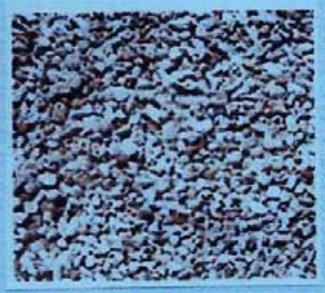
PERLITE

Mother Nature`s Most Perfect Soil Conditioner

From This



To This

Expanded Perlite

To This

Commercial Greenhouse Production with Perlite and Vermiculite Soil Mixes

Uncha Lake Perlite Deposit

NTS Map 93F/13E
December 14, 2006

Innovative Energy Inc.
21664 – Monahan Court
Langley BC, Canada.
V3A8N1

2835

UNCHA LAKE PERLITE DEPOSIT

NTS MAP 93F/13E

December 14. 2006

Innovative Energy Inc.

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Langley BC Canada V3A 8N1
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FAX: (604) 532-6494
Email: *hoppelt@telus.net*

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Appendices

UNCHA LAKE PERLITE DEPOSIT

1. Introduction

Perlite is a term applied to any hydrated volcanic glass of rhyolitic composition which when heated to temperatures greater than 510°C will expand to form a white, porous, lightweight material. In its expanded form perlite is used as an insulating aggregate in plaster and concrete, in horticultural applications and as a filtering agent. Deposits are restricted to volcanic belts ranging in age from Tertiary to Quaternary. At present, all perlite consumed in British Columbia is imported from the United States.

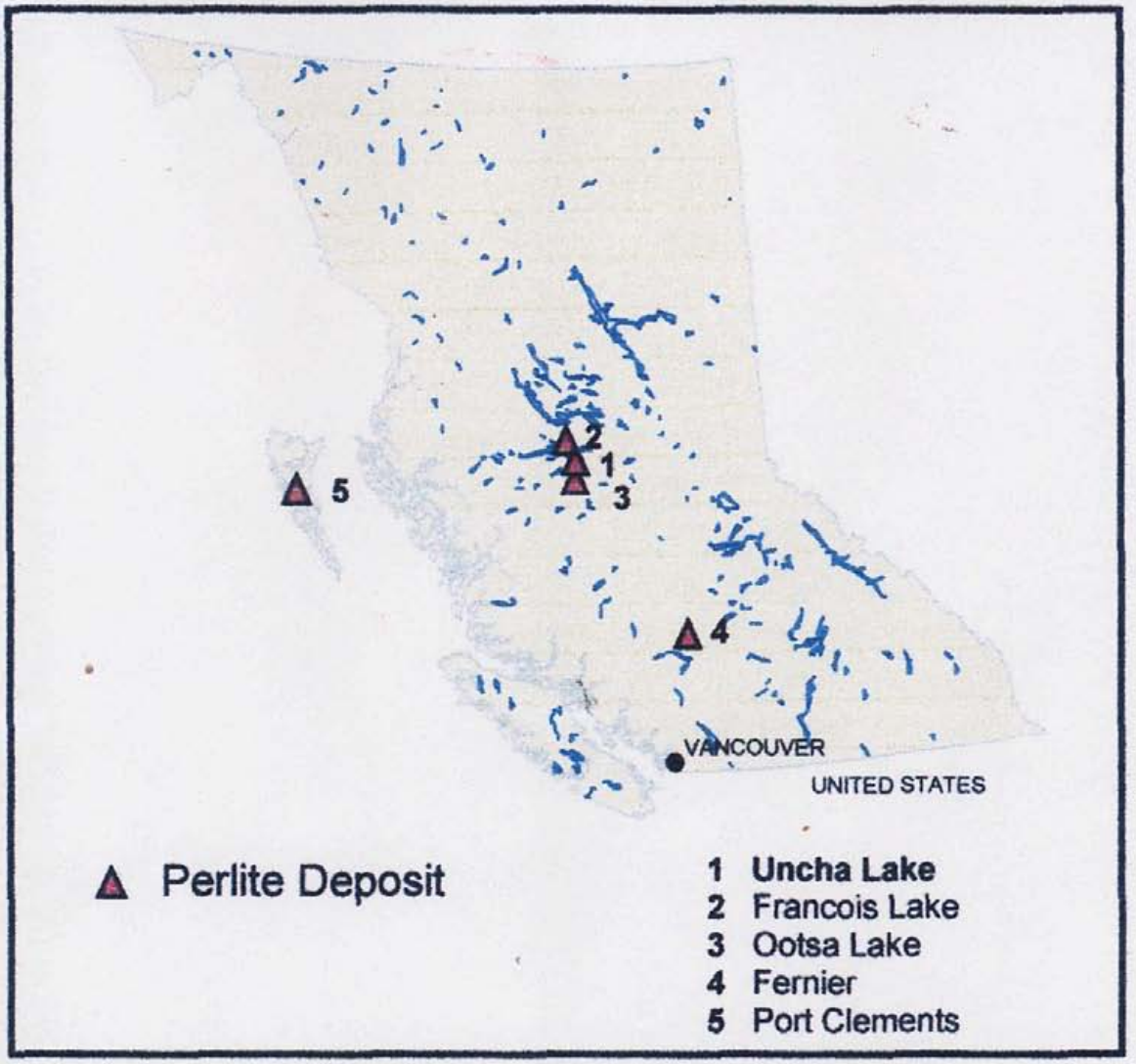


Figure 1: Perlite occurrences in British Columbia.

2. Location and Access

The Uncha Lake Perlite Deposit is located in the Omineca Mining Division within the 93F/13E NTS map sheet The Uncha Lake Perlite Deposit is located on the northwest slopes of Dayeezcha Mountain 25 miles south of the town of Burns Lake, British Columbia (Figure 2). The deposit is reached by taking the all-weather Highway 35 to the ferry terminal at Francois Lake, crossing the lake to the South Bank terminal and continuing on the BC Forest Service Road for approximately 12 miles to the Dayeezcha Mountain area. The Day Claims are located 4.5 miles directly south of Uncha Lake. The roads in the area are well maintained as logging companies are very active in the area. There is road access directly into the property (Figure 3).

Most of the area is very lightly settled, with some small towns along major rivers; major settlements include Burns Lake to the north, Houston, 55 miles to the northwest and Endako, 33 miles to the northeast. There is no settlement on or near the property. Rail transportation is accessible at the Town of Burns Lake.

3. Topography

The Uncha Lake Prospect lies on the Nechako Plateau, the northernmost subdivision of the Interior Plateau (Holland, 1976). The property is located in low and rolling terrain which generally lies between 900 to 1150 metres elevation (Figures 4 and 5). The area is thickly forested with pine and bedrock is obscured by extensive drift cover. Tipper (I963) noted that over 90 per cent of the Nechako River map area is drift covered. Till and glacio-fluvial outwash are the predominant cover materials.

Outcrop is concentrated mostly on ridge crests and steep slopes. Extensive clear cut logging in the area and road building has generated additional exposures and increased access. A satellite photo of the area (Figure 6) demonstrates the active clear cutting by forestry companies. The area is known as the 'Lake District' as there are abundant small lakes created due to the subdued topography and

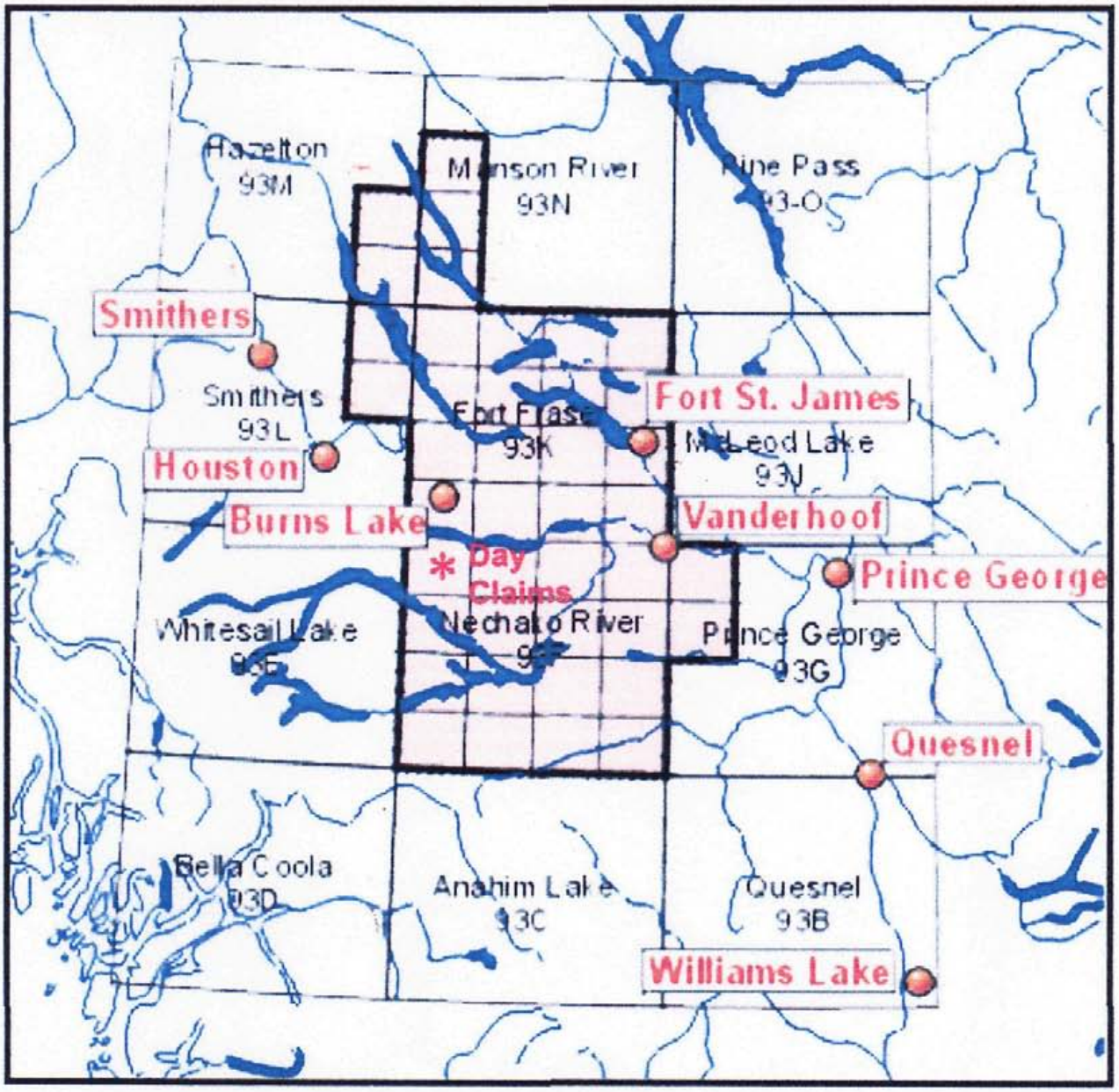


Figure 2: The Nechako Plateau within the Intermontane Belt of northwestern British Columbia.

* Uncha Lake Perlite Prospect

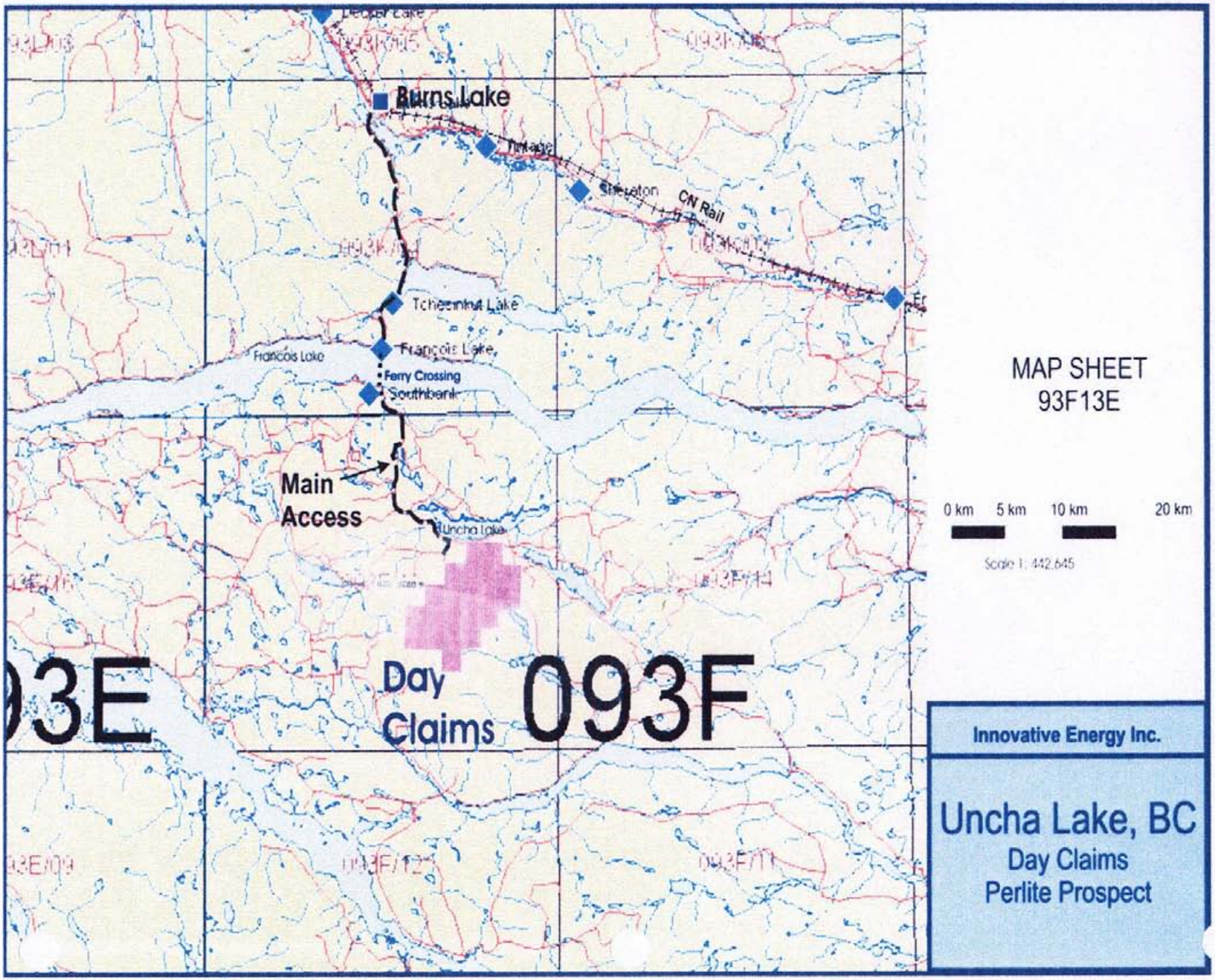


Figure 3: Location of Day Claims, 4.5 kms south of Uncha Lake.

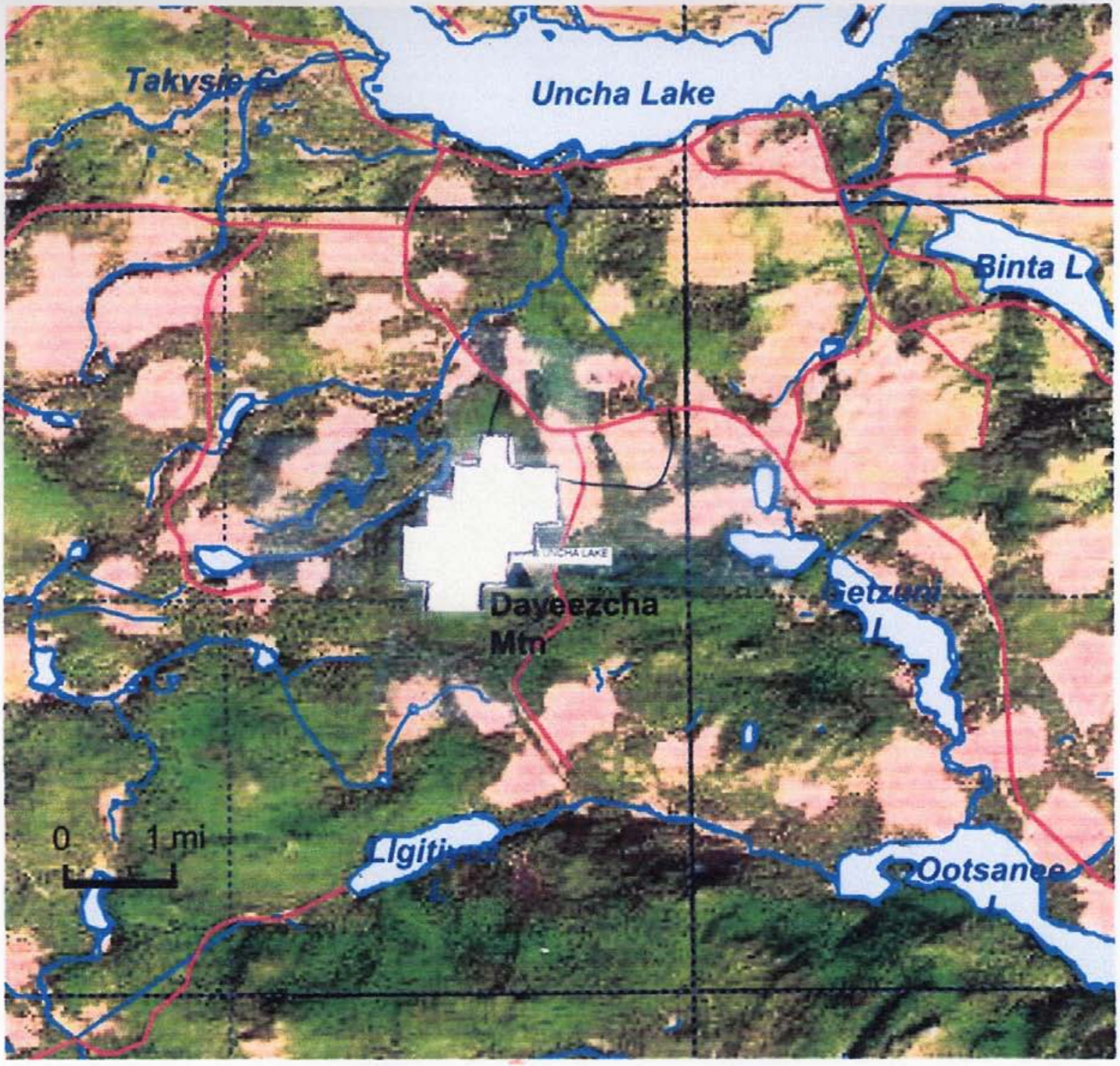


Figure 6: Satellite photograph of the Uncha Lake area on the Nechako Plateau. Red lines indicate access roads.

B

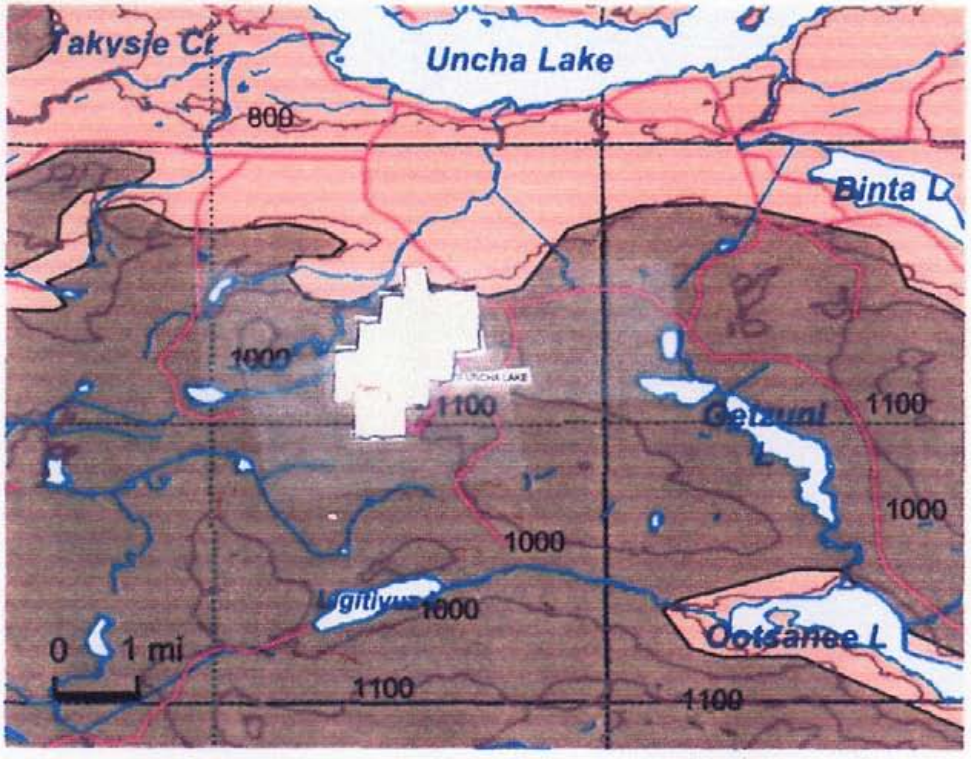


Figure 4: Surface elevation contours in meters of the Uncha Lake area.

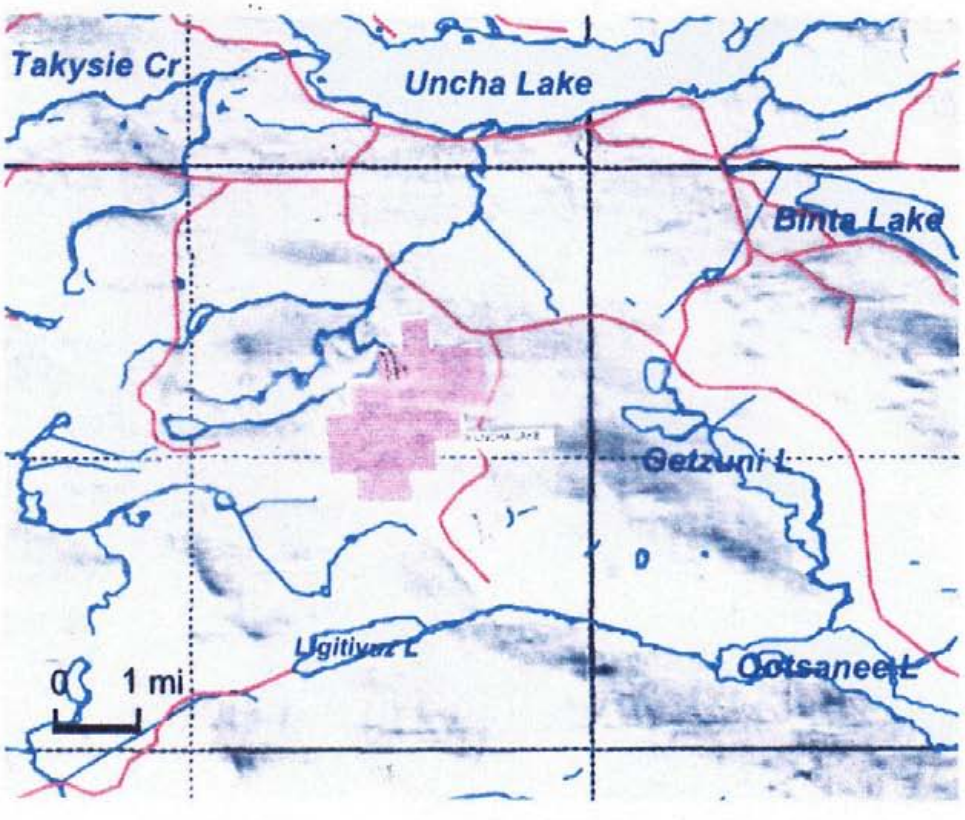
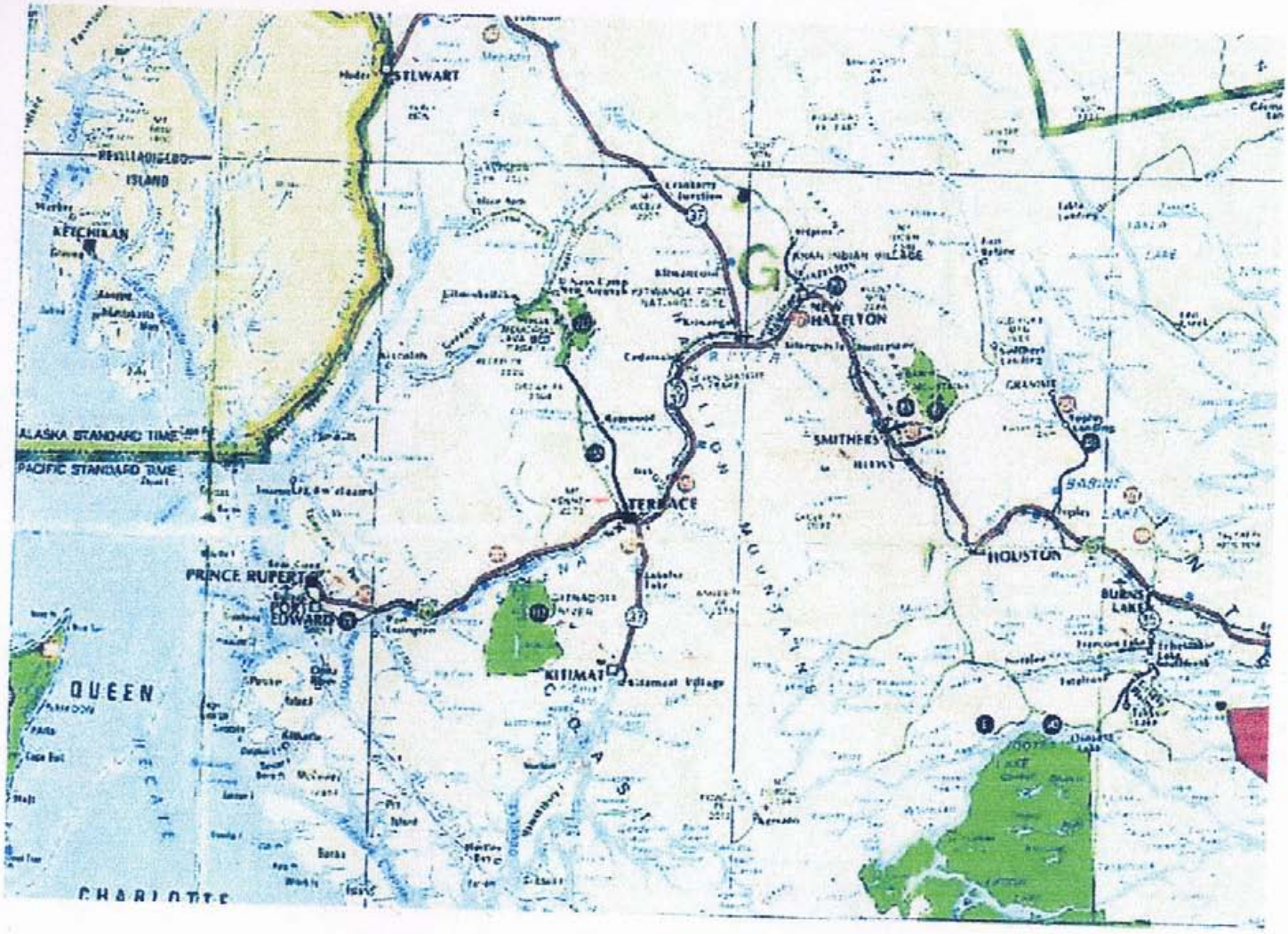
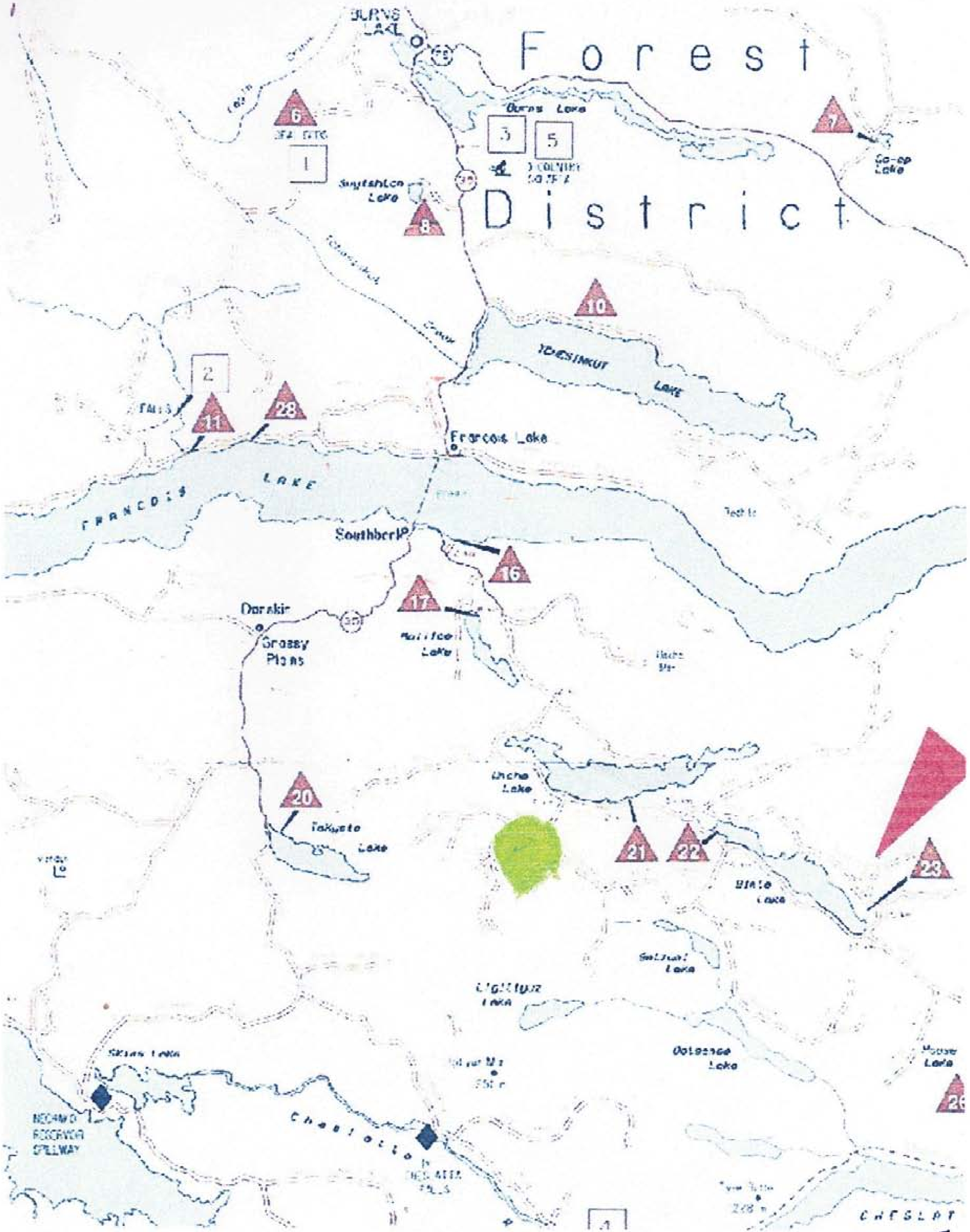


Figure 5: Hillshade relief map of the Nechako River Plateau Area. Lack of shading indicates relatively low relief for area.


STEWART
KETCHIKAN
ALASKA STANDARD TIME
PACIFIC STANDARD TIME
NEW HAZELTON
SMITHERS
TERRACE
HOUSTON
PRINCE RUPERT
PORT EDWARD
KITIMAT
QUEEN
CHARLOTTE
BURNS LAKE

D


Forest District
BURNS LAKE
Burns Lake
Co-op Lake
Francois Lake
FRANCOIS LAKE
TCHESINKUT LAKE
Southbank
Grassy Plains
Uncha Lake
Takysie Lake
Binta Lake
Ootsa Lake
Skins Lake
Moose Lake
CHESLATTA
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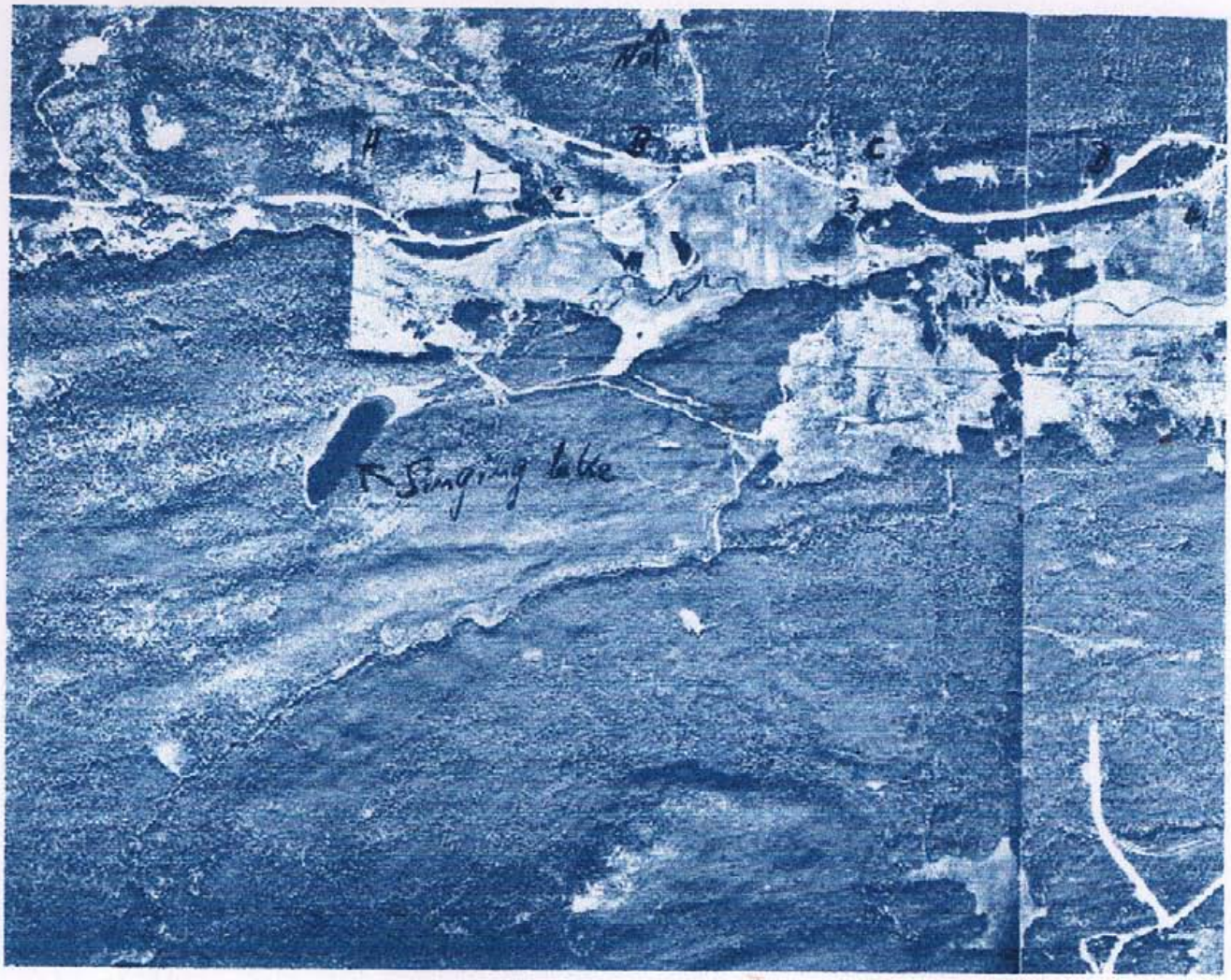
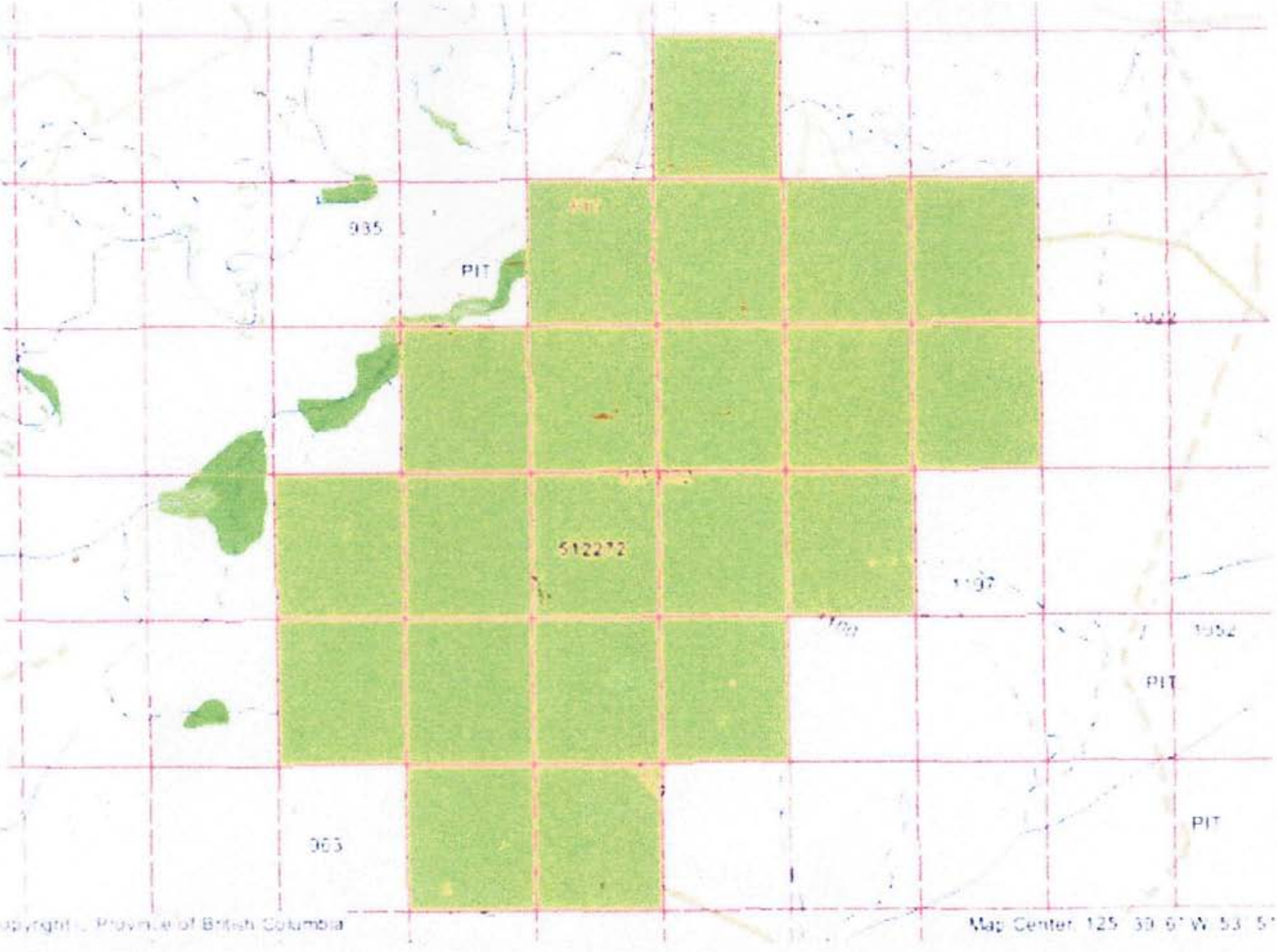

A
B
C
D
Singing Lake

Relatively poor drainage of the Nechako Plateau, Mineral exploration in these areas has been generally hampered by the extensive drift cover and poor exposure, The Day claims are situated along the shallow sloped northwest face of Dayeezcha mountain.

4, Tenure # 512272

All claims are recorded in the name of Harold Oppelt and the Anniversary date is good until 2007/feb/ 07, Day #1 to 21 inclusive A claim location map is listed below, showing the property lines. Fig, #1



BRITISH COLUMBIA

Contact Us ▸

Mineral Titles Online Viewer

Public Access

Tenure Detail

Tenure Number ID	**512272 View Tenure**
Tenure Type	Mineral (M)
Tenure Sub Type	Claim (C)
Title Type	Mineral Cell Title Submission (MCX)
Mining Division	
Good To Date	2007/feb/07
Issue Date	2005/may/09
Termination Type	
Termination Comments	
Termination Date	
Tag Number	
Claim Name	
Old Tenure Code	
Area In Hectares	400.529

Map Numbers:

093F

Owners:

143039 HAROLD RICHARD OPPELT 100.0%

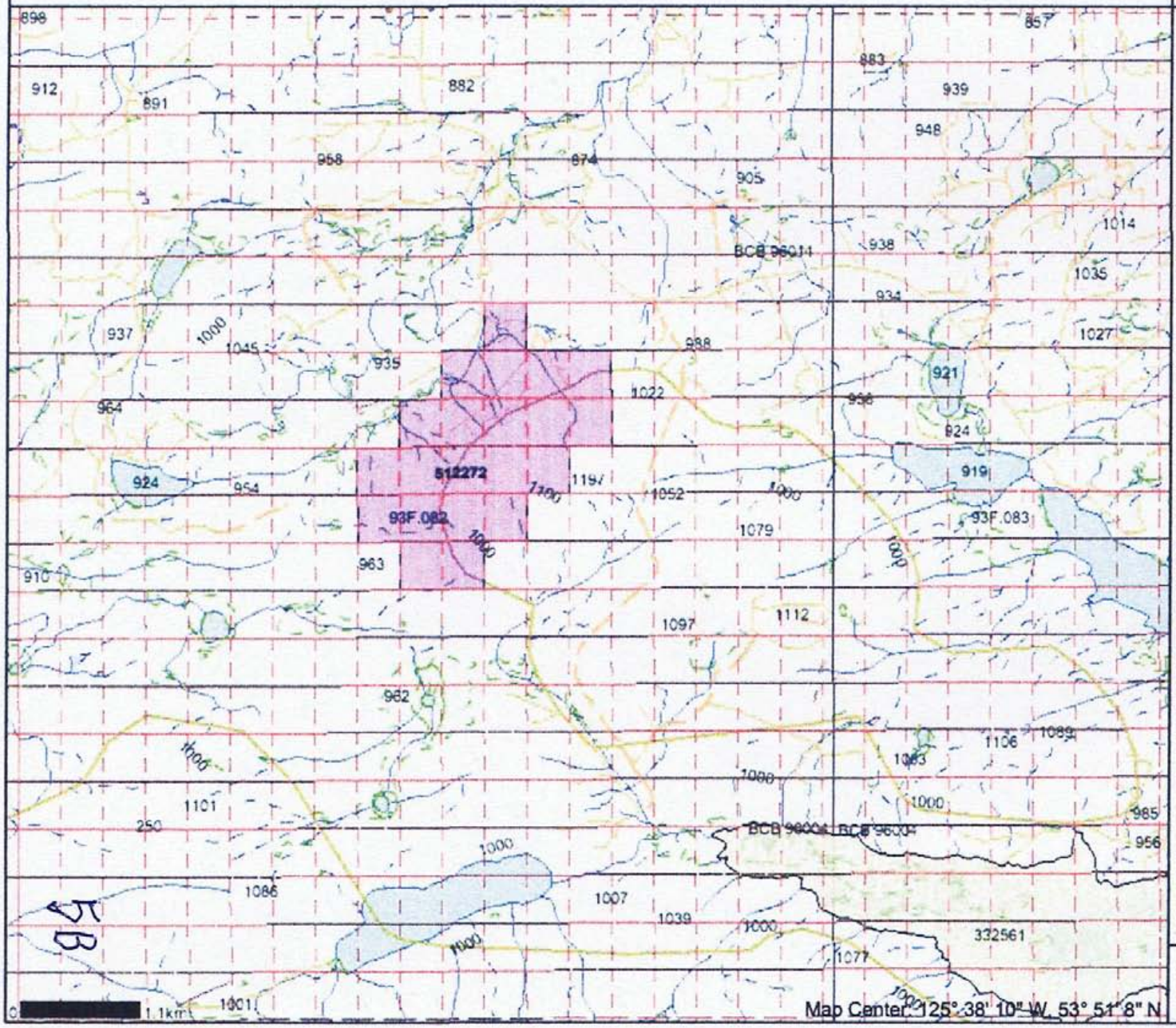
Tenure Events:

Submitter		Event	Effecti
143039	HAROLD RICHARD OPPELT	CONV Claim Conversion(4030212)	2005/I

Click here to go back to the previous page
Click here to go back to the tenure search page.
Click here to print this page.

5A

Map created Mon May 09 11:58:11 PDT 2005



Legend

- Indian Reserves
- National Parks
- Parks
- Mineral Titles Grid
- Mineral Tenures
- Reserves (Sites)
- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others
- BCGS Grid
- Contours (1:250K)
- Contour - Index
- Contour - Intermediate
- Areaof Exclusion
- Areaof Indefinite Contours
- Transportation - Points (TRIM)
- Helipad
- Transportation - Lines (TRIM)
- Airfield
- Airport
- Airstrip
- Airport Abandoned
- Ferry Route
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes
- Road (Gravel Undivided) - U/C - 1 Lane
- Road (Gravel Undivided) - U/C - 2 Lanes
- Road (Paved Divided) - Not Elevated - 1 Lane Each Way
- Road (Paved Divided) - Not Elevated - 2 Lanes Each Way
- Road (Paved Divided) - U/C - Not Elevated - 2 Lanes Each Way
- Road (Paved Undivided) - Not Elevated - 1 Lane
- Road (Paved Undivided) - Not Elevated - 2 Lanes
- Road (Paved Undivided) - Not Elevated - 4 Lanes
- Road (Paved Undivided) - U/C - Not Elevated - 4 Lanes
- Road (Unimproved)
- Cut (Roadway)
- Embankment/Fill (Roadway)
- Trail
- Bridge - Foot
- Bridge - Trestle
- Tunnel
- Bridge
- Rail Line (Double Track)
- Rail Line (Multiple Track)
- Rail Line (Single Track)
- Rail Line - Abandoned Track

Scale: 1:60,000

DO NOT USE FOR NAVIGATION

5. Geological Description

5.1 Regional Geology

The prospect area lies within the Nechako River NTS map sheet 93F and is entirely within the Nechako Basin of the Intermontane Belt. The Nechako River area comprises part of the Stikinia terrane. The Nechako Basin is a Mesozoic forearc basin, bounded by the Skeena Arch to the north, the Fraser River Fault System to the east, and the Yalakom Fault System and Coast Mountain plutons to the west and south. The Nechako Basin formed when Middle Jurassic terrane collisions created the Skeena Arch, which separated the Nechako Basin from the Bowser Basin to the north. Compressional and transform tectonics throughout the Cretaceous caused bordering uplands to shed clastic debris into the Nechako Basin. Strike slip faulting during the Tertiary laterally displaced surrounding terranes and numerous volcanic events mantled much of the basin with basaltic flows.

The stratigraphic succession within the study area is comprised of volcanic and sedimentary rocks of the Lower to Middle Jurassic Hazelton Group, intruded by Late Jurassic, Late Cretaceous and Tertiary felsic plutonic rocks. These are overlain by Eocene volcanics of the Ootsa Lake Group, Oligocene and Miocene volcanics of the Endako Group, and Miocene-Pliocene basalt flows.

The potential of the region to host different styles of mineral deposits has been recently recognized in the area. The Nechako Basin has the potential to host epithermal Au-Ag deposits (Uduk Lake), porphyry-related structurally hosted Au-Ag and base metals, stratabound precious metal and base metal, coal and even oil and gas seeps. The Nechako area contains 68 recorded mineral occurrences. Of these 7 are industrial mineral occurrences, 54 are base and precious metal occurrences and one coal occurrence.

5.2 Local Geology

The Uncha Lake Perlite deposit occurs within the Oosta Lake Group of Eocene age. The Oosta Lake Group is comprised of mainly felsic volcanic rocks and their epiclastic derivatives.

5.2.1 Oosta Lake Group

Eocene continental volcanic rocks of the Ootsa Lake Group are sporacially exposed throughout the area from the Nechako River to the west side of Francois Lake (Figure 2). Diakow and Mihalynuk (1987) recognized six lithologic divisions in the Ootsa Lake Group, which comprises a differentiated succession of andesitic to rhyolitic flows and pyroclastic rocks. Sedimentary rocks, although not common, are interspersed throughout the Oosta Lake sequence.

Potassium-argon ages of approximately 50 Ma have been obtained from Ootsa Lake rocks (Diakow and Koyanagi, 1988). Interest in the precious metal potential of the Ootsa Lake Group has increased in recent years. The Wolf and Clisbako prospects ace epithermal gold-silver occurrences currently under exploration. The Wolf prospect is hosted by felsic flows, tuffs and subvolcanic porphyries, and is a low-sulphur silicified stockwork deposit (Andrew, 1988). The Clisbako prospect is hosted by Eocene basaltic to rhyolitic tuffs, flows and volcanic breccias exhibiting intense silicification and argillic alteration. Gold mineralization in both areas is associated with low-sulphide quartz stockwork zones. The Clisbako prospect has been interpreted to be a high-level volcanic-hosted epithermal system similar to those in the western United States (Dawson, I99I; Schroeter and Lane, 1992). Perlite occurrences have been described by White (1989) in deposits at Francois Lake and at Uncha Lake.

5.2.2 Uncha Lake Prospect Geology *(MINFILE 93F 026)*

The Uncha Lake Perlite Showing on the Day Claims occurs within rhyolotic flows of the Oosta Lake Group on Dayeezcha Mountain. The perlite is interbedded within light to dark grey porphyritic rhyolite layers which are 2.0 to 9.0 metres thick. The perlite is light grey to pale greenish-grey with some perlitic glass occurrences. The perlite generally dips 10 to 30 degrees south and is 7.6 to 23.0 metres thick. A bedrock geology map (Figure 7) of the Uncha Lake area illustrates the extent of the Eocene age Oosta Lake Group. The Oosta Lake Group is bounded on the west by basaltic volcanics of the Late Eocene to Oglicoene Endako Group.

5.2.3 History and Previous Work

Originally staked in 1953 by C.S. Powney and J. Rasmussen of Fort St. James and their associates, the Uncha Lake perlite prospect has been explored by trenching and limited laboratory processing tests. British Columbia Minister of Mines reports indicate that in 1955, Technical Mines Consultants Limited exposed nineteen trenches at approximately 150 foot intervals exposing over 8000 feet of bedrock (Figure 8). Six mineable perlite layers along a zone 850 metres long and 500 metres wide were exposed. Depth of overburden increases to the northeast making further trenching impractical. The company reported that the layers are "irregular in width and attitude, lying interbedded in a folded series of rhyolites striking generally northeast and dipping about 70° to the southeast". The last trench to the southwest end of the workings exposed "three strong layers of perlite". Evidence at the time indicated that the zone extends several hundred feet farther to the southwest.

James (1955) reports the maximum exposed width of at least two layers exceeds 45 metres, and that in some places interbedded rhyolite is sufficiently narrow to permit practical open-pit mining of two or more layers from one pit. Currently the property is inactive and the old trenches are partially filled.

5.2.4 Description of Deposit

Figure 9 shows the distribution of perlite outcrops in the prospect area and the rock types. Past company records are not available so the following description is based on field observations only.

A description of each follows:

Perlite is intercalated with light to dark grey porphyritic and sometimes cherty rhyolites and ranges in colour from brown to medium grey to black to pale green (Figure 10). It often has a good pearly lustre but when exposed for periods of time tends to break down into 2 to 3-centimetre subangular fragments. Uncha Lake perlite expands moderately well when heated with a hand-held propane torch often as rapidly as samples from the Frenier deposit. Glassy occurrences of perlite have a definite perlitic structure and on weathering crumbles along the perlitic cracks to a granular aggregate.

Figure 12: Photo of white rhyolite. Note flow banding steeply dipping southeast; occurrence along access road between Trench #4 and #5.

9

Figure 11: Photo of Perlite occurrence at Trench #2.

Rhyolite, in sharp contact with perlite, ranges from white to dark grey in colour. The rhyolite is a very hard, very fine grain volcanic flow unit which can form ledges and small outcrops up to 25 feet in diameter (Figure 12). Both white and grey varieties contain 1 to 7-centimetre bands of darker "cherty" quartz (chalcedony?) or patches, up to 3 centimetres across, of light green silica possibly indicative of hydrothermal alteration. Rhyolite is occasionally porphyritic with I to 5-centimetre rectangular phenocrysts of potassium feldspar in a fine-grained matrix. Flow banding is evident in some occurrences of the white rhyolites. Near the southern end of the access road siliceous angular fragments, 5 to 7 centimetres across, are observed in rhyolite. A black, very hard, porphyritic rhyolite with rectangular phenocrysts of potassium feldspar occurs at the south-east portion of Trench #6 near the edge of the cleared area.

Figure 10: Photo of perlite occurrence at Trench #4.

Perlite is exposed in trenches south of the access road but not enough bedrock is exposed to determine whether these occurrences represent a single unit. Overburden varies from a few inches to several feet through the property (Figure 11). Significantly, fresh, medium grey perlite is exposed along a ridge west of the trenched area. Structural information is limited but exposures in trenches indicate the host rhyolite strikes northeast and dips steeply southwest.

A

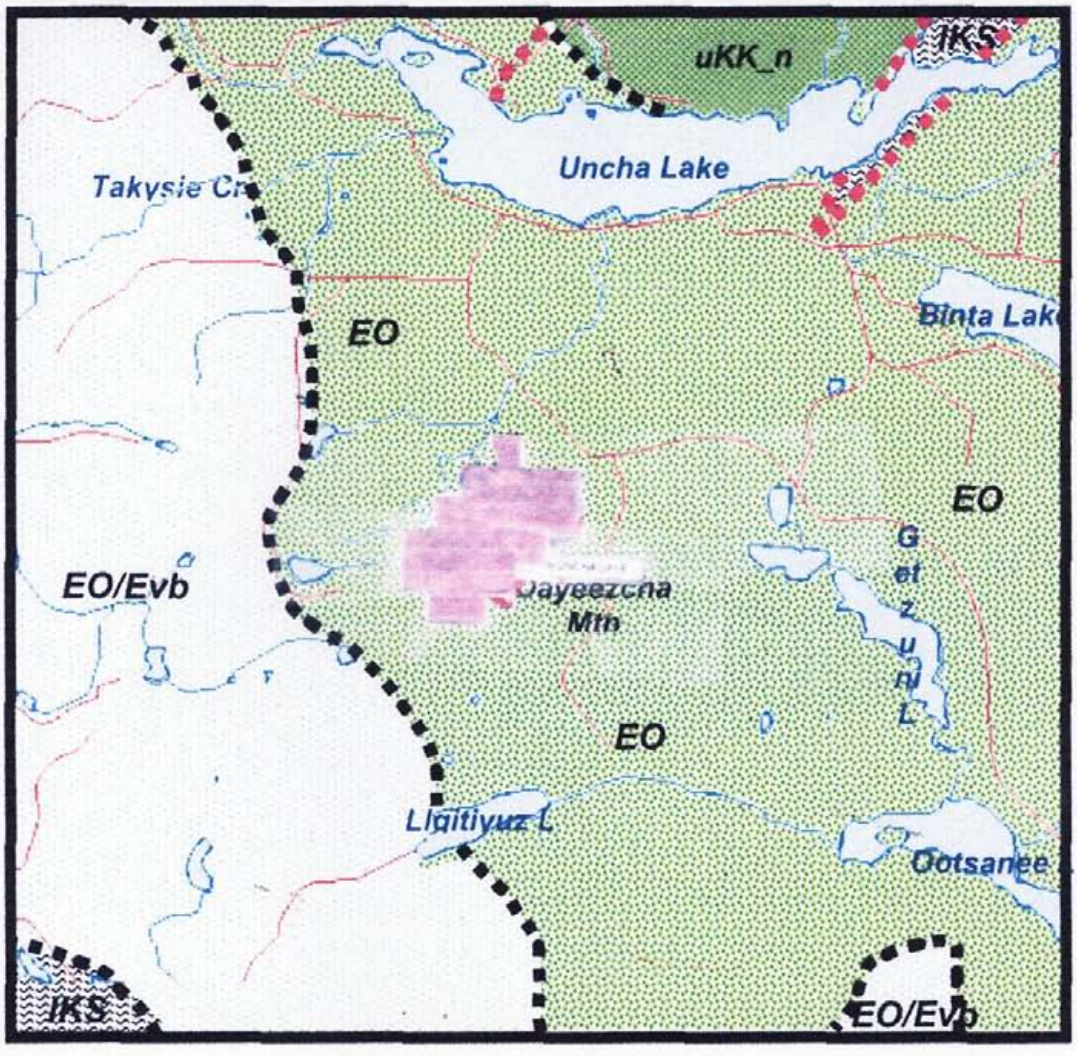


Figure 8: Generalized bedrock geology of the Uncha Lake, BC area and the Day Claims. The Uncha Lake perlite showing, on the Day Claims, occurs within rhyolite flows of the Eocene Ootsa Lake Group on the northwest flank of Dayeezcha Mountain.

A

Fig #9
New discoveries of perlite outcrops
On the 3000 to 3750 level of the
Dayeezcha Mountain mostly from
The Northwest section of the mountain.

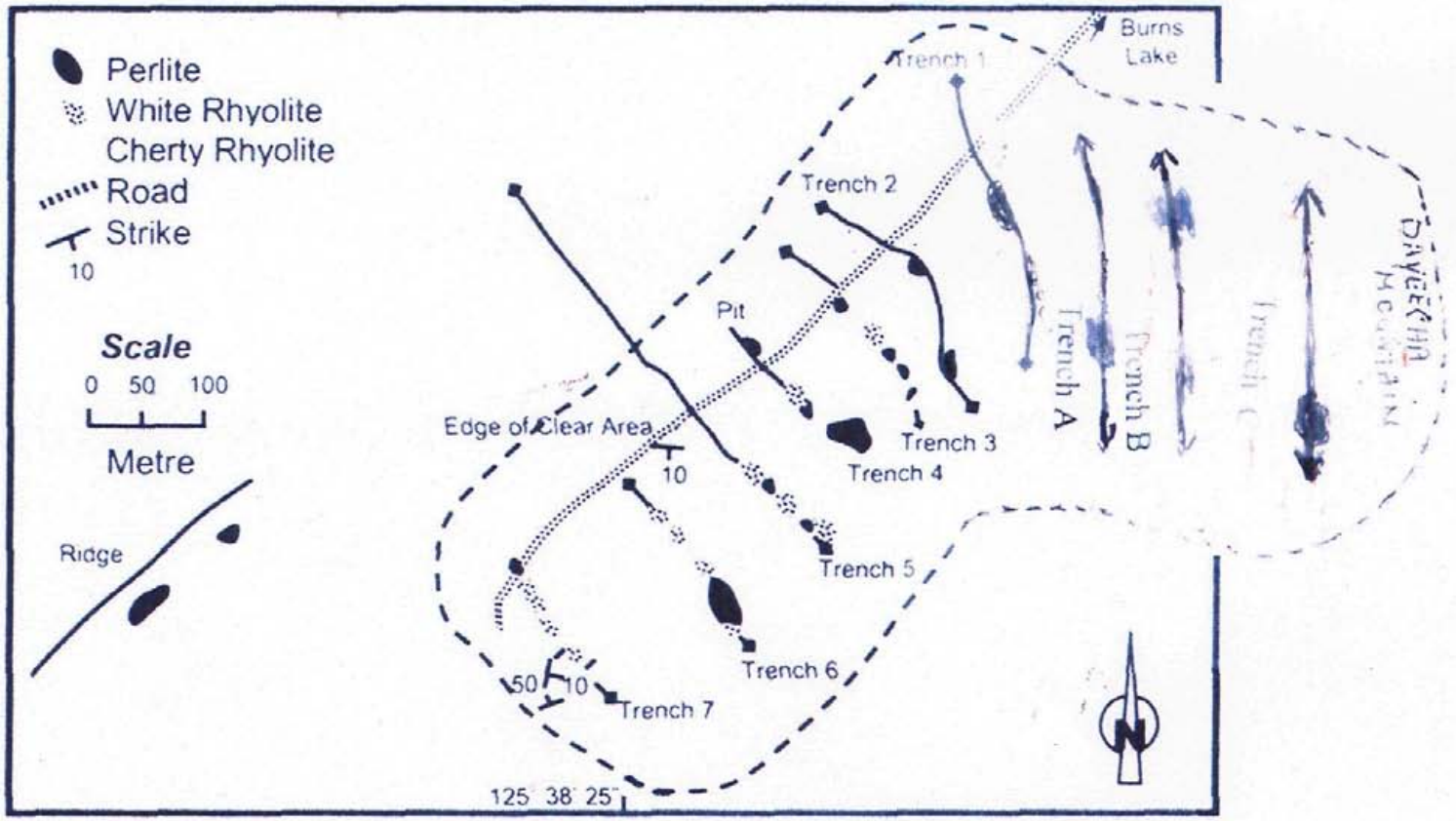


Figure 9: Location of perlite outcrops at Day Claims and previous trenching.

Fig # 9 Shows area of perlite deposit

Uncha Lake Perlite Deposit.

53" 125" N<W> In may of 2004 a geological inspection of the 8 claims called Day 1 to Day 8. A Systematic programme of pit sampling from 6 existing trenches From previous assessment work done have given the following results in Schedule A Aanlyses of the elements contained therein.

A list of comparative samples were obtained from various expanders of perlite rock And analysed for elements of rock being expanded by the industry. It was found the import rock from other parts of the U.S> and Greece were almost identical to the rock Taken from the pits at Uncha Lake.. The one significant difference was the Uncha Lake perlite rock contained 1% more Fe than the comparative samples obtained from others in the expanding industry.

Further testing was done by Dr. James Barker at the New Mexico mines and minerals Laboratory Results to be found in schedule B,

The results being encouraging Harold Oppelt the owner of the 8 day claims extended the showings from 8 claims to 21 cells under the new system of Mineral Titles Online.

During a subsequent visit to the property it was found The main showings are on the North and west slopes of the Dayeezcha mountain at the elevations of 3200 to 3700 foot Level. Dayeezcha Mountain affords a gentle slope to traverse to this area. The area it Lightly timbered but outcrops of bedrock are not plentiful.

Perlite appears to be intercalated with light to dark-gray porphryritic rhyolites flows and tuffs. In no instances were the rocks directly overlying the perlite.

Three separate perlite occurances were investigated. The highest one is at an elevation Of approximately 3700 feet. At this point there is an existing trench quite shallow which exposes about 6 feet of pale-greenish coloured perlite beside 4 feet of resinous brown perlite glass. A small exposure 75 feet awat shows 6 to 8 feet consisting of alternating bands of stony porphryritic rhyolite and 4 to 12 inch layers of resinous brown perlite glass. The flow lines strike approximately North 70 degrees northwest.

Down hill from this exposure the rocks are dark grey to black porphryritic rhyolite In which the flow layers strike north 40 degrees east and dip 65 degrees northwest.

Further to the southwest and at an elevastion of about 3550 feet, a line of holes containing a lot of rubble 1 to 3 feet deep dug through the overburden indicates that perlite extends across a width of possibly 150 feet. No natural exposures of perlite could be seen at this place.

About 2000 feet further southwest and at an elevation of about 3250 feet. Perlite Outcrops in a bluff 20 feet across and about 10 feet high. Other outcrops and pits indicate that the perlite extends across a maximum width of about 100 feet and has a

length of at least 100feet and has a length of at least 250 feet. Flow layers in this area strike Northeast and dip 40 degrees southeast

The perlite in the several showings is light grey or pale-greenish grey in colour. The glass has a definite perlitic structure and on weathering crumbles along the perliticcracks to a granular aggregate. The glass has a few feldspar phenocrysts And displays imperfectly developed flow lines. In this section numerous tiny crystallites are seen to be arranged in parallel orientation. Laboratory tests have indicated both the brown resinous glass and the green – grey perlite indicate they expand moderately well.

Fig # 7 Shows area of perlite deposit

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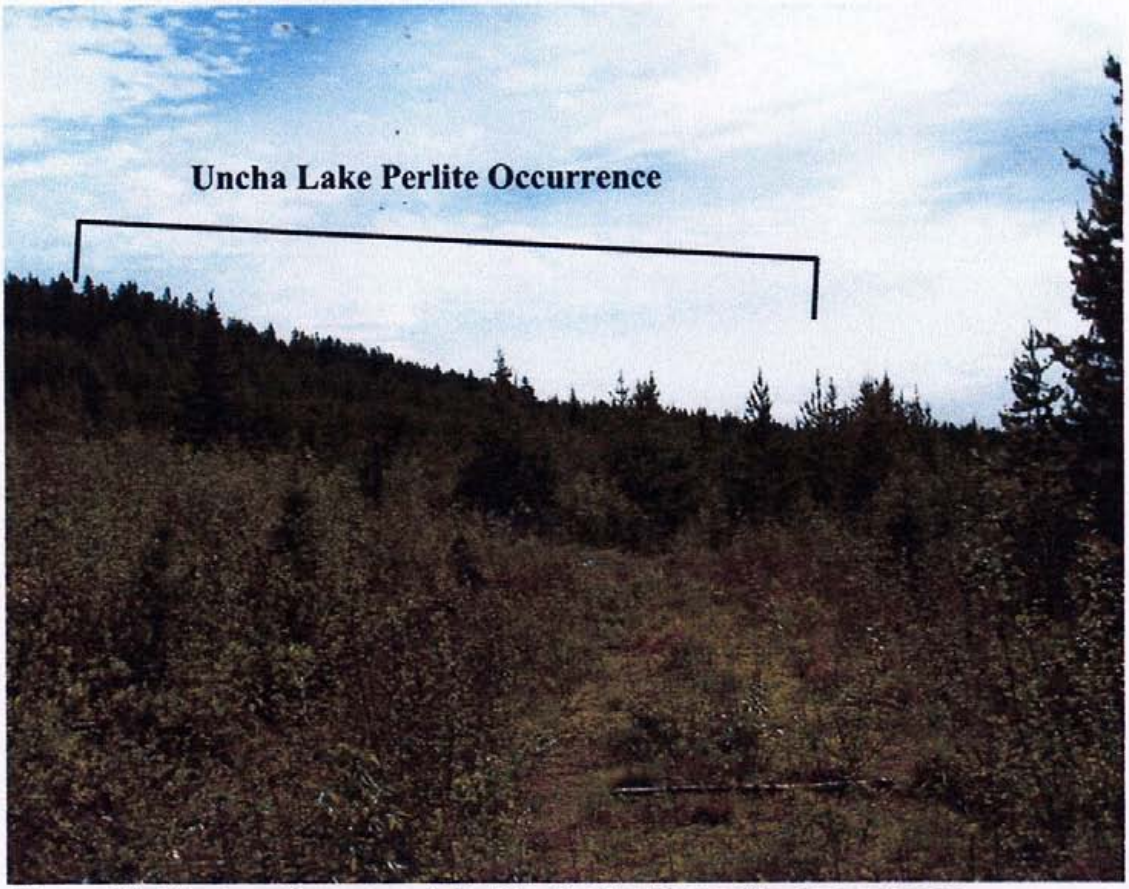


B

Figure 7: Photos of access into Uncha Lake perlite occurrence.

6 Conclusions and Recommendations

Previous exploration efforts on the Uncha Lake property indicate the presence of perlite within rhyolite flows of the Eocene-aged Oosta Lake Group. Systematic trenching had been undertaken on the property tracing perlite exposures for approximately 850 metres along the northwest slope of Dayeezcha Mountain. The perlite layers are between 7.5 metres and 23 metres thick and appear to be intercalated with porphyritic rhyolite flows and tuffs. The perlite rock exhibits definite perlitic structure and on weathering crumbles along the perlitic cracks to a granular aggregate. Testing by CANMET indicates the Uncha Lake Perlite has a moderate well expansion rating, water loss content of 3.2% and a softening temperature range of 1240 to 1260°C.

Additional geologic mapping is required to complete the historical property scale mapping. This would also yield a better understanding of structural geology and stratigraphy. Systematic trenching is recommended to expose the perlite due to the overburden layer. Assuming favourable results are obtained from preliminary work, diamond drilling of perlite occurrences would aid in assessing reserve potential and continuity of perlite layers. The excellent access provided by logging activity in the area would allow for significant cost savings related to mobilization and road construction.

EXECUTIVE SUMMARY

The Uncha Lake Perlite deposit is located 25 miles south of the Town of Burns Lake in north central British Columbia, 600 miles northwest of Vancouver. The deposit occurs on the northwest slope of Dayeezcha Mountain. The deposit is accessible year-round by well maintained roads. Eight mineral claims, known as the 'Day' Claims, cover the Uncha Lake deposit. Topography in the area is gently rolling terrain covered with glacial till and thick forest cover. The Uncha Lake Perlite deposit is an early stage exploration prospect.

The Uncha Lake Perlite layers occur within rhyolite flows of the Eocene aged Oosta Lake Group overlying sedimentary and volcanics of the Jurassic Hazelton Formation. The Oosta Lake Group consists mainly of felsic volcanic rocks and coarse clastic layers.

The Uncha Lake Perlite Prospect is considered to be of comparable quality and physical properties to the Frenier Deposit near Clinton, BC. The Frenier Deposit was a commercial deposit mined from 1983 through 1985 but due to access problems the mining was halted. The Francois Lake Perlite deposit, 14 miles south of Burns Lake, was formerly mined from 1949 to 1953 by Western Gypsum Products.

The Uncha Lake perlite has been tested to expand moderately well and exhibit perlitic structure in outcrop. Water loss on heating has been calculated to be approximately 3.2% on samples tested by CANMET from the Uncha Lake prospect area. The perlite layers ranges from 7.6 metres to 23 metres thick and can be traced in outcrops and from previous trenching for over 850 metres along the mountainside. It is considered to occur in significant quantities to warrant further exploration and potential mining. Preliminary resource estimate may be as much as 4 million tonnes of perlite in place for the Uncha Lake deposit. Further exploration by mapping, trenching, and drilling will provide better estimate of reserves and mineability.

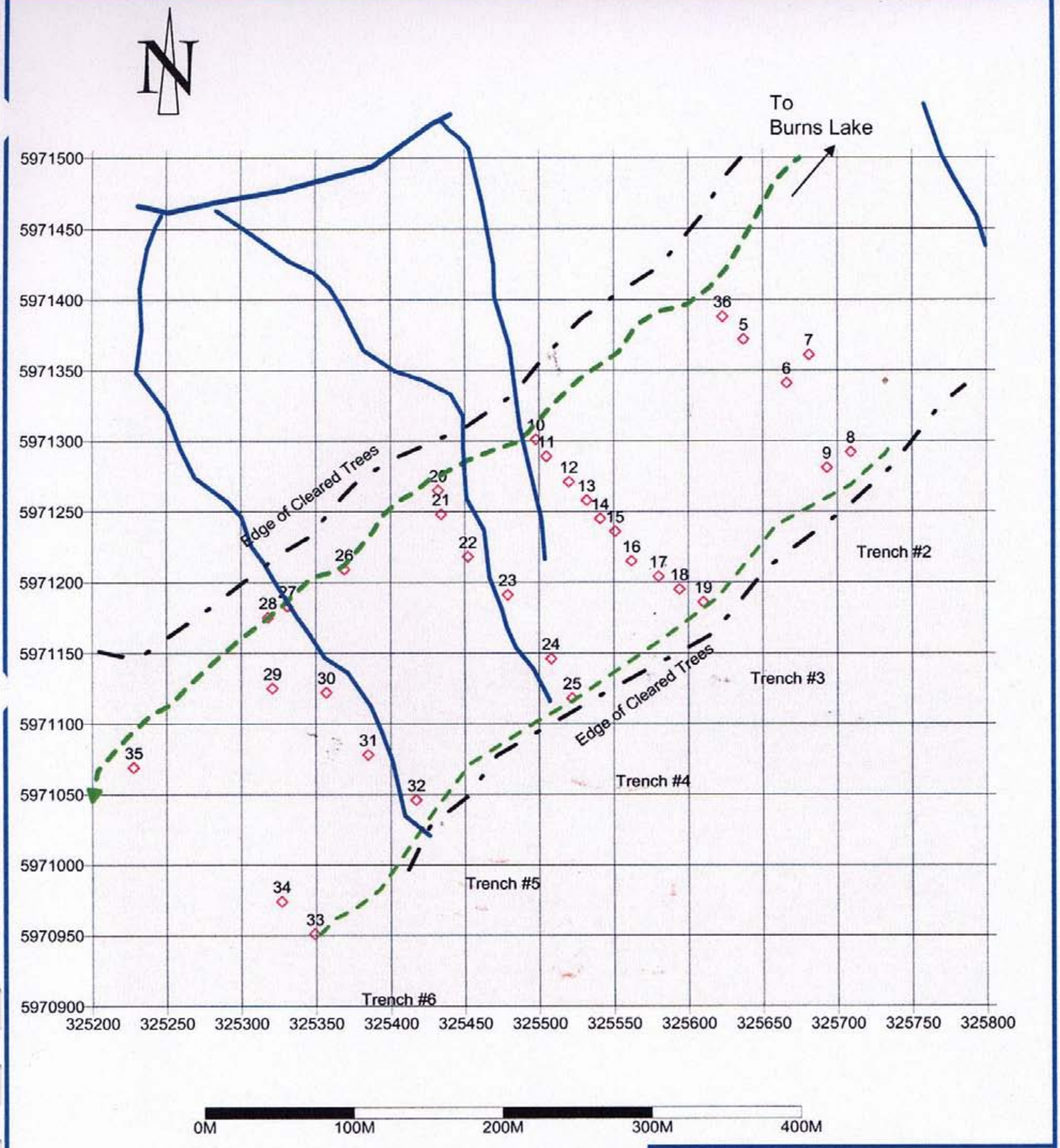
Appendix 2

Geological Mapping

And

Sample Descriptions

December 14, 2006



Legend

29 ◇ Sample Point (See Outcrop Descriptions)

Road cut

Edge of Logged Trees

Innovative Energy Inc.

Uncha Lake Perlite Occurrence

Location of Trenches and Sample Points

May/2004

A

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

WHOLE ROCK ICP ANALYSIS

Innovative Energy Inc. File # A402519R
21664 Monohan Court, Langley BC V3A 8N1 Submitted by: Harold Oppelt

SAMPLE#	SiO2 %	Al2O3 %	Fe2O3 %	MgO %	CaO %	Na2O %	K2O %	TiO2 %	P2O5 %	MnO %	Cr2O3 %	Ba ppm	Ni ppm	Sr ppm	Zr ppm	Y ppm	Nb ppm	Sc ppm	LOI %	TOT/C %	TOT/S %	SUM %
SILBRICO PERLITE	72.92	13.08	.70	.06	.72	4.05	4.50	.06	<.01	.10	<.001	73	<20	27	64	30	92	4	3.8	.02	.01	100.03
USG PERLITE	73.79	12.72	.74	.04	.52	3.42	4.92	.05	<.01	.10	<.001	13	<20	<10	77	27	66	4	3.7	.02	.01	100.02
SUPREME PERLITE OREGON US	73.83	13.30	.85	.06	.84	3.70	4.18	.05	<.01	.06	<.001	268	<20	51	61	21	<10	2	3.1	.01	<.01	100.01
GRADE 1240 317.5G	73.79	13.18	.86	.05	.57	4.27	4.36	.07	<.01	.09	<.001	13	<20	<10	90	26	66	3	2.7	<.01	.01	99.96
GRADE 4500 270.4G	72.81	13.01	.75	.05	.56	4.17	4.75	.07	<.01	.09	<.001	8	<20	<10	101	27	82	3	3.7	.02	.01	99.99
STANDARD SO-17/CSB	61.66	13.85	5.70	2.36	4.69	4.17	1.42	.60	1.00	.53	.442	401	35	311	351	24	26	23	3.4	2.39	5.32	99.96

GROUP 4A - 0.200 GM SAMPLE BY LIBO2 FUSION, ANALYSIS BY ICP-ES. LOI BY LOSS ON IGNITION.
TOTAL C & S BY LECO. (NOT INCLUDED IN THE SUM)
- SAMPLE TYPE: SAND PULP

Data f FA DATE RECEIVED: JUN 15 DATE REPORT MAILED: Jun 21/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C. L
Clarence Leong

Samples received from Expanders
that are using imported Rock
Reason. Comparison to Uncha Lake rock

H OPPELT
Uncha lake Perlite

RE TERRACE RTH #18	62.77	15.39	3.24	.69	2.60	1.68	2.96	.65	.53	.02	.005	1753	<20	1078	190	<10	14	6	9.1	.45	1.14	100.00
UNCHA TR #3	73.78	12.14	1.17	.08	.36	3.15	5.22	.17	<.01	.07	<.001	43	<20	21	190	55	58	2	3.8	.03	.01	99.99
UNCHA TR #3A	73.05	12.15	1.18	.13	.47	3.06	5.36	.17	<.01	.07	<.001	128	<20	51	183	54	60	2	4.3	.02	.01	100.00
UNCHA TR #4	74.02	12.12	1.10	.08	.37	3.28	4.88	.17	<.01	.07	<.001	177	<20	47	184	51	53	1	3.9	.02	.01	100.05
UNCHA TR #5	74.08	12.13	1.08	.05	.29	2.86	5.51	.17	<.01	.06	<.001	28	<20	<10	887	60	52	2	3.7	.03	.01	99.98
UNCHA TR #6	72.94	12.64	1.19	.14	.51	3.23	5.82	.20	<.01	.07	<.001	6	<20	34	256	70	51	3	4.0	.01	.01	100.00
UNCHA TR #6A	73.53	12.16	1.11	.06	.29	3.39	5.18	.17	<.01	.07	<.001	<5	<20	<10	196	55	60	2	4.0	.01	.01	99.99
6 MILE #OLEAN	41.20	13.73	8.33	3.88	13.64	3.17	3.28	.56	.37	.16	.002	1155	27	675	58	13	<10	21	11.2	2.29	1.60	99.65
STANDARD SO-17/CSB	61.66	13.85	5.70	2.36	4.69	4.17	1.41	.60	1.00	.53	.442	401	35	311	351	24	26	24	3.4	2.40	5.31	99.95

13:02
22/04

GROUP 4A - 0.200 GM SAMPLE BY LIBO2 FUSION. ANALYSIS BY ICP-ES. LOI BY LOSS ON IGNITION.
TOTAL C & S BY LECO. (NOT INCLUDED IN THE SUM)
- SAMPLE TYPE: ROCK PULP
Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

Data f FA DATE RECEIVED: JUN 15 DATE REPORT MAILED: Jun 22/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C. L

UNCHA LAKE PERLITE DEPOSIT OUTCROP / TRENCH DESCRIPTIONS

Trench #	Map Point	Elev	UTM Easting	UTM Northing	Sample #	Photo #	Description
1	3	955	325745	5971517	-	-	Trench all deep cover; no exposures
2	4	962	325621	5971396	-	13	**Start** of Trench #2
2	36	956	325623	5971388	2.3	46,47	**Perlite**; Dark green, very friable, pearly luster, v. large crystal face; dug small trench.
2	5	974	325637	5971372	-	-	**Ryholite**;2' wide outcrop very hard white rhyolite
2	6	955	325666	5971341	-	-	**Rhyolite**; End of white rhyolite from above outcrop
2	7	966	325681	5971361	2.1	19	**Perlite**; dk grey to brown, pearly luster; v. friable to white powder; dug small 2' pit goes up for ~20 feet up trench then lose it due to cover.
2	8	1038	325709	5971292	-	-	Possible float?; ultra hard v.f.g. rhyolite; dark olive color; cherty; conchoidal fracture
2	9	1007	325693	5971292	2.2	20,21	**Perlite**; Near end of trench; dk green rhyolite; semi-pearly luster; v. friable turns to powder as sample 2.1; dug two holes along trench same material for 30 ft or more.

Trench #	Map Point	Elev	UTM Easting	UTM Northing	Sample #	Photo #	Description
3	10	972	325498	5971301		14, 15	**Start** of Trench #3
3	11	975	325505	5971289	3.1	24	**Perlite**; pearly luster; dk green large crystal faces; v. friable turns to white powder; dug small pit to see exposure
3	12	989	325520	5971271		25	No outcrop; only float; Gerry took sample here; dug small holes no rock in place
3	13	993	325532	5971258	3.2	26,27	**Perlite;** dk to med green large crystal faces; v. friable turns to white powder; looks slightly cherty; grades laterally down slope into more friable dk green large crystal material as in sample 3.1; dug trench for 15 – 20 ft in same material; Photo 27 is photo of trench of same material; appears bed continues for ~40 ft; upslope of trench is an outcrop of v. hard rhyolite (Map Point 14).
3	14	995	325541	5971245	-	28	**Rhyolite**; outcrop, very hard, dark grey, v.f.g.; outcrop 10 ft in diameter; ledge forming
3	15	991	325551	5971236	3.3	-	**Rhyolite**; v.f.g. siliceous cherty; light grey in color, very hard; conchoidal fracture; outcrop 3 ft in diameter
3	16	992	325562	5971215	-	-	**Rhyolite**; siliceous appearance, v hard; outcrop 10 ft in diameter; same material as Map Point #14
3	17	997	325580	5971204	-	-	**Rhyolite**; same as above; outcrop is 20 ft in diameter
3	18	996	325594	5971195	-	29	**Rhyolite**; same as above; outcrop is 7 ft in diameter; marks **END** of Trench
3	19	999	325610	5971186			Upper road 15m south of end of Trench 3

Trench #	Map Point	Elev	UTM Easting	UTM Northing	Sample #	Photo #	Description
4	20	979	325432	5971265	-	16,17, 30	**Start** of Trench #4 @ Road bed
4	21	985	325434	5971248	4.1	31	**Perlite**; dk. green large crystal face; very friable as in trench #3; dug hole to find exposure; sample point is about 30 ft from start of trench; perlite bed may occur for more than 60 ft along trench.
4	22	992	325452	5971218		32	**Rhyolite**; very hard, not friable; outcrop; same material as Map Point 18
4	23	999	325479	5971191		33	**Rhyolite**; very hard material same as above.
4	24	1005	325508	5971146	4.2	34,35,36,37	**Perlite**; semi-pearly luster, large crystal faces, dark green; turns to white powder; not as friable as other trench samples; moderately hard to break; test individual pieces for any change in expansion; material seems to present until end of trench; weathers to a med brown sand; sand is abundantly present for 90 ft; possible extension of this material is the sand piles; 3 photos (35-37) of sandy material.
4	25	1013	325522	5971118	-	-	**End** of Trench #4; same material as above
Lower Roadcut	26	985	325369	5971209	-	-	**Rhyolite**; on access road towards Trench #5; v. hard rhyolite, v.f.g., not friable; outcrop is 5 ft in diameter; lots of float around
Lower Roadcut	27	993	325331	5971183	-	38	**Rhyolite**; on access road towards Trench #5; v.f.g.; flow banding in rhyolite

Trench #	Map Point	Elev	UTM Easting	UTM Northing	Sample #	Photo #	Description
5	28	993	325318	5971175	5.1	39,40	**Start** of Trench; Rhyolitic; conglomeratic looking, coarse crystalline; purple colored; outcrop 5' in diameter; Photo 40 of roadbed looking northeast.
5	29	1001	325321	5971125	-	41	**Rhyolite;** off trench area; large outcrop ~25 ft in diameter of v. hard, light grey to purple color, v.f.g.; flowbanding dips 70° SE
5	30	1002	325357	5971122	-	-	**Rhyolite**; as above; 15 ft diameter outcrop
5	31	1008	325385	5971078	-	42	Pit; open pit filled with water; Must have taken bulk sample from this pit. 50m east of here is a small trench dug by backhoe for sampling in perlite; Possible perlite occurrence towards end of Trench #5.
5	32	1007	325417	5971046	-	-	**End** of Trench.

Trench #	Map Point	Elev	UTM Easting	UTM Northing	Sample #	Photo #	Description
6	35	1005	325228	5971069	-	-	**Start** of Trench #6, very swampy.
6	34	1009	325327	5970974	6.1	44, 45	**Obsidian;** black with large phenocrysts of feldspar, large crystal faces; off trench area; large outcrop ~25 ft in diameter of v. hard.
6	33	1007	325349	5970951	-	43	**End** of Trench

APPENDIX #1

1989 Furnace test results done by
Canmet laboratories in Ottawa Ont.
On the Uncha Lake perlite rock

6. Uncha Lake Perlite Physical Properties

6.1 Physical Properties

In 1989, CANMET conducted testing of rock samples from various known perlite properties in British Columbia to assess the potential for perlite resources. The samples were subjected to three tests. Tests included the determination of water loss when heated to 800° C (Figure 13); the second determined the softening temperature of the samples (Figure 14); and the third was a measurement of the change in bulk density due to expansion (Figure 15). All perlite occurrences were successfully tested for expansion. The graphs below provide a comparison of the samples tested. It should be noted that the Uncha Lake perlite samples compare favourably to the Frenier deposit and Francois Lake, the only expanding perlite deposits that have been previously mined in BC.

Perlite Content of Various British Columbia Deposits

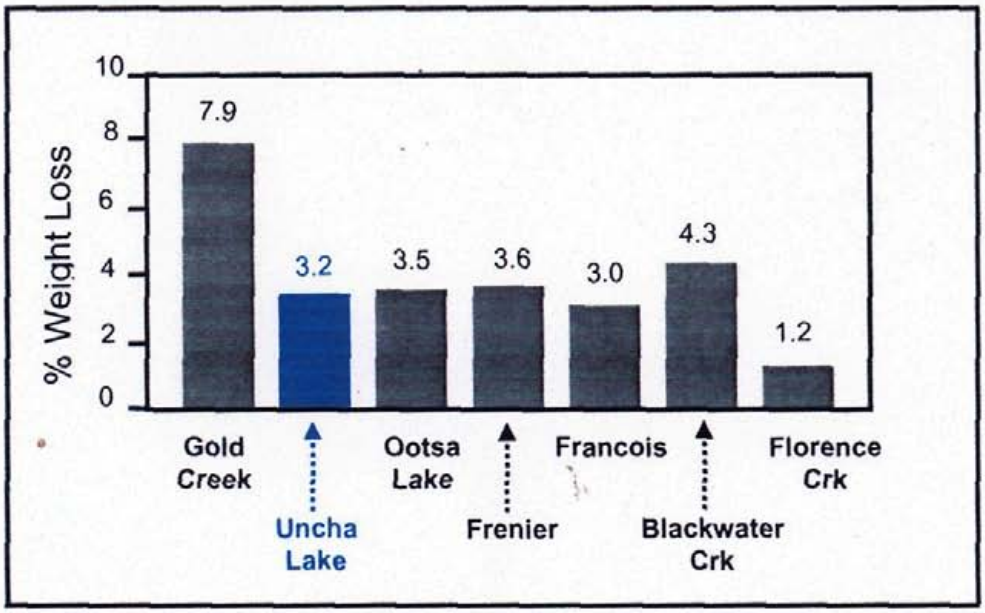


Figure 13: Histogram showing perlite content of samples from Gold Creek, Uncha Lake, Frenier, Francois Lake, Blackwater Creek and Florence Creek.
Taken from EMPR Geological Fieldwork 1990, Paper 1991-1.

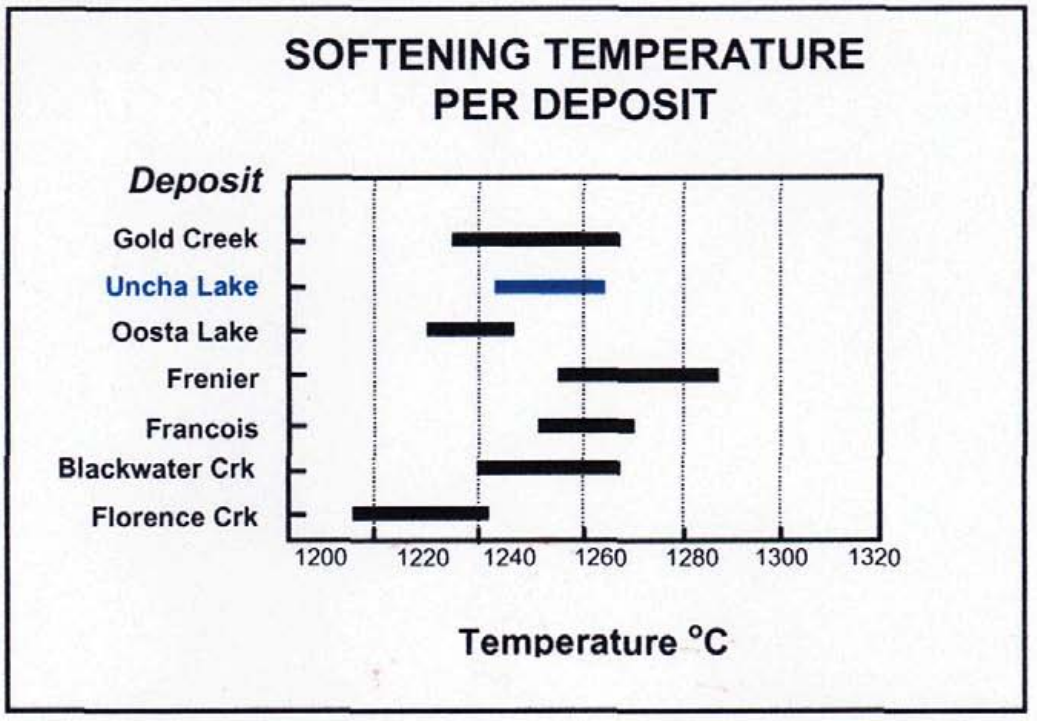


Figure 14: Softening temperatures of perlite samples from Gold Creek, Uncha Lake, Oosta Lake, Frenier, Francois Lake, Blackwater Creek and Florence Creek.
Taken from EMPR Geological Fieldwork 1990, Paper 1991-1.

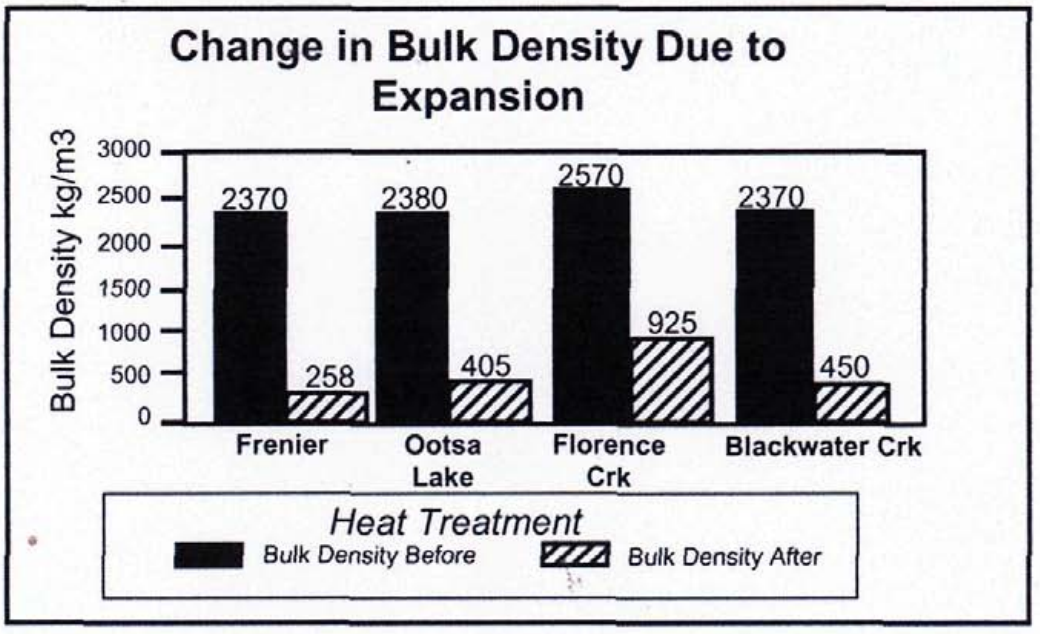


Figure 15: Bar chart indicates the change in bulk density observed due to expansion of perlite samples from Fernier, Oosta Lake, Blackwater Creek and Florence Creek. Uncha Lake sample is comparable to the Frenier and Oosta Lake deposits.
Taken from EMPR Geological Fieldwork 1990, Paper 1991-1.

B

	Expansion	Expansion Ratio	% Expansion *

3. Conditions - 6 lb gas pressure with 32 litres air/min at 1000°C.

Standard (Uras, new Oct 76)	330	1 : 33	
Canadian Sample No. 1	180	1 : 18	54.54
Canadian Sample No. 2	260	1 : 26	78.78
Canadian Sample No. 3	120	1 : 12	36.36
Canadian Sample No. 4	200	1 : 20	60.60
Canadian Sample No. 5	28	1 : 2.8	8.48
Standard (Uras, new Oct 76)	330 (Fusing flame) +		
Milos	280 (Slight fusion)	1 : 28	

+ Due to the fusion of the standard at 1000°C it was thought inadvisable to attempt to expand a sample at 1100°C as this would cause delays due to the switching off of the expander in order to clear the expansion chamber of fused material.

4. Conditions - 12 lb gas pressure with 36 litres air/min at 1100°C.

Canadian Sample No. 1	180	1 : 18	
Canadian Sample No. 2	260	1 : 26	
Canadian Sample No. 3	140	1 : 14	
Canadian Sample No. 4	All material used up		
Canadian Sample No. 5	28	1 : 2.8	

There were signs of the Canadian Perlite beginning to fuse in the expansion chamber at this temperature.

Milos	200	1 : 20	Fusing readily

* Percentage sample against Uras Standard

C

APPENDIX 1 TO
REPORT NO. 77/1

LABORATORY TESTING OF PERLITE SAMPLES

1. Conditions - 1 lb gas pressure with 24 litres air/min at 800°C.

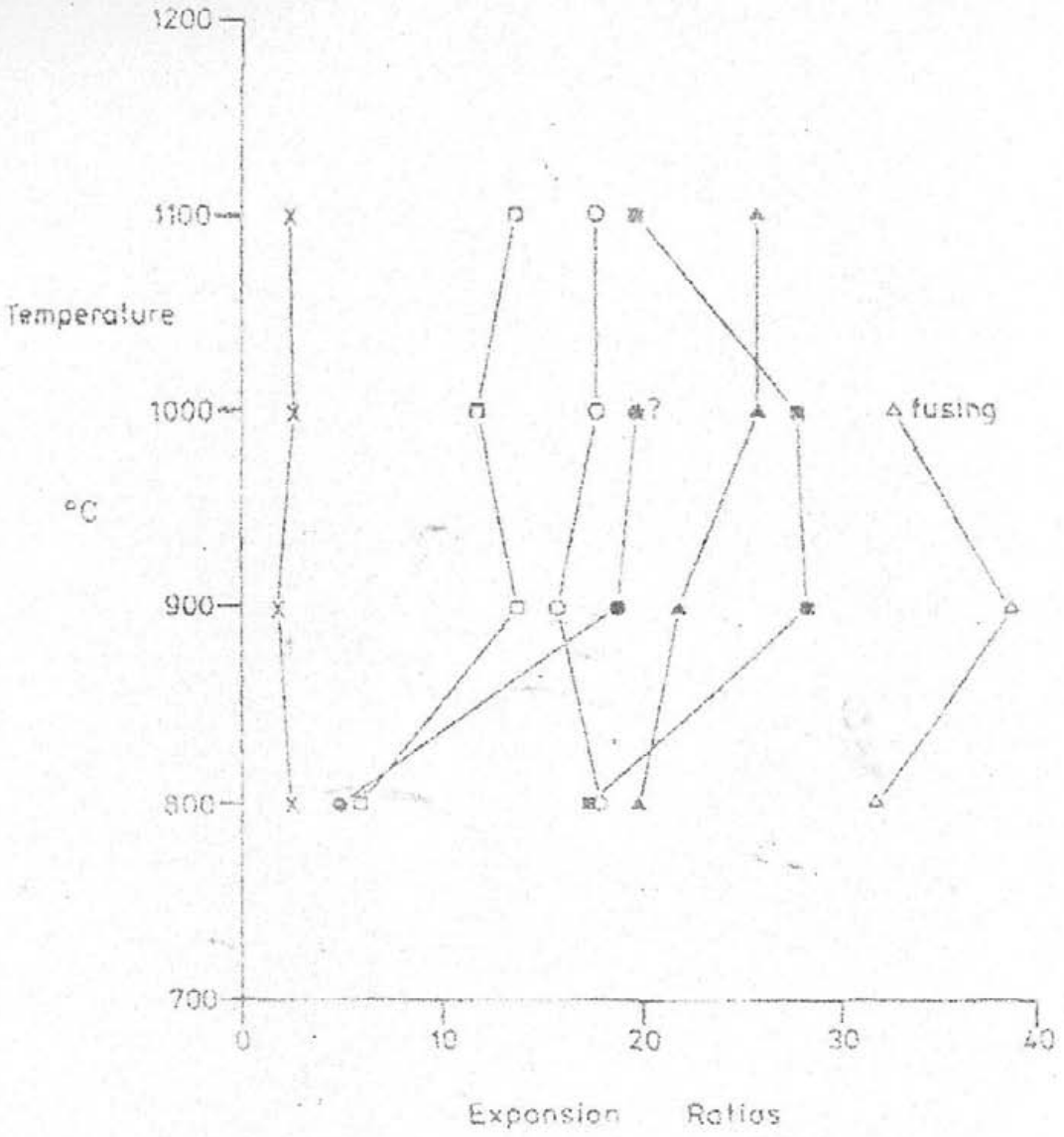
	Expansion	Expansion Ratio	% Expansion *
Standard (Uras, new Oct 76)	320	1 : 32	
Canadian Sample No. 1	180	1 : 18	56.25
Canadian Sample No. 2	200	1 : 20	62.50
Canadian Sample No. 3	60	1 : 6	18.75
Canadian Sample No. 4	50	1 : 5	15.62
Canadian Sample No. 5	24	1 : 2.4	7.5
Standard (Uras, new 76)	330	1 : 33	
Milos	175	1 : 17.5	

2. Conditions - 2 lb gas pressure with 24 litres air/min at 900°C.

Standard (Uras, new Oct 76)	390	1 : 39	
Canadian Sample No. 1	160	1 : 16	41.02
Canadian Sample No. 2	220	1 : 22	56.41
Canadian Sample No. 3	140	1 : 14	35.89
Canadian Sample No. 4	190	1 : 19	48.71
Canadian Sample No. 5	20	1 : 2	5.12
Standard (Uras new Oct 76)	390	1 : 39	
Milos	285	1 : 28.5	

* Percentage sample against Uras Standard

D



KEY

—o— Canada 1
—Δ— Canada 2
—□— Canada 3
—⊕— Canada 4
—X— Canada 5
—■— Milos
—▲— Uras standard

UNCHA LAKE — BRITISH COLUMBIA

Fig. No. 1

PERLITE EXPANSION RATIOS

E

Appendix # 3
Comparative samples of rock used by Expanders from world suppliers.

From ACME ANALYTICAL LABORATORIES LTD 852 E HASTINGS ST VANCOUVER BC V6A 1R6
To Innovative Energy Inc
Acme file # A402518R 23 samples in this disk file
Analysis: GROUP 4A - 0.200 GM

UNCHA TF	73.78	12.14	1.17	0.08	0.36	3.15	5.22	0.17
UNCHA TF	73.05	12.15	1.18	0.13	0.47	3.06	5.36	0.17
UNCHA TF	74.02	12.12	1.1	0.08	0.37	3.28	4.88	0.17
UNCHA TF	74.08	12.13	1.08	0.05	0.29	2.86	5.51	0.17
UNCHA TF	72.94	12.64	1.19	0.14	0.51	3.23	5.02	0.2
UNCHA TF	73.53	12.16	1.11	0.06	0.28	3.39	5.18	0.17

From ACME ANALYTICAL LABORATORIES LTD 852 E HASTINGS ST VANCOUVER BC V6A 1R6
To Innovative Energy Inc.
Acme file # A402519R Received: JUN 15 2004 * 6 samples in this disk file.
Analysis: GROUP 4A - 0.200 GM

ELEMENT	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2
SAMPLES	%	%	%	%	%	%	%	%
SILBRICO	72.92	13.08	0.7	0.06	0.72	4.05	4.5	0.06
USG PERL	73.79	12.72	0.74	0.04	0.52	3.42	4.92	0.05
SUPREME	73.83	13.3	0.85	0.06	0.84	3.7	4.18	0.05
GRADE 12	73.79	13.18	0.86	0.05	0.57	4.27	4.36	0.07
GRADE 45	72.81	13.01	0.75	0.05	0.56	4.17	4.75	0.07
STANDAR	61.66	13.85	5.7	2.36	4.69	4.17	1.42	0.6

A request from various perlite expanders in the USA and Thailand Was full filled and samples received from product rock they are now using was taken to Acme Labs, with the following results. All other mineral elements are very similar in percentages

Schedule B

A

Appendix #4
Cost of exploration 2006

Dec 14. 2006

Appendix # 4

2006 Exploration Cost statement;

1,	**Field Supplies etc.**	**$210.25**
2.	**Salaries**	
	Harold R Oppelt ---------2 days at 475.00 per day	**$950.00**
	Milan Svec ----------4 days at 200.00 per day	**$800.00**
	Jerry Tremblay ---------4 days at 200.00 per day	**$800.00**
	Milan Svec on sampling detail as per statement Attached ---------	**$1248.59**
	Rooms and food 6 days at 265,00 per day	**$1590.00**
	Transportation for 2 vehicles	**$750.00**
	Shipping 600 lb samples for testing	**$400.00**
	To preparation of report	**$1500.00**
----	**Total**	**$8.248.84**

Harold Oppelt.

A

SUMMARY

DATE	WORKING ON	LABOR TIME	DISTANCE TRAVELED
JUNE 9, 2006	BURNS LAKE - GETTING 10 CONTAINERS AND CLEANING THEM	HALF DAY	98 KM
JUNE 16, 2006	BURNS LAKE - BUYING PROPANE TORCH KIT, PROSPECTOR'S HAMMER, #72.94	HALF DAY	98 KM
JUNE 17, 2006	UNCHA PROPERTY TAKING ROCK SAMPLES FROM THE AREA SHOWN ON PHOTOGRAPHS.	FULL DAY	104 KM
JUNE 18, 2006	UNCHA PROPERTY TAKING ROCK SAMPLES FROM THE AREA SHOWN ON PHOTOGRAPHS.	FULL DAY	104 KM
JUNE 20, 2006	SORTING AND TESTING WITH PROPANE TORCH ROCKS FOR NEXT DAY SHIPMENT	2 HOURS	
JUNE 24, 2006	UNCHA PROPERTY - TAKING ROCK SAMPLES FROM TRENCH #2 (2 CONTAINERS), TRENCH #3 (2½ CONTAINERS) AND TRENCH #4 (1 CONTAINER).	FULL DAY	104 KM
JUNE 27, 2006	BURNS LAKE - SHIPPING 6 CONTAINERS.	HALF DAY	98 KM
TOTAL	EXPENSES #72.94	4½ DAYS @ #200 per DAY = #900.00	606 KM @ 45.5¢ per KM = #275.73

= #1,248.67

B

Apendix #5

Proposed budget for year 2007

Budget proposals for the year 2007.

The amount of work that will be done in the year 2007 is contingent On the results from a furnace test that is presently being done on ' The 600 lb sample sent to Imasco Minerals of Langley BC. If the Test prove to be the quality that is suitable for their needs a full Scale drilling programe will take place to prove up reserves. Further mapping and sampling will determine the extent of the Deposit. Some indications are that the deposit is more than 23 Meters thick.
Preliminary tests have shown the Uncha Lake perlite deposit is Adequate for supply to the ceiling tile manufacture, this being a Very large market to follow up on, further market survey has Indicated there is a huge demand for Canadian perlite rock Especially from the area of Uncha Lake. Transportation costs Make the product an economic success and if an operator is Found the following proposal for exploration work will be justified.

1, **Geo-physical and geo-chemical work to proceed with further Mapping of the deposit outlining areas from which mining can be Done, efficiently and economically**

2. **Old reports indicate there are 6 mineable areas, overburden is not Considered to be of any considerable depth in most cases.**

3. **Indications are the bulk of the deposit lies at the 3000 to 3700 foot Level , A large scale clearance of deadfall and under brush should Be undertaken, This will result in further discoveries of the mineable Areas.**

A

1. **Geo-physical and geo- chemical work to be done**
6 man days for 2 men at $500.00 per day $3000.00

2. **Employ a D6 cat, to clear away under brush and fallen logs, also cleaning out previously dug trenches for further sampling to be done. 6 days at $ 600.00 per day $3600.00**

3. **Project manager to direct work to be done .**
6 days at $475.00 per day $2850.00

4. **Geologist services plus expenses $1000,00 per day 2.days at $1000.00 per day $2000.00**

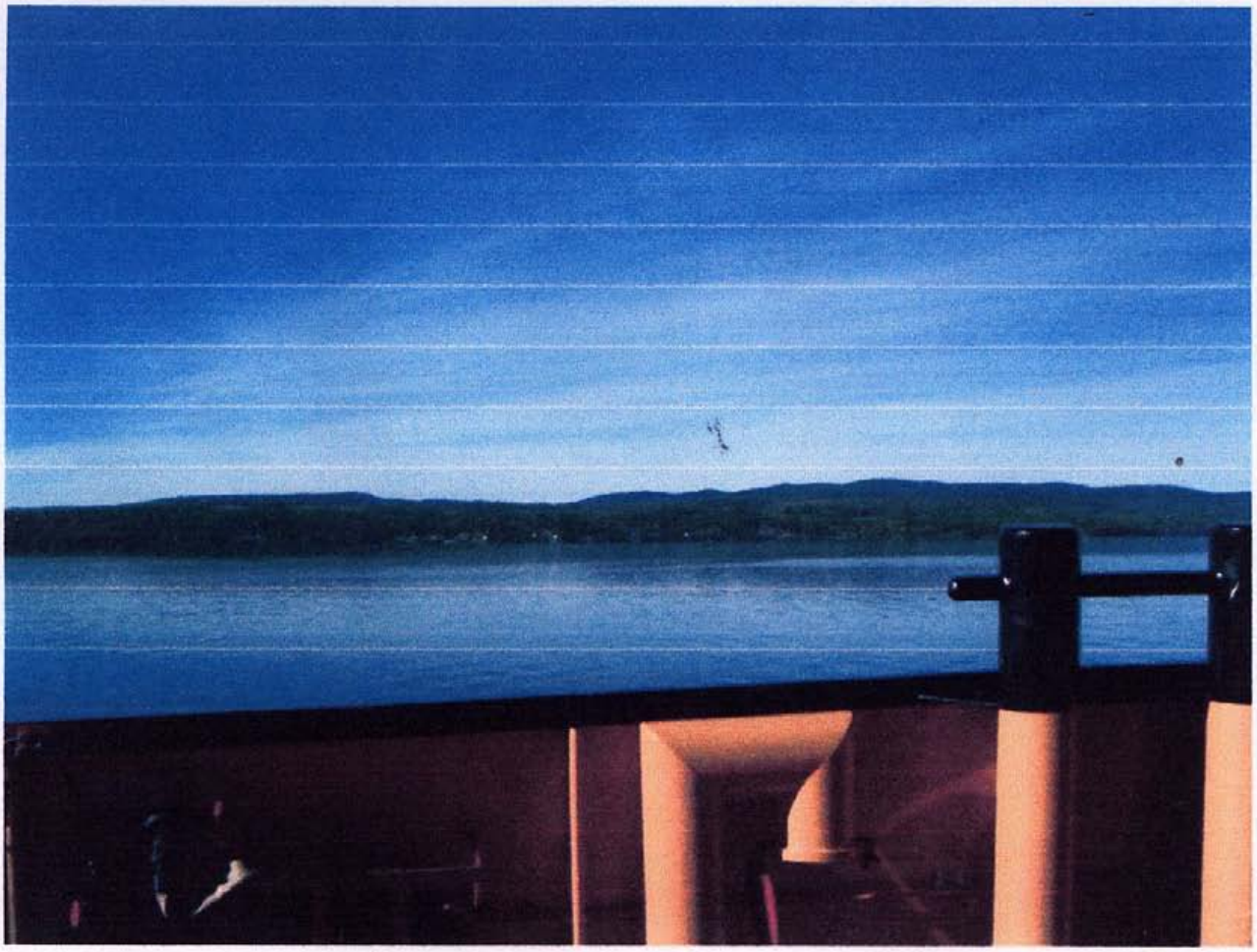
5. **Geological report on the findings $1500.00**

Total $12,950.00

B

Appendix # 6

Additional pictures showing the topographical Areas of the Uncha Lake perlite deposit



Picture from Ferry showing Francois Lake, Ferry service is free every hour on the hour and handles logging trucks etc,

A

B

C

D

E

References

1. F Gunning Oct 1995,
2. J N Schindler P. Geol. Dec 16/02
3. Can met Furnace test 1989
4. B C> Geology
5. Future marketability of Canadian Perlite by Harold R. Oppelt

The following report is added to a report made by Donald F. Gunning P.Eng , Oct 1995,

The deposit of perlite at Uncha Lake on
The NW slope of Dayeezcha Mtn is
Reported to be extensive, but not verified as
To reserves, A programme of drilling is being
Planned to outline depth of perlite rock in place..

The Uncha Lake ore analyses is similar to others
In th NW U<S>.. by comparison tests,

The analyses is on a dry basis,

- 73.8% Silica
- 12,4% Alumina
- 3.15% Na2O
- 5.36% K2O
- 1.18% Iron Oxide
- 3.8% LOI

Conclusions;

Markets for expanded perlite in Western
Canada and the pacific North West States
Are relatively firm and within industry sectors
Exhibiting better than average mid term growth.

The writer of this segment has found through
Research of the expanders of perlite rock in
The North West US there is a strong demand for

A supply of between 30 to 45 thousand tonnes
Of raw perlite rock for this region. Per year.
As Uncha lake perlite meets these quality
Requirements they will be in a favourable position
To meet these demands.

A

Harold Oppelt
President
Innovative Energy Inc.

PERLITE AND IT'S FUTURE

The future is here and now for the most versatile industrial mineral known to man.

In western Canada there has been a couple of feeble attempts at exploiting this very valuable industrial mineral. It wasn't because these attempts were made by people who didn't know what they were doing, they were just too far ahead of what the industry was prepared to accept.

Fresh vegetables were trucked in from warmer climates to meet the needs of the population of the day and were accepted as a produce grown where our environment was thought to be too harsh to raise these commodities but only in the growing season called spring and summer.

That has all changed, farmers in the western region have been looking into possibilities of utilization of their land 12 months of the year, Taxes were paid on the basis of a full year, so why not make your investment in land pay dividends for the full time of their investment and employ workers full time.
SOLUTION; Hydroponic gardening growing fresh produce in covered areas of their land. The west coast environment was inviting this type of investment because of our temperate climate and the need for fresh table produce at fair prices. The advantages were high cost of transportation, high USD and the use of land fully polluted with insecticides from many years of fighting disease and insects.
PERLITE has now come to the rescue, It is disease free, has a high degree of Water retention, Need I say that fresh water is a very valuable commoditity produce can be picked when ready for table use that contains all the natural nutrients and presented to the public at large as fresh just picked this morning, Produce picked from the so called warmer climates had to be picked days ahead of their prime time to get to the market place in reasonable looking condition.

PERLITE has a hundred different uses in industry today, here are but a few; see pages attached.

Harold Oppelt

B

Technical Data

All about Perlite and its many applications.

ISHS Acta Horticulturae 126: Symposium on Substrates in Horticulture other than Soils In Situ

NEW DEVELOPMENTS IN THE USES OF GRADED HORTICULTURAL PERLITE

Author: R.F. Martyr

Abstract:
The horticultural market for expanded perlite is a very small percentage of the total output which is used extensively in a wide range of industries. Much industrial perlite is quite unsuitable for horticultural purposes; thus it is important to ensure that 'horticultural perlite' has been prepared from 'crude ore' free from any source of contamination, and that the finer particles have been removed. Particle size is an important factor in the effectiveness of perlite in its various horticultural uses and the availability now of four distinct size grades should, it is hoped, enable more precise research to be undertaken on the optimal use of the material.

Expanded perlite is an important industrial product used worldwide for its very high thermal and acoustic insulation properties. It may be mixed with a variety of materials to produce plasters, roof insulation or the high temperature insulation of furnaces. Equally it has cryogenic applications at temperatures approaching absolute zero. It is an invaluable filter-aid for liquid filtration of materials ranging from beers and wines to swimming pools. It is used as a filler in plastics, paints and cleansers and as a carrier for many pharmaceuticals.

Its horticultural uses provide only a very small outlet for the perlite producers. Even in the USA, where it has been well established in the plant nursery trade for over 20 years and where the production and processing of perlite

ore is the highest in the world, the horticultural market provides only from 8% to 10% of the total consumption. In most of Europe and in the other Continents this percentage figure is very much smaller. Not every producer, therefore, is prepared to cater for any specific horticultural needs.

Industrial perlite contains a wide range of particle sizes including a high proportion of very fine dust and for many purposes the presence of this dust is of little or no consequence; for horticultural applications, however, it can be disasterous. Material around the 250 micron size will promote waterlogging. The term "fines" is used rather empirically in the industry to designate material up to about 1 mm diameter; for most growth situations particle sizes above 1 mm are required. Horticultural

PERLITE

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: The estimated value (f.o.b. mine) of processed perlite produced in 1997 was $22.4 million. Crude ore production came from eight mines operated by six companies in five Western States. New Mexico continued to be the major producing State. Processed ore was expanded at 61 plants in 31 States. The principal end uses were building construction products, 71%; filter aid, 9%; horticultural aggregate, 9%; fillers, 8%; and other, 3%.

Salient Statistics—United States:	1993	1994	1995	1996	1997e
Production[1]	569	644	700	684	703
Imports for consumption[e]	70	70	84	125	125
Exports[e]	26	30	40	38	38
Consumption, apparent	613	684	744	771	790
Price, average value, dollars per ton, f.o.b. mine	30.63	30.03	27.93	28.25	31.82
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, mine and mill	115	125	125	125	140
Net import reliance[2] as a percent of apparent consumption	7	6	6	11	11

Recycling: Not available.

Import Sources (1993-96): Greece, 100%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN[3] 12/31/97
Mineral substances, not specifically provided for	2530.10.0000	Free	Free.

Depletion Allowance: 10% (Domestic), 10% (Foreign).

Government Stockpile: None.

Prepared by **Wallace P. Bolen, (703) 648-7727 [Fax: (703) 648-7722].**

PERLITE

Events, Trends, and Issues: Processed ore production increased nearly 3% in 1997 after decreasing 2% in 1996. Apparent consumption increased for the sixth straight year. New mines in Oregon and Utah were to be opened in 1997.

Perlite mining generally occurred in remote areas, and environmental problems were not severe. The overburden, reject ore, and mineral fines produced during ore mining and processing are used to reclaim the mined out areas, and, therefore, little waste is produced. Airborne dust is captured by baghouses, and there is practically no runoff that contributes to water pollution.

Domestic perlite continued to encounter transportation cost disadvantages in some areas of the Eastern United States compared with Greek imports. However, Western U.S. perlite exports to Canada partially offset imports into the Eastern United States.

New uses of perlite were being researched, which may increase domestic consumption.

World Processed Perlite Production, Crude Ore Reserves, and Reserve Base:

	Production		Reserves[4]	Reserve base[4]
	1996	1997e		
United States	684	703	50,000	200,000
Greece	350	375	50,000	300,000
Japan	200	200	(5)	(5)
Turkey	160	170	(5)	(5)
Other countries	286	290	600,000	1,500,000
World total (may be rounded)	1,680	1,740	700,000	2,000,000

World Resources: Too little information is available in perlite-producing countries to estimate resources with any reliability.

Substitutes: Alternate materials can be substituted for all uses of perlite, if necessary. Long-established competitive commodities include diatomite, expanded clay and shale, pumice, slag, and vermiculite.

eEstimated. NA Not available.

[1]Processed perlite sold and used by producers.

[2]Defined as imports - exports + adjustments for Government and industry stock changes; changes in stocks not available and assumed to be zero for apparent consumption and net import reliance calculations.

[3]See Appendix B.

[4]See Appendix D for definitions.

[5]Included with "Other countries."

THE SCHUNDLER COMPANY

HORTICULTURAL USES OF PERLITE AND VERMICULITE

Perlite and vermiculite have been used for years to amend professional potting soils made from peat moss (called "soilless" mixes or artificial soils because they literally contain no soil). They also have been used in outdoor mixes, in turfgrass and outdoor plantings, for gardens, for special 100% perlite or vermiculite growing applications, and increasingly for commercial and amateur hydroponic growing and water conservation (especially in landscaping and gardening).

Essentially perlite and vermiculite are used in the horticultural industry because they both provide aeration and drainage, they can retain and hold substantial amounts of water and later release it as needed, they are sterile and free from diseases, they have a fairly neutral pH (especially perlite which is neutral), and they are readily available, non-toxic, safe to use, and relatively inexpensive. As a rule of thumb, perlite tends to last longer, has a more neutral pH, and functions much better in hydroponics, outdoor applications, lawns and gardens (in part because it is stronger). Nevertheless, for decades they both have been used by professionals, dedicated amateurs and gardeners.

Homeowners and hobbyist: If you can't find perlite or vermiculite in your local stores or garden centers, try **Vermiculite.Com**--a site set up to help you find perlite and vermiculite near you.

OUR HORTICULTURAL PLANT GUIDES:

The Schundler Company and The Perlite Institute (at www.perlite.org) have developed an extensive file of brief, but useful Plant Guides on the many uses of perlite and vermiculite. We encourage you to read them!

Plant Guides on Potting Soils and Greenhouses:

Commercial Greenhouse Production with Perlite and Vermiculite Soil Mixes

- **Perlite Gradation and Peat/Perlite Mixtures** ***A fascinating study on how perlite particle size affects water retention, aeration, and drainage--and why smaller sizes could and should be used.***
- **Container Growing with 100% Perlite and Perlite /Peat Mixes**
  Why and how perlite is used in container growing, especially large containers.
- **Indoor Gardening with Perlite**

- **Comparative Growth Studies of Perlite vs. Polystyrene Media**
- **Perlite vs. Polystyrene in Potting Mixes**
- **The Concern Over Flourides**
- **Does Perlite Play a Role in Floride Toxicity of Floricultural Crops? (Not Really!)**

- **Using Perlite in Potted Plants--by George (Doc) and Kay Abraham** ***Old article but still very helpful.***
- **How to Handle Tip Burn** ***Another old but very helpful article.***
- **Cultivation of Spruce Seedlings in Mixtures of Perlite and Sphagnum Peat in Norway**

- **Useful Links to Helpful Sites About Potting Soils and Container Growing**

Plant Guides on Interior Plantscapes:

- **Plantscapes and Interior Containers Using Perlite** *A basic summary of perlite's uses in containers, turf, landscaping, etc.*

Plant Guides on Outdoor Gardening, Landscaping and Landscaping with 100% Perlite:

- **Green Roof Technology: A Growing Trial at the LBJ Research Facility** ***The Latest!***

- **Green Roof Technology: Saves Energy and Water** ***New!!***
- **Green Roof Technology: Simple, Inexpensive, and Practical** ***New!!*** ***Fascinating simple and tested approach to green roofs!!***
- **Biofiltration Designs for Stormwater Management** ***New!!*** ***Helpful information and designs for those trying to comply with the new Phase II Stormwater Management regulations.***
- **Stormwater Management with Perlite and Vermiculite** ***New!!*** ***Another helpful article for those trying to comply with the new Phase II Stormwater Management regulations.***
- **Perl-Lome: An Old Material with Many Uses** ***New!!***
- **Effects of Perlite on Lawn Growth (Perlite's Ability to Hold Water and Resist Compaction)** ***New!!*** ***A summary of research that was dont 40 years ago on how and why fine perlite should be used in landscaping. Explains why many, many Japanese golf courses have 100% perlite under the greens to resist compaction and retain water while still allowing drainage.***
- **Expanded Perlite for Turf and Landscaping and Conserving Water with Perlite** ***A summary of the Japanese work and others on why fine perlite should be used for water conservation in landscaping.***
- **Fine Perlite for Preventing Draught Damage** ***Really New!!*** ***Recent work at the University of Florida confirming some of the work done in Japan years ago.***
- **Effective Watering (*and Water Conservation*) with Horticultural Perlite in Cyprus and India** ***How fine perlite makes growing grass possible in draught conditions.***
- **Horticultural Perlite-The Natural Growing Media for Outdoor Gardening** ***How fine perlite helps outdoor gardens--loosens soil and retains water.***
- **Using Perlite Outdoors---The Easy-To-Use Problem Solver**
- **Horticultural Perlite Solves Compaction Problem at St. Louis Stadium**
- **Golf Green Construction Using Perlite as an Amendment**
- **Renovating Golf Greens with Horticultural Perlite**
- **Perlite in Turf Management**
- **Using 100% Fine Perlite in Israel in**

Commercial Landscaping near the Dead Sea ***Pictures of a resort on the Dead Sea that used 100% perlite under truf, in outdoor containers, and around large trees!***

Commercial Landscaping With Perlite at the Dead Sea

- **Using 100% Fine Perlite in Israel for Commercial Planters and Containers** ***Orange trees being grown in 100% in Israel.***
- **Using 100% Fine Perlite in Residential Lawns (New Jersey)** ***100% perlite under sod lawn in New Jersey. Even in a severe draught, the lawn never died or turned brown.***
- **Large Container Growing with 100% Perlite and Perlite/Peat Mixes**
- **Composting With Perlite (a Rutgers University Study)** ***Using coarse perlite in layers for backyard composting--eliminates the need to "turn" piles while eliminating ordors!***
- **Useful Links to Helpful Sites About Outdoor Gardening and Landscaping**

Plant Guides on Agriculture and Field Grown Crops:

- **Using Perlite and/or Vermiculite in Field Grown Crops** ***New!!***

Plant Guides on Hydroponic Growing and 100% Perlite Systems:

- **Pesticide Ban Drives Switch to Soilless Agriculture**
- **Growing Melons in Perlite Hydroponic Cultures in Florida**
- **Growing Strawberries in Central Florida--A Preliminary Report (Nov. 2000)**
- **"Perlite and Hydroponics:A Possible Substitute for MeBr?" An article from the USDA's *Methyl Bromide Alternatives Newsletter***
- **Keys to Successful Tomato and Cucumber Prodution in Perlite Media**
  (a very useful and informative guide on how to set up and operate hydroponic systems)

- **Hydroponic Miracle Story in Almeria, Spain ---74,000 Acres of Greenhouse Production** *New!!* ***While some in America treat hydroponics as something new and esoteric, growers throughout Europe are using hydroponics systems. Pictures of one area of Spain where there is 74,000 of hyrdoponic greenhouse production.***

- **Hydroponic Growing Using Fine Plaster Grade Perlite---A Report by D.A. Hall, G.M. Hitchon, and R.A.K.Szmidt** ***An older report demonstrating that fine plaster grades of perlite can be used for hydroponics!***

- **Growing Hydroponic Crops Using Perlite---A Basic Primer by G. R. Dixon**
- **Hydroponic Culture of Strawberries in Perlite in Greece**
- **Growing Orchids in Perlite**
- **Will Perlite Beat (replace) Peat?**
- **The Role of Perlite in Hydroponic Culture by David Hall**

- **Hydroponic Growing at McMurdo Station in Antarctica** *Very New!!*
- **The Hydroponicum in Scotland--a fascinating growing station!!** *Very New!!*
- **Hydroponic Lettuce: The Latest by P.A. Schippers**
- **The Hydroponic Farm: One Way to Start in Hydroponics** *New!!*

- **Useful Links to Helpful Sites About Hydroponics and Hydroponic Growing including links to the very helpful University of Florida's Institute of Food and Agricultural Sciences**

Plant Guides on Perlite and/or Hydroponics for Students and the Uninitiated:

- **Perlite Studies at Triton College on Seed Germination and Organic Gardens Using Less Water**
- **Hydroponic Growing in Perlite: Why and How**
- **A Simple Experiment to Demonstrate the Principals of Hydroponic Growing**

- **Horticultural Perlite (A Basic Brochure)**
- **Basic Horticultural Mix Designs (Several Very Very Basic Mixes)**
- **Useful Links to Helpful, Creative Sites for Parents, Children and Teachers.**

Hydroponic Growing at Epcot (Disney World)

Plant Guides on General Technical Standards and Properties:

- **Standard Gradations of Perlite---Fine, Medium, Coarse Defined**
- **The pH of Vermiculite--Variable and Changing**
- **The pH of Growing Mixes--Also Variable and Often Changing**
- **Schundler Company Products and Brandnames Described**

Plant Guides on Strange and Unusual Horticultural Projects Using Perlite and/or Vermiculite :

- **Hypertufa: Lightweight, Artificial "Do-It-Yourselfer" Stone Pots and Forms**

Plant Guides with Basic Commercial Sites with Products, Services, and Helpful Information

(By including these links, we are not endorsing these products or services, but we think they may be of interest and may help some people) :

- **Pet Friendly Fertilizers, Green Roofs, and More....**
- **Flower Framers--manufacturers of beautiful flower boxes**

Because our site has grown to so many pages,
you may find the following search engine helpful in locating what you want:

search This Site The Web

HORTICULTURAL PERLITE:

What is Perlite? ---Perlite is a unique volcanic mineral which expands from four to twenty times its original volume when it is quickly heated to a temperature of approximatley 1600-1700^0 F. This expansion is due to the presence of two to six percent combined water in the crude perlite rock which causes the perlite to pop in a manner similar to that of popcorn. When expanded, each granular, snow-white particle of perlite is sterile with a neutral pH and contains many tiny, closed cells or bubbles. The surface of each particle is covered with tiny cavities which provide an extremely large surface area. These surfaces hold moisture and nutrients and make them available to plant roots. In addition, because of the physical shape of each particle, air passages are formed which provide optimum aeraton and drainage. Because perlite is sterile, it is free of disease, seeds, and insects.

Perlite has been used for many years throughout the world for soil conditioning and as a component of growing mixes with materials such as peat moss or bark. Extensive studies have shown that the unique capillary action of perlite makes it a superior growing media for hydroponic cultures.

Among the many uses of perlite today are propagation and seed cultivation, plug production and transplants, interiorscape and planter growing, composting, hydroponic cultures, turf and lawns, and around

shrubs, trees, and landscaping.

Propagation and Seed Cultivation---Commercial growers and hobby gardeners have found that perlite is an ideal medium for rooting cuttings. Through the use of cuttings rooted in horticultural perlite, the time to first production may be reduced by as much as 40%.

Perlite mixes of fine perlite alone can be used as a seed starting medium because of the ease of maintaining uniform moisture and temperature levels. Perlite's bright white color makes it particularly effective as a seed cover offering protection against bright sunlight and high radiant energy as well as resistance to surface moss or algae growth. In addition, perlite's white color reflects light up under plant foliage which further enhances growth.

In India, it has been found that when seeds are sown with small quantities of fine perlite in field crops, there is a much higher rate of germination and a measurable increase in yields.

Plug Production/Transplants---Comercial plug plant production in greenhouses showcase perlite's role in water and nutrient conservation. Water retention by horticultural perlite is not an indiscriminate action. The amount of water adsorbed on the surface of perlite is a function of particle size. Coarser perlite particles adsorb less water than finer grades ---thus the amount of retained moisture that is desired can be regulated to suit particular requirements.

Perlite's ability to cling to roots and root hairs and the friable nature of a perlite mix reduces transplant shock which increases survival rates. (note the root development seen in Using 100% Fine Perlite in Israel for Commercial Planters and Containers)

Reduced production time, concervation of water and nutrients, reduced labor and shipping costs, and increased survival rates all confirm horticultural perlite's long and enviable record of performance throughout the world.

Rooftop, Interiorscape and Planter Growing---The advantages of horticultural perlite are readily seen in rooftop applications, planters,

and interiorscape displays where weight is a factor. Wet sandy loam weights about 120-140 lbs/ft^3 (1920-2240 kg/m^3;perlite and peat mixed in equal volumes will weigh only about 35 lbs/ft^3 (560 kg/m^3. This difference can be critical where supporting structures such as roofs must be considered. Increasingly, 100% perlite applications are being used both by home gardeners and commercial growers (see Container Growing with 100% Perlite and Perlite /Peat Mixes and/or Using 100% Fine Perlite in Israel for Commercial Planters and Containers).

Composting---Recycling as a result of shrinking land fill disposal areas has increased interest in composting in home gardens and by commercial enterprises and municipalities. Studies at Cook College of Rutgers University reveal that additions of perlite to compost piles speeds decomposition of leaves, grass clippings, and other yard waste. In addition, the use of perlite reduces the amount of labor required to periodically turn piles to insure proper aeration. When composting is completed and the compost is put to use, the perlite will continue to perform for many years as it lightens and aerates the soil while increasing its water holding ability. (see Composting With Perlite).

Hydroponic Culture---The fastest growing application for perlite in the horticultural field is in hydroponic culture. Perlite exhibits a unique capillary action in that nutrient rich water can be drawn up from a reservoir through a fine perlite growing media at the rate that is required by a plant. As a result, plants grown in perlite do not suffer from overwatering or underwatering.

Tomato crops grown hydroponically in perlite have produced average yields 7% higher than tomatoes grown in rockwool. Currently throughout the world many table vegetables are being grown in hydroponic grow bags, melons are being grown in Florida (see Growing Melons in Perlite Hydroponic Cultures in Florida, and in Holland and the U.S., commercial cut flowers, stawberries, and orchids are being grown in 100% hydroponic perlite containers. (see our other Plant Guides on hydroponic applications listed earlier in this section.)

Turf and Lawns---No grass is more highly stressed than stadium turf

and golf greens. These are subject to the whims of nature as well as constant foot traffic and resulting compaction. Horticultural perlite can provide an easy soluton to this problem. When turf is renovated with perlite, excess water will not pond yet an optimum amount of water will be retained for proper growth. Additionally, turf will be lush and green while the soil will remain soft for an extended period of time. (see Horticultural Perlite Solves Compaction Problem at New Stadium.)

For the landscaper or home gardener, fine and medium grades of perlite will promote drainage and eliminate soil crusting in heavy clay soils. In addition, plant roots will more easily penetrate the perlite/soil growing media. Most importantly, the lawn will hold much more water and not have to be watered nearly as much (see Expanded Perlite for Turf and Landscaping.)

Shrubs, Trees, and Landscaping---Fine and medim grades of horticultural perlite is very effective in growing shrubs, trees, and in other landscaping applications. In addition to retaining water which is vitally important in light of the growing shortage of water in many parts of the world, perlite also aerates the growing medium. As landscaping applications are usually permanent in nature, fine and medium grades of horticultural perlite are the ideal choice since they do not rot or otherwise decompose, and perform their water conservatin/aeration roles for the life of the planting.

For more information about these uses of perlite and vermiculite, please call or contact us at:

The Schundler Company 150 Whitman Avenue Edison, New Jersey 08817
(ph)732-287-2244 (fax) 732-287-4185
www.schundler.com
email: info@schundler.com

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Research Report

PERLITE

An Evaluation of Finer Perlite Grades

PLANT GUIDE

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PERLITE GRADATION AND PEAT/PERLITE MIXTURES

Original research by
O.A.Matkin
Soil and Plant Laboratory
Santa Ana, California

Tradition has dictated the use of medium or coarse grades of perlite in propagating media and in planter mixes. Peat moss is a common component in both types of mixes. Using several grades of perlite in varying proportions with peat moss provides an opportunity to compare the suitability of different perlite grades for horticultural use.

Tests were conducted using three different grades of perlite: fine, medium, and coarse. Fine grades of horticultural perlite usually are smaller than 1 mm in size and fall largely in the USDA's sand classification range of coarse and very coarse; coarse grades of horticultural perlite are usually larger than 1mm (often larger than 2mm) and can fall in the USDA's sand classification range of fine gravel.(For more information about perlite gradations, read our guide on Standard Gradations of Perlite---Fine, Medium, Coarse Defined.)

Tests of peat/perlite mixtures were carried out in 1974 and repeated in 1977. Of course, the peat moss source was different for each series of tests. As a result of differences in peat moss quality, all data are not completely comparable but do indicate general trends.

Commercial Greenhouse Production with Perlite and Vermiculite Soil Mixes

Lowest Wet Bulk Density With Perlite Coarse Grades

Both perlite and peat moss are known to be light in weight with dry bulk density values in the range 5.1 to 8.6 lbs/cu.ft. The higher the proportion of peat moss, the lower the dry bulk density.

Since the grower or user is normally working with moist material, wet bulk densities are of more practical interest. Lightweight growing media in containers are much less expensive to handle and ship.

The lowest wet bulk density obtained was 23.3 lb/cu.ft. for a mixture of 25% peat and 75% coarse perlite. The highest wet bulk density was 38.1 lb/cu.ft. for a mixture of 75% peat and 25% fine perlite.

The difference between the average dry bulk density and average wet bulk density is 26.1 lbs/cu.ft. or slightly more than 3 gals. of water per cu.ft. of mix.

To fully appreciate the wet density values of these mixtures, it should be noted that wet bulk densities of soils and sands run well over 100 lb/cu.ft.

Since finer grades of perlite have far more surface area and will hold far more water, it is logical that the highest wet bulk densities occurred with fine grades of perlite and the lowest wet bulk densities occurred with coarse grades.

Different proportions of perlite to peat had the least amount of influence with the finer grades of perlite, whereas higher proportions of coarse perlite consistently lowered the wet bulk density of the mix. It therefore appears that the finer grades of perlite have water holding capacities similar to peat moss, and coarser grades of perlite provide more aeration and have lower water holding capacities.

Absence of Air or Water Is Injurious

In any growing medium, the space not occupied by solids constitutes pore space which is utilized partially for holding water and partially to provide air so plant roots can funtion normally. An absence of either is injurious to the growing plant.

The higher the total porosity, the greater the potential to provide water and air. The smaller the pores,the greater the water retenton and the lower the air supply. Conversely, the larger the pores, the less water retained and the greater the amount of air space in the mixture.

Peat moss is well known for high porosity and perlite has a similar property. The effect of perlite grade is one of increasing porosity as the gradation becomes coarser. Differences in peat/perlite mixes are not large but are consistent in this respect.

Another consistent trend is for total porosity to increase modestly as the proportion of peat moss increases regardless of perlite grade. Differences are not great but indicate slightly higher total porosity for the peat mosses used compared to the perlite sources.

Moisture Retention is Substantial

Summary and Conclusions

Perlite and peat moss have physical properties in the same order of magnitude. Perlite however can be produced uniformly whereas peat moss is likely to vary. Low density media can be produced with all grades of perlite and peat moss in any desired porportions. Highest moisture retention occurs with the finest perlite grades which is comparable to peat moss in this property. Coarser perlite grades have proportionally lower mosture retention and higher free prorosity compared to peat moss. Aeration characteristics are excellent for all grades of perlite/peat moss mixtures and for all component mixes. These data confirm what most growers have known for many years---peat moss/perlite combinations provide outstanding physical properties for propagation and growing media.

In 1974 and 1977 when these tests were conducted, what may not have been appreciated by many growers was the practicality of using finer and finer grades of perlite for many horticultural applications and mix designs---nor could anyone have anticipated the successful use of 100% fine perlite as is being done in several commercial operations in the world today.

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The quantity of water held in a growing medium is best measured on a volume percentage basis. In testing, the lowest water retenton was found in mixtures of 75% coarse perlite and 25% peat, and the highest water retention occurred in mixes with 25% fine perite and 75% peat.

The general trend is for moisture retention to decline as perlite particle sizes become coarser and to increase as peat moss percentages increase. Overall, the differences are not of high magnitude and the quantity of water held in all cases is substantial compared to sand or soil.

Oxygen is Essential

After saturating a growing medium with water and after drainage has ceased, there will be a portion of the total pore space occupied by air. This is the "free porosity" or "air space after drainage." Since oxygen is esssential to healthy root activity, it is important that this value be of sufficient magnitude. In field soils, values of 5% or more are usually considered favorable. In container media, values of 15% to 25% are desirable.

In the tests that were conducted, the lowest free porosity was 21% for the mixes with 75% fine perlite and 25% peat moss, and the highest was 46.1% for the mixes with 75% coarse perlite and 25% peat.

The finer grades of perlite do not consistently affect the free porosity when peat moss fractions are high. The coarser grades of perlite produce extra high free porosity when the proportion of perlite is high and this value declines as the proportion of peat moss increases.

Since all values are in the 15% or higher range, it must be concluded that no problems from inadequate aeration would be expected in any of the blends tested. This suggests that the best mix would be that with the highest water holding capacity. The exception would be in propagation where high mist frequency might require a maximum free porosity and minimum moisture retention. Under these circumstances, the best compromise might be to use 100% coarse perlite as the propagating medium.

OPTIMIZATION OF PERLITE PROCESSING FOR UTILIZATION IN NEW BUILDING MATERIALS

Project Acronym: **Project status:** Completed

Coordinator

Organization name: KNAUF GYPSOPIIA ABEE

Contact person **Address**

Name: KATANOPOULOS (Mr.) PLANT IN STANOS AMPHILOCHIA

Description

Objective:

Achievements:
The main results of the project are:
Assessment of the geology, petrology and mineralogy of crude, raw and expanded Greek perlite. Formulation of relevant data bank with perlite property variation in terms of expansion conditions.
Optimization of expansion process of perlite: Development of an advanced, user-friendly computational tool for the prediction of combustion characteristics, of expansion process and of expanded perlite properties in terms of operating conditions in industrial furnaces. Verification experiments have been performed at three industrial furnaces and a prototype small-scale perlite expansion furnace, designed, constructed and operated for the purposes of the project.
Optimisation of the hydophobisation process of perlite. A Numerical code predicting deposition and coating efficiency of spraying agent on expanded perlite particles has been developed and applied to an industrial expansion furnace. Prototype, laboratory and industrial scale hydrophobisation system has been developed and evaluation experiments have been performed.
Following a number of test productions, the following products, based upon the gypsum-expanded perlite combination, have been successfully developed and produced using properly expanded perlite meeting the necessary requirements, with respect to granulometry, density, stability (compaction resistance) and purity from sinks:
Fire and acoustic boards
Hand applied plasters
Projection plasters
Extruded gypsum products
Some of these products have already been commercialised by the industrial partners.

General information:
The proposed research is directed at developing and testing new methodologies to improve the control and efficiency of the expansion and hydrophobization processes of perlite. It is proposed to use the optimised expanded perlite as light-weight aggregate, for the development of new

building materials with improved density, thermal insulation and fire resistant properties. For building material applications perlites of uniform density, increased hardness and well controlled size distribution are required and cannot be produced without optimisation of the expansion and hydrophobization processes. The application of perlite in building materials either alone or together with other compounds, such as plaster and glass fibres has not been systematically investigated. Three major inter-disciplinary work packages will be performed:

(i) Raw Perlite Appraisal, Mathematical Modelling and Experimental Verification of the Expansion Process of Expanded Perlite
(ii) Improvement of the Hydrophobization Process of Perlite
(ii) Further and New Uses of Expanded and/or Hydrophobized Perlite in Building Materials.

It is estimated that the production price of expanded perlite can be reduced about 10% by optimising the expansion and hydrophobization processes. New light weight, low density, uniformly coated products will broaden the range of expanded perlite applications. Productivity gains in the order of 15% are anticipated with consequential lowering of unit costs up to 20% and improvement in market share.

Project Details

Start date: 1994-01-01

End date: 1996-12-31

Duration: 36 months

Project Reference: BRE20910

Project cost:

Project Funding: 1500000 EURO

Programme Acronym: BRITE/EURAM 2

Programme type: Third Framework Programme

Subprogramme Area: Mineral processing

Contract type: Cost-sharing contracts

URL:

Subject Index: Industrial Manufacture, Aerospace Technology, Materials Technology

Other Indexes: Ore/Mineral processing

Other participants

Organization: PERLITE HELLAS SA

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Record control number: 22790
Quality validation date: 1994-09-19

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Perlite Quality report; JN Schindler , P Geol. Dated Dec, 16/02

The chemical composition of " K" zone is reported as 71.5% SiO2, 12.2% Al2O3. 3.9% K2O. 2.4% Na2O, 1.3% Fe2O3 and 4.1% hydrated water (Horne, 1994) The K and J zones are calculated in this report to contain 375,000 tonnes of perlite with a weighted average expansion factor of 18.3. The expansion factor of raw perliteand the particle size of expanded perlite are key factors in determining the economics of any perlite resource. The expansion factor can be determined in raw perlite, but particle size is a function of processing. Based on past production expanded perlite from this property is reported to be very good commercial quality (White, 1990, and Gunning and McNeal 1994) Giles and Poling, 1991, report the perlite property produced expanded perlite products to meet the requirements of the horticultural, insulation and lightweight aggregate industries. Further their research indicated expanded perlite from this location, the perlite fines (minus 100 mesh) to be suitable for the manufacture of commercial filter -aids.

Notes from the previous operation found the following. To be successful. # 1 Preheat the crushed rock to 450 degrees F and let it cool for 48 hours. Before making a sized product and putting it through the expander..

#2 They found that they were able to make a better expanded product. (less fines)

Yours truly.
Harold Oppelt
President and CEO

Addition Pictures of the Uncha Lake Perlite

Deposit on CD in pocket