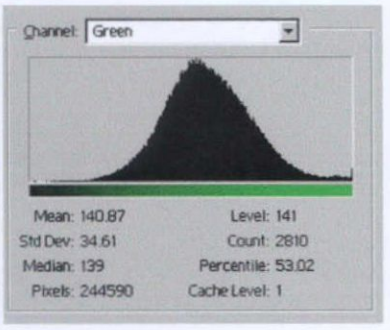


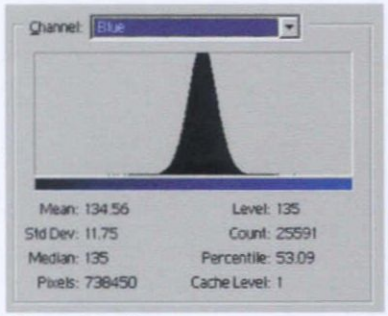


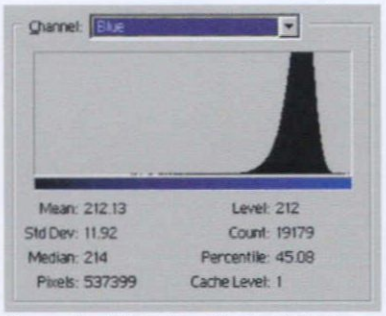


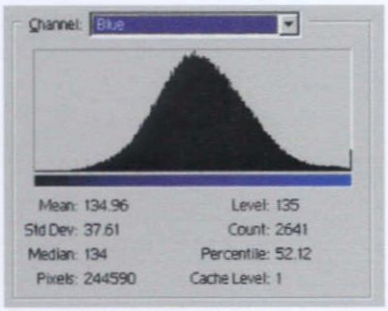






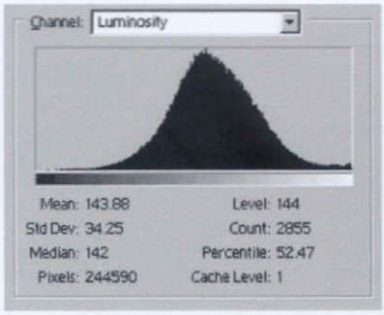


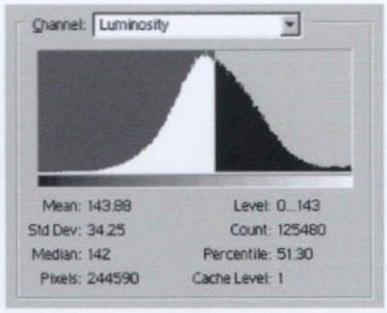


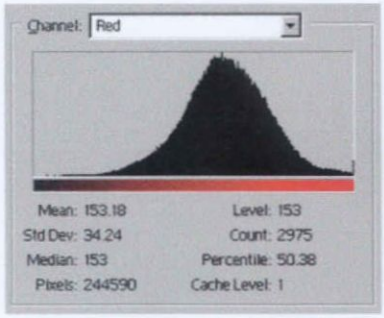


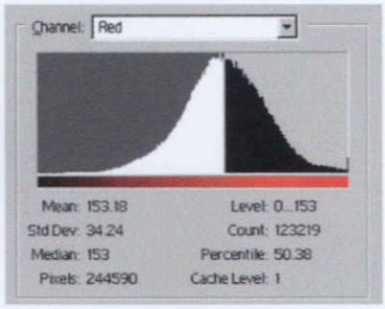
Grey Card | Sample #48 Analytical Pulp | Sample #48 Rock

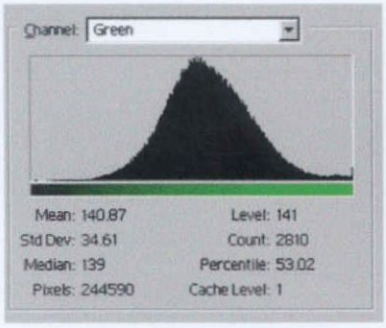
Histograms: Grey Card and Sample #48 Analytical Pulp and Rock.

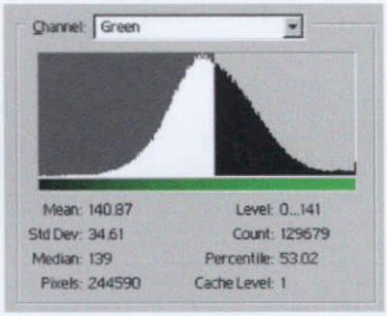


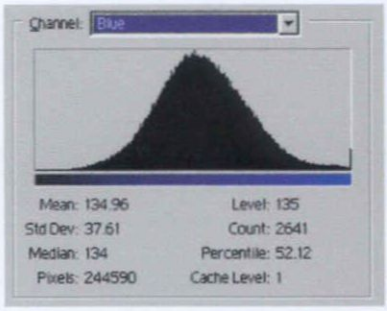


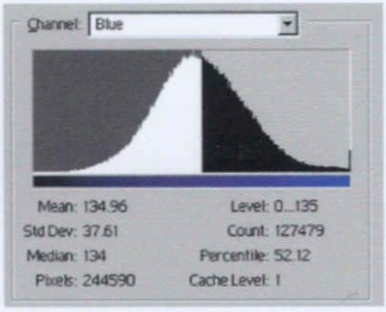












Histograms: Sample #48 Rock.

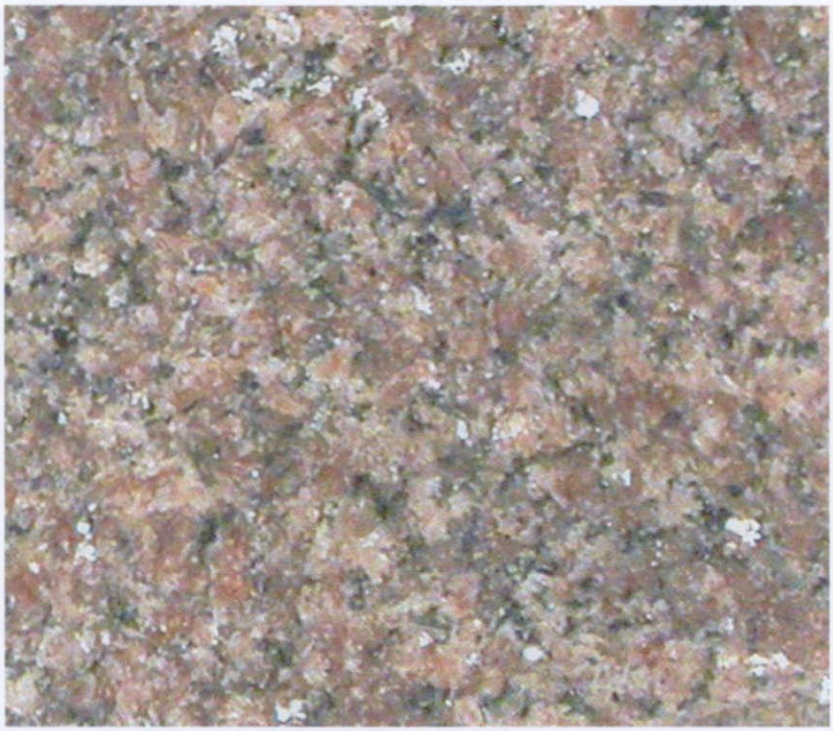
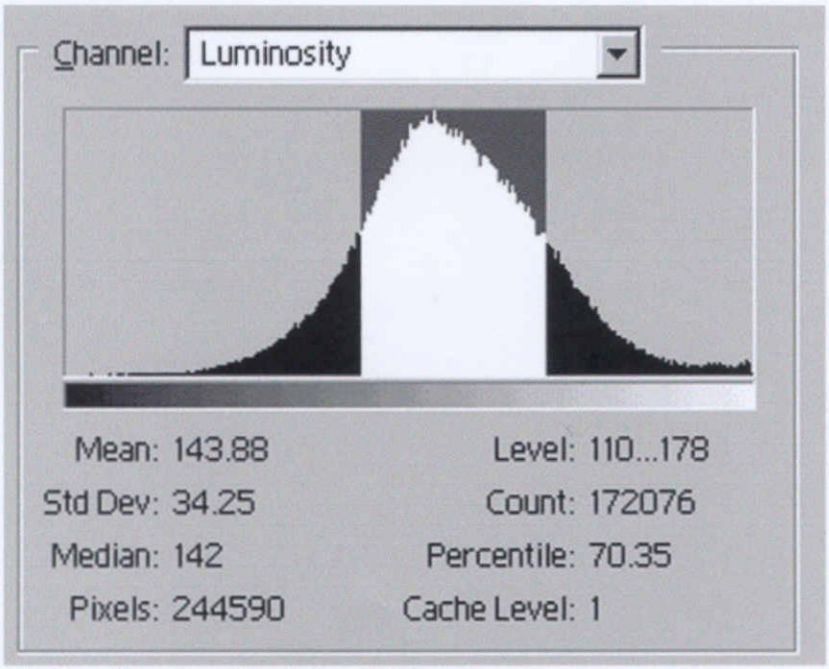


Image Area Sampled: Rock Sample #48



+/- One Standard Deviation White

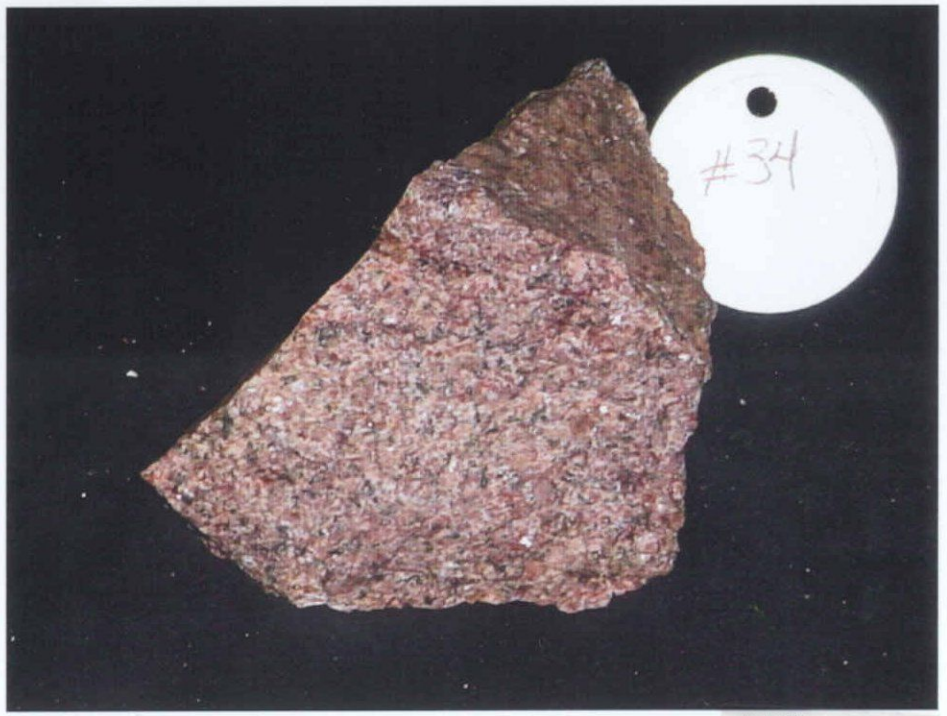
Histogram Showing Population from –1 to +1 Standard Deviations



#33 OTTO-PINK SYENITE



#30 OTTO-PINK SYENITE



Samples 30,32,33,34
January 29, 2004 9:55:11 AM

#34 OTTO-PINK SYENITE



#32 OTTO-PINK SYENITE



#36 OTTO-QUARTZ SYENITE



#37 OTTO-SYENITE DYKE



#38 OTTO-QUARTZ SYENITE



#35 OTTO-QUARTZ SYENITE

Samples 35,36,37,38
January 29, 2004 9:58:41 AM



#1 OTTO-PINK SYENITE

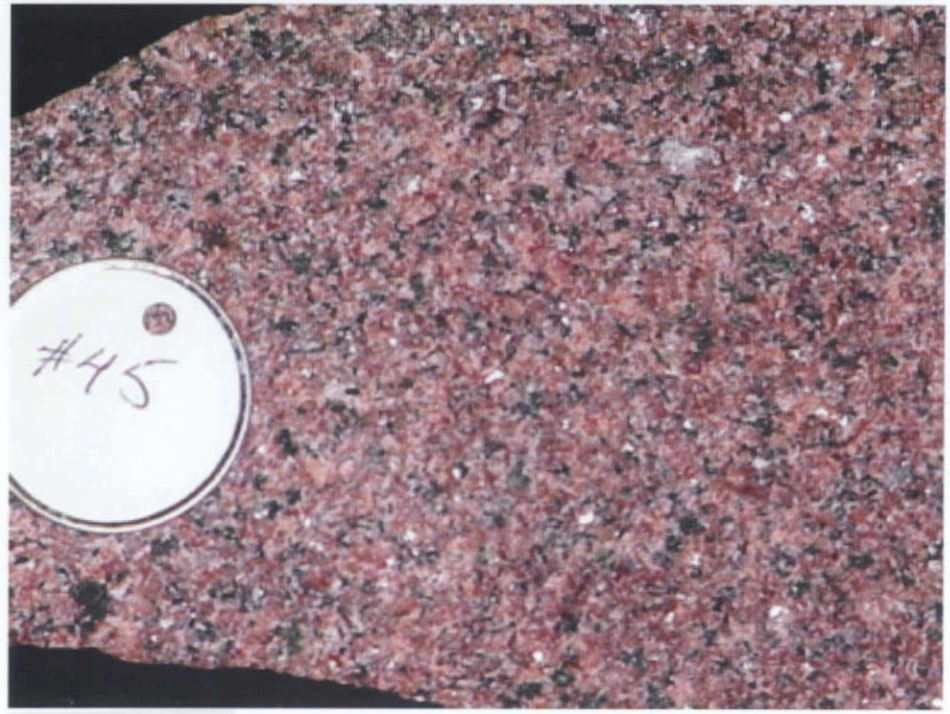


#41 OTTO-QUARTZ SYENITE



Samples 35,36,37,38
January 29, 2004 10:14:11 AM

#31 OTTO-QUARTZ SYENITE



#45 OTTO-PINK SYENITE

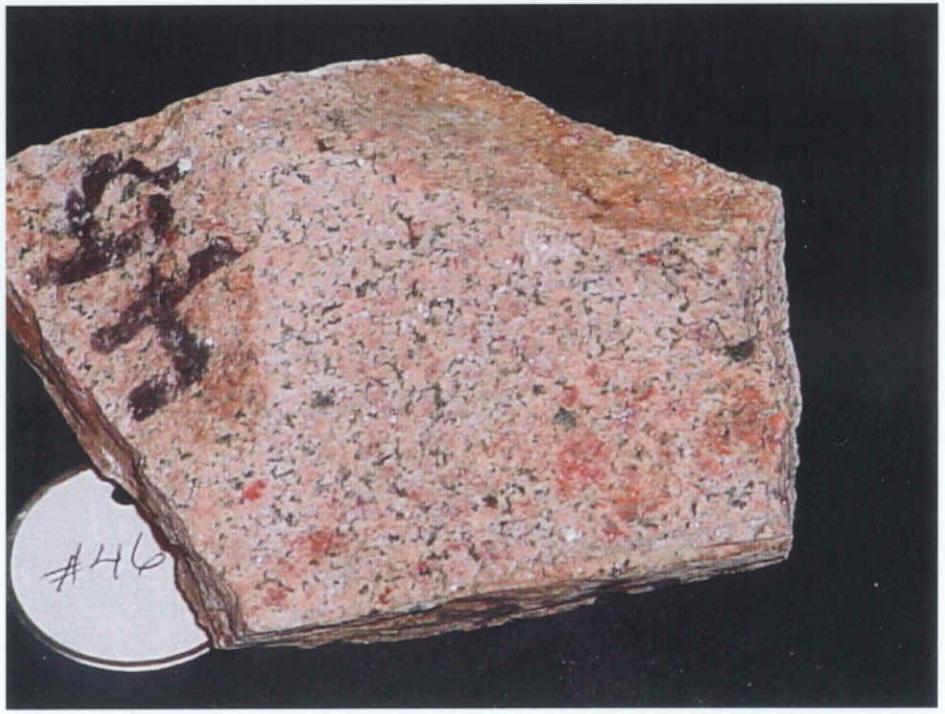
Color profile: Generic CMYK printer profile
Composite Default screen



#43 OTTO-QUARTZ SYENITE

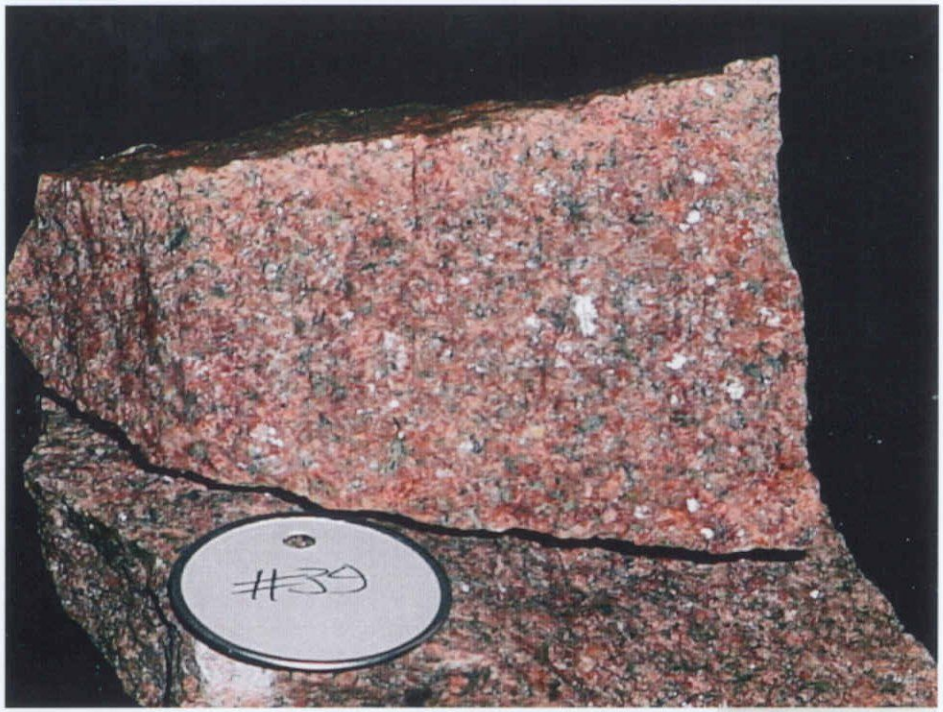


#44 OTTO-PINK SYENITE



E:\Sample 43,44,46
January 29, 2004 3:22:28 PM

#46 OTTO-PINK SYENITE



#39 OTTO-PINK SYENITE



#48 OTTO-PINK SYENITE



#40 OTTO-PINK SYENITE

Samples 39,40,48
January 29, 2004 9:45:41 AM



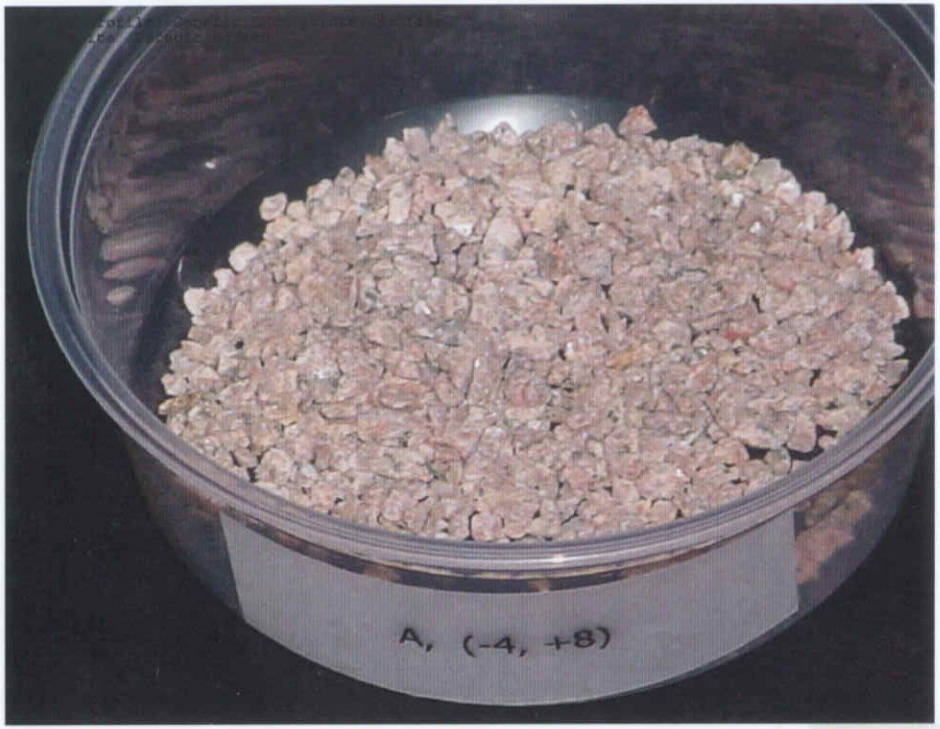


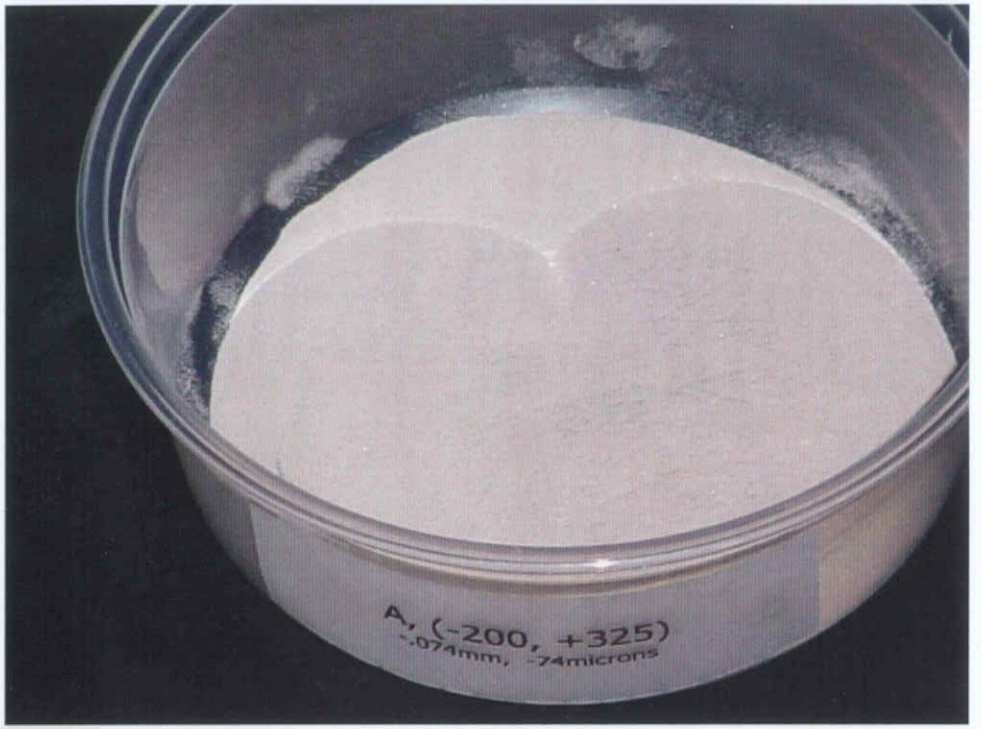
#41 SCREENING-OTTO SYENITE



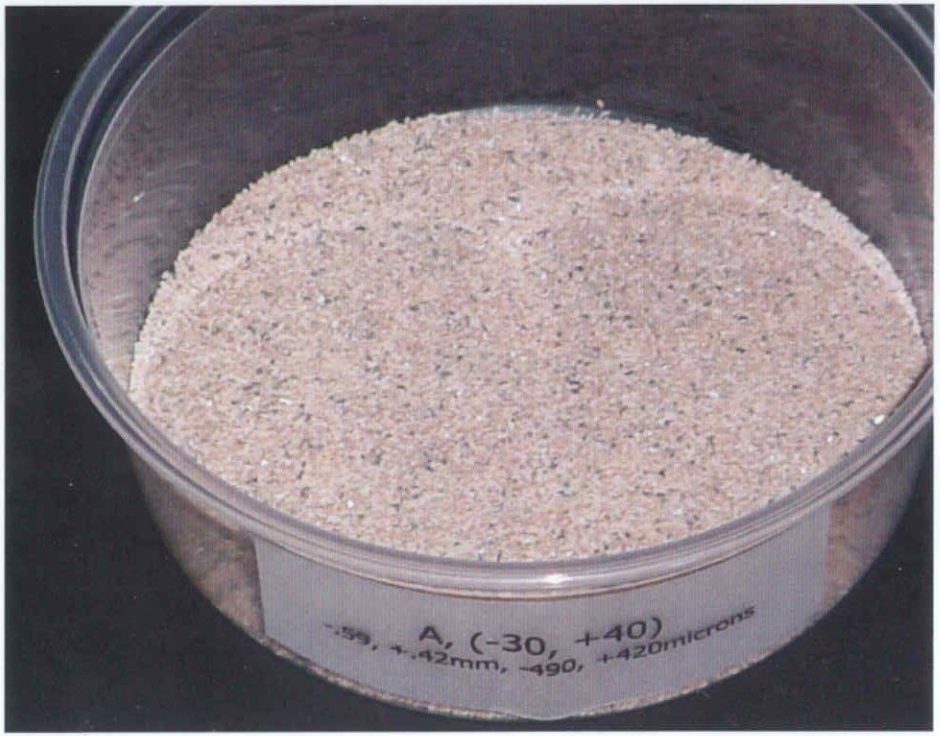


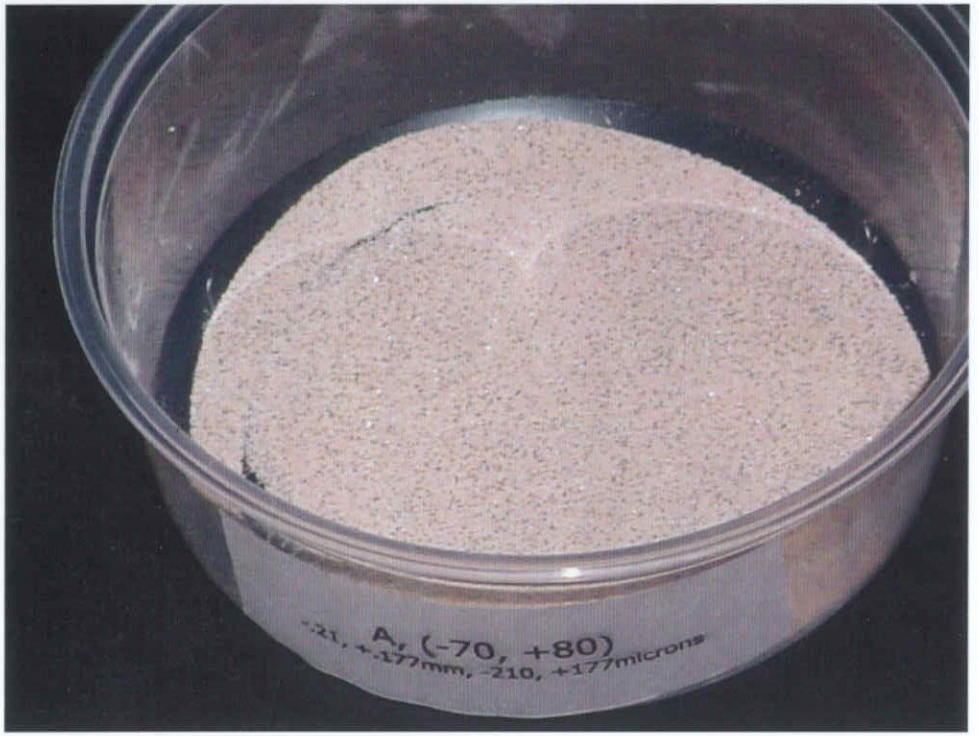
Sample 41
January 29, 2004 8:03:07 AM



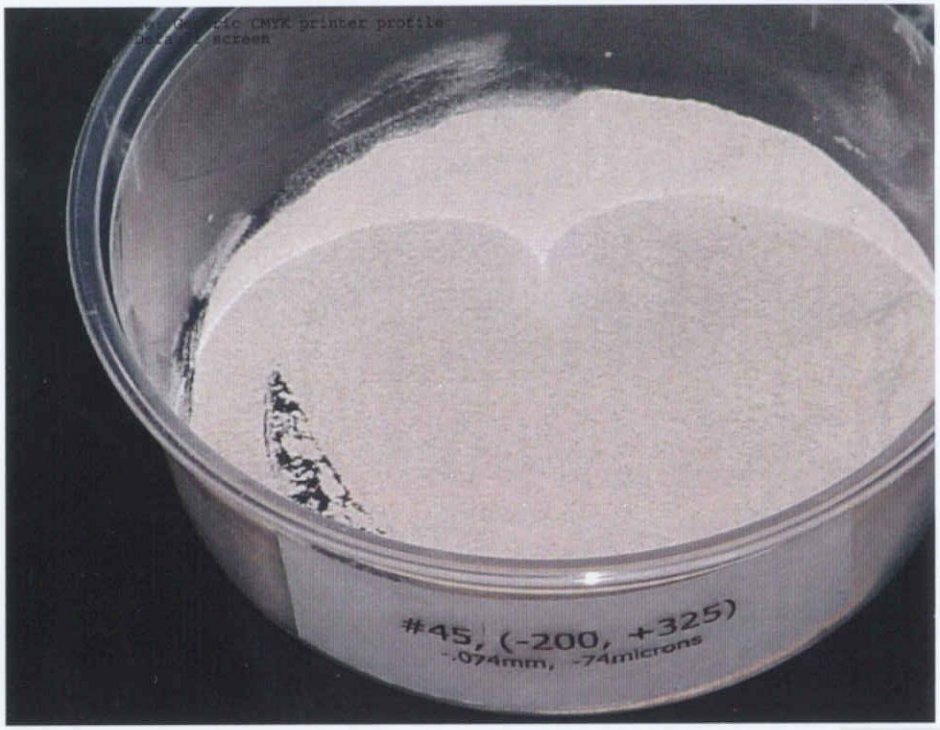


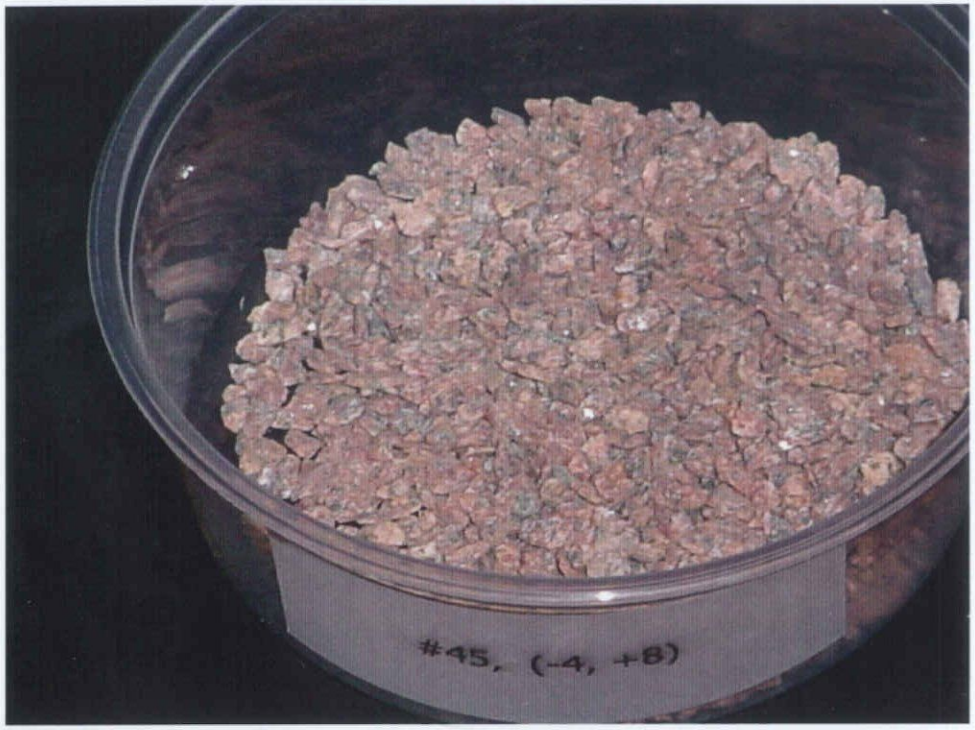
#43(A) SCREENING-OTTO SYENITE



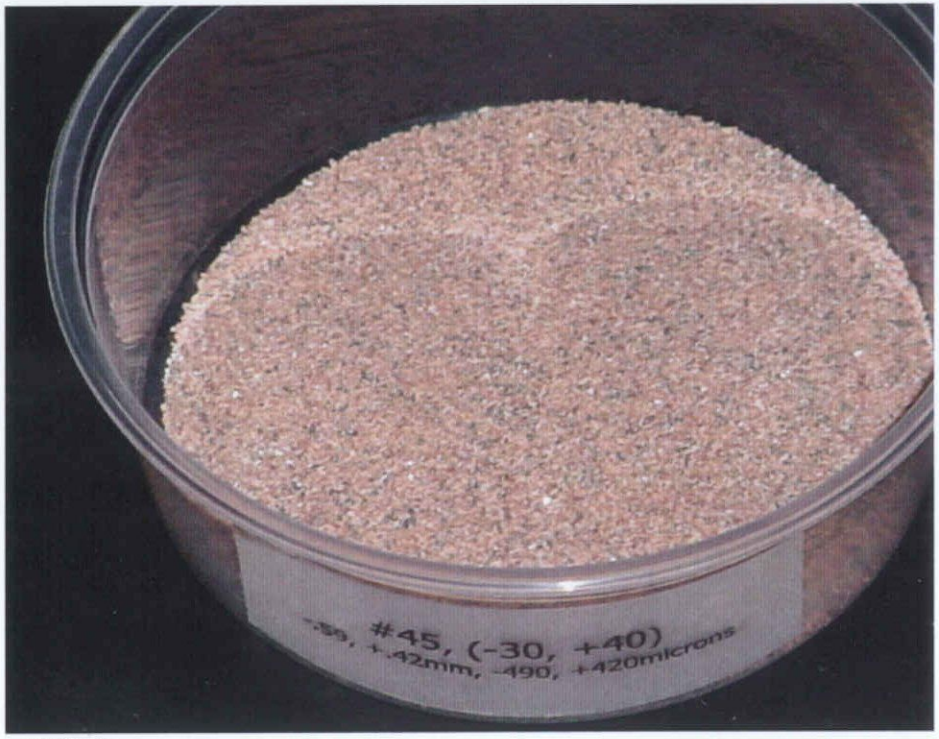


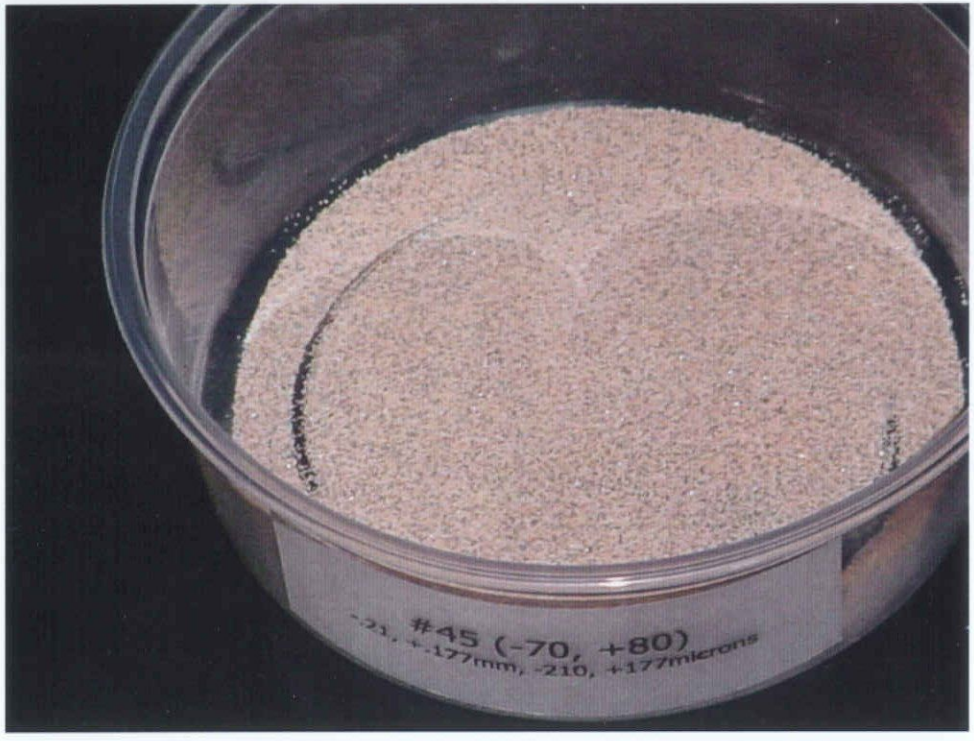
Sample 43 (A)
January 30, 2004 10:16:49 AM





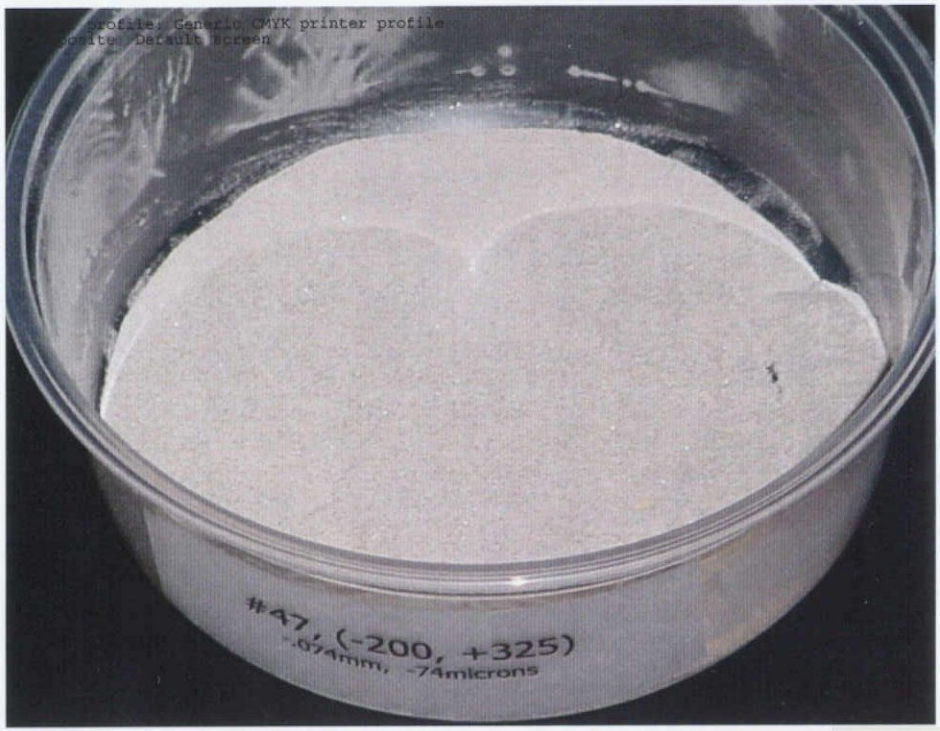
#45 SCREENING-OTTO SYENITE

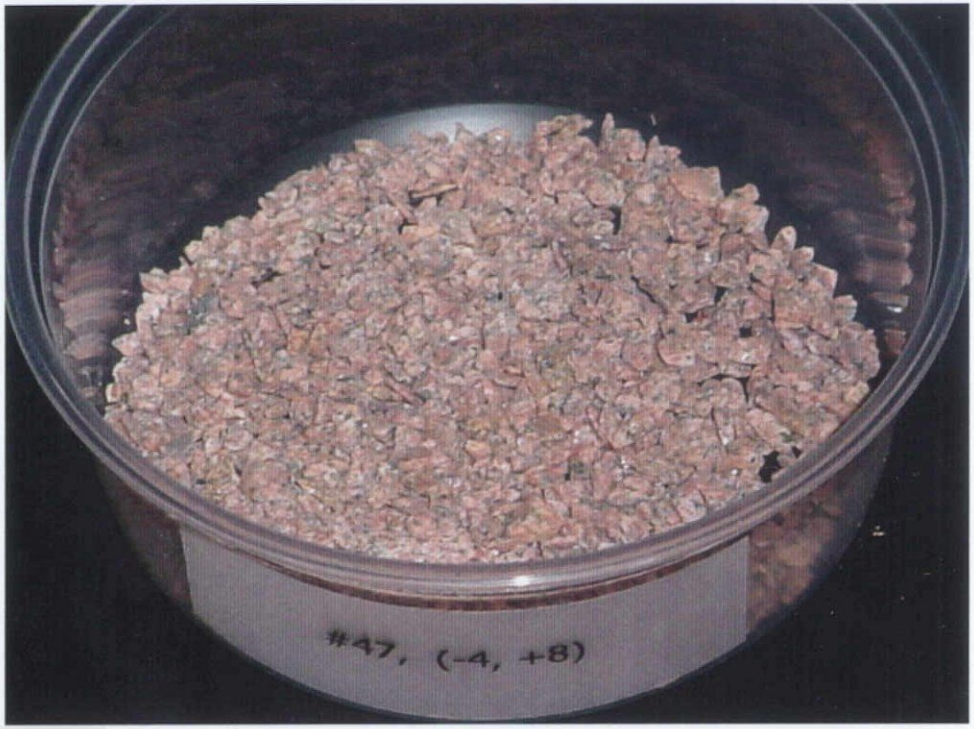




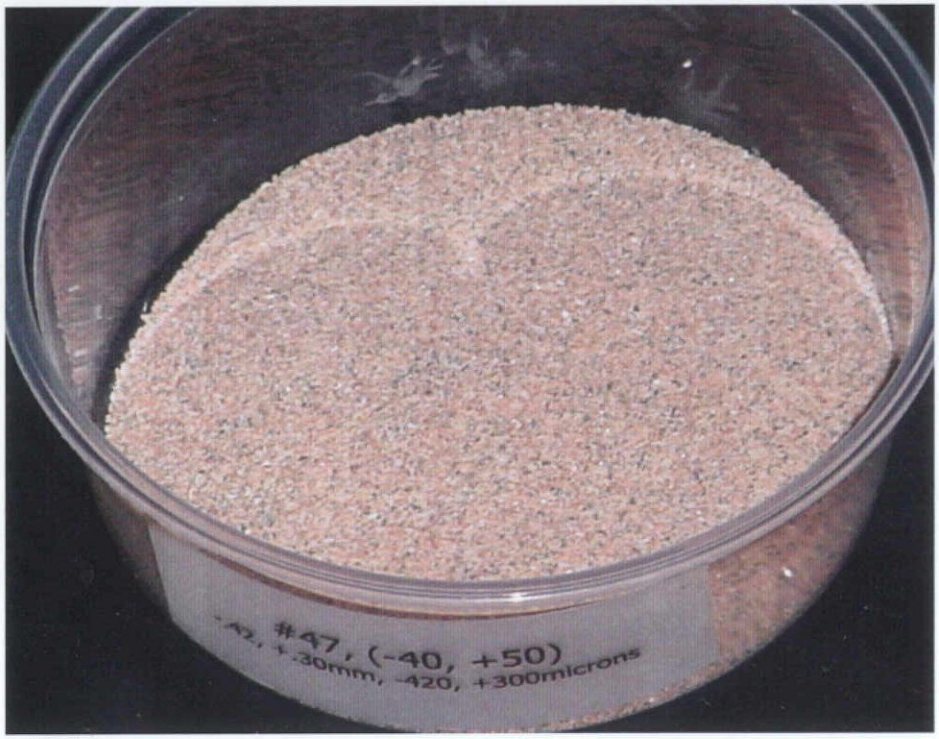
Sample 45
January 29, 2004 8:05:23 AM

profile: Generic CMYK printer profile
opsite: Default screen





#47 SCREENING-OTTO SYENITE



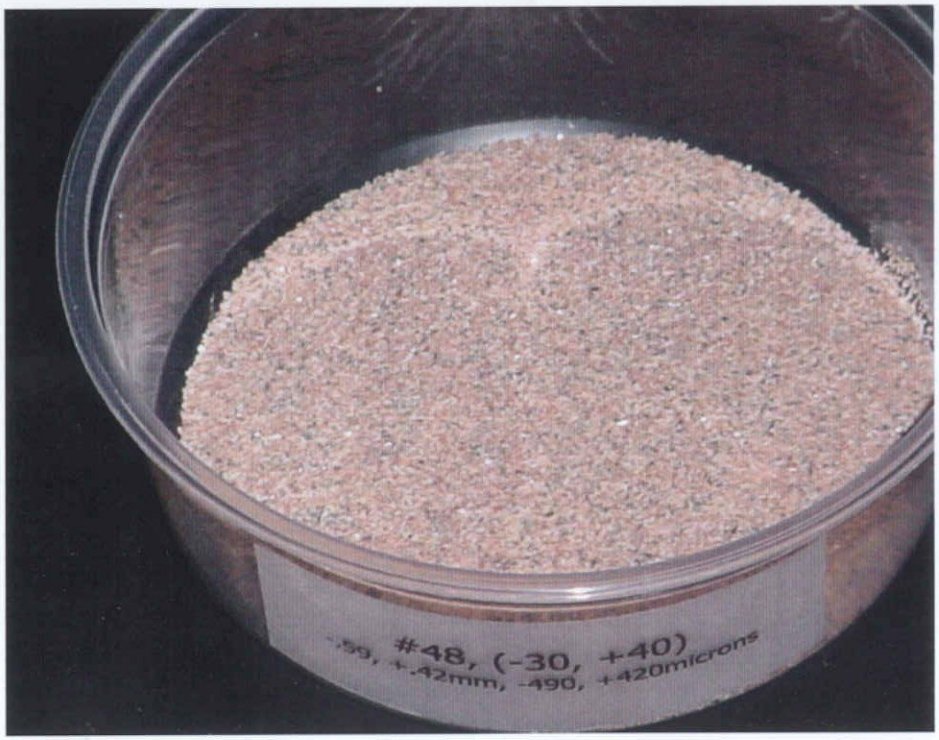


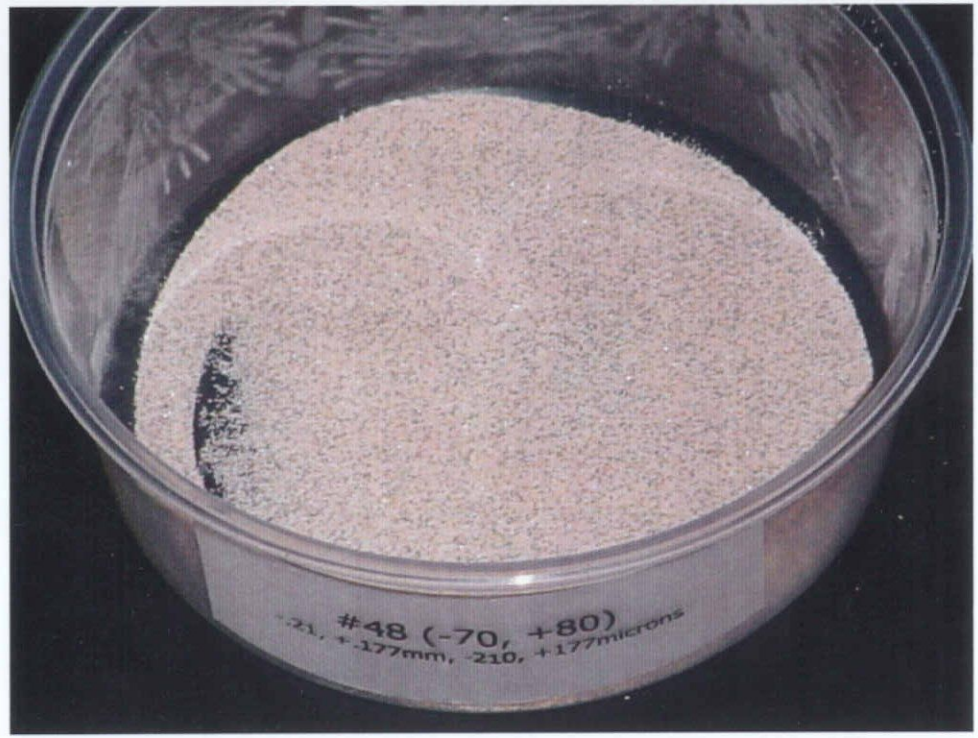
Sample 47
January 29, 2004 8:06:09 AM





#48 SCREENING-OTTO SYENITE





Sample 43
January 29, 2004 8:04:20 AM

Work Report Summary

Transaction No: W0480.00225 **Status:** APPROVED
Recording Date: 2004-FEB-06 **Work Done from:** 2002-AUG-12
Approval Date: 2004-FEB-09 **to:** 2003-MAR-31

Client(s):

392672 GRANT FOREST PRODUCTS CORP.

Survey Type(s):

BENEF INDUS

Work Report Details:

Claim#	Perform	Perform Approve	Applied	Applied Approve	Assign	Assign Approve	Reserve	Reserve Approve	Due Date
L 1199812	$3,855	$3,855	$5,507	$5,507	$0	0	$0	$0	2006-JUL-12
L 1199813	$826	$826	$0	$0	$826	826	$0	$0	2004-JUL-12
L 1199815	$826	$826	$0	$0	$826	826	$0	$0	2004-JUL-12
	$5,507	$5,507	$5,507	$5,507	$1,652	$1,652	$0	$0	

External Credits: $0

Reserve:

$0 Reserve of Work Report#: W0480.00225

$0 Total Remaining

Status of claim is based on information currently on record.

42A01SE2020 2.27149 OTTO 900

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Date: 2004-FEB-10

GEOSCIENCE ASSESSMENT OFFICE
933 RAMSEY LAKE ROAD, 6th FLOOR
SUDBURY, ONTARIO
P3E 6B5

Tel: (888) 415-9845
Fax:(877) 670-1555

DOUGLAS ALLEN BLACKBURN
GRANT FOREST PRODUCTS CORP.
BOX 160
EARLTON, ONTARIO
P0J 1E0 CANADA

Submission Number: 2.27149
Transaction Number(s): W0480.00225

Dear Sir or Madam

Subject: Approval of Assessment Work

We have approved your Assessment Work Submission with the above noted Transaction Number(s). The attached Work Report Summary indicates the results of the approval.

At the discretion of the Ministry, the assessment work performed on the mining lands noted in this work report may be subject to inspection and/or investigation at any time.

If you have any question regarding this correspondence, please contact BRUCE GATES by email at bruce.gates@ndm.gov.on.ca or by phone at (705) 670-5856.

Yours Sincerely,



for Ron C. Gashinski
Senior Manager, Mining Lands Section

Cc: Resident Geologist
Grant Forest Products Corp.
(Claim Holder)

Assessment File Library
Grant Forest Products Corp.
(Assessment Office)

ONTARIO CANADA

MINISTRY OF NORTHERN DEVELOPMENT AND MINES

PROVINCIAL MINING RECORDER'S OFFICE

Mining Land Tenure Map

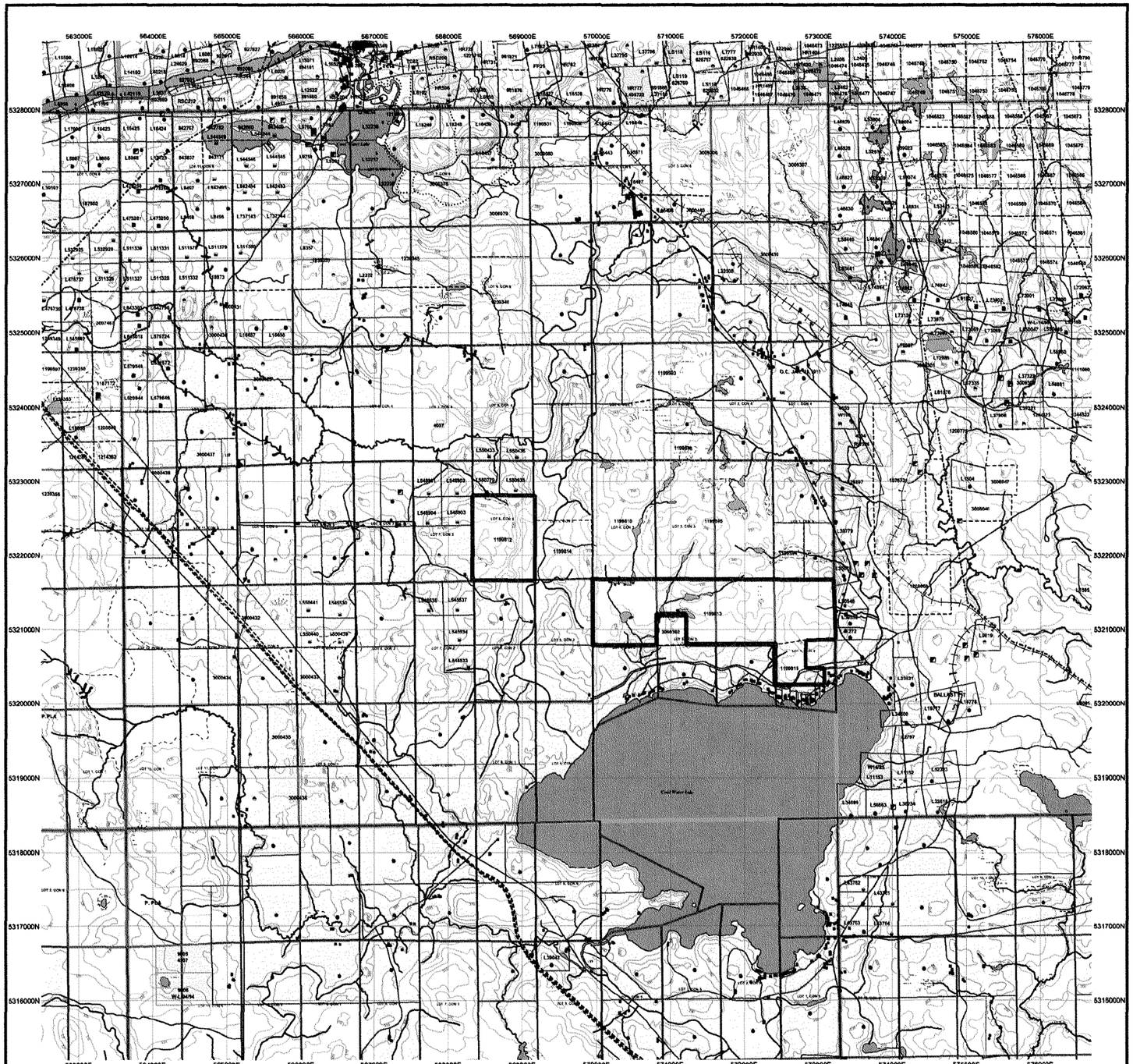
Date / Time of Issue: Mon Feb 09 13:15:51 EST 2004

TOWNSHIP / AREA **PLAN**

OTTO **M-0379**

ADMINISTRATIVE DISTRICTS / DIVISIONS

Mining Division	Larder Lake
Land Titles/Registry Division	TIMISKAMING
Ministry of Natural Resources District	KIRKLAND LAKE



TOPOGRAPHIC

- Administrative Boundaries
- Township
- Concession, Lot
- Provincial Park
- Indian Reserve
- Cliff, Pit & Pile
- Contour
- Mine Shafts
- Mine Headframe
- Railway
- Road
- Trail
- Natural Gas Pipeline
- Utilities
- Tower

Land Tenure

Freehold Patent

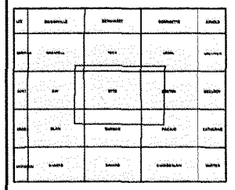
- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only

Leasehold Patent

- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only

License of Occupation

- Uses Not Specified
- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only
- Land Use Permit
- Order In Council (Not open for staking)
- Water Power Lease Agreement
- Mining Claim (1234567)
- Filed Only Mining Claims (1234567)



LAND TENURE WITHDRAWALS

1234 Areas Withdrawn from Disposition

Mining Acts Withdrawal Types

- Wsm Surface And Mining Rights Withdrawn
- Ws Surface Rights Only Withdrawn
- Wm Mining Rights Only Withdrawn

Order In Council Withdrawal Types

- W'sm Surface And Mining Rights Withdrawn
- W's Surface Rights Only Withdrawn
- W'm Mining Rights Only Withdrawn

Mc IMPORTANT NOTICES

750m 0m Scale 1:30000 2.25km

LAND TENURE WITHDRAWAL DESCRIPTIONS

Identifier	Type	Date	Description
4033	Wm	Apr 18, 2001	SEC 43/70 W43/73 M.P.O. 359m
4034	Wsm	Jan 1, 2001	PENDING APPLICATION UNDER PUBLIC LANDS ACT (SURFACE RIGHTS)
4037	Wsm	Jan 1, 2001	400 FT SURFACE RIGHTS RESERVATION ALONG THE SHORES OF ALL LAKES & RIVERS
4107	Wsm	Jan 1, 2001	WASTE DISPOSAL SITE SDS 43
4114	Wsm	Jan 1, 2001	PUBLIC ACCESS
4135	Wsm	Jan 1, 2001	WITHDRAWN FROM STAKING SEC 42 INCLACT FILE 6699 RTE
4142	Wsm	Jan 1, 2001	400 FT SURFACE RIGHTS RESERVATION AROUND ALL LAKES & RIVERS
9005	Wsm	Jan 1, 2001	W1180 NR, 2705 EgH 1899 R.R.O.
9008	Wsm	Jan 1, 2001	WASTE DISPOSAL SITE
P, PLA	Ws	Jan 23, 2002	Pending Application Sec. 30(b) and 39(2). Surface Rights Only.
P, PLA	Wsm	Jan 23, 2002	Pending Application Sec. 30(b) and 39(2). Surface Rights Only.
P,PLA	Ws	Jan 23, 2002	Pending Application Sec. 30(b) and 39(2). Surface Rights Only.
WL-09-01	Wsm	Feb 7, 2001	Sec. 35 WL-09-01 2001/02/07 O.R.O. 1970 30
WL-09-02	Wsm	Feb 5, 2001	Sec. 35 WL-09-02 Mn 1 2001/02/05 1970 30
WL-14/98	Wsm	Apr 17, 1998	SEC 35 WL-14/98 17/04/98 Mn 5 1970 30
WL-31/98	Wm	July 11, 1998	SEC 35 WL-31/98 11/08/98 Mn 1
WL-46/98	Ws	Oct 27, 1998	SEC 35 WL-46/98 OCT 27/98 O.R.O. 1970 30
WL-94/94	Wsm	Jul 26, 1994	WL-94/94 NEW JULY 26 1994 M & S SECTION 35 R.S.O. 1990
WLL-P1614	Wsm	Feb 13, 2002	<a href="http://www.ontarioprecia... ca/MNDMMINES/LANDS/Mining/Forms/2f32/actions/afis1614-02.htm">WLL-P1614-02 UNT N&S withdrawal S. 35 Mining Act SEC 1999, 12/02/02 Boundary generally copies and withdrawn GMA to now actual area withdrawn each
W1485	Ws	Apr 7, 1965	SEC 30/80 W1485 57/485 R.R.O

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General Information and Limitations

These wishing to stake mining claims should consult with the Provincial Mining Recorders Office or the Ministry of Northern Development and Mines for additional information on the status of the lands shown hereon. This map is not intended for navigational, survey, or land title determination purposes as the information shown on this map is compiled from various sources. Completeness and accuracy are not guaranteed. Additional information may also be obtained through the local Land Titles or Registry Office, or the Ministry of Natural Resources.

The information shown is derived from digital data available in the Provincial Mining Recorders' Office at the time of downloading from the Ministry of Northern Development and Mines web site

Contact information:
Provincial Mining Recorders' Office:
Willet Green Miller Centre 153 Pamour Lake Road
Timmins ON P4E 4B5
Mines Page: www.mndm.gov.on.ca/MNDMMINES/LANDS/mlsmmaps.htm

Toll Free:
Tel: 1 (866) 415-0845 ext 114 (Englishe 1Ptn fr Anglais)
Fax: 1 (877) 670-1444

Map Datum: NAD 83
Topographic Data Source: Land Information Ontario
Mining Land Tenure Source: Provincial Mining Recorder's Office

This map may not show unregistered land tenure and interests in land including certain patents, leases, easements, right of ways, flooding rights, licences, or other forms of disposition of rights and interest from the Crown. Also certain land tenure and land uses that restrict or prohibit free entry to stake mining claims may not be illustrated.

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